

## Partial Report N°2

### Understanding the relationship between the Andean cat and its habitat in the high Andes plateau: Implications for its long term conservation

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#### Executive Summary

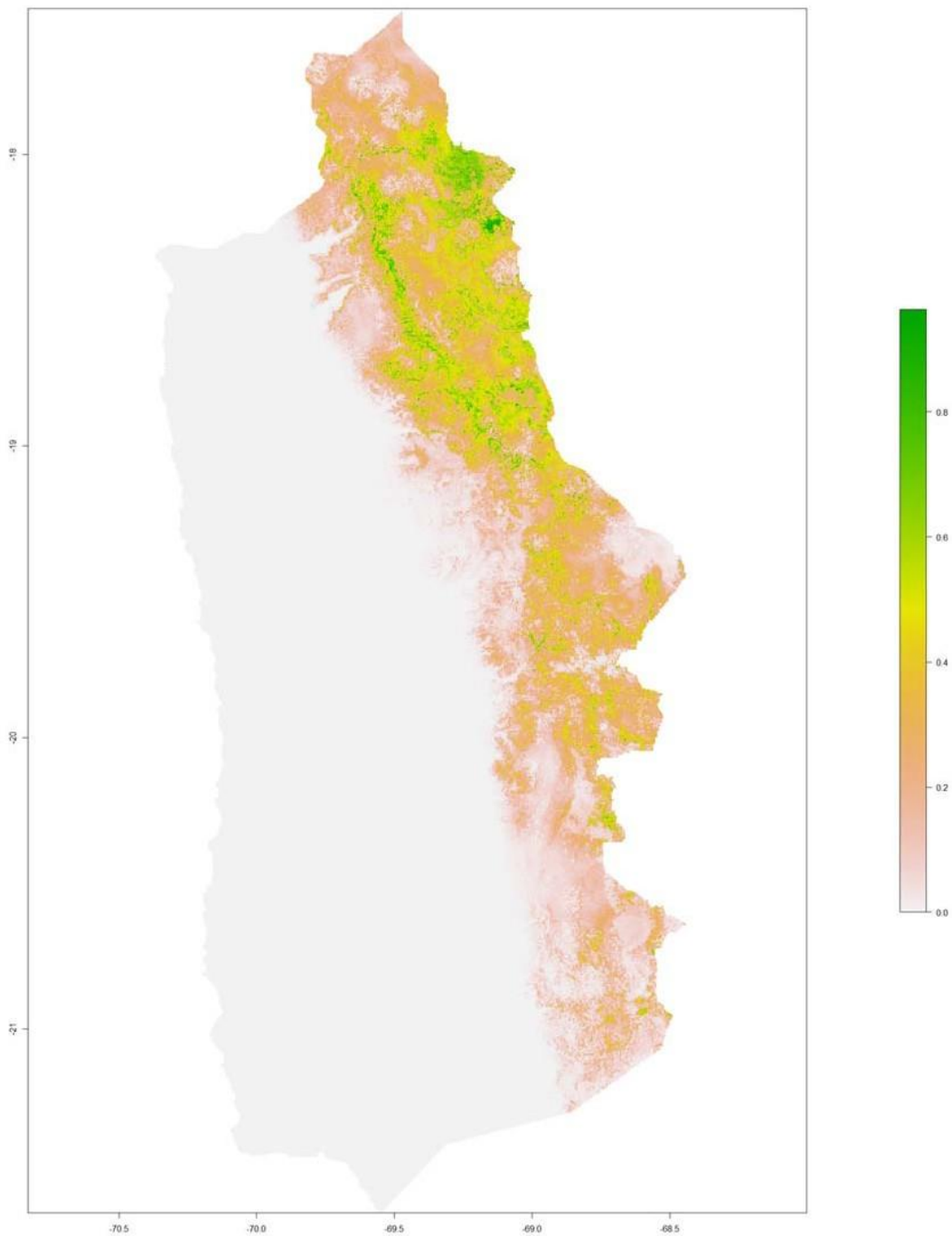
Here I present the second partial report of this project, started in January, 2015. The main objective of the project is to generate a potential suitable habitat map and characterize the populations of the rare and endangered Andean cat in northern Chile, an area extremely threatened due to increasing mining activities, through camera trapping and DNA analysis. The field campaigns ended on December, 2015, and we're now finishing the DNA analyses on the laboratory. A total number of 18 new localities with presence of Andean cat were identified using camera traps and 12 new localities with the DNA analysis. We also helped to the arrangement of the Andean Cat National Conservation Plan (ACNCP), whose elaboration started in May, 2016 and expected to finish in October, in order to be implemented on 2017. Meetings with the main stakeholders involved in the study area were made during the workshops of the ACNCP and in the locality of Enquelga, this last one involving only members of the community.

#### Summary of main activities

- Between February and December 2015 we deployed and checked 96 camera traps, all of them located in new localities, where no Andean cats were recorded before. This is the major effort ever made in a single project using this methodology to obtain records of this species occurrence. Eighteen new localities with presence of the species were added to the database using this methodology.
- Additionally, 112 faecal samples were collected during the field campaigns. DNA of those faecal samples were extracted and sequenced in order to perform the species identification. Twelve of the faecal samples correspond to Andean cat, 87 to pampas cat, 3 to Culpeo fox and 10 samples did not amplify, so we need to repeat the procedures in order to obtain the sequences.
- Combining the two methodologies a total number of 24 new localities with presence of the species inside the study area were recorded, representing an important increment to the 42 previously known localities.
- All previous and new Andean cat records were filtered, considering a radius of 5 km between each record, obtaining a total of 53 records, used to elaborate the predictive model. We started elaborating preliminary models using the package "dismo" for R, and modelled the probability of occurrence of the Andean cat through Maxent and Random Forest (Figure 1), two modelling procedures used widely in animal and plant species modelling studies. We obtained preliminary distribution maps using all predictive variables: Digital Elevation Model (DEM) for the area, a Topographic Position Index (TPI) derived from the DEM, which measures the terrain ruggedness, slope, also derived from the DEM, a layer of the wetlands

of the area, a land cover use layer and the 19 WorldClim bioclimatic layers. We did 30 iterations in each Maxent and Random Forest in order to reduce the number of predictive variables and reduce collinearity. With this subsample of predictors, we'll develop the definitive model of occurrence of the Andean cat.

**Figure 1: Andean cat preliminary potential distribution map for the study area, using all predictive variables (example of one of the 30 iterations done with Maxent). Highly suitable areas are shown in green, non-suitable areas are shown in light grey.**



- After efforts started last year with CONAF (National Forestry Corporation), institution in charge of the administration of the protected areas in Chile, the central office of CONAF decided to start to develop a National Conservation Plan for the Andean Cat, who will be led by one of our project members, Jorge Valenzuela, who is also an Andean Cat Alliance member and part of CONAF staff, in charge of the protected areas of the Region of Tarapacá. The workshops to develop this plan started on April 2016 and in two of them stakeholders of our study area participated, including community members as well as government agencies, local NGOs and a directive of one of the mining companies working in the area. The last workshop was held in the past month (June 29<sup>th</sup>) and one last workshop is expected to be held at the end of August.
- Between May 18<sup>th</sup> and 21<sup>st</sup> we developed a series of activities involving the community members of Enquelga, a small town located inside our study area and inside Isluga National Park. We developed a workshop with the community in which we highlighted the importance to conserve the Andean cat and the Andean ecosystems, and asking them to share their own view of the territory surrounding them. In the future we expect to continue working with this community in order to mutually collaborate in conservation actions who should help to the development of this remote community in the north of Chile.

#### **Plan for the upcoming months**

- Between July and August, we expect to finish with the DNA analysis of the faecal samples who need to be repeated. The total analysis of obtaining the DNA and sequencing it turned to be rather more expensive than we initially thought, since we needed to import the extracting kits to Chile and pay importation and customs costs, in addition to repeat the sequencing service of some of our samples. This additional costs unfortunately will not allow us to continue with the microsatellite analysis of the faecal samples. Besides, considering the number of samples positive to belong to an Andean cat are too small (12), we think the information gathered from this analysis won't be informative to identify subpopulations and define management units based on their genetic structure. Nevertheless, we expect to continue with this methodology in the upcoming years, and expect to apply to a different funding opportunities, including a 2<sup>nd</sup> Rufford small grant in order to increase the faecal samples positive to Andean cat and perform this analysis.
- In the upcoming months we'll finish the modelling procedures and map the threats for the Andean cat in the study area. Both information will be crossed in order to define priority areas for the Andean cat conservation in northern Chile.
- We'll continue with the elaboration of the National Action Plan for the Andean cat, in collaboration with CONAF. The last workshop will be held in August and later we'll continue the work remotely. The plan is expected to be done in October 2016 and be implemented in 2017. This Plan will allow us to strengthen the conservation of this species inside the protected areas, favoring the collaboration between AGA and CONAF to develop activities and programs focused on the Andean cat as a flagship species.



DNA analysis at the lab

Participants of the Andean Cat National Conservation Plan workshop of July 29<sup>th</sup>.



Workshop with the community of Enquelga.

Andean cat photographed by a camera trap



## List of Publications:

Note on the webpage of CONAF covering the first workshop of the Andean Cat National Conservation Plan:

<http://www.conaf.cl/avanza-elaboracion-del-plan-nacional-de-conservacion-del-gato-andino/>



The screenshot shows the CONAF website interface. At the top, there are logos for CONAF and the Chilean Government, along with navigation links: QUIÉNES SOMOS, SERVICIOS EN LÍNEA, CENTRO DE DOCUMENTACIÓN, TRÁMITES CONAF, PREGUNTAS FRECUENTES, and CONTACTO. A search bar is visible on the right. Below the navigation bar, a menu lists: INICIO, NUESTROS BOSQUES, PARQUES NACIONALES, INCENDIOS FORESTALES, CONAF EN REGIONES, FORESTÍN EDUCA, and NOTICIAS. The main content area features a news article titled "Avanza elaboración del Plan Nacional de Conservación del Gato Andino" in green text. The article's sub-headline reads: "En Iquique se realizó la primera etapa grupal en la cual participaron diversos actores territoriales e investigadores vinculados a la conservación del felino." Below the text is a photograph of a young Andean cat perched on a rock. The article text continues: "Investigadores, representantes de servicios públicos y privados, de municipalidades y comunidad local, participaron en Iquique del primer taller grupal para trabajar en la elaboración del Plan Nacional de Conservación del Gato Andino." "La iniciativa convocada por CONAF región de Tarapacá, tuvo por objetivo reunir la opinión de los asistentes para diseñar el primer plan, a nivel nacional e internacional, que incluirá distintas medidas para conservar esta especie clasificada en peligro de extinción que habita en la zona de los altos Andes de Argentina, Bolivia, Chile y Perú." "En esta primera jornada se dio una completa revisión al estado de conservación del gato andino, que es denominado como uno de los más amenazados del mundo, y que, paulatinamente, se ha determinado su presencia en nuestro país, junto con avanzar en su protección y hábitat, además de aumentar el conocimiento público de su conservación." "Para la elaboración de este plan se trabajó con la metodología denominada "Estándares Abiertos para la Práctica de la Conservación de la Biodiversidad", con la cual se definió el alcance del plan -que abarcará su actual área de distribución y potenciales nuevos sectores-, además de la visión y objeto de conservación. Mientras que para el

**Andean cat included in the book "Endangered Chilean wildlife, 32 species to be preserved". 10% of the profits from this book will go directly to conservation initiatives of some of the species that appear in the book, including the Andean Cat Alliance. The book can be purchased online from:**

<http://www.photosintesis.cl/fauna-chilena-amenazada-32-especies-para-conservar-tomo-i/>

*Leopardus jacobita*

# Gato Andino

## Andean mountain cat

Por/By NICOLÁS LAGOS



ANTHONY PEREZ | ILUSTRACIÓN

El gato andino es un felino de tamaño pequeño, de unos 5 kilos de peso promedio y que habita en los Andes centrales de Sudamérica, a altitudes que pueden llegar hasta los 5000 msnm.

Se caracteriza por su coloración grisácea, con una larga y abultada cola, rodeada de anillos oscuros. Prefiere ambientes rocosos, en donde encuentra su principal alimento, la vicacha (*Lagidium* spp.), además de pequeños roedores.

Es una especie extremadamente rara, de la que poco se conoce acerca de su ecología y biología. Para las comunidades alpinas, el gato andino es considerado una especie sagrada, símbolo de fertilidad y prosperidad en la actividad ganadera.

Es el felino más amenazado del continente americano, catalogado como En Peligro por la UICN. Entre las principales amenazas a su conservación se encuentran la pérdida y degradación del ambiente natural en que habita.

The Andean mountain cat is a small wild cat that weighs an average of 5 kilos and lives in altitudes that can reach up to 5000 meters above sea level in the central Andes of South America.

The Andean mountain cat has an ashy-grey fur, a grey head, ears and face, with a long and bushy tail that is marked by dark rings.

It prefers rocky environments, where it's their main food source, vicacha (*Lagidium vicacha*) and small rodents, can be found.

It is an extremely rare species. There is little known about their ecology and biology. For the Andean communities, the Andean cat is considered a sacred species and symbol of fertility and prosperity in agricultural activity.

It is the most endangered cat in the Americas and it is listed as Endangered by the IUCN. The main threats to the cat's conservation include loss and destruction of their natural environment and habitat.

