

# Final Evaluation Report

Your Details	
Full Name	Elín Araceli Avellá Machado
Project Title	Carnivores vs residents: Estimation of frequency of puma (Puma concolor) predation events on livestock in the most productive area of San Juan, Argentina
Application ID	41180-1
Date of this Report	March 2025

**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
Estimate the frequency of predation events and their location in order to identify the sites with the highest risk of predation				Despite the fact that the project was completed in the corresponding year and all the proposed steps could be carried out, the aim could not be fully achieved as insufficient data were available to make accurate estimates. However, according to the information obtained from data provided by the residents, during 2024, 17 predation events were recorded (3 horses, 5 goats and 9 cows). We were also informed of alleged activity involving foals, but these events were neither photographed nor confirmed on-site. For this reason, these events have not been considered for practical purposes. While we have some geographical specification of the predation of goats and cows, the exact locations have not yet been delineated. It is hoped that, during this year, coordination with the person who recorded the events will be achieved so that the locations of the events can be identified using a printed map.

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

**a). Risk predation areas.** The first step of this project involved interviews with residents of Los Baldecitos and Blades del Rosarios. Of the 19 households visited, permission was obtained from ten livestock owners to deploy 26 GPS collars (ten on goats, nine on cows and seven on horses). All interviewees reported having experienced livestock predation by pumas at some point during 2023. The collars were fitted only to females with offspring, as these animals returned to the corral at least once a day to nurse their young. Each collar recorded the animal's geographic position every 15 min and remained active for an average of 30 days.

The information obtained from the collars was combined with a pilot survey carried out in 2023 to produce a map showing the routes followed by the livestock. This made it possible to: i) create a grid covering the area used by the livestock, sampling 55

points over 6-month; ii) allow livestock owners to track their animals' locations. Although only five puma records were obtained, the sierras were identified as the area with the highest predation risk (zones of high spatial heterogeneity), primarily based on the interviews conducted with local residents. Due to its ecology, the puma prefers habitats with greater spatial complexity (such as the sierras) over the simpler environments like the plains, where livestock typically graze. Through the interviews, it was established that the most significant losses in 2023 occurred in the sierras, where livestock are not commonly found—not only due to the presence of pumas but also owing to the lack of pasture. However, the region has been affected by seven consecutive years of drought, forcing livestock owners to move their herds into the sierras, where woody vegetation and water sources are more readily available. Additionally, mesofauna are absent from the sierras; species such as guanacos, maras and peccaries remain in the plains. As a result, local residents are faced with the difficult decision of moving their livestock into a high-risk area for predation in search of water and forage.

**b). Community participation.** A connection with the community was established, and their participation in interviews and subsequent visits was achieved. The commitment of the community to continue working on the collection of data regarding puma attacks on livestock was secured, which allows the expansion of knowledge about the species in the area and its interaction with humans and livestock.

**c). New species.** Two new species were recorded for the province of San Juan: *Tolypeutes matacus* and *Dolichotis salinicola*. Although these species are categorised as "Near Threatened" and "Least Concern", respectively, both nationally (SAREM) and internationally (IUCN), their populations are declining due to habitat loss and hunting for consumption. This finding opens new possibilities for research that may contribute to their protection.

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

The main unforeseen difficulty was the lack of knowledge we had about the geography of the sierras, which made it difficult to place some of the camera traps. This was made possible through the collaboration of livestock farmers ("baqueanos") from the town of Baldes del Rosario, as well as park rangers from Ischigualasto Provincial Park and Talampaya National Park, who offered to guide us through dry rivers to the camera trap locations. On the other hand, delays were also experienced in the purchase of camera traps due to modifications in international purchases and the restructuring carried out by the new government in the science. However, they are currently being acquired. As outlined in the project proposal, the work was carried out using the camera traps available to the working group.

Due to logistical problems involving residents and Ischigualasto Provincial Park staff, only two workshops were held with guides, park rangers and authorities from the park. These workshops took place once the field sampling had been completed, with approximately 20 participants attending each session. The workshops format consisted of a talk on ecosystem services, a group-based interactive activity, and a presentation of preliminary results.

In addition, individual home visits were conducted, beginning with the second field trip. All households of residents who participated in the interviews were visited at least once. During these visits, some of the project's findings were shared, and each

household received a map of their livestock's movement, as recorded by the GPS collars. This approach proved highly effective, as it enabled us to obtain the residents' opinions individually, without social conditioning.

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

Local communities, as well as the staff of both protected areas, have been actively involved since the beginning of the project. This was mainly due to the fact that Dr. Campos and Dr. Cappa have been working with the community and in the protected areas for several years. It was through this work that the issues faced by the community with native wildlife emerged, with repeated mentions of puma predation on goats, calves and foals. Since the concern arose from the residents, they were more willing to collaborate in the interviews and subsequent workshops, where the preliminary results were shared. They also granted us the permission to place the camera traps on their private land and provided help in the identification of the area. Additionally, they offered to guide us through the sierras to place the camera traps in sites that we thought were inaccessible.

Although few puma records were obtained, maps showing the movement of their livestock were provided to the residents so they could observe and become aware of the distances and the most frequently used sites. The usefulness of these maps lies in the fact that the animal owners will have a broader perspective of the livestock movements. Even though puma records were too scarce to be included in the maps, the promise of cooperation from the residents, who committed to marking and identifying the areas where livestock predation occurred (with photographic records using their mobile phones), will help improve this product by increasing the volume of data. With the continuation of this work and the collaboration of the community, the maps will be able to serve as a tool for livestock management and for the authorities of the protected areas.

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

Yes, I want and need to continue this work. Although similar studies exist in the south of Argentina, this is the first time that this issue has been addressed in the province, so there is still much work to be done. Pumas in this region are strongly threatened, and their populations are in decline. One of the main threats is retaliatory hunting following the death or disappearance of livestock. Despite not always responsible, pumas are often the first suspects. In this way, continuing the work of Dr. Campos and Dr. Cappa, the following points are to be studied:

- 1) Puma ecology. With this information, we will be able to determine which environmental variables increase the presence of pumas, which in turn increases their hunting success in the regions of the Argentine Monte. Collaboration is already underway with another institute that has a database of puma records from other locations. This information not only allows us to gain a greater understanding of the pumas but also will provide us with data that will help identify areas of habitat overlap between pumas and livestock.
- 2) Livestock-puma interactions. There is a need to continue identifying the factors that increase the risk of predation, leading to livestock deaths, and to increase the volume of data to generate reliable models. Both the environmental variables that increase puma presence and the factors influencing the risk of predation are necessary to develop mitigation strategies and reduce livestock

mortality caused by this feline. In addition, livestock farmers will have access to information that will be useful when they require the governmental intervention to help them develop livestock management tools.

- 3) Resident perceptions. It is fundamental to maintain the presence of researchers in the villages and to establish a bond with the community. In this way, it will be possible not only to share the information obtained, but also to continue providing workshops to improve the residents' perception of the pumas.

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

Some of the results obtained have already been shared; for example:

1. Poster presented in the Jornadas Argentinas de Mastozoología, title "*El puma Puma concolor ¿Otra de las víctimas de las infraestructuras lineales? Estudio de caso en una porción de Monte de Sierras y Bolsones de Argentina*".
2. Publications in scientific journal *Notas sobre Mamíferos Sudamericanos*: i) *Confirmación de presencia de Tolypeutes matacus (Desmarest, 1804) en una nueva localidad de San Juan, República Argentina: Implicancias para los límites de distribución de la especie* (<https://doi.org/10.31687/SaremNMS25.1164>). ii) *Primer registro del conejo de los palos (Dolichotis salinicola Burmeister, 1876) en la provincia de San Juan, República Argentina* (<https://doi.org/10.31687/SaremNMS25.1158>)
3. Track maps movements of goats, cows and horses were provided to the owners of the animals that wore the GPS collars during the study.
4. Brochures with information about the puma were distributed to the residents, and they will also be used in scientific events that will take place this year.

Currently, we are working in collaboration with the group from IADIZA-CONICET Mendoza, to develop a paper on the ecological variables affecting puma presence in areas of the Monte ecoregion. Additionally, the aim is to share the information from the project at upcoming scientific events in the country, such as 2° Festival de Ciencia y Tecnología en San Juan "Crear ConCiencia", and VIII Congreso Nacional de Conservación de la Biodiversidad, among others. Furthermore, more field campaigns to the study area are planned, during which workshops will continue to be offered to the communities and staff of both protected areas.

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

The next steps are to expand the study area and duration, and to conduct interviews not only with livestock owners but also with the rest of the community. In the sampling conducted for this project, although camera traps were placed based on the tracks of livestock movements obtained from the GPS collars, pumas were only recorded at 5 of the 55 points sampled. Together with the data and the interviews with the residents, who identified the sierras as the area with the highest puma presence and livestock mortality, we are interested in expanding the study area toward that region. Extending the time that the camera traps remain at each point will also increase the possibility of detecting more individuals. Finally, reaching out to residents who do not own livestock but are familiar with their neighbours' interaction with this feline will help us gain a better overall understanding of the community's knowledge of the puma. This will be useful in the future when management and mitigation measures for puma predation on domestic species are proposed.

**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?**

Yes. The foundation's logo was used in a poster presented in the XXXV *Jornadas de Mastozoología*. Additionally, the foundation was mentioned in the recent paper of the first record of *T. matacus* and *D. salinicola*. Furthermore, at the upcoming scientific events, 2º *Festival de Ciencia y Tecnología en San Juan "Crear ConCiencia"*, some of the results will be presented, and brochures with relevant information about the project will be distributed. Similarly, in the future papers that will be written using data from this project, the foundation will be acknowledged.

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

Dr. Elín Avellá Machado. Person in charge of the project.

Dr. Flavio Cappa. Researcher with experience in ungulates and with social-ecological projects in the study area.

Dr. Claudia Campos. Researcher with experience in collaborative projects involving residents and both protected areas.

**10. Any other comments?**

As I previously mentioned, this project will continue in the area, and the Rufford Foundation's support will be crucial. Currently, we do not have enough funding support for field activities or for purchase of more equipment, which will be essential to expand the study area. We are very grateful to the foundation for the opportunity given; without this support, we would not have been able to make progress towards our objectives. We sincerely hope you can continue contributing to our efforts.





In this photo, the structure of one of the sites in the sierras where puma records were obtained.







In these photos, cows and goats fitted with the GPS collars made by the CIGEOBIO (Centro de Investigaciones de la Geósfera y la Biósfera) institute can be observed.

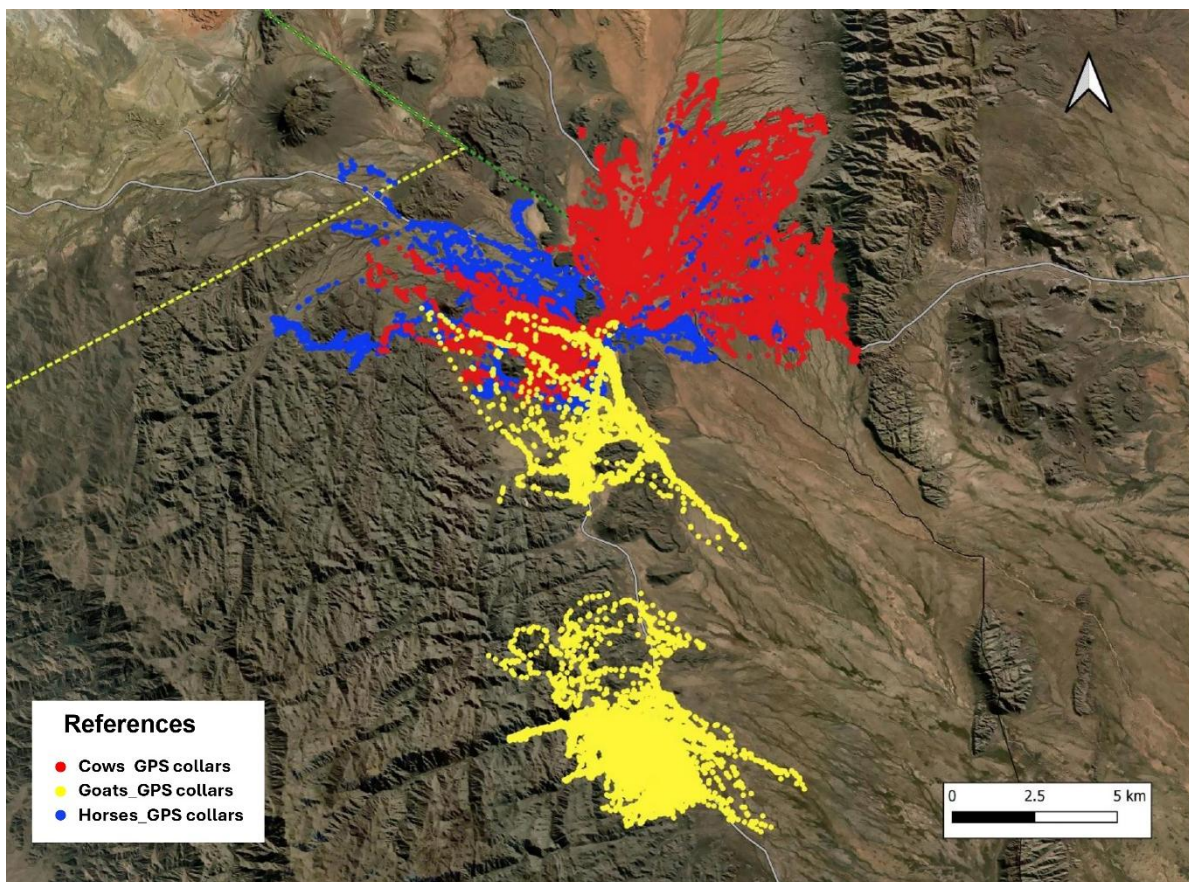
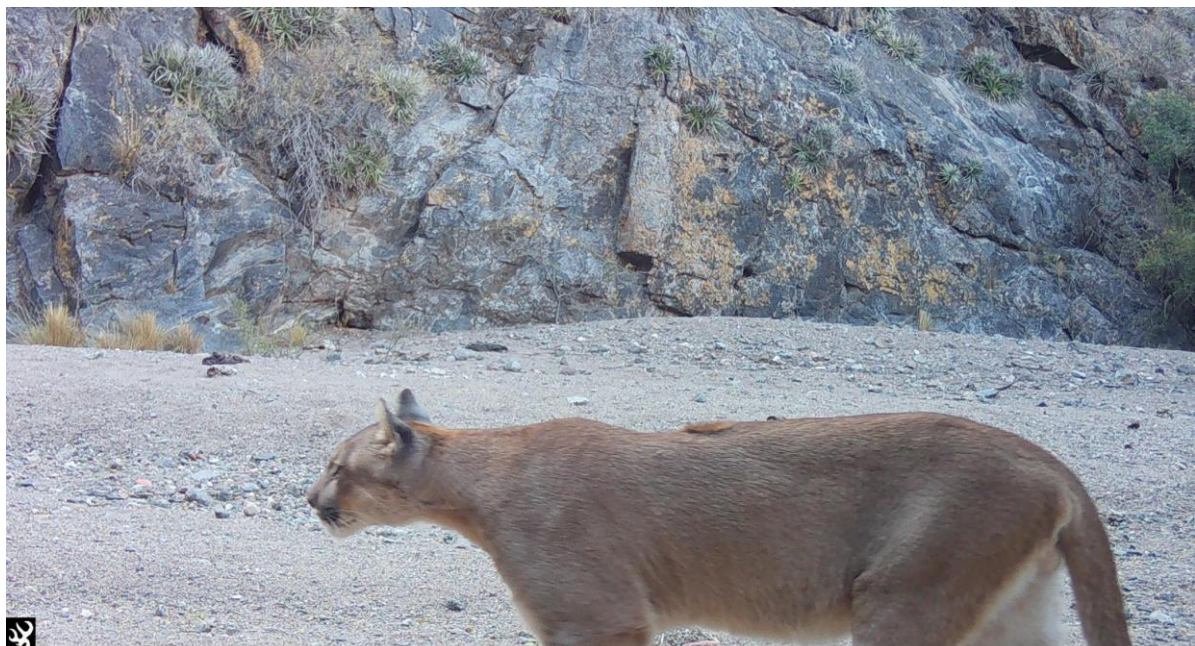


Image showing livestock movements obtained through GPS collars.





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Images obtained from the camera traps in the sierras areas.

**ANNEX – Financial Report**  
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