HABITAT ANALYSIS OF THE ANDEAN BEAR (*Tremarctos ornatus*) IN THE MONTANE EVERGREEN FOREST AND COMMUNITY PERSPECTIVE OF THE HUMAN CONFLICT - BEAR, NATINAL PARK SANGAY, ECUADOR

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Introduction

The Sangay National Park, with its 502.105 ha and its different ecosystems ranging from 900 to 5.230 meters above sea level, is an important protected area of Ecuador. Among the species present in this protected area is the Andean bear, which is the only bear in South America and is a key species for conservation. In the south part of the park an important population of this species has been identified, where bear attacks to cattle have also been reported. The present investigation was directed towards the selection of the habitat of the bear as well as to understand the conflict situation through a social study.

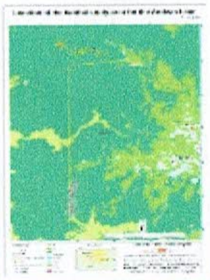
Objetive - Biological Component

- Determine the habitat selection for the Andean bear.
- Characterize some attributes of vegetation in areas used by the bear.

Objetive - Social Component

- Characterize the conflict situation that the community experienced due to the loss of livestock attacked by the bear.
- Explore the perceptions, ideas and testimonies of the people to understand the bear-community relationship.

Methodology



The present investigation was carried out in the southern part of the Sangay National Park in the montane evergreen forest. Two locations were sampled: La Libertad and Colepato, which range in altitude from 2.900 to 3.250 meters above sea level; while the social study was carried out in Colepato.

Figure 1. Area of study and sample sities into the Montane Evegreen forest at southern part of the Sangay National Park

Panoramic View of the Montane Evergreen Forest

From September 2008 to January 2009 30 rectangular plots of 100 x 90m were established, where the use of the habitat was evaluated from indirect signs (footprints, excrements, feeders) and local habitat variables such as canopy cover, diameter at the breast height (DBH), diameter classes, fruit trees consumed by the bear, number of epiphytic bromeliads and richness of morphospecies. Furthermore, the trees used by the bear were characterized taking into account the DBH and the number of bromeliads (by morphospecies and diametric class). The social analysis was realized from structured and in-depth interviews with key actors of the territory as well as focal groups and participant observation.

Indirect signs of Andean Bear

Interviews with local people

Results and Discussion

Table 1. Results of models to evaluate habitat selection by Andean Bear. Sep 2008 - Jan 2009

MODEL	AIC	ΔAICc	AKAIKE	N. PARAMETERS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 2. Numbers of trees with Andean Bear marks and superior and inferior range of DBH

SPECIES	NUMBER OF TREES WITH BEAR MARKS	RANGE OF DBH (cm)	
		INFERIOR	SUPERIOR
[illegible]	5	[illegible]	[illegible]
[illegible]	4	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

The bears selected places with higher DBH trees, which could indicate a preference for mature forests that provide constant nourishment to the bear, especially epiphytic bromeliads. This was observed in studies carried out by Peyton in Peru, but related to fruit trees.

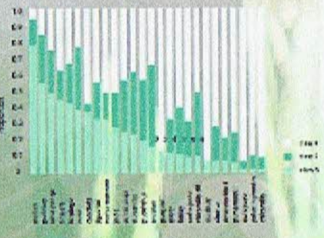


Figure 2. Proportion of diametric classes by morphospecies

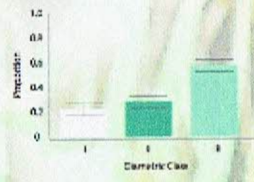


Figure 3. Proportion of bromeliads number by diametric morphospecies

Although the number of epiphytic bromeliads was not an important variable according to the selection of the models, the field evidence suggests that bears do frequently use this food resource. During this study, the availability of fruits was low and the trees mostly used by the bears were the largest trees, such as the Mollon (Prumnopitys montana) and the Sarar (Weinmannia sp.), which also had the largest number of bromeliads.

It is recommended to increase the sample size to improve the approximations of the habitat selection and to incorporate the detection probability. It is also important to consider as a variable the fruiting periods of the species, which could be decisive for the selection of the habitat of the Andean bear.

Regarding the analysis of the human / bear conflict, during the last 10 years a total of 40 head of cattle were killed and one was injured by bears.

The attacks were located near the forest and approximately 12 km away from the populated areas where cattle grazed without supervision. The negative perceptions were related to people who had no formal education as well as to people who had lost livestock due to bears.

Table 3. Results of model selection to evaluate perception (positive / negative) of the local people about the Andean Bear

MODEL	AIC	ΔAICc	AKAIKE	N. PARAMETERS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Age	[illegible]	[illegible]	[illegible]	2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

However, people have a close relationship with the bear, they know his habits, his ecology and have created myths around him. The close link is implicit in the following saying: "The elders used to say that when the bear is climbing the hill, walking on two legs, he looks like a person wearing black clothes, just like oneself"

The knowledge and relationship of people with wildlife along with scientific research could give us future clues to implement consolidated conservation programs with strong social ties and shared learning.

Acknoledgements

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Credit background photo: Jim Clare