

BOSQUES DEL URUGUAY AFFORESTATION THROUGH HIGH QUALITY TIMBER IN GRASSLANDS PROJECT MONITORING REPORT



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Project Title	Bosques del Uruguay Afforestation through High Quality Timber in Grasslands Project
Project ID	1543
Version	3
Report ID	MRBDUI_v3
Date of Issue	25-August-2022
Project Location	Uruguay, Cerro Largo - Treinta y Tres - Durazno - Florida departments
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GHG Accounting/ Crediting Period	30 May 2012 -29 May 2072; 60-year total period
Monitoring Period of this Report	30 May 2012 – 31 July 2021
History of CCB Status	-
Gold Level Criteria	N/A

Table of Contents

1	Summary of Project Benefits	3
1.1	Unique Project Benefits	3
1.2	Standardized Benefit Metrics	5
2	General	9
2.1	Project Description	9
2.2	Project Implementation Status	15
2.3	Stakeholder Engagement	27
2.4	Management Capacity	42
2.5	Legal Status and Property Rights	46
3	Climate	50
3.1	Monitoring GHG Emission Reductions and Removals	50
3.2	Quantification of GHG Emission Reductions and Removals	73
3.3	Optional Criterion: Climate Change Adaptation Benefits	86
4	Community	86
4.1	Net Positive Community Impacts	86
4.2	Other Stakeholder Impacts	93
4.3	Community Impact Monitoring	94
4.4	Optional Criterion: Exceptional Community Benefits	98
5	Biodiversity	99
5.1	Net Positive Biodiversity Impacts	99
5.2	Offsite Biodiversity Impacts	114
5.3	Biodiversity Impact Monitoring	115
5.4	Optional Criterion: Exceptional Biodiversity Benefits	127
6	Additional Project Implementation Information	127
7	Additonal project Impact Information	127
	Appendicies	128
	Appendix 1: New Project Areas and Stakeholders	128
	Appendix 2: Project Risks Table	128

1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Provide experience of forest planting and sustainable forest management in degraded grasslands in connection to HCV areas	The project aims to improve labor conditions and increase workers' technical capacity in line with sustainable forest management and HCV areas. At present, over 300 workers have been trained on sustainable forest operational activities	4.1.1 and 5.1.3	The project aims to improve labor conditions and increase workers' technical capacity in line with sustainable forest management and HCV areas. At present, over 300 workers have been trained on sustainable forest operational activities
2) Improve the ecological environment of the planted areas and the native forest surrounding the forest plantations	Biodiversity monitoring is a key element in the BDU project. Results have shown that project sites are being categorized with high biodiversity value (2 properties in these first period), according to standardized methodologies.	5.1.1 and 5.1.4	Biodiversity monitoring is a key element in the BDU project. Results have shown that project sites are being categorized with high biodiversity value (2 properties in these first period), according to standardized methodologies.
3) Create net positive benefits to the community and stakeholders of the project based on a comparison with the baseline scenario.	Communities are being benefited with the project activity from multiple points of views. Local business is expected to have increased direct and indirectly because of project activity (hotel, restaurants, garages, etc.). Compared with baseline scenario, there are estimated more than 500 medium to highly qualified job position expected to have been	4.1.1 and 4.3.1	Communities are being benefited with the project activity from multiple points of views. Local business is expected to have increased direct and indirectly because of project activity (hotel, restaurants, garages, etc.). Compared with

	generated (directly and indirectly related to project activity). And survey results show economic impact rating for the project activity is above 70% good to very good during the verification period, while the rating for the impact over well-being of communities showed above 65% good to very good.		baseline scenario, there are estimated more than 500 medium to highly qualified job position expected to have been generated (directly and indirectly related to project activity). And survey results show economic impact rating for the project activity is above 70% good to very good during the verification period, while the rating for the impact over well-being of communities showed above 65% good to very good.
4) Create an economic activity with exceptional community communication and participation throughout the Project lifetime while playing leading role in forestry sector.	Community participation and communications are a key point for the project so constant interaction takes place seeking to maintain a good valuation of the project within the impacted community. No claims or complaints have been received throughout the project lifetime, and the rating for community communication has been above 65% good/very good during this verification period.	4.3.1	Community participation and communications are a key point for the project so constant interaction takes place seeking to maintain a good valuation of the project within the impacted community. No claims or complaints have been received throughout the project lifetime, and the rating for community communication has been above 65% good/very good during this verification period.

1.2 Standardized Benefit Metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	841,868.4tnCO ₂ e	3.2	841,868.4tnCO ₂ e
	Net estimated emission reductions in the project area, measured against the without-project scenario	Not applicable	-	Not applicable
Forest ¹ cover	For REDD ² projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	Not applicable	-	Not applicable
	For ARR ³ projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	2,919 ha	2.1.7	2,919 ha
Improved land management	Number of hectares of existing production forest land in which IFM ⁴ practices have occurred as a result of the project's activities, measured against the without-project scenario	Not applicable	-	Not applicable
	Number of hectares of non-forest land in which improved land management has occurred as a	Not applicable	-	Not applicable

¹ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (VCS Program Definitions)

² Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (VCS Program Definitions)

³ Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (VCS Program Definitions)

⁴ Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (VCS Program Definitions)

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	result of the project's activities, measured against the without-project scenario			
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	336	4.3.1	336
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities	13	4.3.1	13
Employment	Total number of people employed in of project activities, ⁵ expressed as number of full time employees ⁶	336	4.3.1	336
	Number of women employed in project activities, expressed as number of full time employees	13	4.3.1	13
Livelihoods	Total number of people with improved livelihoods ⁷ or income generated as a result of project activities	518	4.1.1	518
	Number of women with improved livelihoods or income generated as a result of project activities	20	4.1.1	20

⁵ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

⁶ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

⁷ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. The Sustainable Livelihood Approach to Poverty Reduction. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	336	4.1	336
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	13	4.1	13
Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	928	4.3.1	928
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	454	4.3.1	454
Water	Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable. However, forestry practices applied in BDU are the latest available technology and practices that prevent the laminar erosion or diminishes the leakage of fertilizers, preventing the translocation of sediments or nutrients into the river, which are used as drinkable water.	-	Not applicable. However, forestry practices applied in BDU are the latest available technology and practices that prevent the laminar erosion or diminishes the leakage of fertilizers, preventing the translocation of sediments or nutrients into the river, which are used as drinkable water.
	Number of women who experienced increased water quality and/or improved access to drinking water	Not applicable	-	Not applicable

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	as a result of project activities, measured against the without-project scenario			
Well-being	Total number of community members whose well-being ⁸ was improved as a result of project activities	10,298	4.1.3	10,298
	Number of women whose well-being was improved as a result of project activities	5,354	4.1.3	5,354
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation, ⁹ measured against the without-project scenario	4,796.9ha	5.1.1	4,796.9ha
	Number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a result of project activities, ¹¹ measured against the without-project scenario	3 E IUCN species	5.1.1 and 5.3.1	3 E IUCN species

⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

⁹ Biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation.

¹⁰ Per IUCN's Red List of Threatened Species

¹¹ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

The proposed CCB-VCS project activity hereafter, “BDU project”, is an afforestation project on extensive cattle grazing pastures areas. It takes place in the Central East region of Uruguay (the host country) using exotic species (*Eucalyptus grandis* and *dunnii*) aiming to produce, as a priority product, high quality logs for sawmill industry and secondarily, biomass for energy and/or pulp. All practices follow FSC standard (although not all farms are certified) for sustainable forest management, while enhancing biodiversity conservation by increasing the connectivity of forest and generating income and job opportunities for local communities/ rural areas of central east Uruguay.

The BDU project is a subgroup of lands within BDU trust fund total plots. BDU project area corresponds to 2,919ha effectively planted in 11 plots (10 entire plots and 15% of the 11th one) of the 14 properties of BDU trust fund. This area has slightly changed since the start of the project due to cartographic adjustments from 3,017ha to 2,919ha.

Plantation has been completed in five years: 2012 until 2016. *Eucalyptus grandis* occupies 65.4% of the planted area within the project boundary and the remaining 34.6% is occupied by *Eucalyptus dunnii*. *Eucalyptus grandis*, with an 18-year rotation period, had an initial planting density of 1,100 - 650 trees/ha (seed and *Eucalyptus grandis* clone respectively), and thinning took place in year 2 (the next one expected in year 9 and 14 leaving 200 trees/ha). Whereas *Eucalyptus dunnii* had an initial planting density of 1,450 trees/ha, with no pruning or thinning in its 10-year rotation period. For *Eucalyptus dunnii* plantations a coppicing management is practiced to obtain a second rotation (10 years each). For *Eucalyptus grandis* only one rotation (18 years) will be carried out. Once these 18-year cycles are finished new ones will be started by replanting the area and repeating the process until a project lifetime of 100 years is reached.

The project sequesters CO₂ through forest plantation in grassland areas, generating net anthropogenic removals by sinks. The total GHG benefit for the length of the project is 50,412,527 tCO₂e, when divided by 60 years results in an LTA of 840,209 tCO₂e. Meanwhile, during this first verification period, the total GHG sequestration reached 841,868.4tCO₂e, exciding LTA value slightly. GHG removals were monitored annually (as from year 3) using permanent plots. No events have impacted the GHG removals during this verification period.

The project implementation did not and will not cause any displacement of activities. The only activity on the project area prior to the start date was extensive grazing by beef cattle, which continues to occur after project start. This can be audited by the verification team during onsite visits. It was also stated and validated in the PD that there was no need for a leakage management plan either for leakage mitigation options. The information regarding aspects related to the non-permanence risk of the project, is presented at the “Non Permanence Risk Report”. The potential non-permanence of stored carbon was considered by these risk analysis and buffer determination, and by the fact that a significant fraction of the sequestered carbon will be stored in long-lived products which will not be accounted for.

The project has contributed to the sustainable development of Uruguay, and specifically the project zone by:

- Increasing labor demand from the local population
- Adding value to wood products and diversifying the regional production leading to higher economic revenues for the region
- Promoting an integrated management scheme with the ecosystem, achieving HCV conservation
- Creating and developing a new mechanism to finance projects in the forestry sector

2.1.2 Project Category and Activity Type

- Sectorial scope: 14 (Agriculture, Forestry, Land Use)
- Category: Afforestation, Reforestation and Revegetation (ARR)
- Activity type: establishment of forests on land that had previously been under grassland for more than 50 years
- BDU Project is a single GHG Project.

2.1.3 Project Proponent(s)

Organization name	Agroempresa Forestal S.A. (AF)
Contact person	Dan Guapurá
Title	Country Manager
Address	Juncal 1437 Of. 501; Montevideo - Uruguay
Telephone	+598 2916 2020
Email	dguapura@af.com.uy

2.1.4 Other Entities Involved in the Project

Organization name	EF Asset Management (EFAM)
Role in the project	Trustee of Bosques del Uruguay Trust Fund
Contact person	Alfredo Poggi
Title	Partner
Address	Juncal 1392
Telephone	+598 29001000
Email	efam@ferrere.com

2.1.5 Project Start Date (G1.9)

30/05/2012

Is the date when the activities that lead to the generation of GHG emission removals (weed control in “Don Ramón” plot) were first implemented.¹²

2.1.6 Project Crediting Period (G1.9)

Project crediting period: 60 years (although the project lifetime will be of 100 years)

Start date: 30/05/2012

End date: 29/05/2072

2.1.7 Project Location

BDU Trust fund total area covers a total of 9,568.1 hectares of lands located in the Central East region of Uruguay distributed in 14 plots along the departments (counties) of Florida, Durazno, Cerro Largo and Treinta y Tres. The BDU project is a fraction of BDU trust fund total area that comprises 10 entire plots and a part of the 11th one of the 14 plots. This is clearly seen in the table below wherein the names, areas and unique geographical locations of the plots are detailed:

Plot No.	Plot Name	Department	Geographic location (Center of each land)		Total of Trust (ha)	Area BDU Fund (ha)	Total effectively planted area within BDU VCS project boundary (ha)
			Latitude	Longitude			
1	Don Ramón	Cerro Largo	32°36'35"S	54°25'80"W	805.98		406.73
2	Arévalo	Cerro Largo	32°34'15"S	55°04'49"W	710.06		490.31
3	María Albina	Treinta y Tres	33°25'14"S	54°40'51"W	590.41		390.52
4	Las Rengas1	Durazno	33°02'00"S	55°12'41"W	358.91		271.40
5	Las Rengas 2	Durazno	33°00'25"S	55°12'21"W	196.85		125.44
6	Sequeira	Treinta y Tres	33°06'20"S	54°20'02"W	239.66		164.71

¹² Bill from Guyunusa & Cia. Ltda. to BDU that evidence the works at Don Ramón plot. Available to the VVB at validation.

7	Cañada Brava	Cerro Largo	32°49'31"S	55°16'03"W	438.91	217.22
8	El Cerco	Durazno	33°04'25"S	55°11'19"W	203.61	125.97
9	Puntas del Cordobés	Durazno	33°02'18"S	55°07'42"W	670.89	447.18
10	La Yeguada	Treinta y Tres	32°58'43"S	54°59'44"W	110.53	85.16
11	Mi Generala	Florida	33°47'49"S	55°29'21"W	2,320.58	194.13
12	Caputti	Cerro Largo	32°49'62"S	55°16'37"W	518,84	-
13	Reboledo	Florida	33°58'02"S	55°29'38"W	837,5	-
14	Don Chico	Florida	33°26'13"S	55°22'10"W	1.565,38	-
TOTAL (ha)					9,568.10	2,918.8

The map below illustrates the lands within Uruguay and the project zone¹³

¹³ KML files with the coordinates of each land are provided to the verification entity.

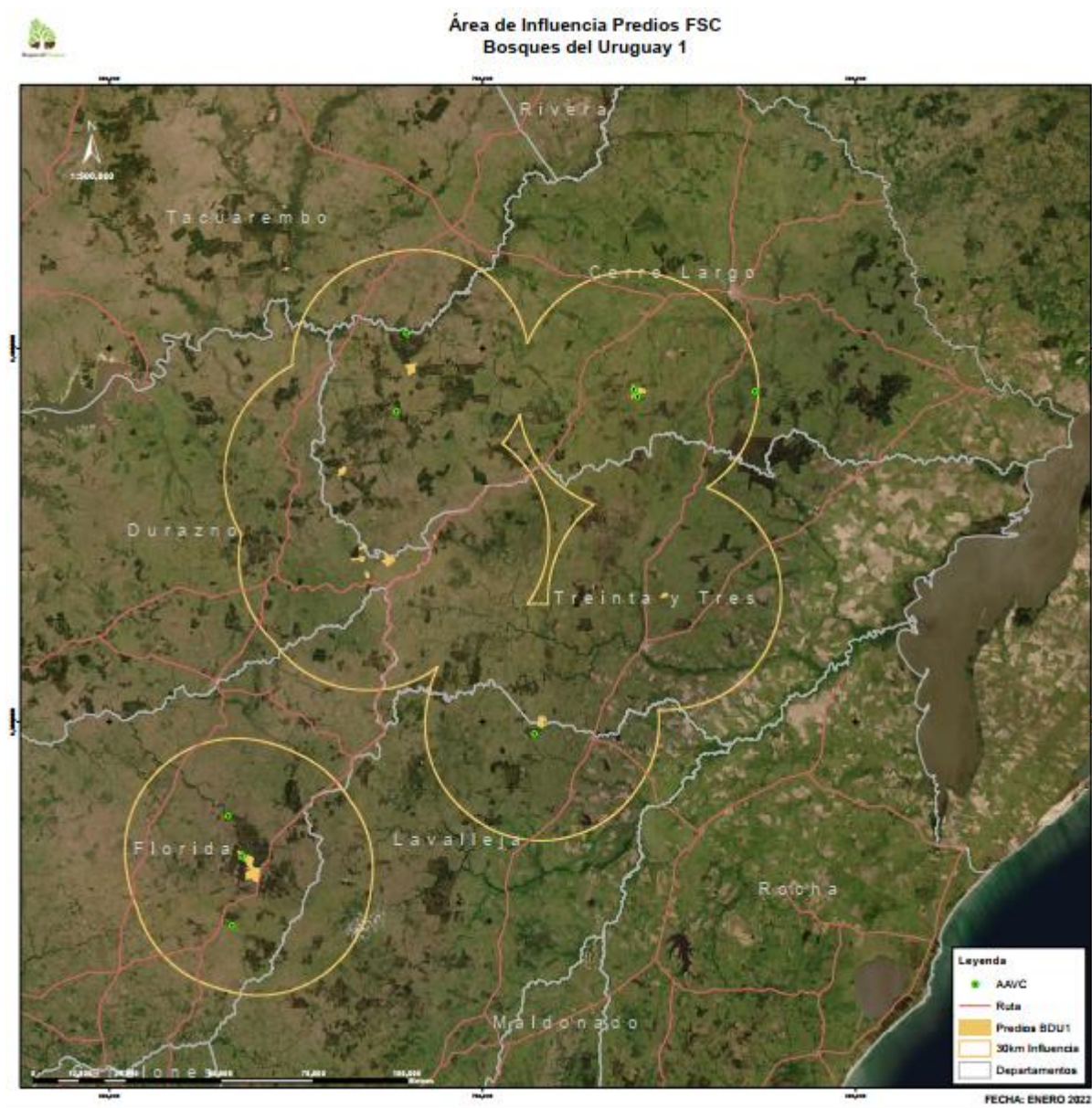


Figure 1. Project zone and properties of BDU project

2.1.8 Title and Reference of Methodology

The following methodology and tools referenced in it are applicable to the present project activity:

- “AR-ACM0003: Afforestation and reforestation of lands except wetlands”, Version 02.0
- “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities”, Version 01
- “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities”, Version 03.1

- “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities”, Version 04.2
- “Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities”, Version 01.1.0
- “Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity”, Version 2.0
- “Calculation of the number of sample plots for measurements within A/R CDM project activities”; Version 2.1.0

Note: the tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is not applicable to the present project activity since biomass burning practices will not be part of the project activity.

2.1.9 Other Programs (G5.9)

Bosques del Uruguay Afforestation through High Quality Timber in Grasslands Project is not participating in other GHG Program other than CCB and VCS

2.1.10 Sustainable Development

The Uruguayan government has approved its first Nationally Determined Contribution¹⁴ by Executive Decree number 310 on November 3rd, 2017, in the framework of the Paris Agreement. It establishes a conservative goal to maintain 100% of the native forest area of year 2012, forest plantation net area under management of year 2015 and shade and shelter forest plantation of year 2012. In a more optimistic scenario, conditional on additional specific means of implementation, the government's goal is to increase 5% in the native forests area of year 2012 and 25% in the shade and shelter forest plantation area of year 2012, including silvopastoral systems. BDU will contribute to achieve the government's goal by the continuation of the project.

At the same time, Uruguay is among the 150 countries that adopted the 2030 Agenda for Sustainable Development, including the Sustainable Development Goals (SDGs)¹⁵ at the United Nations Sustainable Development Summit on 25 September 2015. The 17 SDGs aim to end poverty, hunger and inequality, take action on climate change and the environment, improve access to health and education, build strong institutions and partnerships, and more.

In this regard, BDU project contributes to the achievement of the country's goals defined to reach the SDGs by:

- Increasing labor demand from the local population: the common activity developed in the project region is cattle breeding. Besides the forestry plantation activities, the project will maintain the cattle rising both on the unplanted area and under its plantations from year 2 to the end (many local researchers support cattle

¹⁴https://www.gub.uy/ministerio-ambiente/sites/ministerio-ambiente/files/2021-04/Uruguay_Primer_Contribucion_Determinada_a_nivel_Nacional_0.pdf

¹⁵ <http://www.eg.undp.org/content/undp/en/home/mdgoverview/post-2015-development-agenda/>

breeding inside forests as animals suffer less temperature stress and for storm protection). This will generate a much larger demand of labor when compared to these activities being developed separately.

- Adding value to wood products and diversifying the regional production will lead to higher economic revenues for the region.
- Promoting an integrated management scheme with the ecosystem. In this sense, it has already obtained the necessary approval from the DINAMA (National Directorate of Environment)¹⁶ and the plantations are certified under the FSC standard.
- Accompanying the community needs towards development with permanent communication channels to identify activities' impacts and actions needed.
- Creating and developing a new mechanism to finance projects in the forestry sector.
- Generating net anthropogenic CO₂ removals by sinks.

BDU is a FSC certified project ¹⁷ and thus, social, economic and environmental impacts are monitored. Please, refer to section 4.3 and 5.1 below for further information about BDU community and biodiversity monitoring system (respectively)^{18 19}.

The generation of net anthropogenic CO₂ removals by sinks will be monitored as part of the present CCB and VCS project.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (G1.9)

Date	Milestone(s) in the project's development and implementation
2011-2012	Forest projects presented to the Forest Directorate and EIA to the Environment Office
May 30 th 2012	First forest plantation were established over degraded grassland
Aug 20 th 2015	First Annual Biodiversity survey report completed
Sep 2014	Silvicultural activities started (pruning and thinning)
Dec 18 th 2015	Project was certified FSC
Nov 2015	Community activities are formalized

¹⁶ By the time of submission of this Monitor Report the Ministry of Environment was recently created (July 2020), replacing all legal responsibilities of the DINAMA.

¹⁷ FSC certification report and certificate available for the VVB.

¹⁸ BDU Forestry management plan public summary, which includes the monitoring system, available at: https://www.bosquesdeluruguay.com/media/2022/03/GAF_PM_-_Resumen_Publico_del_Plan_de_Manejo_Grupo_AF_2021.pdf

¹⁹ 2021 Monitoring public summary available at: https://www.bosquesdeluruguay.com/media/2022/03/Resumen_publico_de_Monitoreo_2021.pdf and previous ones available to VVB.

Aug 17 th 2017	Project was VCS validated
Apr 2021	First clear-cut harvest for <i>Eucalyptus dunni</i>
Sep 2022	Project seeks CCB validation and first VCS verification
Sep 2030	First clear-cut harvest expected for <i>Eucalyptus grandis</i>
May 2072	End of project crediting period

2.2.2 Methodology Deviations

There are no methodology deviations.

2.2.3 Minor Changes to Project Description (Rules 3.5.6)

There are no community of biodiversity changes to the project description

2.2.4 Project Description Deviations (Rules 3.5.7 – 3.5.10)

A) Project boundary:

Project area has slightly changed since project description, due to cartographic adjustments, from 3,017ha to 2,918.8ha. These changes took place mainly in Don Ramón and Mi Generala property as it can be seen in the table below (the decimal variation correspond to rounding numbers in validation table):

Plot No	Plot Name	Total Area of BDU Trust Fund at validation (ha)	Area at validation (ha)	Total effectively planted area at verification (ha)	Difference (ha)	Difference (%)
1	Don Ramón	806.49	468	406.73	-61,27	-13,09%
2	Arévalo	696.31	490	490.31	0,31	0.06%
3	María Albina	590.61	391	390.52	-0,48	-0.12%
4	Las Rengas1	358.88	272	271.4	-0,6	-0,22%

5	Las Rengas 2	197.15	125	125.44	0,44	0,35%
6	Sequeira	239.83	171	164.71	-6,29	-3,68%
7	Cañada Brava	438.65	223	217,22	-5.78	-2.59%
8	El Cerco	203.58	126	125.97	-0,03	-0,02%
9	Puntas del Cordobés	670.83	447	447.18	0,18	0.04%
10	La Yeguada	110.54	85	85,16	0.16	0.19%
11	Mi Generala	2,319.75	217	194,13	-22.87	-10,54%
12	Caputti	518.84	-	-	-	-
13	Reboledo	837.5	-	-	-	-
14	Don Chico	1,565.38	-	-	-	-
TOTAL (ha)		9,555.34	3017	2,918.79	-95.6	3.17%

B) Forest cultural activities:

Eucalyptus dunnii rotation period is updated and extended to 10 years, from 9 years in the project description, reducing costs and in line with cultural forestry activities in the area.

Planting stocking densities are corrected from 1333 and 1100 to 1450 trees per hectare for *Eucalyptus dunnii* and 1100 or 650 trees per hectare for *Eucalyptus grandis*, depending whether the origin is seed or clone. At the same time, for *Eucalyptus grandis*, pruning interventions have been adjusted in more detail as follows:

Pruning	Height	Age	Trees/ha
First	3 m	1.5-2	500-550
Second	6 m	3	320-350
Third	9 m	3.5-4	250
Fourth	11 m	4-5	250

Moreover, in the case of *Eucalyptus grandis*, again, more detail is included regarding whether it is seed origin or clone: three thinning interventions are performed in the case of seed, and two interventions when it is a clone. The first thinning, carried out at year 2, removes half of the stocked volume but it does not generate revenues (waste thinning). Its goal is to eliminate the competence and remove the bad shaped and weak individuals and only applies when it is seed. In the second thinning, between year 7-8, all harvested trees go for pulp industry leaving a total of 350 individuals per ha. Finally, in the third thinning (year 11-12) about a third becomes saw timber and two thirds pulpwood. This last thinning leaves a final density of 250 trees/ha of the highest quality.

C) Long-term Average:

Based on this updates, the ex-ante LTA value was updated in order to include changes in area (ha), extension in rotation period (*for dunnii*), growth rates and update Litter carbon from a value of 0,03 to 0,04 as it was wrong.

This ended in an increase of GHG benefits from 41,396,999 tCO₂e (when divided by 60 years results in an LTA of 689,950 tCO₂e) to 50,412,527 tCO₂e and an LTA of 840, 209 tCO₂e.

Years	Estimated GHG emission reductions or removals (tCO ₂ e)
2012 (from 30/05/2012)	0
2013	-39.962
2014	-6.331
2015	86.425
2016	128.813
2017	203.356
2018	211.840
2019	184.678
2020	94.515
2021	70.004
2022	139.900
2023	25.092
2024	38.642
2025	50.749
2026	83.823
2027	118.701
2028	71.381
2029	101.772
2030	157.890
2031	-812.334
2032	-723.890
2033	-117.042
2034	9.558
2035	91.366
2036	203.356
2037	211.840
2038	184.678
2039	94.515
2040	70.004

2041	139.900
2042	25.092
2043	38.642
2044	50.749
2045	83.823
2046	118.701
2047	71.381
2048	101.772
2049	157.890
2050	-812.334
2051	-723.890
2052	-117.042
2053	9.558
2054	91.366
2055	203.356
2056	211.840
2057	184.678
2058	94.515
2059	70.004
2060	139.900
2061	25.092
2062	38.642
2063	50.749
2064	83.823
2065	118.701
2066	71.381
2067	101.772
2068	157.890
2069	-812.334
2070	-723.890
2071	-117.042
2072 (until 29/05/2072)	-36.352
Total estimated ERs	840.209
Total number of	60
Average annual ERs	14.003

D) Monitoring

In terms of monitoring, parameter R_j will be estimated using recommended equation taken from the suggested equation from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs" and calculated based on estimated aboveground biomass for each verification period and not a default value for ranges of biomass from Table 3A.1.8 of IPCC GPG-LULUCF 2003. The parameter for "Data and Parameters monitored" changes to:

Data / Parameter	R _j
Data unit	dimensionless
Description	Root-shoot ratio for tree species j
Source of data	Estimation of carbon stocks and change in carbon stocks of trees and shrubs AR Tool 14.

Description of measurement methods and procedures to be applied	Default values from IPCC guidelines for Eucalyptus in temperate forest according to above-biomass (t/ha): <50= 0.45 51-150= 0.35 >150 = 0.2 For ex-post estimations, R_j will be estimated using the recommended equation taken from the suggested equation from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs" and calculated based on estimated aboveground biomass for each verification period and not a default value for ranges of biomass
Frequency of monitoring/recording	Before every verification event.
Value monitored	0.20 to 0.45 (ex-ante) / varies for ex-post estimations
Monitoring equipment	N/A
QA/QC procedures to be applied	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, are applied.
Purpose of the data	Calculation of project emissions.
Calculation method	$R_j = \frac{e^{(-1.085+0.9256 \times \ln b)}}{b}$ Where B is aboveground biomass content (t.d.m./ha). The aboveground biomass will be calculated per verification period.
Comments	For ex-post estimations, R_j will be estimated using the recommended equation taken from the suggested equation from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs" and calculated based on estimated aboveground biomass for each verification period.

E) Monitoring Plan

In addition to the documentation mentioned during validation, AF has a Forest Inventory Manual in place, which defines step by step the process for plantation growth monitoring which is used to communicate processes to contractors involved in the forest inventories.

Data measured by contractors is sent through email to AF, in charge of conducting a review analysis. All data collected will be archived for a period of at least two years after the end of the last crediting period of the project activity.

- **Stratification**

Stratification was first defined considering the soil types (Coneat Groups 2, 8, and mixture of 8 & G03 and 2 & 8 & G03 unified based on main participation under 2 and 8); age class (plantation date 2012, 2013, 2014, 2015 and 2016); and species planted (*Eucalyptus grandis* & *Eucalyptus dunnii*). Total project area will be divided into 13 stratum.

Current stratification could suffer subdivisions or merges in the case unexpected disturbances occur or insignificant intra-stratum variability is detected in the annual variation in carbon pools (e.g: forest fires).

- **Sampling**

Due to the application of thinning, forest stands in this project have a low number of trees per hectare, tending to have a few large trees per hectare as the stands get older, and uniformly distributed. Thus, taking into consideration the project-specific conditions and the IPCC guidance, circular plots of 300 m² have been selected for monitoring of stratum with *Eucalyptus dunnii* (not thinned, higher density throughout the rotation) and 800m² for stratum with *Eucalyptus grandis*, instead of the 200 and 400m² plots reported during validation. At the same time, permanent plots are visibly marked but no special treatment is received.

Permanent sampling plots are used to measure and monitor changes in carbon stocks from the most relevant carbon pools over the time. These are considered to be more efficient for estimating changes in carbon stocks by filtering out any variance due to plot effect. The plots are located with GPS and they will be prevented from being deforested over the crediting period. At the same time, permanent plots, although visibly marked, did not receive any special treatment.

The number of sample plots was initially estimated according to the “Calculation of the number of sample plots for measurements within A/R CDM project activities” tool during validation. The number of sample plots was recalculated after validation in order to reduce the level of error.

This resulted in an increase from 97 to 108 sample plots in the whole project area. Information on number of plots per stratum are detailed below:

Stratum and plots

Species	Year plantation	Soil (CONEAT)	Area (ha)	No plots
dunni	2012	2	283,7	6
	2012	8	97,2	3
	2013	2	351,6	12
	2014	2	67,4	7
	2015	8	73,7	1

	2016	2	136,0	9
grandis	2012	2	647,8	21
	2012	8	312,2	10
	2013	2	745,8	22
	2014	2	53,0	12
	2014	8	75,0	2
	2015	2	26,0	1
	2015	8	49,2	2
	TOTAL			108

- **Mapping**

The technical team does not use Arcgis 10 anymore, so plot grid is done using QGIS or ArcMaps to randomly locate the permanent sampling plots (location is systematic with random start). The map with the location of the sampling plots (geopdf) is loaded on the GPS receptors used by forest inventory crews, usually AvenzaMaps app, so that they can reach the plots accurately.

- **Measurements**

Further information on QA/QC, calculation method and monitor equipment was included in the parameters monitored and parameters available at validation. At the same time parameters measurements is detailed below:

Quality assurance and Quality control

Although not considered a deviation further information on QA/QC process is included in the present document in section 3.1.3 stating:

Once field measurements have been collected in the field, the contractor sends them by email specifying the type of inventory carried out, establishment surveyed, number of plots and location in kmz format. It is important to clarify that all those doubts or modifications that were carried out in the field are clarified in the column called "observations".

All the information sent is reviewed by the head of inventories. In case of finding any inconsistency or doubt, a field check is performed. Once the data has been reviewed, it is processed using the data processing system Caliper [<https://webapp.avlchile.cl/caliper/caliper.dll>]. It is a software for processing forest

inventories that calculates dasometric variables and delivers a cut of the forest according to the defined products. In addition, it has a module called "Validator", which allows a review of the consistency of the data, detecting possible inconsistencies in the values that could affect the results. In case of detecting inconsistencies, these are analyzed and evaluated prior to processing.

F) Biomass estimation

The Vtree equation used for verification was not that reported during validation suggested by Rachid Casnati et al²⁰ ($v = 0.00003242 * DBH^{1.804} * H^{1.178}$), but the widely used *smalian* volumetric equation using data from a regression equation by Bruce et al. (1968)²¹, extensively used in forestry sector.

The parameters for the regression equation are obtained from studies conducted within the project area, farms owned by BDU and neighboring companies, with variables derived from a data set of more than 50 trees and in line with the conditions stated in A/R Methodological Tool "Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities" V. 1. Information on the procedures are detailed in the Agroempresa Forestal Forest Inventory Manual, section 11²².

The equation and parameters used by species are as follow:

$$dwb_{(b)}^2 / DBHwb^2 = b_1 X^{1.5} + b_2 (X^{1.5} - X^3) DBHwb + b_3 (X^{1.5} - X^3) HT + b_4 (X^{1.5} - X^{32}) HT DBHwb + b_5 (X^{1.5} - X^{32}) HT^{0.5} + b_6 (X^{1.5} - X^{40}) HT^2$$

Where,

$dwb_{(b)}^2$	=Diameter (cm) without bark, measured at trunk height (m)
DBHwb	=Diameter (cm) with bark, measured at 1,3 mts from soil
HT	=Total height (m)
h_j	=Height (m) from soil till diameter d_j ($j = 1, \dots, n$)
X	=(HT – h_j) / (HT – 1,3)
b_i	=Parameters to be estimated ($i=1, \dots, 6$)

Where, parameters to be estimated for each species are²³:

	<i>Eucalyptus grandis</i>	<i>Eucalyptus dunni</i>
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²⁰ Volume and Taper Equations for *P. taeda* (L.) and *E. grandis* (Hill ex. Maiden) Agrociencia Uruguay vol.18 no.2 Montevideo dic. 2014. Rachid Casnati Cecilia, Mason Euan G, Woollons Richard, Resquin Fernando. http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S2301-15482014000200006

²¹ BRUCE, D., R.O CURTIS, C. VANCOEVERING. 1968. "Development of a system of taper and volume tables for red alder", For. Sci. 14(3): 339-350.

²² Forest Inventory manual and associated information available for VVB during verification on request.

²³ A large set of data is available, so the parameters value may vary according to the area involved or project. Detail to be discussed with VVB during verification.

<i>b1</i>	<i>0.88612</i>	<i>0.79307</i>
<i>b2</i>	<i>-0.01139</i>	<i>-0.01139</i>
<i>b3</i>	<i>0.01628</i>	<i>0.01645</i>
<i>b4</i>	<i>-0.00008</i>	<i>-0.00002</i>
<i>b5</i>	<i>-0.00137</i>	<i>0.00272</i>
<i>b6</i>	<i>0.00004</i>	<i>-0.00006</i>

The universal volumetric equation by smalian used is:

$$V_{tree} = DBH \cdot DBH \cdot 0.785 \cdot H$$

Where,

V_{tree}	= Total volume without bark (m3)
DBH	= Diameter (cm) extracted from Bruce et al. equation
H	= Height (cm) equal to 1cm

The next step is to add each section calculated and applied factor to include total volume with bark

2.2.5 Grouped Projects

Not applicable as BDU is not a grouped project.

2.2.6 Risks to the Project (G1.10)

Uruguay is one of the countries in the world with lowest risks of natural disasters. This small Nation is home to few, if any, natural disasters. There is occasional flooding, but not the sort of thing that makes international headlines for its massive destruction. There are no earthquakes, hurricanes, volcanic activity, etc. There are also no nuclear plants in the country. The main risks identified include:

- Natural: fire, diseases and insects, wind and frost
- Human-induced risks: water and soil contamination due to agrochemicals use, natural and artificial habitats affected.

Human-induced risks and impacts are considered of low significance in the Environmental Impact Assessment due to the mitigation measures in place to deal with them. No negative impacts to climate and atmosphere were identified due to the project.

All project risks are detailed in Appendix 2 in the Project Risks Table.

2.2.7 Benefit Permanence (G1.11)

Creation of employment is one of the main social benefits of the project. Typically, an extensive livestock production system employs 2.3 persons every 1,000 ha²⁴. BDU project is expected to multiply that figure by more than 6. Beyond an increased number of jobs, the project is expected to contribute to the development of the region and the country pursuant the priorities defined by Uruguayan government (promotion of small family businesses, increase in exports, eradication of rural poverty, incorporation of technology, increased nationally added value, development of new productive chains and geographic decentralization of development) as follows. BDU project activity will generate several job opportunities, creating nearly 350 job positions when the sustainable production is reached. The vast majority of employees will be hired by contractors. The majority of the outsourced contractor companies currently working with BDU, are registered in Uruguay as “PYMES” (small and medium sized companies), mostly family companies hiring local workers.

Most of the production of BDU (wood, meat and carbon credits) will have the international market as the final destination. The main contribution of BDU project activity to the eradication of rural poverty will be through the generation of high quality and stable employment, in a region of Uruguay with elevated levels of poverty. A study by Carámbula and Piñeiro (2006)²⁵, demonstrates that forestry projects oriented to the production of high quality logs, generates high positive impacts in the eradication of poverty in rural areas and reverting the process of internal migration to big cities. Another study by CPA Ferrere²⁶ done in 2017, informed that the total number of direct employees per hectare in forestry is 32 employees every 1000 hectares, while in beef production, the number of employees every 1000 hectares is 6²⁷.

The project incorporates the best available and affordable technology for optimizing wood productivity and quality through the selection of seeds, site preparation, plantation, weed and pest control, forest management and wood harvesting and logistics, and achieving sustainability objectives. BDU has a program for applied research, continuously testing various practices in order to achieve continuous improvement over time and collaborates with other companies (within the *Sociedad de Productores Forestales*) and public institutions in this regard.

BDU project will produce timber that can be used for high-value products. Even though the area of planted forest grew very fast during the last decade in Uruguay, the forest industry did not follow the same trend. Most of these industries are located in the North, West and South regions, where most plantations were established and away from the project site. For the Central East region, the fact of being away from the forest industries and from the export ports are main reasons to explain the limited development of forestry plantations in the area. However, the presence of BDU and of other similar initiatives in the area which have already secured (Guanaré, Posco Uruguay) or are also seeking carbon finance (BDU II and others) may induce in the future the establishment of industries in the region. And even in the case that no industries are developed, the saw logs and veneer logs produced by BDU could be exported through Montevideo

²⁴ San Ramón (2004) Puestos de trabajo en la fase agraria forestal Dirección General Forestal UY

²⁵ Carámbula, M. y Piñeiro, D. La Forestación En Uruguay: Cambio Demográfico y Empleo en Tres Localidades

²⁶ CPA Ferrer website: <https://www.cpaferriere.com/en/>

²⁷

http://www.camaramercantil.com.uy/uploads/cms_news_docs/Informe%20Impacto%20Cadena%20Forestal%20CPA%20Ferrere%2022-11-17.pdf

harbour at prices which will be higher than those that could be obtained by selling pulpwood, which is the traditional wood product exported from Uruguay.

In addition, the forest management adopted by BDU would increase the amount of carbon sequestered by trees, thus increasing the carbon embedded value in wood products.

As it was mentioned above, BDU project will bring about a number of socio-economic benefits that will mostly impact its surrounding area, which is currently one of the less developed ones in the country. This would decentralise economic activity creating a development pole away from Montevideo, and other areas currently concentrating most of the economic activity in the country.

In terms of biodiversity, the fields where Agroempresa Forestal (AF) operates, environmental assessments and impact surveys are carried out by a team of experts and communicated to communities in order to define mitigation actions. Based on the results obtained in these studies and consultation processes, management and monitoring plans have been developed for the restoration of natural systems which may have been affected by previous practices (agricultural, farming, forestry or other activities), the conservation of natural resources and values in the influence areas (flora, fauna, soils and hydric resources) and the prevention or mitigation of environmental impact caused by forestry operations.

Monitoring tasks include, in particular, regular assessments of the effects of forestry operations on the soil, water, pollution, ecosystems, as well as HVC areas impacts. In this line, studies of the fauna are carried out with the purpose of determining the effect of these operations in the species composition and distribution in the area and the possibility of controlling invasive species -such as the wild boar-.

A wide range of ecosystems can be found in several parts of the country, from different types of native forests, wetlands, grasslands, stony fields, among others. BDU carries out a characterization of the environment in each of the facilities locations and assesses the environmental features, flora and fauna, and defines the conservation areas and the necessary measures for their protection.

In "Don Ramón", north of Cuchilla Grande, province of Cerro Largo, there are complex ecosystems of native forests, lowlands, rocky outcrops, with well conserved lands and good connectivity to high conservation value basins, which means it potentially included HCV area. Since 2015, this area has been considered of High Conservation Value since it is an area with exceptional characteristics for tetrapod's conservation.

Since 2015, BDU has been involved in several presentations related to the fauna and flora of our country, based on monitoring reports, including endemic diseases and mitigation actions related to ophidians located in the area, carried out in rural schools for communities.

In summary, among the measures needed and taken to maintain and enhance the climate, community and biodiversity benefits beyond the project lifetime, are:

- Species selected (Eucalyptus) have previously proven to be adapted to the agro-ecological conditions of the project zone.
- Once the forest is harvested, replanting will be performed between existing lines, being the common practice in long rotation forests aiming to produce high quality wood.
- In order to keep production at same levels throughout project lifetime, it will be necessary to fertilize new seedlings with every new plantation.

- All establishments within project area are privately owned by the fund and no ongoing enforcement or disputes have been raised in the past and until now, relating to the protection of the planting area. In addition, the farms are demarcated by fences, and are correctly marked as private land. This limits external risks that could hinder the continuation of the forest when the project is over.
- The financial profitability produced by the project is very likely to get the project owner to extend the project, to continue management practices that protect the credited carbon stocks beyond the length of the project crediting period (100 years).
- In the project area, soil productivity is relatively low, and production of grass is reduced compared to other soils in Uruguay. These soils are categorized, by Law, as “Forest Priority Soils”. Therefore the best production activity to implement over these soils is forestry. The only other production activity that can be done over these soils is extensive livestock production which, as shown in other sections of this report, forestry is by far the best option.
- Protected areas inside the project area will surely be more developed and better preserved than prior to the Project implementation, so it is expected that after project lifetime, these areas will be of much higher interest to communities and stakeholders.

The type of soils where the project was implemented, were categorized by law, as “Forest Priority Soils”. Because of that, the best productive activity to perform there is forestry. This means that the community benefits will be maintained beyond the lifetime of the project mainly because long rotation forest plantations, which is the main productive activity of the project, will be maintain for the lifetime of the project, and almost certainly, beyond the lifetime of the project. Moreover, all the skills and trainings that direct workers and local contractors will learn during project lifetime, will help these workers to continue working in the forestry sector and in the project region. GHG ERRs will continue beyond the lifetime of the project and probably sequestered carbon stocks will be higher than the ones presented in this report, mainly because future genetics improvements and improved planting/silvicultural technologies. Regarding biodiversity, all the protected areas that today are part of this project will have richer and better-known biodiversity after lifetime of the project.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

The VCS Project Description has been published in the VCS website. The full CCB project documentation will be published also in VCS and CCB’s website for public comments, as well as the project summary in Spanish version. Local communities and other stakeholders can easily access it from the website. Also, the main information of the project, described in the Forest Management Plan, is published in Spanish on BDU website for public review and comments²⁸.

Regarding internet access, Uruguay has 88% of population with access to internet and is the only Latin America country who has secured one laptop per child and teacher in all public schools of the country. There are difference among household income, where 84% of lower income households (Quintil 1) have internet access while high income households’ (Quintil 5) internet connection reach 95%. Since 2010 to 2020 the gap between high and low income households’ internet connection in the country went from 66%

²⁸All online documentation available for investors and stakeholders available at: <https://www.bosquesdeluruguay.com/bdu-i/>

to 11%, being technology access one of the countries' main objectives towards equality. Moreover, in the project zone there are present the "MEC centers". These are public training centers for, among others, IT technology and providing infrastructure for public access to internet, the same as public schools, where internet access is free²⁹.

Given access to internet may still be limited within local communities, the project has also been presented to the community during FSC and VCS validation. Given its FSC certification, public summary reports of the mentioned certification are also available to public access³⁰. Other instances include local newspaper interviews, news programs and events where the main objective of the forestry activity are detailed³¹.

Monitoring reports are also published online for all stakeholders to access, and presented to communities during face-to-face training and communications.

2.3.2 Dissemination of Summary Project Documents (G3.1)

Along with the project's listing, the project summary documentation has been published on VCS and CCB website for all stakeholders, so that they can obtain concise project information and development progress. Also, a summary of project description and monitoring in local language is communicated to local communities through presentations in face-to-face meetings. Moreover, during annual surveys, project information is also provided. But mainly, this information is accessible through BDU's website. These include both, the Forest Management Plan and monitoring reports, for public access, together with specific brochures describing the project characteristics and benefits. Last, FSC certification summary reports are also publicly available in the web.

2.3.3 Informational Meetings with Stakeholders (G3.1)

BDU has been having an active presence in the project area, communicating with the community through meetings organized at rural schools, mayor office, with community groups such as Forestry association, as well as cattle breeders in the farms, among others. These events are publicized using direct contact using telephone, WhatsApp or email (based on project's stakeholder database) or informed during face-to-face interviews. Presentations and brochures have also been directly requested by local stakeholders where the project cost and benefits are detailed as well as other themes requests such as endemic diseases, ophidic attack risks, local fauna and flora, etc³².

Regarding stakeholders (neighbors, or other interested parties) actions taken have included the visit, or digital contact, every year (or more frequent if needed), of BDU employees to present the projects activities and conduct interviews and surveys regarding project's impacts. During these visits/process, after BDU employees explain the process, self-conducted interviews are completed with the form shown in Figure 2,

²⁹ Total list of centers including those within project zone available at: <https://www.gub.uy/ministerio-educacion-cultura/listado-de-centros>; <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/sites/agencia-gobierno-electronico-sociedad-informacion-conocimiento/files/2020-09/Informe%20EUTIC%2009%202020.pdf>

³⁰ Public summary FSC reports <https://info.fsc.org/details.php?id=a023300000WS9bAAAT&type=certificate> and in reference 17 for VVB

³¹ Available to VVB during verification

³² Presentations and poster available to VVB during verification

where information on areas considered of HCV is collected from the interviewed, while contact information of the organization and future meetings is provided. Also, during these visits, stakeholders can complete the “complaints and claims section” to inform discomfort over actions implemented by the project (the complaints and claims are resolved based on specific resolution procedures detailed in section 2.3.12, and active throughout the year).

The information collected, is later processed and recorded by BDU and published in the annual monitoring report available online at BDU website.

Also, the installation of signage, as a communication tool with people passing through the areas of influence of the project and associated communities, such as "slowdown in populated areas", "do not litter", and warning signs of dangers, areas of interest (“High Conservation Areas”) or information signs³³.

³³ HCV areas communication in the field available for VVB during validation

		FORMULARIO DE VISITA A VECINOS	
FECHA DE VISITA		/ /	
PREDIO DE AF S.A. (EN ZONA DE INFLUENCIA)			
NOMBRE Y APELLIDO DEL ENTREVISTADO			
NOMBRE DEL ESTABLECIMIENTO/ INSTITUCIÓN/ COMERCIO			
DIRECCIÓN / UBICACIÓN			
LOCALIDAD / DEPARTAMENTO			
TELÉFONO/S DE CONTACTO			
DIRECCIÓN DE E-MAIL			
CONSIDERA UD. IMPORTANTE LA CONSERVACIÓN DE ÁREAS NATURALES Y/O ELEMENTOS DE VALOR PATRIMONIAL (HISTÓRICOS O CULTURALES)?			
¿CONOCE UD. EN LOS PREDIOS DE LA EMPRESA EN LA ZONA, ALGÚN LUGAR O ELEMENTO DE ESPECIAL INTERÉS PARA SU CONSERVACIÓN?			
QUIERE UD. REALIZAR ALGUNA SUGERENCIA, OBSERVACIÓN, COMENTARIO O RECLAMO?			
Información complementaria			
Se entregan datos de contacto de AF S.A.?	SI	NO	
Se entrega información de presentación de AF S.A.?	SI	NO	
ENTREVISTADO (FIRMA Y ACLARACIÓN)		ENTREVISTADOR (FIRMA Y ACLARACIÓN)	

Figure 2. Visit form to be completed annually by project neighbors.

2.3.4 Community Costs, Risks, and Benefits (G3.2)

As it is described in section 2.1.5. of PD local communities in Uruguay are not entirely depending on forest, they reside in populated centers with different businesses. Communities are not asked to participate directly with the project. Projects' potential risks, costs and benefits are, for example, indirectly transmitted to communities through the increase of labor demand for particular activities (forest implantation). Also through ecosystem services protection (e.g. erosion control) and different In other words, communities can perceive project costs, risks and benefits in an indirect way, through market.

Only cattle breeders and beekeepers community groups are invited to use the area. The company offers grazing to neighbors or previous owners who own cattle with the aim of reducing the amount of fuel in firebreak areas and therefore the risk of fires. In addition, grazing is a way of integrating local livestock producers into the project and involving them in firefighting in the area as well. The activity is controlled by contracts ranging from 1 to 11 months and renewed on expiry (shared reference). The conditions under which grazing takes place is recorded in each grazing contract, including information on number of animals/ha allowed, area within the farm. During environmental assessments, the areas where cattle grazing is allowed is defined, as well as the need to limit domestic animal presence related to cattle breeding culture.

The inclusion of beehives is authorized as a means of promoting the production of non-timber forest products from forests. The beekeepers are generally local. The activity is controlled by contracts ranging from 3 to 6 months, where conditions are detailed prior meeting among parties.

Different formal and informal meetings take place with the community, and other stakeholders, throughout the project's lifetime in order to identify and present the project's risk and benefits analysis. In particular, a public consultation took place in December 2015 during the FSC validation (see section 2.3.7) where the evaluation was presented before a wide group of stakeholders, who were also asked for their views on the forest management issues that were considered relevant as well. Moreover, as mentioned in the previous section, project's impacts are identified in a participatory way by interested stakeholders through self-conducted surveys where the project's activity impact over different areas is rated, identifying main risks and benefits.

Other informal meetings include, as mentioned in section 2.3.3, meetings organized at rural schools, mayor office, with community groups such as Forestry association, as well as cattle breeders in the farms, among others to further present the company's policies and project details, including forest activity risks and benefits (see reference from corresponding section).

Regarding direct and indirect workers, training is provided at the beginning of the activities in order to present the company's policies, FSC principles (including project's benefits) and work risks³⁴.

2.3.5 Information to Stakeholder on Verification Process (G3.3)

National legislation in Uruguay does not obligate project owners with activity in the VCS or CCB Standard to communicate about the validation or verification process to any stakeholders, not even to national or regional governments.

However, the company decides to actively communicate about this process, so any stakeholder can be informed and comment about it. The description of the validation and verification process was informed in detail to all staff members of the company through internal communications stating the process, visit schedules, and organizing meeting with the VVB and related staff.

During both, validation and verification process, stakeholders are informed with due anticipation prior to the date of verification, of the audit process, stating procedure and are personally invited (through the most used contact mean) to participate through one on one, and group interviews with the verification team.

³⁴ List of training areas, training participation and timetables available for VVB during verification

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

The local stakeholders will be informed in advance of the VVB visit, regarding the validation and verification process. As long as the audit plan has been settled, the project owner will arrange a stakeholder meeting with the auditor during the site visit. Invitation will be done using appropriate means of communication, all the stakeholders will be informed via phone, mail or whatsapp regarding the project process and the auditor's visit. Stakeholders identified in section 2.1.6 of PD will be contacted and specifically invited those selected by the VVB in each case.

2.3.7 Stakeholder Consultation (G3.4)

Since the beginning of 2015, AF has in place a mechanism for on-going communication with local stakeholders for BDU projects. The mechanism consists in local communities' surveys to identify their perception of forestry activity' negative impacts and to analyze the actions to be taken to mitigate these impacts. To implement the surveys', AF personnel organize talks at schools near BDU project' lands and invite the community to assist and to ask questions on forestry activities and its impacts in the region³⁵. The assistants receive the survey asking about the social, economic and environmental impacts they perceive. At the end of the talk, the surveys are collected and later analyzed to establish a negative impact mitigation action plan.

As it is explained above, stakeholder's participation in the project is done through formal and informal channels³⁶. There are some types of stakeholders -such as forest contractors' enterprises, beef cattle breeders or rural communities- that can be affected (positively or negatively) by the project. Forest contractors' enterprises hire personnel from the surrounding areas, and beef cattle breeders are sometimes previous land owners living in the area.

Furthermore, it has to be noted that all the forestry plantations were done based on the National Forestry (Law No. 15.939 of December, 1987). BDU forest plantations are done entirely on private land. An Environmental Impact Assessment is requested by public authorities before establishing the forest³⁷. In addition, all the planted areas must meet local regulations on maximum size of plantations, distance to water streams, neighbors' fences, power lines, etc. established by national regulation (public sector' stakeholder).

All the plots submitted for environmental approval have been classified as category A. Therefore, their negative environmental impacts are considered non-significant by the national regulations so there are no regulations that require the submission of the project to public stakeholder consultation, thus there are no stakeholders' comments from regulatory requirements. Nevertheless, as above mentioned BDU project has obtained the FSC certification in 2016. For this process, a stakeholder consultation process took place.

According to the Forest Management Certification Report from SGS³⁸, a wide range of stakeholders were contacted 4 weeks before the planned evaluation - that took place between the 15th and 18th of December of 2015 - in order to inform them about the evaluation and ask for their views on the forest management issues that were considered relevant.

³⁵ Presentations available to VVB (see reference 32)

³⁶ Community surveys on project's impact available

³⁷ Environmental and forestry approvals available for VVB

³⁸ Forest Management Certification Report; SGS; 16/03/2016. Available for the VVB at validation.

Among the stakeholder's local government agencies and forestry authorities, forest users' groups and labor unions were included. Particularly, the following stakeholders were interviewed:

- Don Chico land grazing personnel;
- Batlle y Ordoñez polyclinic;
- Police station N°8, Durazno, Cerro Chato;
- Public high-school N°1, Cerro Chato;
- Cerro Chato hospital and NGO Cerro Chato Plan;
- Public school N°31, Paso Real de Mansavillagra;
- Police Station, Cerro Colorado;
- Public school N°17, Cerro Colorado;
- Cerro Colorado polyclinic;
- San Jorge Hotel, Cerro Colorado;
- Forestal del Norte land workers.

The outcomes of the local stakeholder consultation are contained in the FSC certification report and the stakeholders' is available for VVB (see reference 36).

The stakeholder groups that influence project design are the beef cattle breeders and rural communities. This stakeholder is normally the previous land owner that after forest implementation continues breeding cattle in the non-forested areas. The interaction between cattle and forest is so mutually beneficial that BDU II and cattle breeders communicate about the design of projects in order to synergistically grow. Moreover, experts conducting biodiversity surveys provide recommendations which are later analyzed by AF. In this line, the recommendation on grazing control was also taken into account, and so the maximum stocking rate to be allowed on the farms (this is defined in each contract) and is 0.50 UG/ Ha. Another example worth commenting is BDU's approach to transport impacts in the community. After identifying mitigation measures priory defined were not enough to reduce transport impacts in the area, both communication strategy and measures taken were changed. First, mapping of identified project zone most impacted by the activity was conducted and special attention to communicate future increase in transport circulation to community was paid (especially during harvest seasons). This communication was first conducted through written letters³⁹, and now is in the process of being updated to Whatsapp groups with local representatives. Regarding measures, apart from watering the roads to avoid dust increase in the area, after each high circulation season, rural roads are repaired.

Regarding High Value Conservation areas, within the project area, the definition of these areas is done together with the community and experts consulted, in line with FSC standards. In this line both, annual

³⁹ Letter shared to VVB during verification

surveys and specific community consultation⁴⁰, are conducted to listen to the community, community groups and other stakeholders in terms of HCV areas definition. In the case of historic sites, the community in the project zone is consulted about the knowledge, usage, and value of the site in order to define the category of conservation⁴¹.

Another example is when communities or a community group, together with BDU, identify a need which BDU can help with and analyze the best way forward. Examples include rural roads construction, monuments installation, materials and workforce to paint or maintain rural schools, among others activities where main inputs are provided by BDU⁴².

2.3.8 Continued Consultation and Adaptive Management (G3.4)

As already shown in the previous chapter, there are permanently open channels to communicate with the project developer.

The mechanism consists in local communities' surveys to identify their perception of forestry activity' negative impacts and to analyze the actions to be taken to mitigate these impacts. To implement the surveys', AF personnel organize talks at schools near BDU project' lands and invite the community to assist and to make questions on forestry activities and its impacts in the region. The assistants receive the survey asking about the social, economic and environmental impacts they perceive. At the end of the talk, the surveys are collected and later analyzed to establish a negative impact mitigation action plan.

Moreover, the same surveys are conducted systematically to stakeholders within the project zone and other interested stakeholders. These are self-administered surveys which takes place on paper or digital: paper in the case of neighbors, digital for the case of other stakeholders such as contractors or other. Company personnel take a paper form to the main stakeholders in the locality containing the main dimensions of the evaluation of the impact of forestry (environmental, economic, social and cultural). Once the activity has been explained, they coordinate with the stakeholder to pick up the survey the following week. An annual report is drawn up on the basis of the information.

The registration of complaints from the BDU project' neighbors, contractors, etc. is also used as an on-going communication system with local stakeholders. The External Adviser in charge of AF Management System is in charge of registering the complaints in the corresponding form. Once a complaint is registered, its treatment and deadlines are defined and the complainant is notified about the treatment that will be given.

⁴⁰ Evidence of HVC public comments available to VVB

⁴¹ These is communicated through the stakeholder's survey, shown in figure 2

⁴² List of projects and activities with communities available for VVB in shared Google folder.

Once the treatment is finished, the complainant is consulted about his satisfaction with the result. If he agrees with the result, the complaint is closed. Otherwise, the procedure is repeated until the complainant is satisfied.^{43 44}

Furthermore, as described in the FSC Certification Report, AF has in place since 2015 the “Procedure to solve social and/or illegal activities conflicts or complaints”. This procedure applies to any social complaint including lands’ right of use. No complaints for disputes were received in the public consultations.

As mentioned, stakeholders can raise their comments or suggestions in the “Neighbors visit form” and the “complaints and claims form (Figure 2. The project owner will check the forms regularly and collect all the comments received.

2.3.9 Stakeholder Consultation Channels (G3.5)

Part of the communication with communities consist in verbal communication from the company’ workers towards them. BDU workers are permanently present in the project area and they communicate with communities and stakeholders. BDU has been present in the area for almost 10 years now, and since is an FSC certified activity, an important part of the company’s activities involve working together with the community, identifying mitigation actions, providing solutions to their needs and answer to their comments. In this sense, contact data of the referenced authority for the project’s area are publicly available in the properties. And, as previously mentioned, systematic community rating of the company’s activity impact is analyzed and evidenced in reference n° 36 (see previous section 2.3.8).

BDU web page contains a special section for comments and all the information regarding each project, and is annually updated with its monitor reports which include different indicators, including the analysis of the information from the neighbor’s survey forms. Moreover, all communications and claims are to be reported to the manager within 10 days and a meeting is scheduled within 30 days.

Last, BDU has also implemented a mechanism to prevent complaints. It consists in analyzing the impact of future actions that will be taken by BDU. For example, harvesting of a certain area will increase truck circulation in a public road, generating modifications to the regular activity of the zone. BDU staff anticipates this situation by visiting the neighbors that could be affected, explaining the activities that will be implemented and leaving a contact telephone to contact them in case of need, followed by different mitigation measures to reduce negative impacts.

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

BDU has open channels to enable the effective participation of all communities. The “complaint form” and “visit to neighbor form” (see chapter 2.3.3) is a way for communication to communities and community groups. These channels are open to any culture and gender. Stakeholder identification is based on the level of relation to the project so no discrimination in terms of culture or gender is done. Nevertheless, taking

⁴³ The surveys and complaints mechanisms are established in Chapter 11 (Monitoring System) of BDU’ Forestry Management Plan – Public Summary. Available at: <http://www.bosquesdeluruguay.com/documentos.php?p=bdu-2-plan-de-manejo-forestal>

⁴⁴ The AF schools’ talks programme, the survey form, the 2016 surveys analysis and BDU social monitoring plan and registries for the VVB at validation in reference 32 and 36.

into consideration the capacity to access or use electronic devices, for example, printed options are always available at the time of conducting surveys and communicate.

As previously mentioned, regarding HCV areas, these are defined together with the community, starting with a professional consultancy of the area, but also following any comment raised by neighbors regarding an important site/area for them. Then a community consultation takes place in order to communicate findings and define the category of conservation⁴⁵.

At the same time, regular monitoring report meetings take place, providing an opportunity for the community to raise concerns or comments. Also, when BDU conducts trainings and presentations at rural schools, regarding endemic diseases -or other requested subjects-, or during community work activities such as painting a school, employees are trained to receive and formalize requests/claims.

2.3.11 Anti-Discrimination Assurance (G3.7)

The project owner obeys Labor Law of the Republica Oriental del Uruguay with anti-discrimination assurance.

According to International Labour Convention (ILC) 190: "Each Member shall adopt laws and policies which guarantee the right to equality and non-discrimination in employment and occupation, including women as well as men workers (...)"

National Law No 15903 states, in Article 289, that "violations of international labour conventions, laws, decrees, resolutions, awards and collective agreements, whose control corresponds to the General Inspectorate of Labour and Social Security (IGTSS) are punishable by reprimand, fine or closure of the establishment".

Article 6 of Decree 186/004 states as very serious offences "actions or omissions involving discrimination in working conditions on grounds of sex, nationality, marital status, race, social status, political and religious beliefs and membership or non-membership of trade unions" and states in Article 13 that "very serious offences are punishable in their minimum degree with a fine of 100 to 110 day's wages; at the medium level, from one hundred and eleven to one hundred and twenty-five daily wages, and at a maximum level, from one hundred and twenty-six to one hundred and fifty daily wages, for each worker affected".

Lay No 17.817 also declares the fight against racism, xenophobia and all other forms of discrimination to be of national interest.

BDU has an Operating Framework Guide where it is clearly explained in chapter 1: Code of Ethics and Conduct⁴⁶ that discrimination attitudes are totally forbidden: "any type of discrimination must be avoided in any instance by reason of gender, race, religious, political or other orientation".

2.3.12 Grievances (G3.8)

No grievances were recorded during this verification period. If any, the procedure described in PD would be implemented:

⁴⁵ Information on HCV consultation available to VVB during verification (see reference 40)

⁴⁶ Chapter 1: Code of Ethics and Conduct available to VVB during verification

The registration of complaints from the BDU project' neighbors, contractors, etc. is also used as an on-going communication system with local stakeholders. AF has in place since 2015 the "Procedure to solve social and/or illegal activities conflicts or complaints". This procedure applies to any social complaint including lands' right of use, fires, illegal activity. It clearly explains how BDU proceed once they receive or detect a conflict with any third party:

- If complaints or disputes are received, either directly or through third parties or communication means, BDU will act according to the conflict resolution procedures described in the manual.

- Complaints or complaints transmitted in the field have to be transmitted to forest managers in written within 10 days, who will attend them according to their powers.

- If needed, a meeting between the forest manager and impacted stakeholder/s will be scheduled within 30 days.

- In the meeting pertinence of the claim and possible solutions are defined, seeking to reach a positive answer for all the parties involved.

- Resources needed to implement the proposal are analysed and deadlines and responsibilities for the tasks are established

- Proposal is presented to the Director for its approval

- Proposal is implemented

- In the case the claim is not pertinent, a written response is sent and the claim is archived.

- If the dispute cannot be resolved, for example land tenure, the activity is stopped till the conflict is solved.

The General Manager will designate a person responsible for collecting and processing the information regarding all the complaints received by the company, who will keep record of them and their resolution status. The External Adviser in charge of AF Management System is in charge of registering the complaints in the corresponding form. Once a complaint is registered, its treatment and deadlines are defined and the complainant is notified about the treatment that will be given. Once the treatment is finished, the complainant is consulted about his satisfaction with the result. If he agrees with the result, the complaint is closed. Otherwise, the procedure is repeated until the complainant is satisfied. ^{47 48}

In the case of illegal activity, there is a monitoring plan in place. Once noticed, the activity must be instantly reported to the harvest manager in charge. Depending on the type of activity, it is first resolved within the parties involved (if it is people fishing, for example) and if it cannot be resolved, a report will be made at the nearest police station. If the activity threatens the integrity of AF assets, a report is made to the police.

⁴⁷ The surveys and complaints mechanisms are established in Chapter 11 (Monitoring System) of BDU' Forestry Management Plan – Public Summary. Available at: https://www.bosquesdeluruguay.com/media/2022/03/GAF_PM_-_Resumen_Publico_del_Plan_de_Manejo_Grupo_AF_2021.pdf

⁴⁸ The survey form, the 2016 surveys analysis and BDU social monitoring plan and registries for the VVB at validation (see reference 36).

2.3.13 Worker Training (G3.9)

The project owner and group of experts provide technical advice and technical training to project staff and personnel from forest contractors companies (these last when the contractor has no capacity to manage it itself). These companies usually contract people from the surrounding areas, belonging to the neighboring communities to the project area.

All the workers related to the project must be trained in order to perform the activities with adherence to the Principles & Criteria of the Forest Stewardship Council ® (FSC ®) for forest management and chain of custody. Both, direct employees and contractors working in BDU project are included. The company's "Annual Capacitation Plan"⁴⁹ includes the following training courses, among others:

- Induction for new contractors: Orientation and training activities to inform and establish the BDU management guidelines to those responsible for the contractor companies and their health and safety services
- AF Security and General Policy: BDU Management Policy; Continuous improvement; FSC Principles & Criteria; Occupational Health and Safety; Care of the environment; Social Responsibility, Labor Rights and Duties.
- Security commission: safety and continuous improvement
- Health and First Aid
- Investigation of incidents contractors supervisors
- Procedures during emergencies
- Risks
- FSC Principles and criteria
- Fire control

Every training is recorded in a template, with information about the topic, date, responsibility, etc. The Annual Training Plan and the complete list of trained people in the different topics (biodiversity, FSC, etc.), in the last years, will be available for the VVB if necessary.

Direct BDU employees are also trained in other topics. The following is a list of the courses taken by personnel of different areas⁵⁰:

- Communication skills
- English as a second language

⁴⁹ Available to VVB during verification (see reference 34)

⁵⁰ Complete capacitation plan available for VVB during validation (see previous reference)

- Leadership
- Negotiation

The capacity will not be lost as, first, training is implemented in an annual basis, and secondly, the land has been declared by the agricultural ministry as forestry priority so the activity is expected to continue throughout the project lifetime and beyond.

2.3.14 Community Employment Opportunities (G3.10)

The project is having an impact in a big area located in the Center east region of Uruguay. All the people in the communities (including women, minorities and poor people) are involved directly or indirectly with the project.

All people from the region are given an equal opportunity to fill all work positions if the job requirements are met. A transparent system of contracts is available, through price calls to award long-term contracts and permanent evaluations of suppliers are carried out.

According to the records corresponding to the years 2015 - 2020, during the implementation of the project, forestry activities (plantation, harvest, sawmills and road works) conducted by contracted companies translates into a labor of around 70 new workers per year.

From the total number of contractors working for BDU, it is estimated that around 82% of these contractors are living in the project area departments⁵¹.

There are some forest activities where more subtle or dainty movements are needed or where more meticulous work is demanded, which is the case of the work at nurseries or the harvesting with ultra-sophisticated harvesters. In such cases, women could be better qualified for the task, this is also the case for administrative and technical work (p.e GIS). It is expected that women from the community can participate in such types of activities, or others.

Since 2015, the company has a formal system to record and centralize the information of subcontracted companies, where all the data provided is available, based on the number of operators per company, which allows the documentation of the activity, as well as the training history carried out by the Operators, both by the contracting companies and by BDU.

2.3.15 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

There is a national legislation aimed at the enforcement of safety and health standards, which is controlled by the Ministry of Labor.

Forestry in the country has its own regulation for labor conditions (Decree 372/99), on top of a large number of norms which affect any activity. This decree was developed with the active participation of the forest producers, and basically defines several rules for safety, health and living conditions of forest workers. It establishes the norms that must be considered in the performance of the different tasks in order to cover

⁵¹ EIS Terena S.A (2018) Relevamiento de empleados. Survey conducted by the company who previously owned some of AF's farms within its employees but can be extrapolated to BDU employees given the same employment conditions.

all aspects related to the health and safety of forestry employees. It regulates the use of personal protective equipment in accordance with each task (including agrochemicals), the conditions that must be met by forest workers' accommodation, and the characteristics of canteens when they are used in the forest area, among others.

Uruguay also has a National Code of Good Forestry Practices applicable to the forestry sector, which is a set of prescriptions and work guidelines for forestry workers. This code is of voluntary implementation, but it is enforceable at the level of the FSC certification standard.

Another important regulation relates with the minimum wage regime. In Uruguay, the law promotes the appointment of sectorial three-party committees⁵² (government, workers and companies) to discuss worker categories and minimum wages applicable to each category. The agreements reached by these committees are mandatory for all the companies in the corresponding sector. Historically, rural activities were not included in these committees, and minimum wages were fixed by decrees. In 2005, the forest companies, the forest workers and the government reached the first ever agreement for a minimum wage regime in rural activity.

These agreements set minimum wages by category, with semi-annual adjustments based on inflation and dollar variations. Employees work 48 hours a week, with a maximum of eight-hour per day, (excepting if the hours worked on Saturdays are distributed from Mondays to Fridays). In this case the hours worked per day can be extended to nine and a half hours.

Forest industry workers are organized in a specific union. SOIMA (Uruguay's Wood Industries Workers Union). As of 2014, the Union is presented as one of the strongest in the country and has negotiated significant improvements in wage conditions.

As the Project follows FSC standards (as demonstrated), the working conditions are achieved as the different FSC annual summary reports⁵³ shows. Moreover, BDU requests same compliance to all the contractors involved within its contract. As mentioned in the previous section, a system is in place to monitor the compliance of the legal standards in the sector, including contractors' workers⁵⁴. Moreover, AF and FSC principles and policies (communicated during training to all workers) include code of ethics, anti-discrimination, security, among other rights for workers⁵⁵.

2.3.16 Occupational Safety Assessment (G3.12)

BDU considers the Safety and Health of the people, and of everyone directly or indirectly related to the activities, to be of the utmost importance. The company has implemented a system, coordinated by prevention technicians, oriented to the care of occupational safety, well-being and health risks of the personnel who work in the field. The system encompasses everyone, each and every one of the employees and contractors are committed to take care of their own safety as well as their co-workers'.

Safety management is treated as a continuous self-improvement process which materializes in a systematic process of risks identification, assessment and control which requires the participation of everyone. In this

⁵² These committees are called "Consejos de Salarios" in Spanish.

⁵³ All FSC annual summary reports available to VVB during validation (see reference 17)

⁵⁴ Third party service scope of work available to VVB

⁵⁵ Principles and policies available to VVB during validation

line risk assessments are conducted for the different activities in the project, with the corresponding evaluation in line with the safety plan. Contractors are also evaluated through a registry they are requested to fill⁵⁶.

According to national legislation, the employer has the obligation to register in the Social Security Bank ("Banco de Previsión Social" - BPS) and the Ministry of Labor and Social Security. By this, the employee assures health assistance for every member of the family.

Safety training and dissemination

BDU makes strong emphasis on the training and awareness of the personnel and the people living in the area where it develops its activities. A continuous follow-up of the work conditions and facilities is performed in all the sites where the company operates. Continuous training and teaching is done and the exchange of experience among contractors is promoted. All observations and incident records are processed systematically in order to obtain statistics which allow the detection of issues which require special attention⁵⁷. If there are accidents, a relevant investigation is carried out to reduce future risks.

The company has a Continuous Training Program structured according to the detected needs. The objective is clear: self-protection; the company wants every individual involved to embrace safety measures as a value. The project owner implemented health and safety practices to protect workers from occupational safety and health hazards. These practices shall, proportionate to scale, intensity and risk of management activities, meet or exceed the recommendations of the ILO Code of Practice on Safety and Health in Forestry Work.

In addition, there is a monitoring system in place to check all employee's documentary status –for instance, the validity of the health card, delivery of safety equipment, among others– and reports such information to the corresponding person in case the employee status is not in good standing so as to carry out their duties.

Risk assessment

The environmental impacts assessment conducted in the properties identifies those impacts on workers related to forestry activity. Moreover, a specific impact assessment regarding agrochemicals use was conducted and results are available to VVB during verification (see figure below). In this line, only trained employees in specific agrochemicals application procedures are authorized to manipulate them.

All accidents are reported and monitored in the annual summary report. During the verification period accidents related mainly to pruning activities are reported.

⁵⁶ All information available for VVB during verification

⁵⁷ Annual Indicators Monitoring spreadsheet includes an indicator on accidents per year; results for 2017-2020 available to VVB during verification within reference folder n°58 (*Monitoreo Grupo AF 2020-indicadores*, line 72); also reference on accidents registry available in same folder

CÓDIGO ID	Fipronil	Principio activo	
FECHA	15-mar-21	Fipronil	
Tasas de aplicación (base producto comercial)	Unidades	Tasas de aplicación (base principio activo)	Unidades
5,00E+00	kg producto comercial / ha efectiva*	1,50E-04	kg p.a. / ha
CÓDIGO ID	Fipronil		
ID Riesgo	Indicadores riesgo	Grupo receptor	Datos del escenario
SALUD OCUPACIONAL - OPERACIÓN NORMAL			
Código	Nº	HI	HI cáncer
SON	1	Si HI-6,5-6 (HI-6)	
SALUD OCUPACIONAL - ACCIDENTES LABORALES			
Código	Nº	HI Superior	HI Central
SO-Ac	1	Todos los HI-1	
SALUD DE POBLACIÓN - OPERACIÓN NORMAL - EXPOSICIÓN AGUDA (concentración máxima diaria)			
Código	Nº	HI Superior	HI Central
SPN-A	1	Todos los HI-1	

Figure 3. Part of the risk analysis conducted for Fipronil use.

2.4 Management Capacity

2.4.1 Required Technical Skills (G4.2)

For the development of the Project, are required skills and experience related to:

- Experience in management of natural resources conservation projects
- Ability to interact with different actors and stakeholders,
- Development of Projects with rural populations,
- Experience in the development of carbon projects and environmental services
- Experience in the evaluation and monitoring of biodiversity

AF has a long track record in managing forests. It started its activities in Uruguay in 2000 as a forestry services company, and expanded to Chile and Brazil in 2007 and 2010 respectively. Currently AF offers services throughout the forest growth stages from consulting to forest lands management services. The company supervises more than 50,000 hectares per annum only in Uruguay, plus another 50,000 hectares in Chile and Brazil. AF has a professional, highly specialized and fully independent team composed by 8 agricultural engineers, 19 foresters and field supervisors and 8 administrative staff.

The project owner has many years in sustainable forest management projects, being certified under FSC, by which it has developed capacities to interact with different types of actors, as a result of which it has established cooperation agreements with local governments, companies, producer organizations and native communities. It has also developed a system applicable to environmental projects, which has effective tools and methodologies to have effective control over the interventions carried out.

The project owner and the experts group provide technical advice and technical training, and carry out Project implementation of quality control and quality assurance at the same time.

All the workers (both AF personnel as well as contractors) will be trained in order to perform the activities with adherence to the Principles & Criteria of the Forest Stewardship Council ® (FSC ®) for forest management and chain of custody. More than 50 employees (direct employees and contractors) are working in BDU project. These are specialized in engineering, forestry, administrative and technical. All these employees are included in the company's "Annual Capacitation Plan" (see reference 34).

In terms of social and environmental monitoring, AF has an external advisor and consultant team dedicated to the implementation and monitoring of the FSC principles regarding social and environmental aspects, in line with project implementation plans (personnel qualifications can be access by VVB during verification within reference folder n° 34). All biodiversity surveys are conducted by experts external to the project specially hired for fauna and flora monitoring. While annual monitoring of sites is conducted by internal employees.

Regarding forest inventory monitoring, AF hires experts to conduct the monitoring, and has a technical team, within the planning area, in charge of controlling and analyzing data results obtained from a systematic tool which makes biomass estimations.

Moreover, regarding carbon credits, AF works together with a consultancy firm which provides services and constant support in the climate and carbon aspects of the project.

2.4.2 Management Team Experience (G4.2)

BDU Project is proposed, designed, implemented, operated and administered by Agroempresa Forestal (AF) on behalf of "Fideicomiso Financiero Forestal Bosques del Uruguay" (the trust fund). AF has a long track record in managing forests. It started its activities in Uruguay in 2000 as a forestry services company, and expanded to Chile and Brazil in 2007 and 2010 respectively. Currently AF offers services throughout the forest growth stages from consulting to forest lands management services. The company supervises more than 50,000 hectares per annum only in Uruguay, plus another 50,000 hectares in Chile and Brazil. Its main clients are responsible for more than 80% of Uruguay's afforested area (UPM, Weyerhaeuser, Montes del Plata, Arauco, etc).

The AF Trust has demonstrated in the field its ability to implement a project of this nature complying reasonably well with the plan of proposed business. In addition, the Administrator assumes various obligations and responsibilities that reinforce commitment and trust in the project. Among them stand out: a) it is a beneficiary for the securities it acquires. Although it is not a relevant figure in the project framework (1% of the issue) shows confidence in it; b) assume responsibility for claims that are generated related to companies outsourced, when these have been initiated by breach of the Administrator of any of the contractor control obligations established in the Plan of Business and c) undergoes an annual evaluation of minimum performance standards on the temporary execution of contracts for land tenure, for the plantation, seizure and the so-called IMA (annual average increase). The Failure to comply with any of these standards will be sufficient cause for the Holders by Special Majority of Holders resolve the cessation of the Administrator in their functions.

Moreover, AF has a professional, highly specialized and fully independent team composed by 8 agricultural engineers, 19 foresters and field supervisors and 8 administrative staff. Also 40 forestry services companies are associated with AF employing 600 people. This makes AF a market leader in the provision of forest services.

The project owner has many years in sustainable forest management projects, being certified under FSC, by which it has developed capacities to interact with different types of actors, as a result of which it has established cooperation agreements with local governments, companies, producer organizations and native communities. It has also developed a system applicable to environmental projects, which has effective tools and methodologies to have effective control over the interventions carried out.

The table below describes those activities conducted by BDU-AF and those contracted to suppliers:

Activity	AF/contractor
Farms selection, property analysis, negotiation	AF
Models and projections (plantation, sales, budget, etc.). Silvicultural management strategy, sanitary surveillance, etc.	AF
Plantation	Contractor
Weed control	Contractor
Pruning and Thinning	Contractor
Infrastructure maintenance	Contractor
Cosecha	Contractor
Wood sales	AF
Other commercial negotiations (silvopastoral activity)	AF
Transport	Contractor
Preparation and coordination of FSC certification process	AF
Commercial and operative report to investors	AF
Environment and community relationships	AF
Suppliers contract and execution and quality control	AF
Execution and supervision of activities according to the Forest Management Manual, objectives, environmental standards and legal framework	AF

The company manages its forest plantations integrated with other land uses, optimizing the management of natural resources in a responsible manner in accordance with the companies' sustainable forest management policy:

- ✓ The Forests that make up the "GRUPO AGRO EMPRESA FORESTAL" are committed to the environment, for this reason we make an efficient and rational use of natural resources, minimizing the use of pesticides and not using those that are prohibited.
- ✓ The respect and protection of these resources are in line with our commitment towards continuous improvement.

- ✓ We ensure that our operating processes minimize negative impacts on our employees and the environment, safeguarding their health and safety. To this end, we comply with applicable regulations and requirements.
- ✓ We seek to contribute to the economic and social development of our local communities through the generation and valorization of forestry work.
- ✓ We ensure that our employees are trained so that they are responsible and committed to the environment and their daily work.
- ✓ We provide our employees, adjacent communities and other stakeholders with relevant and appropriate information about the environmental and social quality of our operations.
- ✓ We encourage the AF GROUP's key suppliers to comply with our Sustainable Forest Management Policy.

At AF GROUP we work according to economic, social and environmental principles that demonstrate a long-term commitment to sustainable environmental; complying with the Principles and Criteria of the Forest Stewardship Council TM (FSC®).

2.4.3 Project Management Partnerships/Team Development (G4.2)

Whenever necessary, AF hires third parties in order to conduct specific surveys, analysis and assistance. This is the case of ProSustentia, with a contract for continuous assistance on Carbon credits and related activities. In the same line, it works together with biodiversity experts on the surveys and mitigation actions to promote biodiversity conservation and recovery.

Moreover, AF takes part in the Forestry Producers Association, where partners identify needs and analyze mitigation actions on different subjects. For example, different analysis related to forestry impacts are conducted, as well as communication campaigns and actions on pests and fire control, among others.

2.4.4 Financial Health of Implementing Organization(s) (G4.3)

The project developer is a legally registered company in Uruguay, and according to the public information listed in National Enterprise Credit Information Publicity System, none of them were involved in or complicit in any form of corruption such as bribery, embezzlement, fraud, favoritism, cronyism, nepotism, extortion, and collusion.

BDU Trust's objective is to structure a long-term investment alternative supported by a tangible asset that increases its value throughout time and by a strong management plan. Following the highest productive, environmental and social standards, and aiming to attain a production of high quality timber, the trust will offer pension fund investors reasonable long term profits.

The novelty of this trust lies in the fact of being the first one in the history of the country presenting a public offer at Montevideo stock exchange and the first one that convinces a pension fund (called AFAP in Uruguay) to invest in this type of project with physical assets and productive risks. In general, these funds invest in low risk government bonds which offer similar rates of return but at a much lower risk.

Among the values promoted by the trust are: excellence in the performance, accountability and ethics. In order to convince the pension funds to invest money in the trust many aspects of the BDU project were highlighted, being climate change mitigation, sustainability and carbon credits incomes the most relevant ones. The endeavor was not easy though. In fact, in the last days prior to the certificated issuance the

whole process was close to failing given the negative pressure from some of the AFAPs, who were reluctant to commit before the IPO.

In order to become operative, the Trust had to obtain the approval of its business plan from the president of the country and the Central Bank of Uruguay which took around 18 months.

As stated in BDU Informative Prospectus, the total investment of the project in year zero was 50 million USD. Furthermore, the project cash flow with the results per year are illustrated in the prospectus. Based on this information it is possible to determine that the project cash flow breakeven point is 11 years and 11.4 months.⁵⁸

This has been demonstrated in the validation process under VCS.

2.4.5 Avoidance of Corruption and Other Unethical Behavior (G4.3)

Although Uruguay in many aspects already has regulations in line with those established by the anti-corruption Convention, on the one hand of a preventive nature and on the other repressive, there is still no anti-corruption law in Uruguay for the private sector.

Anyway, this project has an Operating Framework Guide where it is clearly explained that corruption and other unethical behaviors are totally forbidden. Moreover, as legally registered companies, the project owner and other involved entities have the obligation to comply with relevant regulations. The annual audits on general legislation compliance makes sure that it operates with full compliance with Uruguay law and regulations⁵⁹.

2.4.6 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

None of the project documents will be considered as commercially sensitive information, and all of the documentations are available to any stakeholders

2.5 Legal Status and Property Rights

2.5.1 Recognition of Property Rights (G5.1)

National legislation enshrines different forms of land tenure, use and enjoyment, which, in principle and in general terms, can be divided into two forms: those of a permanent nature and those of a transitory nature. Table 1 detail land tenure according to area farmed (ha) for 2011 in the departments of the project zone.

Moreover, in Uruguay, since 1948, there has been another special form of land tenure, which is part of a public policy called Colonization carried out by the INC (National Institute of Colonization). It is defined as a set of measures to be adopted in accordance with Law No. 11.029, in order to promote a rational

⁵⁸ BDU Informative Prospectus; Pages 58-59.

<https://www.bosquesdeluruguay.com/media/2022/04/Prospecto-de-Emission-BDU-1.pdf>. Breakeven point calculation available to the DOE at validation.

⁵⁹ This include working conditions, fiscal regulations, environmental legislation, among others and compliance of legislation is evidenced in FSC summary reports under reference 17, in section 10 “Results”, under FSC Principle 1 compliance.

subdivision of land and its adequate exploitation, and improvement of the agricultural production and the settlement and welfare of the rural worker.

The INC facilitates access to land with security of tenure, to aspiring settlers through the leasing of land, with a land rental value lower than the market value. Until 2005, there was a second modality: sale of land financed on a term basis (INC 2017). The figure 4 show the INC tenure within the project zone⁶⁰.

In the case of the project area, all the land is privately owned by the BDU project. The establishments included in BDU I that enter the AF GROUP are: My Generala, Reboledo, Don Chico, El Cerco, Las Rengas, Las Rengas II, Puntas del Cordobés, La Yeguada I, Caputti, Cañada Brava, Arevalo, Don Ramón, Sequeira and María Albina these belong to the group of investors that acquired the forests in the year 2012. In the case of Reboledo and Don Chico, this farms don't take part in the present carbon project.

Table 1. Land tenure by department for the project zone based on area farmed (ha)⁶¹.

Area farmed by tenure status, according to department							
Departments	Area farmed (ha)						
	Total	Land tenure					
		Property	Lease	Grazing	Share cropping	Occupier	Other forms
Artigas	1.144.493	777.332	285.512	18.416	1.682	32.369	29.182
Canelones	336.805	252.574	61.937	4.011	665	8.240	9.378
Cerro Largo	1.325.852	939.620	287.245	29.379	3.002	32.779	33.827
Colonia	563.177	327.346	196.835	2.010	6.286	6.631	24.069
Durazno	1.098.847	636.196	323.703	43.062	7.095	38.307	50.484
Flores	502.914	296.369	162.947	5.809	4.880	8.719	24.190
Florida	973.091	594.537	303.164	14.607	2.047	27.127	31.609
Lavalleja	944.241	643.136	203.257	33.926	2.574	36.053	25.295
Maldonado	387.166	271.293	71.263	16.464	1.467	7.382	19.297
Montevideo	15.363	13.268	788	70	201	277	759
Paysandú	1.438.706	900.115	383.057	73.621	21.660	30.333	29.920
Río Negro	914.414	556.597	256.624	48.261	18.625	5.797	28.510
Rivera	865.692	536.245	199.171	65.777	4.186	29.967	30.346
Rocha	921.189	577.840	252.730	26.129	893	26.371	37.226
Salto	1.280.105	850.706	331.524	18.043	1.067	51.571	27.194
San José	442.926	257.308	137.908	4.283	3.735	15.722	23.970
Soriano	839.682	453.941	301.542	18.746	26.650	13.631	25.172
Tacuarembó	1.490.989	1.077.350	254.586	84.088	4.117	34.258	36.590
Treinta y Tres	871.646	521.597	290.968	12.577	1.543	29.319	15.642

⁶⁰ Source: Proyecto REDD+ Uruguay (2020). Tenencia de tierra y bosque nativo en Uruguay. Chiesa, V., Rodríguez, P., Gasparini, K., García, M.L., Olivera, J., Rama, G. y Martino, D. Ministerio de Ganadería, Agricultura y Pesca - Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente. Montevideo.

⁶¹ Source: General Agriculture survey 2011, (figure 162 translated)

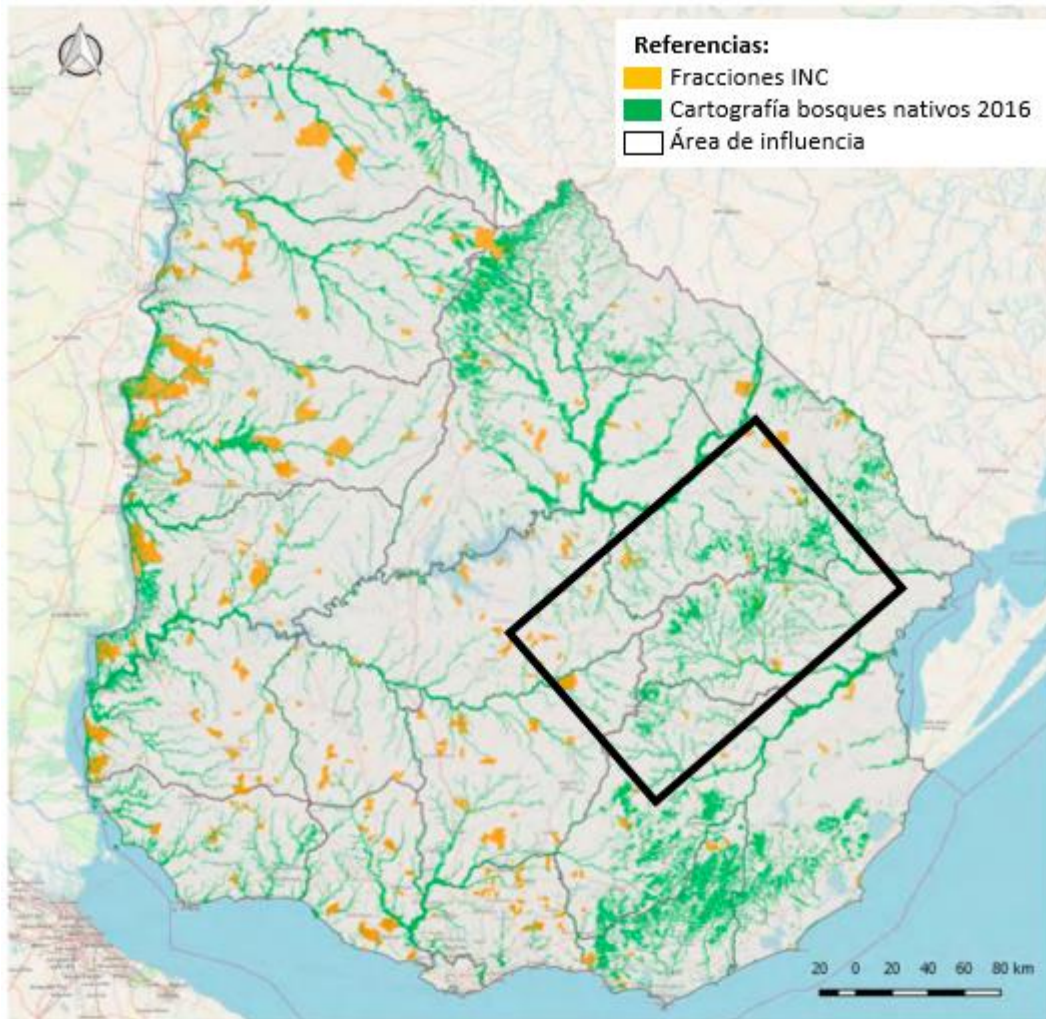


Figure 4: INC tenure and native forests in project zone. Source: adapted from Proyecto REDD+ Uruguay (2020), Map n°2.

2.5.2 Free, Prior and Informed Consent (G5.2)

Prior to the project initiation, all of the project land was owned by BDU project. Land tenure evidence is provided through notarial certificates of ownership⁶² which comply with Uruguayan legislation. To make sure the successful development of the project, the project owner which had the ownership of forest land had presented all the requested documentation to government authorities⁶³. So, the project will not encroach uninvited on private property, community property or government property; the ownership is clear, and there is no dispute over land ownership in the project site. Moreover, evidence of complying with principle n°2 Rights and Responsibilities of Tenure and Use of FSC certification are reported in FSC summary reports publicly available⁶⁴.

⁶² Land ownership evidence available for VVB during validation

⁶³ Authorization available to VVB (see reference 37)

⁶⁴ FSC summary reports available in reference 17

Cattle breeding activity owners are invited to continue the activity within the property once the trees are 2-3 years, to avoid damages. This is done through signed agreements. The same applies to beekeepers.

2.5.3 Property Right Protection (G5.3)

Prior to the project implementation, the project area was degraded grasslands where farmers (private owners) used these lands for extensive beef production. Private owners voluntarily sold the lands to project owners, therefore the project activities will not lead to involuntary removal or relocation of property rights holders from their lands or territories, and does not force rights holders to relocate activities important to their culture or livelihood.

Due to its history, there are no native peoples in Uruguay. Only a new stream of people who have recognized themselves as descendants of indigenous communities, but who currently reside in cities. Roque Roldán's estimate for a paper for the Inter-American Development Bank, presented in Fortaleza in March 2002⁶⁵ based on ILO data, estimated its total number at 524 (0.02% of the Uruguayan population) even though it is a subject of debate among different historians, the historical reports of the different auditing houses that certify in Uruguay indicate that there is no indigenous population according to the definitions of FSC.

2.5.4 Identification of Illegal Activity (G5.4)

The forests are nursed by project staff regularly as a result of the implementation of the project, so there has not been illegal activities or deforestation of native forests inside BDU farms or surrounding the project boundaries. Furthermore, all farms are gated. There is also a process in place and staff aware of procedures in order to avoid any illegal encroachment in the properties.

The project benefits are gained from legal activities. Therefore, the project's climate, community and biodiversity impacts will not be affected by illegal activities.

2.5.5 Ongoing Disputes (G5.5)

Because the project owner signed legal purchase agreements on all the land, the forest land was developed reasonably and legally, so there are neither ongoing or unresolved conflicts or disputes over rights to lands, territories and resources nor any disputes that were resolved and recorded.

2.5.6 National and Local Laws (G5.6)

The project activity complies with the National law and binding regulations, since forest investment has been approved by the General Forestry Directorate (entity of the Ministry of Agriculture, Livestock and Fishery) and the National Environment Directorate (entity of the Ministry of Housing, Territorial Planning and the Environment at the time of project presentation, since July 2020 in charge of the National Directorate of Quality and Environmental Assessment under the Ministry of Environment). The former ensures that the project activity complies with National Law N° 15.939 and all binding decrees and decisions, while the second grants environmental authorization.

⁶⁵ Roque Rubén en Echeverría, Ruben G. (2003) Desarrollo territorial rural en América Latina y el Caribe. Manejo sostenible de recursos naturales, acceso a tierras y finanzas rurales. Washington D.C.. BID.

Evidence for the compliance of local and national laws is provided under the FSC annual certifications, section 10 “Results”, complying with Principle 1 of the FSC.

No changes have occurred regarding the list presented in the PD.

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Data / Parameter	VTREE,j,p,i
Data unit	m ³
Description	Stem volume of trees of species or group of species j in plot p in stratum i
Source of data	Local growth model (SAG grandis and dunnii); INIA
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	The stem volume values come from the Grandis and Dunnii SAC INIA models (or growth simulators) used to predict the plantation growth.
Purpose of the data	Calculation of project ex-ante emissions
Comments	-

Data / Parameter	D _j
Data unit	t d.m. m ⁻³
Description	Density (over-bark) of tree species j
Source of data	ACHUGAR, L.; SCAGLIONE, G. 2003. Evaluación de propiedades de la madera en clones de <i>Eucalyptus grandis</i> Hill (ex Maiden). Thesis Ing.Agr. Montevideo, Uruguay, Universidad de la República- Facultad de Agronomía

Value applied	0.38 to 0.49 (depending on the tree age)
Justification of choice of data or description of measurement methods and procedures applied	1) basic density values are taken from results of a thesis investigation work (national and local data) 2) the values used are the ones from the bottom of the confidence interval of 95%, to be conservative 3) values are plotted and tendency line is added, the tendency line with the highest r^2 4) power function is used to estimate the density values for the whole period 5) real and calculated values are plotted
Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	$BEF_{2,j}$
Data unit	Dimensionless
Description	Biomass expansion factor for conversion of stem biomass to above-ground biomass for tree species j
Source of data	Default values from Table 3A.1.10 of IPCC GPG-LULUCF 2003
Value applied	1.15 to 3.2 (depending on the tree age)
Justification of choice of data or description of measurement methods and procedures applied	BEF varies with the age, being the highest values for young plantations and the lowest for mature plantations. A conservative approach was taken varying the BEF very quickly, reducing it to a half by year 5 and considering the forest as mature at the age of 10 years.
Purpose of the data	Calculation of project emissions

Comments	According to the A/R methodological tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities", for ex post estimation the conservative default value of 1.15 will be used unless transparent and verifiable information can be provided to justify a different value.
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Data / Parameter	R _j
Data unit	dimensionless
Description	Root-shoot ratio for tree species j
Source of data	Table 3A.1.8 of IPCC GPG-LULUCF 2003.
Value applied	0.20 to 0.45
Justification of choice of data or description of measurement methods and procedures applied	According to IPCC 2003, the value of R depends on aerial biomass (t / ha). For values less than 50 tonnes / ha 0.45 was used, for values between 50 and 150t/ha 0.35 was used and for over 150 0.2 was used
Purpose of the data	Calculation of project emissions
Comments	For ex-post estimations, R _j will be estimated using the recommended equation taken from the suggested equation from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs" and calculated based on estimated aboveground biomass for each verification period.

Data / Parameter	CF _{TREE}
Data unit	t C (t.d.m) ⁻¹

Description	Carbon fraction of tree biomass
Source of data	A/R Methodological tool: Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities, version 04.2
Value applied	0.47
Justification of choice of data or description of measurement methods and procedures applied	Default value
Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	DF _{DW}
Data unit	Per cent
Description	Conservative default factor expressing carbon stock in dead wood as a percentage of carbon stock in tree biomass
Source of data	A/R Methodological tool: Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities; Version 03.1
Value applied	8%
Justification of choice of data or description of measurement methods and procedures applied	The chosen value of 8% corresponds to a Temperate/Boreal Biome.

Purpose of the data	Calculation of project emissions
Comments	N/A

Data / Parameter	DF _{LI}
Data unit	Per cent
Description	Default factor for the relationship between carbon stock in litter and carbon stock in living trees
Source of data	A/R Methodological tool: Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities; Version 03.1
Value applied	4%
Justification of choice of data or description of measurement methods and procedures applied	The chosen value of 4% corresponds to a Temperate/Boreal Biome.
Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	SOC _{REF}
Data unit	t C ha ⁻¹
Description	Reference SOC stock corresponding to the reference condition in native lands (i.e. non-degraded, unimproved lands under native

	vegetation . normally forest) by climate region and soil type applicable to stratum i of the areas of land
Source of data	Table 3, Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities, v 01.1.0
Value applied	88
Justification of choice of data or description of measurement methods and procedures applied	The chosen value of 88 corresponds to a “warm temperate” climate region and soils with high activity clay.
Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	$f_{LU,i}$
Data unit	Dimensionless
Description	Relative stock change factor for baseline land-use in stratum i of the areas of land
Source of data	Tables 6, Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project” activities, v 01.1.0
Value applied	1
Justification of choice of data or description of measurement methods and procedures applied	All permanent grassland is assigned a land-use factor of 1.

Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	$f_{MG,i}$
Data unit	Dimensionless
Description	Relative stock change factor for baseline management regime in stratum i of the areas of land
Source of data	Tables 6, Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project" activities, v 01.1.0
Value applied	0.95
Justification of choice of data or description of measurement methods and procedures applied	The chosen value of 0.95 corresponds to a moderately degraded grassland on a Temperate/Boreal climate regime.
Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	$f_{IN,i}$
Data unit	Dimensionless
Description	Relative stock change factor for baseline input regime (e.g. crop residue returns, manure) in stratum i of the areas of land

Source of data	Tables 6, Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM Project” activities, v 01.1.0
Value applied	1
Justification of choice of data or description of measurement methods and procedures applied	The chosen value of 1 corresponds to a low/medium level for all grassland without input of fertilizers.
Purpose of the data	Calculation of project emissions
Comments	-

3.1.2 Data and Parameters Monitored

Data / Parameter	A_i
Data unit	Ha
Description	Area of stratum i
Source of data	Monitoring of strata and stand boundaries was done using a Geographical Information System (GIS)
Description of measurement methods and procedures to be applied	Strata area were measured based on cartography documents, related with GIS.
Frequency of monitoring/recording	Every time the project boundaries are modified. when disturbances events take place, the project participants shall re-built the stratum and add the area of the project under disturbance in the GIS
Value monitored	2,919 ha
Monitoring equipment	Garmin GPS, model eTrex Legend.
QA/QC procedures to be applied	There is a technical specified team trained for GIS mapping and data analysis. All information is digital and updated as silvicultural activities evolve.

Purpose of the data	Calculation of project emissions
Calculation method	The value was used in equations N° 3, 12 y 24 of the Methodological tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” (Version 4.1), Equations N° 7 and 13 of the Methodological tool “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities” (Version 3.1)
Comments	N/A

Data / Parameter	DBH
Data unit	Cm
Description	Diameter at Breast Height of tree
Source of data	Field measurements
Description of measurement methods and procedures to be applied	DBH is measured at 1.3 m above ground, over the bark. In case of stem deformation at this level, measurement was done over the deformation once the stem took its normal shape, with the purpose of being conservative. DBH was measured in all trees within the plots. In order to avoid over- and under-estimations, every tree was considered inside the plot when the mark of 9.77 m overpassed the 50% of the diameter of every tree.
Frequency of monitoring/recording	Every tree within sample plots
Value monitored	Varies with stratum
Monitoring equipment	In most of the cases, the instrument used for measuring DBH was a caliper model “Mantax Blue” of Haglof, Sweden. Also, for the minority of trees, it was used a diametric tape for measuring DBH.
QA/QC procedures to be applied	A quality control procedure consisted in qualified personnel conducting the measurements in the first place, and the first control is conducted by contractor. Secondly, a random control of 5% of the plots measured is made by AF personnel, using the same data collection sheet, where unsupported errors include: - a difference of more than 3% in the DBH measured with caliper

	Instruments were checked and tested before starting the verification process. Items checked: -Correct visualization if numbers in the calliper. -The straightness of the calliper and the lack of mechanical problems. The calliper length is not a problem since it is impossible the equipment stretches. Bark that is not stick to the stem was removed before measuring.
Purpose of the data	Calculation of project emissions.
Calculation method	Diameters were measured by taking one measure, always pointing the instrument's shaft in direction to the middle of the plot. Parameter used indirectly in Equation N° 1 of the Methodological tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 4.1); for calculation of basal area and then volume..
Comments	N/A

Data / Parameter	H
Data unit	m
Description	Height of trees within sample plot
Source of data	Field measurement
Description of measurement methods and procedures to be applied	All trees within the plot in the case of permanent plots. In relation to the height measurement, the following considerations according to each situation take place: 1. Trees with zero slope: To achieve a correct measurement, the operator must be located at a distance equivalent to the tree height. It is important to keep in mind that the distance taken with the tape measure is the one entered in the inclinometer.

	2. Measurements with slope (positive or negative): In those cases where the tree base is located over the contractor visual sight, the measurement and total height will be a result of the subtraction of the measurements. If the operator is over a hill, the height will be the sum of the measurements. 3. Trees that are dead, burned, or broken will be excluded from the measurement. 4. In order to always measure the heights from the same location and thus avoid bias or errors, height records must always be made in the same direction. For this, the face of the tree where the measurement took place will be marked and identified with paint.
Frequency of monitoring/recording	During every monitoring, for every plot within different stratum.
Value monitored	Varies according to tree classes in plot
Monitoring equipment	Hagl�f ECII-D Electronic Clino/Height Meter
QA/QC procedures to be applied	A quality control procedure consists in qualified personnel conducting the measurements in the first place, and the first control is conducted by a contractor. Secondly, a random control of 5% of the plots measured is made by AF personnel, using the same data collection sheet, where unsupported errors include: Height measurements will not be made on those days where the wind speed exceeds scale 5 of Beaufort (30-38 km / hr), causing a great movement of the trees top (NOAA, 2020). - In the same way as with the DAP record, the height values will be expressed in decimeters, avoiding errors in the register. When referring to this electronic device, it is recommended to check the correct visualization of the display. The clinometer was always kept in safe places in order to avoid display rupture. The equipment was always full charged batteries and back up batteries were always available in case of emergency. At the same time it must previously be calibrated before each daily measurement activity. Make control measurements using all involved equipment (human error should be minimized at minimum with well

	training and cross-checked control measurement activities).
Purpose of the data	Calculation of project emissions.
Calculation method	Once the plot is delimited and all trees to be included are defined, all tree heights are measured in permanent plots. According to the measurement description. In order to avoid over- and under-estimations, every tree was considered inside the plot when the mark of 9.77/15.95 m overpassed the 50% of the diameter of every tree.
Comments	Parameter used indirectly in Equation N° 1 of the Methodological tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 4.1); for project emissions.

Data / Parameter	Rj
Data unit	dimensionless
Description	Root-shoot ratio for tree species j
Source of data	Estimation of carbon stocks and change in carbon stocks of trees and shrubs AR Tool 14.
Description of measurement methods and procedures to be applied	Default values from IPCC guidelines for Eucalyptus in temperate forest according to above-biomass (t/ha): <50= 0.45 51-150= 0.35 >150 = 0.2 For ex-post estimations, Rj will be estimated using the recommended equation taken from the suggested equation from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs" and calculated based on estimated aboveground biomass for each verification period and not a default value for ranges of biomass
Frequency of monitoring/recording	Before every verification event.
Value monitored	0.20 to 0.45 (ex-ante) / varies for ex-post estimations
Monitoring equipment	N/A

QA/QC procedures to be applied	Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, are applied.
Purpose of the data	Calculation of project emissions.
Calculation method	$R_j = \frac{e^{(-1.085+0.9256 \times \ln b)}}{b}$ Where B is aboveground biomass content (t.d.m./ha). The aboveground biomass will be calculated per verification period.
Comments	For ex-post estimations, Rj will be estimated using the recommended equation taken from the suggested equation from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs" and calculated based on estimated aboveground biomass for each verification period.

Data / Parameter	Ap,i
Data unit	m ²
Description	Area of sampling plot
Source of data	Field measurement
Description of measurement methods and procedures to be applied	The center of the plot was marked with the assistance of a GPS. One staff member stayed at the center of the plot taking notes of the diameters and heights measured while the other expert of the team walked inside the plot measuring them. Both experts were always connected with a measuring tape, and every tree measured was previously checked in order to determine if the distance to the center was minor to 9.77/15.95 m (radius of a circular plot of 300/800m ²).
Frequency of monitoring/recording	Every plot measured in BDU I, 108 in total.
Value monitored	Varies with every plot
Monitoring equipment	N/A

QA/QC procedures to be applied	The company's cartography area generates a GEOpdf with the location and numbering of each sample plot to be installed. This point is validated in the field with the capture of the UTM coordinates of the center of the plot installed. The original location is then checked in the office with respect to the actual location of each plot. A minimum of 15 trees must be included per plot, if this is not so, the contractor communicates with the forest manager to define action which may include increasing plot size.
Purpose of the data	Calculation of project emissions
Calculation method	$300m^2 = r^2(9.77) \cdot \pi$ (E.dunni) $800m^2 = r^2(15.95) \cdot \pi$ (E.grandis) The center of the plot will be marked with a stake painted, at a visible height and depth that can be maintained for at least 6 months after the completion of the plot. The two trees that make up the center of the plot must be marked with a letter "C". The center of the plot is identified with a tape measure based on this point, the perimeter of the circle is delimited, identifying the trees to be included. Finally, the plot number will be recorded in tree 1. The delimitation of the plot will be done using a tape measure or electronic instruments (distance meter, for example), the trees will be marked and they must always be visible from the center of the plot. In turn, the plot will be limited with anti-water paint or aerosol and all trees within radius used will be counted. Those trees where half or more of the diameters are within the plot, they will be included in it. The first tree in the plot will be the one furthest to the left of the center of the plot, always heading towards the steepest slope and will be marked with the number 1. The order of tree numbering is as follows: from tree 1 the specimens are numbered towards the right to the end of the parcel in that row and then move to the next row above to finish the semicircle on the side of tree 1. Then you go to the other semicircle and repeat the process. Within the plot, all places with or without trees are counted.
Comments	Sample plots are permanent and circular. The plots were laid down in a shapefile, positioned systematically with a random start. The location of the plots within the forest plantation was

	done with a GPS. The area of each plot is not a variable but a fixed value, but must be measured by its radius in order to determine the variable "number of trees within the plot".
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3.1.3 Monitoring Plan

AF has in place a Quality Management System certified UNIT-ISO 9001 since 2/12/2004. Furthermore, AF has set a forest management system for BDU project. The system includes a Monitoring Plan - which specifies (among other relevant information) the forestry inventory -, procedures and monitoring reports. The documents are publicly available on BDU website.

BDU Forest Management system received on March 2016 the FSC certification as a recognition of its well managed forest⁶⁶. These certifications evidence the concern and experience of AF in the implementation and management of very demanding control systems, and consequently in the monitoring of them to ensure the quality of the forestry. Therefore, AF staff is aware of the importance that monitoring has and is committed to monitor the data correctly for the entire crediting period.

BDU monitoring plan has been designed in line with the methodology AR-ACM0003 and its applicable tools referenced in sections 2.1 and 2.2 above in order to provide all relevant data necessary to verify: i) the applicability conditions listed under section 2.2 are met; ii) changes in carbon stocks in the pools selected; and iii) project emissions and leakage emissions.

The monitoring activities were carried out by a third party in accordance with the Forest Inventory Manual guidelines⁶⁷. Read below detailed information on the monitoring process:

Organizational structure, responsibilities and competencies.

The organizational structure and responsibilities of AF team with regards to the monitoring system are as follow⁶⁸:

- **General Manager:** has the overall responsibility of the forest management system and thus, the monitoring plan;
- **Forests Administration Chief:** responsible for the operational management; resources monitoring; forestry inventories; coordination and control of activities; selection and control of contractors; supervision of AF personnel in various fields and approval of all system documentation.
- **Lands supervisors (AF personnel in the fields):** responsible for controlling the contractors' personnel activities in the fields; supervising the plantations; reporting the forest administration chief; among other activities.

⁶⁶ UNIT-ISO 9001 and FSC certifications are available for the VVB

⁶⁷ Available to VVB during verification (see reference 22)

⁶⁸ BDU management plan; Company description; <http://www.bosquesdeluruguay.com/download/PMBU-4-Descripcion-Empresa.pdf>; and AF organizational chart and Job profiles and responsibilities (available for the VVB) (see reference 18)

- **Forest inventory third party:** Bosques Servicios Forestales SA are the contractors in charge of installing sample plots in the field and conducting forest inventories, first data consistency analysis and checks.

BDU technical team receives training on: the environmental management policy of the AF, the FSC principles and requirements, the management plan main chapters – among others issues - to warranty their competencies to perform their duties as established in BDU Training Plan Procedure⁶⁹. Contractors also receive training on various topics among security and FSC principles and criteria. Contracts include the inventory guidelines, described in the mentioned Forest Inventory Manual.

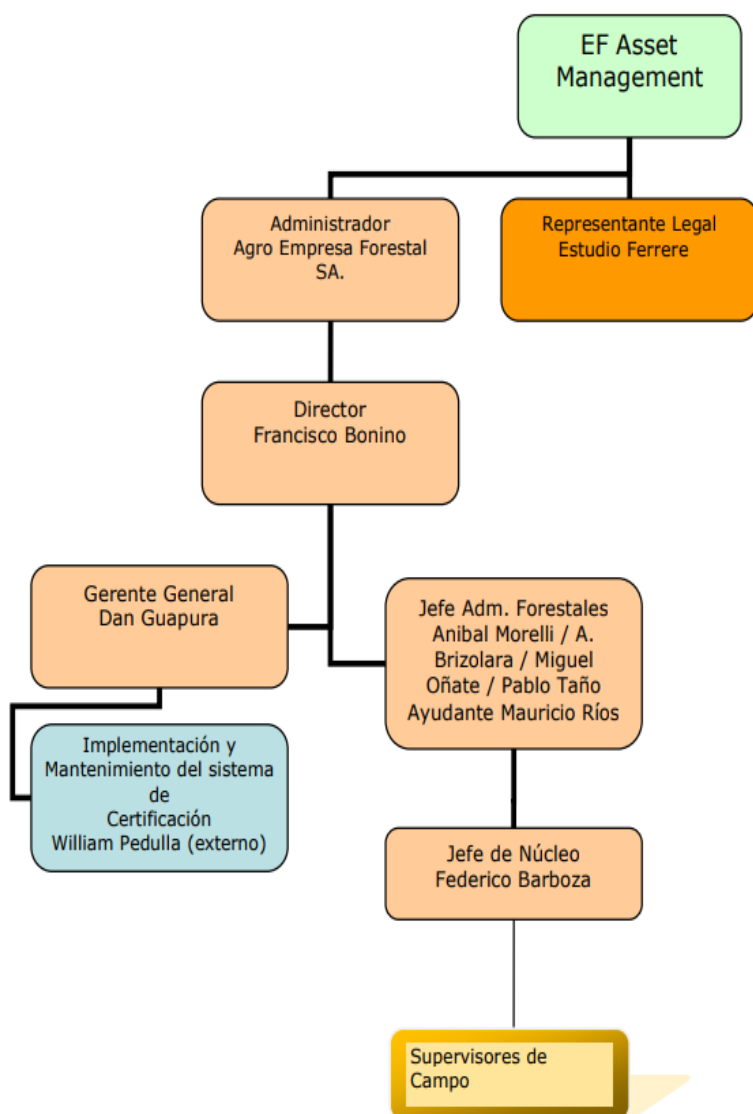


Figure 5. AF's hierarchy chart

⁶⁹ Available for the VVB at validation (see reference 34)

Inventory for permanent plots

They are fixed plots that are installed in the different stratum and whose purpose is to represent and reflect the different productivities. These plots are measured annually.

The objective is to generate information on the growth rate of a species in certain sites for decision-making related to forest management and monitoring carbon sequestration.

The permanent plots are installed as of the third year from plantation and are measured in the months of June to August when vegetative growth is slowed down. These plots have been installed following a stratified sampling design. The strata are defined as a combination of site quality, planting year, and species as already mentioned.

In case of installing a new permanent plot, this is defined in accordance with the criterion mentioned above. The site of the new permanent plot is located at a distance greater than or equal to 50 m from the edge and with a percentage of 90% live trees.

Stratification

The stratification eliminates sources of variation that can mask the results of the inventory, once the variability inside the strata shall be lower than that of the whole population. Hence, it will be possible to obtain more precise statistics due to the population stratification. The stratification also facilitates the data collection and the processing of it per stratum, being also suitable for the planning and execution of the work on the field.

Stratification was done considering the soil types (Coneat Gropus 2, 8, G); age class (plantation date 2012, 2013, 2014, 2015 and 2016); and species planted (*E. grandis* & *E. dunnii*). Total project area will be divided into 23 stratum (for some possible combinations in the planted areas were nil).

Current stratification could suffer subdivisions or merges in the case unexpected disturbances occur or insignificant intra-stratum variability is detected in the annual variation in carbon pools (e.g: forest fires).

Sampling

The sample size involves the number of plots to be distributed with a certain statistical criterion in every stratum. The representative number of plots of the total project area and of every stratum shall be previously decided in order to accomplish the predefined level of accuracy and precision.

The size of the sample plot is a trade-off between accuracy, precision, and time (cost) of measurement. The size is also related to the number of trees, their diameter and the carbon stock variance among plots. The plot should be large enough to contain an adequate number of trees per plot to be measured.

Due to the application of thinning, forest stands in this project have a low number of trees per hectare, tending to have a few large trees per hectare as the stands get older, and uniformly distributed. Thus, taking into consideration the project-specific conditions and the IPCC guidance, circular plots of 300 m² have been selected for monitoring of stratum with *Eucalyptus dunnii* (not thinned, higher density throughout the rotation) and 800 m² for stratum with *Eucalyptus grandis*.

Permanent sampling plots are used to measure and monitor changes in carbon stocks from the most relevant carbon pools over the time. These are considered to be more efficient for estimating changes in carbon stocks by filtering out any variance due to plot effect. The plots will be located with GPS and same treatment is assured, in the same way as all the project extension (e.g. during site and soil preparation, weeding, fertilization, harvesting, etc.) and are prevented from being deforested over the crediting period.

The number of sample plots was first estimated according to the “Calculation of the number of sample plots for measurements within A/R CDM project activities” tool. The outcome of the estimation from the tool was a total of 97 plots for the whole project area. The plots were later updated and increased to 108 seeking higher confidence values.

An example of Power BI dashboard where all permanent plots information is managed is available in figure 6. Moreover, an example of permanent plot mapping is available for Cañada Brava in figure 7.

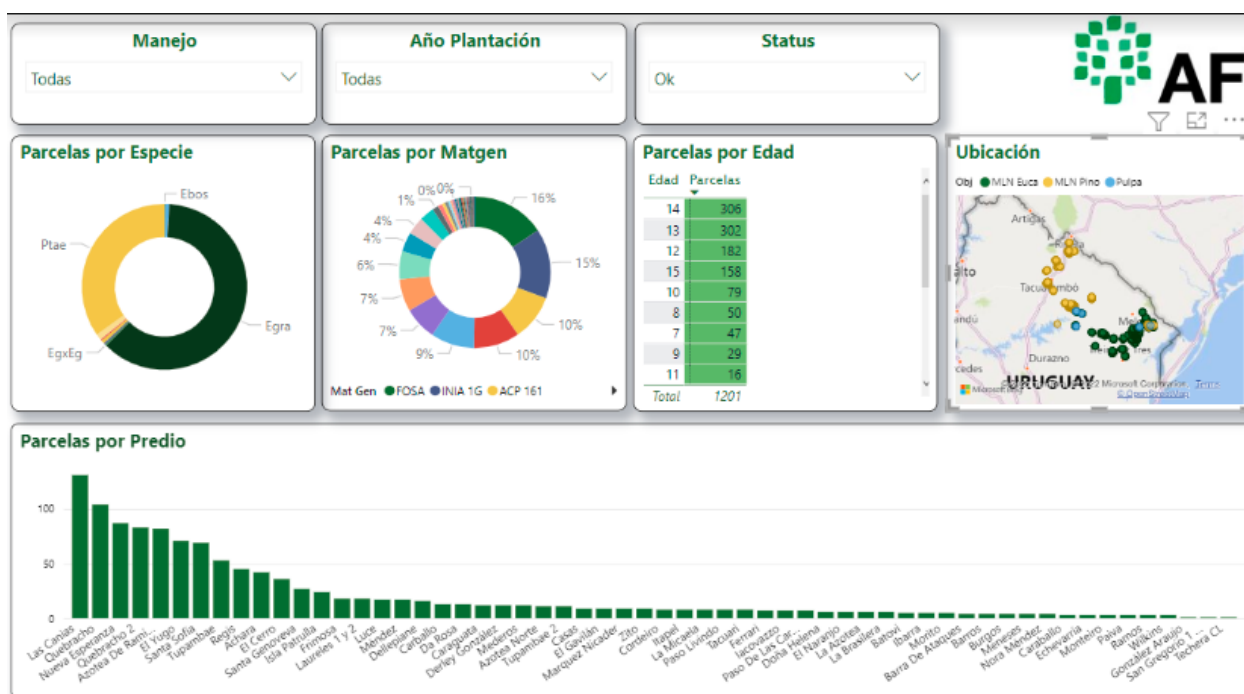


Figure 6. Sample plots management dashboard under AF management

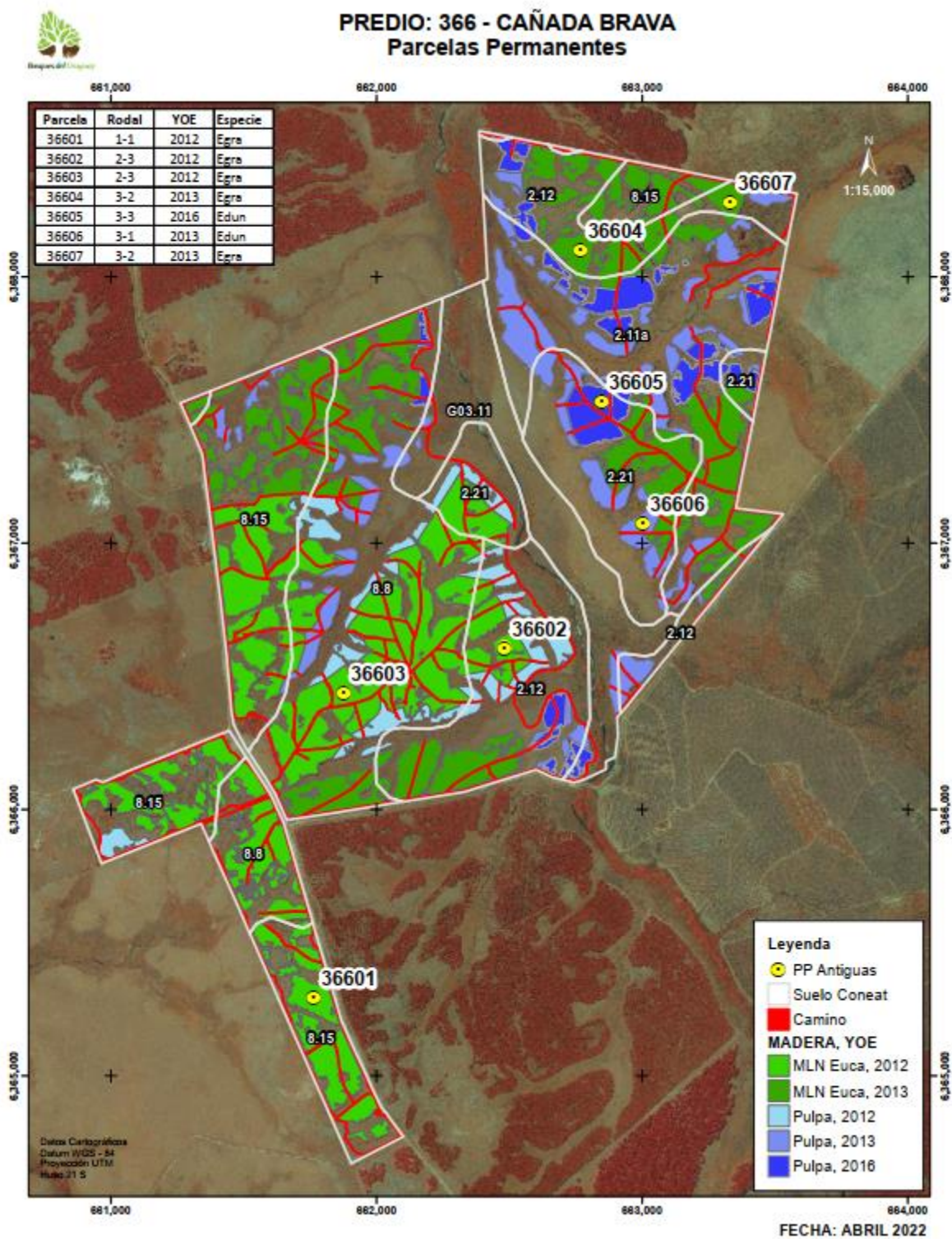


Figure 7. Permanent plots mapping for Cañada Brava.

Mapping

The location of the plots will follow the guidance given by the corresponding methodological tool, as well as IPCC Good Practice Guidance for LULUCF (2002), Chapter 4.3.

Plot grid is done using QGIS or ArcMaps to randomly locate the permanent sampling plots (location is systematic with random start). The map with the location of the sampling plots (geopdf) is loaded on the GPS receptors used by forest inventory crews, usually AvenzaMaps app, so that they can reach the plots accurately.

Further information about the inventory, stratification, sampling, data collection, etc. is available in BDU Management System – Monitoring System document and Forest Inventory Manual⁷⁰

Once the plot was located, the coordinates were registered in the GPS and recorded in the spreadsheet. Afterwards, the previously defined circular plot area was installed. The center of the plot corresponded to the midpoint between two trees (1 per row, faced) and in between. These two trees were marked with the corresponding plot number and the letter "C", from where the plot was delimited, identifying those trees that are on the plot edge.

The next step included marking every tree that was within the plot. The first tree in the plot is the one furthest to the left of the plot, based on how the operator arrived at the site, and this is marked with the number 1. The numbering was then carried out as follows: starting from tree 1, the trees to the right to the end of the plot in that row are numbered. Then it's the turn for the next row above, to finish the semicircle on the side of tree 1. Then, the same procedure was repeated on to the other side of the plot.

Measurement

Each source of GHG emissions/removals is estimated ex post according to the equations previously described and based on the following methods and monitored parameters:

- CTREE (carbon stocks in above and below ground biomass of trees): will be estimated based on stratified random sampling method as described. For this purpose, VTREE (stem volume of tree) will be calculated applying a manual of procedures developed for local conditions, based on diameter at breast height (DBH) and height (H) measurement in each plot.
- DBH measuring: By convention, the diameter is measured at 1.30 m from the ground level, so this measure remains standardized independently of the operator and its height. At this height the instrument is also easy to manage. The DBH is a direct measure from which it is possible to calculate the transverse area, the basal area, the individual and total volume, the growth and the form quotient of the tree, and other variables of interest. In the estimating processes that involve the use of regression functions, the DBH is always the first independent variable because of its easy assessment and for presenting normally a high correlation with the volume, weight and other dependent variables.
- H measuring: The height of a tree or portion of it is the linear distance along its principal axis, departing from the ground up to the top or up to another referential point, always in conformity with the type of height that is needed to measure. The height serves essentially for the calculation of volume and for the calculation

⁷⁰ available to VVB during verification (see reference 22)

of increases in height and in volume. Total Height refers to the distance between the ground and the apex along the principal axis.

Data processing

Once the data has been collected in the field, the contractor must send them by email specifying the type of inventory carried out, establishment surveyed, number of plots and location in kmz format. This data is sent in the electronic spreadsheet (see figure 6) according to the type inventory, in a neat and orderly manner, previously verified that the data does not present errors or repetitions. All those doubts or modifications that arose during monitoring out in the field are clarified in the column called "comments".

The data obtained in the field during monitoring, was then revised, processed and analyzed by the forest planning team in charge of inventories (Daniel Romero y Camila Gomez). In case of finding any inconsistency or doubt, a field check was performed when necessary.

Once the data was reviewed, it was processed using the data processing system Caliper [<https://webapp.avlchile.cl/caliper/caliper.dll>]. It is a software for processing forest inventories that calculates dasometric variables and other variables defined by the user.

In addition, it has a module called "Validator", which allows a review of the consistency of the data, detecting possible inconsistencies in the values that could affect the results. In case of detecting inconsistencies, they are analyzed and evaluated prior to processing.

After processing the data with the configured and established parameters, the software generated an inventory report made with all the information for analysis (these results are presented at product, log, tree, and parcel or stand level).

Finally, the results obtained at the stand level were uploaded to the Forest Management System INFLOR [<https://af.inflor.cloud/sgf/>], generating a database with which reports are made both for volume estimates for carbon sequestration estimates and support for the forestry and strategic planning of the company.

NRO_INVENT	FECHA_INV	PREDIO	ID_PREDIO	ANO_PLAN	MODAL	SUP_MODAL	PARCELA	SUPPARCELA	Nº Arbol	Especie	DAP	Alt Total	Calidad	HCalidad	UTM_N	UTM_E	Marcados	Sanidad	Forma	Daño	Comentarios
									1												
									2												
									3												
									4												
									5												
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									36												
									37												

ESPECIES	
CODIGO	DESCRIPCIÓN
1	E.dunnii
2	E.smithii

NOMENCLATURA	
CODIGO	DESCRIPCIÓN
PREDIO	Código del predio
ID_PREDIO	Nombre del predio
SUPPARCELA	300;500;800;1.000
DAP	Milímetros
Alt. Total	Decímetros
UTM N	7 dígitos
UTM E	6 dígitos

Figure 8: spreadsheet used during monitoring by contractor

QA/QC procedures

The implementation of the monitoring plan includes a QA/QC system to minimize errors in measurement and data analysis, and to provide documentation and consistency in data archiving. Quality Assurance measures are implemented, in order to verify that data quality objectives are met, and in general, to support the effectiveness of the QC system. QA/QC plan includes some of activities aiming at achieving accuracy and precision of data, and transparency of procedures are:

- Development of Standard Operating Procedures for field measurements, clearly defining objectives, admissible and inadmissible errors during monitoring, procedures, and responsibilities⁷¹;
- Training of personnel in field measuring and hiring experienced technicians for the task;

⁷¹ Forest Inventory manual available for VVB during verification (see reference 22)

- Assure periodical check and maintenance of measuring instruments: all mechanical, optical and electronic instruments will be periodically checked by qualified personnel.
- In addition, consistency on field data will be permanently monitored, in order to detect any error.
- Fully document and archive field and processed data: to ensure data preservation, all relevant monitoring documents (data, data analyses, static factors, photos, images, GIS output and other data) will be stored in electronic and/or paper format and back-ups will be done periodically.

During the execution of the monitoring activities, quality controls were carried by AF in the field, without previous notice. The quality of the measurement carried out is controlled with an intensity of 10% of the plots measured, using the same data collection sheet.

The following aspects are evaluated:

- Location: the plot must be clearly identifiable and agree with the location predefined geographic location.
- Identification: the plot must be correctly marked with a stake and trees must be correctly numbered.
- Total height: differences of more than 5% in height measured with clinometer will not be accepted.
- DAP: differences greater than 3% in the DAP measured with diametric tape will not be accepted.

In those cases where the errors were greater than does admissible, the contractor had to re-measure 100% of the plot.

Another measure in place for permanent plots is the “buffer area”. The establishment of buffer areas in permanent plots is intended to avoid edge problems, wind damage, accidental extraction of trees, pathways, etc. and allows destructive sampling of trees for various purposes without altering the measurement plot itself. The buffer area consists of 1.56ha whose center is the plot itself [square area of 125 * 125 m. sideways].

Further information about QA/QC is available in BDU Management System – Monitoring System document⁷².

3.1.4 Dissemination of Monitoring Plan and Results (CL4.2)

Along with the project implementation, the project documentation will be published on VCS and CCB website for all stakeholders, so that they can obtain the detailed project information and development progress. Also, the project’s information is available in local language at BDU website. This includes management and monitoring plans. Moreover, different communications are made publicly in the media regarding carbon certification of the project⁷³.

⁷² Available at https://www.bosquesdeluruguay.com/media/2022/03/GAF_PM_-_Resumen_Publico_del_Plan_de_Manejo_Grupo_AF_2021.pdf as well as Forest inventory manual available to VVB during verification

⁷³ Radio, local newspaper and events where project’s communication regarding carbon credits takes place (see reference 31)

Results from climate monitoring analysis will be available on the BDU website after verification together with updated risk analysis at specific brochures describing the project characteristics and benefits.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

As validated in PD, since continuation of an activity that has been applied without changes for more than 20 years has been selected as the baseline scenario, it is assumed, in agreement with IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry (2003) that the net GHG removals by sinks in the baseline equals zero. This has resulted from applying the “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities”.

3.2.2 Project Emissions

Actual net GHG removals by sinks

GHG emissions resulting from removal of herbaceous vegetation, combustion of fossil fuel, fertilizer application, use of wood, decomposition of litter and fine roots of N-fixing trees, construction of access roads within the project boundary, and transportation attributable to the project activity shall be considered insignificant and therefore accounted as zero.

The actual net GHG removals by sinks shall be calculated as follows:

$$\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t}$$

Where:

$\Delta C_{ACTUAL,t}$	=	Actual net GHG removals by sinks, in year t ; t CO ₂ -e
$\Delta C_{P,t}$	=	Change in the carbon stocks in project, occurring in the selected carbon pools, in year t ; t CO ₂ -e
$GHG_{E,t}$	=	Increase in non-CO ₂ GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t , as estimated in the tool “Estimation of non-CO ₂ GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity”; t CO ₂ -e

The use of fire for site preparation and/or to clear the land of harvest residue prior to replanting is specifically excluded from the project management and therefore project emissions are estimated as zero as suggested in the tool for “Estimation of non-CO₂ GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity”.

$$GHG_{E,t} = 0$$

Change in the carbon stocks in project, occurring in the selected carbon pools in year t shall be calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE_PROJ,t} + \Delta C_{SHRUB_PROJ,t} + \Delta C_{DW_PROJ,t} + \Delta C_{LI_PROJ,t} + \Delta SOC_{AL,t}$$

Where:

$\Delta C_{P,t}$	=	Change in the carbon stocks in project, occurring in the selected carbon pools, in year t ; t CO ₂ -e
$\Delta C_{TREE_PROJ,t}$	=	Change in carbon stock in tree biomass in project in year t , as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO ₂ -e
$\Delta C_{SHRUB_PROJ,t}$	=	Change in carbon stock in shrub biomass in project in year t , as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO ₂ -e
$\Delta C_{DW_PROJ,t}$	=	Change in carbon stock in dead wood in project in year t , as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO ₂ -e
$\Delta C_{LI_PROJ,t}$	=	Change in carbon stock in litter in project in year t , as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO ₂ -e
$\Delta SOC_{AL,t}$	=	Change in carbon stock in SOC in project, in year t , in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; t CO ₂ -e

According to the "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activity" tool, change in carbon stock in trees in a year is estimated as follows:

$$\Delta C_{TREE,t} = \frac{C_{TREE,t_2} - C_{TREE,t_1}}{T} \times 1 \text{ year}$$

Where:

C_{TREE,t_2}	=	Carbon stock in trees within the project boundary at time t_2 ; t CO ₂ e.
C_{TREE,t_1}	=	Carbon stock in trees within the project boundary at time t_1 ; t CO ₂ e.
T	=	Time elapsed between two successive estimations ($T=t_2 - t_1$); yr.

According to the tool, carbon stock in trees at a point of time can be estimated by using one or a combination of four methods.

- Ex-post estimation of carbon stock in trees

Ex-post estimations are based on method (a) of the applicable tool AR-TOOL14 (method "Estimation by measurement of sample plots") and more specifically in option (a) of this method: "Stratified random sampling".

According to this method, mean carbon stock in trees within the tree biomass estimation strata and the associated uncertainty will be estimated as follows:

$$C_{TREE} = \frac{44}{12} \times CF_{TREE} \times B_{TREE}$$

$$B_{TREE} = A \times b_{TREE}$$

$$b_{TREE} = \sum_{i=1}^M w_i \times b_{TREE,i}$$

$$u_C = \frac{t_{VAL} \times \sqrt{\sum_{i=1}^M w_i^2 \times \frac{s_i^2}{n_i}}}{b_{TREE}}$$

Where:

C_{TREE}	=	Carbon stock in trees in the tree biomass estimation strata; t CO ₂ e
CF_{TREE}	=	Carbon fraction of tree biomass; t C (t d.m.) ⁻¹ . A default value of 0.47 is used unless transparent and verifiable information can be provided to justify a different value.
B_{TREE}	=	Tree biomass in the tree biomass estimation strata; t d.m.
A	=	Sum of areas of the tree biomass estimation strata; ha
b_{TREE}	=	Mean tree biomass per hectare in the tree biomass estimation strata; t d.m. ha ⁻¹
w_i	=	Ratio of the area of stratum i to the sum of areas of tree biomass estimation strata (i.e. $w_i = A_i / A$); dimensionless
$b_{TREE,i}$	=	Mean tree biomass per hectare in stratum i ; t d.m. ha ⁻¹
u_C	=	Uncertainty in C_{TREE}
t_{VAL}	=	Two-sided Student's t -value for a confidence level of 90 per cent and degrees of freedom equal to $n - M$, where n is total number of sample plots within the tree biomass estimation strata and M is the total number of tree biomass estimation strata
s_i^2	=	Variance of tree biomass per hectare across all sample plots in stratum i (t d.m. ha ⁻¹) ²
n_i	=	Number of sample plots in stratum i

Mean tree biomass per hectare in a stratum (b_{TREE}) and the associated variance (s_i^2) will be estimated as follows:

$$b_{TREE,i} = \frac{\sum_{p=1}^{n_i} b_{TREE,p,i}}{n_i}$$

$$s_i^2 = \frac{n_i \times \sum_{p=1}^{n_i} b_{TREE,p,i}^2 - (\sum_{p=1}^{n_i} b_{TREE,p,i})^2}{n_i \times (n_i - 1)}$$

Where:

$b_{TREE,p,i}$	=	Tree biomass per hectare in plot p of stratum i : t d.m. ha ⁻¹
n_i	=	Number of sample plots in stratum i

Finally, according to Appendix 1 (Methods of plot biomass measurement) of the tool, the plot biomass value will be determined as follows:

$$b_{TREE,p,i} = \frac{B_{TREE,p,i}}{A_{PLOT,i}}$$

$$B_{TREE,p,i} = \sum_j B_{TREE,j,p,i}$$

$$B_{TREE,j,p,i} = \sum_l B_{TREE,l,j,p,i}$$

Where:

$b_{TREE,p,i}$	=	Tree biomass per hectare in sample plot p of stratum i : t d.m. ha ⁻¹
$B_{TREE,p,i}$	=	Tree biomass in sample plot p of stratum i : t d.m.
$A_{PLOT,i}$	=	Size of sample plot in stratum i : ha
$B_{TREE,j,p,i}$	=	Biomass of trees of species j in sample plot p of stratum i : t d.m.
$B_{TREE,l,j,p,i}$	=	Biomass of tree l of species j in sample plot p of stratum i : t d.m.

With:

$$B_{TREE,l,j,p,i} = f_j(x_{1,l}, x_{2,l}, x_{3,l}, \dots) \times (1 + R_j)$$

$$B_{TREE,l,j,p,i} = V_{TREE,j}(x_{1,l}, x_{2,l}, x_{3,l}, \dots) \times D_j \times BEF_{2,j} \times (1 + R_j)$$

Where:

$f_j(x_{1,l}, x_{2,l}, x_{3,l}, \dots)$ = Above-ground biomass of the tree returned by the allometric equation for species j relating the measurements of tree l to the above-ground biomass of the tree; t d.m.

R_j = Root-shoot ratio for tree species j ; dimensionless

The value of R_j is estimated as:

$$R_j = \frac{e^{(-1.085 + 0.9256 \times \ln b)}}{b}$$

Where b is the above-ground tree biomass per hectare (in t d.m. ha⁻¹), unless transparent and verifiable information can be provided to justify a different value.

Note. If trees have grown as coppice regeneration after a harvest, then the value of R_j should be multiplied by a factor equal to $v_{harvest}/v_{tree}$ or 1, whichever is greater, where $v_{harvest}$ is the volume per hectare of trees harvested and v_{tree} is the volume per hectare of trees standing in the plot at the time of measurement.

$V_{TREE,j}(x_{1,l}, x_{2,l}, x_{3,l}, \dots)$ = Stem volume of tree l of species j in sample plot p of stratum i , estimated from the tree dimension(s) as entry data into a volume table or volume equation; m³

Vtree

Aboveground biomass is calculated based on Bruce et al (1968) regression models (taper function) and the volumetric equation expressed below. The equations were updated from PDD in line with the calculations during forestry inventories:

Bruce et al (1968) taper function is used based on the parameters for each species:

$$dwb(h)^2 / DBH_b^2 = b_1 \cdot X^{1.5} + b_2 (X^{1.5} - X^3) DBH_b + b_3 (X^{1.5} - X^3) H + b_4 (X^{1.5} - X^{32}) H \cdot DBH_b + b_5 (X^{1.5} - X^{32}) H^{0.5} + b_6 (X^{1.5} - X^{40}) H^2$$

Where,

$dwb(h)$ = diameter (cm) without bark, measured at stem height (m)

$DBH(b)$ = diameter (cm) with bark at breast height, 1,3m from ground

H = total height (m)

h_j = height (m) from ground to diameter g_j ($j=1, \dots, n$)

X = $(H - h_j) / (H - 1,3)$

b_i = parameters estimated for each species ($i=1, \dots, 6$)

Parameter	<i>Eucalyptus grandis</i>	<i>Eucalyptus dunni</i>
b1	0,88612	0,79307
b2	-0,01139	-0,01139
b3	0,01628	0,01645
b4	-0,00008	-0,00002
b5	-0,00137	0,00272
b6	0,00004	-0,00006

The universal volumetric equation by smalian used is:
 $V_{tree} = DBH \cdot DBH \cdot 0.785 \cdot H$

Where,

V_{tree} = Total volume without bark (m³)
 DBH = Diameter (cm) extracted from Bruce et al. equation
 H = Height (cm) equal to 1cm

The next step is to add each section calculated and applied factor to include total volume with bark

D_j = Density (over-bark) of tree species j ; t d.m. m⁻³

According to the methodology values are taken from Table 3A.1.9 of IPCC GPG-LULUCF 2003 unless transparent and verifiable information can be provided to justify different values.

Note. Where density (specific gravity) of the bark of a tree species is different from the density of the wood, suitable correction should be applied to estimate a conservative value of the overall (over-bark) density of tree stem.

In this case, ACHUGAR, L. & SCAGLIONE, G. (2003) was used to calculate *Eucalyptus* densities at different ages. Based on the values published by Achugar et al. a regression was conducted to generate values for all rotation period. The procedure is described as follows:

- 1) basic density values are taken from results of a thesis investigation work (national and local data)
- 2) the values used are the ones from the bottom of the confidence interval of 95%, to be conservative
- 3) values are plotted and tendency line is added, the tendency line with the highest r^2
- 4) power function is used to estimate the density values for the whole period
- 5) real and calculated values are plotted.

BEF_{2j}

= Biomass expansion factor for conversion of tree stem biomass to above-ground tree biomass, for tree species j ; dimensionless

For ex-post estimation the V_{tree} value is calculated for all aerial biomass so BEF is not used. In the case it is necessary the conservative default value of 1.15 will be used, unless transparent and verifiable information can be provided to justify a different value.

- **Change in carbon stock in shrub biomass in the project**

Regarding change in carbon stock in shrub biomass in the project, since the baseline scenario is the continuation of extensive cattle breeding in pasture land, this landscape does not present shrubs on it. Therefore it is not a source of GHG emissions.

$$AC_{SHRUB\ PROJ,t} = 0$$

Litter and Dead Wood Carbon Pools

The “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities” tool was used to estimate carbon stock in these pools.

- **Estimation of carbon stock and change in carbon stock in dead wood**

The conservative default factor based method has been selected as the preferred method to estimate this source of emissions since the dead wood will remain in situ and will not be removed from the project boundary through any type of anthropogenic activities. According to it, the carbon stock in dead wood is estimated as:

$$C_{DW,i,t} = C_{TREE,i,t} * DF_{DW}$$

Where:

$C_{DW,i,t}$	Carbon stock in dead wood in stratum i at a given point of time in year t ; t CO ₂ -e
$C_{TREE,i,t}$	Carbon stock in trees biomass in stratum i at a point of time in year t , as calculated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activity"; t CO ₂ -e
DF_{DW}	Conservative default factor expressing carbon stock in dead wood as a percentage of carbon stock in tree biomass; per cent

According to the tool, the rate of change of dead wood biomass over a period of time is calculated assuming a linear change, as follows:

$$dC_{DW,(t_1,t_2)} = \frac{C_{DW,t_2} - C_{DW,t_1}}{T}$$

Where:

$dC_{DW,(t_1,t_2)}$	= Rate of change in carbon stock in dead wood within the project boundary during the period between a point of time in year t_1 and a point of time in year t_2 ; t CO ₂ e yr ⁻¹
C_{DW,t_2}	= Carbon stock in dead wood within the project boundary at a point of time in year t_2 ; t CO ₂ e
C_{DW,t_1}	= Carbon stock in dead wood within the project boundary at a point of time in year t_1 ; t CO ₂ e
T	= Time elapsed between two successive estimations ($T=t_2 - t_1$); yr

Thus, change in carbon stock in dead wood within the project boundary in year t ($t_1 \leq t \leq t_2$) is given by:

$$\Delta C_{DW,t} = dC_{DW,(t_1,t_2)} \times 1 \text{ year for } t_1 \leq t \leq t_2$$

- **Estimation of carbon stock and change in carbon stock in litter**

The conservative default factor based method has been selected as the preferred method to estimate carbon stock and change in carbon stock in litter since litter will remain in situ and will not be removed from the project boundary through any type of anthropogenic activities.

According to it, the carbon stock in dead wood is estimated as:

$$C_{LI,i,t} = C_{TREE,i,t} * DF_{LI}$$

$C_{LI,i,t}$	Carbon stock in litter in stratum i at a given point of time in year y ; t CO ₂ -e
$C_{TREE,i,t}$	Carbon stock in trees biomass in stratum i at a point of time in year y , as calculated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activity"; t CO ₂ -e
DF_{LI}	Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass; percent

According to the tool, the rate of change of litter biomass over a period of time is calculated assuming a linear change, as follows:

$$dC_{LI,(t_1,t_2)} = \frac{C_{LI,t_2} - C_{LI,t_1}}{T}$$

Where:

$DC_{LI,(t_1,t_2)}$	=	Rate of change in carbon stock in litter within the project boundary during the period between a point of time in year t_1 and a point of time in year t_2 ; t CO ₂ e yr ⁻¹
C_{LI,t_2}	=	Carbon stock in litter within the project boundary at a point of time in year t_2 ; t CO ₂ e
C_{LI,t_1}	=	Carbon stock in litter within the project boundary at a point of time in year t_1 ; t CO ₂ e
T	=	Time elapsed between two successive estimations ($T=t_2 - t_1$); yr

Thus, change in carbon stock in litter within the project boundary in year t ($t_1 \leq t \leq t_2$) is given by:

$$\Delta C_{LI,t} = dC_{LI,(t_1,t_2)} \times 1 \text{ year for } t_1 \leq t \leq t_2$$

Soil organic carbon Pool

As from the tool, it is assumed that:

- Site preparation and planting take place within a year of each other;
- The implementation of the project activity increases the SOC content of the lands from the pre-project level to the level that is equal to the steady-state SOC content under native vegetation;
- The increase in SOC content in the project scenario takes place at a constant rate over a period of 20 years from the year of planting.

The initial SOC stock ($SOC_{INITIAL,i}$) at the start of the project is estimated as follows:

$$SOC_{INITIAL,i} = SOC_{REF,i} * f_{LU,i} * f_{MG,i} * f_{IN,i}$$

Where:

$SOC_{INITIAL,i}$	SOC stock at the beginning of the A/R CDM project activity in stratum i of the areas of land; t C ha ⁻¹
$SOC_{REF,i}$	Reference SOC stock corresponding to the reference condition in native lands (i.e. non-degraded, unimproved lands under native vegetation, normally forest) by climate region and soil type applicable to stratum i of the areas of land; t C ha ⁻¹
$f_{LU,i}$	Relative stock change factor for baseline land-use in stratum i of the areas of land; dimensionless
$f_{MG,i}$	Relative stock change factor for baseline management regime in stratum i of the areas of land; dimensionless
$f_{IN,i}$	Relative stock change factor for baseline input regime (e.g. crop residue returns, manure) in stratum i of the areas of land; dimensionless
i	1, 2, 3... strata of areas of land; dimensionless

As per the tool, for each stratum of the areas of land which is subject to soil disturbance attributable to project activity and for which the total area disturbed, over and above the area disturbed in the baseline (if any), is greater than 10 percent of the area of the stratum, which is the case of the present project activity, the following carbon loss is accounted:

$$SOC_{LOSS,i} = SOC_{INITIAL,i} * 0.1$$

$SOC_{LOSS,i}$	Loss of SOC caused by soil disturbance attributable the A/R CDM project activity, in stratum i of the areas of land; t C ha ⁻¹
0.1	The approximate proportion of SOC lost within the first five years from the year of site preparation
i	1, 2, 3... strata of areas of land; dimensionless

For this project the soil disturbance area was calculated considering a ploughing strip of 80 cm every 4 meter (distance between plantation lines). This results in a 20% of the area disturbed, i.e. above the 10% established by the tool.

The rate of change in SOC stock in project scenario until the steady-state SOC content is reached is estimated as follows:

$$dSOC_{t,i} = 0 \quad \text{for } t < t_{PREP,i}$$

$$dSOC_{t,i} = -\frac{SOC_{LOSS,i}}{1 \text{ year}} \quad \text{for } t = t_{PREP,i}$$

$$dSOC_{t,i} = \frac{SOC_{REF,i} - (SOC_{INITIAL,i} - SOC_{LOSS,i})}{20 \text{ years}} \quad \text{for } t_{PREP,i} < t \leq t_{PREP,i} + 20$$

Where:

$dSOC_{t,i}$	the rate of change in SOC stock in stratum i of the area of land, in year t ; $t \text{ C ha}^{-1} \text{ yr}^{-1}$
$t_{PREP,i}$	the year in which first soil disturbance takes place in stratum i of the areas of land
$SOC_{LOSS,i}$	Loss of SOC caused by soil disturbance attributable the A/R CDM project activity, in stratum i of the areas of land; $t \text{ C ha}^{-1}$
$SOC_{REF,i}$	Reference SOC stock corresponding to the reference condition in native lands by climate region and soil types applicable to stratum i of the area of land; $t \text{ C ha}^{-1}$
$SOC_{INITIAL,i}$	SOC stock at the beginning of the A/R CDM project activity in stratum i of the areas of land; $t \text{ C ha}^{-1}$
i	1,2,3...strata of areas of land; dimensionless
t	1,2,3...years elapsed since the start of the A/R CDM project activity

Furthermore, according to the tool, due to uncertainties and inherent limitation of the precision of a factor-based estimation used in the tool, value of the rate of change of SOC stock is not accounted as more than $0.8 \text{ t C ha}^{-1} \text{ yr}^{-1}$, that is:

If $dSOC_{t,i} > 0.8 \text{ t C ha}^{-1} \text{ yr}^{-1}$ then $dSOC_{t,i} = 0.8 \text{ t C ha}^{-1} \text{ yr}^{-1}$

Finally, the change in SOC stock for all the strata of the areas of land, in year t , is calculated as:

$$\Delta SOC_{AL,t} = \frac{44}{12} * \sum_i A_i * dSOC_{t,i} * 1 \text{ year}$$

Where:

$\Delta SOC_{AL,t}$	Change in SOC stock in areas of land meeting the applicability conditions of this tool, in year t ; $t \text{ CO}_2\text{-e}$
A_i	The area of stratum i of the areas of land; ha
$dSOC_{t,i}$	The rate of change in SOC stocks in stratum i of the areas of land; $t \text{ C ha}^{-1} \text{ yr}^{-1}$
i	1, 2, 3... strata of areas of land; dimensionless

3.2.3 Leakage

According to the methodology AR-ACM003 v.2.0, section 5.6, leakage emissions shall be estimated as follows:

$$LK_t = LK_{AGRIC,t}$$

Where:

LK_t = GHG emissions due to leakage, in year t ; $t \text{ CO}_2\text{-e}$

$LK_{AGRIC,t}$ = Leakage due to the displacement of agricultural activities in year t , as estimated in the tool "Estimation of the increase in GHG

emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity"; t CO₂-e

According to the "*Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity*" tool, leakage emission attributable to the displacement of agricultural activities due to implementation of an A/R CDM project activity is estimated as the decrease in carbon stocks in the affected carbon pools of the land receiving the displaced activity.

Leakage emission attributable to the displacement of grazing activities under the following conditions is considered insignificant and hence accounted as zero:

- a. Animals are displaced to existing grazing land and the total number of animals in the receiving grazing land (displaced and existing) does not exceed the carrying capacity of the grazing land;
- b. Animals are displaced to existing non-grazing grassland and the total number of animals displaced does not exceed the carrying capacity of the receiving grassland;
- c. Animals are displaced to cropland that has been abandoned within the last five years;
- d. Animals are displaced to forested lands, and no clearance of trees, or decrease in crown cover of trees and shrubs, occurs due to the displaced animals;
- e. Animals are displaced to a zero-grazing system.

For the case of the BDU project, condition "a" applies. Agreements with previous land owners and external cattle breeders were reached in which cattle could keep grazing the land until the moment of plantation. Then, once plantations are established, the cattle have to leave the area temporarily until the trees reach the age of 2 years. During that period the cattle is transferred to other plots of the project that are not planted yet, will never be planted or were planted already 2 years ago. This scheme is possible given the effective area to be covered with new forests and the rate of plantation. About 60% of the area will be planted, the remaining of it for grazing activities (after discounting areas of infrastructure, water courses, etc). Regarding plantation rate, activities will be carried out in 3 years meaning that by the third year of plantations, the cattle could go back to the areas planted in the first year. If this area is not enough to hold 100% of the cattle then part of it could also go back to the farm of their owner or to other neighboring farms with vacant capacity.

Since the type of production carried out in this region is extensive, the carrying capacity of the grazing land was not reached before the project started. According to Marcos Martínez, from Plan Agropecuario⁷⁴, the mean carrying capacity for this region is 0.71 UG/ha with a pasture harvest efficiency of 44%. This is for a region that produces an annual mean of 4.4 tn/dry matter with an annual consumption of 2.7 tn/dry matter. Several authors indicate that efficiencies of harvest of more than 50% are indicative of heavy grazing and loss of species. For the case of the BDU project's region there is still room for the efficiency to increase

⁷⁴ "¿Cuánto produce un campo de las sierras del este y cuál sería la estrategia de manejo con cría vacuna?"; Ing. Agr. Marcos Martínez; Instituto Plan Agropecuario; Magazine N° 138; Recursos Naturales; Page 58; May 2011. Available at: http://www.planagropecuario.org.uy/publicaciones/revista/R138/R_138_56.pdf (Accessed on: 26/03/2016)

(from 44% to 50%) before pastures start to degrade. Therefore, the cattle could be moved to the unplanted areas or to neighbor farms without exceeding the carrying capacity.

The previous conditions allow concluding that the displacement of grazing activities is considered insignificant and hence accounted as zero.

$$LK_t = 0$$

3.2.4 Net GHG Emission Reductions and Removals

During this verification period (30 May 2012 to 31 July 2021), net GHG emission reductions reached 841,868.4tCO_{2e}, as detailed bellow, including the buffer credits calculated taking into consideration the non-permanence risk value of 10% for this monitoring period:

Year	Baseline emissions or removals (tCO _{2e})	Project emissions or removals (tCO _{2e})	Leakage emissions (tCO _{2e})	Net GHG emission reductions or removals (tCO _{2e})
2012-2015	0	43,839.0	0	43,839.0
2016	0	63,256.5	0	63,256.5
2017	0	70,105.8	0	70,105.8
2018	0	91,927.6	0	91,927.6
2019	0	344,906.9	0	344,906.9
2020	0	138,433.9	0	138,433.9
2021	0	89,398.9	0	89,398.9
Total	0	841,868.4	0	841,868.4

These values come from the calculation of the different carbon pools considered. Next table show carbon emission/removals to date:

Year/pool	Baseline (tCO _{2e})	Leakage (tCO _{2e})	Above and below ground (tCO _{2e})	Dead wood (tCO _{2e})	Litter (tCO _{2e})	SOC (tCO _{2e})	Total (tCO _{2e})	Net GHG emission reductions or removals (tCO _{2e})	VCUs eligible for issuance before buffer pool allocation	Buffer pool allocation	VCUs eligible for issuance
2012	0	0	6139,9	491,2	245,6	-11676,2	-4799,5	-4800	-	-	-
2013	0	0	16665,5	1333,2	666,6	-9888,1	8777,2	13577	8777	878	7899
2014	0	0	27191,0	2175,3	1087,6	-2762,1	27691,8	18915	18915	1891	17023
2015	0	0	37716,6	3017,3	1508,7	1596,4	43839,0	16147	16147	1615	14532
2016	0	0	93531,9	7482,5	3741,3	2339,8	107095,4	63256	63256	6326	56931
2017	0	0	152119,1	12169,5	6084,8	6827,9	177201,2	70106	70106	7011	63095
2018	0	0	234197,2	18735,8	9367,9	6827,9	269128,7	91928	91928	9193	82735
2019	0	0	542149,8	43372,0	21686,0	6827,9	614035,6	344907	344907	34491	310416
2020	0	0	665751,5	53260,1	26630,1	6827,9	752469,5	138434	138434	13843	124591
2021	0	0	745572,0	59645,8	29822,9	6827,9	841868,4	89399	89399	8940	80459
TOTAL							841868,4	841868	841868	84187	757681

Buffer credits would be equal to 84,186.8 tCO_{2e} in line with the 10% value result from the NPRR assessment. On the other hand, LTA is of 840, 209 tCO_{2e}, meaning the maximum VCUs to be emitted is

slightly lower than that measured in pools. In summary: year 2021 value would equal to 87,739.5 tCO₂e and total buffer equal to 84,020.9 tCO₂e as shown in the next table.

Year/pool	Net GHG emission reductions or removals (tCO ₂ e)	VCUs eligible for issuance before buffer pool allocation	Buffer pool allocation	VCUs eligible for issuance
2012	-4,799.5	-	-	-
2013	13,576.7	8,777.0	877.7	7,899.3
2014	18,914.6	18,914.6	1,891.5	17,023.1
2015	16,147.2	16,147.2	1,614.7	14,532.5
2016	63,256.5	63,256.5	6,325.6	56,930.8
2017	70,105.8	70,105.8	7,010.6	63,095.2
2018	91,927.5	91,927.5	9,192.8	82,734.8
2019	344,906.9	344,906.9	34,490.7	310,416.2
2020	138,433.9	138,433.9	13,843.4	124,590.5
2021	89,398.9	89,398.9	8,939.9	80,459.0
Total	841,868.4	841,868.4	84,186.8	757,681.6
LTA	840,209.0	840,209.0	84,020.9	756,188.1
Corrected 2021	87,739.5	87,739.5	8,773.9	78,965.5

Uncertainty values reach 3.8% with a confidence interval of 95% and calculations are available to VVB.

3.3 Optional Criterion: Climate Change Adaptation Benefits

Not applicable

3.3.1 Activities and/or processes implemented for Adaptation (GL1.3)

Not applicable

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM2.1)

As previously mentioned, periodic surveys to the community allow to identify the forestry activity impacts on the communities. In this line the impacts analyzed include: impact on local jobs, community well-being, employees respect for local communities culture, environment conservation, among others.

Moreover, the Company interacts with the community in accordance with the criteria of Social Responsibility and assuming its role as a neighbor. Through socio-cultural studies, possible interactions are identified, for example:

- a) Generation of manpower and use of local services.
- b) Collaboration with educational activities (presentations, collaborations, etc.).
- c) Talks on forest fire prevention and care for the environment in schools and high schools in the areas of influence, whether rural or urban.

As a result of the project activity an increase in the creation of jobs in an area with high unemployment and high poverty rates is observed with more than 336 jobs generated (with 13 estimated to be women). In the case of the project, all workers are annually trained on FSC principles and criteria, AF policies, working security as well as others providing experience of forest planting and sustainable forest management in degraded grasslands in connection to HCV areas. The forest activity in Uruguay causes an increase in the number of jobs compared to extensive farming activity, as well as job quality, since forestry wages are typically higher than other activities rural areas. These will contribute to the attenuation or reversal of the phenomenon of population migration from the project zone to urban and other areas of the country. Moreover, the development of services in the towns next to project area is expected to increase due to project activity.

In addition, there is a tendency in the country that forestry workers return home after each workday, which is a big improvement in respect to livestock, which strongly depends on the residence workers on farms, far from their families.

On the other hand, the gross value of production per unit land area will increase between 6 to 8 times compared to extensive livestock farming. Forestry produces an increase in tax revenue. Biomass production and energy resource is of high strategic value for Uruguay, the project will increase supply of forest residues, which is considered a security for the country in terms of energy sources.

Regarding each community group impacts have been identified:

Community Group	Cattle breeders
Impact(s)	Temporary relocation of activities, changes in the beef cattle breeding system (to silviculture)
Type of Benefit/Cost/Risk	Actual and predicted impacts beneficial to the cattle breeders (with temporary inconveniences)
Change in Well-being	Changes towards silvicultural activities have shown to bring benefits to cattle animals in comparison to grassland breeding, this being the provision of shelter from high temperature weather and storms. Moreover, with the objective of reducing fire risks, cattle breeders and neighbors are capacitated on fire prevention and care for the environment during talks and community work.
Community Group	Rural population
Impact(s)	Increase in economic activities and demand for services in the area; improve of local communities well-being and livelihoods

Type of Benefit/Cost/Risk	A direct actual benefit is that BDU has implemented a program to support and assist local communities, public schools, public entities (firefighters, police) or any stakeholders identifying together problems solvable by BDU, with donations of various types⁷⁵. From materials goods (firewood, tools, and school supplies), to staff time (educational presentations in schools). BDU is committed to promote and enhance the well-being of the community. An indirect predicted benefit with the increase in the demand for services in the area, as a result of more activities taking place, is the generation of more jobs in different sectors⁷⁶. This value is expected to represent a 150% in relation to direct jobs generated by the project⁷⁷ meaning an improvement in the livelihood of 518 persons (considering direct and indirect jobs, including cattle breeders and beekeepers within the project boundary) of which 20 are estimated to be women⁷⁸. Another direct benefit for rural communities' well-being is erosion control and HCV conservation. Impacts rating is measured based on annual surveys to community
Change in Well-being	Improvement given more people access jobs and training; conservation of environmental services. The implementation of the project activity will result in an effective protection of the soil against erosion and in a reversion of the degradation by building up soil organic carbon. Soils will be disrupted only once each rotation cycle and site preparation will be based on strip tillage, with strips oriented perpendicularly to slope direction, and use of glyphosate herbicide to minimize the exposure the soil to erosion agents. The tree vegetation will completely protect the soil and at harvest, bark, leaves and branches will be left on the ground, thus minimizing any negative impacts of erosion by rainfall and soil degradation by harvesting machinery

Community Group	Forest producers and workers
Impact(s)	Increase in scale and demand for jobs and industries; management experience improvement
Type of Benefit/Cost/Risk	Indirect predicted benefit given by economic studies ⁷⁹
Change in Well-being	The project will contribute to create a development pole away from Montevideo and other areas which concentrate most of the economic activity in the country

Community Group	Project forestry workers
Impact(s)	Chemical management

⁷⁵ A complete and detailed list of donations is available for VVB during validation (see reference 42)

⁷⁶ Based on the report by Ferrere (2017) "Contribución de la Cadena Forestal a la Economía de Uruguay"

⁷⁷ Based on information from the report of Ferrer, 2017 (previous reference); where induced jobs from the forestry sector represented more than 150% of direct jobs in 2016.

⁷⁸ Based on General Census 2011 values for population structure.

⁷⁹ Based on the report by Ferrere (2017) "Contribución de la Cadena Forestal a la Economía de Uruguay" (see reference 75)

Type of Benefit/Cost/Risk	Identified direct potential risk – low significance (given the mitigation actions in place)
Change in Well-being	Potential health risk

Community Group	Rural school students and staff
Impact(s)	Education improvements by upgrading education facilities that are child sensitive
Type of Benefit/Cost/Risk	Actual direct benefit received by students and education institution staff
Change in Well-being	This will be achieved through the project's donations to improve the school infrastructure and maintenance. It also includes talks on subject of interest to school authorities as: locally transmitted diseases, risk of locally present ophidians, flora and others ⁸⁰

Project impact analysis is summarized in the EIA table that follows:

Table 2. Project impact analysis from the Environmental Impact Assessment for forestry activity in the farms

Factors impacted		Project activities - impact significance (N= negative; P= positive)				
		Silvicultural management	Forest harvest	Transport	Plantation and re-planting	Agrochemical uses
Physical	Soil		N - Low		N - Low	N - Low
	Water		N - Low			N - Low
	Atmosphere					
	Climate	P - very				
Biotic	Flora	N - low	N - low		N - low	N - Low
	Fauna	N - low	N - low			N - Low
	Singular habitats					
Socio-economic	Population	P - very	P - very	P - very	P - very	
	Economy			P - very		
	Health					N - low
Constructed	Infrastructure (roads)		N - low	N - very		
Perception	Landscape	N - low	N - low	N - low		
	Cultural aspects		N - low			

4.1.2 Negative Community Impact Mitigation (CM2.2)

On the basis of this theoretical assessment of the impacts identified as negative as a result of the planned interventions and related forest activities, the aim is to establish mitigation measures that will depend on each particular situation.

Mitigation is understood as the design and execution of works, activities or measures aimed at moderating, attenuating or measures aimed at moderating, attenuating, minimizing or diminishing the negative impacts that this that this project may generate on the human and natural environment.

The project impacts identified in the Environmental Impact Assessment will be mitigated based on:

⁸⁰ A complete and detailed list of donations is available for VVB during validation (see reference 42)

Impacts on personnel: the mitigation measures that result in a low risk weighting are: the mandatory use of PPE (shoes or rubber boots, overalls, nitrile gloves, respirator for organic vapors, cap and goggles in the case of transferring products to be filled, etc.) rubber boots, overalls, nitrile gloves, respirator for organic vapors, cap and goggles in the case of transferring products for filling goggle backpacks). It is also compulsory to have an applicator's license which implies going through a specific training course in the application of chemical products.

Roads and Routes: The Company establishes that on rainy days it is forbidden to drive on unpaved roads to avoid road and routes deterioration.

Soil and water contamination by chemicals: There is an operating procedure in place for the correct use and care to be taken to avoid spills and contamination by limiting use, trained personnel in charge, among other actions.

Flora: Operators will be trained in operational IT to prevent the product from contaminating the local flora.

To the extent that negative impacts are identified that could have a greater significance than foreseen, the necessary corrective measures will be taken immediately. These will depend on the specific situation in each case and will be evaluated by the management of the legal entity, the AF GROUP and the appointed technical advisors.

No elements have been established to determine or establish compensation measures to restore environmental impacts, given that they have not been identified in the production process of the properties that make up the AF GROUP. The following are some of the situations that could be found and the measures that could be taken in the event that they are found:

Gullies: If there are significant gullies, their surface area is measured and monitored to ensure that it does not increase. If this is the case, the area is measured and monitored to ensure that it does not increase, and if it does, it will be filled in or trees will be planted, selecting the most appropriate measure for each situation.

Erosion: Planting lines should preferably be carried out perpendicular to the slope, in the event that there is a longitudinal and transverse slope, it shall be cross slope, with drains/roads that allow for a change in the direction of the tillage so that there are no downhill furrows. The furrows should have a slight slope (2%), which is necessary to prevent the accumulation of water that would limit the growth of the trees.

Whenever possible, roads should not be used when they are wet, so as not to risk jeopardizing their preservation.

Water wells: In the water wells, physical and chemical analysis of the water is carried out and the water table is measured on a biannual basis.

Soil analysis: If necessary, soil analysis will be carried out at selected sites. This can be defined e.g. when plantations are monitored and growth is found to be below expectations.

Harvesting: Given that forest harvesting is the activity that potentially generates the greatest impacts, certain aspects to be taken into account after harvesting are recorded in the Harvest Environmental Monitoring Sheet.

Roads: Given that forest harvesting is the activity that potentially generates the greatest impacts, certain aspects to be taken into account after harvesting are recorded in the Harvest Environmental Monitoring Sheet.

Moreover, the project area has management and monitor plan in place for HCV and APIC areas to ensure the conservation of those areas identified, throughout the project's lifetime (see section 4.2.4 and 4.4.1).

During this verification period, no complaints have been raised in terms of impact generated by the project⁸¹.

4.1.3 Net Positive Community Well-Being (CM2.3, GL1.4)

The main source of income for communities associated with the agriculture in the project area is beef-cattle breeding (cow-calves). The production methods have been applied for the last 300 years (extensive production) and are affected by natural disasters such as droughts, floods. Overall, agricultural production is low. The project will benefit communities economically and socially.

- 1) Income improvement: during the project period, the net income generated by the project includes generation of employment and increasing labor income
- 2) Job creation: The project will provide permanent, temporary, direct and indirect employment opportunities. Most of the work will belong to local farmers involved in the project.
- 3) Enhance social cohesion: project developers will form a closer interaction channel, which will strengthen communication between communities, local/national governments and forestry contractors' companies.
- 4) Technical training: people from communities hired to develop forest activities will be technically trained.
- 5) During the project implementation, it will contribute to HCV areas conservation.

All the previous benefits lead to the improvement in the well-being of 10,298 people (of whom 5,354 are estimated to be women). These value takes into consideration those areas where direct and indirect jobs have been generated (generated and expected to have been generated), donations and development projects with the communities for the verification period, as well as population near HVC identified. This is estimated then as the total population for the corresponding communities:

Community	Population (INE, 2011)
AREVALO	272
CERRO CHATO	3,227
CERRO COLORADO	409
CERRO DE LAS CUENTAS	1,694
FRAILE MUERTO	3,168
MARIA ALBINA	68
SANTA CLARA DE OLIMAR	2,341
TOLEDO (CEL)	132
VALENTINES	178

⁸¹ Annual survey

ZAPICAN	553
TOTAL	10,298

Evidence of the net positive impact of the project's activity are the results of the activity's rating by the stakeholders on the well-being, job generation and other variables analyzed in the annual community survey. These results are reported in section 4.3.1 of this report.

Those impacts identified will be mitigated based on the procedures further described in the general Forest Management Plan leading to net positive impacts.

4.1.4 Protection of High Conservation Values (CM2.4)

None of the HCV will be negatively affected by the project because they are either protected by national laws or voluntarily protected by the project proponent (for those within private lands). Almost all HCV related to community well-being are not located in the rural areas, but in towns, negligible being affected by the project activity. Two sites of HCV for communities are defined in the property MI GENERALA in the tombs belonging to Geronimo Farias and Cirilo Vera⁸².

Those HCV found within the project area will be monitored and protected as mentioned in the BDU project Management Plan and section 5:

MANAGEMENT PLAN FOR HISTORICAL RESOURCES

The following management plan is defined for their care and conservation:

- Visual inspection of each tomb will be carried out once a year whether there have been visits or not.
- Removal of existing weeds in the vicinity of the graves.
- Placement of HCA signage.
- Prohibition for visitors to remove or change parts of the graves (plaques, etc.).
- No machinery is allowed near the graves.
- No planting near the graves.
- Any existing natural regeneration (exotics) shall be removed.
- Visitors are prohibited from any hunting, fishing, camping, that is considered illegal activity.
- It is forbidden to barbecue on the property, to gather firewood, to cut branches, to throw trees.

⁸² More information of the HCV in the "Resumen de monitoreo 2020"

Monitoring is based on the following management guidelines and will comply with Procedure 18th – “Authorization of Visits, Grave Management and Monitoring” more information on Chapter 11 –Monitoring of the Forest Management Plan.

Evidence of monitoring is recorded on the Grave Monitoring form and the record will be kept for 5 years.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

It is well known that planting trees on a grassland site usually causes a reduction in the runoff and an increase in the evapotranspiration. This might cause some competition for water with other users (e.g, cattle farms located downstream in the watersheds, hydroelectric power generation, and water for human consumption). Some studies (e.g. Silveira et al., 2006⁸³) have shown that this effect is not significant in Uruguay at the medium-size watershed scale (due to high precipitation). At the micro-watershed level, there might be some problems, which can be minimized by plantation design (e.g. by limiting the extent of forest plantations in a watershed)⁸⁴. The proposed project will leave at least 35-40% of the land area unplanted, which would greatly reduce the hydrological effects, as compared with a more common 25- 30% of unplanted area. In addition, since most of the project area flows into rivers with relatively high flow rate, no significant downstream effects are expected.

On the other hand, given the fact that climate change in Uruguay has increased precipitations and is expected to continue causing an increased frequency of extreme precipitation events associated with flooding⁸⁵ causing severe infrastructure damage and displacement of people from their homes, the establishment of forests acts as a factor attenuating such negative impacts, by moderating the runoff. This is in fact a positive environmental service of the project. Given the fact that soil erosion will be controlled and that a minimal amount of agro chemicals will be used no negative impacts on water quality is expected either.

Any potential negative impacts on the hydrological cycle processes will be minimized by: a) the design of plantations, which will occupy only approximately 52%⁸⁶ of the land of BDU project area, avoiding sensitive areas; and b) the fact that the annual rainfall, and in particular during the spring-summer period, when usually water deficits occur, has been increasing over recent decades, and is expected to continue in the future, thus offsetting the expected decrease in runoff.

No other negative impacts have been identified on other stakeholders, but periodic monitoring of project activities impacts will allow quick identification and opportunity for its mitigation.

⁸³ Silveira, L., Alonso, J., y Martínez, L. 2006. Efecto de las plantaciones forestales sobre el recurso agua en el Uruguay. Agrociencia (2006) Vol. X N°2 pág. 75-93

⁸⁴ Nosetto, M. & Jobbagy, G. (2016) Análisis del impacto hídrico de la expansión forestal en cuencas de Uruguay at Sociedad de Productores Forestales Uruguay

⁸⁵ As mentioned in section III of: Giménez et al (2006) Cambio climático en Uruguay, posibles impactos y medidas de adaptación en el sector agropecuario. Serie Técnica N° 178, INIA

⁸⁶ This takes into consideration only the forested surface, meaning, for example only 1,225ha of Mi Generala farm is considered when the whole farm is 2,319ha

4.2.2 Net Impacts on Other Stakeholders (CM3.3)

As previously analyzed, given the fact that climate change in Uruguay has been causing, and is expected to continue causing an increased frequency of extreme precipitation events associated with flooding causing severe infrastructure damage and displacement of people from their homes, the establishment of forests acts as a factor attenuating such negative impacts, by moderating the runoff. Together with the mitigating actions, with proper forest design, instead of causing a negative impact on other stakeholders in terms of runoffs, the project presents a clear environmental service.

As there has not been identified other negative impacts, there is no need to anticipate their results.

In order to evaluate that no net negative impacts on other stakeholders have taken place surveys are conducted not only with neighbours, but different stakeholders with different backgrounds, activities and relation to the project (including contractors and other interested parties, see reference number 36). Moreover, during annual FSC certification, a wide array of stakeholders are interviewed and no complaints have arisen regarding negative impacts of the project, other than local impacts mitigated, such as rural road deterioration⁸⁷.

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

The community monitoring plan includes a matrix where the different variables analyzed are monitored (monthly or annually according to indicator) and publicly available on BDU webpage to stakeholders in the form of summary monitoring reports, in local language.

Impacts on the communities' well-being is analyzed from the information collected through the annual survey conducted by BDU (see section 2.3.3). The results for the verification period are reported in the annual summary monitoring reports mentioned where the rating for different forestry activity impacts is summarized. Other variables are systematically monitored using internal reports including working accidents, jobs generated, trained employees, number of complaints resolved, and contribution of project developer to communities in material assistance. Results for the verification period of some of the variables are reported below⁸⁸:

Cost/benefit/risk	Indicator	Monitoring frequency	Goal	Results for verification				
				Year	Jobs		Training	
					Men	Women	Men	Women
Improvement of livelihoods of communities and stakeholders	Number of direct and indirect employees	Annual	Prioritize local hiring if needs are met	2015	38	6	38	6
				2016	17	3	17	3
				2017	49	8	49	8
				2018	24	4	24	4
				2019	33	5	33	5
				2020	176	28	176	28

⁸⁷ FSC summary reports available in reference 17.

⁸⁸ Complete results available for VVB during verification in annual monitoring reports and registry spreadsheet in reference 82

Cost/benefit/risk	Indicator	Monitoring frequency	Goal	Results for verification period
Improvement of technical capacities of communities and stakeholders	Number of trained people in forestry-related areas	Annual	100% forestry contracted companies should be trained every year	
Achieve exceptional community communication and participation throughout the project lifetime	Number of complaints resolved	Annual	100% of complaints should be answered and solved in line with procedures in place	No complaints received during verification period
	Communities valorisation of project communication procedures	Annual	Maintain values of good/very good results above 60%	Average for the period 82,5%
Improvement of communities well-being	Contribution of project developer to communities in material assistance	Annual	Contribute with communities with what is possible	13 schools benefited (painting, firewood, park maintenance, park game fixing, equipment, presentations) 2 neighbor community (festival, public space infrastructure, etc) 2 police departments (firewood)
	Number of schools and children impacted by donations related to facilities improvement	Annual	As many requests from schools as possible within the project zone	928 students in 13 schools, of which 454 students are girls.
	Communities valorization of project improvement to community well-being	Annual	Maintain values of good/very good results above 60%	Average for the period 74,5%
Cattle breeders participation	Number of cattle breeders in properties	Monthly	Maintain interaction with cattle breeders	12 cattle breeders

Cost/benefit/risk	Indicator	Monitoring frequency	Goal	Results for verification period														
Maintenance of community HCV	Community HCV conservation status within premises	Annual	No HCV negatively impacted	2 well maintained graves within the properties														
Mitigate workers health risks	N° of accidents/1million on working hours	Monthly	Reduce accidents to 4 accidents every 1 million working hours	Accidents x 1000000 working hours (2016-2021)  <table><thead><tr><th>Year</th><th>Accidents x 1000000 working hours</th></tr></thead><tbody><tr><td>2016</td><td>1.1</td></tr><tr><td>2017</td><td>1.2</td></tr><tr><td>2018</td><td>1.3</td></tr><tr><td>2019</td><td>1.4</td></tr><tr><td>2020</td><td>6.07</td></tr><tr><td>2021</td><td>1.3</td></tr></tbody></table>	Year	Accidents x 1000000 working hours	2016	1.1	2017	1.2	2018	1.3	2019	1.4	2020	6.07	2021	1.3
Year	Accidents x 1000000 working hours																	
2016	1.1																	
2017	1.2																	
2018	1.3																	
2019	1.4																	
2020	6.07																	
2021	1.3																	

Community HCV identified within project zone are described below. None of these have been negatively affected by the project because they are either protected by national laws or voluntarily protected by the project proponent (for those within private lands). Almost all HCV related to community well-being are not located in the rural areas, but in towns, negligible being affected by the project activity.

Those HCV for community found within the project area, are monitored and protected as mentioned in the BDU project Management Plan. The BDU project is not affected or affecting HCV for community well-being. In the particular case of Mi Generala HCV graves the monitoring reports are shown below. The monitoring tool used for these cases is the annual inspection of each grave in accordance with Protocol18 on authorization of grave visits, management and monitoring registered in the graves monitoring form annually.

Table 3. Monitor results for Mi Generala HCV - graves

Indicators	2017	2018	2019	2020
Weeds presence near the graves (3 mts around the graves should be free of weeds).	a) No	a) Weeds present, extraction conducted	a) Weeds present, extraction conducted	a) Weeds present, extraction conducted
Presence of machine tracks (10 mts around the graves should be free of any machine tracks).	b) No	b) No	b) No	b) No
Presence of invasive, exotic species (minimum 10 mts free of	c) No	c) No	c) No	c) No

invasive or exotic species).				
Distance to planting (should be a minimum of 10 mts).	d) Yes	d) Yes	d) Yes	d) Yes
Indication that the site is a HCV (specific signage on each grave).	e) Signs in good shape	e) Signs in good shape	e) Signs in good shape	e) Signs in good shape
Condition of graves after visits (no changes or graffiti, etc.)	f) No signs of graffiti or other damage.	f) No signs of graffiti or other damage.	f) No signs of graffiti or other damage.	f) No signs of graffiti or other damage.
The environment or vicinity of the graves should not be disturbed (illegal practices, cutting branches, fire, hunting, etc.)	g) No disturbance or illegal practices observed	g) No disturbance or illegal practices observed	g) No disturbance or illegal practices observed	g) No disturbance or illegal practices observed

Monitor reports show updated information on stakeholders identified in the project zone related to the BDU Fund establishments. Further analysis is conducted to identify those related to the farms within the carbon project specifically by applying the 30km radius to each farm, and identifying the communities most impacted by transport activities considering the routes and exits used. The most updated information is presented in the PD, section 2.1.5 and 2.1.7.

Impacts on this communities well-being is analyzed through the annual survey conducted by BDU employees. The results for the verification period are reported in the annual summary survey and analyze the rating for different forestry activity impacts. The general BDU premises results are included below, but information is available at establishment level⁸⁹:

Table 4. Survey results for forestry project activity on community in project zone

Variable analyzed/year	2017	2018	2019	2020
Economic impact	77.1%	81.2%	72.2%	59.1%

⁸⁹ Survey may vary according to activities, prioritizing information around those premises where activity took place and may indicate negative impacts.

Jobs generated	67.4%	62.5%	63%	54.5%
Working conditions	90.3%	75%	70.4%	47.7%
Communication rating between employees and communities	85.5%	96.9%	81.5%	65.9%
Employees integration to the communities customs	91.5%	96.9%	83.3%	75%
Environmental impact of forestry activity	77%	56.3% (15% no answers)	62%	25% (52% no answers)
Impact over communities well-being	81.9%	84.4%	65.7%	65.9%

4.3.2 Monitoring Plan Dissemination (CM4.3)

The monitoring plan and annual monitoring results are published on BDU website which can be consulted openly by stakeholders⁹⁰. Monitoring reports are also presented to the stakeholders during face-to-face presentations organized with the communities, during FSC certification.

4.4 Optional Criterion: Exceptional Community Benefits

Not applicable as the project does not seek Gold standard

4.4.1 Short-term and Long-term Community Benefits (GL2.2)

Not applicable

4.4.2 Marginalized and/or Vulnerable Community Groups (GL2.4)

Not applicable

⁹⁰ Annual monitoring reports available for VVB (see reference 82) and last two years available at BDU website:
https://www.bosquesdeluruguay.com/media/2022/03/RESUMEN_PUBLICO_MONITOREOS_2020.pdf

4.4.3 Net Impacts on Women (GL2.5)

Not applicable

4.4.4 Benefit Sharing Mechanisms (GL2.6)

Not applicable

4.4.5 Governance and Implementation Structures (GL2.8)

Not applicable.

4.4.6 Smallholders/Community Members Capacity Development (GL2.9)

Not applicable

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B2.1)

The expected biodiversity changes include an improvement of the ecological environment of the planted areas and the native forest and grassland surrounding these forest plantations, meaning the total of the properties (only considering the cadastral units part of the project): 4796.9ha. This is due to the fact that native forests won't be impacted by the activity and monitored to avoid negative impacts, whereas those degraded grasslands due to cattle breeding with HVC potential are being protected and monitored, allowing its recovery. Cattle breeding activity did not include this measures, leading to degradation in the area.

Change in Biodiversity	Increase in the richness of flora biodiversity
Monitored Change	In Mi Generala property, in order to analyze the condition of the vegetation, the following variables were monitored: a) Species growth b) Reduction or elimination of species c) Possible fragmentation or discontinuity of areas and corridors d) Natural regeneration of cultivated forest species towards unwanted areas. e) Population of invasive species within the HCV area f) Presence of livestock within native forests g) Extra-stand forestry practices h) Status of non-forest areas i) Status of fences and signage j) Land cover k) Coverage of natural regeneration and state of the understory and mountain and riverine forest ecosystems.

	I) Presence of populations of SNAP species in the different environments described
Justification of Change	Evidence from <i>Mi Generala 2021 Biodiversity Monitoring Report</i> (available to VVB under reference n° 111 and monitoring spreadsheet n° 114) show there has not been a reduction or fragmentation of the areas/species analyzed and no regeneration of cultivated forest species or invasive species. The HCV condition, which limits activities and implements adequate management of non-forested areas is considered the reason for an increase in the number of species identified during monitors: Surveys carried out at this stage allowed the following number of Total / SNAP / CITES-IUCN vascular plants to be recorded: 280/15/10. In relation to the 2019 baseline, the increase is summarized as: Totals / SNAP / CITES-IUCN: 7/1/2

Change in Biodiversity	Conservation status of flora habitat
Monitored Change	In Don Ramón properties, flora valuation indicators considered are: a) Existence of natural regeneration of woody species (Eucalyptus, Pinus, etc.) towards unwanted areas. b) Existence of populations of invasive species within native forests. c) Execution of extra-stand forestry practices invading representative conservation areas. d) State of natural field areas (height of pastures, % of soil covered, and erosion). e) Surveys by specialists, in the AAVC areas with the following procedures: i. Quantitative studies by rapid procedures for trees in forests. Tracing of transects for the quantification of woody species (to be controlled every 5 years). ii. Installation of permanent sites for the quantification of natural regeneration and understory (controlled annually). iii. Quantification of natural regeneration (specimens by species). iv. Number of strata present (1-2). v. Composition of the understory to. Number of different epiphytic species observed vi. Number of different terrestrial and rock species observed
Justification of Change	The last monitoring reports have provided evidence that there is no invasion of non-native species in the HCV area, with no erosion or loss of pasture in the natural field area. An adequate pastoral management of the surrounding area is maintained, with

	exclusion in critical areas, which has enabled the development of communities of various species Regarding biodiversity surveys, the evidences observed in 2020 results in an increase in the number of SNAP species from 36 to 38. With 15 CITES (11 species of cacti and 4 of orchids have been registered) Also, there is evidence of preserved <i>Dicksonia sellowiana</i> fern. General understory development is important and continuous. SNAP, cactus and a fern, <i>Frailea fulviseta</i> and <i>Pityrogramma calomelanos</i> var. <i>Austro Americana</i>, in the first appointment of these species for the country. <i>Luzula campestris</i>, linked to rocky areas is a new SNAP registered.
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Change in Biodiversity	Fauna biodiversity increase in species richness
Monitored Change	In “Don Ramón”, & “Punta del Cordobés” the indicators used during baseline analysis were: a) Specific richness (number of different species) of each one of the studied zoological classes (amphibians, reptiles, birds and mammals) general of the property. b) Specific richness by environments, within each establishment. The number of different species in each of the most relevant environments of each establishment will be determined. c) Proportion of resident and migratory species of the Class Aves. d) Proportion of bird species in observation frequency categories. The categories considered are Common, Fairly Common, Uncommon and Rare (according to Azpiroz, 2003). e) Maintained presence or not of the species that appear in the IUCN threat categories, both on a global scale (for their entire distribution) and for the region, strictly. f) Maintained presence or not of the species integrated to the List of Priority Species for Conservation in Uruguay (Soutullo et al., 2013).
Justification of Change	During the monitoring period, considered of baseline analysis, there has been an increase in the number of tetrapod surveyed, which can be explained due to the conservation procedures in place in the HCV area

Change in Biodiversity	Invasive species control
Monitored Change	Visual inspection of field supervisor tours (with camera tool) Analyzing:

	• Is there natural regeneration of Eucalyptus and Pinus in unwanted areas? • Are there populations of other invasive plant species within the native forest, conservation areas and HCV? • Is the execution of extra-stand forestry practices invading conservation areas? • State of natural field areas (height of horizon of leaves in pastures, % of soil covered, erosion)? • Is any animal species displayed, if YES which one?
Justification of Change	Results have shown no increase in areas occupied by invasive species, compared to without-project condition, but <i>same species identified in cattle breeding livestock dumps areas: Cynodon dactylon y Pennisetum clandestinum</i> . The evidence observed shows the conservation procedures conducted in the HCV areas are limiting outbreaks of invasive or non-native species (<i>Eucalyptus</i>), controlling erosion levels, allowing for the regeneration of pastures.

5.1.2 Mitigation Actions (B2.3)

The measures taken are listed below:

- Mapping of the conservation area and implementation of procedures to be respected by others activities (crops, alternative productions, vehicular traffic, activities not in accordance with the objective of the area, etc.).
- Control the entry of hunters, fishermen, birders, and people outside the company staff in general.
- Evaluate the relevance of carrying out livestock management with objectives compatible with the conservation of environments, their flora and fauna.
- Minimize the use of dogs in livestock management, since in general they are an important cause of mortality of wild fauna, mainly of small and medium-sized mammals.
- Fence the area where vulnerable species have been found.
- Reconstruction plan: management of invasive alien species and Pines

There are a number of aspects that are common to the management plan for unplanted areas of all farms (from the point of view of the fauna tetrapoda) and with greater emphasis on HVCs.

- Access restriction. The presence of people should be restricted to the minimum essential in the case of company personnel and contractors.
- Establish effective surveillance of the areas by Field Supervisors.

- Perform access control tasks and installation of posters deterrent. It would be desirable to prohibit (and enforce the prohibition) the access to unauthorized persons, in particular, but not exclusively, hunters, fishermen, campers, birders, etc.
- Prohibit (as far as possible, and if not reduce to a minimum essential) the presence of dogs linked to the performance of livestock movement tasks, in the environment of residences or accompanying visitors. Dogs in living areas must:
- Restrict employee's circulation, preventing them from entering conservation areas and particular to HVCs.
- Maintain special attention on the presence of exotic species feral (wild boar dogs and pigs (*Sus scrofa*), axis deer - Axis and Hare - *Lepus europaeus*), mainly) for detect presences, or substantial increases that warrant taking control actions.
- Control the presence, within the HVC, of plant species invasive aliens that imply an impoverishment of the environments for tetrapod fauna.
- Adjust livestock endowments (and categories and species) in response to its affectation to the vegetation cover, keeping in the as much as possible a good soil cover and the supply of Shelters (tall grass, accumulated plant material) and food (seeds, leaves) for wildlife. It is desirable to consider cattle within HVCs as a management tool for the vegetation rather than as a strictly productive objective.
- Reduce the risk of fire through: perimeter firewalls, green areas, surveillance, and prohibition of fire and control of access.
- In the particular case of HVC it is desirable to avoid inter-fingering between cultivation and natural areas, minimizing the area contact and avoiding, in particular, cutting or narrowing excessive, biological corridors and connections.
- In all cases, the installation of posters relating to areas of conservation or HVC should be one of the last actions (subsequent to the establishment of controls and specific surveillance) since many times they have the opposite effect, warning about the presence of securities and tending to illegal access rather than avoiding it.
- Vegetable waste must be at least 20 meters away with respect to the areas defined as priority conservation areas, as well as of water courses, buffer zones and ecotones.
- The roads and storage areas will be planned avoiding affecting areas of conservation of the property, as well as the shallows, water courses, etc. and in special conservation priority areas.

After the harvest:

- Verification that the 20 m buffer zones have been well defined with respect to the plantation firebreak.
- Verification that there are no specimens of Eucalyptus (or other exotics invasive) in conservation priority areas or other sites.

Moreover, specific considerations are defined for each HCV area in the project area, applicable to others if defined in the project area. For example:

- Control possible fragmentation or discontinuity of areas and corridor
- Control the natural regeneration of cultivated forest species towards unwanted areas.
- Eliminate invasive species populations within HVC and RA
- Verify that extra-stand forestry practices are not carried out.
- Verify the status of non-forested areas, fences and posters.
- Verify the ground cover and adjust accordingly the provision of livestock.
- Circulation with heavy machinery is restricted in areas to conserve and areas to conserve.

Specific considerations for areas of particular conservation interest are defines, as is the case for La Cascada establishment:

- Take care of the possible fragmentation or discontinuity of areas and corridors.
- Control the natural regeneration of forest species cultivated towards unwanted areas.
- Eliminate invasive species populations within areas of special interest for conservation
- Verify that extra-stand forestry practices are not carried out.
- Verify the status of non-forested areas, fences and signage.
- Verify the ground cover and adjust accordingly the provision of livestock.
- Circulation with heavy machinery is restricted in the areas to be conserved and areas to conserve.

Regarding forestry activities, the mitigation plan in place include:

A. During harvest:

- Tree cutting: The most suitable cutting form should be used to ensure the conservation of the surrounding areas classified as HCV. Special attention should be paid to areas adjacent to the sites defined as conservation priority areas and lowlands.

- Traffic of machinery: The traffic of machinery should be avoided in the HCV, as well as in the vicinity thereof, the sites to be protected must be clearly marked.

- Entering the "conservation priority" areas should be avoided by employees.

- Vegetable residues must be at a minimum of 20 meters with respect to the areas defined as priority conservation areas, as well as of water courses, buffer zones and ecotones.

- The roads and storage areas will be planned avoiding affecting areas of conservation of the property, as well as the shallows, water courses, etc. and in special conservation priority areas.

B. After the harvest:

- Verify that the 25 m buffer zones have been well defined with respect to the firebreak of the plantations on the South side and 12 other sides.
- Verify that there are no specimens of Eucalyptus (or other exotics invasive) in conservation priority areas or other sites.

C. Grazing

- Bovine cattle, in the permitted areas, must be controlled during the year to facilitate the seedling of native forage value pastures.
- monitoring the state of grasses especially in the lowlands taking as reference the average height of the horizon of leaves.
- The possibility of dividing the property into paddocks should be analyzed to manage livestock in the best possible way in different circumstances / times of year.

D. Planning management or re-planting:

- The design of the stands and management activities should be planned in order to ensure not to affect priority areas for conservation.
- Low forested areas should be re-planned, eliminating the stands included within them.

5.1.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

First, due to long-term farming, ecological structure of most project sites where afforestation takes place was relatively homogenous, with low biodiversity. BDU project implemented afforestation activities with scientific and reasonable configuration method, with no burning and slash. The row site preparation will protect the existing vegetation as much as possible. Therefore, the implementation of this project will not decrease biodiversity of project sites.

Second, because ecotones and buffer areas are very important areas from the point of view of biodiversity and its conservation, BDU project focused special studies in those areas. In them, the biggest number of fauna species are registered in relation to forestry plots, inside each farm. At the same time, they act as biological corridors, avoiding isolation or genetic drift. The implementation and maintenance of buffer zones between forest plantations and native forests of more than 20 meters, allow the development and, in some cases, the improvement of pastures. These pastures are habitat and biological corridors for many RAE fauna species; identified as HCV, control in the use of these ecotones allow to improve the ecological environment of the planted areas, native forest and pastures surrounding the forest plantations. These

results on the monitoring in connection to HCV areas is publicly available⁹¹, and consulted with interested stakeholders generated valuable information for the activity⁹².



Figure 9: Biodiversity and community's HVC brochure for one of BDU I properties: Mi Generala

Last, scientific and rational afforestation projects can adjust the hydrological cycle, reduce drought and flood risk; promote soil nutrient cycle, improve local micro-climate and others ecological environments.

More details are described in items 5.1.1 and 5.1.2, the positive impacts of the development of the project are demonstrated above compared with conditions under the without-project land use scenario.

5.1.4 High Conservation Values Protected (B2.4)

From what is indicated in items 5.1.1, the increase in the biodiversity of flora and fauna for the HCV sites is demonstrated. It is also reiterated what is indicated in the Project Description, after the afforestation project is fully launched, there will be an increase in plant species, and the project will implement afforestation

⁹¹ <https://www.bosquesdeluruguay.com/compromiso-con-la-conservacion-de-flora-y-fauna-autoctona/> as well as other brochures available for VVB during verification (see reference 32).

⁹² Information is also shared through other means, as the SPF, in order to communicate on forestry activity impacts; communication exchange available to VVB during verification,

activities through scientific and rational allocation methods, without burning and cutting or harvesting native forests.

A wide range of ecosystems can be found in various parts of the project area, from different types of native forests, wetlands, grasslands, stony fields, among others.

In the property “Don Ramón”, “Mi Generala” and “Puntas del Cordobés” establishments it is possible to identify HCV areas both for flora and fauna biodiversity. In these areas there are priority species for conservation of vascular plants, and fauna. For this reason, a specific monitoring plan was defined for these areas, different to areas with no HCVs. Monitoring report results have shown no negative impact in the verification period as can be seen in the Mi Generala and Don Ramón’s 2021 biodiversity monitoring reports (available to VVB during verification under reference n°79).

During 2015 biodiversity baseline, HCV were identified both within the project area and project zone. Don Ramón is identified with HCV. Adding the areas corresponding to lowlands, native forests, rocky outcrops and pre-defined conservation areas, a total of 225.84 ha of just over 800 ha of Don Ramón establishment (Don Ramón and Don Ramón III) are conserved. The property of Don Ramón, based on the results of the monitoring work concludes that the property has areas of fields stony that merit its qualification as HVC1 according to Principle 9 of FSC® from the floristic point of view, taking into account the diversity of species.

The surveys carried out allowed 18 taxa of vascular plants listed as priority species for conservation according to the SNAP list, to be recorded. Fourteen of the SNAP species have a restricted natural distribution in Uruguay and two of them had no known populations in the wild at the time of publication of the list (2013), which justifies the conservation of the environments and their classification as HCV areas. In one sector, a population of the tree fern *Dicksonia sellowiana* was identified.

Also, regarding fauna it is concluded that Don Ramón has HCV in the property, overlapping with territory considered a Priority for Conservation in Uruguay (20%). On the property the Cañada de la Coronilla and Cañada Fiera channels are part of the Tacuarí River basin, of recognized value for the native fauna and flora it contains (which also links it to Bañado de Medina, also with high biodiversity values). They are, together with the rocky outcrops and cornices, the environments that give the property a high value as a conservation site. Fourteen of the SNAP species have a restricted natural distribution in Uruguay and two of them had no known populations at the time of the publication of the list (2013), which justifies the conservation of the conservation of the environments and their classification as HCVs in the broad sense.

In “Mi Generala”, the species *Grazielia brevipetiolata* was identified, an endemic plant to southeastern Uruguay, from which there are no reports of it in other floras in the region. This means its presence in Mi Generala constitutes, to date, the only record known to the Florida department. The total area of the species found is 74.4 Ha.

Within project zone, it is considered that the set of unplanted areas of Don Chico farm (47%) corresponding to 405.6 Ha is an HCV area as representative of a set of characteristic environments of the lands in the area, especially from a floristic point of view, taking into account the diversity of species. Due to the current degree of development, conservation and continuity of ecosystems and habitats around the Molles del Pescado stream, it is ratified to qualify this HCV as HCV3.

Conservation protection and management activities are documented in the Management Plan and detailed in the cartography. The "Natural Resources Management" chapter of the management plan shows that the

flora and fauna studies are carried out by external experts to know the natural resources on lands certified by BDU. Within the same chapter, the areas to be protected or preserved are established. Additionally, hunting is prohibited on all BDU lands and native forests are not disturbed.

There are detailed wildlife censuses, carried out by external experts that characterize the different existing ecosystems. There is a list of existing and potential species on the land according to their conservation status. The silvicultural systems applied to artificial plantations meet the production objectives and are similar to those of other companies in the area and approved by the competent authorities. In this line, new potential HCV areas are studied and identified throughout the project lifetime.

No degraded areas were identified that might require the implementation of restoration plans. However, based on these baseline studies, the Plan for the Elimination of Invasive species (ELEI) 2020 -2021 was established.

A control of the elimination of exotic species is in place, with intervention activities that depend upon the property's need. The project preserves areas of native forest, natural grasslands with rocky outcrops, and low grasslands. These areas are mapped and identified and are well known to land workers.

5.1.5 Invasive Species (B2.5)

BDU plantations are with exotic species of *Eucalyptus*. They have been evaluated and validated by national regulatory and research bodies. Specifically, the Exotic Invasive Species Committee for Uruguay (CEEI) has published a list of invasive flora and fauna, where *Eucalyptus* is not among them⁹³. There is no evidence of invasive species. The results obtained from the monitoring of the verification period, described in items 5.2 and 5.4, showed the reduction of invasive species and no new exotic and / or invasive species were identified

5.1.6 Impacts of Non-native Species (B2.6)

The project uses mostly *Eucalyptus grandis* and *Eucalyptus dunni*. None of the species are native to the area. The choice of species is due primarily to the fact that they ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. On the other hand, they originate in regions with ecological conditions highly similar to those in Uruguay. At the same time, the mentioned species are broadly used in Uruguay and therefore adapted to the project agro-ecological zone.

These similarities explain why this species adapted so well to Uruguayan conditions, where it has been successfully grown and bred for many years. Proof of this is that other VCS forestry plantations projects are using the same species.

Species	<i>Eucalyptus grandis</i>
Justification of Use	They ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if

⁹³ Available at: <https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/lista-especies-exoticas-invasoras-uruguay#:~:text=El%20Comit%C3%A9%20de%20Especies%20Ex%C3%B3ticas,requieren%20de%20atenci%C3%B3n%20prioritaria%20dado> and for VVB during verification

	other species were used. The project will produce high quality wood suitable for plywood and saw wood production. To produce these type of logs, intensive silvicultural management is implemented (pruning up to 9 meters and thinning), which means intensive and specialized workforce
Potential Adverse Effect	As a general measure, the project will voluntarily adopt the application of the National Code of Good Forest Practices. Likewise, an environmental management system will be implemented with a focus on continuous improvement, following the FSC (Forest Stewardship Council) standard. Based on the environmental impact studies carried out, a significant negative environmental impact is not expected as a consequence of the implementation of the project activities and the use of <i>Eucalyptus grandis</i>. The project is classified in Category A in DINAMA (lower impact). Natural regeneration (mainly in buffer zones and lowlands) will be controlled. After pruning and thinning, drainage zones will be controlled, and no pruning/thinning residues will be allowed in these areas.

Species	<i>Eucalyptus dunnii</i>
Justification of Use	This specie will be planted in lower areas where <i>Eucalyptus grandis</i> can be affected by frost damage. Similarly to <i>Eucalyptus grandis</i> , <i>Eucalyptus dunnii</i> ensures an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. The project will produce high quality wood suitable for plywood and saw wood production. To produce these type of logs, intensive silvicultural management is implemented (pruning up to 9 meters and thinning), which means intensive and specialized workforce.
Potential Adverse Effect	As a general measure, the project will voluntarily adopt the application of the National Code of Good Forest Practices. Likewise, an environmental management system will be implemented with a focus on continuous improvement, following the FSC (Forest Stewardship Council) standard. Based on the environmental impact studies carried out, a significant negative environmental impact is not expected as a consequence of the implementation of the project activities and the use of <i>Eucalyptus dunnii</i>. The project is classified in Category A in DINAMA (lower impact). Natural regeneration (mainly in buffer zones and lowlands) will be controlled after pruning and thinning, drainage zones will be controlled and no pruning/thinning residues will be allowed in these areas.

5.1.7 GMO Exclusion (B2.7)

BDU Project is FSC certified so it has a commitment with FSC values. One of them is the prohibition of introduction of genetically modified organisms in forestry operations.

5.1.8 Inputs Justification (B2.8)

Based on FSC Principle 6, Environmental Impact, management systems should promote the development and adoption of non-chemical methods for pest management, in order not to harm the environment. The use of chemical pesticides should be avoided. Because of that, BDU has in place an internal policy and strategy to minimize the use of chemical substances. In the case of pest control, if chemical pesticides are needed, an environmental and social risk assessment is conducted prior to application, with the aim of identifying impacts, mitigation and monitoring measures of the different chemical alternatives.

At the same time, given forestry sanitation is considered to need a national scale solution among producers, AF channels its efforts through the Health Commission of the Society of Forest Producers (CS-SPF), participating actively. The CS-SPF establishes a short and medium-term work plan, which includes lines of work in aspects of monitoring, control, investigation and training / dissemination for pests considered priority. In turn, forest health issues at the national level are coordinated by the CECOPE (Executive Council for the Coordination of Pests and Diseases forestry) made up of representatives of the MGAP through the General Directorate Forestry and the General Directorate of Agricultural Services, INIA and SPF.

Moreover, a report conducted by a specialist in the use of agrochemicals "Report on the justification of the use of agrochemicals (herbicides and ant killer) in forest plantations" (2020) includes a technical analysis of weed control and agrochemicals, including a detailed national and regional literature review. The analysis concludes the need for the use of agrochemicals as the most economically profitable method and the impossibility of the mechanical method for areas larger than 100 ha per hectare due to the lack of local labor, as well as being more costly and involving a higher level of risk. There is a history that the non-use of agrochemicals for weed control significantly reduces the yield of Eucalyptus plantations, making them unviable. Agrochemicals are used responsibly and operational procedures are in place for the storage, transport and use of agrochemicals, according to CNBPf guidelines and FAO codes.

In reference to the use of ant-killers, it presents studies that conclude at the local level that there are no alternatives to the use of ant-killer and that plantations cannot be established without ant control, citing studies carried out by the Universidad de la República at the request of the working group of the Health Commission of the Society of Forest Producers.

Some of the inputs eventually used includes⁹⁴:

Name	Fipronil ⁹⁵
Justification of Use	It is used for ant control during the establishment of the trees, meaning with a minimum of 8-9 years between applications. In the absence of a national regulation regarding use of the input, the company has decided internally the minimum distance for

⁹⁴ A complete list of inputs used annually, quantity and establishments where it is applied is available at annual monitoring reports (in reference 82).

⁹⁵ Source: <http://www.plaguicidasdecentroamerica.una.ac.cr/index.php/base-de-datos-menu/259-fipronil>

	application near water bodies, being 10 mts to water bodies when terrestrially applied. Fipronil is applied manually in a solid format, inside bateholders minimizing risks of runoffs for localized control of ants. Only specially trained personnel manage the chemicals. The project will follow FSC standards regarding these input⁹⁶.
Potential Adverse Effect	The WHO and EPA consider fipronil "moderately toxic" to humans. It is considered low to moderately toxic depending on the route of exposure. It is classified within group C, a possible human carcinogen. In the environment it behaves as: Solubility in water: low. Persistence in the soil: extreme to medium. Mobility on the ground: medium to light. Persistence in water sediment: less persistent. Volatility: not volatile. Bioaccumulation: medium.

Name	Metsulfuron
Justification of Use	Used to control wide-leaf weeds. In addition, grazing is used as an effective method to control the vegetation before planting
Potential Adverse Effect	EPA considers it as "Slightly toxic". In the environment it behaves as: Solubility in water: moderate. Persistence in the soil: medium to non-persistent. Mobility on the ground *: extreme. Persistence in water sediment *: more persistent. Volatility: not volatile. Bioaccumulation: slight.⁹⁷

Name	Glyphosate
Justification of Use	Weed control is performed by using glyphosate, a moderate toxicity⁹⁸ herbicide according to Uruguay legislation on toxic substances. Two applications are carried out some days before tillage and/or plantation. Generally, the last row (4th row) and the last intermediate row (3rd row) are applied with glyphosate. The rest of the rows are made with selective and pre-emergent herbicides which do not contain glyphosate. In addition, grazing is used as an effective method to control the vegetation before planting.
Potential Adverse Effect	Given its potential effect on soils it is limited to pre-emergence periods (tillage and or plantation) and used only over last and last intermediate rows.

⁹⁶ The project has been granted by FSC a permit to use the chemical till 2021, after which risk analysis and mitigation plans are to be presented till the use of Fipronil is discontinued.

⁹⁷ Source: <http://www.plaguicidasdecentroamerica.una.ac.cr/index.php/base-de-datos-menu/395-metsulfuron>

⁹⁸ In Uruguay, Glyphosate has now been declared with a moderate toxicity, corresponding to a Category III (blue label): Category 1a. Extremely dangerous or very toxic; Category 1b. Very dangerous or toxic; Category 2. Moderately dangerous or noxious; Category 3. Moderately dangerous or careful; Category 4. Normally not dangerous or careful

Name	NPK
Justification of Use	Because the soils where the company is established are deficient in P and N and research information tells us that Eucalyptus has higher response to this fertilization in Uruguay, it's fertilized with doses of 100 Kg / ha of di-ammonium phosphate (18-46-00) which is adjusted in each case according to the results of the soil analysis. Fertilization is manually applied around each tree after plantation
Potential Adverse Effect	Excessive amounts used in rainy seasons could potentially cause runoffs to water bodies, causing eutrophication. Fertilizers are applied manually by trained contractors, in controlled amounts, avoiding rainy season.

Name	Phosphorite
Justification of Use	Fertilization is mechanically applied on plantation stripes before tree plantation
Potential Adverse Effect	Phosphorite is a natural, low-impact fertilizer for the environment. Products and their waste have a better nutritional quality (higher P content than unfertilized crops). The incorporation of such organic residues improves the biological activity of the soil and the accumulation of carbon in the soil, helping to improve its physical and chemical properties. Excessive amounts used in rainy seasons or degraded soil could potentially cause runoffs to water bodies, causing eutrophication ⁹⁹ .

Name	Chlorine-free insecticides
Justification of Use	On the first year after plantation, during the month February and March, ant control is systematically performed over the whole area. Afterwards insecticides are selectively applied on ant paths and nests
Potential Adverse Effect	It has a reduced permanence in the ecosystem, but potential effects can be clinical manifestations to people depending on the exposure

Name	2,4 D-Amine ¹⁰⁰
Justification of Use	It is a selective herbicide with low volatility and systemic action, specially designed to combat broad-leaved weeds in natural fields and grass pastures.
Potential Adverse Effect	In the environment it behaves as ¹⁰¹ :

⁹⁹Source: <http://fosfatosdelhuila.com/fhportal/wp-content/uploads/2014/02/LIBRO-APLICACION-ROCA-FOSFORICA1.pdf>

¹⁰⁰ http://www.lanther.com.ar/producto/73/2_4-d-amina-60-lanther/

¹⁰¹ <http://www.plaguicidasdecentroamerica.una.ac.cr/index.php/base-de-datos-menu/5-24-d>

	Solubility in water: high. Persistence in soil: medium to non-persistent. Mobility in soil: high to light (depending on pH; high pH5). Persistence in water sediment: less persistent. Volatility: not volatile. Bioaccumulation: slight.
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Name	Haloxifop metil
Justification of Use	Non-residual systemic herbicide, it is selective for the post-emergent control of annual and perennial grass weeds (narrow leaf).
Potential Adverse Effect	In the environment it behaves as ¹⁰² Solubility in water: low. Persistence in soil: medium to non-persistent. Mobility in the soil: high to medium. Persistence in water sediment: less persistent. Volatility: not volatile. Bioaccumulation: slight.

Name	S-metolachlor
Justification of Use	It is a systemic herbicide, for pre-emergent use, it is absorbed by coleoptile and radicle in annual grasses and by hypocotile and radicle in germinating broadleaf weeds. It is important to bear in mind that this product will not exert control if it is applied on emerged weeds.
Potential Adverse Effect	In the environment it behaves as ¹⁰³ : Solubility in water: high to light. Persistence in the soil: slight. Mobility in the soil: high to medium. Persistence in water sediment: more persistent. Volatility: not volatile. Bioaccumulation: medium to slight.

Name	Oxyfluorfen
Justification of Use	Pre-emergence broad leaf weed control is performed by using the active principle oxyfluorfen.
Potential Adverse Effect	Given its potential effect on soil, water and people health (both operators and neighboring communities), it's use authorization is now limited with a specific risk assessment and mitigation plan ¹⁰⁴ .

¹⁰² <http://www.plaguicidasdecentroamerica.una.ac.cr/index.php/base-de-datos-menu/309-haloxifop>

¹⁰³ <http://www.plaguicidasdecentroamerica.una.ac.cr/index.php/base-de-datos-menu/388-metolachlor>

¹⁰⁴ More detailed information on risk form elaborated specifically for these input (as well as Fipronil) in reference 98

This policy meets the requirements of the National Code of Good Forest Practices and the ILO Code. It is also established that products prohibited by the FSC will not be utilized.

All pesticide and agrochemical inputs used are public information available in BDU annual reports in the web (Public Summary Monitoring). This information includes: the pesticides used by active principle, quantities applied and area

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Actions (B3.2)

Negative Offsite Impact	Mitigation Measure(s)
Livestock enters protected natural areas or the exclusion of livestock in those areas.	Build fences or exclusion of livestock in those areas.
High density of cattle - degradation of grasslands and native forest, by shift of livestock from plantation to said natural areas	Proper management. Livestock density control (units per ha). Livestock management plan. Evaluation of pastures within afforestation. Annual survey on impacts in HVC areas within farms
The advance of the native forest towards the plantation, eliminates the buffer areas	Buffer zones are established or re-established between forest plantation and native forests. This grasslands buffers zones must be equal or bigger than 20 meters.
Plague outbreaks	BDU project works together with the Health Commission of the Forest Producers Society (CS-SPF for its acronym in Spanish). CS-SPF establishes a short- and medium-term work plan, which includes monitoring, control, research and training/dissemination for priority pests, training/dissemination for priority pests. In this framework, the activities of the AF Group's health management plan are part of or aligned with the activities of the CS-SPF. The main areas of the plan include ¹⁰⁵ : - Preventive actions: material selection; health check of seedlings on entry; silvicultural management (timing, procedures) - Monitoring: systematic survey; survey of specific events - Control: biological; silvicultural (sanitary thinning); chemical as last resource.

5.2.2 Net Offsite Biodiversity Benefits (B3.3)

The BDU project is a subgroup of lands within BDU trust fund total plots. BDU trust fund comprises 14 properties or plots located in the Central East region of Uruguay (the host country), with a total area of

¹⁰⁵ More information on the Forestry Management Plan section 3.6

9,528 ha of which, 5,826 ha are effectively planted. Due to the above, BDU project area corresponds to 2,919 ha effectively planted in 11 plots (10 entire plots and 15% of the 11th one).

The project has a long history of grazing by beef cattle, activities that have caused soil erosion and land degradation. BDU project, forest plantations for obtaining pulp and saw wood and removing carbon dioxide from the atmosphere have been established since 2012, significantly decreasing soil erosion and soil degradation.

Before the implementation of the BDU project, native fauna or flora studies in the area were never conducted. Extensive beef production companies did not have the habit nor the obligation to carry out this kind of studies, since traditionally the extensive cattle is not certified by international standards (for example, FSC or similar), nor is it controlled by the Ministry of the Environment (ex-DINAMA). Burning was a common activity in pastures by cattle breeders. With the BDU project implementation, new HCVs areas are defined, native forests are strictly controlled and fires are controlled. Periodic monitoring activities allows to identify the activities' impact on HCV.

The ongoing forestry project in terms of land occupation with the management being carried out to date does not affect the conservation areas identified as representative. A coherent design and areas of interest are maintained and are interconnected within the property and through streams and gullies also with neighboring fields. The establishment has significant areas of fields with rocky outcrops. In these areas, fragmentation was generally avoided by the occupation of land in the implanted forestry project. At the end of the 2021 monitoring, the stands remain within the limits defined in accordance with the project and adjusted to the established distances from the native forest. Machinery traffic is being carried out outside the aforementioned areas defined as representative, without affecting low-lying areas.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

Summary

During 2015, the first characterization and survey of the properties with potential conservation interest were conducted. The goal of the studies was to detect those areas that contain the most conservation values, in a broad sense, encompassing not only species but also conservation values. Considering the connectivity and the representativeness of the values contained with respect to the region in which they are located, defining the presence or not of areas of High Conservation Value (HCV). If present, initial measures were proposed to ensure their continuity and the implementation of specific monitoring plans developed for each category and appropriate management plans.

An analysis of the flora and tetrapod fauna potentially present was carried out based on the available databases consulted (MVOTMA, 2017) using the Military Geographic Service, which means the analysis covered a much larger surface area than those of the properties. Based on these, an approximation was made of the conservation status and the importance of the environments as biodiversity hotspots, their functioning as biological corridors and their link to conservation strategies. From the analysis, it was determined that Mi Generala, Don Ramón and Punta del Cordobés present potential species richness to be considered HCV (for flora and fauna, respectively). In same year (between August to October) field surveys took place in both to reduce the potential listings obtained to listings closer to field reality.

Flora field sampling was planned by means of prior photo-interpretation, identification of different environments and definition of permanent sample areas, and further field visits with the corresponding identification of species and herborization of plants. A checklist was generated to report vegetation conservation conditions and species identification.

In the case of fauna field sampling, these are conducted at establishment level with bi-annual frequency (taking into consideration seasonal variety), for HCV areas, based on sighting methodology, with visual inspection during the field supervisor's tours (photographic camera tool). The sampling identifies species richness for: amphibians, reptiles, mammals and birds.

Finally, monitoring plans are designed and implemented based on the category of conservation considered.

Criteria for the categorization of representative BDU properties for the conservation of biodiversity

The following criteria¹⁰⁶ is used for the categorization of forest properties in BDU pointing to the greater efficiency in the application of conservation measures and considering human and economic resources availability for their management and monitoring.

- 1) Presence of SNAP (National System of Protected Areas) or high value areas for HCVA conservation according to the definition originally developed by the FSC for High Conservation Value Forests in the certification of forest ecosystems.
- 2) Biogeographic representativeness
- 3) Representativeness of watersheds.
- 4) Presence of threatened species of flora or fauna at the international or regional level according to the International Union for the Conservation of Nature.
- 5) Presence of endangered species of flora or fauna at the international or regional level according to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).
- 6) Connectivity of the areas.
- 7) Estimated wealth (Chao 1).
- 8) Special landscape value.
- 9) Effective total area of natural areas
- 10) If there are still conflicts in the categorization of the areas after the application of these criteria, indexes of similarity between communities can be applied (Greig-Smith)

¹⁰⁶ Inclusion criteria varies according to fauna and flora subgroups analyzed, more information on each biodiversity report available to VVB during validation.

Based on the aforementioned criteria, the properties selected as representative are surveyed (monitored) in greater depth to clearly determine its habitat values with precise identification of their attributes in order to define conservation plans.

The monitoring studies would be applied over properties with HCV, presence of natural environments or species of particular study interest or farms with high species richness values. These studies involve annual surveys (at least two surveys to gain information on different times of the year), calculation of diversity indexes, spatial distribution, indicator species, wealth estimation, etc.

The follow-up studies would be applied to the rest of the representative farms. These studies involve surveys every five years, calculation of species richness, distribution of species and indicator species.

The categorizations made are subject to changes due to the entry of higher priority properties (more representative) or changes in management or anthropogenic activity that may change their condition.

Activities taken to perform the flora and fauna monitoring studies include:

- 1) Prior to the fieldwork, surveys over satellite images (Google Earth) to identify environmental composition and over available historical information are made. Based on this information, areas of interest, access to them and other logistical aspects are defined.
- 2) In situ, ground survey (surface data) according to vegetation physiognomy is carried out.

Subsequently, walking and vehicle trips are made by transects in the natural environments present in the property. The vegetation is characterized by recording the dominant species of each zone, through observation, collection and registration.

The analysis includes the comparison of total lists of potential species within the area, and those actually present (detected by different means during the field visit), as well as to those that are considered to be present according to the composition and state of the composition and status of the environments represented.

An approximation is made of the conservation status and the importance of the environments as biodiversity hotspots and their functioning as biological corridors.

In relation to the fauna, walking tours are the main tool used to reduce the potential lists obtained from bibliographic information to lists closer to the real ones, recording the richness and abundance of the tetrapod fauna species. This emanates from the recognition of the environments actually represented in the study area and their conservation status. The lists generated are analysed to detect species present based on IUCN Red Book (IUCN, 2013), Red List of the Birds of Uruguay (Azpiroz et al., 2012, and the List of Priority Species for Conservation (SNAP - DINAMA) (Soutullo DINAMA) (Soutullo et al., 2013). The presence of migratory species is also analyzed, as well as those that are present in different observation probability categories (Azpiroz, 2003).

Photographs are taken with digital cameras, of the most representative species. For the bird survey, binocular are used for walking tours and for the group of birds, the number of species (richness) and the number of individuals of each (abundance) based on direct sightings and the identification of vocalizations is recorded.

For the amphibian survey, surveys are carried out with estimation of abundance by sound record of vocalizations and by active search of individuals. For reptiles, an active search is made under stones, trunks and other cryptozoic shelters. For mammals, traces and caves are surveyed.

Fauna Monitoring Plan

Fauna biodiversity plans are performed in most representative farms belonging to BDU by using environmental indicators that describe the impact on the environment.

According to Canter L.W. 1998, environmental indices are useful for:

- 1) summarize existing environmental data;
- 2) report on the quality of the affected environment;
- 3) assess the vulnerability or susceptibility to contamination of a certain environmental category;
- 4) selectively focus on key environmental factors;
- 5) serve as a basis to predict the impact.

The specific biological diversity of a site depends on the number of species present (Wealth of species) and the number of individuals that make up each of the species (relative abundance).

Low values may indicate:

- Disturbances due to harvesting activities (noise, traffic of vehicles and people, exposure to atmospheric agents, etc.)
- Lack of buffer zones between planted forests and natural environments.
- Lack of connection or biological corridors in natural areas.
- Lack of natural environments that act as feeding or reproduction areas.
- Barrier effect for the movement of species, mainly because of height of planted trees (final stage of forestry before harvest).

Species richness indexes (Chao) are also used to evaluate the real number of species present in each farm studied. Chao 1 is a nonparametric estimator of the number of species in a community based on the number of rare species present in the sample. The richness of the species distributed in a non-homogeneous way, between the different environments inside the area, would indicate a certain human affectation in the area that would be increasing the number of some particularly sensitive species.

In turn, the distribution of the species is estimated taking into account the levels of specific richness and relative abundance detected in the main landscape units. So far, in the monitored farms, the structure of the different species present in the area tends to be fairly homogeneous (it is not clearly dominated by any species). That is, all the species observed have a similar high abundance, which indicates a low degree of

imbalance. The population differences are not enough for these species to affect the rest of the community. In some properties, high or very high values have been recorded in the biodiversity indexes.

Criteria for the selection of species to determine the biological diversity of a given site:

At the global level, both invertebrate and vertebrate species are used for studies of biological diversity. In the case of the research team, the Bird Class was chosen, subphylum Vertebrata (Vertebrates) due to:

- Easy direct and / or indirect registration
- Important number of species in our country
- Specific conservation status defined in most species, whether at the national, regional and global levels (Ministry of Environment, IUCN, CITES).
- Can apply as RAE species for international forest standards

Selection of species as indicators (“Indicator species”)

An indicator organism is a species selected for its sensitivity or tolerance to the various types of contamination and their effects. In addition, the use of indicator species are useful for diagnosing environmental quality because they have some important characteristics:

- Provide valuable information quickly to take conservation measures in a minimum time available.
- Animals, plants and their quantitative and qualitative relationships are modified to different types of environmental degradation even when they are produced sporadically or discontinuously over time.
- Many species, due to their mobility, absorb and indicate environmental actions of broad or specific foci in a natural area.
- The biological indicators are compatible and can complement with analysis and physicochemical indicators

Selection criteria

To select indicator species, the role they play in the ecosystem will be taken into account, especially considering those species known to be sensitive to specific actions of the use of resources related to the project in question, species that play a basic role in a given community and species that represent a certain group of species (associations). For example, some bird species that are not very specialized, find food resources in modified environments, where some specific plant species that provided food to other species of birds specialized in them have disappeared. These last ones (specialists) will see reduced population in these areas, while those (generalists) will see them increase sensibly due to lack of competence in the availability of other resources (shelters, water, etc.).

Migratory species have often been shown to be more sensitive to environmental changes in the sites where they arrive, meaning that they may no longer be stopover, feeding, breeding or resting sites. The proportion of migratory species in the total number of species detected is a good indicator of the conservation or otherwise of environmental suitability.

Moreover, the proportion of bird species in categories of frequency of observation are a good indicator of the degree of health of the environments studied. The categories considered are Common, Fairly Common, Uncommon and Rare (according to Azpiroz, 2003). Environments that suffer strong disturbances tend to vary the proportions of observation frequency categories, generally with an increase in Common and Fairly common species to the detriment of Uncommon and Rare species.

The analysis of the relative abundances of these species will be useful for the purpose of evaluating changes in the habitat that determine high or low levels in the populations and are manifestations of impacts on a larger scale. It is also important the real or potential value from the aesthetic, scientific or economic point of view, its survival expectation and its rarity at the local and global level.

In these sense, the presence maintained or not of species listed in IUCN threat categories, both globally (for their entire distribution) and strictly for the region are indicators monitored and taken into account:

- "Extinct",
- "Extinct in the wild",
- "In critical danger",
- "In danger",
- "Vulnerable",
- "Threatened"

Special consideration is given to those species that the Ministry of Environment recommended for its inclusion in the "List of Priority Species for Conservation in Uruguay" (Soutullo et al, 2013). The presence maintained or not of species included in these list is one of the indicators monitored.

Flora Monitoring Plan

The first step towards the definition of HCV is the implementation of a programme for the survey and characterization of environments and flora. For the purpose of establishing a priority list of properties to be studied, a grid is drawn up in which the sites are rated on a scale of 3 to 1 (High, Medium and Low respectively), in which attributes such as species richness (α diversity), diversity of environments as a potential for species turnover (β diversity), and ratio between non-forested area within the establishment in relation to the area occupied by forest crops were the selected indicators. The Conservation Importance Value that arises from the sum of the values of each of the attributes allowed a ranking of properties to be surveyed in more detail.

In the case of flora present, the monitoring plan includes annual surveys in order to evaluate:

- a. Verification of species under the National Protection Area System list in order to assign conservation category.
- b. Fragmentation of natural areas and biological corridors
- c. Buffer areas condition around HCV and particular interest for conservation areas.
- d. Natural regeneration of woody invasive species, within both, productive areas and native forest.
- e. Invasive species control procedures carried out in HCV areas.

f. General natural land condition, based on land use and land use management.

Biologists identified and georeferenced populations of priority species for conservation, SNAP, some of them new for Uruguayan flora in the area.

The conservation of these species has been possible thanks to the control work done on the environments where they live, through an adequate rational management of them, with a rigorous permanent monitoring.

The monitoring plan also includes the variables surveyed on HCV sites regarding any presence of impact from the forestry activity as well as illegal activities. In this sense, indicators include: presence of vehicle tracks, invasion of exotic species, conservation state of the signs, among others, in order to ensure HCV protection. Additionally, hunting is prohibited in all BDU lands¹⁰⁷, native forest are not altered and the silvicultural systems applied to artificial plantations meet the production targets approved by the competent authorities.

Moreover, level of degradation is monitored, in order to define the need for a restoration plan implementation. Although no degraded areas were identified that might require the implementation of restoration plans, based on the baseline studies, a plan for the elimination of invasive species (ELEI 2020 -2021¹⁰⁸) was elaborated.

The project preserves areas of native forest, natural grassland with rocky outcrops and low meadows. These areas are mapped and identified and well known by the land's workers.

Results:

The results obtained during the verification period for the biodiversity monitoring is described in items 5.1.1 and 5.1.2. They indicate the identified species and their proven presence.

Variables analyzed and results for Mi Generala, Don Ramón and Punta del Cordobés are further detailed in the tables below. Complete species tables are listed in the monitoring reports identifying those within SNAP, CITES and IUCN lists^{109 110 111} and BDUs indicators monitoring summary¹¹².

For the case of Mi Generala, interest conservation areas monitored are identified in the figure below, and example of monitoring methodology and sampling spreadsheets in the following table. In this property, the main HCV identified is an endemic flora species: *Grazielia brevipetiolata*. These is endemic of the eastern mountains of Uruguay and it's the only location known to date in the department of Florida. Monitoring have shown conservation efforts is allowing the natural regeneration of the species, as the population increases the number of individuals since it was located in the first survey five years ago.

¹⁰⁷ Only special authorization may be issued for hunting does animal species listed by the national Directorate for Renewable Natural Resources as of compulsory control, or control free of authorization

¹⁰⁸ Invasive species management plan available on request by VVB during validation

¹⁰⁹ Brussa & Walker. Establecimiento Mi Generala - Monitoreo de ambientes y flora

¹¹⁰ Brussa & Walker. Establecimiento Don Ramón – Monitoreo de ambientes y flora

¹¹¹ Rudolf Macció. Punta del Cordobés - Informe sobre fauna tetrápoda del Establecimiento Puntas del Cordobés (Departamento de Durazno).

¹¹² BDU systematic indicator monitoring available for VVB

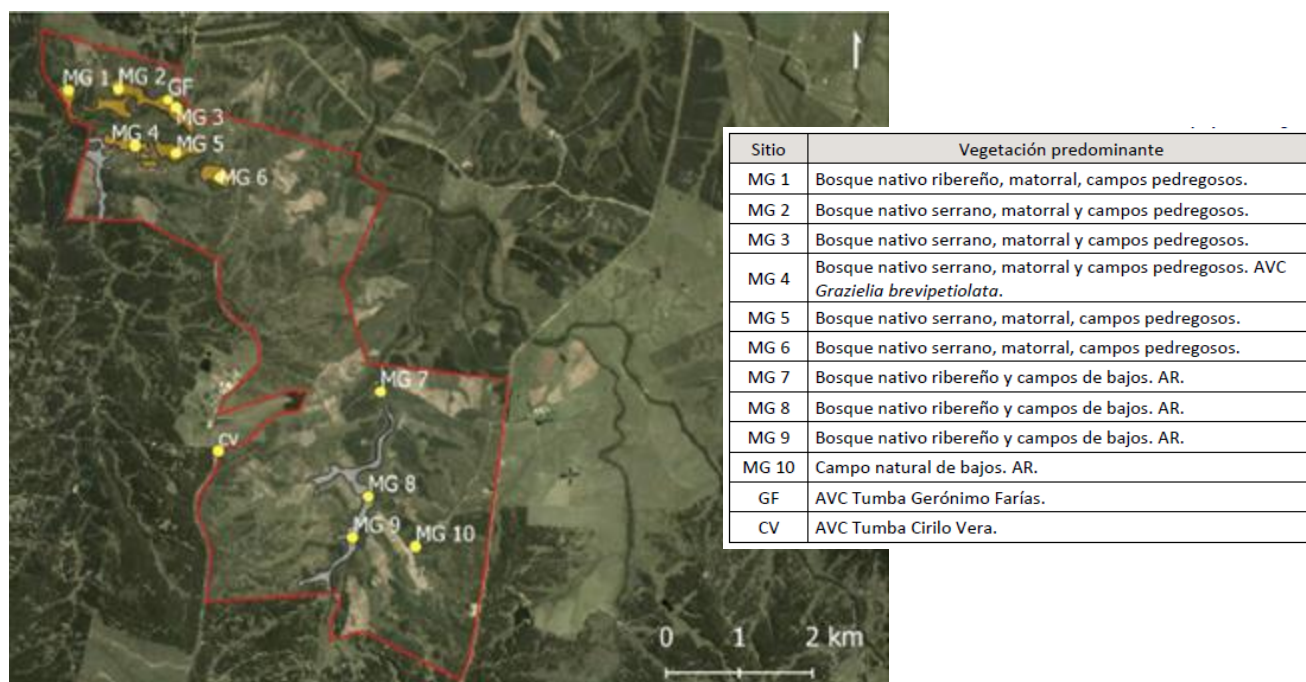


Figure 10. Cartography of the conservation areas in Mi Generala: Orange HVC areas. Greys: Representative areas of riparian fields and forests.



Figure 11. HVC area in Mi Generala conserving the habitat of the endemic shrub-species *Graziella brevipetiolata*. Photographs of 2021 monitoring in sampling point MG4.

Table 5. General condition of the environments identified within Mi Generala HCV

RESUMEN ESTADO DE LOS ECOSISTEMAS EXISTENTES				
Mi Generala - Sitio MG1				
Campo inundable - Latitud: 33° 45' 00,7" S Longitud: 55° 32' 50,6" O				
Campo pedregoso - Latitud: 33° 44' 58,9" S Longitud: 55° 32' 47,8" O				
		2019	2020	2021
Generales	Especies Invasoras	<i>Acacia dealbata</i> a controlar nuevamente	<i>Acacia dealbata</i> y <i>Gleditsia tricanthos</i> regeneración y adultos	<i>Acacia dealbata</i> y <i>Gleditsia tricanthos</i> regeneración y adultos
	Prácticas forestales en AR	NO	NO	NO
Monte nativo (Ribereño, contra A° de Tigre)	Regeneración Natural	Medio	Medio	Medio
	Sotobosque	Medio	Medio	Alto
	Epífitas	Bajo	Bajo	Bajo
	Trepadoras	Bajo	Bajo	Bajo
	Exóticas invasoras	NO	<i>Gleditsia tricanthos</i>	<i>Gleditsia tricanthos</i>
	Talas, quemas	NO	NO	NO
	Presencia de ganado/intensidad	NO	NO	NO
Campo	Exóticas invasoras	<i>Acacia dealbata</i> continuar control	<i>Acacia dealbata</i> continuar control y <i>Gleditsia tricanthos</i>	<i>Acacia dealbata</i> continuar control y <i>Gleditsia tricanthos</i>
	Altura de pasturas (horizonte de hojas)	50 cm (campo)-130 cm (pajonal)	70 cm (campo)-130 cm (pajonal)	40 -70 cm
	% cobertura vegetal	80-85 %	80-85 %	80-85 %
	Grado de erosión	Nulo	Nulo	Nulo
	Presencia de ganado/intensidad	Baja	Nula	Baja
	Número de especies presentes	Alto	Medio	Medio

Don Ramón has been categorized as HVC both for flora and fauna. In the case of fauna, 2 endangered IUCN category species have been identified as potentially present¹¹³:

Melanophryniscus devincenzii (Devincenzi frog). It inhabits high and rocky areas, in the northeastern mountains of the territory.

Wilfredomys oenax (Rata de Hocico Ferrugíneo). Presents one of the most limited distribution, both nationally and globally. Inhabits natural forests and its population is found to be diminishing due to habitat loss and fragmentation globally.

In the case of flora, among the main attributes of the Don Ramón establishment, the high diversity of ferns observed (59 species) stands out, which represent more than a third of the total number of ferns registered for the country, in addition to the high richness of SNAP species (39 taxa) including *cactaceae* and

¹¹³ Rudolf Macció. Informe sobre fauna tetrápoda del Establecimiento Don Ramón y Don Ramón III - (Departamento de Cerro Largo).

orchidaceae. Evidence of the interest conservation areas monitored are identified in the figure below, and example of monitoring methodology and sampling spreadsheets in the following table.

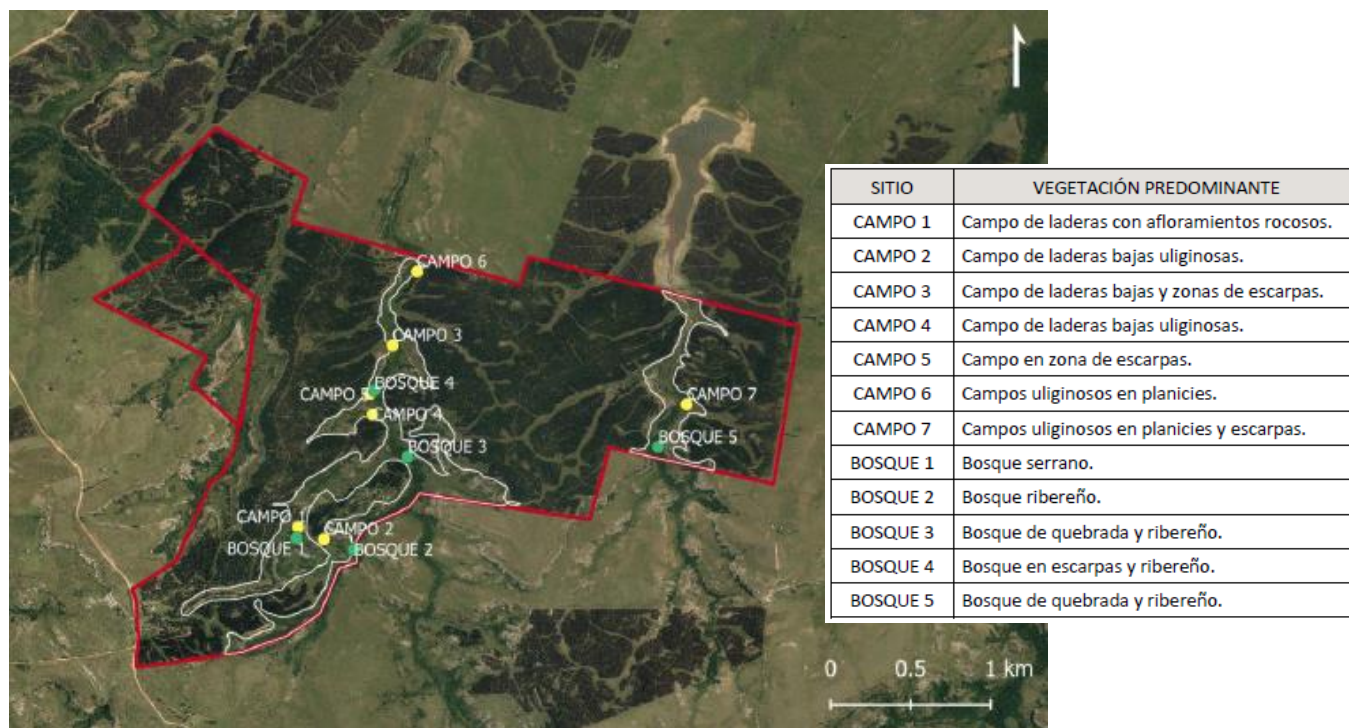


Figure 12. Cartography of the conservation areas in Don Ramón for flora.



Figure 13. HVC signaling near “Campo 7” sampling point and a view of *Frailea fulviseta* specimen (VU by IUCN Red list) identified in the field.

Table 6. General condition of the environments identified within Don Ramón HCV

RESUMEN ESTADO DE LOS ECOSISTEMAS EXISTENTES				
Don Ramón – Sitios BOSQUE 1 y CAMPO 1				
Latitud: 32°37'22.95"S Longitud: 54°26'8.29"O				
Latitud: 32°37'25.89"S Longitud: 54°26'3.75"O				
		2019	2020	2021
Generales	Especies Invasoras	NO	NO	NO
	Prácticas forestales en AR	NO	NO	NO
Monte nativo (Matorral con cornisas y laderas)	Regeneración Natural	Medio	Bajo	Bajo
	Sotobosque	Medio	Medio	Alto
	Epifitas	Baja	Baja	Baja
	Trepadoras	Baja	Baja	Media
	Exóticas invasoras	NO	NO	NO
	Talas, quemas	NO	NO	NO
	Presencia de ganado/intensidad	Nula	Baja	Baja
	Exóticas invasoras	NO	NO	NO
Campo (Pedregoso, suelos superficiales)	Altura de pasturas (horizonte de hojas)	5-25 cm	5-25 cm	4-10 cm
	% cobertura vegetal	70 -100%	50 - 90%	50 - 90%
	Grado de erosión	Bajo	Bajo	Bajo
	Presencia de ganado/intensidad	Media	Media	Media
	Número de especies presentes	Medio	Medio	Medio
	Exóticas invasoras			NO
Campo (Pajonal - Caraguatal)	Altura de pasturas (horizonte de hojas)	-	-	5-25 cm
	% cobertura vegetal	-	-	90-100%
	Grado de erosión	-	-	Nulo
	Presencia de ganado/intensidad	-	-	Baja
	Número de especies presentes	-	-	Bajo
	Exóticas invasoras			NO

Last, in the case of Punta del Cordobés, 2 Endangered IUCN species were identified:

Gubernatrix cristata (Cardenal Amarillo) widely distributed nationally but with low registration levels. It is estimated that the Uruguayan population contains about 300 individuals. Both illegal hunting and habitat modification would be responsible for its compromised conservation status.

Wilfredomys oenax (Rata de Hocico Ferrugíneo). As well as in the case of Don Ramón, in Punta del Cordobés this species is potentially present. It presents one of the most limited distribution, both nationally and globally. Inhabits natural forests and its population is found to be diminishing due to habitat loss and fragmentation globally.

5.3.2 Biodiversity Monitoring Plan Dissemination (B4.3)

Annually, the Monitoring report is updated in the BDU webpage¹¹⁴ including a summary of the biodiversity monitoring report results. A summary of fauna and flora monitored is available online¹¹⁵. This information is later presented to interested stakeholders where the category classification or re-classification of the HCV

¹¹⁴ https://www.bosquesdeluruguay.com/media/2022/03/Resumen_publico_de_Monitoreo_2021.pdf

¹¹⁵ <https://www.bosquesdeluruguay.com/compromiso-con-la-conservacion-de-flora-y-fauna-autoctona/> . Whole document available to VVB during verification

is defined during public consultation¹¹⁶. Moreover, biodiversity presentations are conducted at schools for both teachers and students in the project zone as well as other platforms as SPF¹¹⁷.

Moreover, along with the project implementation, the project documentation will be published on VCS and CCB website for all stakeholders, so that they can obtain the detailed project information and development progress. Also, the summary of project description in local language is also disseminated to local communities, as well as the summary of monitoring reports during each verification.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

Not applicable as the project does not seek Gold standard

5.4.1 Trigger Species Population Trends (GL3.3)

Not applicable

6 ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

7 ADDITIONAL PROJECT IMPACT INFORMATION

¹¹⁶ Public consultation of HVC documentation available to VVB during verification see reference 40.

¹¹⁷ Communication on HVC monitoring available to VVB during verification (see reference 32)

APPENDICIES

Appendix 1: New Project Areas and Stakeholders

Appendix 2: Project Risks Table

Identify Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
Fire	The risk of fires in commercial forest plantations in Uruguay is very low due to reduced population density and a very humid climate. Normally forest fires in Uruguay only occur in summer in the coastal areas of the South and Southeast of the country, associated with the tourism activity. In spite of prevention activities, fires can happen. In that case, equipment and staff (owned and contracted) is ready and trained for firefighting.	In compliance with national regulations, BDU has implemented an extensive plan to prevent forest fires. There are many preventive activities such as: i) establishment of a network of firebreaks surrounding forests blocks with an area not larger than 50 ha; ii) the introduction of cattle in early stages of the forestation for maintaining pastures short and green, thus reducing the volumes of fuel; iii) permanent surveillance of the project area, particularly at times of medium to high risk of fire; iv) burning as possible technique for cleaning fields is particularly excluded; v) warning signs with risk of fire are placed next to forest sites; vi) transit of non-authorized hunters, hikers or campers is forbidden; vii) fire extinguishers must set in vehicles (including tractors) that circulate in the property; viii) the project has fire insurance hired
Diseases and insects	With a low to intermediate possibility of occurrence, there could be diseases and insects that may damage the planted trees, but the diseases and insects will be prevented by routine oversight.	Upon routine oversight, the diseases will be treated according to the Weeds and Insects Control Plan, immediately with biological control once occurred. The chemical pesticides are allowed to be used only if there is a serious pest problem erupted in the project area, and the pesticides will be used in accordance with the National Pesticides Policy and FSC standard.

		Given forestry sanitation is considered to need a national scale solution among producers, AF channels its efforts through the Health Commission of the Society of Forest Producers (CS-SPF), participating actively. The CS-SPF establishes a short and medium-term work plan, which includes lines of work in aspects of monitoring, control, investigation and training / dissemination for pests considered priority. In turn, forest health issues at the national level are coordinated by the CECOPE (Executive Council for the Coordination of Pests and Diseases forestry) made up of representatives of the MGAP through the General Forestry Directorate and the General Directorate of Agricultural Services, INIA and SPF.
Wind	Although it has a very low probability of occurrence, and affects mainly young individuals, another risk is related to an eventual increase in felling off or damage to trees by wind storms. Intensive thinning of eucalypt plantations is known to increase the risk of wind damages due to the opening of wide spaces within the forest that may channel the wind and increase its speed, aggravated by the vulnerability of tall trees. There is no information on an eventual increase in this vulnerability in thinned stands with very tall trees such as those with ages 15 or more, but there have been some cases of plantations losses due to strong wind storms.	High density initial plantation. Thinned density never below 150 trees per hectare. Also the use of climate insurance in critical moments, geographic diversification and last, avoidance of critical activities during periods of expected adverse meteorological conditions.
Frost	Night frosts occur during the winter (from mid-May to early October), with an average of 30 days with frost per year, with temperatures seldom falling below -5 °C.	Those areas imposing restrictions to tree growth or with high vulnerability to frost were excluded; soils occupying low areas were excluded because of risk of frost. E. dunnii were planted in lower areas to prevent frost damage.
Soil and water contamination	Low significance impacts to water sources contamination was found from the EIA to the properties due to agrochemicals use.	Operative procedures in place to assure a correct use of agrochemicals avoiding all risk of contamination and leak to

		water and soil. Water physicochemical analysis is conducted and phreatic levels are measured.
Natural and artificial habitats affected	Low significance impacts to natural habitat were identified during the EIA to the properties due to the activities taking place during plantation growth and harvest.	Plantations take place in grasslands with no natural habitat replacement. Environmental monitoring takes place during and after harvest, determining all aspects to take place in future activities.
Economic risks	Although with a low probability of occurrences, internal and external demand for the project's products, changes in national tax legislation, infrastructure maintenance, among others may lead to changes in the project's first description including demand for jobs, hectares planted, among others objectives.	Adaptation to new conditions, alternative markets to be found, export internal market products or delay harvest to maintain project's objectives, among others if needed.

