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Carbonable

Quarterly report of field activities

Mangrove Project

Las Delicias

September 2022

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Project summary

Overview

Project developer : Fundación Naturaleza Panamá

Elaborated by : Reveca Abrego

Verified by : Agzel Marin

Location : Bahía Lomas nursery

Date : May, June, July 2022

Updated information of the *Bahía Lomas* nursery.

Activities completed

The project started with a clean-up of the nursery area before building it. A ground level structure was also conceived for the arrangement and support of seedlings. All the tools and inputs required to start the project activities were purchased during the same period while field teams were trained for the collection, classification and selection of mangrove seeds. They were also trained for the mixing of substrates for the nursery.

Once the nursery was built towards the end of June, local teams collected more than 5,000 propagules and 4,037 seedlings were selected, collected and classified before being put in bags with substrates in preparation for the plantation. A monitoring was done after the first 15 days of establishment of the nursery to monitor survival rates and water content.

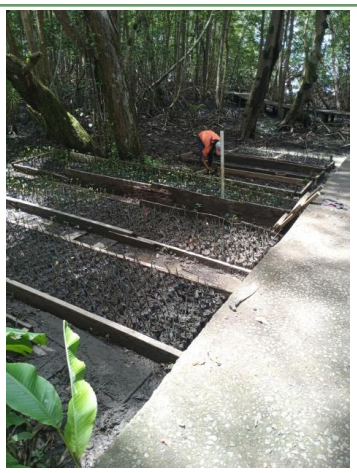
Restoration technique

- **Construction of the nursery**

Activities	Description	Photos
Field selection	The nursery area was chosen based on access, location, seed availability, conditions conducive to propagule development, water and substrate availability, as well as shade.	 02/07/2022 12:40 p.m. N 09° 11.524', W 082° 19.692'
Substrate used	To guarantee proper root and foliage growth, the substrate used on the site was composed of soil, sand, decomposed material and mud to mimic mangrove ecosystems. Such composition enables propagules to get used to real field conditions.	 1/08/2022 10:40 a.m. N 09° 11.524', W 082° 19.692'

Substrate treatment	Small arthropods found in the substrate were eliminated, as well as coarse roots, stones and any non-biodegradable material.	 1/08/2022 03:00 p.m. N 09° 11.524', W 082° 19.692
Bag selection	2 lb. bags.	 02/07/2022 09:03 a.m. N 09° 11.524', W 082° 19.692
Filling and arranging the bags in beds or plots	During the filling of the bags, the substrate was humid, the bags were completely filled and the seedlings were arranged in blocks or beds of 10 rows, with a spacing between blocks of 60 cm.	 1/08/2022 09:12 a.m. N 09° 11.524', W 082° 19.692

Sowing and transplanting seeds to bags	The seeds were sown directly in the bags, after having been collected, classified and selected. During transplanting, care of the roots, first leaves and stems was taken into account.	 02/08/2022 01:46 p.m. N 09° 11.524', W 082° 19.692
Nursery irrigation	Due to the proximity to the sea, the soil in the nursery is constantly wet and the seedlings are washed during each high tide.	 02/08/2022 12:20 p.m. N 09° 11.524', W 082° 19.692
Fertilization of seeds sown	After transplanting, the first application of NPK 20-20-20 foliar fertilizer was made at a dose of 3 grams per liter of water.	 02/08/2022 08:00 a.m. N 09° 11.524', W 082° 19.692

Phytosanitary control	Elimination of weeds in the bags and aisles was carried out manually.	 02/08/2022 07:40 a.m. N 09° 11.524', W 082° 19.692

- **Relative germination and survival in the nursery**

Species	Average relative germination	Survival
Rhizophora mangle (Red mangrove)	99.08	94.07

Trees planted

- **Tree species**

Species	Quantities planted	Quantities left to plant	Date of last planting activity	Replaced seedlings	Photos
Rhizophora mangle (Red mangrove)	800	9 200	June	80 during the month of June	

- **Survival and mortality rates on the field (reforestation area)**

Species	Survival rate	Mortality rate
Rhizophora mangle (Red mangrove)	90.0	10.0

- **Impacted area**

Species	Planting distance	Total area	Missing area	Photos
Rhizophora mangle (Red mangrove)	2m between plants and rows	3 200 m², equivalent to 0.32 ha.	133 200 m², equivalent to 13.68 ha.	

Social activities

- **Reforestation**

We received the visit of a group of university students from the Audiovisual Communication career of the Faculty of Social Communication of the Autonomous University of Chiriqui (UNACHI), in order to publicize the project, and record a short film on the experiences of those in charge, volunteers and participating community, NGO's volunteers and civil society. The goal of this activity was to point out the importance of the project for the site in particular and the province in general, the experiences lived and lessons learned, as well as to promote the conservation and restoration of mangrove ecosystems. Approximately 50 people participated, and during that activity, bird arbors were replaced.

- **Reforestation**

Students from the Faculty of Agricultural Sciences, Watershed and Environmental Management Engineering of the University of Panama (UP), based in Bocas del Toro (CRUBO), visited the area. A reforestation activity was carried out to replace the dead seedlings in the area, raise awareness of the project at the local level, and explain the research aspect of the project and its importance.

Project testimony

“The Reforestation Pilot Project of the Delicias Island [...] was initiated by state institutions such as the Institute of Agricultural Research of Panama, the Authority of Aquatic Resources of Panama, and the Municipality of Isla Colon, who under the administration of the Mayor of the district [were allowed] to carry out reforestation activities on the site. Since 2017, Fundación Naturaleza with the support of IDIAP and other state institutions has continued with the reforestation process, which today has had positive results allowing us to assert the viability and success of the project.

Thanks to the financial support of Wildsense and Carbonable, the project is now 25% advanced according to the work schedule, providing environmental benefits for the inhabitants of the area. We are very satisfied with the funding received which will hopefully allow us to turn the site into a reserve, a dream for locals who long to see the island restored.

I am grateful for the support provided by Wildsense and Carbonable, as it allows us to grow professionally, support environmental conservation and demonstrate that as long as we support nature, it can regenerate ecosystem services for the population.”

Agzel Marín
President of Fundación Naturaleza