

Villalba L, Lucherini M, Walker S, Cossíos D, Iriarte A, Sanderson J, Gallardo G, Alfaro F, Napolitano C, Sillero-Zubiri C. 2004. The Andean cat: Conservation action plan. La Paz, Bolivia: Andean Cat Alliance. 69 pp.

Keywords: action plan/Andean cat/conservation/*Oreailurus jacobita*

Abstract: The Andean cat (*Oreailurus jacobita*) is one of the least known felines in the world and is the most threatened felid species in the Americas. The available information suggests that this species has unique features and is genetically distinct from other small felid species, because it is very specialized to rocky habitats at elevations above 3500 m in the Andes of Argentina, Bolivia, Chile and Perú. The document presents an assessment of the threats and the proposed actions to further the conservation of this unique species.

THE ANDEAN CAT:

**A CONSERVATION
ACTION PLAN**



ANDEAN CAT ALLIANCE

© 2004 Alianza Gato Andino

Reproduction of this publication for educational and other non-commercial purposes is authorized without permission from the copyright holder, provided the source is adequately cited. Reproduction for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

Cite:

Villalba, L., Lucherini, M., Walker, S., Cossíos, D., Iriarte, A., Sanderson, J., Gallardo, G., Alfaro, F., Napolitano, C., and C. Sillero-Zubiri. 2004. The andean cat: Conservation action plan. Andean Cat Alliance. La Paz, Bolivia.

Published by: Andean Cat Alliance – Alianza Gato Andino (AGA)

Financed by: Wildlife Conservation Network. Los Altos - CA, USA

Printed by: Editora Atenea SRL. - Loayza 255 - Tel: 220-2161 - La Paz, Bolivia

Cover photo: Andean cat, *Oreailurus jacobita*, in Monumento Nacional Salar de Surire, Chile (Jim Sanderson).

THE ANDEAN CAT:

CONSERVATION ACTION PLAN

Authors: Lilián Villalba, Mauro Lucherini, Susan Walker, Daniel Cossíos, Agustín Iriarte, Jim Sanderson, Giovana Gallardo, Fernando Alfaro, Constanza Napolitano, Claudio Sillero-Zubiri

Collaborators: Roberval Almeida, José Luis Condori, Alejandra Lacaze, Analí Madrid, Andrés Novaro, Pablo Perovic.



**Endorsed by the IUCN/SSC
Cat Specialist Group**



Contents

Prologue	VII
Urs and Christine Breitenmoser	
Acknowledgments	VIII
Actions developed previous to the Action Plan	IX
Executive Summary	X

Part I

1. INTRODUCTION	1
1.1. Background	1
1.1.1. Species description	1
Common names	1
Systematics	3
General description	3
1.1.2. Natural history	4
Habitat	4
Habits	5
Biology and ecology	6
1.1.3. Distribution	7
Argentina	7
Bolivia	8
Chile	9
Perú	9
1.2. Andean cat and humans	10
1.2.1. Beliefs and attitudes	10
Argentina	10
Bolivia	10
Chile	11
Perú	11
1.2.2. Resource use, Livestock husbandry and Agriculture	12
1.3. Conservation status	12
1.3.1. Legal status	13
Argentina	14

Bolivia	14
Chile	14
Perú	14
1.3.2. Protected Areas	15
Argentina	15
Bolivia	16
Chile	17
Perú	18
1.4. Factors Threatening Andean Cat Conservation	19
1.4.1. Habitat fragmentation and habitat loss/degradation	19
Argentina	19
Bolivia	19
Chile	20
Perú	20
1.4.2. Hunting	20
Argentina	20
Bolivia	21
Chile	21
Perú	21
1.4.3. Intraguild competition	21
1.4.4. Reduction of the main prey	21
Argentina	22
Bolivia	22
Chile	22
Perú	22
1.4.5. Small Population size, Genetic variability and Diseases	22
1.5. Prioritization of the Identified Threats	23
1.6. Limiting Factors for Andean Cat Conservation	24
1.6.1. Lack of Information	24
1.6.2. Legislation and Conservation Policies	24
1.6.3. Law Infringement	24
1.6.4. Protected Areas and Corridors	25
1.7. Limitations of the Action Plan	25

Part II

2. OBJECTIVES 26

2.1. Main Objective 26

2.2. Specific Objectives 26

2.3. Assumptions 26

3. ACTION PLAN 27

Objective 1 27

Actions 27

Objective 2 28

Actions 28

Objective 3 29

Actions 29

Objective 4 30

Actions 30

Objective 5 31

Actions 31

Objective 6 31

Actions 32

4. SPECIFIC PROJECTS 32

Distribution 33

Population Genetics 36

Natural History 37

Education/community participation 40

Conservation management 44

Legislation 47

Monitoring of the Action Plan 48

5. FUTURE INITIATIVES 50

ANNEXES	52
Annex 1. Andean Cat Alliance members list	52
Annex 2. Andean Cat Alliance Work Shop – participants’ list	55
Annex 3. Glossary	58
REFERENCES	59
Andean cat distribution map	8

List of tables

Table 1.1 Local and common names by which Andean cat and pampas cat are known.	2
Table 1.2 Protected areas of Argentina, with current and potential presence of the Andean cat.	15
Table 1.3 Protected Areas of Bolivia with management that are within the Andean cat distributional range.	16
Table 1.4 Protected Areas of Chile with actual and potential presence of the Andean cat.	17
Table 1.5 Protected areas in Perú that are located within Andean cat distributional range.	18
Table 1.6 Prioritization by country and globally of factors identified as main threats to Andean cat conservation.	23

Color plates

- Andean cat features
- Andean cat habitat
- Andean cat habitat
- Vegetation types and other wildlife in the Andean cat habitat
- Andean cat and humans
- Titi and humans

PROLOGUE

The Andean cat is one of the most elusive cat species of the world. The historical geographic range is between 3500m and 5500m in the Andes of Argentina, Bolivia, Chile, and Peru. Human-caused threats such as direct persecution, complete elimination of some of its prey, and alteration of the cat's natural habitat have caused the geographic range to fragment and contract.

In 2002, the IUCN/SSC Cat Specialist Group had to uplist the Andean cat in the IUCN Red List from *Vulnerable* to *Endangered*. Intensive field surveys in all four range countries led biologists to believe that the distribution of the Andean cat was likely highly fragmented and that the population size of the Andean cat was smaller than previously believed. The colleagues involved in the surveys founded the Andean Cat Conservation Committee, which later became the Andean Cat Alliance or *Alianza Gato Andino*. The group organized two workshops and developed the Andean Cat Conservation Action Plan presented here.

In part one the document presents the current knowledge of the species' ecology, geographic distribution, the conservation status, threats, and human–cat interactions. The group prioritized the threat factors for each country using their own personal experience and knowledge. The three most significant threats to the continued existence of the Andean cat are traditional hunting, prey reduction, and habitat fragmentation and loss. Ancient beliefs hold that Andean cat skins, when used during religious ceremonies, bestow good fortune, ensure bountiful crops, and productive livestock. The mountain chinchilla, a staple prey of the Andean cat, was heavily hunted in the past and became locally extinct. Data indicate that this loss of prey led to geographic range contraction throughout central Chile.

Limited information, insufficient law enforcement, and lack of management measures were identified as limiting factors for effective Andean cat conservation. Basic aspects of the cat's ecology are still unknown and the distribution information is not yet complete. Despite the fact that the Andean cat is protected in all four range countries, there are no specific conservation policies for the species. Laws are often violated because people are not aware of the legal protection and the critical status of the Andean cat.

In Part II of the Action Plan, goals, specific objectives, actions, time scale, budget, and roles and responsibilities for each range country are presented. The objectives are meant to deal with specific threats. The actions help to close knowledge gaps and involve local people in Andean cat conservation efforts, thus ensuring that the people respect both the laws of the country and the Andean cat's right to exist.

We are very encouraged that a highly motivated multi-national group is advancing the conservation of the Andean cat. The *Alianza Gato Andino* with its cross-border cooperation and step-by-step approach in developing a conservation strategy for this endangered species serves as a model for cat conservation globally. We look forward to working with the Andean Cat Alliance. Furthermore, for all range countries we urge through our endorsement government authorities, conservation organizations, and special interest groups to support the implementation of the Andean Cat Action Plan.

**Urs and Christine Breitenmoser
Co-chairs IUCN/SSC Cat Specialist Group**

AKNOWLEDGEMENTS

Wildlife Conservation Network (WCN - USA) supported the completion of this Action Plan and two previous workshops carried out for this purpose. We want to thank Christine Hemrick for the support she provides to the Andean Cat Alliance (AGA) through WCN. Thanks as well to Charles Knowles and Elaine Iverson for their commitment and efforts for Andean cat conservation.

Likewise we thank Kristin Nowell of Cat Action Treasury (CAT - USA), The Bosack and Kruger Foundation (USA), and Francesco Rocca from the Società Zoológica “La Torbiera” (Italy), who provided support for the initiation of research on the species and for the creation and strengthening of the Andean Cat Conservation Committee (COCGA, Spanish acronym), predecessor of AGA.

We also wish to acknowledge the people/institutions currently sponsoring the development of research and education projects within the four range countries: Gibson Anderson (USA); Ian Anderson (USA); Dawn Simas, Wild About Cats (USA); Jim Sanderson, Conservation International (CI - USA) - Small Cat Alliance; British Petroleum Conservation Programme (UK); Idea Wild (USA); International Society for Endangered Cats (ISEC - Canada); Rufford Foundation (UK); The Bosack and Kruger Foundation (USA); The Wellcome Trust (UK); Wildlife Conservation Research Unit (WildCRU - UK); Wildlife Conservation Society (WCS - Argentina, Bolivia).

We are grateful as well to all local institutions that have supported and/or facilitated field work in the range countries: **Argentina:** Administración de Parques Nacionales (APN); Centro de Ecología Aplicada del Neuquén; Dirección General de Medio Ambiente y Desarrollo Sustentable de la Provincia de La Rioja; Dirección Nacional de Fauna y Flora Silvestres - Secretaría de Ambiente y Desarrollo Sustentable; Grupo de Ecología Comportamental de Mamíferos (GECM) – Cát. Fisiología Animal, Universidad Nacional del Sur – Bahía Blanca; Grupo para la Conservación de los Flamencos; Museo Nacional de Ciencias Naturales - Salta; Servicio de Fauna Silvestre de la Provincia de Catamarca; **Bolivia:** Áreas Naturales de Manejo Integrado “Apolobamba” y “Cotapata”; Centro de Estudios de Biología Teórica y Aplicada (BIOTA); Colección Boliviana de Fauna; Museo Nacional de Historia Natural – La Paz; Parque Nacional “Sajama”; Reserva Nacional de Fauna Andina “Eduardo Avaroa”; Unidad de Vida Silvestre de la Dirección General de Biodiversidad. **Chile:** Corporación Nacional Forestal (CONAF); empresas mineras Quiborax y Doña Inés de Collahuasi de la I Región y La Escondida de la II Región; Servicio Agrícola y Ganadero (SAG). **Perú:** Instituto Nacional de Recursos Naturales (INRENA), Proyecto Araucaria – Colca; Reserva Nacional de Salinas y Aguada Blanca.

Our special thanks to Gustav Peters, from Cat Specialist Group (Germany) and Cecile B. de Morales (Bolivia) for reviewing this document.

ACTIONS DEVELOPED PREVIOUS TO THE ACTION PLAN

In 1996, the Cat Specialist Group (CSG) of the International Union for the Conservation of Nature (IUCN) categorized the Andean cat among the most threatened felid species throughout the world and the Americas. The species was also considered to be among the least known felid species. As a response to the need to produce basic information about the species to take adequate conservation actions, between 1997 and 2000, with the support of Cat Action Treasury and the Sociedad Zoológica “La Torbiera”, researchers from Argentina, Bolivia and Chile began field surveys to determine the distribution and conservation status of the Andean cat.

Later, as an initiative of the “Grupo de Ecología Comportamental de Mamíferos” (GECM - Universidad Nacional Del Sur) and with the support of CAT, the “1st International Workshop on the Andean cat”, was carried out in November 1999, in Salta, Argentina. The objectives of this workshop were to evaluate the status of knowledge on the Andean cat and to agree on actions for its conservation. The workshop participants formed the **Andean Cat Conservation Committee (COCGA)** to coordinate individual efforts, share knowledge and experiences as a way of to contribute to the growth of knowledge of the Andean cat, and to develop actions for conservation of the species.

As a result of this workshop and the creation of COCGA, different cooperative activities have been carried out: a) under the coordination of Chilean members a poster on the Andean cat was produced, with the text printed in Spanish and local languages (Aymara and Qhechua). The poster was distributed within local communities of the four range countries; b) Argentinean members coordinate the elaboration of Spanish-English edition of a brochure on the Andean cat and the function of COCGA; c) A multinational project in order to update and evaluate the information on Andean cat distribution was started, this project is being coordinating by Argentinean researchers; d) A bi-national Argentina-Bolivia expedition was carried out in Bolivia, to standardize survey/collecting methods and to test the efficiency of attractants for camera trapping and e) Peruvian researchers were integrated to COCGA to carry out field surveys and assess Andean cat distribution and status in this country.

In October 2003, Wildlife Conservation Network organized in Los Altos Hills, California-USA, the “Andean Cat Strategy Planning Workshop” and researchers from the four range countries, Argentina, Bolivia, Chile, and Peru, attended. In this workshop the basis for the development of an action plan was established and COCGA was renamed the **Andean Cat Alliance (AGA)**, from Spanish name: Alianza Gato Andino). During the following months, AGA members elaborated a first draft of the Action Plan, which was discussed in April 2004 during the 2nd International Andean Cat Conservation Workshop. This workshop was organized by AGA with the support of WCN.

Accordingly, this document represents the contribution and consensus of current AGA members (Annex 1), which are presently carrying out different conservation activities (research, education, management) in favour of Andean cat conservation.

Disclaimer

The opinions expressed in this document are those of the authors and do not necessarily reflect the views of the WCN or other sponsors.

EXECUTIVE SUMMARY

The Andean cat (*Oreailurus jacobita*) is one of the least known felines in the world and is the most threatened felid species in the Americas. The available information suggests that this species has unique features and is genetically distinct from other small felid species, because it is very specialized to rocky habitats at elevations above 3500 m in the Andes of Argentina, Bolivia, Chile, and Perú.

There is little information on the natural history of this species. The Andean cat is considered a solitary and a crepuscular or nocturnal species and females with kittens have been observed in October and April (period that corresponds to spring and summer in the southern hemisphere). Until now, the size of the species' populations has not been possible to establish but we consider that its distribution is naturally fragmented and presume that populations are found at low densities.

Information on the past distribution of the species is also limited, but we know that Andean cultures considered the Andean cat and/or pampas cat (*Oncifelis colocolo*) sacred species, and their skins were used in ceremonies related to the marking of domestic camelids and/or the planting season.

The main problems for conservation of the Andean cat are related to habitat fragmentation and habitat disturbance/loss, hunting, intraguild competition, decline of prey populations, and small population size. The intensity of these factors varies among the range countries. However, as a result of a joint preliminary assessment of these factors, hunting appears to be one of the main threats for the species.

Lack of information on the species, absence of specific conservation policies and lack of law enforcement are common limiting factors in range countries, which hinder the development of adequate conservation programs.

Accordingly, we established three main areas under which we developed the action plan. To continue **research**, is very important, with the aim of improving our understanding of the species and as a basis to develop other conservation actions. At the same time, to develop **educational programs** is necessary to obtain the support and active involvement of local communities and to reduce the impact that they could cause to the Andean cat and/or its habitat. Finally, assistance in **conservation-oriented management** at the local and regional levels and in protected areas is also important as a way to promote the development of policies and rules that favour Andean cat conservation.

Within these three general areas, we identified six objectives and actions to achieve those objectives:

- 1.- To determine the current distribution and relative abundance of Andean cat populations, and the threats that affect the species and natural ecosystems;
- 2.- To carry out research to produce basic information on Andean cat biology and ecology;
- 3.- To mitigate impacts of human activities on the Andean cat and natural ecosystems through community participation and education;
- 4.- To strengthen the management of protected areas where the Andean cat is present, promote the establishment of new areas or corridors, and encourage the development of conservation

initiatives in the region;

- 5.- To promote the implementation and adequacy of conservation legislation and policies regarding the Andean cat and natural ecosystems;
- 6.- To continuously evaluate the actions developed during the implementation of this plan.

Based on the identified objectives and actions, we propose projects, several of which are already being carried out, mainly by current members of the Andean Cat Alliance (AGA). However, these objectives, actions and projects are a basis for the development of other projects and the participation of other teams that would like to support the conservation of the Andean cat. We expect as well that this action plan can be useful as a guide for governmental and non governmental institutions related to wildlife and protected areas management within the distributional range of the Andean cat.

In addition, this plan is formulated as a tool to obtain financial support, an essential condition to progress step by step toward the achievement of our main objective, which is to assure the long-term survival of the Andean cat, by ensuring the existence of viable populations and the the integrity of natural habitats through community participation.

The plan is proposed for five years, divided in two phases. The first phase initiates now and continues until April 2007, and the second phase is between May 2007 and June 2009. A continuous monitoring and assessment of the implementation of this plan is essential; particularly those actions developed during the first phase, with the purpose of reviewing the priorities and to adjust the action plan, following an adaptive management model and according to our achievements.

THE ANDEAN CAT: CONSERVATION ACTION PLAN

PART I

1. INTRODUCTION

The Andean cat* (*Oreailurus jacobita*), is one of the least known felids worldwide and is the most threatened American felid species. It is listed as an Endangered (EN) species in the 2002 IUCN Red List (Nowell 2002a). Recently, at the end of the nineties, research on the species was initiated to determine its geographic distribution and conservation status, and important advances have been achieved. However, the critical condition of this species has also been confirmed.

A distribution restricted to high areas of the Andean region of Argentina, Bolivia, Chile, and Perú, as well as its possible specificity to rocky habitats, which in general are patchily distributed, makes the species vulnerable, particularly to those threats related to habitat loss, fragmentation and/or disturbance, and loss of prey as with the chinchilla. Similarly, hunting for different reasons might likely be a significant threat to the species, mostly if we assume that the Andean cat has small isolated populations.

As a result of the accumulated information, elaboration of an action plan is now possible. A widely endorsed action plan will prioritize actions that will contribute to the conservation of the Andean cat and to provide a guide and a basis to unite and coordinate efforts and resources among multiple actors and levels which are dedicated to this task. In Part I of this document, a compilation of the available information on the species is presented, as well as the main threats and limiting factors that affect Andean cat conservation. In Part II, under six common objectives, we propose global actions for all range countries and specific projects by country.

1.1. Background

1.1.1. Species Description

Common Names

Within the four range countries, in areas where people speak Aymara, the Andean cat (*O. jacobita*) and the pampas cat (*Oncifelis colocolo*) are mainly known as *titi* and Quechua people call them *osqhollo*. However, within each country there are local variations, in Table 1.1, we present the different local names that both cat species are known.

In some localities both species are well distinguished and have their respective name. In certain cases those names describe a particular characteristic of one or the other species. For example, the word *huañatiti* assigned to the Andean cat in Bolivia, is of Aymara origin and means “cat that lives in dry zones or hills” (Villalba et al. in prep.), while the name *hualpasua*, which is given to the same species in Perú (Cossíos and Madrid 2003) probably comes from the combination of two Quechua words: *huallpa* = hen, *sua* = thief/to steal, implying that the Andean cat is known as “hen thief”.

*Note in Annex 3

Names in Spanish are in general given to both species and in some cases those names are also assigned to other small wild cat species. In Bolivia, the common name “wild cat” is given to the Andean cat, pampas cat and Geoffroy’s cat (*Oncifelis geoffroyi*). Likewise the common name *osqhollo*, which means wild cat in Qhechua, is also given to this last species in the region of the valleys (Núñez and Gallardo 2002, Villalba et al. in prep.).

**Table 1.1
Local and common names by which Andean cat
and pampas cat are known**

Country	Local Name	Species	Source
Argentina	oscollo*, gato de las peñas	Andean cat	Lucherini et al. 2003
	titi, sacha michi titi michi, caca michi	Pampas cat	
Bolivia	huaña titi, gato zonzo, gato rayado	Andean cat	Villalba et al. in prep.
	titi, titi misi, titi phisi, osqhollo*, q’uita gato, gato lince, gato montés	Andean and pampas cat	
	titi	Andean and pampas cat	Núñez and Gallardo 2002
	uma titi, gato chaskoso	Pampas cat	Villalba et al. in prep.
	oskollo*	Pampas cat and Geoffroy’s cat	Núñez and Gallardo 2002
	titi, osjo, gato lince	Andean cat	Iriarte 1999
chinchay	Andean and pampas cat		
abatire, oskollo*	Pampas cat		
Perú	misi, gato chacra, hualpasua	Andean cat	Cossíos and Madrid 2003
	misi, osjollo*, chinchay, osjo, osjollo* titire, osqo misi, chinchalla, gato del monte, gato montés, gato cimarrón, tigrillo, monte gato, leoncillo	Andean and pampas cat	Almeida and Condori 2002, Cossíos and Madrid 2003.

*Note in Annex 3

Systematics

Felid classification has been the object of several studies and reviews, and even in more recent works there is not a consensus on the systematic position for the different species that compose this family (Werdelin 1996).

The Andean cat is not the exception to this situation. In 1865 the species was described for the first time by Cornalia within the genus *Felis*, which included several small cat species. In 1940, Cabrera proposed a unique and separate genus *Oreailurus*, due to the presence of a distinctive character: in the Andean cat skull, in contrast to other small felid species, the ectotympanic or frontal chamber of the auditory bullae is much larger than the entotympanic or posterior chamber (Scrocchi and Halloy 1986).

Later, Herrington (1986, quoted by Werdelin 1996) placed the Andean cat within the genus *Leopardus*, together with other small and medium size felids from South America, and also very close to the pampas cat. Johnson et al. (1998), in a more recent study based on molecular techniques and taking several felid species into account, define the Andean cat as a unique species different from other felines, but related to the ocelot (*Leopardus pardalis*) lineage. They suggest a common ancestor for the Andean cat, ocelot and margay (*L. wieddii*). Based on this study, some authors suggest that the Andean cat may be included in the genus *Leopardus* (Yensen and Seymour 2000) and others already place the species within this genus (Salazar-Bravo et al. 2003), however the Andean cat split long ago from *Leopardus*, probably 4-5 millions years (Johnson et al. 1998) and is the most unique member of its genus.

In this document, we adopt the classification proposed by Wozencraft (1993)

Family :	Felidae	(Fischer, 1817)
Sub Family:	Felinae	(Fischer, 1817)
Genus :	Oreailurus	(Cabrera, 1940)
Species:	jacobita	(Cornalia, 1865)

General Description

Of the three felid species that inhabit the Puna and/or high Andean region, the Andean cat is the unique species that lives only in the high Andean region of Argentina, Bolivia, Chile and Perú. The other two species: the larger puma, or mountain lion (*Puma concolor*), and the smaller pampas cat, have more extensive distributions than the Andean cat.

The Andean cat is a medium-sized felid. From measures taken from pelts collected we have the following information: in adults the total length varies from 740 to 850mm and in sub-adults varies from 577 to 600mm; tail length is from 410 to 485 for adults and 330 to 420mm for sub-adults. Regarding the weight we have only two records, the first from a sub-adult specimen from Perú, which weighed 4kg (Pearson 1957, García-Perea 2002) and the second is from an adult female from Bolivia which weighed 4.5kg (Delgado et al. 2004).

Andean cat fur is mainly ash grey with brown-yellowish blotches that are distributed as vertical lines at both sides of the body, giving the appearance of continuous stripes. The tail of the Andean cat is very characteristic. It is very long (66 - 75% of the head and body length), thick and cylindrical, with a fluffy aspect and with 6 to 9 wide rings of dark brown to black colour (García-Perea 2002).

The legs also have dark and narrower blotches or stripes, but they don't form complete rings (Plate 1).

The Andean cat is some times confused with the pampas cat, but the length of the tail and its rings are very distinctive features, in addition to its black nose and ears with rounded tips (García-Perea 2002, Villalba et al. en prep.).

Apparently the species is not sexually dimorphic in terms of fur colour, but there are differences between juvenile and adult specimens, with juveniles having a lighter colouration and more and smaller blotches (García-Perea 2002). Because of these features, sub-adult or juvenile Andean cats can be confused much more easily with pampas cats (García-Perea 2002).

The length of the Andean cat skull varies from 100 to 108mm (n=3) for adult specimens and compared to that of the pampas cat from the Altiplano, the length of the sagittal crest is larger, the premolar P⁴ and the molar M¹ are significantly more massive, the dorsal profile of the skull is more flat and elongated and the size of the ectotympanic chamber is equal to or larger than the entotympanic chamber (García-Perea 2002). However, this last feature is not exclusive for the Andean cat; other species like the manul or Pallas cat (*Otocolobus manul*), the sand cat (*Felis margarita*) and the pampas cat in Chile, possess this same character (García-Perea 2002). The differentiation in the tympanic chambers is typical in those species that live in arid habitats with little vegetation cover and that require a high auditory capacity, to detect their prey and natural enemies (García-Perea 2002, Nowell and Jackson 1996). The Andean cat has in total 28 teeth and its dental formula is I3/3, C1/1, P2/2 and M1/1, although the second premolar may be absent; in fact the skulls examined lacked this tooth (García-Perea 2002, Yensen and Seymour 2000).

Greater size of the males compared to females is a common feature among felid species and it is likely that the Andean cat follows this pattern. Comparisons among Andean cat skulls carried out by García-Perea (2002) suggest that sexual dimorphism is present, but it is necessary to confirm this result with a larger number of samples.

1.1.2. Natural History

Available information on natural history of the Andean cat is scarce and mainly comes from unexpected sightings of the species. Some information can be inferred from collected specimens (skins, skulls), interviews with local people and more recently from field studies that are being carried out on the species. Despite the apparent docility of the Andean cat there are very few encounters with the species and attempts at live trapping have in general been unsuccessful (Perovic 1998, Sanderson 1999, Iriarte and Sanderson 2000), although recently a female Andean cat was live trapped in Bolivia and fitted with a radio collar, to carry out the respective monitoring and study (Delgado et al. 2004).

Habitat

The Andean cat lives in rocky areas at high elevations of the Andean region of Argentina, Bolivia, Chile and Perú, demonstrating its adaptation to environments of severe climate, characterized by mean annual temperatures that vary between 0° and 4°C, frequent freezes, intense solar radiation, large daily thermal variations and low precipitation (less than 100 to 800mm annually). Along the Andean mountain range climatic conditions vary from northeast to southwest; to the south the

rainfall diminishes, the rainy season is shorter and aridity is greater (Brush 1989, Little and Gómez Molina 1989).

The elevation of the “high Andean” region or geographic province varies from south to north. At its most southern extent it is found above 3000m, and in the tropical zone, above 4200m (Cabrera and Willink 1973). In general, the environment which the Andean cat inhabits is characterized by sparse vegetation, where xerophitic graminoids and creeping herbs are predominant. Shrubs are mainly represented by several species of “thola” (*Parastrephia* spp. and *Lepidophyllum* spp.). In areas with more severe climatic conditions, the vegetation is shorter and its distribution is more scattered.

The cushion plant “yareta” (*Azorella compacta*) and the “queñoa” (*Polylepis* spp.), a small tree species that has adapted to these conditions of high elevation, grow in areas of volcanic origin. The presence of “bofedales” or “vegas” is also characteristic in these environments of high altitude and they are an important resource for wildlife and domestic animals that inhabit the area. “Bofedales” are a vegetation structure composed of species arranged in large and harsh cushions (*Distichia* spp. and *Oxichloe* spp.), as well as other juncaceous and hydrophilic herbs. Bofedales are permanently fed by water courses that normally come from melting ice from the mountains.

The presence of free water is probably an important factor for the Andean cat as well as the mountain “vizcachas” or “chinchillones” (*Lagidium viscacia* or *L. Peruanum*), that are permanent inhabitants of rocky sites. The specificity of the vizcachas to rocky environments is also possibly a factor influencing Andean cat distribution and population density. According to the staff of the Corporación Nacional Forestal (CONAF, Chile) and local inhabitants of northern Chile, the bofedales, rocky slopes, colonies of mountain vizcachas and other rodents, as well as waterfowl are important components of Andean cat habitat (Iriarte 1999). The association of *O. jacobita* and *O. colocolo* with rocky places was also confirmed in Argentina (Lucherini et al. 1999).

Other carnivores that partially share this habitat type are the “culpeo” or Andean fox (*Pseudalopex culpaeus*), the grison (*Galictis cuja*), the skunk (*Conepatus chinga-rex*), the pampas cat and puma. In Argentina the grey fox (*P. griseus*) is also found.

Among sympatric herbivores, in addition to mountain vizcacha, are found the vicuña (*Vicugna vicugna*), the “suri” or American ostrich (*Pterocnemia pennata*) and a variety of small mammals (*Abrocoma*, *Akodon*, *Calomys*, *Chroeomys*, *Phyllotis*, etc.), waterfowl and birds. The guanaco (*Lama guanicoe*) is also found in Argentina, Chile and southern Perú.

Habits

Although reported sightings have mainly been during daytime, it is possible that the Andean cat has mostly crepuscular or nocturnal habits and that its diurnal activity be more reduced or limited to certain periods of the year. Scrocchi and Halloy (1986) suggest that the Andean cat is a nocturnal animal and current fieldwork on this species, with camera traps, report activity primarily at early hours of the morning or after dusk (Perovic 1998, Villalba 2002, Lucherini et al. in press, Villalba and Delgado in prep). More recently, preliminary observations of a radio-collared Andean cat indicate activity mainly at night (Villalba unpubl. data). The crepuscular or nocturnal habits of the Andean cat are likely related with feeding habits of its main prey, the mountain vizcacha.

The presence of the mountain vizcacha or chinchillón in the Andean cat's diet is being confirmed in different ways. On one hand, remains of vizcachas, in addition to other smaller rodents, some small birds and waterfowl, have been found in faecal samples of small felids, taken from localities in Argentina and Bolivia where the presence of Andean cats has been corroborated (Lucherini unpub. data, Perovic pers. com., Villalba and Delgado in prep.).

In addition, sightings have reported Andean cats stalking mountain vizcachas (Grimwood 1968, Ziesler 1992, Sanderson 1998, Villalba 2002, Lucherini et al. in press), carrying a mountain vizcacha in its muzzle (Delgado pers. com.), and eating this rodent (Lucherini et al. in press). In the same way, camera trapping has been successful using fresh meat of vizcachas as bait (Villalba unpub. data).

Iriarte (1999) suggests that the Andean cat, like other small felid species, is probably an opportunistic hunter and that waterfowl and birds might be part of its diet. Park guards from the "Las Vicuñas" National Reserve (Chile) reported an Andean cat stalking waterfowl at the edge of a lagoon in a "Japu" salt pan. Similarly, preliminary analyses of faecal samples from small felids collected at the "Surire" National Monument (Chile) included the presence of feathers in 10% of the total faecal samples (Napolitano unpubl. data).

Although mountain vizcachas can normally be seen sunning during the day time, it is possible that this species is not strictly diurnal and its feeding habits might be vespertine or nocturnal. This is being supported by observations made by park guards and researchers in two protected areas in Bolivia and two in Chile (Iriarte 1999, Sanderson 1999, Villalba et al. in prep.), as well as by photographs of mountain vizcachas taken with camera traps, during the night time (Lucherini et al. in prep., Villalba and Delgado in prep.). However is necessary to define whether mountain vizcachas maintain these habits all year or seasonally.

Mountain chinchillas (*Chinchilla* spp.) were likely previously important prey of the Andean cat, and that the hunting of these rodents for its fur, resulting in local extinctions and extirpations in most of their distributional range, has been one of the factors provoking the decline of Andean cat populations (Nowell and Jackson 1996).

Biology and Ecology

Very little is known about Andean cat biology. The most recent information comes from fieldwork that is currently being carried out within the four range countries, mainly to establish the presence of the species.

Data on territoriality and species movements are practically absent. However, it is possible that male territories are larger than those of females and that there could be a certain degree of territory overlapping between the sexes, as occurs with most felids (Sunquist and Sunquist 2002). Sandell (1989) claims that for solitary carnivore species (non-cooperative) overlapping territories are larger than those when there is no overlapping. He also mentions that territory overlapping in this type of carnivore is more feasible in those species that have an irregular distribution.

The size of territories depends in general on food availability, with the addition of the presence of receptive females during mating season for males (Sandell 1989). Because Andean cat habitat conditions are severe, it is probable that territory and home ranges are very large, and thus that populations are at low densities.

The Andean cat is perhaps a solitary species, but may be seen in pairs or with cubs during mating season and after births respectively. According to local people in Bolivia, mating season is between July and August; which would result in births between September and November (Villalba et al. in prep.).

However, it is possible that birth times may be extended, as small cubs have been observed in October and April in Bolivia and in April in Chile (Villalba 2002, Delgado pers. com., Sanderson obs. pers.). In the same way, García-Perea (2002) suggests that births could take place in October, after examining skins of two adult females from Argentina. For these reasons, birth season probably occurs between October and April, with mating season possibly extended until November or December. The period between October and March corresponds to the spring and summer season in the southern hemisphere, and during these seasons it is common to record births for other wildlife species and it is the period of major productivity of vegetation.

Although we don't know the average size of Andean cat litters, on two occasions at different locations, two cubs have been observed (Villalba 2002, Sanderson obs. pers.).

1.1.3. Distribution

The Andean cat is present in southern Perú, the highlands of Bolivia, northern Chile, and the northwest of Argentina (Yensen and Seymour 2000). Apparently it occurs exclusively in the high Andean biogeographic province. Because of this the Andean cat is considered an endemic species for this region and greatly specialized to zones of high elevation (Scrocchi and Halloy 1986). There are very few records concerning its past distribution and the areas where the species was previously recorded generally coincide with those where the presence of the species has been currently verified. The existence of an earlier record (Philippi 1865) for a locality near Santiago suggests that the Andean cat could have had a more extended distribution in the past and/or that its movements were not so restricted like now, probably being able to cross the valleys that separate the high zones (Scrocchi and Halloy 1986).

Recently, Andean cat sightings have been reported in three of the range countries (Argentina, Bolivia and Chile) and its presence has been recorded in new localities through collection of skins and skulls and species identification through faecal DNA analyses. This information is being used to develop a multinational project of AGA, with the purpose of determining the current distribution of the Andean cat and evaluating its conservation status within the four range countries. The reports elaborated as a result of this initiative represent a significant advance in knowledge of the species distribution (Walker and Novaro 2001, 2003). Figure 1 shows an updated distribution map of the Andean cat, based on the information obtained since 1990 until now. Following we report the progress that each range country has achieved in this subject.

Argentina

The first record of an Andean cat for Argentina was published in 1879 for Salta province. Later publications between 1929 and 1961 report the existence of the species in Catamarca, Tucuman and La Rioja provinces (Scrocchi and Halloy 1986). Currently, Andean cat presence has been verified, based on sightings and DNA faecal analyses, in all of these provinces and additionally in Jujuy and San Juan (Perovic et al 2003, Lucherini et al. in prep., Novaro unpubl. data). According to these findings, San Juan province is the southern limit (29.7°S) of the Andean cat distribution for Argentina and South America.

Bolivia

The distribution of the Andean cat in Bolivia is still little known and there aren't records of its past distribution, except of the type locality that would be located in southern Potosí Department, near the Argentina border (Scrocchi and Halloy 1986). However, there is some uncertainty regarding the location of this record because of the different information provided by Cornalia (1865, quoted by Anderson 1997), who stated in his text that the specimen comes from Potosí, but when the specimen is described in the plate, it is attributed to Argentina (Anderson 1997).

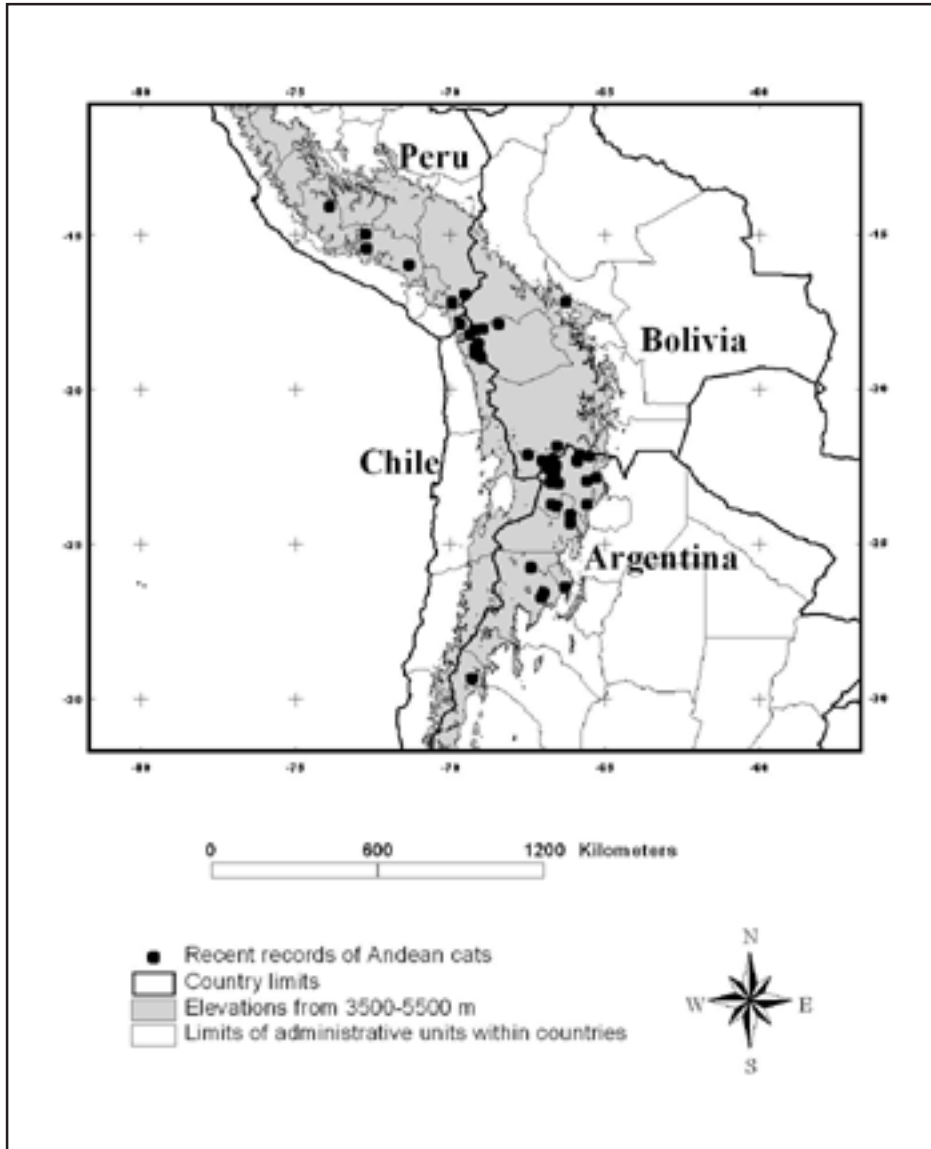


Figure 1.- Location of verified records (skins, skulls, sightings, faecal samples) of Andean cat presence, obtained in range countries since the last 20 years up to date (Source: Walker et al. in prep.).

More recent data indicate the presence of this species in four localities in southern Potosí Department, at one locality in the Cordillera of Tunari in Cochabamba (Villalba et al. in prep.) and two localities in Oruro Department: (Núñez and Gallardo 2002, Pacheco pers. com.). Accordingly, the Andean cat in Bolivia would be restricted to the high Andean region of the country, above 4100 meters.

Until now, the presence of the species has been verified in three Bolivian Departments (Cochabamba, Oruro and Potosí), out of six where the species could possibly occur. The occurrence of the Andean cat in Chuquisaca, La Paz and Tarija Departments has not been verified yet. However it is possible that the species is present in the high Andean part of the “Cotapata” Natural Area of Integrated Management (La Paz) (Pacheco et al. 2003) and in the Apolobamba region (La Paz) which would be the northern limit of the Andean cat distribution in Bolivia (Villalba et al. in prep.).

Chile

The Andean cat was initially recorded in Chile at La Dehesa, in the pre-Cordillera of Santiago (33°S), Metropolitan Region. The paper that presents this information was published by Philippi in 1869 (Scrocchi and Halloy 1986, Iriarte 1999). A second record was for the Tarapacá province (I Region) in northern Chile, from a specimen collected in 1940. Subsequently there were two records for the Atacama province (III Region) and again for Tarapaca (Cabrera 1961, Greer 1965, Pine et al. 1979, quoted by Scrocchi and Halloy 1986).

The most recent studies, based mainly on field interviews and observation of skins, confirm the presence of the species in seven localities of the Tarapacá region, all of them located at elevations equal to or higher than 4200 meters (Iriarte 1999). Current occurrence of the Andean cat based on sightings was only verified in the Surire salt pan, also situated within the I Region (Ziesler 1992, Iriarte 1999, Sanderson 1999).

Since the first record of Philippi, the distribution of the Andean cat in Chile has been greatly reduced and it is likely that the species is currently found only in the high parts of Regions I, II and III, from the Peruvian border in the north to 28°S in the south. Because the species is present in southwest Bolivia near the Chilean border and in other regions that border with Argentina, there is a possibility that the Andean cat could be present in Region II, although until now the presence of the species has been verified only in localities that are within the northern part of its historic geographic distribution (Iriarte 1999).

Perú

The first records of the presence of Andean cats in Perú come from a specimen collected in Arequipa department in 1952 at 4724 meters above sea level (Pearson 1957) and from another observed near Azángaro, Puno (Grimwood 1969). There are no additional records of the species until the reports recently made by Almeida and Condori (2002) and Cossíos and Madrid (2003).

Surveys based mainly on field interviews have confirmed the presence of the species, through observation of skins, in the departments of Ayacucho, Arequipa, Puno and Tacna in southern Perú. The localities where these specimens were observed are situated at elevations that vary from 3900 to more than 4500 m.

Although not all the potential range of the Andean cat has been evaluated in Perú, it is possible that the species is present at high elevations of the departments of Moquegua, Cusco, Apurímac,

Huancavelica, Junín, Huanuco, Ancash, Lima and Pasco, based on reports of local people and the presence of apparently adequate habitat (Cossíos and Madrid 2003).

1.2. Andean Cat and Humans

1.2.1. Beliefs and Attitudes

In Argentina, Bolivia, Chile and Perú people of Aymara origin, and in some cases Quechua, have similar beliefs regarding the Andean cat and pampas cat (both known as *titi*). A common tradition is the use of a skin or a stuffed cat during ceremonies that people perform for marking their domestic livestock, mainly llamas or alpacas. It is important to note that both the Andean cat and pampas cat are part of these traditions and beliefs, and in general, are used indistinctively. There are some local variations within and between countries and in some cases the influence of western culture has resulted in a total or partial loss of the values of Andean cultures and the distortion of ancestral customs regarding the *titi*.

Argentina

The Andean cat and pampas cat are hunted to obtain skins to use in religious ceremonies performed by local communities and because both cat species are considered potential predators of their domestic animals (Lucherini et al. 2003, Perovic et al. 2003). In some places the tradition of connecting the Andean cat with abundance and fertility of livestock is still maintained, and because of this belief the Andean cat is handled with respect. In other cases, however, to see a cat is considered bad luck. Without a doubt, in most cases these traditions are disappearing (Lucherini obs. pers).

Bolivia

The *titi* is considered a sacred animal related with the abundance, fertility and quality of crops, and is a messenger of good news (Yapu, 2001). The complete skin or the “tejeta” (stuffed animal) of the *titi* is used in different ceremonies related to the marking of domestic camelids or the beginning of sowing time. The preserved animals are placed in special arches, on the backs of dancers, and/or are filled with wool or ear pieces of the marked animals, asking for the welfare and good production of the herds. They also make special offers called ritual “mesas” (tables), where they use only small pieces of the skin (Yapu 2001, Núñez and Gallardo 2002, Villalba et al. in prep.).

After the ceremonies, the skins or stuffed animals are well kept to be used in the next year or ceremony. According to field interviews, the skins are inherited from the father to the son. However this tradition or belief is not performed or maintained in all Aymara communities, because of the influence of evangelism that discourages this type of custom (Núñez and Gallardo 2002, Villalba et al. in prep.). In some places where people do not maintain these beliefs they sell the skins to hunters that sell them in special markets, where a variety of animals and plants are sold to be used in different ceremonies (Villalba et al. in prep.).

Yapu (2001) presents an analysis with relation to the *titi* and he refers to other authors that have investigated the different customs of Andean nations, as well as chroniclers of the colonial epoch. This analysis confirms that the *titi* has been an animal greatly respected by the Andean cultures, and that nowadays this reverence continues in some communities mostly of Aymara origin. Currently

this reverence for the titi implies that it should generally not be hunted or bothered, but when it is hunted, for using in the above-mentioned rituals, the owner of the skin must make an annual offering or payment to the “Pachamama” or mother Earth. If this is not done the hunter and/or his family will have bad luck or the life of one of them will be at risk (Villalba et al., in prep.).

Chile

The Andean cat and pampas cat are part of the religious beliefs and traditions of Aymara people that live in the high areas of the northern region of Chile. The titi is used to bring good luck for crops and the reproduction of the domestic camelids, with both species playing an important function in the festivities that these people carry out annually in February during the marking ceremony of the herds. At this time people dance with the skins or the stuffed animals of both cat species on their backs (Iriarte 1999).

In the town of Putre (3500m), every 24th of June, the inhabitants of Aymara origin celebrate the “Titi Party”, performing similar dances and also using both species. When the different ceremonies are finished, the embalmed animals or the skins are wrapped in a coloured blanket (aguayo), along with coca leaves, small objects with anthropomorphic figures, long, thin bands of coloured paper (serpentina), money, and other objects, and are stored until the next year or ceremony (Iriarte 1999).

In other sectors of the Chilean Altiplano, the inhabitants have the belief that the wild cat must be caught and killed whenever they are seen. The person who is able to catch a titi will have one year of good luck and important social recognition from his community. On the contrary, if the animal is seen but not caught, the person will have a year of bad luck (Iriarte 1999).

As in the other countries, these traditions are not performed in those communities where people have converted to the evangelist religion, and there are strong conflicts within the same community or between communities, between people that maintain these customs and those that are evangelists. Iriarte (1999) considers that the introduction of new beliefs could be favorable for the survival of both cat species.

Perú

The families that possess livestock in the southern region of Perú utilize the skins of wild cats – with out differentiating Andean cat from pampas cat - during religious activities, in the belief that the preserved cat will improve the reproduction of the livestock. These activities comprise the ceremony of marking the livestock, called “Tinkachi” in some areas. On certain occasions the preserved cats are kept during the year as the protector of a small pot that contains blood of the marked animals (Cossíos and Madrid 2003). Some people indicate that it is only necessary to have one skin per family, but the majority prefers to have several specimens (Cossíos and Madrid 2003). Almeida and Condori (2002) mention that according to the “Lari” (person that leads the ritual), the presence of “wild cat” skins has a significant function in the worship of the earth, hills, lagoons, and in especially the alpaca.

Some Andean inhabitants hunt wild cats because they are considered as dangerous for domestic animals. Some persons, mainly from the region of Tacna and southern Puno, believe that it is good luck to kill a wild cat, and that not killing one after having seen it would bring bad luck to them. In many parts of southern Perú, including the departments of Ayacucho, Puno and Cusco, dances

are performed and the skins of wild cat are used as a part of the costumes (Cossíos and Madrid 2003). The exhibition of skins in special ceremonies has also been reported by Almeida and Condori (2002) for many localities of the department of Arequipa. However, some communities converted to the evangelism, no longer maintain these folk traditions and so do not hunt wild cats or store their skins (Cossíos and Madrid 2003).

1.2.2. Resource use, Livestock husbandry and Agriculture

In spite of the severe climatic conditions of the environment which the Andean cat inhabits, this environment is also inhabited by humans, but in lower densities than in the Altiplano region. In the high Andean region, the main economic activity is the breeding of domestic camelids (llamas, alpacas) and also introduced animals like sheep and goats in some areas. The disturbance of the pastures is not as great as in the Altiplano, but there are areas with high levels of overgrazing.

However, the extraction of certain plant species like thola, yareta and queñoa, which are used as fuel and/or construction material, has had a greater impact which is still ongoing. In addition these areas are rich in mineral resources. Mining is carried out by some local communities, but is mainly an activity of trans-national or national companies. In any case, this activity has more impact on Andean cat habitat (contamination, resource extraction for fuel, hunting of Andean cat prey) and on the species itself than do traditional uses.

The Andean cat is not considered a threat to domestic camelids, but in some regions of Chile, Perú and Argentina, it is persecuted because local people consider that the species preys on small domestic animals, such as sheep, goats, and fowl (Iriarte 1999, Cossíos and Madrid 2003, Lucherini et al. 2003).

1.3. Conservation Status

It is very likely that Andean cat populations are found naturally in low densities. However, it is possible that those have been reduced and are still being affected within the range countries, because of hunting and habitat alteration. In addition, some features of the species' habitat also make the Andean cat distribution naturally fragmented.

One of the factors that probably influenced the reduction of Andean cat populations was the extinction in large areas of the distributional range of the two species of mountain chinchillas (*Chinchilla lanigera* and *C. brevicaudata*), which perhaps were the main prey for the Andean cat (Nowell and Jackson 1996). What occurred in Chile would confirm this hypothesis; the past distribution of the Andean cat in this country coincided with that of both mountain chinchilla species, which were heavily hunted until they became locally extinct in the southern part of their range where there were previous records of Andean cats, but which are no longer present (Iriarte 1999).

In spite of the important progress we have made in the last few years, mainly regarding knowledge of the distribution of the Andean cat, it is still difficult to know with certainty the status of Andean cat populations.

The IUCN categorises the Andean cat as an Endangered (EN) species under the criterion: "C2a" that signifies: population size estimated at less than 2500 mature individuals, with a diminishing

trend and absence of sub-populations that have more than 250 mature individuals (IUCN 2002 in Perovic et al. 2003, Nowell 2002a, 2002b).

Previously, the Andean cat was listed as a Rare and Vulnerable species (1990); later it was categorized as Vulnerable (VU), following the criteria of: small population size, in decline and fragmented (Baillie and Groombridge 1996, Hilton-Taylor 2000).

Nowell and Jackson (1996) developed a specific categorization for felid species and the Andean cat is assigned a Vulnerability Index in category 2 at the global level and category 1 at the regional level, category 1 being the most vulnerable.

Within range countries there have also been efforts to evaluate and categorize the status of populations of wildlife, in general following the IUCN criteria, with the purpose of prioritizing conservation actions.

In Argentina the Andean cat is considered as Vulnerable in the Red Data Book of Argentinean mammals (García Fernández et al. 1997).

In Bolivia the species was considered as Vulnerable and Rare in the Red Data Book of Bolivian vertebrates (Tarifa 1996). Later in an assessment made for the fauna of the “Eduardo Avaroa” National Andean Fauna Reserve, the Andean cat is categorized as Vulnerable (Ergueta et al. 1997). More recently, following the IUCN categories (Baillie and Groombridge 1996), Bernal (1999) places the Andean cat as an endangered species, however she remarks on the scarce information about this species.

In Chile is considered as Rare due to the extremely low population density of the species throughout its distributional range (Red Data Book of Chilean vertebrate fauna 1993). Cofre and Marquet (1999), who made an assessment of the conservation status and rarity of the Chilean mammals with the purpose of establishing conservation priorities, situate the Andean cat as Endangered, Vulnerable and Critical being the categories of less and major threat, respectively. The latest classification studies suggest listing the species within the category “In danger of extinction” (Iriarte 1999).

In Perú, until now, the Andean cat is legally considered “In danger of extinction”, a category of major threat. Recently, after the decision of the Government to adopt the IUCN classification for Peruvian threatened species, it has proposed the inclusion of the Andean cat as an Endangered species, which is the same category used by the IUCN at the global level. The approval of the new list of Peruvian threatened fauna is expected shortly.

1.3.1. Legal Status

At the international level, the Andean cat is protected by the Convention for International Trade of Threatened Flora and Fauna Species (CITES) and is included in Appendix I, that comprises those species that are in danger of extinction or that can be affected by trade. The commerce of these species is subject to a special and strict regulation. Within the range countries the Andean cat is mainly protected together with other wildlife and in some cases by more specific rules.

However, in all these countries, enforcement of the law is not absolute and wildlife hunting continues, whether the hunted species have some commercial value or not. In the case of the Andean cat, recently hunted specimens can be observed in the field or for sale in special markets to be used in religious ceremonies as already mentioned. Currently there are no reports that the Andean cat is hunted for international skin trade, although in 1976, CITES recorded that 84 skins of the species were exported to Spain (Broad 1987).

Argentina

The Andean cat is protected by National Law 22421 of wildlife conservation and its Statutory Decree 666/97. Also, Resolution N°63/86 of the Secretary of Agriculture, Livestock and Fisheries prohibits the hunting, commerce and export of Andean cats.

Bolivia

Along with other wild species of fauna and flora, the Andean cat is protected by the Supreme Decree N°22641, promulgated in 1990, which establishes a general and undefined ban for the pursuit, capture, storing and conditioning of wild animals and its derivative products.

Chile

All felid species are fully protected since 1972 by Law N° 19473. The illegal hunting of felines in Chile is penalized with fines up to US\$ 6.000 and imprisonment up to 3 years.

Perú

In Perú the Andean cat is considered a threatened species and its hunting, commerce and possession (live or dead animals or its parts) is prohibited (Supreme Decree N°013-99-AG, year 1999).

1.3.2. Protected Areas

Argentina

In Argentina nine protected areas have been identified within the Andean cat distributional range. In seven of them its presence has already been verified based on collection of skulls, skins, direct sightings, or faecal DNA analysis. Of the other two protected areas, one has not been surveyed yet and in the other, where a partial survey has been done, the occurrence of the Andean cat has not been confirmed so far. However in both protected areas the presence of the Andean could be expected, due to the presence of the species in other localities within Salta province.

Table 1.2
Protected areas of Argentina, with current and potential presence of the Andean cat

Protected Area	Administrative Unit	Altitudinal Range	Area (Km ²)	Type of evidence for Andean cat presence
1. "Laguna de los Pozuelos" Biosphere Reserve	Jujuy	3.400 – 5.000m	944	Sighting, skin
2. "Olaroz-Cauchari" Provincial Reserve	Jujuy	3.400 – 5.000m	2.202	Skin
3. "Laguna Vilama" Ramsar Site Provincial Reserve	Jujuy	4.500 – 6.500m	3.100	Sighting, faeces, skin
4. "Los Andes" Provincial Reserve	Salta	>3.500m	14.013	(ne)
5. "Los Cardones" National Park	Salta	>3.500m	580	(pe)
6. "Campo de los Alisos" National Park	Tucumán	500 – 5.500m	27	Skull
7. "Laguna Blanca" Provincial Reserve	Catamarca	>3.500m	6.318	Skins
8. "Laguna Brava" Provincial Reserve	La Rioja	>3.500m	3.796	Interviews
9. "San Guillermo" National Park	San Juan	2.100 – 5.800m	7.802	Interviews, faeces

(ne) = not evaluated,
(pe) = partial evaluation, no evidences found
Source: Modified from Walker et al. in prep.

Bolivia

The National System of Protected Areas in Bolivia currently has 66 protected areas (PA), of which 19 have some degree of management and are recognized at the national level (SERNAP 2001). Of these 19 PAs, seven are within the Andean cat distributional range, with and additional protected area recognized at the departmental level. Until now, the presence of the Andean cat has been verified in two protected areas and close to another PA located at southern Bolivia. Although there are no verified records for the protected areas in La Paz Department, it is possible that the species occurs there, according to field interviews and surveys in two of them (Pacheco et al. 2003, Villalba et al. in prep.).

The protected areas mentioned in table 1.3 in general are large, but only two of them are exclusively within the high Andean region. The other areas comprise other ecosystems and none have yet been evaluated to determine the size of available habitat for the Andean cat. On the other hand, in all protected areas there are human populations and the level of management implementation is variable. Because of this, it is difficult to establish how effective the protection of the Andean cat within these areas is at present and it is important to carry out an evaluation.

Table 1.3
Protected Areas of Bolivia with management that are within the Andean cat distributional range

Protected Area	Administrative Unit	Altitudinal Range	Area (Km ²)	Type of evidence for Andean cat presence
1. "Apolobamba" National natural area of integrated management (ANMIN-A)	La Paz	800 – 6.200 m	4.837	Interviews ¹
2. "Cotapata" National Park and Natural area of integrated management (PNyANMI-C)	La Paz	1.000 – 5.900 m	400	Unidentified footprints of small cat ²
3. "Carrasco" National Park (PNC)	Cochabamba	300- 4700 m	6.226	(ne)
4. "Tunari" National Park (PNT)	Cochabamba	2.000-4.400	3.000	Skin ¹
5. "Altamachi" Departamental Park (*)	Cochabamba	2.000 -4.800	—	(ne)
6. "Sajama" National Park (PNS)	Oruro	4.000 – 6.542 m	1.002 estimated	Skin ³
7. "Eduardo Avaroa" National Andean fauna Reserve (REA)	Potosí	4.200 – 6.000 m	7.147	Skin, sightings, photos (outside of the Reserve border) ¹
8. "Cordillera de Sama" Biologic Reserve (RBCS)	Tarija	1.800 – 4.700 m	1.085	Interviews(pe) ¹

(ne) = no evaluated

¹ Villalba et al., ² Pacheco, et al. 2003 ³ Pacheco com pers.

Source: Modified from SERNAP 2001 and Walker et al. in prep.

(pe) = partial evaluation, no evidence found, (*) : Protected area of recent creation.

Chile

In Chile the presence of the Andean cat has been confirmed in four protected areas (Table 1.4.) and all located in Region I in the northern part of the species' range. Further south, three protected areas "Los Flamencos" National Reserve, "Llullaillaco" and "Nevado Tres Cruces" National Parks, located respectively in Regions I and III, probably contain small populations of this species.

Table 1.4
Protected Areas of Chile with current
and potential presence of the Andean cat

Protected Area	Administrative Unit	Altitudinal Range	Area (Km²)	Type of evidence for Andean cat presence
1. "Las Vicuñas" National Reserve	Region I	4.570 – 5795 m	2.091	Skin
2. "Lauca" National Park	Region I	3.200 – 6.432	1.378	Skin
3. "Salar de Surire" National Monument	Region I	4.100 – 4.276 m	112	Sightings
4. "Volcan Isluga" National Park	Region I	2.100 – 5.400	1.747	Interviews
5. "Los Flamencos" National Reserve unidentified	Region II	2.300- 3.600	739	Sighting of an small cat
6. Llullaillaco National Park	Region II	2.800 – 4.000	2.682	Sighting of an unidentified small cat
7. "Nevado Tres Cruces" National Park	Region III	2.200 – 3.200	469	Pampas cat presence

Source: Iriarte 1999, Walker et al. in prep.

Perú

Twelve protected areas have been identified where the Andean cat could be present, due to the location and elevation range of those areas. To date, only in two of these protected areas the presence of the species has been confirmed through observation of skins in the possession of local people, but its presence is expected in at least two other areas, according to field interviews carried out in those areas (Table 1.5) The remaining areas have not yet been evaluated.

Table 1.5
Protected areas in Perú that are located within
the Andean cat distributional range

Protected Area	Administrative Unit	Altitudinal Range	Area (Km ²)	Type of evidence for Andean cat presence
1. "Ampay" National Sanctuary	Apurimac	2.780 – 5.235 m	36	(ne)
2. "Aymara Lupaca" Reserved Zone	Puno	3.825 – 4500 m	3.000	Skins ¹
3. "Chacamarca" Historic Sanctuary	Junín	4.000 - 4.400 m	25	(ne)
4. "Cordillera Huayhuash" Reserved Zone	Lima, Huanuco, Ancash	3.650 – 6.600	675	(ne)
5. "Junin" National Reserve	Junín, Pasco	4.080 – 4.125 m	530	(ne)
6. "Machupicchu" Historic Sanctuary	Cusco	1.800 – 6.270 m	325	(ne)
7. "Nor Yauyos-Cochas" Landscape Reserve	Lima, Junín	2.750 – 5.730	2.212	(ne)
8. "Pampa Galeras" National Reserve	Ayacucho	3.800 – 4.200 m	65	Interviews ¹
9. "Huascaran" National Park	Ancash	2.500 – 6.768 m	3.400	Interviews ¹
10 "Manu" National Park	Cusco, Madre de Dios	365 – 4.000 m	17.162	(ne)
11. "Huayllay" National Sanctuary	Pasco	4.078 – 4.593 m	68	(ne)
12. "Salinas and Aguada Blanca" National Reserve	Arequipa, Moquehua	3.400 – 6.057 m	3.669	Skin ^{1,2}

(ne) = not evaluated

¹ Cossíos and Madrid 2003,
Source: Ponce 1996, Modified from Walker et al. in prep.

² Almeida and Condori 2002.

1.4. Factors Threatening Andean Cat Conservation

The main threats identified for the four countries of the cats' range are:

- Habitat fragmentation and habitat loss/disturbance,
- Hunting,
- Intraguild competition,
- Reduction of the main prey,
- Small population size.

The intensity or degree of importance of these threats varies in each country, and the order that they are mentioned here does not imply a prioritization. However, in table 1.6., we present a preliminary prioritization by country and globally.

1.4.1. Habitat Fragmentation and Habitat Loss/Disturbance

Habitat loss is one of the main factors causing reduction of biodiversity, because it results in the disappearance of species, and/or the fragmentation or degradation of the remnant habitats (Dinerstein et al. 1995). An assessment of the conservation status of the ecoregions of Latin America places the Puna region (including the high Andean region) of the Central Andes in the Vulnerable category and within the levels of high priority for its conservation at the regional level (Dinerstein et al. 1995).

Although there is little information available on the Andean cat and its habitat requirements, it can be asserted that the habitat of this species is naturally fragmented and of high fragility, particularly the dry high Andean regions. In adverse climatic conditions, wildlife populations are found in limited habitats, such as rocky places that exhibit a spatial structure in mosaic (SERNAP 2000). This structure affects normal movement of animals in search of food, refuge, and mates or during dispersal.

Land use, mainly livestock grazing, firewood extraction, and mining, is also an important threat for the Andean cat, both directly (by hunting) and indirectly (extraction of structural resources, prey competition, general habitat disturbance). The degree of threat is variable within and among countries.

Argentina

Habitat alteration is considered a low threat to Andean cat populations in Argentina (Lucherini obs. pers.), mostly because of the low intensity of resource use in the regions occupied by the species. However the high specificity of the Andean cat to isolated rocky habitats makes it very vulnerable to habitat changes.

Bolivia

According to available information, the Andean cat is restricted to the high Andean region in Bolivia. This places the species in a fragile position, especially if we consider the probable association of this felid with the high forests of queñoa (*Polylepis* spp.) and rocky zones of volcanic origin. Queñoa trees, in addition to having a fragmented distribution, have been subjected to intensive extraction. Currently, only 10% of the original forests of *Polylepis* survive in Bolivia. Most are found in the

western Andean mountain range where the climatic conditions are more extreme compared to that of the eastern Andean mountain range, where only 1% of the forest cover remains (Kessler 2001).

Although the high Andean region is not as populated as the Altiplanic region or Puna, the intensity of human use can affect Andean cat habitat. The small forests of queñoa in some cases are the only source of firewood and building material, particularly for remote human populations, even where queñoa trees are difficult to access. Queñoa forests are mainly associated with rocky habitats, and in some regions these places are locally known as “Salles”, where species of small rodents and marsupials are found in abundance (Alfaro obs. pers.). In addition, it is possible that queñoas are an important structural resource for the Andean cat, because the trees can conceal cat dens and feeding sites. Apart from this, grazing of domestic animals in slopes and bofedales, which can serve as corridors of passage for the Andean cat, also represent a disturbance factor for the species.

Chile

Habitat loss is considered a low threat for the Andean cat populations in Chile (Iriarte 1999). The human population density is low and 30% of the Andean cat distribution area is protected through protected areas.

Perú

Habitat fragmentation in Perú can be an important threat to the Andean cat, mainly due to the reduction of the area occupied by queñoa trees. The development of human populations and agricultural activities may have negatively affected the Andean cat distribution as well, although to a lesser degree. This situation probably occurred in the region near Azangaro and around the city of Puno (Puno department).

1.4.2. Hunting

Hunting of the species is an important threat in all range countries. Most commonly it is related with the use of the species in different ceremonies that Andean cultures maintain to a certain degree. However, other reasons for the hunting of the Andean cat have also been detected. Compared to the other countries, for example, in Argentina, the species is more often hunted because it is considered a harmful species. Killing for no reason is apparently of less intensity in all range countries but it is necessary to carry out an assessment of this subject. Also, it is necessary to evaluate to what extent tourism can affect the species, particularly by promoting illegal commerce, as it has been detected that tourists occasionally buy skins of Andean cats, mostly in Perú (Almeida com. pers.). This activity could be stimulating hunting of the species and as a consequence increases hunting pressure on this species.

Argentina

Hunting is currently the most important threat to the Andean cat. Hunting for traditional use is less of a threat compared to hunting carried out because the species is considered harmful or apparently for no reason (Lucherini unpubl. data). Nevertheless, there are variations at the local level. In Jujuy province traditional hunting is less common than persecution of the species, and both types of threats are minor in this region compared to other areas of the country (Perovic pers. com.).

Bolivia

Andean cat hunting, either for traditional reasons or without reasons, is another threat to the species, particularly because the species' populations are considered to be reduced and fragmented. It is probable that traditional use has more impact than other types of hunting, but the apparent docility of the species makes it very vulnerable to every type of hunting. According to available information, the Andean cat in Bolivia is not blamed for preying on domestic animals. This constitutes an important issue to consider when carrying out educational campaigns in favour of conservation of the species (Villalba et al. in prep.).

Chile

In Chile, hunting for traditional reasons is a major threat to the Andean cat, compared to hunting carried out because it is considered a harmful species (Iriarte 1999).

Perú

Hunting of the Andean cat for traditional uses or beliefs has a major impact compared to hunting that is carried out because it is considered a damaging species. However, several of the human groups that use Andean cat skins for their ceremonies, persecute the species because they consider it as dangerous to themselves or to their domestic animals (Cossíos and Madrid 2003). On the other hand, Almeida and Condori (2002) mention that in some regions where the species is used ceremonially, it is not considered harmful because the species occurs there sporadically or it isn't present at all; thus the authors indicate that hunting for traditional use is occasional.

1.4.3. Intraguild Competition

Although there are no detailed studies on this subject, it is very likely that competition is present between Andean cat and pampas cat in those areas where the species are sympatric, and also with the Andean fox. In the case of puma, a much larger felid, it is probable that niche overlap is minimal, as well as with the much smaller grison. There is probably little or no niche overlap with the skunk. Nevertheless, it is essential to carry out comparative studies on this subject to determine which species compete with the Andean cat, the level of this competition and how this affects to the Andean cat.

In Argentina, this factor has been considered among the main threats for Andean cat survival. Data obtained until now suggest a strong overlapping in distribution and space use among the Andean cat, the pampas cat and the Andean fox (Perovic et al. 2003, Lucherini and Luengos 2003).

Presence of domestic carnivores (dog and cat), also can be a negative factor for the Andean cat, either through competition for resources or the possibility of disease transmission.

1.4.4. Population Reductions of Main Prey

Reduction of population of the main prey species is considered a threat of medium to high level in the four countries, although further evaluation is necessary in each case. This reduction can be attributed to different factors that, combined, can influence the population size of the species that constitute the Andean cat diet. These factors may be:

a) Hunting of prey - Principally hunting of mountain vizcachas for meat, which is consumed at the local level, or the skin, which is sold. Although hunting mountain vizcachas and other potential prey of the Andean cat is prohibited in all range countries, law enforcement is not effective. In general there are few studies of mountain vizcachas and even fewer of other prey species. Such studies would provide important information related to the trophic ecology of the Andean cat.

b) Intraguild competition among herbivorous species - Is necessary to evaluate to what extent this type of competition affects Andean cat prey species, particularly in the case of domestic animals (native and introduced) whose grazing areas overlap with feeding areas of mountain vizcachas.

c) The presence of exotic wild species - Particularly the European hare (*Lepus europaeus*), which is considered a pest in Argentina where it was initially introduced (Bonino and Montenegro 1997) and is currently found throughout the four range countries. Studies have shown that the damage that this species produces to crops and in competition with domestic livestock is significant (Bonino and Montenegro 1997). Furthermore since the European hare is a crepuscular or nocturnal species (Bonino 1986) it could be an important competitor with the mountain vizcacha. It is necessary to assess the level of competition and how this exotic species could be affecting native wild species that are the prey of Andean cats.

Argentina

Despite the scarcity of available data, hunting of potential Andean cat prey species, particularly the mountain vizcacha is considered one of the three most important threats, as these rodents are hunted for local human consumption and also to feed domestic dogs.

Bolivia

In Bolivia, although hunting all wildlife is prohibited, mountain vizcachas are hunted for local consumption in some areas. In other cases they are hunted for “sport” and blankets made from the skin of these rodents also can be found for sale in the cities. In addition, in some communities mountain vizcachas are hunted because people consider that these rodents are competing with their llamas.

Chile

Hunting of vizcachas is considered a low threat for the Andean cat, because nearly 30% of the distributional range of the species is under protection and, because high population densities of vizcachas have been observed in different areas (Iriarte 1999).

Perú

The case is similar to that of Bolivia but considers the Peruvian mountain vizcacha (*Lagidium Peruanum*). The impact of hunting on populations of potential Andean cat prey has not been evaluated, but reports of the reduction of mountain vizcacha populations are not rare. The expansion of the European hare and its impact should also be evaluated in southern Perú.

1.4.5. Small Population Size, Genetic Variability, Diseases

Although little is known of the Andean cat, the apparently low density at which the species naturally occurs ensures that the population size is generally small and very likely highly fragmented. This circumstance places the viability of these populations at high risk, because they are subject to

local extinctions through stochastic events, such as disease outbreaks and natural disasters. In addition, the naturally fragmented distribution which has become increasingly fragmented by human activity suggests that populations are isolated as well as small.

Accordingly, the species' demographic and genetic viability may be low, as isolated populations can be greatly differentiated and subjected to a reduction of genetic variability. Although Johnson et al. (1998), in a genetic study based on seven skins from the four range countries, conclude that the Andean cat has moderated levels of genetic variation, it is important to carry out more studies on this subject.

Furthermore, a reduction of genetic variability places small populations in a vulnerable position in the face of diseases. Available information on the effect of diseases on populations of wild felids is limited, but in the few identified cases, it is known that diseases caused a considerable decline of the felid species that were affected (Nowell and Jackson 1986). The presence of domestic cats and dogs also can be a threat for the Andean cat, as these domestic animals can be carriers of pathogenic organisms, and they normally have no health care.

1.5. Prioritization of the Identified Threats

With the objective of prioritizing the threats to Andean cat conservation, an interview was carried out during the workshop in Arica. Each Delegation prioritized, based on their personal experience, the threats previously identified. Then, the average of the priority values assigned by each country was calculated for each threat and these values were used to assign the priority order at the global level (Table 1.6.).

Table 1.6
Prioritization by country and globally of factors identified as main threats to Andean cat conservation (1 = factor of threat with themajor priority)

THREATS	PERÚ	BOLIVIA	ARGENTINA	CHILE	GLOBAL
Traditional hunting	3	3	4	1	1
Prey reduction	2	2	3	5	2
Habitat loss/fragmentation	1	1	7	4	3
Hunting	4	4	1	6	4
Population size	5	5	5	2	5
Intraguild competition	6	8	2	3	6
Genetic variability	7	6	8	7	7
Diseases	8	7	6	8	8

1.6. Limiting Factors for Andean Cat Conservation

Four limiting factors that influence the conservation of the Andean cat have been identified. Lack of information and several issues related with wildlife management are the most significant.

1.6.1. Lack of Information

Studies of the Andean cat have until now, focused mainly on determining its presence and distribution. What little information we have on the biology and ecology of this species, comes principally from unexpected encounters (Scrocchi and Halloy 1986, Ziesler 1992), and from sightings that occurred when researchers were carrying out presence surveys, which in turn verify the current presence of the Andean cat in Argentina, Bolivia and Chile (Iriarte 1999, Sanderson 1999, Villalba 2002, Perovic et al. 2003, Lucherini et al. in press).

Based on all the information produced to the present, we have a better understanding of the habitat features where the species occurs, and it is possible to carry out preliminary evaluations of habitat quality of potential areas. Nevertheless, basic aspects of Andean cat biology and ecology are still unknown, and information on its distribution is still incomplete, with large areas still not surveyed. Without a doubt, this lack of information enormously restrains planning and the development of actions for Andean cat conservation.

1.6.2. Legislation and Conservation Policies

Although the Andean cat is protected by national laws and international treaties, in general governments have no specific conservation policies for this species. They have paid more attention to those wild species (ex. vicuña, guanaco, lagarto, etc.) that can provide direct benefits to local populations and/or because there are private companies that are interested in investing in the management and use of those species.

In fact, some wildlife protection policies developed by these four countries, for example for the vicuña, have served as an umbrella for the protection of other species that share the habitat of this wild camelid. However, carnivore species maybe have been less favoured, because of the conflicts that in general exist between these species and domestic animals.

Currently there are initiatives, mostly at the local level, from authorities and people associated with protected areas to evaluate the damage that wild carnivores produce. This work is being carried out with the support of organizations or scientific institutions. Based on these projects, more integrated studies are being developed that include the gathering of basic information on other wild species.

1.6.3. Law Infringement

Another limiting factor that affects the species' conservation is the violation of laws that each country has concerning wildlife. However, this is greatly related to people not being well informed about these laws and to the lack of awareness, particularly of the local authorities and of the public in general.

In this sense, application of coercive measures to promote compliance with the law is not very efficient. It is necessary to develop educational campaigns regarding the importance of conservation of the Andean cat and of wildlife in general.

1.6.4. Protected Areas and Corridors

Another important subject related to lack of information and management is protected areas. As was seen in the chapter on protected areas, the presence of the Andean cat has only been verified in 50% or less of the protected areas where the species could occur in each country. The other areas have not been surveyed or the evaluation was partial. In these circumstances it is essential to determine in which protected areas the species is present, to what extent those areas protect the species, and the efficiency of their management.

1.7. Limitations of the Action Plan

As it was mentioned in various parts of this document, the Andean cat is a poorly known species. More systematic efforts to determine the distribution of the species were initiated in the late nineties. Important advances have been achieved in this topic, but it is necessary to continue in this theme and to initiate studies concerning Andean cat natural history.

Therefore, this action plan is based on what little information exists on the Andean cat, which restricts in some cases a better action plan. However, we now to have a starting point to adapt, plan and coordinate actions, as well as to coordinate efforts among the four range countries for a common objective: the conservation of the Andean cat and its habitat.

Nevertheless, we are conscious that a planning tool is dynamic and this plan has been elaborated to cover a five-year period, which was divided in two phases; the first phase starts now and continues until April 2007, and the second phase is between May 2007 and June 2009. In general, those activities that are necessary for proceeding to the second phase and that encompass activities already underway were prioritized in this first phase. At the end of the first phase, evaluation of the actions carried out thus far, is important to review priorities and to adjust the action plan based on the achievements obtained.

THE ANDEAN CAT: CONSERVATION ACTION PLAN

PART II

2. OBJECTIVES

2.1. Main Objective

The Andean cat is among the world's most threatened species and is listed as Endangered according to the IUCN Red List (Nowell 2002a). The geographic distribution is thought to be highly fragmented because of the cat's specialization for certain types of high-altitude habitats and population densities are believed to be naturally low.

The goal of this plan is to outline the actions necessary to assure the long-term survival of the Andean cat by ensuring the existence of viable populations and the integrity of natural habitats through the participation of local human populations in these tasks.

2.2. Specific Objectives

With the purpose of fulfilling our main objective, actions in three general areas must be developed: Research, Education, and Conservation Management. We propose six objectives, set under these three main areas.

1. To determine the current distribution and relative abundance of Andean cat populations, and the threats that affect the species and natural ecosystems;
2. To carry out scientific research to produce basic information on Andean cat biology and ecology;
3. To mitigate impacts of human activities on the Andean cat and natural ecosystems through community participation and education;
4. To strengthen the management of protected areas where the Andean cat is present, promote the establishment of new areas or corridors and encourage the development of conservation initiatives in the region;
5. To promote the implementation and adequacy of conservation legislation and policies regarding the Andean cat and natural ecosystems;
6. To continuously evaluate the actions developed during the implementation of this plan.

2.3. Assumptions

Conservation efforts will be fruitless if they are not grounded on sound knowledge about the distribution and ecology of the species and threats to population persistence. Thus research that will generate the minimum information required to plan effective and direct conservation activities is a high priority.

At the same time, publicity, educational, and awareness campaigns must be initiated, particularly at the local level, to share information on the Andean cat and the beliefs and attitudes that local people have so as to achieve their participation in the protection of the species and natural habitats.

3. ACTION PLAN

Objective 1: To determine the current distribution and relative abundance of Andean cat populations, and the threats that affect the species and natural ecosystems

The high Andean region has been identified as the principal habitat of the Andean cat. However, the Puna or Altiplano, and southern Andean steppe habitats might be used by the species as well. During the last three years we have compiled the information currently available on the presence of the species in the four range countries, carrying out field surveys in some areas to update information (Walker et al. 2001, 2003). Using Geographic Information Systems (GIS), we have begun to generate information on the current and potential distribution of the species, and the availability of potential habitat. We also started to identify critical areas where information is lacking or conservation efforts are needed. This is an ongoing effort that needs to be constantly updated by AGA as new information becomes available.

Actions

- 1.1. Evaluate and determine the potential habitat of the Andean cat using available information and GIS techniques.
 - Identify areas where the species may be present and estimate available habitat
 - Identify and prioritize areas where conservation efforts should be carried out
 - Identify and evaluate the impact of existing or future projects being carried out within the distribution of the Andean cat
 - Identify areas that serve as corridors between populations that may be fragmented or isolated.
- 1.2. Carry out field surveys to establish the current presence and abundance of the Andean cat, through interviews and rapid assessment, collection and identification of samples (faecal samples, hair, skins), camera trapping and sign evaluation.
- 1.3. Test different available methods for the estimation of relative abundance of the Andean cat and other carnivores (transects, camera traps, DNA analysis of faeces, hair traps, etc.)
- 1.4. Learn about beliefs and attitudes of local people toward the species.

Recommendations

- Use a common protocol in the four range countries to carry out evaluations of presence/absence and estimations of relative abundance.

Objective 2: To carry out scientific research to produce basic information on Andean cat biology and ecology

Very little is known about the biology of the Andean cat. The elusive nature and rarity of the species have thwarted previous research efforts. Nevertheless, in some localities the Andean cat's presence has been detected recently by direct observation, photographs obtained on repeated occasions using camera traps, filming on two occasions, and DNA analysis of faecal samples. These places where the species has already been detected are potential areas to initiate more detailed biological studies, using a combination of different techniques (ex., radio telemetry, camera trapping, collection of faeces for diet and genetic studies).

Available information on Andean cat food habits suggests that the mountain vizcacha is a principal prey species. However, diet studies must be initiated to establish to what degree the presence, abundance, and other population characteristics of diverse prey species affect the distribution and abundance of the Andean cat. This information will allow us to evaluate the quality of habitat at different sites, making possible the elaboration of models that predict Andean cat presence in other areas within the geographic range. Additionally, will support development of management actions directed to augment or prevent declines in appropriate prey species.

Data on the spatial ecology and habitat requirements of the Andean cat is necessary to understand the nature of interspecific competition with other carnivores.

Further studies on genetics, population dynamics, dispersal and epidemiology will support different conservation actions. Because Andean cat populations are probably fragmented and at very low densities, studies of population genetics are essential to prioritize conservation actions. AGA members are already using non-invasive methods of molecular biology for the identification of faecal samples that allow determining the presence of the Andean cat. Individual identity, sex, and kinship as well as genetic variability within and among populations can also theoretically be determined. This information will assist in the development of conservation actions such as the establishment of corridors, possible translocations, and/or the special or priority treatment of those populations that are highly differentiated and/or have very low genetic diversity.

Actions

- 2.1. Identify and prioritize areas where more detailed studies of the species can be carried out.
- 2.2. Determine the Andean cat diet through analysis of faeces.
- 2.3. Estimate the distribution and abundance of principal prey species.
- 2.4. Standardize methods for trapping and/or censusing prey species.
- 2.5. Determine the habitat and spatial requirements of the Andean cat.
- 2.6. Elucidate the interactions between the Andean cat and other carnivores of the high Andean region, particularly the pampas cat.

- 2.7. Evaluate connectivity among Andean cat sub-populations, using GIS and molecular techniques (by coordinating sample collection within Andean cat range) to determine:
 - Size, structure, and genetic variation of every sub-population
 - Connectivity among sub-populations
 - Priority Andean cat populations for conservation and possible management of meta-populations.
- 2.8. Using samples obtained opportunistically, assess illnesses and parasites that might affect the Andean cat.
- 2.9. Design and plan future studies on population structure and dynamics, dispersal, etc.

Recommendations

- Develop these activities in selected areas and in areas where detailed studies of the species are being carried out.
- Explore non-invasive methods for the study of space and habitat use (genetic studies based on hair or faeces, and/or camera traps).
- Develop methods and protocols for live capture and animal handling that minimize risk of the animals and take into account animal welfare considerations.

Objective 3: To mitigate impacts of human activities on the Andean cat and natural ecosystems through community participation and education

The Andean cultures have traditions and beliefs that are still maintained to some degree among some populations, principally Aymara and Quechua. The titi (Andean cat and/or pampas cat) is hunted so the skin can be used in some cultural ceremonies, placing both wild cats at risk. Hunting for other reasons also has been recorded in some countries, generally in those areas where such traditions have been lost. For instance, persecution of the Andean cat in parts of Argentina, Perú, and Chile is based on the belief that the cat is a predator of domestic livestock and fowl, or perception that the cat is a threat to domestic animals or even to humans.

As the human population density is much lower in the high Andean region than in the Altiplano or Puna, there is also less habitat alteration. Nevertheless, the types of human activity and the degree to which these are affecting the populations of the Andean cat in various habitats must be determined.

A successful reduction in the hunting of the Andean cat and the alteration of natural habitat requires many different strategies, including education and the participation of the people of local settlements, and the authorities directly involved. Alternative resource use that is compatible with conservation must be found.

Actions

- 3.1. Identify the causes that lead to hunting and habitat alteration in the different areas occupied by the species.

3.2. Identify and prioritize target groups at the local and regional levels.

3.3. Design and implement an educational and publicity campaign aiming to:

- Develop educational material, both global and specific
- Inform/educate about the natural history and conservation of the Andean cat
- Change negative attitudes toward the Andean cat and local habitat
- Recover values and concepts of the Andean cultures with respect to wildlife in general and the Andean cat in particular
- Develop actions to support law enforcement.

3.4. Develop mechanisms to involve local populations in the conservation of the Andean cat and local habitat.

- Carry out workshops in communities
- Strengthen local communities in their role concerning management and conservation of natural resources
- Carry out education and training workshops for park guards
- Seek alternative uses of resources compatible with conservation based on pilot projects

Objective 4: To strengthen the management of protected areas where the Andean cat is present, promote the establishment of new areas or corridors, and encourage the development of conservation initiatives in the region

In the four countries, 36 protected areas have been identified where the Andean cat might possibly occur. Presence has been verified in fourteen of these areas, based on skins, skulls, DNA analysis of faeces, and/or sightings. These existing protected areas are not all exclusively within the high Andean region, so each must be evaluated to determine the presence of the Andean cat and to establish to what degree they favor the conservation of the species in the long term. Based on these surveys and the more general surveys outside of protected areas, we can evaluate the need for promoting expansions of borders of existing areas, the creation of new protected areas, and the establishment of corridors. In addition, we can identify areas where management must be strengthened, principally at a local level.

Actions

4.1. Identify and evaluate protected areas where the Andean cat may be present.

4.2. Verify the presence of the species in existing protected areas.

4.3. Evaluate the need to create new protected areas and/or corridors and identify potential areas.

4.4. Support the management of protected areas where the Andean cat is present, with the purpose of optimizing protection, research, environmental education, and monitoring.

4.5. Where necessary strengthen and increase the capacity of park guards.

- 4.6. Promote cooperative work among range countries, at the level of local administrative units, and support management of wildlife and protected areas.

Objective 5: To promote the implementation and adequacy of conservation legislation and policies regarding the Andean cat and natural ecosystems

The lack of conservation policies regarding the Andean cat and potential habitat, the infringement of existing regulations that protect wildlife, and/or the low capacity for law enforcement of governments have been identified as limiting factors for the conservation of the Andean cat. Thus, actions must be developed that are directed at the local, regional and national levels of decision makers with the purpose of promoting the generation of policies that support the conservation of species such as the Andean cat; as well as publicizing existing laws and educating about the importance of wildlife conservation.

Actions

- 5.1. Develop actions that support the compliance of laws that protect wildlife.
- 5.2. Promote the generation of policies that support the conservation of the Andean cat and natural ecosystems.
- 5.3. Promote the creation of new protected areas and/or corridors.
- 5.4. Develop actions oriented towards obtaining recognition of the Andean cat conservation action plan as an official document within the conservation policies of the local, regional and/or national governments.

Objective 6: To continuously evaluate the actions developed during the implementation of this plan

A system for evaluating progress towards our common conservation goals must be developed. Such a system is necessary particularly when actions involve coordination at different levels and the combined efforts of multiple actors. An evaluation system is critical for determining effectiveness and adjusting or altering measures to improve effectiveness.

In addition, with the purpose of contributing to the achievement of the objectives planned and carrying out the identified actions, this document must be distributed to different sectors of the society, including governmental authorities, research institutions, conservation organizations, and the general public.

The Andean Cat Alliance has an important role in these monitoring and evaluation tasks and the distribution of the action plan, while simultaneously being active agents in the implementation of the plan.

Actions

- 6.1. Maintain coordination among the different actors involved in the conservation of the Andean cat.
- 6.2. Coordinate the distribution of the action plan at the regional and global scales
- 6.3. Design and implement a system to follow and evaluate actions developed in the different themes.
- 6.4. Encourage coordinated and cooperative efforts among authorities and technicians in border areas between range countries where the Andean cat is present.

4. SPECIFIC PROJECTS

Below we detail the prioritized projects according to the objectives and actions proposed. Under each objective, projects of global importance that are necessary to carry out in the four range countries, under the coordination of one or more country representative are described followed by the priority projects identified for each country.

For each project we outline the objectives, method of implementation, corresponding objective/action of the action plan, and the threats or limiting factors that are addressed. The threats or limiting factors are referred to with the prefix which was identified in the Section 1.4. We also indicate the budget required using four categories:

I	= < 2.000	USD
II	= 2.000 to 5.000	USD
III	= 5.000 to 10.000	USD
IV	= > 10.000	USD

The proposed schedule for each project and the corresponding action plan phase are also included. The two phases for the implementation of this five-year action plan are:

Phase I:	July 2004 to April 2007
Phase II:	May 2007 to June 2009

Projects with an (*) are those that are already underway, but that in most cases require additional funding to continue.

For each project the responsible person(s) or institution(s) is listed, as well as the main contact for the project (addresses are provided in Annex 1). Note that many projects need more support, not only in terms of funds, but also in terms of people that are interested in participating. Furthermore, we welcome other projects that are not considered here but that fall within the framework established by the objectives and actions proposed in the plan. Finally, we state in which country the project will be carried out. Those projects that will be implemented in the four range countries are referred to as global.

1. Current distribution and abundance, threats that affect the Andean cat and its ecosystem

1.1. Development of methods of standardized sampling for presence surveys and estimation of relative abundance of the Andean cat and other carnivores (*)

Objectives: Elaborate efficient methods to estimate the abundance of the Andean cat and to determine its status.

Implementation: Test hair and photo trapping, detection of signs, carry out molecular genetic analysis.

Actions: 1.3.

Threats/Limiting factors: 1.4.1, 1.4.2, 1.4.3., 1.4.5., 1.61., 1.6.4.

Annual Budget: IV

Chronogram: On going – Phase I

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM), Wildlife Conservation Society (WCS) - Centro de Ecología Aplicada del Neuquén (CEAN) and Museo de Ciencias Naturales de Salta (MCNS).

Contact: Mauro Lucherini

Locality: Global

1.2. To agree on methods of standardized sampling

Objectives: To obtain uniform data

Implementation: Global consultation by email and carry out a workshop.

Actions: 1.3.

Threats/Limiting factors: 1.4.1, 1.4.2, 1.4.3., 1.4.5., 1.61., 1.6.4.

Annual Budget: II

Chronogram: On going – Phase I

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM) and Museo de Ciencias Naturales de Salta (MCNS).

Contact: Mauro Lucherini

Locality: Global

1.3. Update information on Andean cat distribution, study the factors that affect it, and evaluate habitat requirements (*)

Objectives: Elaborate a distribution map of the Andean cat in South America, assess its conservation status, and carry out an analysis of available and potential habitat.

Implementation: Contribution from each range country based on interviews, field surveys, DNA analysis and GIS.

Actions: 1.1., 1.2., 2.1. 2.2.

Threats/Limiting factors: 1.4.1, 1.61.

Annual Budget: I

Chronogram: On going – Phase I

Responsible: Wildlife Conservation Society (WCS) - Centro de Ecología Aplicada del Neuquén (CEAN).

Contact: Susan Walker

Locality: Global

1.4. Intensify the study of Andean cat distribution and abundance and on habitat and space requirements (*)

Objectives: To achieve a detailed knowledge of the Andean cat distribution and the factors that affects it.

Implementation: Interviews, field surveys, DNA analysis and GIS.

Actions: 1.1., 1.2., 2.1. 2.2.

Threats/Limiting factors: 1.4.1, 1.4.3., 1.61.

Annual Budget: III

Chronogram: On going – Phase I and II

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM), Wildlife Conservation Society (WCS) - Centro de Ecología Aplicada del Neuquén (CEAN) and Museo de Ciencias Naturales de Salta (MCNS).

Contact: Mauro Lucherini

Locality: Argentina

1.5. Evaluate Andean cat habitat and distribution in Bolivia (*)

Objectives: Obtain a detailed map of the Andean cat distribution in Bolivia, evaluate its potential habitat and obtain information on current conservation status of populations.

Implementation: Use of GIS analysis, identification and evaluation of potential areas and protected areas, interviews, field surveys, collection of hair and/or faecal samples, DNA analysis.

Actions: 1.1., 1.2., 2.1. 2.2., 4.1., 4.3.

Threats/Limiting factors: 1.4.1, 1.61.

Annual Budget: III

Chronogram: On going – Phase I

Responsible: Fernando Alfaro, Giovana Gallardo and Lilián Villalba

Contact: Fernando Alfaro

Locality: Bolivia (selected areas of Cochabamba, Chuquisaca, La Paz, Oruro, Potosí and Tarija)

1.6. To determine the current distribution, abundance and status of the Andean cat in Chile (*)

Objectives: Carry out presence/absence surveys in potential sites. Determine relative abundance of isolated Andean cat populations. Evaluate the threats that affect the species and its habitat. To understand the level of connectivity of Andean cat populations and how this affects their long-term conservation.

Implementation: Interviews, detection of signs (tracks, faecal samples), hair and/or photo trapping, faecal or hair DNA analysis. Use of GIS. Recruit help of park guards.

Actions: 1.1., 1.2., 1.3., 2.1., 2.7., 2.9.

Threats/Limiting factors: 1.4.1, 1.4.4., 1.4.5., 1.6.1.

Annual Budget: IV

Chronogram: On going – Phase I

Responsible: Agustin Iriarte Walton and Constanza Napolitano

Contact: Agustin Iriarte Walton

Locality: Chile: Regions I to V and metropolitan area

1.7. Distribution and conservation status of the Andean cat in range areas of Perú (*)

Objectives: To determine the distribution and conservation status of the Andean cat in range areas of Perú.

Implementation: Interviews, detection of signs, photo trap, DNA analysis of hair and faecal samples.

Actions: 1.1., 1.2., 2.1., 2.2.

Threats/Limiting factors: 1.4.1., 1.6.1.

Annual budget: IV

Chronogram: Phase I

Responsible: Analí Madrid, José Luis Condori, Daniel Cossíos and Roberval Almeida

Contact: Analí Madrid

Locality: Perú: Ancash, Huanuco, Lima, Junín, Pasco, Huancavelica, Apurímac, Cuzco, Arequipa, Moquegua, Tacna and Puno

2. Population Genetics

2.1. Evaluate the genetic variability of and connectivity between Andean cat populations

Objectives: Determine the structure and genetic variability of each population of Andean cats and the extent of connectivity among them. To determine through population genetic studies which Andean cat populations are more endangered. Determine whether hunting and other factors currently influence the genetic variation of Andean cat populations.

Implementation: Development of adequate microsatellite markers. DNA analysis of faecal and/or hair samples previously collected by other AGA projects. Species identification and structure of populations using appropriate genetic markers. Comparison between Andean and pampas cat populations.

Actions: 1.2., 2.6., 2.7.

Threats/Limiting factors: 1.4.1., 1.4.2., 1.4.5.

Annual budget: III

Chronogram: Phases I and II

Responsible: Daniel Cossíos

Contact: Daniel Cossíos

Locality: Global

2.2. Evaluate Andean cat populations through molecular techniques in key areas of Bolivia

Objectives: Identify species presence through the analysis of hair and faeces; determine structure and genetic variation of the sampled populations, build local capacity to carry out complementary studies of the species using molecular techniques.

Implementation: Collection of samples (faeces/hair) within the projects carried out by the different Bolivian teams. Collaboration and training is planned in conjunction with other South American research institutions.

Actions: 1.1., 1.2., 2.7., 2.9.

Threats/Limiting factors: 1.4.4., 1.4.5.

Annual budget: IV

Chronogram: Phases I and II

Responsible: Fernando Alfaro, Giovana Gallardo and Lilián Villalba

Contact: Lilián Villalba

Locality: Bolivia (selected areas from Cochabamba, Chuquisaca, La Paz, Oruro, Potosí and Tarija)

3. Natural History

3.1. To estimate the habitat and spatial requirements of the Andean cat in Bolivia (*)

Objectives: Carry out a study of habitat use and other aspects of biology and ecology of the Andean cat.

Implementation: Use of radio telemetry and complementary techniques (camera traps, track analysis, collection of faecal or hair samples, and laboratory techniques).

Actions: 2.1., 2.5., 2.7.

Threats/Limiting factors: 1.4.3., 1.4.5., 1.6.1.

Annual Budget: IV

Chronogram: On going, Phases I and II

Responsible: Lilián Villalba

Contact: Lilián Villalba

Locality: Bolivia: Potosí

3.2. Increase understanding of the ecology of the Andean cat in Chile

Objectives: Carry out studies in selected areas to evaluate habitat use and spatial ecology of the species using radio telemetry studies. Determine the Andean cat diet. Determine presence, relative abundance and prey availability in the study sites. Build local capacity to carry out DNA analysis of faecal or hair samples.

Implementation: GIS, camera traps, live trapping of animals for radio collaring. Faecal samples collection for individual identification through DNA analysis. Prey base evaluation and trapping. Interviews to local people and park rangers.

Actions: 1.1., 1.2., 2.1., 2.2., 2.3., 2.4., 2.5., 2.6., 4.1., 4.2.

Threats/Limiting factors: 1.4.1., 1.4.2., 1.4.3. 1.4.4., 1.4.5., 1.6.1., 1.6.4.

Annual budget: IV

Chronogram: Phase I

Responsible: Agustín Iriarte Walton, Magdalena Bennet and Constanza Napolitano

Contact: Agustín Iriarte Walton

Locality: Chile: Regions I and II

3.3. To study the abundance and habitat characterization of the Andean cat in selected areas of Perú

Objectives: Estimate the relative abundance of the Andean cat and determine its potential habitat

Implementation: Field surveys and use of GIS.

Actions: 1.1., 1.2., 2.1.

Threats/Limiting factors: 1.4.1., 1.4.5., 1.6.1.

Annual budget: IV

Chronogram: Phases I and II

Responsible: Analí Madrid and José Luis Condori

Contact: Analí Madrid

Locality Perú: Kovire-Tacna, Aymara Lupaca-Puno

3.4. To study the diet of the Andean cat and other guild members in relation to prey abundance and distribution in Argentina (*)

Objectives: To understand how availability of prey and interspecific competition affect the current status of the Andean cat.

Implementation: Field surveys, analysis of faecal samples, trapping and censusing of prey.

Actions: 2.1., 2.2., 2.3., 2.4., 2.6.

Threats/Limiting factors: 1.4.3., 1.4.4., 1.6.1.

Annual budget: III

Chronogram: On going – Phase I

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM) – Wildlife Conservation Society (WCS) and Centro de Ecología Aplicada del Neuquén (CEAN) – Museo de Ciencias Naturales de Salta (MCNS).

Contact: Mauro Lucherini

Locality: Argentina, in key localities

3.5. Evaluate the Andean cat diet and estimate the distribution and abundance of its prey in key areas of Bolivia (*)

Objectives: Study the food habits of the Andean cat and other carnivores, determine the level of competition. Estimate the relative abundance of the main prey and contribute to a better knowledge of the species.

Implementation: Field surveys, collection and analysis of faecal samples, evaluation of prey species through censusing and/or prey trapping.

Actions: 2.1., 2.2., 2.3., 2.4., 2.6., 2.9.

Threats/Limiting factors: 1.4.3., 1.4.4., 1.6.1.

Annual budget: III

Chronogram: Phase I: 3 key localities, Phase II: other areas

Responsible: Fernando Alfaro, Giovana Gallardo and Lilián Villalba

Contact: Fernando Alfaro, Lilián Villalba

Locality: Bolivia, key localities

3.6. Study of the diet of the Andean cat and other carnivores in selected areas of Perú and estimate relative abundance of potential preys.

Objectives: Determine the Andean cat diet and compare to that of other carnivores present in the areas to be evaluated. Determine the relative abundance of Andean cat potential prey.

Implementation: Field surveys for collecting faecal samples and prey species, analysis of the faecal samples. Create reference collections (zoological and botanical material). Carry out census and/or prey trapping.

Actions: 2.1., 2.2., 2.3., 2.6.

Threats/Limiting factors: 1.4.3., 1.4.4., 1.6.1.

Annual Budget: III

Chronogram: Phases I and II

Responsible: Daniel Cossíos and José Luis Condori

Contact: Daniel Cossíos, José Luis Condori

Locality: Perú: Kovire-Tacna, Aymara Lupaca-Puno

4. Mitigate the impact of human activities on the Andean cat and its habitat

4.1. Organize a global community education campaign

Objectives: Design and produce educational strategies and material, train educators

Implementation: Consultation by email and workshop

Actions: 3.3, 3.4., 4.4., 4.5.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.4.4, 1.6.3.

Annual budget: II – III

Chronogram: On going – Phase I

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM) and Museo de Ciencias Naturales de Salta (MCNS).

Contact: Mauro Lucherini

Locality: Global

4.2. Carry out educational campaigns and a community participation pilot project

Objectives: Mitigate impacts, change negative attitudes, increase public awareness, inform and involve local communities in Andean cat conservation.

Implementation: Workshops, meetings, festivals, community integration, development of economic alternatives.

Actions: 3.1., 3.2., 3.3., 3.4.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: I – II

Chronogram: On going – Phase I and possible extension to Phase II

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM) and Museo de Ciencias Naturales de Salta (MCNS)

Contact: Mauro Lucherini

Locality: Argentina, key localities

4.3. Development of educational activities at the rural and urban levels in key areas for Andean cat conservation

Objectives: Promote the conservation of the species and achieve local community participation.

Implementation: Carry out workshops and other educational activities, production of educational/extension material.

Actions: 3.1., 3.2., .3.3., 3.4., 4.4., 4.5.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: III

Chronogram: Phases I and II

Responsible: Fernando Alfaro, Giovana Gallardo and Lilián Villalba

Contact: Fernando Alfaro

Locality: Bolivia, key areas

4.4. Promote education and community participation to reduce impact of human activities in Chile

Objectives: Determine and evaluate human activities that impact Andean cat populations and their habitats. Develop an educational and informative campaign. Involve local communities in conservation actions and strengthen park guard's ability to carry out control and educational activities. Mitigate impacts, change negative attitudes towards Andean cat and support law enforcement.

Implementation: Design, production and distribution of educational material in schools and villages. Carry out interviews in main villages of the study area. Educational and informative campaigns in schools and villages through park guards of CONAF. Training of park guards.

Actions: 3.3., 3.4., 5.1.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: III

Chronogram: Phase I

Responsible: Constanza Napolitano and Leonardo Turra

Contact: Constanza Napolitano

Locality: Chile: Regions I and II

4.5. Didactic module on Andean cat conservation for educational centres of Perú

Objectives: Educate school age population on the importance of Andean cat conservation.

Implementation: Elaborate the materials for the module (booklet, posters, puppets, activity manual for teachers and park guards).

Actions: 3.3., 4.5., 5.1.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: III

Chronogram: Phase I

Responsible: Daniel Cossíos and Jessica Espinoza

Contact: Daniel Cossíos

Locality: Perú

4.6. Participation and community education for Andean cat conservation in Perú

Objectives: Develop a community education program.

Implementation: Workshops, extension activities, work with environmental groups.

Actions: 3.3., 4.5., 5.1.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: III

Chronogram: Phases I and II

Responsible: Analí Madrid and José Luis Condori

Contact: José Luis Condori

Locality: Perú

4.7. Recovery of Andean social and cultural values and social awareness for Andean cat conservation in key areas of Bolivia

Objectives: Obtain information on traditions and social and cultural values of the Andean communities concerning the Andean cat and pampas cat; validate socially the interest to conserve the species; elaborate a conservation plan with the participation of the communities, contribute to the knowledge of Andean cat distribution.

Implementation: Interviews and workshop with local communities

Actions: 3.3., 4.5., 5.1.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: III

Chronogram: Phase I

Responsible: Giovana Gallardo, Lilián Villalba and Fredy Yapu

Contact: Giovana Gallardo, Lilián Villalba

Locality: Bolivia, key areas

4.8. To value traditional customs and awareness for Andean cat conservation in Perú

Objectives: To learn about and value the traditional customs of the high Andean communities of Perú related to wild felids.

Implementation: Interviews with local people. Elaborate extension materials as support of the local implementation of tourist information

Actions: 3.3., 4.5., 5.1.

Threats/Limiting factors: 1.4.1, 1.4.2., 1.6.3.

Annual budget: III

Chronogram: Phase I

Responsible: Analí Madrid and José Luis Condori

Contact: Analí Madrid

Locality: Perú

5. Strengthen management related to conservation at the local and regional levels

5.1. To strengthen the management of protected areas and promote the establishment of others in Argentina (*)

Objectives: To contribute to the improvement of the conservation status of the Andean cat in Argentina.

Implementation: Participate in the development of management plans, design of new protected areas and/or corridors, in collaboration and interaction with NGOs and GOs.

Actions: 4.2., 4.3., 4.4., 5.3.

Threats/Limiting factors: 1.4.1, 1.6.1, 1.6.2., 1.6.4.

Annual budget: I – II

Chronogram: On going (2003) – Long term

Responsible: Grupo de Ecología Comportamental de Mamíferos (GECM), Wildlife Conservation Society (WCS) - Centro de Ecología Aplicada del Neuquén (CEAN) and Museo de Ciencias Naturales de Salta (MCNS).

Contact: Susan Walker

Locality: Argentina, key localities

5.2. Support local management of protected areas and communities in key areas of Bolivia where the Andean cat is present

Objective: Promote Andean cat conservation in protected and non protected areas where

Implementation: Extension activities, educational workshop, community participation and training of park guards.

Actions: 4.1., 4.2., 4.3., 4.4., 4.5., 5.1.

Threats/Limiting factors: 1.4.1., 1.6.2, 1.6.3., 1.6.4.

Annual budget: II

Chronogram: Phases I and II

Responsible: Fernando Alfaro, Giovana Gallardo and Lilián Villalba

Contact: Lilián Villalba

Locality: Bolivia: key localities (Cochabamba, Chuquisaca, La Paz, Oruro, Potosí, Tarija)

5.3. Create new protected areas and strengthen the established areas in Chile

Objectives: Strengthen the actions and management of protected areas; promote the establishment of new protected areas within the National System of Wild Protected Areas of the State (SNASPE). Evaluate and promote the creation of corridors and foment the development of initiatives and conservation actions.

Implementation: Evaluation of Andean cat presence in areas outside of protected areas. Strengthen the actions within protected areas through training of park guards of CONAF.

Actions: 4.2., 5.2., 5.3.

Threats/Limiting factors: 1.4.1., 1.6.2, 1.6.3., 1.6.4.

Annual budget: II

Chronogram: Phase I

Responsible: Magdalena Bennet, Constanza Napolitano and Agustín Iriarte Walton

Contact: Agustín Iriarte Walton

Locality: Chile

5.4. Participation in the elaboration and execution of planning documents for protected areas in Perú

Objectives: Provide support in the elaboration of management plans of protected areas where the Andean cat is or can be present.

Implementation: Develop technical-scientific studies in selected protected areas.

Actions: 4.2., 4.3., 4.4., 5.3.

Threats/Limiting factors: 1.4.1, 1.6.1, 1.6.2., 1.6.4.

Annual budget: II

Chronogram: Phase II

Responsible: José Luis Condori and Roberval Almeida

Contact: José Luis Condori

Locality: Perú

5.5. Promote the creation of a natural protected area in the department of Tacna, Perú

Objectives: Support the creation of a natural protected area in Tacna, based on Andean cat conservation

Implementation: Field surveys to map areas of potential and current use by the Andean cat, elaborate distribution maps of other key species and land use. Results will support the creation of a protected area in Tacna and its zonification.

Actions: 4.2., 5.2., 5.3.

Threats/Limiting factors: 1.4.1., 1.6.2, 1.6.3., 1.6.4.

Annual budget: II

Chronogram: Phase I

Responsible: José Luis Condori and Analí Madrid

Contact: José Luis Condori

Locality Perú, Tacna

5.6. Andean cat conservation training program for managers in Perú

Objectives: Increase the capacity of park guards where necessary. Instruction of the staff from governmental institutions related to environmental protection. Educate teachers.

Implementation: Courses, workshops, development of educational material.

Actions: 3.3., 3.4., 4.4., 4.5.

Threats/Limiting factors: 1.6.2., 1.6.4.

Annual budget: II

Chronogram: Phases I and II

Responsible: Analí Madrid, José Luis Condori and Roberval Almeida

Contact: Analí Madrid

Locality: Perú

6. Promotion of legislation and policies related to the Andean cat and its ecosystem

6.1. Organize workshops and extension activities directed towards decision-maker groups at urban and rural levels in Bolivia

Objectives: Influence the generation of conservation policies

Implementation: Elaborate educational material and organize workshops, meetings.

Actions: 3.3., 5.1., 5.2., 5.3., 5.4.

Threats/Limiting factors: 1.4.1., 1.4.5., 1.6.2., 1.6.3., 1.6.4.

Annual budget: I

Chronogram: Phases I and II

Responsible: Fernando Alfaro, Giovana Gallardo and Lilián Villalba

Contact: Lilián Villalba

Locality: Bolivia: key areas, urban and rural

6.2. Promote changes in policies and legislation to favor Andean cat conservation in Chile (*)

Objectives: Improve compliance of the law and have policies and legislation that favor conservation of the Andean cat and its habitat.

Implementation: Coordinate actions with governmental agencies; develop meetings, elaboration of reports directed to key personnel (technicians and authorities) of SAG, CONAF and Carabineros staff.

Actions: 5.1., 5.2.

Threats/Limiting factors: 1.4.1., 1.4.5., 1.6.2., 1.6.3., 1.6.4.

Annual budget: III

Chronogram: Phase I

Responsible: Agustín Iriarte Walton, Warren Johnson and Constanza Napolitano

Contact: Warren Johnson

Locality: Chile

7. Monitoring and evaluation of the implementation of the action plan

7.1. Development of coordinated actions to implement the action plan

Objectives: Coordinate actions that require the participation of different range countries. Maintain a permanent coordination among AGA members and other persons involved in Andean cat conservation.

Implementation: Identification and implementation of joint tasks, maintain permanent contact and coordination. Contact via e-mail, AGA meetings every two years.

Actions: 6.1., 6.3.

Annual budget: I (General Coordination), II (AGA meetings, every two years)

Chronogram: Permanent activity

Responsible: AGA Coordinator and AGA representatives by country

Contact: Lilián Villalba, Mauro Lucherini, Agustín Iriarte W., Daniel Cossíos

Locality: Range countries and global

7.2. Distribution of the action plan to key sectors and areas

Objectives: To spread the objectives and actions of the action plan, contact and take on personnel interested in supporting the implementation of this plan, identify strategic alliances to support the Plan.

Implementation: Identification of sectors and areas inside and outside the range countries, distribution of the action plan. Contact via e-mail, meetings with key sectors.

Actions: 6.2., 6.4.

Annual budget: I (by country)

Chronogram: Phase I

Responsible: AGA Coordinator and AGA representatives by country

Contact: Lilián Villalba, Mauro Lucherini, Agustín Iriarte Walton, Daniel Cossíos/José Luis Condori

Locality: Range countries and global

7.3. Implement a monitoring plan and evaluate the proposed actions in the plan

Objectives: Monitor and evaluate periodically the proposed actions of this plan.

Implementation: Elaborate a monitoring and evaluation plan; consult with AGA members, coordination via e-mail, AGA meetings every two years.

Actions: 6.1., 6.3., 6.4.

Annual budget: I

Chronogram: Phases I and II

Responsible: AGA Coordinator and AGA representatives by country

Contact: Lilián Villalba, Mauro Lucherini, Agustín Iriarte Walton, Daniel Cossíos

Locality: Within range countries and global

5. FUTURE INITIATIVES

5.1. Create a multifunctional web site for AGA

Objectives: 1) Develop a web site of free access to inform the public and allow their participation in the different activities of AGA; 2) Develop a site of internal use for AGA members that facilitate the concentration, exchange and evaluation of the information and progress obtained by AGA.

Executive summary: The WEB is a powerful tool to support the objectives of AGA. It allows the exchange of information with a numerous public, makes electronic donations possible, helps development of collaborations, and allows updating of a data base for internal use.

Annual budget: I – II

Responsible: AGA

Contact: AGA coordinator, AGA country representatives

Locality: Range countries and global

5.2. Create a red of monitors of high Andean fauna

Objectives: 1) Involve local communities in an Andean cat monitoring and a species protection program; 2) Maintain long term monitoring of selected populations.

Executive summary: The personal involvement of the people is an important tool to obtain the support of local communities in conservation. Through meetings, workshops and training in field techniques, a group of local people will be selected to participate in long term monitoring and care of carnivores in key localities. Incentives will ensure participation of the monitors. The formation of a net of monitors facilitates the exchange of the information. Furthermore, the training could be useful for the development of tourist enterprises at a small scale, driven by local communities.

Annual budget: II - III

Responsible: Mauro Lucherini

Contact: Mauro Lucherini and AGA country representatives

Locality: Global, Initially Argentina

5.3. Include other carnivore species of the high Andean region, within the Andean cat conservation plan

Objectives: Diversify the task of AGA in actions directed to the conservation of other carnivore species that are part of the Andean cat habitat.

Executive summary: The conservation of the Andean cat involves the development of actions directed at habitat conservation as well as the conservation of other species that share this habitat. An integral approach of research activities and conservation will allow an efficient management of human and scarce financial resources. This project is related with proposal 5.2., so implementation must be coordinated.

Annual budget: II

Responsible: Fernando Alfaro

Contact: Fernando Alfaro and AGA country representatives

Locality: Global, Initially Bolivia

5.4. Four-country training, rehabilitation and captive breeding program for the Andean cat and Pampas cat

Objectives: 1) To strength local capacity in range countries for small felid management/rehabilitation in captivity through researchers/wildlife manager training, 2) Establish a common rehabilitation program for Andean cats and other small felids from Argentina, Bolivia, Chile, and Perú, 3) Establish a captive breeding program for Andean cats and other small felids from Argentina, Bolivia, Chile, and Perú.

Executive summary: Wild cats confiscated by wildlife authorities or caught by individuals are often brought to public facilities such as zoos. These zoos have little or no expertise to care for these rare cats. In the past these cats died within a few months. Currently there are none in any zoos. The Pampas cat and the Andean mountain cat are far too rare for this to continue. To avoid this situation, local capacities already present must be strengthened.

Annual budget: III - IV

Responsible: Jim Sanderson, Agustin Iriarte, Constanza Napolitano, Analí Madrid

Contact: Jim Sanderson, Agustin Iriarte (Chile), Analí Madrid (Perú)

Locality: Objective 1) Training in countries of expertise for range country participants, Objectives 2) and 3) Range countries

ANNEX 1

Andean Cat Alliance members - AGA-

AGA Coordinator : Lilián Villalba;
Country Representatives:
Argentina: Mauro Lucherini; Bolivia: Lilián Villalba;
Chile: Agustin Iriarte W.; Perú: Daniel Cossios

Alfaro, Fernando

Centro de Biodiversidad y Genética (CBG)
Sucre y Parque La Torre
Casilla 538
Cochabamba, Bolivia
e-mail: nanoalfaro@gmx.net

Almeida, Roberval

Asociación Mesoamericana y del Caribe de zoológicos y acuarios (AMACZOOA)
Apdo. 26.8203 Puerto Jiménez
Península de Osa, Costa Rica
e-mail: aroberval@hotmail.com

Condori, José Luis

Santuario Nacional Lagunas de Mejía, INRENA
Calle Juana Cervantes E-3, Cerro Colorado
Arequipa, Perú
e-mail: jose8c@hotmail.com / ctongo@yahoo.com

Cossíos, Daniel

Universidad Nacional Mayor de San Marcos
Córdoba N° 110 Higuiereta, Surco
Lima 33, Perú
e-mail: dcossios@yahoo.com

Gallardo, Giovana

BIOTA
Home Address:
Los Pinos calle 6, Bloque 82, Depto. 202
La Paz, Bolivia
e-mail: giovigallardo@hotmail.com / giovanagallardo@yahoo.com

García-Perea, R.

Museo Nacional de Ciencias Naturales
Departamento de Biodiversidad
C/J. Gutierrez Abascal N° 2
Madrid 28006, Spain
e-mail: mcng310@mncn.csic.es

Iriarte W, Agustín

Presidente
Fundación Biodiversitas
Suecia 3304
Santiago, Chile
Fax: 562-274-2879
e-mail: airiarte@biodiversitas.cl

Lucherini, Mauro

Grupo de Ecología Comportamental de Mamíferos (GECM)
Cát. Fisiología Animal
Departamento de Biología, Bioquímica y Farmacia
Universidad Nacional del Sur
San Juan 670
(8000) Bahía Blanca, Argentina
Fax: 54-291-4595130
e-mail: luengos@criba.edu.ar

Madrid, Analí

Reserva Nacional de Salinas y Aguada Blanca
ARAUCARIA-Colca Project
Calle Zela N° 203 Yanahuara
Arequipa, Perú
e-mail: anali_madrid@hotmail.com / amadrid_rivera_pe@yahoo.com

Merino, María José

Grupo de Ecología Comportamental de Mamíferos (GECM)
Cát. Fisiología Animal
Departamento de Biología, Bioquímica y Farmacia
Universidad Nacional del Sur
San Juan 670
(8000) Bahía Blanca, Argentina
Fax: 54-291-4595130
e-mail: luengos@criba.edu.ar

Napolitano, Constanza

Universidad de Chile
Home Address:
Charles Hamilton N° 13.731 Las Condes
Santiago, Chile.
e-mail: mochuela@hotmail.com / gata_andina@hotmail.com

Novaro, Andrés

Wildlife Conservation Society
Centro de Ecología Aplicada del Neuquen (CEAN)
C.C. 7, Junín de los Andes
(8371) Neuquen, Argentina
e-mail: novawalk@fronteradigital.net.ar / novawalk@smandes.com.ar

Perovic, Pablo

Museo de Ciencias Naturales, Universidad de Salta
Mendoza 2
(4400) Salta, Argentina
e-mail: perovic@unsa.edu.ar

Sanderson, Jim

Center for Applied Biodiversity Science
Conservation International 1919 M Street, NW, Suite 600
Washington, DC 20036-3521, USA
Fax: 202-912-0773
email: gato_andino@yahoo.com

Villalba, Lilián

Colección Boliviana de Fauna (CBF)
Home Address:
Achumani, Calle 17 N°41
La Paz, Bolivia
e-mail: lilianvillalba@hotmail.com / oreailuritus_04@yahoo.com

Walker, Susan

Wildlife Conservation Society
Centro de Ecología Aplicada del Neuquen (CEAN)
C.C. 7, Junín de los Andes
(8371) Neuquen, Argentina
e-mail: novawalk@fronteradigital.net.ar / novawalk@smandes.com.ar

ANNEX 2

Participants' List

WORKSHOP

ALIANZA GATO ANDINO - ANDEAN CAT ALLIANCE WILDLIFE CONSERVATION NETWORK

ACTION PLAN FOR THE ANDEAN CAT CONSERVATION April 12 - 15, 2004, Arica, Chile

Argentina

- **Mauro Lucherini**
Argentina AGA Representative
Grupo de Ecología Comportamental de Mamíferos (GECM)
Universidad Nacional del Sur
Bahía Blanca
- **Pablo Perovic**
Museo de Ciencias Naturales, Universidad de Salta
Salta

Bolivia

- **Fernando Alfaro**
Associate Researcher, Centro de Biodiversidad y Genética (CBG)
Cochabamba
- **Giovana Gallardo**
Centro de Estudios en Biología Teórica y Aplicada (BIOTA)
La Paz
- **Alejandra Lacaze**
Universidad Mayor de San Simón
Cochabamba
- **Lilián Villalba**
AGA Coordinator and Bolivia AGA Representative
Associate Researcher, Colección Boliviana de Fauna (CBF)
La Paz

Chile

- **Agustín Iriarte**
Chile AGA Representative
Corporación Nacional Forestal (CONAF)
Santiago
- **Constanza Napolitano**
Universidad de Chile
Santiago

- **Oscar Concha**
Director Regional
Servicio Agrícola y Ganadero (SAG), Región I
Arica
- **Victor Valdivia**
Encargado
Deporen Servicio Agrícola y Ganadero (SAG) Región I
Arica
- **Leonardo Turra**
Médico veterinario
SAG, Región I
Arica
- **Ricardo Porcel**
Jefe
Secretaría Regional Ministerial de Agricultura Región I
Arica
- **Guillermo Cisternas Valenzuela**
Director Regional
Corporación Nacional Forestal (CONAF), Región I
Arica
- **Cesar Cardozo Rojas**
Jefe
U.G. Patrimonio Silvestre CONAF, Región I
Arica
- **Jorge Herreros de Lartundo**
Encargado de Fauna
CONAF, Región I
Arica
- **Enrique Miranda Franulic**
Encargado de Flora
CONAF, Región I
Arica
- **Carlos Nassar San Martín**
Encargado de Operaciones
CONAF, Región I
Arica

Perú

- **Roberval Almeida**
Researcher
Asociación Mesoamericana y del Caribe de Zoológicos y Acuarios
Costa Rica
- **José Luis Condori**
Instituto Nacional de Recursos Naturales
Arequipa

- **Analí Madrid**
Responsible of area management and protected species
Reserva Nacional de Salinas y Aguada Blanca
ARAUCARIA-Colca Project
Arequipa

United States

- **Elaine Iverson**
Program Manager
Wildlife Conservation Network (WCN)
25745 Basset Lane
Los Altos CA 94022
e-mail: elaine_iverson@sbcglobal.net
- **Jim Sanderson**
Center for Applied Biodiversity Science
Conservation International
Small Cat Conservation Alliance

United Kingdom

- **Claudio Sillero-Zubiri**
People & Wildlife Initiative
Wildlife Conservation Research Unit (WildCRU)
Zoology Department, Oxford University
South Parks Road
Oxford OX1 3PS
e-mail: claudio.sillero@zoo.ox.ac.uk

ANNEX 3

Glossary

Aymara:

The Andean region (highlands and valleys) were occupied by the Aymara nation before the Inca conquest and the invasion of Spaniards. Today an important number of people of Aymara origin live in the highlands of mainly Bolivia, Perú and northern Chile. These people maintain in certain degree some ancient costumes, values and still speak the Aymara language.

Biogeographic

Province:

We use the classification of biogeographic regions proposed by Cabrera and Willink (1973). They divide these regions in “domains” and “provinces”, based mainly on vegetation features. The high-Andean and Puna provinces are within the “Andean-Patagonico” Domain.

Bofedales:

These are special vegetation formations in the highlands of the Andes. Hidrophyle plants grow and form big cushions that are permanent irrigated by small streams that mainly come from the mountains and melting ice.

Quechua:

Is the language that Inkas talked. Nowadays, people that still talking this language and keep some ancient traditions inhabit mainly the valleys of Perú and Bolivia.

Puna/Altiplano:

The biogeographic province Puna encompasses the high-tableau (altiplano) that is situated between the parallels 15° and 27° of south latitude. Consist of extensive plains, dissected by smaller mountain ranges and bordered by the two main branches of the Andean mountain range: to the east by the “Cordillera Real” and to the west by the “Cordillera de los Andes”. The elevation range is between 3200 and 4400m but lower limits increase from south to north. Dominant vegetation is an arbustive steppe and mean annual temperature fluctuates from 8,5° to 9,5°C (Cabrera y Willink 1973).

High Andean:

Embraces the higher mountains of the Andean mountain range, from Venezuela to Tierra del Fuego. In tropical zones, this province is situated above 4200m of elevation up to perpetual snowline and to the south the lower elevation varies: at parallel 34, begins at 3000m and at parallel 54° (Tierra del fuego) begins at 500m above sea level. Vegetation is scarce and scattered and, temperatures are lower than Puna region. Pluvial precipitation comes mainly as snow or hail.

Note for page 1:

At the meeting in Arica, members of the Andean Cat Alliance agreed to change the English name “Andean mountain cat” to **Andean cat**, because the use of the words “Andean” and “mountain” together is redundant.

Note for page 2:

The local names: **Oscollo, osqhollo, oskollo, osjollo**, are the same names. The variation in the spelling is owed to that Aymara and Qhechua were languages with out writing text and writing words for both languages is relatively recent; then those differences comes from the different ways to express in writing the special pronunciation of this local name.

REFERENCES

- Almeida, R. and J. Condori. 2002. Ecología y conservación del gato andino (*Oreailurus jacobita*) en la Reserva Nacional de Salinas and Aguada Blanca, Arequipa – Perú. Primer informe no publicado de la iniciativa multinacional para determinar la situación del gato andino y las prioridades para su conservación. Cat Action Treasury - COCGA.
- Anderson, S. 1997. Mammals of Bolivia, taxonomy and distribution. *Bulletin of The American Museum of Natural History*. 231:337-338.
- Baillie, J. and B. Groombridge. 1996. *The 1996 IUCN Red List of threatened animals*. IUCN, Gland, Switzerland.
- Bernal, N. 1999. Capítulo Mamíferos. In J. Sarmiento, ed. *Plan de acción para las especies amenazadas de Bolivia*. Diagnóstico. Museo Nacional de Historia Natural. La Paz, Bolivia.
- Bonino, N. 1986. La liebre europea I, aspectos bio-ecológicos e importancia económica. *Fauna Silvestre, Especies 2*. INTA. Argentina. 4 pp.
- Bonino, N. and A. Montenegro. 1997. Reproduction of the European hare in Patagonia, Argentina. *Acta Theriologica* 42:47-54.
- Broad, S. 1987. International trade in skins of Latin American spotted cats. *Traffic Bulletin*, Vol. 9, N°2/3. 8pp.
- Brush, S.B. 1989. El ambiente natural y humano de los Andes centrales. In: *Informe sobre los conocimientos actuales de los ecosistemas Andinos*. Vol.2. UNESCO/PNUMA – MAB. Uruguay. 53 pp.
- Cabrera, A.L. and A. Willink. 1973. Biogeografía de América Latina. *Organización de los Estados Americanos - Monografía* 3:83-89.
- Cofre, H. and P. Marquet. 1999. Conservation status, rarity and geographic priorities for conservation of Chilean mammals: an assessment. *Biological Conservation* 88:53-68.
- CONAF. 1988. *Libro rojo de los vertebrados terrestres chilenos*. Corporación Nacional Forestal, Ministerio de Agricultura, Santiago, Chile.
- Condori, J. and R.T. Almeida. 2001. Distribución and estado de conservación de felinos silvestres en la Reserva Nacional de Salinas de Aguada Blanca – Perú. In: *Libro de Resúmenes del V Congreso Internacional de Manejo de Fauna Silvestre In Amazonía and Latinoamérica*. Cartagena de Indias. Colombia.
- Cornalia, E. 1865. Descrizione di una nuova specie del genere *Felis*, *Felis jacobita* (Corn.). *Mem. Soc. Ital. Sci. Nat.* 1:1-9.

- Cossíos, D. and A. Madrid. 2003. *Andean mountain cat (Oreailurus jacobita) and other Andean carnivores. Status survey in Ayacucho, Arequipa, Puno and Tacna Departments, Peru.* Unpublished Report. Cat Action Treasury. Lima, Perú.
- Delgado, E., Villalba, L., Sanderson, J., Napolitano, C., Berna, M. and J. Esquivel. 2004. Capture of an Andean Cat in Bolivia. *Cat News* 40:2.
- Dinerstein, E., Olson, D.M., Graham, D.J., Webster, A.L. Primm, S.A., Bookbinder, M.P. and G. Ledec. 1995. *A conservation Assessment of the terrestrial ecoregions of Latin America and the Caribbean.* WWF, The World Bank, Washington, D.C., USA.
- Ergueta, P., Gómez, H. and O. Rocha. 1997. Un análisis sobre el estado de conservación de los vertebrados de la Reserva Nacional de Fauna Andina Eduardo Avaroa (Provincia Sud Lípez, Departamento Potosí, Bolivia). *Ecología en Bolivia* 30:1-32.
- García-Perea, R. 2002. Andean mountain cat, *Oreailurus jacobita*: morphological description and comparison with other felines from the Altiplano. *Journal of Mammalogy* 83:110-124.
- García Fernández, J.J., Ojeda, R.A., Fraga, R.M., Díaz, G.B. and R.J., Baigún. 1997. *Mamíferos and aves amenazados de la Argentina.* FUCEMA, Buenos Aires, Argentina.
- Greer, J.K. 1965b. Another record of the Andean Highland Cat from Chile. *Journal of Mammalogy* 46:507.
- Grimwood, I. R., 1968. *Notes on the distribution and status of some Peruvian mammals.* Special Publication N° 21. American Committee for International Wildlife Protection and New York Zoological Society. New York. USA.
- Groombridge, B. ed. 1993. *The 1994 IUCN Red List of threatened animals.* IUCN, Gland, Switzerland.
- Hilton-Taylor, C. compiler. 2000. *The 2000 IUCN Red List of threatened animals.* IUCN, Gland, Switzerland.
- Iriarte, A. 1999. *Gato montés andino In Chile: Estado de conservación y distribución geográfica.* Report to Cat Action Treasury and IUCN Cat Specialist Group. www.felidae.org/projects. Santiago, Chile.
- Iriarte, A. and J. Sanderson. 2000. *Co-existence of the Andean mountain cat and Pampas cat in Chilean Altiplano.* Unpublished Progress Report, IUCN Cat Specialist Group.
- IUCN. 2001. *IUCN Red List categories and criteria vers. 3.1.* IUCN, Gland, Switzerland.
- Johnson, W.E., Culver, M., Iriarte, J.A., Eizirik, E., Seymour, K.L. and S. J. O'Brien. 1998. Tracking the evolution of the elusive Andean mountain cat (*Oreailurus jacobita*) from mitochondrial DNA. *The Journal of Heredity* 89:227-232.

- Kessler, M. 2001. Forgotten forests of the high Andes, <http://www.plant-talk.org/Pages/15andes.html>
- Little, A. and E. Gomez Molina. 1989. Geoecología de los Andes. Las ciencias naturales como base para la planificación de las investigaciones. In *Informe sobre los conocimientos actuales de los ecosistemas Andinos, Una Visión General de la Región Andina*. Vol. 1:35-80. Rostlac. UNESCO, Uruguay.
- Lucherini, M., Sana, D. and D. Birochio. 1999. The Andean Mountain cat and the other wild carnivores in the proposed Anconquija National Park, Argentina. *Società Zoologica La Torbiera Scientific Reports*. Società Zoologica La Torbiera, Italia.
- Lucherini, M., Birochio, D., Luengos Vidal, E., Merino, M.J. and L. Soler. 2003. *Linking education and research for the conservation of the Andean Mountain cat*. Unpublished Final Report. BP Conservation Programme. Bahía Blanca, Argentina.
- Lucherini, M. and E. Luengos Vidal. 2003. Intraguild competition as a potential factor affecting the conservation of two endangered cats in Argentina. *Endangered Species Updates* 2:211-220.
- Lucherini, M., Huaranca, J.C., Savini, S., Tavera, G., Luengos Vidal, E. and M. J. Merino. In press. New photographs of the Andean Mountain cat: have we found a viable population? *Cat News*.
- Nowell, K. 2002 a. Revision of the Felidae Red List of Threatened Species. *Cat News* 37:4-6.
- Nowell K. 2002 b. The Cat Specialist Group digital library as a measure of cat conservation effort. *Cat News* 37:23-24.
- Nowell, K. and P. Jackson. eds, 1996. *Wild Cats. Status Survey and Conservation Action Plan*. ICUN/SSC Cat Specialist Group. IUCN. Gland, Switzerland.
- Núñez, A and G. Gallardo. 2002. *Distribución de tres especies de felinos: gato andino (Oreailurus jacobitus), gato de las pampas (Lynchailurus pajeros) and oskollo (Oncifelis geoffroyi) en Bolivia*. Informe no publicado para la Iniciativa Multinacional para Determinar la Situación del Gato Andino and las Prioridades para su Conservación. Cat Action Treasury - COCGA. La Paz, Bolivia.
- Osgood, W.H. 1943. The mammals of Chile. *Field Museum of Natural History, Zoology Series* 30:1-268.
- Pacheco, L.F., Guerra, J.F. and B. Ríos-Uzeda. 2003. Eficiencia de atrayentes para carnívoros In bosques yungueños and praderas altoandinas en Bolivia. *Notas Técnicas. Mastozoología Neotropical* 10:167-176
- Pearson, O.P. 1957. Additions to the Mammalian fauna of Peru and notes on some other Peruvian mammals. *Breviora* 73:1-7
- Perovic, P.G. 1998. La comunidad de carnívoros de la Reserva de Biósfera Laguna de Pozuelos. Capítulo XIII. In J. Cajal, J.J. García Fernández and R.A. Tecchi, eds., *Bases para el manejo de la puna and la cordillera frontal: El rol de las Reservas de Biósferas*. UNESCO-MAB. 137-146.

- Perovic, P., Walker, S. and A. Novaro. 2003. New records of the Endangered Andean mountain cat at high altitudes in northern Argentina. *Oryx* 37:1-4.
- Salazar–Bravo, J., Tarifa, T., Aguirre, L.F., Yensen, E. and T.L. Yates. 2003. Revised checklist of Bolivian mammals. Museum Texas Tech University. *Occasional Papers*. 220:1-27.
- Sandell, M. 1989. The mating tactics and spacing patterns of solitary carnivores. In J.L. Gittleman, ed., *Carnivore behaviour, ecology and evolution* Vol.1:164-182. Cornell University, New York, USA.
- Sanderson, J. 1999. Andean mountain cats (*Oreailurus jacobita*) in northern Chile. *Cat News* 30:25-26
- Scrocchi, G.J., and S.P. Halloy, 1986. Notas sistemáticas, ecológicas, etológicas and biogeográficas sobre el gato Andino, *Felis jacobita* Cornalia (*Felidae*, Carnívora). *Acta Zoológica Lilloana* XXXVIII, 2:157-170
- SERNAP, 2000. *Plan de Manejo de la Unidad de Conservación: Reserva Nacional de Vida Silvestre "Eduardo Avaroa" y Santuario Nacional Laguna Colorada*. Informe Final de Consorcio: Swed Forest International AB - Trópico. Servicio Nacional de Áreas Protegidas, Ministerio de Desarrollo Sostenible and Planificación. La Paz, Bolivia.
- SERNAP, 2001. *Sistema Nacional de Áreas Protegidas* (2ª. Ed.) Servicio Nacional de Áreas Protegidas, Ministerio de Desarrollo Sostenible y Planificación. La Paz, Bolivia.
- Sunquist, M. and F. Sunquist. 2002. *Wild cats of the world*. University of Chicago Press, Chicago, USA and London, UK.
- Tarifa, T. 1996. Capítulo Mamíferos. In: P. Ergueta and C. de Morales, eds., *Libro rojo de los vertebrados de Bolivia*. CDC. La Paz, Bolivia.
- Villalba, L. 2002. Andean cat photographed in Southwest Bolivia. *Cat News* 36:19-20,25.
- Walker, S. and A. Novaro. 2001. *First Report on the Multinational Initiative to determine the Status of the Andean Mountain Cat and Priorities for its Conservation*. Unpublished report to the Cat Action Treasury on behalf of the Committee for the Conservation of the Andean Mountain Cat (COCGA).
- Walker, S and A. Novaro. 2003. *Second Report on the Multinational Initiative to determine the Status of the Andean Mountain Cat and Priorities for its Conservation*. Unpublished report to the Cat Action Treasury on behalf of the Committee for the Conservation of the Andean Mountain Cat (COCGA).
- Werdelin, L. 1996. The history of felid classification. In K. Nowell and P. Jackson, eds., *Wild Cats. Status Survey and Conservation Action Plan*. IUCN/SSC Cat Specialist Group. IUCN. Gland, Switzerland.

Wozencraft, W.C. 1993. Order Carnivora. Pp. 286-346, In D.E. Wilson and D.M. Reeder, eds., *Mammal species of the world: a taxonomic and geographic reference*. 2nd Edition. Smithsonian Institution Press, Washington D.C., USA, and London, UK.

Yapu, F. 2001. *Memorias del Titikaka. Cosmovisión y leyenda del Lago Sagrado*. La Paz, Bolivia.

Yensen, E. and K.L. Seymour. 2000. *Oreailurus jacobita*. *Mammalian Species* N°611:1-6.

Ziesler, G. 1992. Souvenir d'un chat des Andes: Encounter with an Andean mountain cat. *Animan* 50:68-79 (in French).

TITI (GATO ANDINO Y/O GATO DE LAS PAMPAS) Y USO HUMANO
TITI (ANDEAN CAT AND/OR PAMPAS CAT) AND HUMANS



Mauro Lucherini - GECM

b) Piel de gato de las pampas, Provincia de Salta, Argentina. Pampas cat skin. Province of Salta, Argentina



a)

Nuria Bernal

a) Campesino de Escara (Oruro, Bolivia) muestra como se usa un gato de las pampas embalsamado cuando danzan en sus ceremonias especiales.

A peasant from Escara (Oruro, Bolivia) shows the use of a stuffed pampas cat, when they dance in special ceremonies.



Lilian Villalba

c) Gato de las pampas. Parque Nacional Sajama (Oruro, Bolivia) A stuffed pampas cat. Sajama National Park (Oruro, Bolivia)

GATO ANDINO Y USO HUMANO - ANDEAN CAT AND HUMANS



Jim Sanderson

a)

a) Reproducción en una lámina de cobre, de una pictografía encontrada en una cueva cerca de Putre (Chile).

Reproduction on a copper plate of a pictograph found in a cave near Putre (Chile)

Campesinos de Cochabamba, Bolivia (b) y de Tacna, Perú (c), muestran una piel de gato andino. En ambos casos las pieles están adornadas con las típicas serpentinas.

Peasants from Cochabamba, Bolivia (b) and from Tacna, Perú (c), show an Andean cat skin. In both cases the skins are adorned with the typical coloured stripes (serpentinas).



b)

Nuria Bernal



c)

Daniel Cossios

TIPOS DE VEGETACION Y OTRA FAUNA EN EL HABITAT DEL GATO ANDINO VEGETATION TYPES AND OTHER WILDLIFE IN THE ANDEAN CAT HABITAT



Lilian Villaba

- a) Reserva Nacional de Fauna Andina
"Eduardo Avaroa" National Andean Fauna
Reserve, Bolivia.



Jim Sanderson

- b) Monumento Nacional "Salzar de Surire",
"Salzar de Surire" National Monument, Chile.



Jim Sanderson

- c) Surire, Chile

- a) Vizcachas encima de un típico cojín de yareta.
A mountain vizcacha above of a typical cushion
of "yareta"
- b) Vicuñas al borde un pastizal húmedo y el Salzar
de Surire.
Vicuñas at the border of a wet grassland and
Surire salt pan.
- c) Zorro andino entre un típico tholar y pajonal.
An Andean fox is standing within a typical "tholar"
and bunch grasses.

HÁBITAT DEL GATO ANDINO - ANDEAN CAT HABITAT



a) Khastor (Potosí, Bolivia)

Jim Sanderson



b) Surire (Región I, Chile)

Jim Sanderson



c) Coranzulí (Jujuy, Argentina)

Mauro Lucherini - GECM



d) Khastor (Potosí, Bolivia)

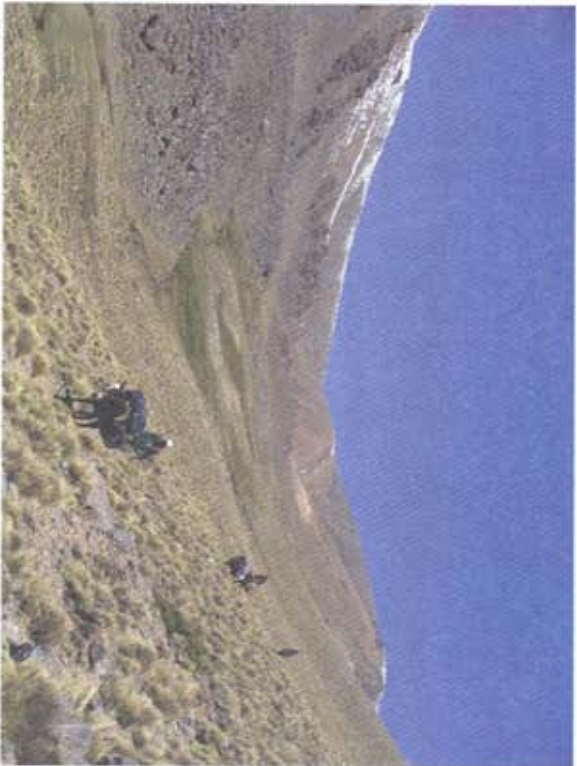
Lilian Villalba

HÁBITAT DEL GATO ANDINO - ANDEAN CAT HABITAT



a) Khastor (Potosí, Bolivia)

Lilian Villalba



b) Parque Nacional/National Park "Campo de los Alisos"
(Tucumán, Argentina)

Mauro Lucherini - GECM



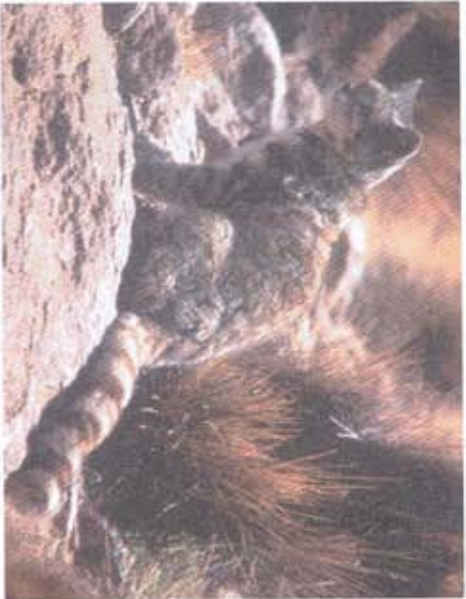
c) Catamarca, Argentina

Mauro Lucherini - GECM

El hábitat del gato andino comprende valles altos rodeados de laderas pendientes y rocosas, mesetas onduladas y la presencia de lagunas salobres.

The habitat of the Andean cat include high rocky valleys, steep slopes, rolling plains and the presence of saline lagoons.

CARACTERISTICAS DEL GATO ANDINO - ANDEAN CAT FEATURES



Jim Sanderson

a)



Jim Sanderson

b)



Jim Sanderson

c)

Fotos a, b y c muestran las diferentes características del gato andino: a) color predominante de la piel gris-cenizo cola larga, gruesa y con varios anillos completos alrededor, b) en las patas delanteras se observa bandas más oscuras e incompletas c) las manchas café/amarillentas se disponen a ambos costados de cuerpo formando líneas verticales casi continuas.

Photos a, b and c show the different features of the Andean cat: a) the predominant ash grey colour of the fur and the long, thick and several rings around the tail, b) the legs have incomplete dark blotches and c) the brown/yellowish blotches are distributed at both sides of the body appearing continuous and vertical stripes.