

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Melissa Esther Rodríguez Menjívar
<b>Project Title</b>	Dispersal of large-seeded plants by tent roosting bats (Phyllostomidae) and understory forest conditions in two alluvial forests of El Salvador
<b>Application ID</b>	29218-2
<b>Grant Amount</b>	£6000
<b>Email Address</b>	Melissa.rg784@gmail.com
<b>Date of this Report</b>	January 25 <sup>th</sup> 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
Determinate the effective role of small frugivorous Phyllostomid bats in the maintenance of the flora composed by large-seeded plants in two alluvial forest of El Salvador,				With the project we were able to identify at least four species of trees that Phyllostomid bats are dispersing. One of the tree species that bats are dispersing is threatened in El Salvador ( <i>Calophyllum brasiliensis</i> ) and the other is important in the diet of other species of mammals and birds ( <i>Spondias radlkoferi</i> , <i>Spondias mombin</i> )
Measure the understory coverage of the areas				Due to some delays with COVID-19 in running the project we decided to do this objective during our field trips of 2022. Therefore, the objective could not be accomplished for this phase of the project.
Record the plant species used as tents by Phyllostomid bats in El Salvador				The second RSG had helped us to determine the plant species that bats are using as roosts ("tents") in many sites of El Salvador. The records are being published in a scientific article that is in preparation to be sent in March 2022 by the latest.
Involve and teach local biology students and assistants in the rural community				With this second grant we focused our training efforts on park rangers, building capacities in bats ecology, and study techniques for at least 10 park rangers. At least five members of the Bat Conservation Program of El Salvador were also able to learn new research techniques and to be involved in different aspects of the project. In addition, we trained the 10 park rangers and at least 12 young professionals to use the application "ArcGIS Survey 123" so they learn how to locate tents and start a bigger project to start monitoring tents for 2022.

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.**

- Covid 19 contagion fluctuation was one of the main difficulties of the project, as the government decided to close the natural protected areas for a while and members of our team that were helping in the project also got infected during the project execution. To tackle the situation, we postponed the field trips and we finished the fieldwork in December 2021 despite it being supposed to finish before that date.
- Another difficulty was the presence of vandal groups in one of the areas, which affected data collection for a couple of months. To tackle the situation, we postponed the field trips for almost 3 months, for that delay, we are going to collect data from that site in March and April 2022 (when the permits to keep with the project can be renewed).

**3. Briefly describe the three most important outcomes of your project.**

1. This research combined with the information generated by Elías-Díaz (unpublished information) is the first information about large seed dispersal in this type of ecosystem in Central America and El Salvador. The data collected so far suggest that tent roosting bats are dispersing five large-seeded plant species, *Spondias radlkoferi* and *Spondias mombin*, the most abundant, followed by *Calophyllum brasiliensis*. Our results showed two other morphs of plants, which we are still identifying. Moreover, we had proved that the seed rain under the tents is significantly higher than the seed rain in random sites across the forest, highlighting the importance of tents as sites to carry a great abundance of large seeds.
2. This project in collaboration with other observations made by our team in different sites of El Salvador has allowed us to document information about "tents" as roosts for bats in El Salvador. Nine species of plant belonging to seven families of vascular plants (Araceae, Arecaceae, Cecropiaceae, Heliconiaceae, Malvaceae, Marantaceae, Musaceae, Polygonaceae, and Urticaceae) are being used as tents. This research also helped to clarify the Ministry of the Environment and local park rangers, to the proper identification of a palm (*Brahea salvadorensis*), which was thought to be present in the area, but it was misidentified in the past - the palm present in the area and used for bats as roost is *Sabal mexicana*. All this information on the plant species used as tents and the type of architecture is new for the country.
3. Training park rangers and young researchers is contributing to future projects in El Salvador. This action also supported the national goals in teaching technological tools to park rangers for future monitoring projects, as the government is also planning to use ArcGIS Survey 123 as a tool for conservation. We design a project in the ArcGIS Survey 123 app that we hope to run in 2022. Moreover, in collaboration with the Ministry of the Environment, two environmental interpretation signs were established in each area to

contribute the knowledge about bats ecosystem services and the importance of each natural protected area.

**4. Briefly describe the involvement of local communities and how they have benefited from the project.**

- Due to COVID-19 we were not that successful in involving local communities and local tour guides in the process, as the tourism sector was closed in the first months of the pandemic. However, we focused our efforts on training to build new capacities in park rangers of at least five National Protected Areas (NPAs), Santa Rita NPA, El Imposible National Park, Nancuchiname NPA, Normandía NPA, Chaguantique NPA and Las Nieves NPA.
- We want to continue the project and develop activities that can help us to work with the local communities more closely.

**5. Are there any plans to continue this work?**

Yes, for 2022 and 2023 I am planning to increase the area of incidence of the project and document the seed dispersal in an altitude gradient near Santa Rita, which corresponds to the biggest national park in El Salvador, which is El Imposible. I would like to enhance people's knowledge about bats through environmental education talks and printing a guide of bats roosts so the public can know about their importance on how to protect bats and their habitats that contribute a lot with the ecosystem services they provide. In addition, we want to strengthen the plant nursery in Santa Rita with plants that are important for bats and other vertebrates (as birds) that help with the natural forest restoration. For Normandía, I am looking forward to establishing a plant nursery and organising reforestation campaigns with the local communities to increase the areas for bats and another fauna in the area like the Central America spider monkey (which is the most endangered terrestrial mammal in El Salvador) is present in that area.

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

During the execution of this research we had shared some information through the local newspaper (<https://www.elsalvador.com/noticias/nacional/murcielagos-agricultores-nocturnos-el-salvador/852567/2021/>). We were also sharing the information of our project through social media in the following post in which I am showing the amount of people reached with the information shared of the project.

In addition, we are preparing two scientific articles, one of them based on the findings of plants use as tents by phyllostomid bats in El Salvador will soon be sent to review. For the second one, we are still analysing the data relating to large seed plant species that are being dispersed and their abundance in the two sites.



**Territorios Vivos El Salvador**

Publicado por George Gonzalez ·  
16 de diciembre de 2020 ·

El pasado 08 de diciembre en el Área Natural Protegida Santa Rita como [PCM El Salvador](#) y [Territorios Vivos El Salvador](#), dimos inicio al Proyecto gracias a [Rufford Small Grants Foundation](#) sobre dispersión de semillas grandes por [#murciélagos](#). En el marco del proyecto se llevó a cabo una capacitación para guardarecursos y guías locales con el apoyo del [Ministerio de Medio Ambiente](#).

En esta primera fase, nuestros participantes aprendieron sobre los siguientes temas: Generalidades sobre los murciélagos, mitos y verdades sobre los murciélagos y desarrollo de la fase de campo del proyecto; asimismo, se realizó la presentación del proyecto de estudio poblacional en vida silvestre del murciélago de labio verrugoso *Trachops cirrhosus*.



26

7 comentarios

508 Personas alcanzadas

3 Me gusta, comentarios y veces que se ha compartido

29 Clics en publicaciones

9 Visualizaciones de fotos	1 Clics en el enlace	19 Otros clics
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3 Me gusta, comentarios y veces que se ha compartido

**DISTRIBUCIÓN DE CONTENIDO DE MARCA** Ver desglose

508 Alcance total	508 Alcance orgánico	0 Alcance pagado
547 Impresiones totales	547 Impresiones orgánicas	0 Impresiones de pago

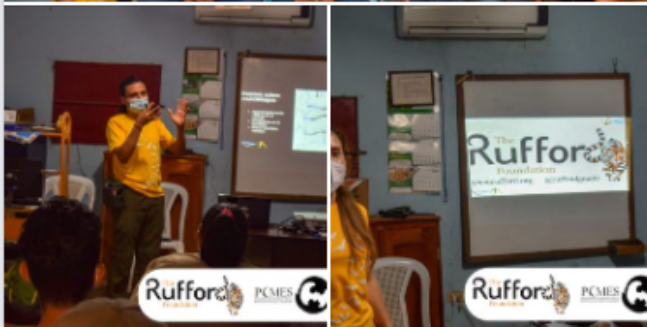




**Territorios Vivos El Salvador**

Publicado por George Gonzalez ·  
15 de diciembre de 2020 ·

El pasado 04 de diciembre, nuestro Programa de Conservación de Murciélagos visitó el ANP Normandía, para dar inicio al proyecto [The Rufford Foundation](#) de semillas grandes dispersadas por [#murciélagos](#), el cual tiene una fase de capacitación para guardarrrecursos y guías locales y que se desarrolló en grata colaboración con el [Ministerio de Medio Ambiente](#).  
En esta primera fase, los asistentes aprendieron junto a nosotros sobre: Generalidades de murciélagos y proyecto de dispersión de semillas grandes por murciélagos tienderos.



15

4 veces compartida

Me gusta Comentar Compartir

### Rendimiento de tu publicación

1402 Personas alcanzadas

12 Me gusta, comentarios y veces que se ha compartido  
6

103 Clics en publicaciones

23 Visualizaciones de fotos	0 Clics en el enlace	80 Otros clics
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12 Me gusta, comentarios y veces que se ha compartido  
6

### DISTRIBUCIÓN DE CONTENIDO DE MARCA Ver desglose

1402 Alcance total	1402 Alcance orgánico	0 Alcance pagado
1587 Impresiones totales	1586 Impresiones orgánicas	0 Impresiones de pago



Territorios Vivos El Salvador

Publicado por Lucía Sánchez Trejo ·  
26 de marzo de 2021 ·

En el marco del [#DialInternacionaldelosbosques](#), compartimos avances de nuestro proyecto sobre dispersión de semillas grandes por murciélagos frugívoros en el [#ANPSantaRita](#), con apoyo de [The Rufford Foundation](#). Hemos encontrado que, durante los últimos meses (enero a marzo), algunas especies de murciélagos trasladan frutos del árbol *Calophyllum brasiliense* "barío" y depositan las semillas bajo los sitios de alimentación en el bosque, lo que refleja el consumo de este fruto en l... Ver más



44

15 veces compartida

Me gusta Comentar Compartir

### Rendimiento de tu publicación

3197 Personas alcanzadas

15 Me gusta, comentarios y veces que se ha compartido  
0

117 Clics en publicaciones

8 Visualizaciones de fotos	0 Clics en el enlace	109 Otros clics
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### DISTRIBUCIÓN DE CONTENIDO DE MARCA [Ver desglose](#)

3197 Alcance total	3197 Alcance orgánico	0 Alcance pagado
3489 Impresiones totales	3488 Impresiones orgánicas	0 Impresiones de pago



**Territorios Vivos El Salvador**

Publicado por Lucía Sánchez Trejo ·  
30 de junio de 2021 ·

🌿 Proyecto dispersión de semillas grandes 🌱

Con el apoyo de [The Rufford Foundation](#), en el [PCM El Salvador](#) estamos evaluando el papel que juegan los murciélagos frugívoros en la dispersión de semillas grandes en dos bosques aluviales del país.

Como parte de este fundamental proceso en la regeneración de los bosques, hemos colocado trampas para recolectar semillas grandes mayores a 5 mm. Estas pertenecen principalmente a especies de árboles formadores de bosques como el "palo de hule" (Castilla elastica), "ojushte" (Brossimum alicastrum), "jocote" (Spondias radlkoferi), "barío" (Calophyllum brasiliense); y de esta manera, entender que la conservación y protección de los murciélagos frugívoros es determinante en la regeneración y el futuro de los bosques de El Salvador.

[#conservaciónsv](#)  
[#biodiversidadsv](#)  
[#bosquesv](#)



👍❤️ 45

2 comentarios 15 veces compartida

**Rendimiento de tu publicación**

**3815** Personas alcanzadas

**21** Me gusta, comentarios y veces que se ha compartido  
**0**

**333** Clics en publicaciones

<b>54</b> Visualizaciones de fotos	<b>0</b> Clics en el enlace	<b>279</b> Otros clics
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[Ver más detalles](#)

**COMENTARIOS NEGATIVOS**

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<b>0</b> Denunciar como spam	<b>0</b> Ya no me gusta esta página

**21** Me gusta, comentarios y veces que se ha compartido  
**0**

**DISTRIBUCIÓN DE CONTENIDO DE MARCA** [Ver desglose](#)

<b>3815</b> Alcance total	<b>3815</b> Alcance orgánico	<b>0</b> Alcance pagado
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<b>4162</b> Impresiones totales	<b>4161</b> Impresiones orgánicas	<b>0</b> Impresiones de pago
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Ver estadísticas

Promocionar



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pcm.elsalvador El pasado sábado 27 de noviembre se colocó un rótulo en el ANP Santa Rita como parte del Proyecto de Dispersión de semillas grandes por murciélagos financiado por @ruffordgrants .

Con el rótulo se pretende informar a todo visitante sobre uno de los servicios ecosistémicos que brindan los murciélagos y que contribuye a la regeneración de nuestros bosques. Además, dar a conocer algunas especies de semillas grandes que están siendo dispersadas por estos mamíferos en el área.

Agradecemos al @medioambientesv por todo el apoyo que nos brinda en el proyecto.

#ConservaciónSV



**7. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?**

The offer letter between RSG and myself was signed on January 31<sup>st</sup>, 2020, with the plan to execute the project in 1 year. Due to COVID-19, the Natural Protected Areas were closed for 10 months (March – November 2020). For that reason, we started the project in December 2020 with activities related to the training sessions for the park rangers. Then in August 2021, we had some troubles visiting Normandía NPA due to vandalism in the area, which delayed the project in that area for almost 3 months. In consequence, we are extending the field visits to Normandía for this year (2022). Despite of the unforeseen, we were able to complete the fieldwork in Santa Rita and complete almost all the activities for this phase of the project.

**8. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.**

Item	Budgeted Amount	Actual Amount	Difference	Comments
NGO administrative expenses	600	600		
Environmental interpretation signs	500	500		This amount was used for the elaboration, design and the placement of the signs in each area. This amount was given by Rufford.
Training (workshops expenses)	500	610	+110	For the training we spent the funds in coffee breaks, diesel to get to the communities, materials and a small fee for the trainer. The difference was covered by the NGO budget.
GPS	200	200		At the end we use an old GPS from the NGO, and we use the money to pay the communication assistant that made the posts in social networks and who was in charge of the follow up of the note in the local newspaper.
Transport (fuel)	500	564	+64	The difference is due to fuels increment in the last year.
Food	1500	2732	+1232	1200 Co-funding/ 1500 RSG. At

				The end there were 1232 of co-funding with the extra expenses for the food expenses.
Assistant salary	2200	3600	+1400	1400 Co-funding / 2200 (RSG)
<b>Sub-total</b>	<b>6000</b>	<b>8806</b>	<b>+2806</b>	
Seed traps and aluminium rows		300		We reduce the expenses in the materials for the field, as we use some equipment that Debora Elías Díaz (the student that previously worked with the topic). This was a counterpart from the NGO. But we had to spend in other materials and this amount was taken from RSG amount.
Materials		320	+320	
Camera		500		This was a counterpart from the NGO
Car maintenance		420		This was a counterpart from the NGO
Lodging		900		This was a counterpart from the NGO
<b>TOTAL</b>	<b>6000</b>	<b>11246</b>	<b>+5246</b>	The total amount for the project £11,040 was divided as follows: £5,040 co-funding and £6000 that RSG gave us for the execution.

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



- Despite of all the efforts, Covid-19 did not let us work directly with the communities; however, we need to increase the awareness about bats, and the many benefits they provide for forest maintenance and humans wellbeing. This can be reached through environmental education and educative material in the areas.
- We need to strengthen the plant nursery in Santa Rita NPA and to include El Imposible National Park to generate more information of the large-seeded plant species that bats are dispersing. Santa Rita and El Imposible, are both part of a Conservation Area of El Salvador, which is also an Area of Importance for the Conservation of Bats (AICOM in Spanish).
- We need to establish a plant nursery in Normandía and follow methodologies to facilitate restoration in the area, as the browsing and trampling of cattle are affecting the regeneration of the forest in that area.
- For the cattle problem in Normandía NPA we were not able to go further with the Ministry of the Environment, however, they explained the options to find

some solutions for the situation in the Municipality. This is an action that has to be solved shortly so Normandía NPA can persist in time. Therefore, this is one of our goals for the following two years.



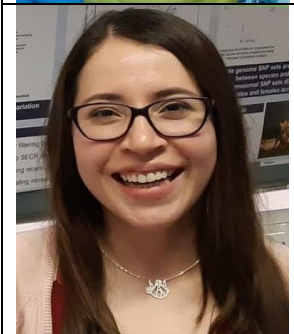

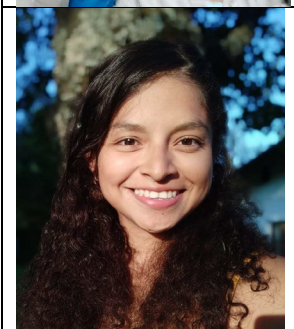
**10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?**

Yes, we use the logo in our social media posts and in the t-shirts, we made for the project that were given to the team and the park rangers that we trained. The logo was also used in the environmental interpretation signs that were established in each of the areas of the project.


**11. Please provide a full list of all the members of your team and briefly what was their role in the project.**

Team member	Role
	<p><b>Melissa E. Rodríguez</b>  <b>Project Coordinator</b></p> <ul style="list-style-type: none"> <li>- Organize the field trips</li> <li>- Coordinate the team and activities of the project</li> <li>- Administrate the project together with the administrator and accountant of the NGO</li> <li>- Check the organization of the data base of the project</li> <li>- Analyse the results</li> <li>- Write the manuscripts</li> <li>- Organize the workshops and presentations with park rangers</li> <li>- Follow up of the project</li> </ul>
	<p><b>Debora Elías Díaz</b>  <b>Project Sub-coordinator</b></p> <ul style="list-style-type: none"> <li>- Help to organize the field trips</li> <li>- Organize the data base of the project</li> <li>- Help to Analyse the results</li> <li>- Getting involved in the preparation of the manuscripts</li> <li>- Support in the elaboration of the contents of the presentations for Park rangers for the workshops</li> <li>- Follow up of the project</li> </ul>



	<p><b>Iván Edgardo Samayoa</b>  <b>Project Sub-coordinator in absence of Débora</b></p> <ul style="list-style-type: none"> <li>- Be in charge of the field trips when coordinator and sub coordinator are not in the field</li> <li>- GPS manager and help to monitor the Gentry parcels</li> <li>- Help to Analyse the results of the Gentry parcels</li> <li>- Follow up of the project</li> </ul>
	<p><b>Katherine Mercedes Agreda</b>  <b>Project field assistant</b></p> <ul style="list-style-type: none"> <li>- Support in the field trips</li> <li>- Support the workshops to park rangers</li> <li>- Organize the pictures of the project and the tents' locations in the Survey 123 app of ESRI</li> </ul>
	<p><b>Gloria Lucía Sánchez</b>  <b>Project field assistant and designer of the materials and signs</b></p> <ul style="list-style-type: none"> <li>- Support in the field trips</li> <li>- Support the workshops to park rangers</li> <li>- Design the environmental interpretation signs in coordination with the Communication department of the Ministry of the Environment.</li> </ul>
	<p><b>Zuleyma Vanessa Campos</b>  <b>Project field assistant</b></p> <ul style="list-style-type: none"> <li>- Support in the field trips</li> <li>- Support the workshops to park rangers</li> </ul>
	<p><b>Andrea Morales Rivas</b>  <b>Project field assistant and designer of the workshops using the 123 Survey application of ESRI (ArcGIS)</b></p> <ul style="list-style-type: none"> <li>- Support in the field trips</li> <li>- Be in charge of two workshops for the park rangers</li> </ul>



	<p><b>Jorge González Linares</b>  <b>Social network manager of Asociación Territorios Vivos El Salvador and it's programs</b></p> <ul style="list-style-type: none"> <li>- Technical support with the photos and posts in the social networks</li> <li>- Analysis of the public reached through our social media in the project.</li> </ul>
	<p><b>Bernal Rodríguez-Herrera</b>  <b>Professor at the University of Costa Rica</b></p> <ul style="list-style-type: none"> <li>- Main advisor of the project</li> </ul>

## 12. Any other comments?

Having the opportunity to develop this project was a real challenge but at the same time, it was gratifying to see the park rangers' involvement and willingness to learn. This project is giving us new insight in regard to the role that phyllostomid bats play in places where there has been a severe land-use change process and in sites where other medium-size mammals have been extirpated. We are eager to continue with this study and add new questions to explore the seed dispersal phenomenon in El Salvador. Having more information on the seed dispersal interaction in bats will also contribute to future actions of restoration, which is a trending topic but also a solution to increase connectivity in El Salvador.

Thank you so much to The Rufford Foundation for believing in our project and to all the team members that contributed to making it possible.