

**ECOLOGY OF REINTRODUCED ANDEAN BEARS IN THE MAQUIPUCUNA BIOLOGICAL RESERVE,
ECUADOR: CONSERVATION IMPLICATIONS**

Armando X. Castellanos P.¹

1 Espíritu del Bosque Foundation, Reina Victoria 17-37 y La Pinta, Quito-Ecuador

email: iznachi@yahoo.com.mx

Introduction

One of the many gaps that still exist in the knowledge of Neotropical mammals is the Andean bear, better known as the spectacled bear (*Tremarctos ornatus*). The few studies carried out have been based on the analysis of evidence of bear activity (tracks, excrement, foot prints, scratches, etc.). Although such evidence can certainly add to our understanding, records of visual observation are the most reliable data for interpreting spatial patterns and factors in habitat selection.

The objective of the present study was to increase the limited knowledge that exists about the ecology of this species and to acquire experience in reintroducing the Andean bear. To fulfill this objective it was decided to rehabilitate and release three individuals in the Biological Reserve Maquipucuna, and track them after liberation by means of terrestrial radio telemetry.

Methodology

This study was carried out in the Maquipucuna Biological Reserve, in the cloud forests of the western slope of the Andes, in northwestern Ecuador. The Reserve covers 4500 hectares, surrounded by a protective forest of 14000 hectares. Altitudes range from 1200 to 2800 m. Annual temperatures vary between 10 and 20°C.

In 1995, three juvenile bears were selected, two females and a male, nicknamed Chiquita, Tuta and Paddington, respectively. The bears were born wild, but their origins were unknown. At 4 to 5 months of age, authorities confiscated them from people who had them as pets in southern Ecuador. The bears entered the program when they were approximately 17 months of age. Following the procedures recommended by the IUCN (1987) for programs of reintroduction, and after 8 months of rehabilitation, the bears were liberated.

Each liberated bear wore a radiocollar with a movement sensor. The primary purpose of the telemetry was to allow the researchers to approach the animal. During eight months of monitoring each bear was tracked 8 days per month for 12 hours a day, generally from 06H00 to 18H00. Only two bears were successfully tracked because Tuta took off her radio collar after liberation.

When an animal was sighted, the trackers kept a distance of approximately 30 m and watched through binoculars, although in some instances we surprised the bear at distances as close as about 5 m. Each activity the animal carried out was recorded, with the exact time it happened. Behavior was only documented when the bear did not notice our presence. We assumed that the animal had discovered the investigator's presence when it began to sniff insistently and scrutinize the area in search of intruders. We opted not to bother the animal, and did not record this possibly slanted data of their behavior.

Results

The study bears were followed for eight months, resulting in 127 approaches between 5 and 30 m, for a total of 1440 minutes of direct observation, the study bears used 70.2% of their time eating, 19.7% walking and 9.1% resting.

Paddington had a Home Range of 61 Km² and a Core range of 24.9 Km². These are 15 and 7 times bigger, respectively, than those of Chiquita at 4.1 Km² and 3.5 Km².

The olfaction of these animals is extremely sensitive. They can perceive from ground level when a tree is loaded with ripe fruits. Their hearing is moderate and vision is not good.

On several occasions we observed them from the top of a 3-meter high tree. In these encounters the bears appeared restless, constantly sniffing in search of intruders, but they were never able to locate the observer. When threatened or surprised on the ground, the bears stood erect on their back paws or they stopped to look for the intruder. Once the danger was located, if it was close, they ran away or climbed the nearest tree.

The bears crossed torrential rivers without any more effort than walking from one place to another. This was recorded on 4 occasions for Paddington and 2 for Tuta.

Six different types of sounds were detected. Eight terrestrial nests and two arboreal nests were built by the study bears, usually located inside gulches of mature forest, next to currents of water.

Discussion

The bears of the present study were born wild, but their time spent in captivity made them tame. When they left for the forest after rehabilitation, they "forgot" their dependence on man and they began to manifest "wild" behaviors, including increases in natural escape behaviors (except Tuta). This behavior was observed in similar studies with black bears (*Ursus americanus*).

Among Ursids, males travel over large areas, attempting to satisfy their high metabolic demands, (Joshi et al. 1995) . This may explain why Paddington's Home Range is 15 times bigger than Chiquita's. He may also have been exploring and colonizing his new habitat. Moving long distances after liberation is very common in large translocated carnivorous animals, especially in bears.

Chiquita's and Paddington's core areas were superimposed at one point in time, but they were not together. Although we occasionally observed them feeding simultaneously in overlapping areas, they remained at least 25 m and did not attempt to meet, confirming the solitary character of this species.

The bears of the study used paths on the mountain ridges to make large movements, as do other large Andean mammals like the Andean tapir, confirming that the Andean bears use ridges as routes between the high and low parts of the mountain (Peyton 1980).

The Andean bear may be the least aggressive with man of all the bear species. When we had near encounters with the study bears they preferred to escape rather than to attack us. When threatened, they generally went up as high as possible in the tree, looking for a place to sleep and take refuge. They emitted nervous groans and blows, broke and threw branches, leaves, and moss, and feigned building nests. Local informants reported that when the Andean bear is surrounded in the top of a tree he jumps to the ground to escape.

The sounds heard from the study bears were also reported in mature bears of the Natural Reserve The Planada - Colombia. It appears that a communication system exclusive to the species exists. The low visual acuity observed in the study bears, the sniffing to search for intruders, and the methods of escaping from danger were also noted in a wild bear in Cochabamba, Bolivia. The oral masturbation observed in Paddington has also been noticed in other Andean bears.

Although there have been several reports of livestock pillaging by Andean bears (Peyton 1980, Suárez 1985, Mondolfi 1989), this animal is not a true hunter. It is more scavenger than predator. Since the Andean bear is anatomically designed to squeeze and crush the vegetation on which it feeds, it is the most herbivorous of all the bear species.

Paddington hunted, killing 3 young calves, one at a time. We deduced that he attacked in the open fields and dragged the calf about 30 meters to his nest in the forest to devour it peacefully. He also took to his nest belongings like blankets, utensils, and provisions that he "stole" from loggers.

CONSERVATION IMPLICATIONS

The present study does not seek to impose criteria or discredit previous studies on the ecology and conservation of the Andean bear. Rather, it tries to gather all the information possible about the individual ecology of this vertebrate and to infer the state of its populations, before the development of a national program of reintroduction.

The reintroduction of the bears in this study has been questioned because the origins of the animals are unknown. This is a concern if there are subspecies of Andean bears, which could cause a decrease in population due to exogamy. However, the available data indicate that there is no subspecies of this bear. Thus, there is no valid scientific foundation to impede studies of reintroduction and/or translocation of individuals. In fact, this study may have helped increase the alarmingly low genetic variability in the wild bear population.

Reintroduction seeks not only to increase the number of individuals in a population in decline, but also to show that individuals can adapt to their natural habitat. During this study the animals were nutritionally self sufficient, and within two years of having finished this study Chiquita was observed with cubs. Thus, there is reproductive success and a flow of genes coming from these new individuals. We can infer that Chiquita had not lost or had recovered important aspects within her social, sexual and feeding behavior that allow her to interact like any wild bear.

The approaches of Tuta and Paddington to farms near the study area could be indications of an anthropic dependence. However, these approaches are not unique; they are also made by wild bears in the Andean region, black bears in North America and brown bears in Spain. This behavior is generally associated with anthropic changes within the historical range of distribution of the species, resulting in a concentration of nutrition resources in relatively easily accessible fields of crops and livestock. Since farms basically surround the Reserve, the two bears were moved to the Sangay National Park, in Central Ecuador.

CONCLUSION

Before this study there was little scientific information on the individual ecology of the Andean bear in Ecuador. Most available information was based on anecdotes, speculation, and extrapolations of results of populational studies of other species of bears, resulting in inaccurate conclusions about important

aspects of the Andean bear's ecology and behavior. The data collected and analyzed in this study provides accurate information about the individual ecology of this species.

We hope that the experiences and results obtained in this study will motivate new efforts to reintroduce individuals in Andean countries where populations of the Andean bear still exist or where there are bears in captivity. Programs of this type are the only way to save this species from extinction, but they should be conceptualized and oriented in a way that not only involves the populational recovery of the species but also the protection and/or restoration of their natural habitat.

References

IUCN. 1987. The re-introduccion of species. The IUCN Position Stament on Traslocation of Living Organisms. Switzerland.

Joshi, A. R., D.L. Garshelis and J.L.D. Smith. 1995. Home ranges of sloth bears in Nepal: Implications for conservation. The Journal of Wildlife Management 59(2):204-214.

Mondolfi, E. 1989. Notes on the distribution, habitat, food habitats, status and conservation of the spectacled bear (*Tremarctos ornatus*) in Venezuela. Mammalia 53(4): 525-536.

Peyton, B. 1980. Ecology, distribution, and food habits of spectacled bears *Tremarctos ornatus* in Perú. Journal of Mammalogy 61(4): 639-652.

Suárez, L. 1985. Hábitos alimenticios y distribución estacional del oso andino, *Tremarctos ornatus*, en el páramo sur oriental del volcán Antisana, Ecuador. Tesis de Licenciatura, Departamento de Ciencias Biológicas, PUCE, Quito.