

**Impact of anthropic and environmental variables on ecology and conservation of carnivores
in the recently created Ansenuza National Park, Argentina.**

Carnivore populations are experiencing significant declines worldwide. In the Argentinean dry Chaco, the protected areas are very important but still not enough to protect their most representative species. The Ansenuza National Park, created in 2022, is an expansive wetland considered a key site for biodiversity by the RAMSAR Convention. Ansenuza is the largest salt lagoon in South America and the fifth largest in the world, with a global importance for migratory species. Also, it preserves one of the last patches of forest of this ecoregion in the north of Córdoba, in an advanced productive matrix with high rates of deforestation due to livestock and agricultural expansion. This site has the most biodiversity of mammals in the province and their forest still conserves species of high conservation value like *Puma concolor*, *Chrysocyon brachyurus* and *Leopardus colocolo*.

The objective of this research is to comprehensively analyze the anthropogenic factors that influence the structure of carnivore assemblages in areas with varying degrees of human impact and protection levels. This will enable us to better understand the factors that favor or negatively affect carnivore conservation. Ultimately, our goal is to provide science-based proposals to decision-makers, so they can make well-informed decisions about the conservation of carnivores in the region. The findings of this study will be crucial for the management plan of the new protected area.

Methodology

To conduct the survey of the mammal community, particularly carnivores, in northern Ansenuza, we are using camera traps placed on private lands located within the *Reserva de Usos Múltiples Bañados del Río Dulce y Laguna Mar Chiquita*, as well as in the *Parque y Reserva Nacional Ansenuza* and on lands without any protection category. Several field campaigns have been

conducted since the project's inception, during between 5 and 15 days each. Over 50 private properties were visited, with permission obtained for camera trap placement in approximately 35 of them. We established the camera-trap's stations strategically distributed along vehicular roads, pedestrian trails and animal trails, spaced 3 to 5 km apart, and active 24 hours a day. To date, the survey has covered approximately 100,000 hectares.

Throughout the survey process, we traveled 3,000 kilometers. On some occasions, two vehicles were necessary to cover all the sites. The cameras were installed in several types of environments present in the area: grassland, shrubland, saline shrubland, open woodland, and closed woodland. Each field campaign required the participation of 3 to 7 individuals, including technicians, biologists, and volunteers, who took turns assisting with on-site logistics (Figure 1). During the sampling and fieldwork, we collected additional data, including records of roadkill mammals, direct sightings, footprint and feces of carnivores.



Figure 1: Left: Installation of a camera trap with Dra. Verónica Quiroga. Right: Checking a camera trap with a volunteer of the project.

Preliminary results

We obtained over of 200,000 photographs across the camera trap stations. These images capture a variety of species, including native and exotic animals, domestic livestock, humans, birds, vehicles, and even vegetation movement on hot and/or windy days. The collected data is being meticulously analyzed and categorized to create a standardized and organized database that

documents the presence and identity of each species, along with other relevant information such as activity patterns, behaviors, number of individuals, carnivores with preys on its mouth, among others. We identified 18 medium and large native mammals (weighing over 0.5 kg) across the study area. These belong to six different taxonomic orders, including the Order Carnivora. We list eight species of native carnivores, five of them are currently classified under some category of threat at the provincial level, excluding those considered "Near Threatened." Moreover, two of these eight species of carnivores are categorized as "Vulnerable" at the national level (see Table 1 and Figure 2).

Table 1: List of native species of Order Carnivora photographed by camera-traps and their national (Argentina) and provincial (Córdoba) conservation status, in *Parque y Reserva Nacional Ansenuza* and *Reserva Provincial Bañados del Río Dulce y Laguna Mar Chiquita*, in northern Córdoba during the survey.

EN: Endangered. VU: Vulnerable. NT: Near Threatened. LC: Least Concern.

| Species | Common name | National category of conservation | Provincial category of conservation |
|---------------------------------|--------------------------|-----------------------------------|-------------------------------------|
| <i>Puma concolor</i> | Puma | LC | VU |
| <i>Herpailurus yagouaroundi</i> | Jaguarundi | LC | VU |
| <i>Leopardus colocolo</i> | Pampas cat | VU | EN |
| <i>Leopardus geoffroyi</i> | Geoffroy's Cat | LC | VU |
| <i>Chrysocyon brachyurus</i> | Maned wolf | VU | EN |
| <i>Lycalopex gymnocercus</i> | Pampas Fox | LC | LC |
| <i>Conepatus chinga</i> | Molina's Hog-nosed Skunk | LC | LC |
| <i>Galictis cuja</i> | Lesser Grison | LC | NT |

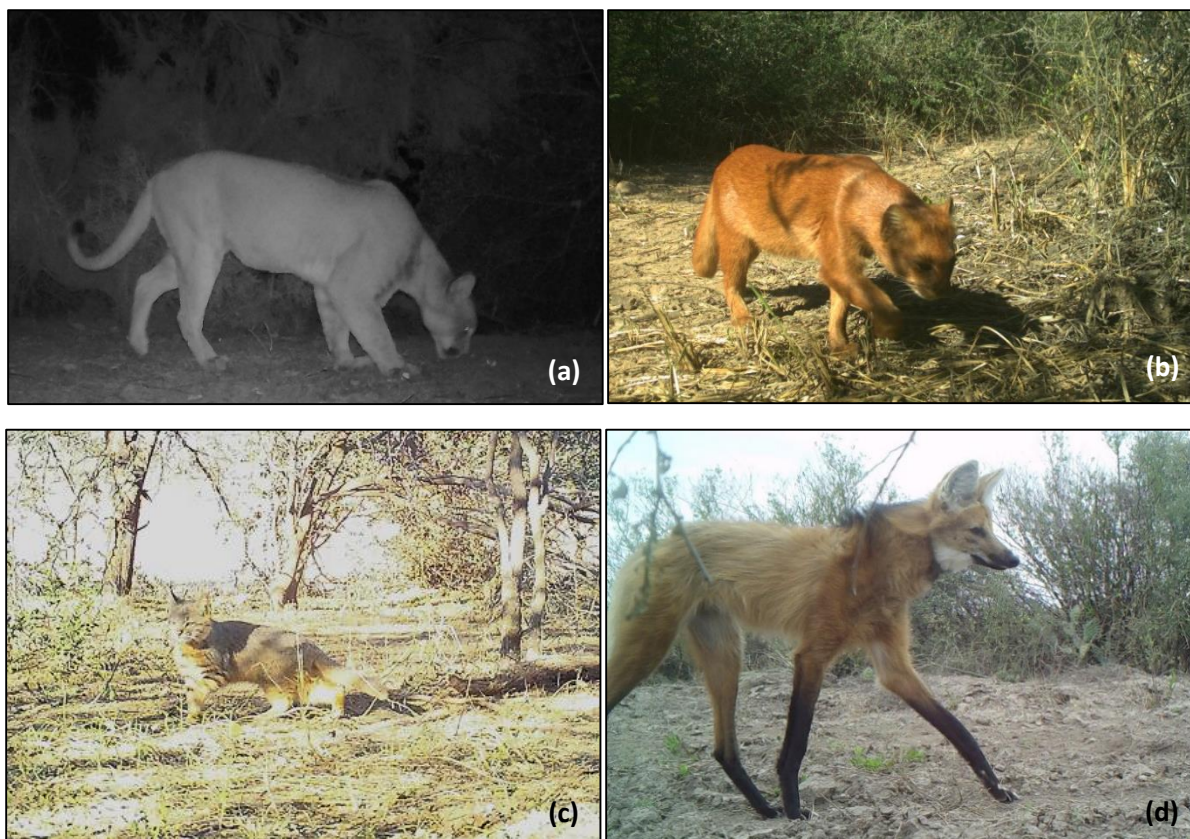


Figure 2: Records of carnivores of special interest for conservation, photographed using camera traps in the *Parque y Reserva Nacional Ansenúza* and *Reserva Provincial Bañados del Río Dulce y Laguna Mar Chiquita* and surrounding areas. (a) *Puma concolor* (Puma), (b) *Herpailurus yagouaroundi* (Jaguarundi), (c) *Leopardus colocolo* (Pampas cat), (d) *Chrysocyon brachyurus* (Maned wolf).

The survey also revealed the presence of nine exotic species, seven of domestic origin and two of wild origin. Among the species of domestic origin, there are the typical ones expected for this livestock area (cows, goats, pigs, sheep, horses, dogs and cats). Domestic dogs and cats belong to the Carnivora Order, so they will be included in the analysis of the doctoral to evaluate their influence or interaction with native carnivore's species.

Among the wild species, we found *Sus scrofa* and *Lepus europaeus*, both has significantly impacts on native ecosystems and its records are much relevant for organisms of exotic species control.

Conservation networks

In the original proposal, we outlined the intention to establish a network of connections with key stakeholders, including institutions and organizations that could contribute to and benefit from the project's outcomes. This plan was successfully implemented through collaborative work with several of these actors, fostering partnerships, agreements, and proposals for rise the conservations efforts of the area. Specifically, we engaged with the technicians and authorities of *Parque y Reserva Nacional Ansenuza*, whose interest lies in enhancing the management and biodiversity baselines for the recently created National Park. Additionally, we worked with the parkrangers of the *Ministerio de Ambiente y Economía Circular* of Córdoba province, leveraging their support to access provincial protected areas and use their installations in the field. Partnerships with NGOs such as *Aves Argentinas* was also pivotal. This organization, actively involved in the region, contributed a lot for the project's success.

Furthermore, while we work on developing a dedicated website through CelBA, we are sharing preliminary results through social media accounts. This approach ensures that the progress and findings of the project reach a wide audience, maintaining transparency and engagement with the community.

Involvement of local communities

As part of our commitment to the staff and authorities of the protected areas, I organized an "Internal Training and Update Workshop" (Figure 3). This event brought together individuals and social actors with the aim of keeping them informed of these first results obtained. The seminar included participation from NGO *Aves Argentinas*, parkrangers of the *Reserva Provincial Bañados del Río Dulce y Laguna Mar Chiquita*, members of *Parque Nacional Ansenuza* and ONG *Natura Argentina*, as well as external people, including tourism service providers and museum staff. These organizations also share with us their findings in relations to conservation mammals of the region.



Figure 3: Presentation of preliminary results to key stakeholders, including agents from Aves Argentinas, Parque Nacional Ansenuza, Ministerio de Ambiente y Economía Circular de Córdoba, Natura Argentina, tourism service providers, and museum staff from Miramar City, Córdoba.

As part of our communications goals, we conducted an activity with children of different grade's levels at a rural school in the region (Figure 4), where we shared information about the project and the species we have documented. The students welcomed us with exceptional enthusiasm

and curiosity, making the experience truly rewarding. During the visit, we engaged the children with interactive presentations and activities, promoting the appreciation for local wildlife and the importance of protecting it. Additionally, we distributed posters of native mammals to five schools in the area, providing educational materials that can serve to inspire awareness and interest in the region's biodiversity. These activities highlight our commitment to involving local communities, especially younger generations, in the conservation journey.



Figure 4: Present of preliminary results and interactive activities at a rural school with children from multiple school degrees. The children's faces have been covered to protect their identity.

Challenges Faced

This year 2024 has presented very difficulties for conservation and science due to the current political government and political decisions in Argentina. The budget allocated to these important areas, such as conservation and science, has been seriously damaged, creating a scenario of uncertainty that made it difficult to realize the fieldwork as they were originally planned. That is why we are still continuing with the fieldwork to be able to achieve all the objectives. In this context, external funding, such as the support provided by Rufford, along with collaborations with other institutions, have been crucial for continue the project. These contributions have played an essential role in sustaining this project, enabling us to continue our research and conservation efforts despite these challenging circumstances.

Conclusions

This report shows the preliminary results and baseline for carnivore's biodiversity in the recently created *Parque Nacional Ansenuza*, which together with their buffer areas constitute a large Conservation Unit. The analyses derived from this research will significantly contribute to the deep understanding of the local ecology of carnivores in the Ansenuza region and how human activities and environmental variables influence them. Effective protection could establish this region as a vital core area for carnivores' populations in Córdoba province.