Final Evaluation Report

Your Details	
Full Name	Alejandro Gonzalez Bernal
Project Title	Estimating the Carrying Capacity for the Mexican Grey Wolf (*Canis lupus baileyi*) across Mexico
Application ID	23219-1
Date of this Report	8/5/2022

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
Provide the first estimation of ecological carrying capacity (ECC) for Mexican wolves.			✓	With the information obtained, I was able to estimate the potential number of wolves in the areas with the highest habitat quality in Mexico.
Elaborate the first range-wide map of ungulate density across the remaining suitable habitat of the Mexican wolf using systematic and comparable field surveys			✓	The data from the camera traps allowed us to calculate the density of the main ungulates. This estimate and the resulting map represent the first at the regional level, which will help in future ecological analyses related to carnivores.
Update the densities of the other carnivores present in the ecosystem (puma, black bear and coyotes) to be considered in the estimation of ECC of the Mexican wolf.			✓	The camera traps also yielded information about the rest of the carnivores. The analysis carried out, allowed estimating the abundances of puma and black bear in norther Mexico.
Workshops in which we will engage with ranchers and private owners and to consolidate a group of at least three private owners to start implementing conservation and management actions of wild prey to promote human-carnivore coexistence		✓		Due to Covid-19 restrictions, we were unable to do the workshop. After personal conversation with ranchers, two were interested in the information derived from the cameras and were attracted to start monitoring their ranches.

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

a). Five sites along the historical distribution of the Mexican wolf were monitored using camera traps in which densities of ungulates varied widely mainly due to variation in species and habitat quality.

b). I estimated the carrying capacity for the Mexican wolf throughout its historical range. In the high-quality patches, wolf density ranged from 4 to 19 wolves per 1000 km^2.

c). The developed risk map shows us the most probable areas of carnivore-human conflict. These areas are mostly in transition zones of vegetation types and close to population centres.

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

The greatest difficulty faced was the pandemic caused by Covid-19 and the prohibition of face-to-face activities and meetings. The closure of activities, both government and educational, caused delays in our field trips, because our university did not allow us to go to the field. In October 2020, we tried to carry out our field trip, however the owners of the ranches asked us to wait until the activities were allowed by the health institutions of Mexico. We were allowed to pick up the cameras in November 2021. Surprisingly, some of the cameras were still active and taking photos. However, a proportion of our cameras disappeared (either stolen, broken or burned).

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

Communities and private owners are a fundamental part of our monitoring. With all the owners of the ranches where we monitored, we had long conversations regarding the conservation of large carnivores and their prey. All of them have committed to conserving these species on their properties and promoting activities that are compatible with nature. During the field work, we always went together with key members of the community or the private property, during which they learn how to setup the cameras. Also, they helped us decide the most optimal and efficient logistics for the placement of the cameras. Finally, two ranchers were so interested in the information derived from the cameras that requested us further assistance in choosing the best brand of cameras trap to start monitoring their ranches.

5. Are there any plans to continue this work?

The Mexican wolf recovery project, despite the fact that it began in Mexico 10 years ago, still has a long way to go to achieve a total recovery of this subspecies. The recovery plan for the Mexican wolf establishes that the species will be considered recovered (in Mexico) when an average population of 200 wolves is reached over a period of 8 years. The estimation of the carrying capacity for the wolf in Mexico indicates that it is necessary to consider the entire Sierra Madre Occidental. Because of this, it is necessary to continue the monitoring efforts in various or different areas throughout the Sierra Madre Occidental, to assess prey populations and social perception and find potential reintroduction areas along this Sierra. In this sense, we will continue to explore new potential areas to propose new reintroduction sites for this subspecies in Mexico.

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

All the information derived from this project will be submitted to a scientific journal for publication. Also, we regularly have presentations (virtual and in person) aimed at the general public but with emphasis on the livestock and ranchers' group. Finally, I will attend to at least two national congresses and one international congress to present results from my thesis.

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

Continue monitoring in Durango and southern Chihuahua to estimate the abundance of the main carnivores, quantify the availability of the main wild prey, and the presence of livestock (cattle, sheep, goats, horses). Also, evaluate the social perception and level of acceptance of local people to the presence of wolves. Based on this, identify new sites for the reintroduction of this species

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?

Throughout this time, I (and my team) have participated in different forums and meetings in which we have presented the results of the monitoring carried out as part of my thesis. In all the presentations we have put the Rufford logo. Also, in each of the publications in scientific journals that come out with this information we will thank Rufford. Finally, due to the large amount of data acquired with the camera traps, two master's students had started their thesis using this information. They will also thank The Rufford Foundation

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

Dr. Enrique Martínez-Meyer: His role was to lead in the analysis of the different objectives advise us during the project on topics of modelling, geographic analysis.

M. en C. Zaira González-Saucedo. Zaira help setting camera traps in the field. In the same way, she collaborated in the creation of the databases and in the analysis focused on carnivores, such as the puma, black bear and coyote.

Volunteers: Between 4-6 volunteers help us checking all the photos derived from the monitoring (~800,000 photos) Yissel Gomez-Gayosso, Marcos Cruz González, Alejandra Aguirre, Alejandra Ortiz, Abraham Bravo.

10. Any other comments?

I would like to thank The Rufford Foundation for the immense support you gave me. Without this grant, the culmination of my thesis field work, as well as all the information generated would not have been possible. Definitely, this grant helped me maintain my interest in carrying out conservation actions that materialise in

measurable results. I will always talk exceptionally from this foundation and encourage participation of my colleagues and future students.