FOREST REPORT
FINCAS OF WALDMENSCHEN S.A.

(SUBSIDIARY OF THE GENERATION FOREST EG)

2021

ANNUAL REPORT OF WALDMENSCHEN S.A.

IMPLENTATION OF THE OPERATIONAL PLAN 2021

Operations Manager, Juan González

Technician in charge, Jonathan Domínguez

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1. Introduction

This document contains information about the operational plan that will be implemented in 2021 on the Waldmenschen fincas. The fincas concerned are located in Darién and Colón.

Darien: Reina, La Ponderosa, Claritas 1, Claritas 2, Claritas 3, Darío Castro, Raúl Castro, El Límite

Colón: La Conexión, Gatún 1.

The information on fincas, reforested areas by species, planting year, original spacing and protected areas are presented in tables. In addition, maps are presented to better understand the tables and the work plan for 2021.

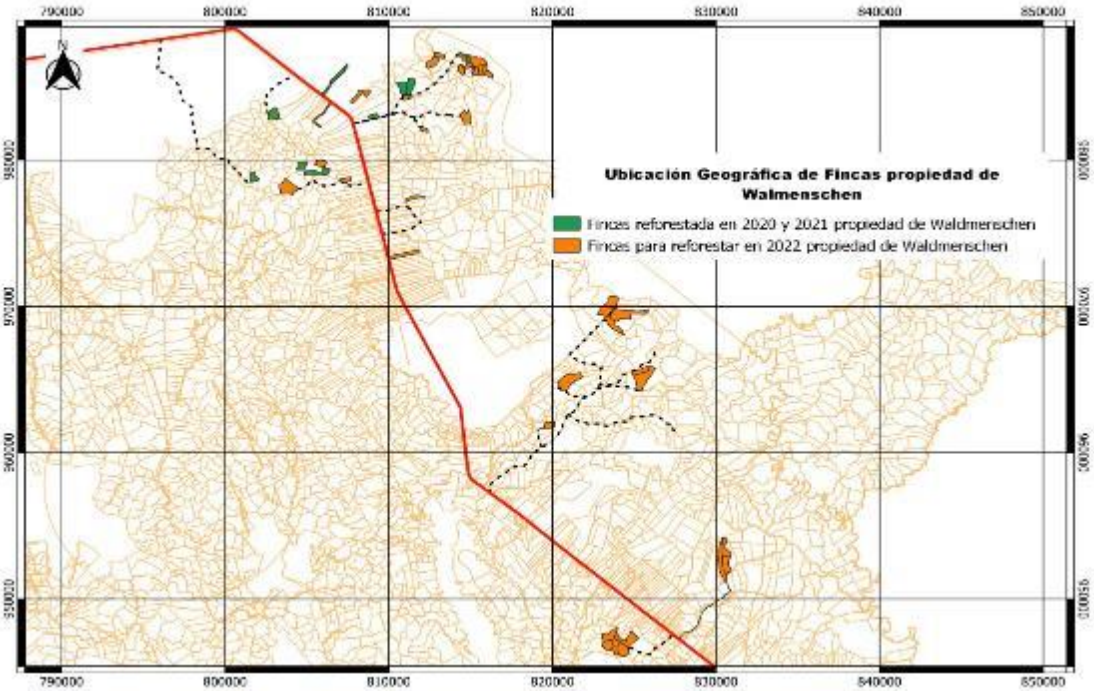
Some representative photos are included, and a summary of growth based on 2021 monitoring is presented for the older fincas.

2. Distribution of use by finca, year planted, area protected and area to be reforested.

Afforested area per finca and year of planting Waldmenschen						
Finca	*No. Finca*	*Year of planting*	*Hectare cultivated*	*for reforestation*	*Protection and others*	*Total area*
La Reina	2015	2013			4.7	25.4
		2017	8.7			
Gatun 1	TP* TP* TP* TP* TP* TP* TP* TP* TP* TP* TP* TP* TP* TP	2019	27.24		21.56	48.98
La Conexión	6704	2019	5.07		43.73	48.99
La Ponderosa	218957	2020	7.2		1.72	8.92
	235655	2021	10.5		2.67	13.17
	280254	2020	2.6		4.31	26.72
	280254	2021	19.81			
Clarita 1	30124630	2021	32.9		7.09	39.99
	30123319	2021	39.8		3.63	43.43
Claritas 2	218060	2021	13.23		4.07	17.3
Claritas 3	235668	2021	8.7	29	4.53	42.23
Agua Fría D. Castro	1866	2021	32.49		10.14	42.63
Agua Fría R. Castro	3479	2021	14.4		12.56	26.96
El limite	30358872	2021	11.5	4.94	1	17.44
Total			246.1	33.94	121.711	402.161

*Possessory title

Location Fincas Waldmenschen S.A.



3. Operational plan implemented 2021-Common Expenditure

Plan implemented Fincas Common expenses													
Description	**JANUARY**	**FEBRUARY**	**MARCH**	**APRIL**	**MAY**	**JUNE**	**JULY**	**AUGUST**	**SEPTEMBER**	**OCTOBER**	**NOVEMBER**	**DECEMBER**	**Total**
Maintenance of internal roads	-	-	-	-	-	-			5	-	-	-	
GPS measurement	-	-	-			-	-			63	49		**204**
Training	-	-	-	-	-	-	-		-	-	-	-	
Unforeseen events	-	-	-	-	-	-	-				8	5	**69**
Personnel transfer	-	-	-	-	-	-	-	10	192	-	-	-	**202**
Cooking	-	-	-	-	-	-	-			-	-	-	**59**
Monitoring	-	-	-	-	-	-	-	1	-	5			**40**
Input transfer	-	-	-	-	-	-	-	30	124				**214**
Infrastructure maintenance and cleaning	-	-	-	-	-	-	-	-		5	-	-	**8**
New planted	-	-	-	-	-	-	-	-	-	1	-	-	**1**

Data collector information	-	-	-	-	-	-	-	-	-		-	-	
Total	**-**	**-**	**-**			**-**		**142**	**396**	**124**	**99**	**65**	**844**

4. Description of the work to be performed under the 2021 Operational Plan.

Description of the planting, maintenance and management work carried out as part of the Forest People 2021 projects.	
Weed control	Removal of vegetation that competes with planted trees for light and nutrients.
Cleaning in slices	Removal of vegetation with a machete within one meter of the tree.
Cleaning the belt	Removal of vegetation in the row of plants, this cleaning is done alternately with disc cleaning to reduce costs.
Removing lianas	Removal of entangled vegetation from trees.
Fighting machete fern	Ferns are strong and very costly competition for planted trees.
Release	Pruning shrubs that cast a lot of shade. The clearing should bring more light
Tree release	Eliminate competition for valuable trees from natural regeneration.
Euphemism	Application of lime compounds to regulate pH, only when the pH is below 5, to the soil around the seedlings.
Fertilization	Fertilizer application
Stakeout	New planting of dead or damaged trees
Weeding	Elimination of regrowth at the base of the tree.
Trimming teak	Elimination of low tails
Height trimming	Removal of branches with a height of more than 7 meters.
Teak wood stripping	Offshoots are new branches on the marketable trunk. They should be removed when they are very tender to obtain good quality wood.
Formative pruning	Removing low branches on young trees so they reach a marketable height.
Thinning mark	Selection and marking of trees to be removed at an early age.
Thinning	Removal of trees that need to be removed so that the best trees can grow. This is to make room for those that remain
Conservation of the soil	This involves work to reduce water erosion. It involves the construction of physical barriers that slow down the flow of water when it rains.

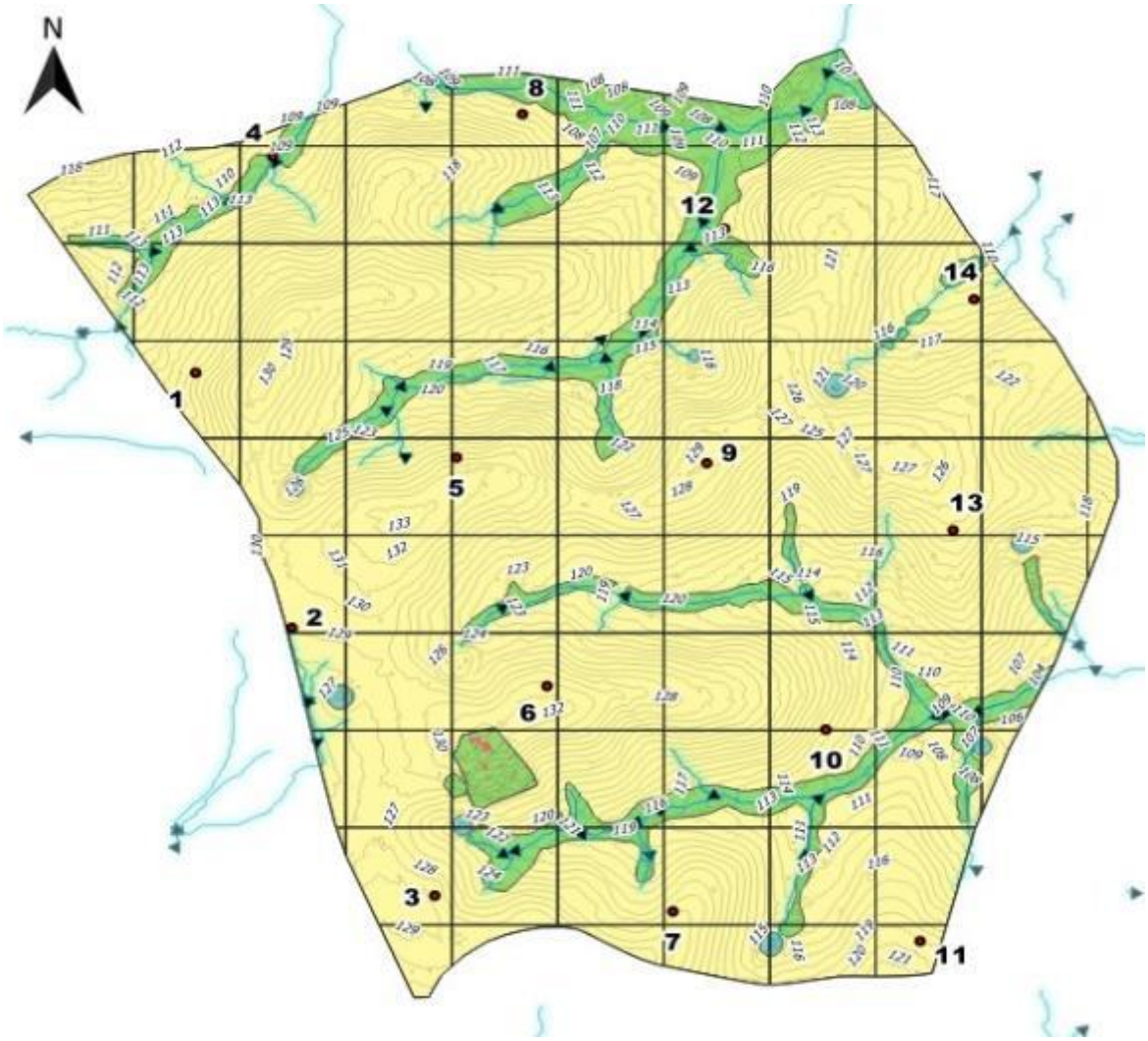
Firewall	Cleaning up boundaries and firebreaks, removing combustible material from leaves and sticks.
Fence maintenance	Repair of fences to prevent livestock from entering fincas
phytosanitary control	Constant control of pests and diseases and muleteers.
Monitoring	Measurement of diameter and height growth of trees.

5. Description of the preparation of fincas for planting 2021.

On the finas to be reforested, the terrain is surveyed and flown over using drones to create a topographic map showing the terrain elevations from the highest to the lowest slopes that may lead to insufficient drainage. In general, the fincas in the area where the 2021 reforestation was carried out have a relief that ranges from almost flat to slightly hilly to hilly and very hilly.

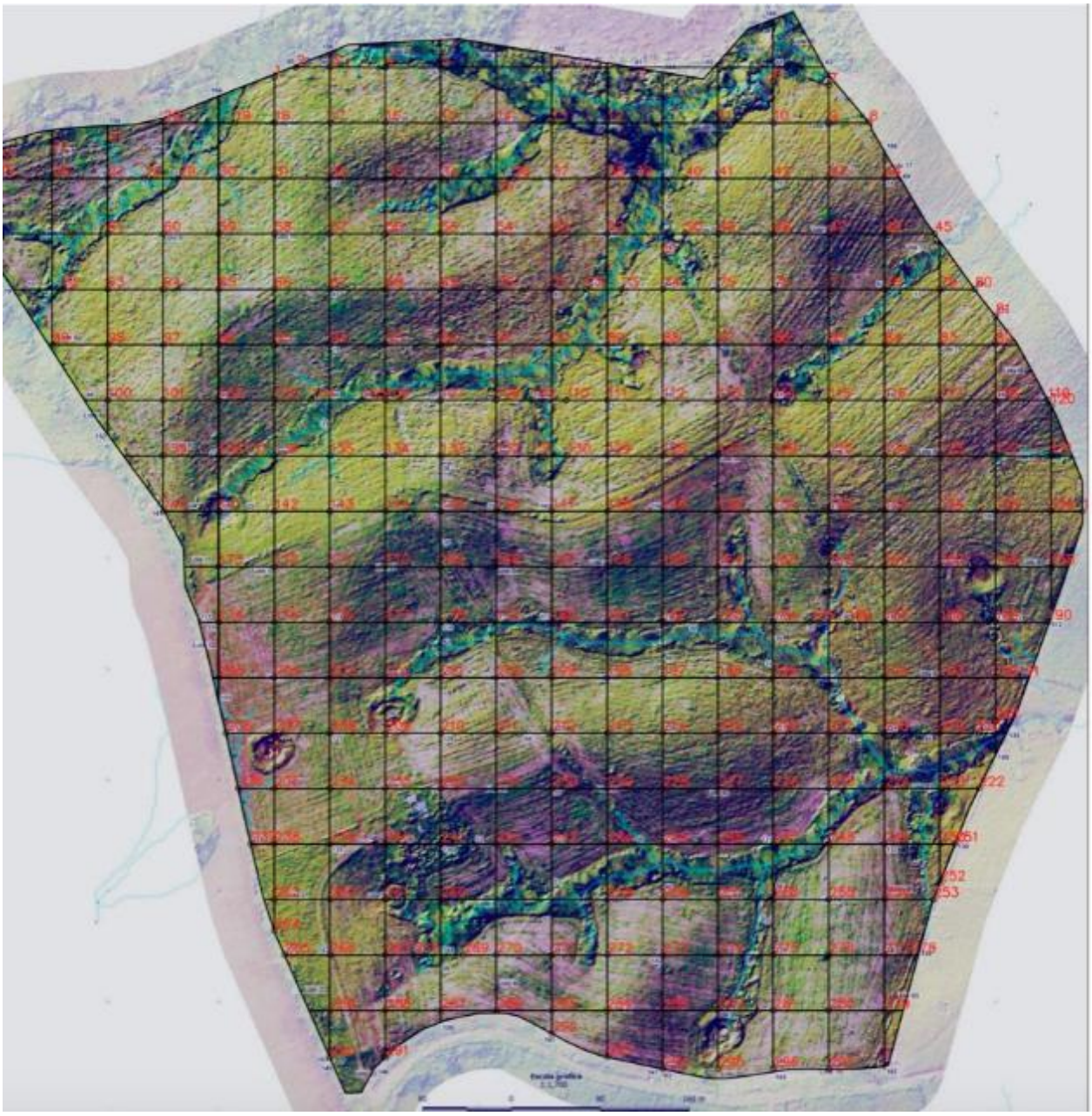
On these topographic maps, contour lines are drawn, roads are traced, and the various features of the farm such as vegetation, drainage, hydrology, effective reforestation area are considered in more detail, so that areas can be better selected according to the requirements of each species.

The following figure shows the distribution of the slopes on the finca. These works allow the design of the main and secondary roads.



5.1 Fixing the apex of the planting grid on the field:

It consists in marking on the field the corner points that will serve as a guide for planting. It facilitates the marking of plantings, speeds up field work and allows better control and monitoring of plantings. As a result, better monitoring of maintenance.



5.2 Identification of planting lots by species.

The best sites are reserved for the most valuable and demanding species.

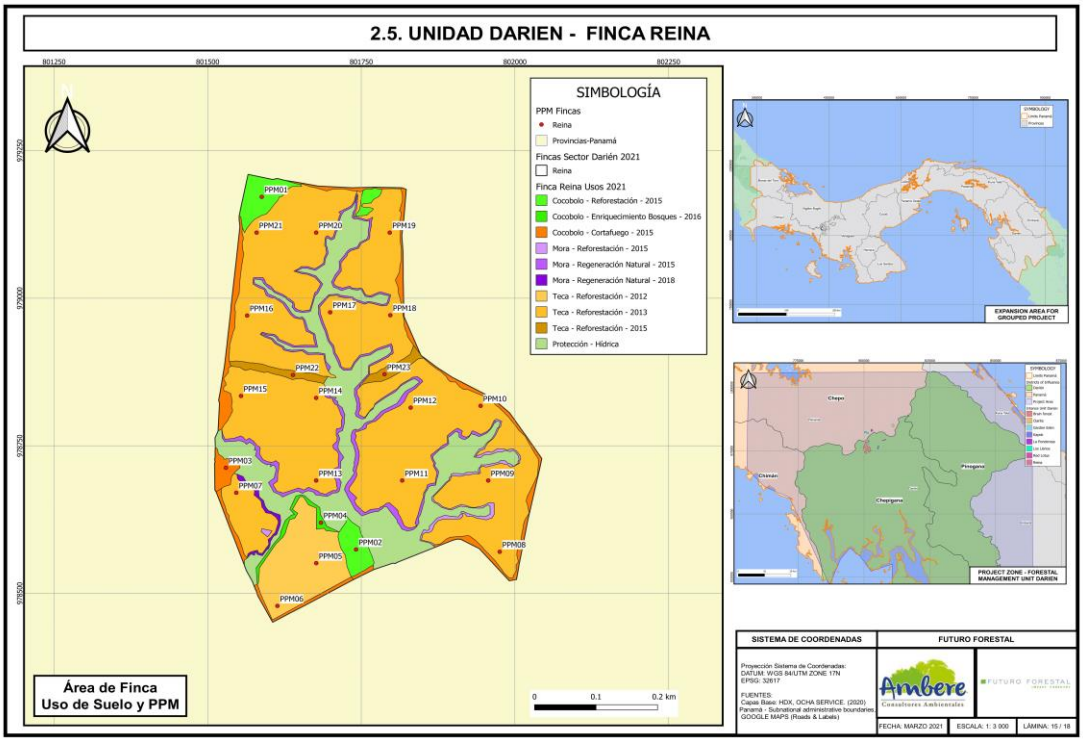
This procedure applies to all fincas, which is why we only give an example, all information per farm is available in the cloud.

6. Report 2021 by finca, in order of age.

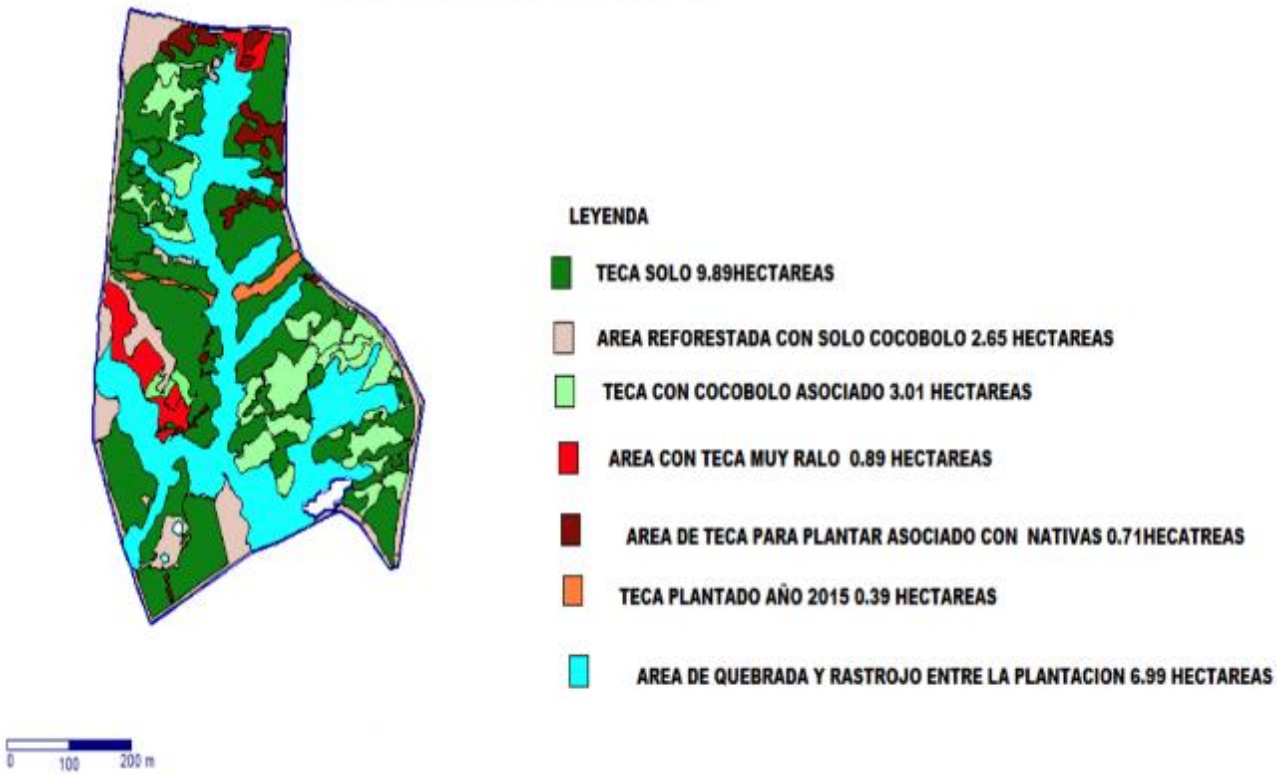
6.1 La Reina, reforested project area 2013

Finca # 2015 La Reina								
Finca	Impact/ha	Types	Scientific name	arb/ha.	2013	2015	2017	Total/ha
La Reina Finca. # 2015	25.4	Bitter cedar	Cedrela odorata				1	1
		Cocobolo	Dalbergia retusa	4x4		2.7	2	4.7
		Blackberry	Maclura tinctorea				1	1
		Oak	Tabebuia rosea				2	2
		Teak	Tectona grandis	*3x3*	12			**12**
		total, reforested						20.7
		Drainage protection						4.7
		Area of the plot						25.4

Map of the location of the observation plots for 2020



6.2 Species distribution map, Finca La Reina



6.3 Average growth of afforestation, 2013-2016

Teak	Average growth in diameter and height, monitoring 2021. Finca # 2015, La Reina					
Age	Years	DBH (cm)	ALT (m)	IMA DBH (cm)	IMA ALT (m)	Vol /arb
2,1	2015	7,1	5,9	3,37	2,81	0,0049
3,7	2017	12,5	10,5	3,38	3,38	0,0306
5,4	2019	16,6	16,4	3,07	3,07	0,0812
6,4	2020	21,7	18,0	3,38	3,38	0,1382
7,5	2021	23,4	19,8	3,12	3,12	0,1613

Growth range/site class in 2 to 10 year old plantings.				
Variables	Unit	At	Medium	High
IMA DAP	cm/year	<2,4	2,5 a 3,0*	3,02 a 3,8*
IMA height	m/year	<2,2*	2,33 a 3,14*	3,15 a 4,05*

Teak, Finca La Reina,

6.4 Growth of other native species La Reina.

Average cocobolo growth monitoring 2021. by diameter class (2.7 ha).			
Class se dap	% per class /dap	Average/dap/cm	Average/ height/m
less than 5 cm	19.0%	3.8	8
5cm to 9.9	57.0%	7.37	12.14
10cm at 14.9	19.0%	11.39	13.6
more than 15 cm	5.0%	15.9	13.5
current density 560 trees/ha			

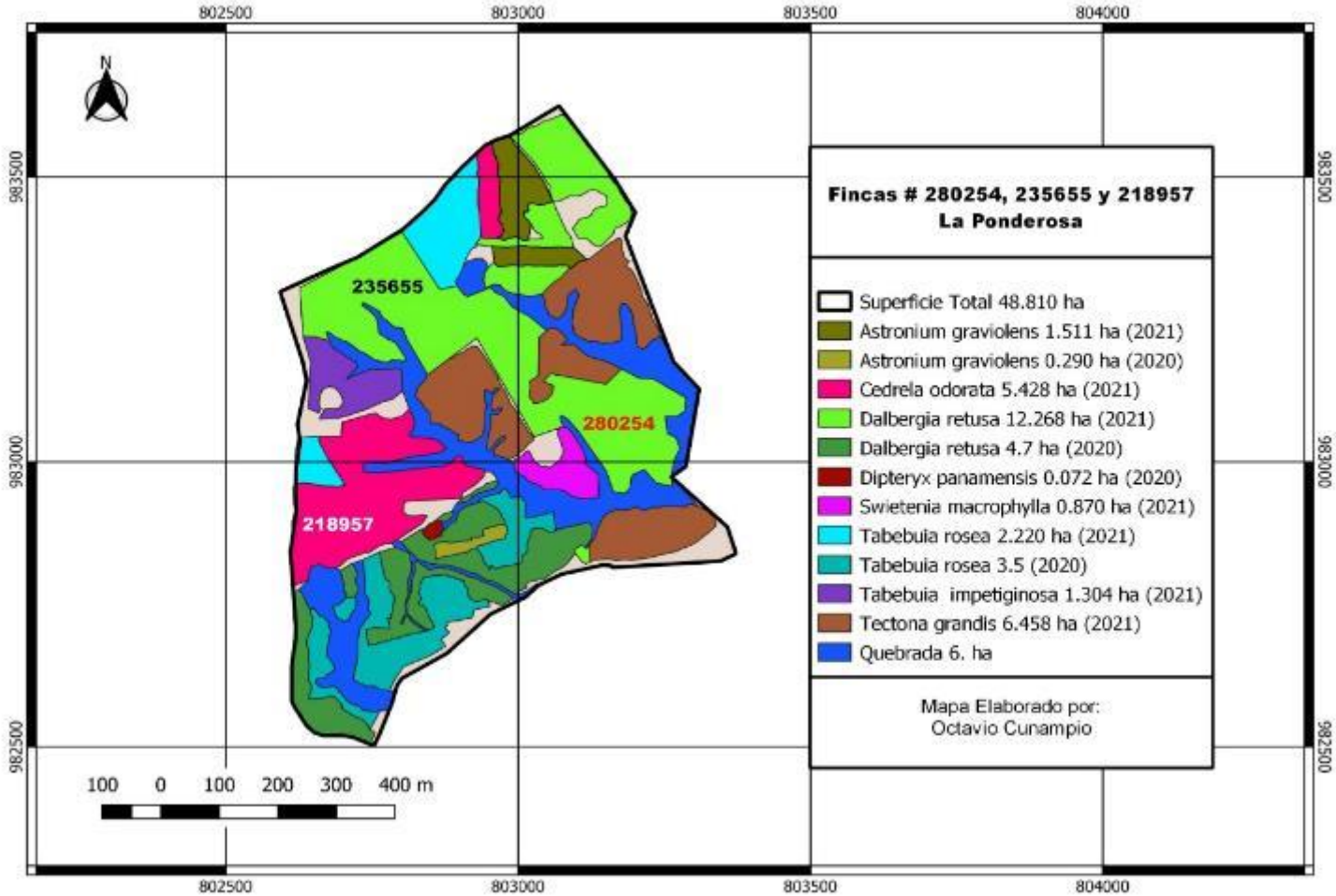
Average growth, by diameter class, cocobolo monitoring 2021, (2 ha) planted 2017.			
Class se dap	% per class /dap	Average/dap/cm	Average/ height/m
less than 5 cm	65%	4.2	5.85
5cm to 9.9	35%	6.68	9.75
current density 420 trees per ha			

Return of fauna to the protected areas and corridors of the La Reina finca.

7. La Ponderosa, afforested area in 2021 by species.

Reforestation of the Finca La Ponderosa in the years 2020 and 2021							
Finca	Surface	Types	Scientific name	Plants/ha.	2020	2021	ha Total
La Ponderosa Fincas # 280254; 235655; 218957	48.81	Ron Ron	Astronium graviolens	3x4	0.29	1.51	1.80
		Bitter cedar	*Cedrela odorata*	3x4	1.26	5.43	6.69
		Cocobolo	*Dalbergia retusa*	3x4	4.70	12.26	16.96
		Almond Tree	Dipteryx panamensis	3x4	0.07		0.07
		Mahogany	*Swietenia macrophylla*	3x4	0.17	0.87	1.04
		Purple guaiac	Tabebuia impetiginosa	3x4		1.38	1.38
		Oak	*Tabebuia rosea*	3x4	3.50	2.22	5.72
		Teak	Tectona grandis	5x4		6.50	6.50
		Total, reforested			10	30.17	40.16
		Protection and drainage				6.30	6.30
		Roads and landscapes				2.00	2.00
		Area of the plot					48.50

7.1 Species map, La Ponderosa



7.2 Work plan 2021.

Plan implemented Finca Ponderosa 2021																										
Description	**JANUARY**		**FEBRUARY**		**MARCH**		**APRIL**		**MAY**		**JUNE**		**JULY**		**AUGUST**		**SEPTEMBER**		**OCTOBER**		**NOVEMBER**		**DECEMBER**		**Total**	
	Plan	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**	**Plan**	**Execute**
Chapia tractor					27								27													
GPS measurement		-		-		-		-		-		-		-		-		-		2.00		-		-	**-**	**2.00**
Boundary marking - clearance for surveyors		-		-	70.00	-		-		-		-		-		-		-		3.00		-		-	**70.00**	**3.00**
Staked marker		-		-		-	70	-	70	-		-		-		-		-		11		-		-	**140**	**11**
Weed control - establishment rolls		-		-		-	35	-	35	-		-		-		70				-		-		-	**70**	**85**
Monitoring		-		-		-	140	-		12		22		10		20		3		30		13		-	**140**	**88**
Fumigation									44		34				44										**88**	**-**
Planted		-		-		-		-	-	-	175	-		-		180		35		11		-		-	**-**	**226**
Chapia manual		-		-		-		-		-		-	24	-		1	24	-		23	24	18		-	**72**	**42**
Arriera control			4		4		4		4		4		2		2		2				2		2		**23**	**-**
Training		-		-		-		-		-		-		-		10		7		-		-		-	**-**	**17**
New planted		-		-		-		-		-		-		-		11		-		-		-		-	**-**	**11**
Foliar fertilization		-		-		-		-		-		-		-		-		-		-		11		-	**-**	**11**
Release		-		-		-		-		-		-		-		-		-		-		1		-	**-**	**1**
Maintenance disk		-		-		-		-		-		-	35	-		-	35	-		-	35	117		-	**105**	**117**
Total	**-**	**-**	**4**	**-**	**74**	**-**	**249**	**-**	**153**	**12**	**213**	**22**	**61**	**10**	**46**	**292**	**61**	**60**	**-**	**80**	**61**	**160**	**2**	**-**	**708**	**614**

7.3 Schedule of works 2020.

Plan implemented Finca Ponderosa 2020																												
Description	**JANUARY**		**FEBRUARY**		**MARCH**		**APRIL**		**MAY**		**JUNE**		**JULY**		**AUGUST**		**SEPTEMBER**		**OCTOBER**		**NOVEMBER**		**DECEMBER**		**Total**	
	Plan	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**	**Plan**	**Executed**
Weed control - mechanical		-		-		-		-		-		-		4		-		-		-		-		-	**-**	**4**
Granular fertilization		-		-		-		-	8	-		-		1		-		-		-		-		-	**8**	**1**
Unforeseen events		-		-		-		-		28		4		3		-		-		-		-		-	**-**	**35**
Marking stakeout		-		-		-		-		-		-		-		21		-		-		-		-	**-**	**21**
Staked marker		-		-		-		-		-		-		-		211		-		-		-		-	**-**	**211**
Chemical weed control - spraying plots of land		-	20	-		-	20	-		-		-		4	20	7		-	20	-		-		-	**100**	**11**
Monitoring		1		-		-		-		-		-		-		-		-		4		24		-	**-**	**29**
Fence maintenance		-		-		-		-		-		-		-		-		-		3		30		-	**-**	**33**
Weed control - Chemical weed control		-		18		-		-		-		-		-		-		-		-		-		-	**-**	**18**
Washer maintenance	10	11		4	10	-		8	10	4		11	10	-		39	10	-		11	10	15		-	**60**	**103**
Chapia manual		-	16	-		-	16	-		20	16	15		39		-		-		-		105		-	**48**	**179**
Chapia tractor			6				6				6														**18**	**-**
Manual phytosanitary control - screens		1		1		-		-		-		-		-		14		2		-		-		-	**-**	**18**
Training		-		-		-		-		-		-		-		4		-		-		-		-	**-**	**4**
Monitoring		-		-		-		8		6		-		-		-		-		-		-		-	**-**	**14**
New planted		-		-		-		-	10	-		-		-		-		-		15		-		-	**10**	**15**
Total	**10**	**13**	**42**	**23**	**10**	**-**	**42**	**16**	**28**	**58**	**42**	**30**	**10**	**51**	**20**	**296**	**10**	**2**	**20**	**33**	**10**	**174**	**-**	**-**	**244**	**696**

7.4 Mortality table Finca la Ponderosa.

Finca	*afforested area*	*Average % Mortality*	**Cocobolo**			**Bitter cedar**			**Teak**			**Oak**			**Guayacan purple**			**Mahogany**			**Ron Ron**		
			Planted	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**	
			Ha	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**
La Ponderosa	30.06	24%	12.26	1.35	11 %	5.43	1.34	25 %	6.50	1.78	27 %	2.22	0.56	25 %	1.38	0.50	37 %	0.87	0.04	5 %	1.51	0.57	38 %

Main causes of mortality.

- the plants have experienced a short but intense summer (about two and a half months), and some plants were not yet adaptable enough to survive the dry season.

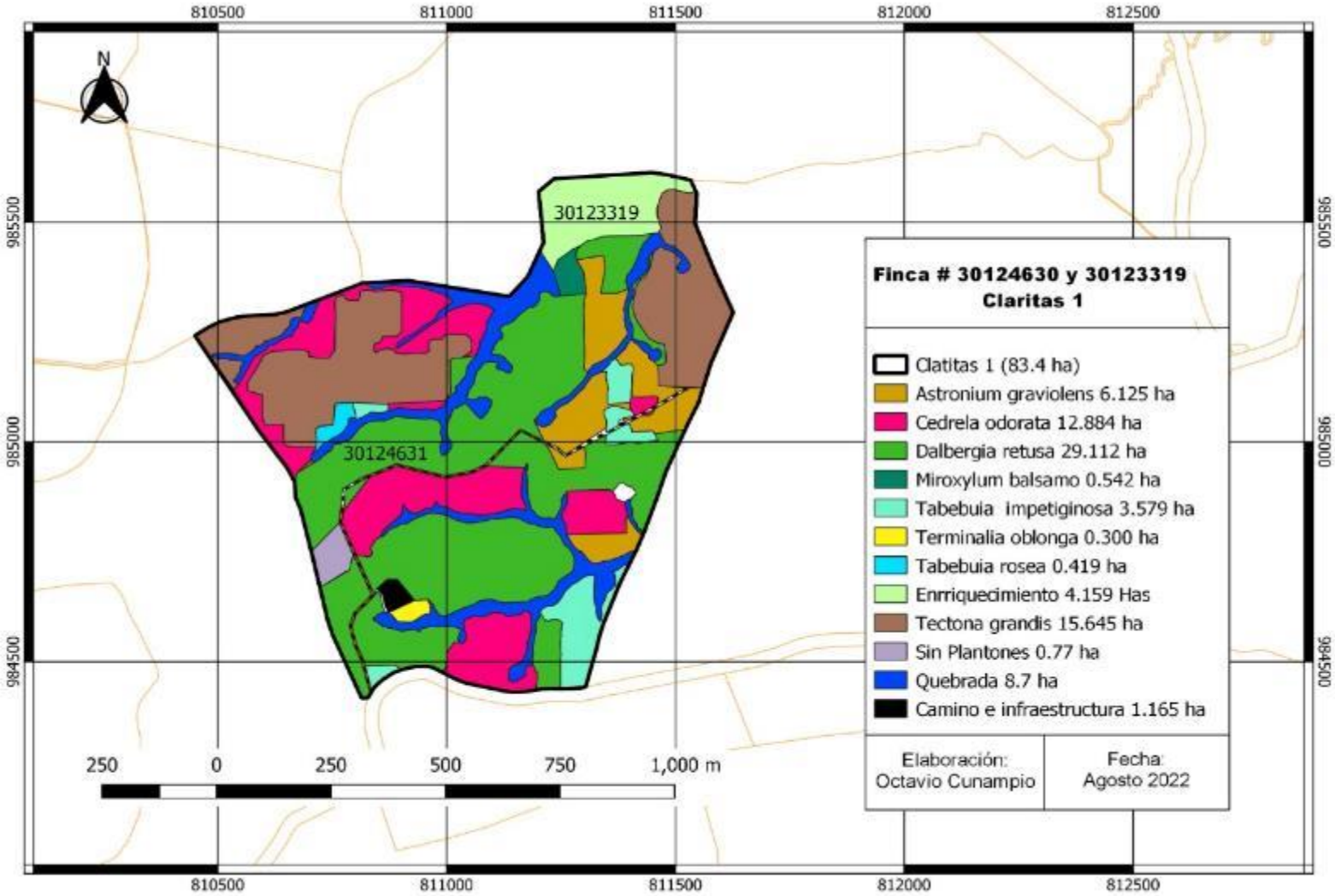
8. Clarita #1

9. Finca No. 30124630, 39,99 ha, Finca No. 30123319, 43,043 ha

8.1 Afforested area by species.

Finca 30123319/30124630, Clarita #1 reforestation 2021						
Finca	Surface	Types	Scientific name	Plants/ha.	2021	ha Total
Clarita #1 30123319/ 30124630	83.4	Brown	Astronium graviolens	3x4	6.13	6.13
		Bitter cedar	Cedrela odorata	3x4	12.88	12.88
		Cocobolo	Dalbergia retusa	3x4	29.11	29.11
		Balm	Miroxylum balm	3x4	0.54	0.54
		Purple guaiac	Tabebuia impetiginosa	3x4	3.58	3.58
		Yellow	Terminalia oblonga	3x4	0.30	0.30
		Oak	Tabebuia rosea	3x4	0.419	0.42
		Teak	Tectona grandis	5x4	15.65	15.65
		Enrichment		5x5	4.159	4.16
		total, planted				72.77
		for planting				0.77
		Drainage protection				8.7
		Roads and camps				1.2
		Area of the plot				83.4

8.2 Clarita Map #1 Species Distribution



Plan implemented Finca Claritas 2021																										
Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute
Chapia tractor					60																				60	
Internal road maintenance		-		-		-		-		-		7		-		-		-		-		-		-		7
GPS measurement		-		-		-	312	-		-		5		-		1		-		1		-		10	312	7
Unforeseen events		-		-		-		-		-		4		-		-		-		-		-		-		4
Marking stakeout		-		-		-		-		-		140		89		57		-		-		-		-		286
Boundary marking - clearance		-		-		-		-		-		32		-		-		-		-		-		-		32
Staked marker		-		-		-	156	-		-		100		85		14		-		-		-		-	156	199
Slices of the device		-		-		-	78	-		-		40		83		23		-		-		-		-	78	146
Monitoring		-		-		-		-		-		4		25		50		69				-		7		183
Marking - collection of stakes		-		-	156.00	-		-		-		5		17		-		-		-		-		-	156	22
Planted		-		-		-		-		-		-		60		47		112		43		-		-		262
Input transfer		-		-		-		-		-		-		8		-		-		-		-		-		8
Trochado		-		-		-		-		-		-		-		8		-		-		-		-		8
Chapia manual		-		-		-		-		-		-		54		127		-		182		10		-		373
Manual plant protection control - Sweepers		-	7.80	-	7.80	-	8	-		-		-		24		15		-		-		-		-	23.6	62
Conservation of the soil		-		-		-		-		-		-		-		13		-		-		-		-		13

Training		-		-		-		-		-		9		8		2		-		-		-		-		19
Manual cutting machine		-		-		-		-		-		-		-		-		57		-		-		-		57
Weed control-manual weed control chapia		-		-		-		-		-		-		-		-		50		-		-		-		50
Personnel transfer		-		-		-		-		-		-		-		-		20		-		-		-		20
New planted		-		-		-		-		-		-		-		-		-		33		-		-		33
Foliar fertilization		-		-		-		-		-		-		-		-		-		7		-		-		7
Maintenance disk		-		-		-		-		1		-		-		-		64		20		-		-		85
Total	-	-	7.80	-	223.80	-	554	-	-	1	-	346	-	453	-	357	-	372	-	314	-	10	-	17	785.6	1,883

8.3 Mortality table Finca Claritas 1.

Finca	*afforested area*	*Average mortality*	Cocobolo			Bitter cedar			Teak			Oak			Guayacan purple			Ron Ron			Balsam			Enrichment		
			Planted	Mortality		Planted	Mortality		Planted	Mortality		Planted	Mortality		Planted	Mortality		Planted	Mortality		Planted	Mortality		Planted	Mortality	
			Ha	Ha	%	Ha	Ha	%	Ha	Ha	%	Ha	Ha	%	Ha	Ha	%	Ha	Ha	%	Ha	Ha	%	Ha	Ha	%
Clarita 1	72.7	24%	29.10	2.47	9%	12.80	3.84	30%	15.64	5.18	33%	0.41	0.02	5%	3.50	1.34	38%	6.10	2.27	37%	0.50	0.08	15%	4.10	0.90	22%

Main causes of mortality.

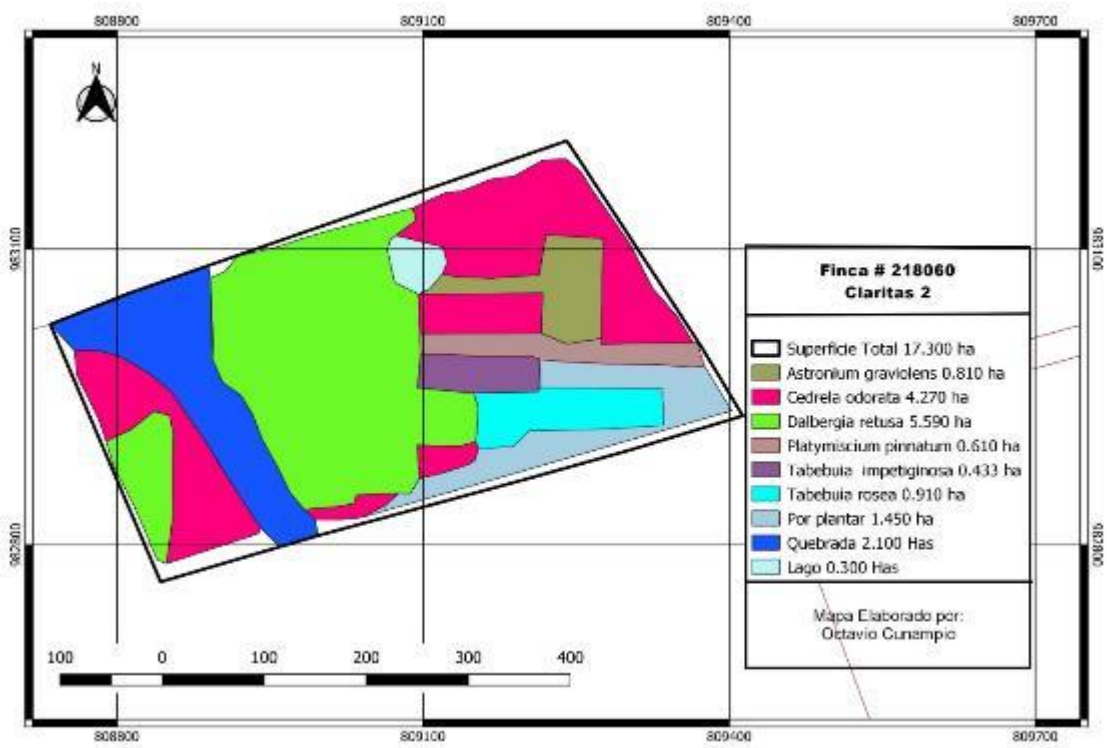
- the plants have experienced a short but intense summer (about two and a half months), and some plants were not yet adaptable enough to survive the dry season.

9. Clarita #2

9.1 Afforested area by species

Finca No. 218060 Clarita #2 Reforestation 2021						
Finca	Surface	Types	scientific name	Plants/ha.	2021	ha Total
Finca No. 218060 Clarita No. 2.	17.3	Ron Ron	Astronium graviolens	3x5	0.81	0.81
		Bitter cedar	Cedrela odorata	3x4	4.27	4.27
		Cocobolo	Dalbergia retusa	3x4	5.59	5.59
		Medlar	Manilkara zapote	3x4	0.607	0.607
		Quira	Platymiscium pinnatum	3x4	0.61	0.61
		Purple guaiac	Tabebuia impetiginosa	3x4	0.43	0.433
		Oak	Tabebuia rosea	3x4	0.91	0.91
		total, planted				13.23
		for planting				1.45
		Protection				2.10
		Roads and camps				0.50
		Area of the plot				17.3

.2 Clarita map #2 species distribution



9.3 Work plan 2021

Plan implemented Finca Claritas 2																										
Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute
GPS measurement		-		-		-		-		-		-		-		-		-		1		-		-	-	1
Obtaining cuttings							12																		12	-
Marking stakeout		-		-		-		-	18	-	18	-		95		-		-		6		-		-	36	101
Boundary marking - clearance for surveyors		-		-		-		-		-		13	36	-		-	36	-		-	36	-		-	108	13
Fumigation							15		15						15				15						60	-
Weed control - establishment rolls		-		-		-	24	-	24	-		-		26		-		-		-		-		-	48	26
Monitoring		-		-		-	24	-		-		-		12		-		-		7		2		13	24	34
Planted		-		-		-		-		-	60	-		90		-		-		6		-		-	60	96
Input transfer		-		-		-		-		-		-		2		-		-		-		-		-	-	2
Trochado		-		-		-	60	-	60	-		-		-		-		-		2		-		-	120	2
Chapia manual		-		-		-		-		-		-	36	-		-	36	-		11		-		7	72	18
Manual phytosanitary control - screens		-	1	-	1	-	1	-	1	-	1	-	1	2	1	-	1	-	1	-	12	-	1	-	21	2
Weed Control Chemistry		-		-		-		-		-		-		4		-		-		-		-		-	-	4
Fence construction		-		-		-		-		-		-		-		-		-		-		9		-	-	9

Manual cutting machine		-		-		-		-		-		-		-		-		-		-		12		42	-	54
Weed control-manual weed control chapia		-		-		-		-		-		-		-		-		-		-		-		-	-	-
Weed control - Chemical weed control		-		-		-		-		-		-		-		-		-		-		-		1	-	1
New planted		-		-		-		-		-		-		-		-		-		7		-		-	-	7
Foliar fertilization		-		-		-		-		-		-		-		-		-		8		11		-	-	19
Maintenance disk		-		-		-		-		-		-	12	-		-	12	-		4		15		-	24	19
Total	-	-	1	-	13	-	142	-	118	-	61	13	85	231	16	-	85	-	16	52	48	49	1	63	585	408

9.4 Mortality table Finca Claritas 2.

Finca	*afforested area*	*Average mortality*	**Cocobolo**			**Bitter cedar**			**Oak**			**Guayacan purple**			**Ron Ron**			**Quira**		
			Planted	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**	
			Ha	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**
Clarity 2	13.23	24%	5.50	0.61	11%	4.20	0.97	23%	0.90	0.06	7%	0.40	0.16	39%	0.80	0.29	36%	0.60	0.16	27%

Main causes of mortality.

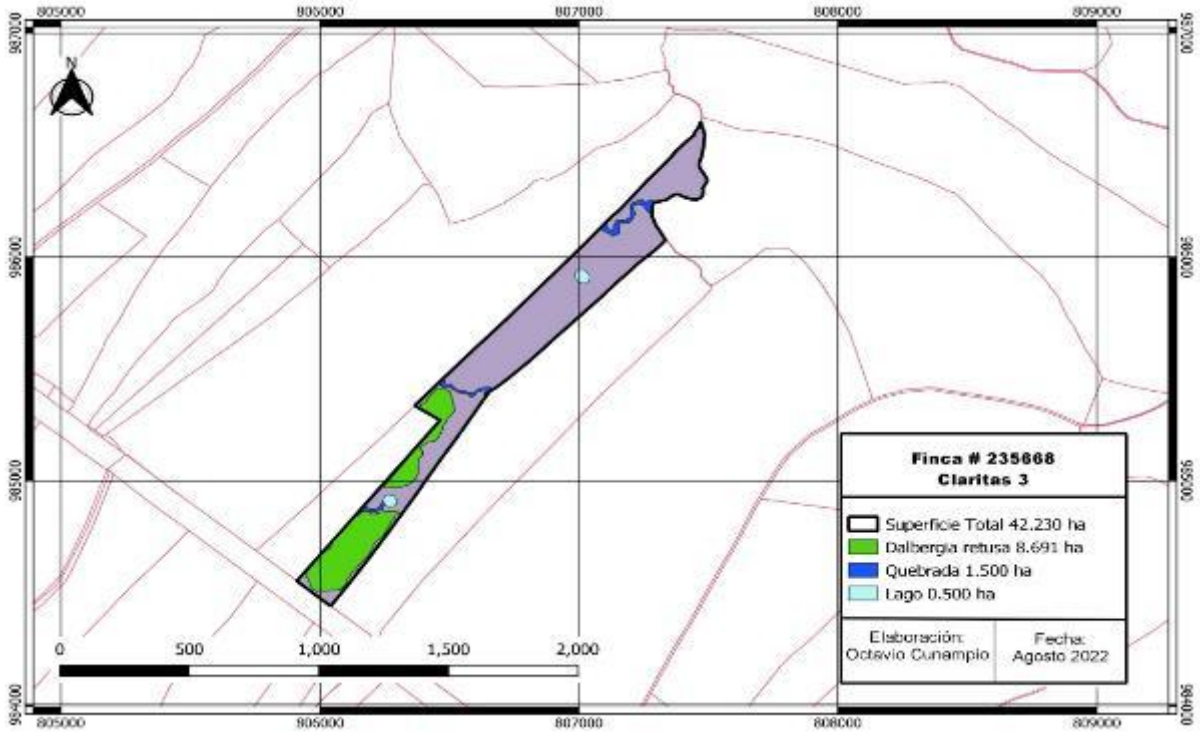
- the plants have experienced a short but intense summer (about two and a half months), and some plants were not yet adaptable enough to survive the dry season.

10. Clarita #3

10.1 Afforested area by species

Finca No. 235668, Clarita No. 3, Afforested 2021						
Finca	Surface	Types	Scientific name	Plants/ha.	2021	ha Total
Finca No. 235668 Clarita No. 3,	42.23	Cocobolo	Dalbergia retusa	3x4	8.691	8.691
		Almond Tree	Dipteryx p.	3x4		0
		Medlar	Manilkara zapote	3x4		0
		Balsam	Miroxylom balm	3x4		0
		Mahogany	*Swietenia macrophylla*	3x4		0
		Purple Guayacán	Tabebuia impetiginosa	3x4		0
		Oak	Tabebuia rosea	3x4		0
		total, has planted		3x4		8.691
		for planting			29.54	29.54
		Protection and drainage			4	4.00
		Area of the plot				42.23

10.2 Clarita Map #2 Species Distribution



10.3 Work plan 2021

Plan implemented Finca Claritas 3																										
Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute
Pitchfork extraction					17																				17	-
Boundary marking - clearance for surveyors		-		-		-		-		-		7		-		-		-		-		-		-	-	7
Staked marker		-		-		-	17	-	17	-		-		-		-		40		-		-		-	34	40
Chapia													26				26								52	-
Weed control - establishment rolls		-		-		-	9	-	9	-		-		-		-		45		-		-		-	17	45
Fumigation									11						11				11						33	-
Monitoring		-		-		-	35	-		-		5		-		-		3		6		1		-	35	15
Planted		-		-		-		-		-	44	-		-		-		40		-		-		-	44	40
Arriera control	1		1		1		1		1		1		0		0		0		0		0		0		8	-
Manual cutting machine		-		-		-		-		-		-		-		-		-		38		-		-	-	38
First fertilization		-		-		-		-		-		-		-		-		50		-		-		-	-	50
Maintenance disk		-		-		-	9	-		-		-	9	-		-	9	-		-	9	5		-	35	5
Total	1	-	1	-	1	-	70	-	38	-	45		35	-	11	-	35	178	11	44	9	6	0	-	275	240

10.4 Mortality table Finca Claritas 3.

Finca	*afforested area*	*Average mortality*	**Cocobolo**		
			Planted	**Mortality**	
			Ha	**Ha**	**%**
Claritas 3	8.7	54%	8.70	4.72	54%

Main causes of mortality.

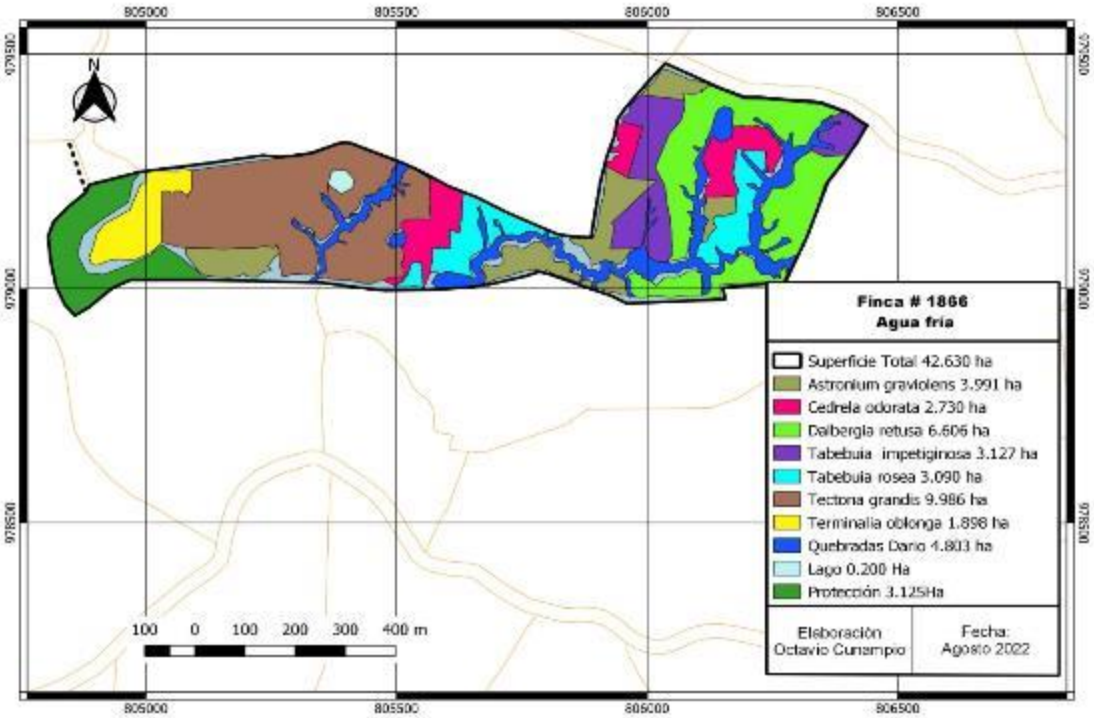
- The percentage of mortality was very high due to the soil conditions, as the soils are very clayey and have high moisture. In addition, the previous owner used this farm for rice cultivation, which completely destroyed the natural drainage of the farm, increasing the wet areas.

11. Agua Fria Finca 1866,

11.1 Reforested area by species

Finca # 1866 Agua Fria, Dario Castro area will be reforested in 2021						
Finca	Surface	Types	Scientific name	Plants/ha.	Super/sp	ha Total
Finca # 1866 Agua fría	42.6313	Ron Ron	Astronium graviolens	3x4	3.991	3.99
		Bitter cedar	Cedrela odorata	3x4	2.730	2.73
		Cocobolo	Dalbergia retusa	3x4	6.606	6.61
		Mahogany	*Swietenia macrophylla*	3x4		0.00
		Purple guaiac	Tabebuia impetiginosa	3x4	3.3	3.30
		Oak	Tabebuia rosea	3x4	3.09	3.09
		Teak	Tectona grandis	3x4	9.986	9.99
		Yellow	Terminalia oblonga?	3x4	1.898	1.90
		total, planted			31.601	31.601
		for planting			2	2.00
		Protection and drainage			7.928	7.93
		Roads			1.1	1.10
		Area of the plot				42.629

11.2 Map Agua Fria Finca 1866 distribution by species (Darío Castro).



11.3 Schedule for the work in 2021

Implemented plan Finca Darío Castro

Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute
Chapia tractor					30																				**30**	**-**
Obtaining cuttings					50																				**50**	**-**
Cuadra batches for marking		-		-		-		-		-		-		-		4		-		-		-		-	**-**	**4**
GPS measurement		-		-		-		-		-		-		-		-		-		1		-		-	**-**	**1**
Unforeseen events		-		-		-		-		-		-		-		-		-		28		-		-	**-**	**28**
Weed control - chemical cutting		-		-		-		-		-		-		-		-		-		-		-		70	**-**	**70**
Staked marker		-		-		-	75	-	75	-		-		-		90		84		-		-		-	**150**	**174**
Weed control - establishment rolls		-		-		-	100	-		-		-		-		-		-				-		-	**100**	**2**
Arriera control					5		5		5		5		3		3		3		3		3				**35**	**-**
Monitoring		-		-		-	100	-		-		-		-		9		67		11		35		19	**100**	**141**
Fumigation									63		38				63				63						**227**	**-**
Planted		-		-		-		-		-	250	-		-		-		96		21		-		-	**250**	**117**
Input transfer		-		-		-		-		-		-		-		-		-		8		-		-	**-**	**8**

Trochado		-		-		-	100	-	100	-		-		-		-		84		-		-		-	**200**	**84**
Chapia manual		-		-	150	-		-		-		-		-		100	60	32		-		17		-	**210**	**149**
Fence maintenance		-		-		-		-		-		-		-		-		-		-		58		-	**-**	**58**
Weed control-manual weed control chapia		-		-		-		-		-		-		-		-		245		7		-		-	**-**	**252**
Hoyado-manual		-		-		-		-		-		-		-		-		-		9		-		-	**-**	**9**
Personnel transfer		-		-		-		-		-		-		-		-		80		-		-		-	**-**	**80**
New planted		-		-		-		-		-		-		-		-		-		30		-		-	**-**	**30**
Transfer to the workplace		-		-		-		-		-		-		-		-		-		51		-		-	**-**	**51**
Tree clearing		-		-		-		-		-		-		-		-	60	135		-	60	32		18	**120**	**185**
Maintenance disk		-		-		-		-	100	-		-		-		-	50	-		28	50	111		-	**200**	**139**
Total	**-**	**-**	**-**	**-**	**235**	**-**	**380**	**-**	**343**	**-**	**293**	**-**	**3**	**-**	**66**	**203**	**173**	**823**	**66**	**196**	**113**	**253**	**3**	**107**	**1,672**	**1,582**

11.4 Mortality table Finca Darío Castro.

Finca	*afforested area*	*Average mortality*	**Cocobolo**			**Bitter cedar**			**Teak**			**Oak**			**Guayacan purple**			**Ron Ron**			**Guayabo de Charco**		
			Planted	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**	
			Ha	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**	**Ha**	**Ha**	**%**
Agua Fría D. Castro	32.49	21%	6.60	0.44	7%	2.73	0.49	18%	9.99	2.40	24%	3.09	0.46	15%	3.30	1.10	33%	3.99	1.49	37%	1.90	0.23	12%

Main causes of mortality.

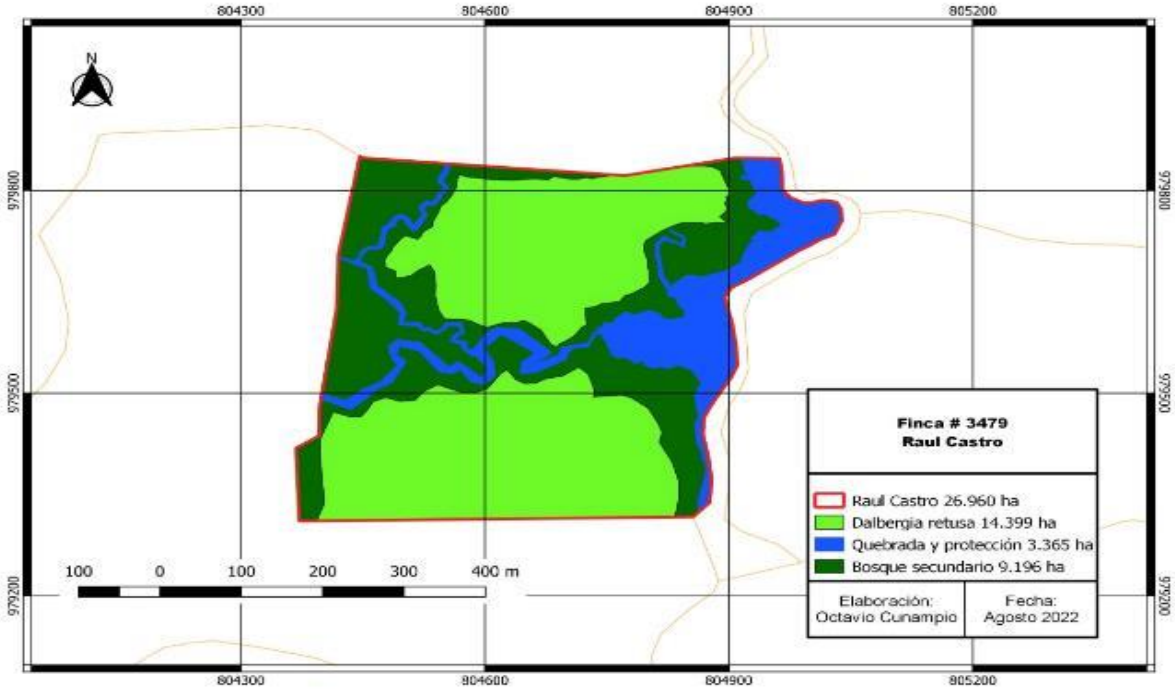
- the plants have experienced a short but intense summer (about two and a half months), and some plants were not yet adaptable enough to survive the dry season.

12. Agua Fria Finca 3479,

12.1 Reforested area by species (Raúl Castro)

Finca # 3479 Agua Fria, Raul Castro, Reforested 2021						
Finca	Surface	Types	Scientific name	Plants/ha.	2021	ha Total
Finca No. 3479. Agua Fria	26.96	Cocobolo	Dalbergia retusa	3x4	14.4	14.40
		Mahogany	*Swietenia macrophylla*	3x4		0.00
		total, planted				14.40
		Protection and drainage			3.37	3.37
		Secondary forest			9.20	9.20
		Roads				0.00
		Total,				26.96

12.2 Map Agua Fria Finca 3479 Distribution by species (Raul Castro).



The Finca's work record is included in the Finca 1866 (Darío Castro) record, as it was managed as a unit of two farms.

12.3 Mortality table Raúl Castro Finca.

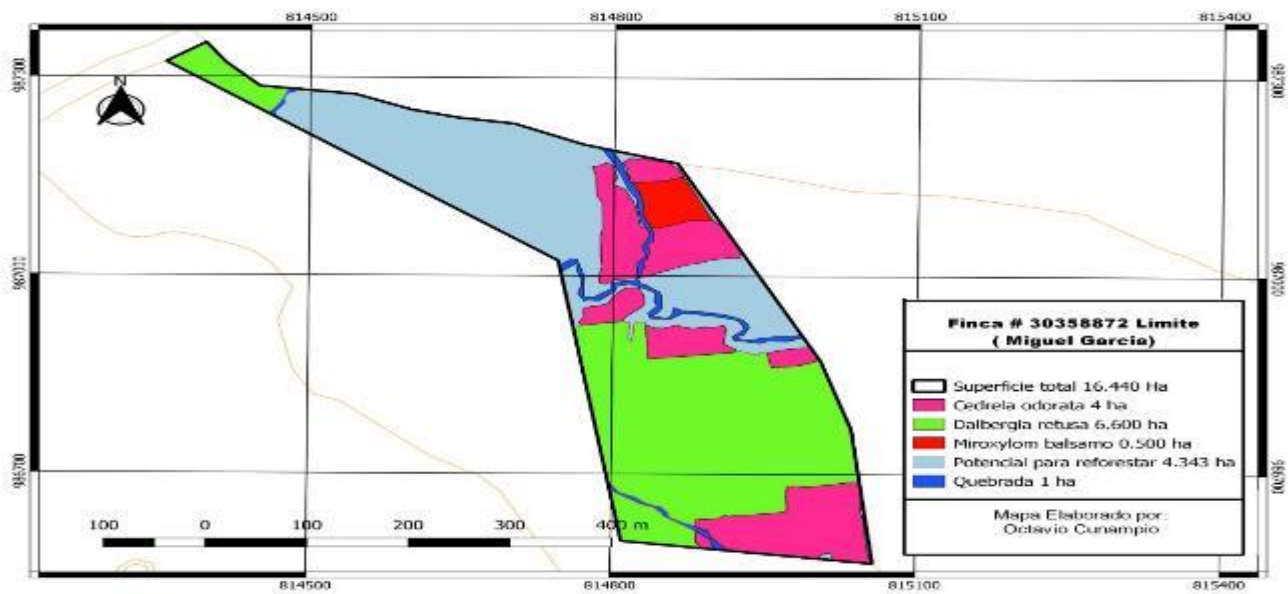
Finca	*Average mortality*	*afforested area*	**Cocobolo**		
			Planted	**Mortality**	
			Ha	**Ha**	**%**
Agua Fría R. Castro	13%	14.4	14.40	1.93	13%

13. El Límite,

13.1 Reforested area by species.

Finca #30358872. El Límite, Afforested 2021						
Finca	Surface	Types	Scientific name	Plants/ha.	2021	ha Total
Finca No. 30358872. El Limite	16.44	Bitter cedar	Cedrela odorata		4.0	4.0
		Cocobolo	Dalbergia retusa		6.6	6.6
		Balsam	Miroxylom balm		0.5	0.5
		total, planted				11.1
		Potential for reforestation			4.343	4.343
		Gorge			1	1
		Area of the plot				16.443

13.2 Map: The distribution limit of the species.



13.3 Mortality table Raúl Castro Finca.

Finca	*afforested area*	*Average mortality*	**Cocobolo**			**Bitter cedar**			**Balm**		
			Planted	**Mortality**		**Planted**	**Mortality**		**Planted**	**Mortality**	
			Ha	**Ha**	**%**	**Ha**	**Ha**		**Ha**	**Ha**	**%**
El limite	11.1	23%	6.60	0.50		4.00	1.33	33%	0.50	0.09	17%

Main causes of mortality.

- the plants have experienced a short but intense summer (about two and a half months), and some plants were not yet adaptable enough to survive the dry season.

13.3 Work plan 2021

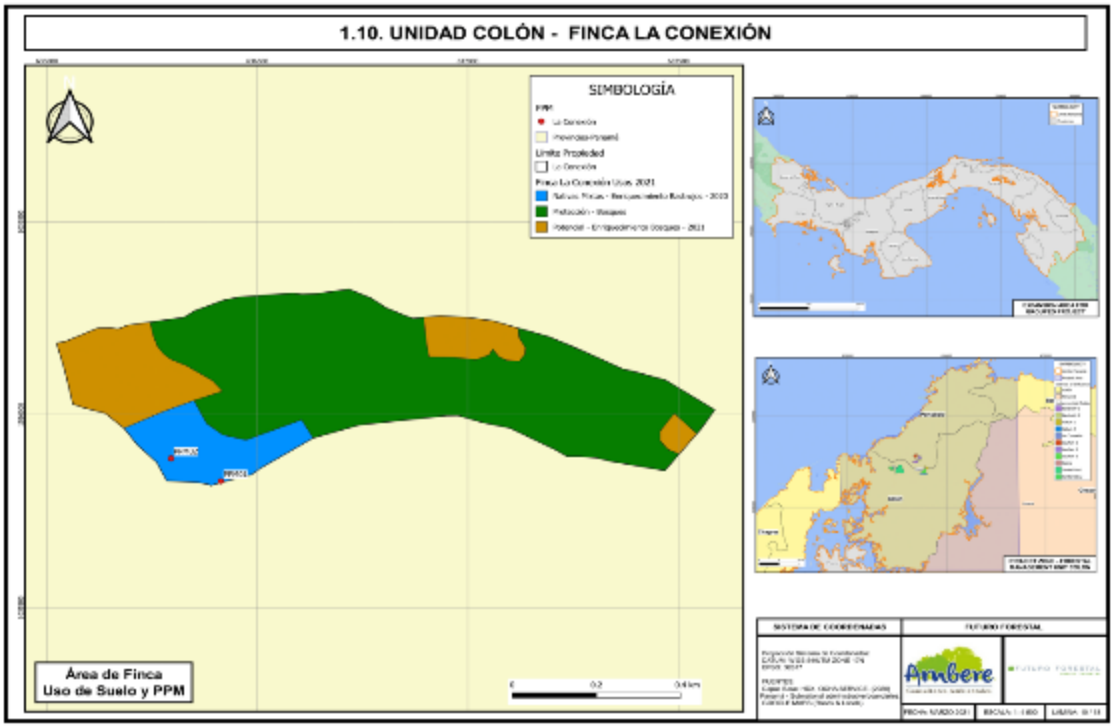
Plan implemented Finca El Limite																										
Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed	Plan	Executed
Unforeseen events		-		-		-		-		-		-		-		-		-		1		-		-	-	1
Staking		-		-		-		-		-		-		-		-		-		38		-		-	-	38
Obtaining cuttings					24																				24	-
Fence maintenance		-		-		-		-		-		-		-		-		-		-		10		-	-	10
Staked marker		-		-		-	24	-	24	-		-		-		-		37		4		-		-	48	41
Slices of the device		-		-		-	12	-	12	-		-		-		-		22		30		-		-	24	52
Monitoring		-		-		-	48	-		-		-		-		-		-		20		15		-	48	35
Planted		-		-		-		-		-	60	-		-		-		-		77		-		-	60	77
Fumigation									15						15				15						45	-
Chapia manual		-		-		-		-		-		-	36	-		-	36	-		22		32		-	72	54
Manual rounds		-		-		-		-		-		-		-		-		-		7		-		-	-	7
Foliar fertilization		-		-		-		-		-		-		-		-		-		19		-		-	-	19
Arriera control			1		1		1		1		1		1		1		1		1		1		1		10	-
Manual cutting machine		-		-		-		-		-		-		-		-		-		11		-		-	-	11
Weed control-manual weed control chapia		-		-		-		-		-		-		-		-		20		-		-		-	-	20
Personnel transfer		-		-		-		-		-		-		-		-		21		-		-		-	-	21
New planted		-		-		-		-		-		-		-		-		-		5		-		-	-	5
Hoyado-manual		-		-		-		-		-		-		-		-		-		1		-		-	-	1
Maintenance disk		-		-	12	-		-		-		-	12	-		-	12	-		8	12	17		-	48	25
Total	-	-	1	-	37	-	85	-	52	-	61	-	49	-	16	-	49	100		243	13	74	1	-	379	417

14. Fincas Colon

14.1 La Conexíon, planted area by species in 2020.

Finca la Conexión, Reforested 2019						
Finca	Surface	Types	Scientific name	Plants/ha.	2019	ha Total
Finca La Conexíon. # 6704	48.8	Alcarreto	Aspidosperma desmanthum	5x6	0.28	0.28
		Maria Grande	Calophylum bidentata	5x3	0.13	0.13
		Maria Grande	Calophylum bidentata	5x6	0.32	0.32
		Little Mary	Calophylum brasiliense	5x3	0.87	0.87
		Beat	Carapa guianensis	5x3	0.3	0.30
		Cocobolo	Dalbergia retusa	5x3	0.4	0.40
		Almond Tree	Dipteryx panamensis	5x3	0.64	0.64
		Almond Tree	Dipteryx panamensis	5x6	0.1	0.10
		Medlar	Manilkara bidentata	5x3	0.8	0.80
		Medlar	Manilkara zapote	5x6	0.35	0.35
		Aceituno	Simarouba amara	5x3	0.31	0.31
		Alcarreto	Simarouba amara	5x3	0.57	0.57
		total, reforested				**5.07**
		Natural forest				43.73
		Total area				48.80

14.1 Map La Conexíon



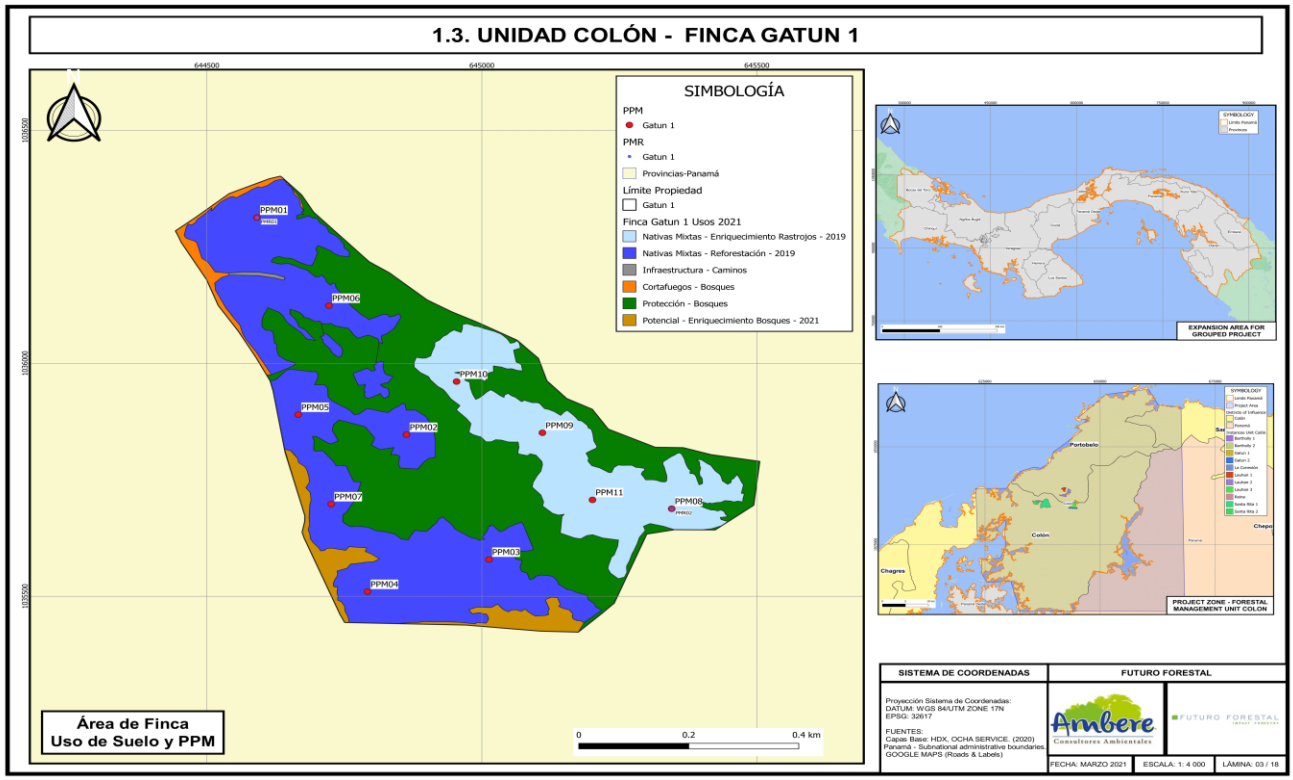
14.2 Work plan 2021

Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute
Chapia																										-
Fertilized									6.25									12.00							6.25	12.00
Trochado																										-
Release			9.00	5.00	9.00	4.00						42.00		16.00				12.00							18.00	79.00
Euphemism			7.50		7.50																				15.00	-
Planted											15.00														15.00	-
Establishment disk																										-
Cutting, maintenance or removal of lianas			10.00						10.00						10.00				10.00						40.00	-
Plant maintenance																										-
Cleaning hiking trails							10.00				10.00				10.00				10.00						40.00	-
Hoyado																										-
Fumigation									7.50				7.50				7.50				7.50				30.00	-
Total		-	26.50	5.00	16.50	4.00	10.00	-	23.75	-	25.00	42.00	7.50	16.00	20.00	-	7.50	24.00	20.00	-	7.50	-	-	-	164.25	91.00

15. Area by species, Gatun #1

Finca Gatun 1, Afforested 2019						
finca	Surface	Types	Scientific name	Plants/ha.	2019	ha Total
Gatun 1	48.8	Alcarreto	Aspidosperma desmanthum	5x3	1.92	1.92
		Berba	Brossimun alicastrum	5x3	0.37	0.52
		Maria	Calophylum brasiliense	5x3	2.24	2.24
		Carapas	Carapa guianensis	5x3	2.10	2.10
		Cocobolo	Dalbergia retusa	5x3	8.41	8.41
		Cocobolo	Dalbergia retusa	3x3	1.95	1.95
		Almond Tree	Dipteryx panamensis	5x3	2.21	2.21
		Medlar	Manilkara bidentata	5x3	1.93	1.93
		Caobillo	Tapirira guianensis	5x3	0.75	1.09
		Amarillo	Terminalia amazonia	5x3	1.19	1.84
		Amarillo	Terminalia amazonia	3x3	3.04	3.04
		total, reforested				27.24
		Protection				21.56
		Total area				48.80

15.1 Gatun map 1



15.2 Work plan 2021.

GATUN DEPLOYMENT PLAN 1																										
Description	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		Total	
	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute	Plan	Execute
Release		5.00	45.00	20.00	45.00	51.00		28.00		51.00		34.00		30.00		47.00		40.00		68.00		96.00			90.00	470.00
Euphemism			37.50		37.50																				75.00	-
Fumigation									45.00				45.00				45.00				45.00				180.00	-
Planted											90.00														90.00	-
Foliar fertilization														6.00											37.50	6.00
Weed control-manual weed control chapia				12.00				16.00																		28.00
Manual cutting machine			50.00						60.00					16.00	60.00	20.00			60.00						230.00	36.00
Granular fertilization									37.50							10.00		34.00		8.00						52.00
Cleaning the path							60.00				60.00				60.00				60.00						240.00	-
Total	-	5.00	132.50	32.00	82.50	51.00	60.00	44.00	142.50	51.00	150.00	34.00	45.00	52.00	120.00	77.00	45.00	74.00	120.00	76.00	45.00	96.00	-	-	942.50	592.00

16. Streets:

Repair of public roads and improvement of primary service roads. for reforestation 2021.

Planted Clarita #1 April 2021

Photos of the general condition of the trees



Ron Ron tree, mahogany, 9 months old cocobolo. Ponderosa.


Ponderosa, 6 months old Cocobolo


Start planting Clarita #1 May 2021 C bitter. Clarita #1 6 months


Clarita #1 6 months old cedars.

Photo, April 2021 FAD Marking Team.




17. Carbon monitoring

Between 2020 and 2021, the carbon cluster project was developed according to VERRA's Verified Carbon Standard and Climate, Community and Biodiversity (VCS-CCB) standards. The project was successfully validated. Permanent monitoring plots were established on the forest human fincas (Colón, Gatún 1, La Reina and La Ponderosa) and carbon monitoring was conducted.

Carbon monitoring only includes trees with DBH greater than 10 cm, both commercial and non-commercial. Therefore, it is common for native species to require several years of growth before reaching the minimum DBH criterion of 10 cm and being counted in the future. In Fincas La Conexión and Gatún 1 (Colón), growth monitoring was done in 2021, so there is no data to monitor seedling growth. This will be done next year. The two farms that have trees with DBH greater than 10 cm are La Reina and Gatun 1.

The results of carbon storage in forest human farms are:

Carbon storage between 2016 and 2021, forest people fincas. Monitoring 2021			
Finca	Teak	Local	Tons of CO2 sequestered
La Reina	3.240	535	3.775
Gatun 1	0	817	817
		TOTAL	**4.591**

The validation and verification audit of the project, conducted by an ICONTEC validation/verification institute in Colombia, took place during the months of June to

September 2021. The validation was reviewed by VERRA and approved in November 2021.

18. Phytosanitary control.

Control of *Hypsipyla grandella*: An insect that lays its larvae in the top of mahogany and bitter cedar trees. In the adult stage it is a moth and in the larval stage it is a worm that bores into the top of species of the Meliaceae family.

Treatment: Control is done by pruning to eliminate the larvae and prevent them from eating the crown of the tree. In other words, the part where the larvae are is cut off and the young tree sprouts again, continues to grow and maintains a good shape. New treatments are constantly being developed that are more effective and economical without harming the environment.


Products to combat *hypsipyla.* *Mosquito bite*

Control of armyworms: Armyworms are defoliating ants. In the establishment phase, they cause great damage, resulting in total loss of the plants.
To control them, the nests are constantly monitored and preparations are used to reduce the growth of the fungus on which they feed.

Organic Mowing: Organic mowing involves depositing grass clippings from the clearing at the base of the tree, creating a mulch layer that reduces the growth of vegetation around the plant, reducing competition for nutrients while maintaining moisture and adding organic matter to the soil through decomposition.


19. Difficulties with the FAD 2021

Road construction:

The network of public and private roads was very short during the dry season, and not enough equipment and labor could be hired for the repair work, so some work was done on foot.

With the constant influx of new employees, ongoing training is required for planting operations.

Photo: Transport of cocobolo to the farm of Dario Castro. *Quebrada grande*

20. Recommendations:

- A system is in place to monitor planting and overall survival, but there is a need to expand Hipsiphylla control monitoring to include more frequent monitoring of cedar and mahogany tops. Multiple monitoring will be initiated to ensure that trees of these two species are brought to a minimum height of 7 meters.
- The only species that requires major weed control is teak. To avoid delays, early warning is necessary.
- The change of land use from pasture to afforestation favors the development of deciduous tree species. This is especially true for vines and creepers, which are a major growth problem for this vegetation. An early control strategy is necessary to promote the regeneration of pioneer species of trees and shrubs that reduce the development of vines.
- One species that threatens biodiversity and drives up maintenance costs is the aggressive development of the ***sandpiper, an*** exotic species that is invading all the far***ms*** in the region. It is very important to create a plan for the reduction of this species.
- Strengthening the training program for technicians.