Final Evaluation Report

Your Details	
Full Name	Lucía Belén Zamora Nasca
Project Title	Domestic dog interactions with wildlife in protected areas of Argentina
Application ID	42101-2
Date of this Report	October 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
1) to quantify the density of free-roaming dogs (FRDs) in cities and rural human settlements near protected areas (PAs)			X	We successfully performed street surveys to quantify free-roaming dogs in five human settlements surrounded by the Nahuel Huapi National Park; two urban cities, Bariloche and La Angostura, and three rural areas; Traful, Cuyin Manzano and Villa Llanquin during 2024. Survey activities in Bariloche—where our team is based—were conducted through a collaborative sampling effort with local volunteers. An open call invited residents to survey the streets of their own neighbourhoods, resulting in 44 volunteers participating. To date, we have analysed the data from the Bariloche street surveys, and analyses for the remaining four human settlements will follow shortly. Across Bariloche, observed FRD counts ranged from 0 to 38 dogs per 570-m transect, with an average of 5.3 dogs per transect. Based on the replicated, city-wide sampling and subsequent statistical analyses, the estimated number of FRDs per block is approximately 10 in low, 5 in lower-middle, 3 in middle, 2 in upper-middle, and 1 in high

				socioeconomic areas. Extrapolating these estimates to the full street network of each area, we calculated a total of 36,386 FRDs across Bariloche. (please see update 1 for more details and this report). During this project, a short survey was administered to volunteers before and after the street-dog survey to assess whether their perceptions of free-roaming dogs changed after participating in the counts. However, response rates differed substantially between the two moments (before: 28 of 44 participants; after: 12 of 44), reducing the statistical robustness of temporal comparisons. The available results are therefore reported with appropriate caution, acknowledging the limitations imposed by sample size, please see "ANNEX – Final report, 1-Street dogs survey with volunteers". Importantly, all 44 volunteers actively participated in the monitoring across multiple neighborhoods, so the lower number of survey responses does not reflect their level of engagement or commitment to the activity.
2) to determine the presence and abundance of FRDs in PAs adjacent to human settlements			X	I installed 21 camera trap stations in La Angostura (please see update 2 for more details). The cameras stayed functional from January to May 2025. I went to check batteries and memories of the cameras each 20 days. The
3) to estimate the spatial and temporal			X	

overlap in habitat use between FRDs and wildlife in PAs				cameras captured a total of 33,521 images; currently I'm finalizing the cleaning and tagging of the images to perform the statistical analyses to estimate the presence and abundance of FRDs and their spatial and temporal overlap of habitat use with wildlife. We planned to install 30 but fewer camera-trap stations were installed because I did not have enough cameras at that time, and additionally the terrain in La Angostura limited the number of suitable sites. Many remaining areas were too steep or unlikely to host dog–wildlife interactions according to the requirements of the study. I am now installing additional stations in the other zones surrounding the other human settlements where street dog surveys were conducted (please see "Annex – Final report, 2 - Camera trapping").
4) to estimate diet overlap between FRDs and wildlife in PAs		X		During the camera trap installation, I collected carnivore faeces for the dietary study (123 samples). Most of the faeces are from foxes, so we are looking for other ways to find faeces of dogs and less common wild carnivores to be able to develop the dietary comparisons.
Continuously as we achieve each aim: -Extension and outreach activities -Write scientific papers and technical reports.			X	I performed a technical report with the data obtained from this project that is available to the general public, the municipalities, the national park service and any other interested party. (Link to the

				report) Along the period of the grant, I gave talks and performed outreach activities in approximately 30 schools, each with 15 to 30 students. I gave two talks for the general public, with 15 and 25 attendees, respectively. I gave three talks in research institutes, with 25 to 30 researchers each. I gave one presentation at a congress, with approximately 45–50 attendees. (Please see ANNEX – Final report, 3 - Participation in outreach – extension activities and update 1 for more details)

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

a) *To have a concrete number of free roaming dogs in the streets.*
The municipalities of the surveyed areas are considering spay/neuter campaigns; however, they do not have the resources to conduct such dog population surveys themselves, making this data particularly valuable for planning and executing effective dog spay/neuter interventions.

b) *The involvement of the society in the problem.*
Currently there is a generalized lack of trust in science researchers in Argentina, driven by a government campaign to discredit scientific activities. In this context, the high number of volunteers interested in participating—and the continued commitment of some even after the street survey—reflects the success of the project. I am genuinely pleased to see such engagement, as it demonstrates the potential to rebuild trust between science and the community through collaborative work.

c) *To have data on the abundance of dogs and wildlife in the protected areas surrounding the cities where we work.*
To our knowledge, no other studies have specifically addressed the situation at the edges of these protected areas in relation to anthropogenic impacts on wildlife presence and abundance. Within our team, another researcher (Laura Alvarez Borla, Rufford Grant 41002-1) is complementing this study's camera-trap data with a survey conducted in more strictly protected conservation zones. Together, these two

approaches aim to provide a broader understanding of the conservation–disturbance gradient—from urban areas, through the transitional edges between urban and natural environments, to the restricted-use zones of protected areas.

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

a) My fourth objective was to estimate diet overlap between free-roaming dogs (FRDs) and wildlife in protected areas (PAs) through the analysis of faecal samples. However, I mostly found fox faeces and very few samples from other carnivores. We had planned to work with a detection dog, but unfortunately, the dog passed away. His trainer is now working with a new dog, and we have resumed our collaboration. With the samples collected so far, it is not yet possible to compare diets, but we hope to gather more data in the near future to allow for this type of analysis.

Nevertheless, since we have numerous fox faecal samples collected across multiple sites and at different times of the year, we will be able to analyse them to characterise the fox's diet in the edge areas between cities and natural habitats. The fox is a highly adaptable species that thrives in these transitional zones and is one of the wildlife species with the greatest habitat overlap with dogs. Even if we are unable to compare diets across species, understanding the fox's diet in these areas already represents a valuable contribution of the project.

b) I was able to complete all the planned activities within the projected timeframe. However, I managed to finish the fieldwork on time thanks to the support of colleagues who kindly lent me some of the necessary camera traps. Since last year, I had been waiting for government approval to import this equipment. The Argentine government imposed several restrictions on the import of research materials, and many of these items were not available for purchase in the country. As a result, I was not able to finalize the purchase of my own camera traps during the project period, which caused a delay of about three months in completing the administrative aspects of the project (final financial report and the present Evaluation Report). Despite these challenges, all field activities were successfully completed, and all the project objectives were achieved.

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

The street surveys in more distant and smaller human settlements (La Angostura, Traful and Cuyin Manzano) were performed by us; meanwhile survey activity in Bariloche city -where we are placed- was performed through a collaborative sampling with volunteers. We made an open call for every interested citizen to participate by performing the survey in streets of their neighbourhoods. There were 44 volunteers interested. So, local communities have played a key role in the first aim of this project through active participation in the estimation of the number of free-roaming dogs in the streets. With their help, we were able to carry out systematic observations and data collection across different neighbourhoods. This collaboration

not only allowed us to gather more comprehensive data but also fostered a sense of community involvement and shared responsibility regarding the issue.

As a result of their volunteer work, community members began raising questions and engaging in conversations about the issue of free-roaming dogs. These discussions opened the door for deeper reflection on the ecological and social impacts of the problem, including public health concerns and threats to local wildlife. This spontaneous interest led to increased awareness and a stronger desire to get involved. For example, one volunteer—a dog trainer and canine behaviour specialist—began collaborating with us after the dog survey to organize workshops on responsible pet ownership, basic dog training, and how to enjoy nature with dogs while minimizing environmental impact. Another case involves a participant who manages a popular outreach page and expressed interest in raising awareness about the issue through targeted social media posts.

In turn, the municipality of Bariloche and La Angostura cities showed interest in the data to think in the measures to take regarding dogs on the streets.

Overall, the community benefited through increased knowledge, stronger networks of collaboration with different stakeholders (Municipality, Andean Club, dogs trainer, NGOs), and a more informed and proactive approach to addressing the presence of stray dogs in the city.

5. Are there any plans to continue this work?

Yes, definitely. This project represents the main line of my research, and I plan to continue addressing different aspects of the free-roaming dog issue. In the coming years, I intend to expand the study area to include other ecosystems. I have already begun fieldwork in Yungas forest environments in northern Argentina, where reports indicate that the problem of free-roaming dogs is increasing.
I also plan to investigate dog movement patterns and to incorporate a One Health perspective, studying the potential transmission of diseases from dogs to wildlife, humans, and the environment.

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

Outreach and Technical Reports
We prepared a technical report with the results of the survey and shared it with the volunteers who participated, on our social media, and in local newspapers. The report (in Spanish) is available for download at the following link:
Link to the technical report and one social media publication:
https://drive.google.com/file/d/11Q4AgqzLjswY8TsH7PoZsYMXf4BbJNv0/view?usp=sharing

https://www.instagram.com/p/DCSJZv4yG6P/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA==

Talks and Seminars
I gave several talks to both general and scientific audiences. These included events at the National University, in several schools, and at the *Club Andino* Bariloche—a local organization for people involved in outdoor activities.
Additionally, I carried out a one-month research exchange in Madagascar in July 2025, where I worked with a team of researchers addressing the issue of free-roaming dogs in that country. There, I gave a seminar to share the results of this project, as well as findings from a previous project funded by the Rufford Foundation.

Scientific Publications
Once I finish analysing the collected data, I plan to write a paper for submission to a scientific journal.
I was also invited to write an opinion column for the national ecology journal about this issue.
Link to the column (in Spanish):
http://asaeargentina.com.ar/docs/amen/junio-2025.pdf

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

Building on results from this and previous Rufford-funded projects, we observed significant spatial overlap among domestic dogs, wildlife, and humans. In the study area — located in northwestern Argentine Patagonia — rapid urban growth, land use change, and habitat fragmentation are intensifying these interactions. Combined with limited access to health services and a lack of responsible pet ownership, this creates a high risk for the emergence and transmission of zoonotic diseases. As a next step, we plan to investigate the prevalence and transmission dynamics of shared pathogens—especially zoonotic ones—across these groups. Specifically, we aim to:

1. Track the movement of free-roaming dogs near natural areas using GPS collars;
2. Sample pathogens and parasites from these dogs, as well as from dogs attending neutering/vaccination campaigns and local vet clinics;
3. Sample road-killed and deceased wildlife to detect potential domestic-origin pathogens.

This follow-up project seeks to better understand the risks of pathogen spillover in a landscape under strong anthropogenic pressure, while promoting responsible pet ownership as a key strategy for protecting both human and ecosystem health.

For other part, given similar emerging problems reported in other regions, we have begun expanding the study to the Yungas forests of northern Argentina, where free-roaming dogs are also becoming increasingly common. So far, we have estimated the abundance of free-roaming dogs in a city located near natural areas corresponding to Yungas ecoregion (Yerba Buena, in Tucumán Province,

northwestern Argentina). The next step is to start camera trap sampling along the boundaries between urban areas and natural habitats.

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, I used The Rufford Foundation logo in various materials related to the project. During the workshop with volunteers participating in the street dog survey, the logo was displayed, and the volunteers also received pens with the logo (Figure 3).
I recently travelled to Madagascar for a scientific collaboration on a project related to this grant, and I included the Rufford logo in the presentation of my work.
I also used the logo in a presentation at the *Club Andino*—a local organization for people involved in outdoor activities. I was invited to give a talk there on how to enjoy outdoor activities with dogs while minimizing their impact on wildlife.
Additionally, I included The Rufford Foundation logo in several social media posts related to the project.
I plan to acknowledge The Rufford Foundation in all scientific papers resulting from this project.

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

-Dra. Lucía Zamora-Nasca (INIBIOMA, UNCo-CONICET): I am the leader of the project. I have been working on biological invasions and biodiversity conservation for the last twelve years, two during my undergraduate thesis, five as part of my PhD and three during my postdoc. I am a full researcher at CONICET (National Scientific and Technical Research Council) since two years and this is my principal research project.

-Dr. Sergio Lambertucci: He is a senior researcher at CONICET and a professor at the National University of Comahue. Currently, I am working together with Dr. Sergio Lambertucci as he is my career researcher advisor at CONICET. He works on research projects focused on ecology and species conservation. Specifically, his interests are focused on environmental problems caused by anthropogenic impacts. In his studies, he seeks to promote, based on scientific evidence, measures that allow for a harmonic coexistence between humans and nature. He has worked on a wide range of issues, from the impact of habitat fragmentation on wildlife, pollutants, persecution and the perception of wildlife. He develops and conducts studies on trophic ecology, movement ecology, toxicology, genetics, isotopes and studies for the identification of areas of importance for wildlife conservation. His expertise and approach to work are key to the development of all aspects of human-wildlife conflict resolution.

-Mgter. Marina de la Reta: During her undergraduate studies she has gained experience in the capture and handling of small mammals in rural areas. In her undergraduate thesis, she conducted the first census of stray dogs in the city of Río Cuarto, Córdoba, proposing a robust census and handling tool to be used by public entities. In her master's degree, she focused on the planning and management of

protected areas, working through participatory workshops with the concerns and realities of the social actors linked to them. She is currently working on her Ph.D. evaluating the impacts of domestic dogs on wildlife and livestock in protected areas and farms in Northern Patagonia.

-Dra. Agustina di Virgilio: She is a researcher at CONICET and works with ranchers around the study area and focuses her studies on sustainable management of livestock and human–carnivore conflict (including dogs) in Patagonian steppes.

-Dr. Vet. Pablo Plaza: He is a researcher at CONICET and has 20 years of experience working in zoonosis municipal agencies and working with urban dog populations and the conflicts that free-roaming dogs bring. His assistance when working with the stakeholders involved in the human-dog-wildlife conflict was of great importance.

10. Any other comments?

I am extremely grateful for this funding. The economic situation in Argentina is very serious, and science in particular is currently severely underfunded. This is further aggravated by a growing discrediting of science within society. Being able to carry out field-based projects like this one, and to work directly with local communities, is crucial under these circumstances. Without this grant, it would have been literally impossible to carry out this project and to sustain the same level of scientific productivity and quality.

ANNEX – Final report

1 - STREET DOGS SURVEY WITH VOLUNTEERS

During this project, a short survey was conducted to the volunteers that participated in the Street dog surveys before and after de activity, to know if the perceptions about the free roaming dogs in the street change after the counting. However, there was a considerable difference in sample size between the two sampling moments (before: 28 respondents of 44 participants; after: 12 respondents of 44 participants). This asymmetry in response effort reduced the expected statistical robustness for direct comparisons over time. All participants, however, actively took part in the training and field counts. The topic is highly sensitive in the region, and perceptions of free-ranging dogs are polarized; some groups, including animal welfare advocates, often distrust or question scientific approaches in Argentina. To respect these sensitivities and avoid placing additional pressure on volunteers who had already contributed substantially, I chose not to insist further on survey submission, which likely contributed to the reduced response rate. I acknowledge that I could have implemented additional strategies to improve participation, but I preferred not to push volunteers who had already dedicated significant time and effort. However, the available results are presented below, accompanied by a cautious interpretation that reflects the limitations imposed by the sample size.

Initially, I attempted to match individual responses anonymously using date of birth, but this information was not entered consistently and, given that only half of the respondents completed the second survey, it was not possible to perform paired statistical analyses. For this reason, the results are reported at the population level rather than matched per person. Although more volunteers completed the initial survey (n = 28) than the follow-up (n = 12), those who responded afterwards represent almost half of the active participants and provided highly valuable feedback.

Survey questions

We made open question in the two surveys to know some general opinions of the volunteers about the problematic and also we made three close questions, the same in both instances, to asses some changes in perceptions of the participant about the free roaming dogs. These three close questions were:

Q1: According to their perception, the number of stray dogs in the streets and public spaces of Bariloche:

(If you have lived in the city for less than six years, please answer according to your time of residence and indicate below how long you have lived here)

-Has decreased in the last six years
-Is similar to the last six years
-Has increased in the last six years

Q2: On a scale of 0 to 10, how necessary do you think it is to work on measures that seek to reduce the number of free-roaming dogs on the streets of Bariloche?

Q3: On a scale of 0 to 10, how serious do you consider the situation of the presence of free-roaming dogs in the streets of Bariloche (in terms of number and condition of the dogs and effects that they could generate)?

The other questions of the first survey to know some general opinions of the volunteers about the problematic were:

a) Regard the stray dogs:

*(You can select more than one answer)

- They don't bother anyone
- They don't worry me
- I like seeing them in the streets
- They make me feel powerless
- I feel sorry for them
- They scare me
- They make me uncomfortable
- I feel they are a threat to my physical safety

- Do you wish to share any other opinion or feelings about this?

b) What measures do you suggest for managing stray dogs?

c) Do you think you could do anything about it?

The open question in the second survey was:

a) Do you have any comments, opinions, or suggestions you would like to leave?

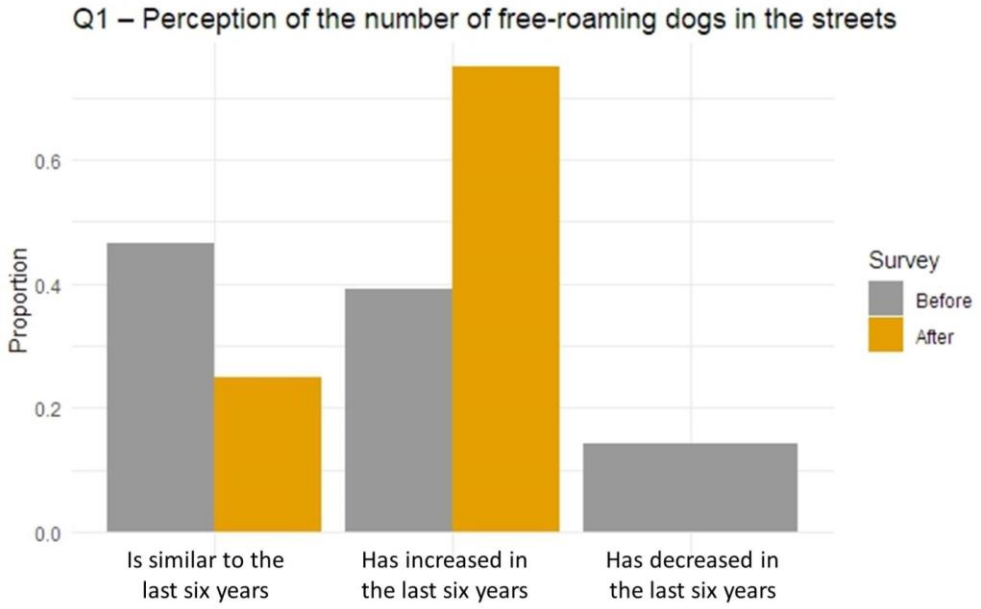
Outcomes of the three close question after/before the street surveys.

Q1 – Perception of the number of free-roaming dogs in the streets.
Responses were compared between the initial period (*before*) and a later reassessment (*after*). Although some visible differences emerged (e.g., a higher proportion of respondents perceived an *increase* in free-ranging dogs after participating in the project), statistical tests did not confirm significant changes:

Fisher's Exact Test, applied to each response category:

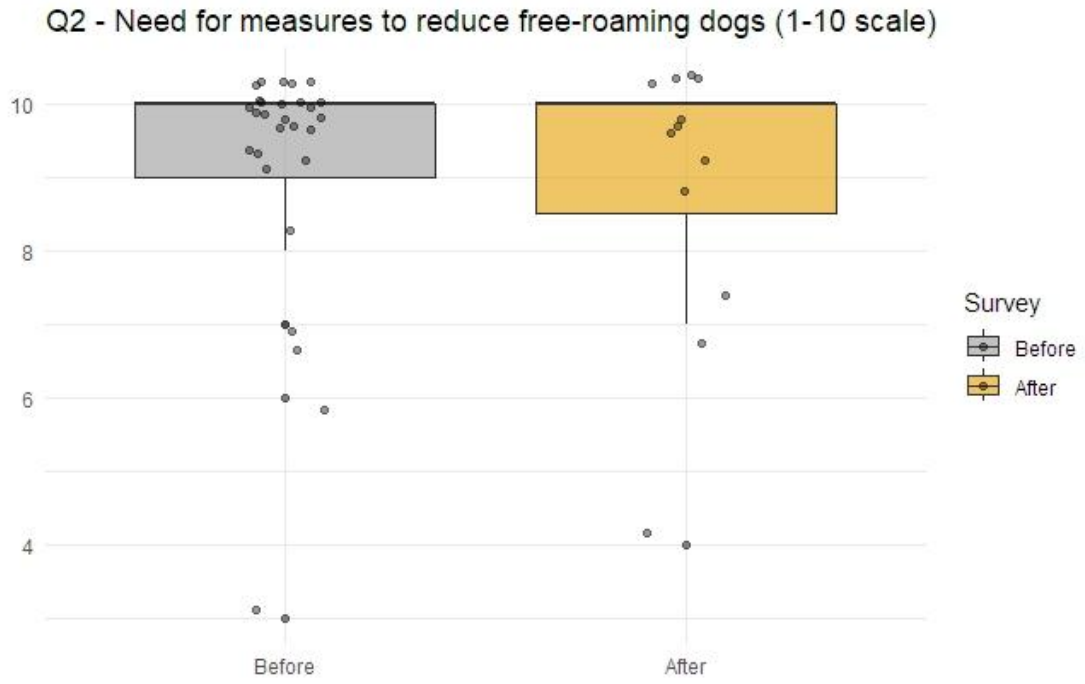
"It has remained similar": p = 0.2969
"It has increased": p = 0.08236 (non-significant trend)
"It has decreased": p = 0.2969

Although the option *"It has increased"* was more frequently selected in the second survey, this apparent trend did not reach statistical significance, likely due to the reduced number of respondents in the follow-up period. These results therefore indicate a possible increase in the perceived number of free-ranging dogs, but a larger sample size would be required to confirm this pattern reliably.



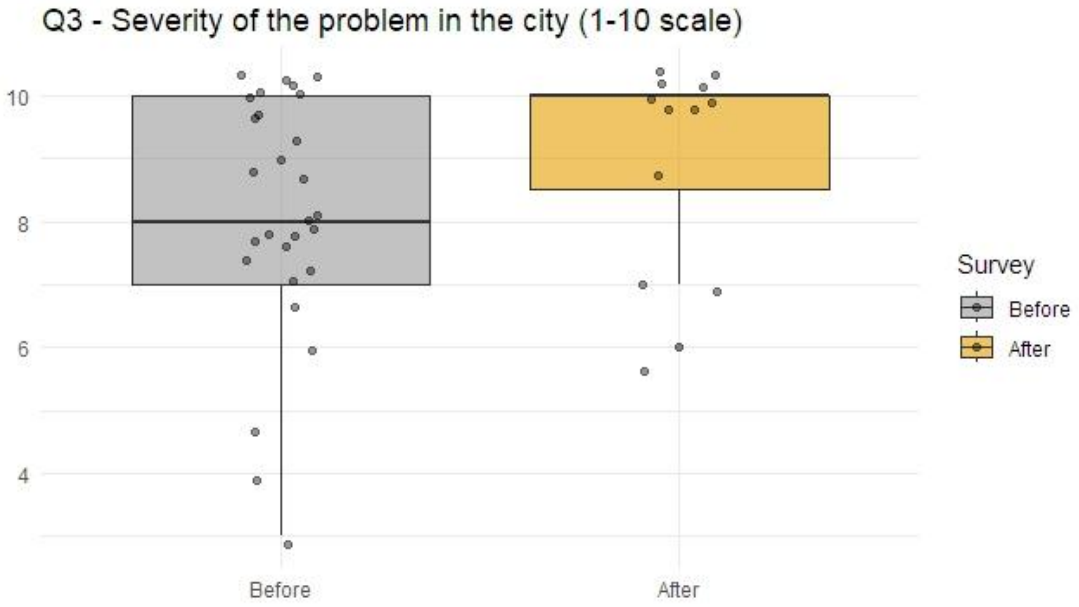
Q2 – Need for measures to reduce free-roaming dogs
The importance to take management actions was high in the two instances of surveys and did not vary significantly across surveys. However, open-ended responses after the activity showed greater emphasis on responsible ownership (registration, sterilization, control) and a strong willingness to remain involved in future management actions.

Due to the responses did not follow a normal distribution in either group (Before: *Shapiro–Wilk*: W = 0.585, $p < 0.0001$; After: *Shapiro–Wilk*: W = 0.691, $p = 0.0007$) a Wilcoxon rank-sum test was applied and no significant difference was detected in the perceived need to implement management actions (Wilcoxon test: W = 185.5, $p = 0.555$).



Q3 – Severity of the problem in the city.
Participants consistently identified free-roaming dogs as an important urban management issue in both surveys, with no significant difference between responses. Awareness was already high before participation, and remained strong after the monitoring.

Due to the responses were non-normal in both surveys (Before: *Shapiro–Wilk*: W = 0.859, *p* = 0.0014; After: *Shapiro–Wilk*: W = 0.658, *p* = 0.0003) a Wilcoxon rank-sum test was performed and it showed no statistically significant change in perceived severity (wilcoxon test: W = 115.5, *p* = 0.108)



Qualitative questions

Although few participants completed the second survey, all 44 volunteers actively contributed to the dog census, covering different neighborhoods of Bariloche. Also, although the second online survey reached fewer respondents, several participants continued engaging after the count and they provided thoughtful feedback and expressed interest in sustained collaboration with local initiatives. This indicates a positive social impact and community involvement that may not yet be fully captured through quantitative results.

In the open questions, participants expressed strong concern about responsible ownership, animal welfare, and the impact of dogs on both urban spaces and local wildlife. Some representative statements included:

"I hope people realize that animals must be cared for responsibly, given a safe place, and not left wandering."

"There is a deeply rooted idea that dogs should be 'free', but this leads to accidents and conflict. How can we change that mentality?"

"More education is needed: social media campaigns, talks, leaflets, volunteer networks, and learning from other cities."

"I saw two pet dogs chasing a fox on the new recreational nature trail "Cerro lindo". We need awareness about how dogs affect local wildlife."

"How can dogs enjoy 'a dog's life' while still being safe, and preventing risks to wildlife and people? We need solutions that balance both."

"Excellent work and contribution to the community. Thank you very much."

"Hopefully these results will raise awareness about the seriousness of the problem."

ANNEX – Final report

2- CAMERA TRAPPING

The aim of the project is to carry out camera-trap sampling in the surroundings of the human settlements where we are estimating the number of free-roaming dogs in the streets. The sampling design consists of installing cameras from the edge of the settlements toward the interior of the natural areas to search for possible interactions between dogs and wildlife.

With the first Rufford grant, we conducted the camera-trap sampling near Bariloche city; in the second, we estimated the number of free-roaming dogs in five human settlements and carried out the camera trapping near La Angostura city (Figure 1). I am now installing camera traps near Dina Huapi, Llanquín, and Cuyín Manzano (Figure 2).

Maps removed for online version

ANNEX – Final report

3 - PARTICIPATION IN OUTREACH – EXTENSION ACTIVITIES

Participation in two editions of the annual extension activities of the Biodiversity and Environment Research Institute (INIBIOMA). In that activity, every research group performs different outreach activities. I carried out a game about responsible care of dogs. During this game, we also communicated the results of the street dog survey.
In the 2024 edition, we worked with 10 schools over three days, each school with approximately 20–30 students. In the 2025 edition, we performed the activity for 3 schools with approximately 25 students each (Figure 3).

I participated in a day of outreach activities organized by the National University of Comahue, "The UNCo Opens Its Doors." In that instance, I participated with the game for 3 schools with approximately 15 students each.

I participated in an open public talk at the Andean Club of Bariloche. Almost 25 adults attended (Figure 3).

I collaborated in Madagascar with another research project that works with the problem of free-roaming dogs. In that instance, I gave a workshop for 32 graduate students and a talk about my project and findings at the Madagascar Biodiversity Center (Figure 3).

In the context of an extension project of the National University of Comahue, I collaborated with talks about the project for high-school students. I delivered these talks in 15 schools. In each instance, each school had approximately 30 students. Twice, we performed the talks for the entire school at the same time (approximately 700 people).

I gave one talk for all audiences in the context of the "Walk the Trail" project, which seeks to promote low-impact practices in natural environments. Approximately 15 people attended.

I am a member of the "Tourism Management Board" of Bariloche city, as part of the team that develops a continuous communication campaign to encourage responsible outdoor activities and care for nature. In this context, we gave a talk about the different problems associated with recreational use of natural areas, including free-roaming dogs. The talk was for the Research Institute and approximately 25 researchers participated.

I started to collaborate in another CONICET research institute addressing the problem of free-roaming dogs in the north of Argentina. In that context, I gave a talk at the Regional Ecology Institute (IER) about my findings in Patagonia for approximately 20 researchers.

I participated in the XXX National Ecology Congress and presented the results of my project, funded by the first Rufford Small Grant (because it was in October 2023). Authors and title of the presentation: *Zamora Nasca, L. B.; Lambertucci, S. A. "The problem of free-roaming dogs in natural protected areas."* XXX Reunión Argentina de Ecología. Approximately 45 people attended the presentation.

Figure 3. Photos of the outreach activities

ANNEX – Financial Report

Your Details	
Full Name	Lucía Belen Zamora Nasca
Project Title	Domestic dog interactions with wildlife in protected areas of Argentina
Application ID	42101-2

Using the budget provided with your original application, please give a breakdown of budgeted versus actual expenditure. If there is a difference between the budgeted and actual amounts, please explain why.

If there are funds remaining, these should be returned to the foundation. We will provide details of how this can be done.

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.

All figures should be given in pound sterling, indicating the local exchange rate used.