Final Evaluation Report

Your Details	
Full Name	María Paula Názaro
Project Title	Reconciling conservation and forest use in an endangered ecosystem, promoting the regeneration of species of forest value in the Argentine Piedmont Forest
Application ID	31823-2
Date of this Report	May 2022

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Determine soil moisture			✓	The monitoring frequency was increased (monthly).
Determine the survival of renovals			✓	The survival of 12 species of trees of commercial value was determined.
Determine the phenology of the main commercial forest species			✓	Monthly monitoring of the phenology of 220 individuals from 12 species of trees of commercial value was carried out for one year.
Data analysis: processing of the information obtained in the field to establish silvicultural guidelines that favor the regeneration of the forest.			✓	We assessed the conservation status of 12 tree species. An index was developed with the density of the renovals, the density of the adults and the occurrence of the species. We also generate information on the phenology and survival of renovals.
Information transfer			✓	Due to the covid-19 pandemic, the strategy to report the results was changed. The information was disseminated in: - Scientific article in the Journal for Nature Conservation. - Informative dissemination bulletin. - Short information leaflet. - Documentary video. - Scientific poster and explanatory video at LACA Conservation Latin America Congress. - Illustrative stickers of threatened native trees. - Social networks of the Cebio Foundation - Live interview on social networks of the Cebio Foundation. - Journalistic note in the newspaper El tribuno de Salta. - Interview in television programme VideoTar (regional).

2. Describe the three most important outcomes of your project.

a). During April 2022, we returned to 11 sites located in the pedemontano forest where 52 plots of 122 m² each were sampled to determine the survival of the 726 renovales marked in 2019. The survival of the renovals was high (more than 50% survival).

Table 1. Survival of 12 tree species after three years

Scientific name	Number of renovales year 2019	Number of renovales year 2022	Survival at the third year (%)
Myracrodruon urundeuva	8	4	50
Parapiptadenia excelsa	50	32	64
Anadenanthera colubrina	85	55	65
Phyllostylon rhamnoides	290	246	85
Calycophyllum multiflorum	110	100	91
Myroxylon peruiferum	100	91	91
Cedrela balansae	13	12	92
Handroanthus impetiginosus	65	61	94
Handroanthus ochraceus	4	4	100
Amburana cearensis	1	1	100
Jacaranda mimosifolia	0	0	
Enterolobium contortisiliquum	0	0	
Total	726	606	83

b). We monitored soil moisture monthly during 2021 in 25 plots in two sites. Monthly data were recorded at 485 points. Humidity decreased in the period from August to November. It began to rise in December with the peak in April.
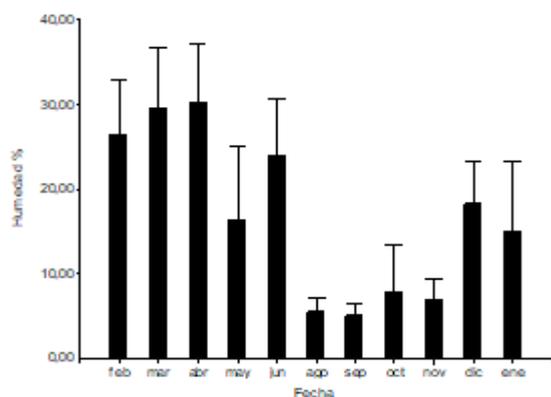

Figure. 1. Monthly soil moisture in the Bosque pedemontano (average ± D.E.).

c). The phenology of 12 tree species was monitored monthly for 1 year. We took pictures of the cup of 220 individuals with the help of a drone and camera.

Ten of the 12 species studied fell all the leaves between April and November 2021. *Myroxylon peruiferum* and *Parapiptadenia excelsa* did not fell all the leaves.

In 2021, 75% of individuals over 40 cm of dbh produced fruit and had a cup of more than 55 m^2. 62% of individuals with a dbh between 21-39 cm produced fruits and had a cup of 20 to 55 m^2. 15% of individuals less than 20 cm of dbh produced fruit and had a crown area of less than 20 m^2.

1. *Calycophyllum multiflorum*. 17 individuals were monitored. It bloomed in February, March and April. The fruits formed in April-May and were green until August. Between June and August, they changed to brown. Between August and February, the fruits fell. The leaves began to wither in May. It was leafless in September, October and November. In December it had new leaves. All individuals over 20 cm of dbh (11 individuals) flourished and bore fruit. 33% (6 individuals) over 10 and less than 20 cm dbh did not bear fruit.

2. *Phyllostylon rhamnoides*. 20 individuals were monitored. The flowers began to develop in November. The fruits were formed and ripened in December. The leaves fell from May to November. In December it had new leaves. All individuals over 20 cm of dbh (16 individuals) flourished and bore fruit. Of the four individuals with < 20 cm of dbh, 50% were fruitful.

3. *Cedrela balansae*. 22 individuals were monitored. It bloomed from December to February. The fruits began to develop between February-March and ripened and fell between September, October and November. From June to October-November they were without leaves. Between November and December new leaves sprouted. All over 30 cm of dbh (14 individuals) produced flowers and fruits. Of the eight individuals monitored for less than 30 cm of dbh, only one individual (12%) flourished and bore fruit.

4. *Jacaranda mimosifolia*. Two individuals were monitored. It bloomed from October to November. The fruits began to develop in December and ripened in October of the following year. The leaves fell in August and September. From September to November, new leaves grew. The 95 cm dbh individual produced flowers and fruits. The 34 cm dbh individual produced flowers but did not bear fruit.

Left: Fruits of Enterolobium contortisiliquum. Right: Flowers of Anadenanthera colubrina.

Left: Flowers of Amburana cearensis. Right: Leaves and fruits of Parapiptadenia excelsa.

9. *Myroxylon peruiferum*. 17 individuals were monitored. It bloomed in September and October. The fruits were formed in October and November, ripened in December and January. In October it renewed some leaves. It didn't drop all the leaves. All individuals from 22 cm of dbh (12 individuals) flourished and 92% fruited. Two of the five individuals between 10-22 cm of dbh bloomed and bore fruit.

10. *Myracrodruon urundeuva*. 21 individuals were monitored. It began to bloom from August to October. Fruiting began in September and October and the fruits ripened in November. The leaves began to fall in August. In September it had no leaves. In October and November new leaves began to sprout. The 12 individuals measuring more than 26 cm of dbh flourished and bore fruit. Between 20-25 cm of dbh bloomed and fruited two of the four individuals monitored. The five individuals of less than 20 cm of dbh did not bloom.

11. *Handroanthus impetiginosus*. 21 individuals were monitored. It bloomed in August. It bore fruit between September and November. In August it had no leaves. The leaves sprouted again between September, October and November. By December all individuals had new leaves developed. The 15 individuals measuring more than 22 cm of dbh flourished. The 14 individuals of

more than 28 cm of dbh bore fruit. The six individuals under the age of 20 did not bloom.

12. *Handroanthus ochraceus*. 19 individuals were monitored. It bloomed and bore fruit in October and November. In October and November, it had no leaves. In December they had new leaves. 11 of the 13 individuals larger than 25 cm of dbh flourished. The three individuals of more than 43 cm of dbh bore fruit. The six individuals of less than 20 cm of dbh did not bloom or bear fruit.

Left: Fruits and leaves of Myroxylon peruiferum. Right: Leaves and fruits of Myracrodruon urundeuva.

Left: Flowers, fruits and leaves of Handroanthus impetiginosus. Right: Flower buds of Handroanthus ochraceus.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

- The flowers and fruits of some species of trees are located above the level of the leaves, therefore they could not be observed or photographed from ground level. Which is why we bought a dji drone that allowed us to observe the treetops from above.

- We had to postpone the monitoring of renovals to April 2022, after the summer rains, because spring 2021 was very dry and the renovales still had no leaves.

- Due to the pandemic we had to change the strategy to disseminate the results. Instead of holding face-to-face workshops, we disseminate the information through social networks (Facebook, Instagram, websites, newspapers, congress). A documentary video, interviews, newsletter, informative brochure, poster and stickers were made.

- The soil moisture sensor began to deteriorate due to intensive use, so we decreased the measurement points from 900 to 485 on average but increased the monitoring frequency.

- Buy a tablet to avoid the use of paper sheets in the field and save time in the digitisation of data.

- In the countryside we do not have electric power, so we use the van to charge the batteries of the tablet, drone and camera.

4. Describe the involvement of local communities and how they have benefitted from the project.

The generation of information on the regeneration dynamics of each of the species under study allows us to propose silvicultural guidelines that ensure the natural regeneration of these tree species, which will guarantee the long-term use and conservation of species of high timber value. Failure by forestry companies to take urgent action could eliminate high-value tree species, impoverishing forests and eliminating the possibility of the forest sector using a timber resource. In addition, by improving silvicultural practices, it is possible to contribute so that many families and native communities can also make sustainable use of wood. These forests function holistically, so if this ecosystem is fully functioning, it can benefit other species of trees, birds, reptiles, and mammals that depend on the conservation of this habitat. Society at large will also benefit from the role forests play in carbon sequestration to mitigate climate change.

5. Are there any plans to continue this work?

We would like to do germination and restoration trials of degraded native forests.

6. How do you plan to share the results of your work with others?

We plan to publish at least two more scientific articles with the information obtained in this project.

7. Looking ahead, what do you feel are the important next steps?

Prepare a scientific article to disseminate the results of survival of renovales and another manuscript for phenology.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Newsletter:
https://www.dropbox.com/s/uqy4w10d1ylo3s8/Boletin%20N%C2%BA%2012.pdf?dl=0

Congress LACA Conservation Latin America:

Documentary Video VideoTar:
https://www.facebook.com/noticiasenvideotar/videos/25899793277035

Scientific article JNC:
https://www.sciencedirect.com/science/article/pii/S161713812030193X

Information leaflet:

9. Provide a full list of all the members of your team and their role in the project.

Scientific advisors: **Natalia Politi y Guillermo Martinez Pastur**

Volunteers who accompanied me to the field: **Alejandro Massa, Pia Pozzi, Agostina Muños, Ezequiel Cavadini, Juan Terrazas, Valeria Bento, Sebastian Aguirre, Florencia Baca, Ariel Suarez, Sofia Ocaransa, Alvaro Buitagro, Florencia Barbarich, Bruno Rendón, Agustina Belicari y José María Acuña.**

10. Any other comments?

The results were disseminated on the channel Videotar Noticias a (reaching 60000 people), Instagram of Cebio b (reach 580 people), Facebook of Cebio c (reaching 2900 people), Congress LACA Conservation Latin America (reaching 500 people) and newspaper the Tribune Salta d (reaching 550000 people)

https://www.facebook.com/noticiasenvideotar/videos/258997932777035

https://www.instagram.com/p/CUlOd4rLjMZ/?igshid=YmMyMTA2M2Y=

https://www.facebook.com/Conservacion.Estudio.Biodiversidad/videos/1437319439971548/

https://www.facebook.com/Conservacion.Estudio.Biodiversidad/photos/a.3606275956088488/4184616578254420/

www.eltribuno.com/salta/nota/2021-11-8-22-54-0-preocupa-la-baja-cantidad-de-lapachos-amarillos-y-rosados?fbclid=IwAR2VHuI48pno7dgXXtC4M1wNa6EtPeJJ-1CadxP6k3NQpYylz37c6TzRWNY