

Final Evaluation Report

Your Details	
Full Name	Monica Emilia Torres Almazán
Project Title	Upscaling and enhancing biological corridors for the conservation of <i>Abronia campbelli</i> , through research and capacity building.
Application ID	38040-2
Date of this Report	3/10/2023

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
Strategic habitat restoration expansion				<p>In a concerted effort with farm owners and administrative staff, we have undertaken the development of tailored conservation plans aimed at driving habitat restoration across five key farms for the conservation of <i>Abronia campbelli</i>. Our collaborative strategy is designed to reclaim 100 ha of land, from being highly degraded to being conservation areas for <i>A. campbelli</i>, within the next 3 years (2023-2025). The created plans have already been set in motion, with the implementation of the 2023 phase, marked by the planting of the first 15,000 trees. This milestone signifies the tangible manifestation of commitment of local farms to the conservation of <i>A. campbelli</i>.</p>
Conservation capacity building through the creation of farm-nurseries				<p>We have successfully established five satellite nurseries devoted to supplying native key tree species, facilitating the realisation of habitat restoration plans for each farm. This strategic initiative not only centres conservation capacity directly within local farms but also amplifies our annual habitat restoration impact, doubling our tree planting efforts from 20,000 to an impressive 40,000. This represents a significant leap forward in our commitment to sustainable conservation practices and the restoration of <i>A. campbelli</i> habitat.</p>
Evaluation of Nursery Techniques				<p>Research projects have yielded invaluable insights into tree nursery care techniques. These findings underscore the critical role of solar exposure in fostering seedling vitality, emphasise resource-efficient practices within the nursery, and unveil nuanced dynamics governing the interplay between root development and foliage growth. Such insights empower us</p>

				to refine our methodologies and optimise our conservation actions.
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2. Describe the three most important outcomes of your project.

a). Through unprecedented collaboration, crucial farms have become custodians of biodiversity, embedding sustainability in their operations. The creation and implementation of conservation plans for five farms, focused on habitat restoration, stands as a cornerstone achievement. The established farm conservation plan underlines the potential for a transformed landscape capable of sustaining a thriving population of *A. campbelli*. These plans impacted conservation actions carried out in 2023, marked by the successful inaugural planting of 15,000 trees, and will continue shaping efforts in the subsequent 2 years. Within these farms, the collective commitment to the conservation of *A. campbelli* culminates in the allocation of 100 ha for habitat restoration. This entails the establishment of biological corridors, spanning a linear distance of 16,370 m. The maturation of these habitat restoration zones promises a profound transformation in the growth and care of 40,000 essential native key trees. A conservative evaluation, factoring in the capacity of each tree to sustain four adult individuals, accentuates the impactful results of this project. The calculated outcome underscores the project's scope to sculpt a habitat capable of supporting a noteworthy population exceeding 160,000 *A. campbelli* individuals. This emphasises the substantial magnitude of our conservation efforts in fostering the survival and proliferation of this critically endangered species.

b). We have successfully established five satellite nurseries devoted to supplying native key tree species, facilitating the realisation of habitat restoration plans for each farm. These nurseries enhance our annual habitat restoration capacity twofold (from 20,000 to 40,000 trees) while ensuring the sustainability of our initiatives represents a significant milestone. The pivotal outcome lies in the commitment of farmers who have embraced the challenge and are evolving their mindset to encompass not just immediate conservation actions but also to prioritise, formulate and implement longer-term and enduring conservation efforts.

c). Scientific insights generated through nursery research enhance our toolkit for efficient restoration and exemplifies the synergy between conservation and innovation. The research findings underscore the importance of solar exposure for seedling biomass gain. Results also eliminate the necessity for fertilisers and soil preparation, thereby constituting a substantial resource saving measure. Furthermore, the investigation illuminates pivotal nuances in growth dynamics, specifically the interplay between root development and foliage growth. These revelations are catalysing adjustments in our nurseries, integrating this new knowledge into our conservation practices.

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

Campbell's alligator lizard habitat is characterised by two main oak species: *Quercus peduncularis* and *Quercus tristis*. Seed collection turned out to be one of

the biggest challenges of the project. The year 2022 was characterised by increased and sustained rainfall throughout the entire year, which impacted seed collection times and the number of seeds produced by different native forest species. This resulted in a delay of almost two months for the collection of oak seeds.

This climatic anomaly resulted in unusually high seed production of the oak species *Quercus tristis*, a species that generally produces limited seeds. However, the increase in rainfall resulted in the diminished production of seeds by the species *Quercus peduncularis*, which is generally the species that annually produces more abundant seeds. Therefore, habitat restoration and research were made with *Quercus tristis* and another native tree species *Liquidambar styraciflua*. This species also harbours *A. campbelli* and is important because unlike the local oak species that have a slow growth rate, this species is characterised by rapid growth.

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

This project represents a significant step in our overarching conservation plan for *A. campbelli*, cementing our collaboration with five local farms in pursuit of ambitious habitat restoration objectives. Through this partnership, these farms are assuming a heightened responsibility for safeguarding natural resources and biodiversity for their intrinsic value and for the sake of future human generations. Empowering local actors into taking responsibility and control over conservation actions on their land.

Every square meter from this farms that is now dedicated to the conservation of *A. campbelli*, through habitat restoration signifies a substantial triumph. Given that this land embodies a premium level of productivity highly esteemed in the market, these farms have made the admirable decision to dedicate these land sections exclusively for conservation purposes. These farms derive advantages from a more sustainable and biodiversity-friendly management approach, actively participating as key local contributors in the creation, protection, and interconnection of habitat. Habitat not only essential for the conservation of *A. campbelli* but also indispensable for securing the environmental goods and services vital to the farms' operations.

5. Are there any plans to continue this work?

Certainly, we have established long-term plans to persist in our habitat restoration and research endeavours in the region. This commitment extends not only to completing the execution of the conservation plans formulated within this project but also to advancing habitat restoration initiatives in other areas. Concurrently, the research instigated by this project necessitates ongoing fieldwork to assess the establishment and survival of trees in their natural environment.

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

We aim to publish the results of the nursery evaluation techniques in a peer-reviewed journal, transcript will be written in the upcoming year. Also, we formally report all our work to the National Council of Protected Areas (Consejo Nacional de Áreas

Protegidas CONAP), the entity in charge of supervising wildlife conservation in Guatemala.

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

As the project advances, the subsequent pivotal steps entail prioritising research and habitat restoration actions, specifically concentrating on the epiphytic plants comprising the microhabitat of *A. campbelli* within the tree canopy. With our initial habitat restoration patches maturing, a new phase has begun, directing the restoration efforts on tank bromeliads. This strategic shift aims to accelerate and ensure the recreation of the essential habitat for *A. campbelli*.

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?

We utilised the logo on the nursery signs. The comprehensive conservation project for the species garnered attention throughout our endeavours, particularly with the publication of the Women in Herpetology book. One chapter of the book is dedicated to spotlighting the conservation of *A. campbelli* and the ongoing efforts dedicated to its preservation. <https://www.womeninherpetology.com/>

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

Thomas Schrei: Biologist with more than 10 years of experience in reptile conservation. Expert in protected area management, habitat restoration and environmental education in rural communities. His greatest professional achievements are clearly reflected in the success of conservation strategies designed to protect the Guatemalan Beaded Lizard (*Heloderma charlesbogerti*). His conservation work stands out due to an impressive local involvement and support, tightly interwoven in field research and application of conservation actions. His role in the project was support on the field for the implementation of all project activities.

Cristian Ramirez: Nursery manager, he has developed and perfected the methodology to collect, sow and germinate the specific native tree species we use for the creation of the biological corridors. The success of the nursery relies on Cristian's local knowledge in combination with his ability to incorporate new technical information to his work skills. In addition, Cristian belongs to one of the local communities, so his social network is a great advantage to easily contact local leaders and community members. His role was the assistance in the construction of the nurseries and help the initial management of them in the farms.



Abronia campbelli.



Nursery.



Habitat restoration.