

THE SPECTACLED BEAR IN THE SIERRA NEVADA NATIONAL PARK OF VENEZUELA

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Abstract: The spectacled bear (*Tremarctos ornatus*), is a threatened species that inhabits the Andean zones of South America. Its threatened status is due primarily to deforestation and hunting pressure. Its future in Venezuela depends on the populations that remain in national parks. The Sierra Nevada National Park (Mérida and Barinas States, Venezuela) is one of the most important parks for bears in Venezuela. During 1990 and 1991, PROVITA undertook an ethnozoological study in this national park to determine significant human-bear interactions. This study was used to define priorities for conducting an environmental education program in the park, with the spectacled bear as the key to this program. Eighty-six personal interviews concerning the spectacled bear were carried out in 35 sites within and bordering the park. Hunting pressure is greater outside than within the park. The presence of the park seems to be more effective in protecting the bears than general laws prohibiting bear hunting. In the southwestern part of the park the hunting pressure is especially high, and this zone should have the highest priority for urgent action. The most important changes needed are modification of the cattle raising system employed in the zone and the transformation of the mythical beliefs held about this animal.

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The studies of the biology and ecology of the spectacled bear in Venezuela (Fig. 1), have been made by 3 authors: Edgardo Mondolfi (1971, 1989), Edgard Yerena (1987, 1988a, 1988b), and Isaac Goldstein (1988).



Fig. 1. Geographical location of Venezuela in South America.

The primary populations of this species are located in the Andean and Perijá Mountain Ranges in the western part of the country (Yerena 1987). These populations may consist of about 1,000 individuals (Yerena 1988a).

The areas inhabited by the spectacled bear (cloud forests, montane forests, and "páramos" [tropical alpine lands]) (Yerena 1987) have been used since prehispanic times as croplands (Monasterios 1980). In the last 30 years, the Andean highlands have become increasingly valuable as agricultural areas (Monasterios 1980) resulting in a constant reduction of the available habitat for the bear. Forested areas have been cleared mainly for the opening of grazing fields for cattle for agricultural purposes and for gathering firewood. The "páramos" are also used as extensive grazing sites in which cattle use large areas with very little monitoring by their owners (Monasterios 1980). As a result of human use of these lands, the spectacled bear has been displaced from parts of its habitat and has occasionally moved into agricultural lands and grazing sites where it occasionally destroys some crops. Additionally, local people believe it is a cattle predator and a mythical enemy of people (Rojas and Rodríguez 1988). Consequently it is perceived as a dangerous animal that must be eliminated, thus hunting pressure is high (Goldstein 1988).

Because of this pressure, PROVITA (a Venezuelan nongovernment organization [NGO]) decided to undertake an ethnozoological research project in the Sierra Nevada National Park of Venezuela. The goal of this project was to test the efficacy of a method using interviews of local people. The specific information

gathered using this method concerned human-bear interactions, assessment of the frequency of bear sightings, hunting, cattle predation, myths, and the uses that humans make of bears. The long-term objective of this project is to identify priorities for subsequent studies and design an educational strategy aimed at the conservation of spectacled bears in this area.

METHODS

Study Area

The Sierra Nevada National Park is located in northwestern Venezuela in the states of Mérida and Barinas ($8^{\circ}26'10''-8^{\circ}54'32''$ N, $70^{\circ}38'10''-71^{\circ}17'27''$ W, Fig. 2). It was created on May 1952 and covers 276,466 ha. The park has a great altitudinal range that goes from the Andean foothills of Barinas State (300 m) to the highest mountain peak of the country, the Pico Bolívar (5,007 m). The result is a wide diversity of habitats, including savannas, semi-deciduous forests, evergreen forests, cloud forests, Andean dwarf forests, and "páramos" (Yerena 1988a).

To most effectively survey the park for information on human-bear interactions, 5 areas were selected on the basis of their accessibility, the presence of human populations that carry out agricultural or cattle-raising activities, and past reports of the presence of spectacled bears (Fig. 3). The first 3 areas: (1) Los Nevados-Socopó, (2) Gavidia-El Algarrobo, and (3) Tabay-El Bao, were surveyed in August 1990. The remaining two: (4) Gavidia-San Juan Bautista and (5) Los



Fig. 2. Approximate location of the Sierra Nevada National Park in Venezuela.



Fig. 3. Survey routes along the Sierra Nevada National Park.

Nevados-Aricagua, were surveyed in March 1991.

Each area was surveyed by a work-group of 2-4 persons who were responsible for data collection in the towns or settlements in these areas.

Data Collection and Classification

Information was gathered through personal interviews with local settlers. Once a possible informant was identified, an informal conversation was established and oriented by the interviewer through a series of "primary questions." This process had the objective of formalizing data collection without losing the informality of the interview. The most common "primary questions" were: (1) Which wild animals do you usually see around this place? (2) Which problems do you have with crops or cattle? (3) Are there any wild animals that are causing you harm? (4) Which animals are hunted around this place? (5) When did (or when do) these events take place? Care was taken not to bias the interview toward any particular subject. However, in those opportunities when no information about spectacled bears was generated, the interviewers initiated the subject.

During the interviews, no notes or recordings were taken. Once they had finished, each of the parties that witnessed the meeting wrote down the most important aspects of the conversation. At the end of each day, the groups discussed the results, exchanging ideas and summarizing the day's findings.

On returning from the field, information was divided and classified into individual reports and fed into a database. Each report consisted of: name of the reporter, date of interview, place where the interview

was held, animal that was the subject of the report, place and date where the reported event took place, report type, evidence that supported the report, information regarding feeding habits of the reported animal, human use of this animal, and information related to the hunting pressure on it.

It is important to point out that by "report type" we mean one of the following three categories:

Comment (C): Accounts that were purely verbal, with no concrete evidence to support them. In this category we grouped a great variety of reports such as tales, events that supposedly had happened to persons other than the informant, or events that are part of popular knowledge.

Direct report (D): Accounts that had direct evidence to support them, such as a direct sighting of the reported animal or a skin or other part of an animal shown by the informant.

Indirect report (I): Reports based on indirect evidence of the presence of an animal, such as tracks, marks, dead cattle (supposedly predated), or sounds.

RESULTS

Interviews

Interviews were held in 35 towns or settlements along routes within the 5 selected areas (Fig. 4). A total of 86 persons were interviewed, obtaining 352 reports (average \approx 4 reports/person), regarding more than 60 different animal species.

Spectacled Bear Reports

Forty-two percent of all the reports involved spectacled bears. The most frequent individual category was "Comments" without evidence, though "Direct" and "Indirect" accounts add up to more than 57% of all the reports (Fig. 5). On the other hand, for the distribution of the reports in time (Fig. 6) the category with the greatest value was "indeterminate date." As most of the reports were "Comments" and most of these comments were imprecise, reporters frequently could not assign a date to them: they often happened "a long time ago." However, more than 25% of the reports were recent (within a year). Recent accounts were remembered well because bear sightings

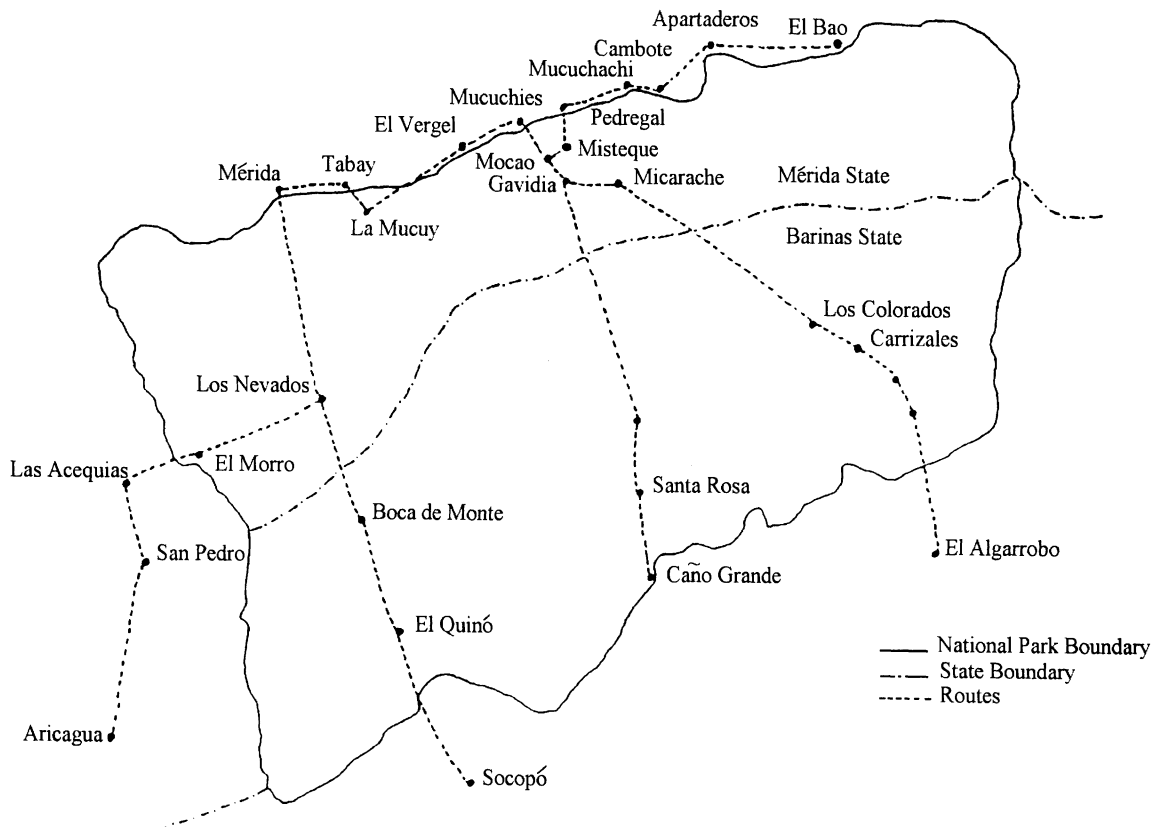


Fig. 4. Approximate location of the most important settlements visited during the survey.

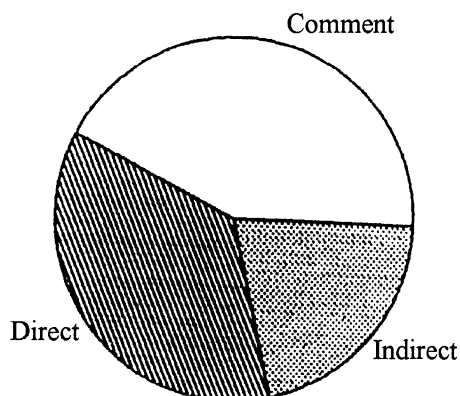


Fig. 5. Proportion of the different types of reports about spectacled bears.

are infrequent. Venezuelan Andean settlers living in remote areas seldom see more than 3 or 4 bears in their lifetime (Yerena 1988a), thus once a bear is found the news spreads quickly. It is likely that the precision of the report date was inversely proportional to the time passed. For this reason events that occurred 10 or more years previously were pooled.

Reports of bears were not equally frequent or detailed in the 5 areas. The Los Nevados-Socopó area had the fewest bear reports (8) and all of them of indeterminate date (Table 1). The route in this area had few established settlers, which may be the cause of the lack of information. Alternatively, few bear reports could suggest that in this area bears exist at very low densities or are not there at all.

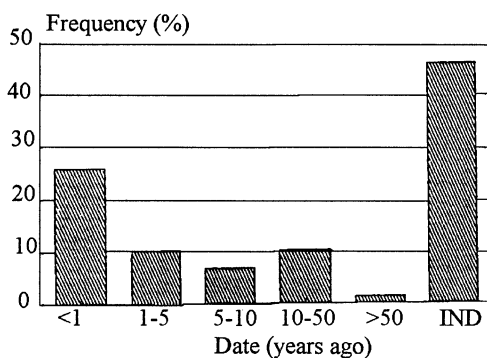


Fig. 6. Frequency of spectacled bear reports for different date categories (IND: indeterminate date).

Table 1. Distribution of spectacled bear reports in time, according to the different sampling areas. Numbers represent frequency of reports (%) that fall in each time category on each route (IND: indeterminate date, N: number of reports on each route.)

Area	Time ago (years)					IND
	<1	1-5	5-10	10-50	>50	
Los Nevados-Socopó (N = 8)	0.00	0.00	0.00	0.00	0.00	100.00
Gavidia-El Algarrobo (N = 18)	55.56	0.00	0.00	0.00	0.00	44.44
Tabay-El Bao (N = 34)	14.71	20.58	14.71	14.71	2.94	32.35
Gavidia-San Juan Bautista (N = 22)	18.18	9.10	0.00	13.63	0.00	59.09
Los Nevados-Aricagua (N = 65)	33.86	4.61	3.07	10.77	0.00	47.69

For routes within the areas Gavidia-Algarrobo and Los Nevados-Aricagua, recent bear reports were frequent. In the Gavidia-El Algarrobo area, with only 18 reports (the second smallest number), 55.56% were accounts less than 1 year old, and the rest were of indeterminate date. Additionally, near Carrizal, the work group found and collected excrements on the trail, which afterwards proved to be from a spectacled bear (I. Goldstein, Wildl. Conserv. Int., pers. commun.).

Figure 7 shows the sites and an approximation of the dates where bear reports took place. However, several of the report sites could not be located on the map given the uncertainty of their description. Two areas of concentration of recent reports are evident. One is near the town of Carrizales (Gavidia-El Algarrobo area) and the other is in the southwestern part of the park, near its boundaries. Important localities for bears in this area are: El Quinó, Páramo Don Pedro, and the "páramos" and forest close to Aricagua. The northwestern part of the park (which is the closest to Mérida city) shows the least evidence for bears of all zones.

Myths and Legends about Spectacled Bears

Spectacled bears are something between reality and fiction for the settlers in the Sierra Nevada National Park. The most common name for the bears in this region is "el salvaje" (the savage), which is evidently anthropomorphic (Yerena 1988a).

The most widespread tale concerns the story of "Juan Salvajito" (John, the little Savage). It recounts the story of a male bear that kidnapped a woman who was

and arthritis; and ground bones give strength.

Reports that were gathered along the Los Nevados-Aricagua route suggest that bears are very valuable for curative products as well as for skins and amulets (claws, bones, etc.). Most of these products are sold to people in the city of Mérida and very frequently they are paid and asked for in advance. One informant also suggested that live bears were relatively easy to sell to zoos.

Spectacled Bear Behavior and Habits

Spectacled bears are considered aggressive animals, especially when females are with cubs. In spite of this belief, they have been observed grazing peacefully with cattle. It has also been reported that bears can be timid and will only attack when they feel threatened.

Often, local people detect the presence of spectacled bears indirectly through the presence of nests and food caches. The former are structures constructed with sticks and broken branches located in the higher portions of the vegetation in the forest where bears rest. When a female has cubs, cubs are said to sleep and rest on the nests, while the female remains on the ground to guard against intruders.

Food caches are normally on trees or branches, where the bear hangs pieces of the animals it has recently captured. References to this behavior are more widespread than those of nests.

Beliefs about feeding habits of bears vary widely. Most local people think they are carnivorous, while only 34.48% think they are vegetarian (Fig. 8). If the categories "carnivorous," "omnivorous," and "scavenger" are considered together, they add up 65.52%, which means that the majority of people believe that spectacled bears are active meat consumers. This belief leads to fear spectacled bears as important

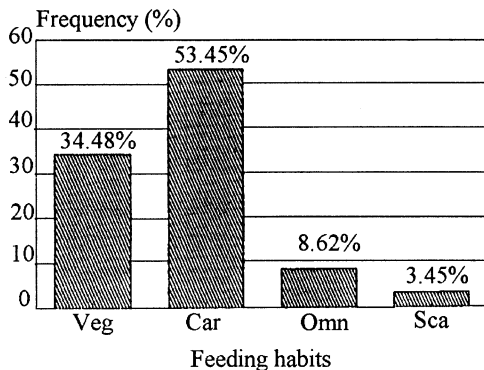


Fig. 8. Spectacled bear feeding habits according to the people interviewed (Veg: vegetarian, Car: carnivore, Omn: omnivorous, Sca: scavenger).

predators of cattle, sheep, and goats.

Table 2 summarizes individual items that were reported to be consumed by bears.

Cattle Predation by Spectacled Bears

Reports along the Los Nevados-Aricagua route indicated that an individual spectacled bear is capable of killing a great number of cows. One informant talked about 2 bears that were responsible for the death of 6 and 14 cows, respectively.

Predation reports have 2 common aspects. First, there were no eyewitnesses of cattle predation. Reports are either "Comments" without evidence, or findings of dead cows whose death is attributed to bears. Most people are able to distinguish marks on the predated cows that enable them to identify the predator. Cougars are believed to have preference for smaller animals (such as sheep) and they leave very conspicuous wounds on the neck. Predated animals that are large and don't have the typical cougar signs are generally attributed to bears. When people find meat hanging on trees or on the floor of the forest, the

Table 2. Food items reported to be consumed by spectacled bears in the Sierra Nevada National Park.

Plants:	
	Fruits (only specified guava, <i>Psidium</i> sp.)
	Ferns
	Palm trees
	Bromeliads (<i>Puya</i> sp.) ^a
Crops:	
	Corn
	Bana
	Sugar cane
	Potatoes
Wild Animals:	
	Rabbits (<i>Sylvilagus</i> sp.)
	Sloth (<i>Bradypus</i> sp.)
	Paca (<i>Agouti paca</i> and <i>A. taczanowski</i>)
	Deer (<i>Mazama</i> sp. or <i>Odocoileus virginianus</i>)
Domestic animals:	
	Goats
	Cows
	Lambs

^a Most reported individual item.

predator is always said to be a bear.

Second, the dates of predation reports are rarely recent. Apparently cattle-raising activities in the Sierra Nevada National Park have been decreasing steadily since the park was created. With fewer cattle grazing in the area, predation events are likely to be less frequent.

According to the people interviewed, bears use the following predation strategy on cattle, they approach the prey quietly and grab it by the tail. Then they spin it around until it falls down dizzy. Afterwards they consume it, often while it is still alive.

The most important consequence of bear predation beliefs are their contribution to maintaining high hunting pressure (Fig. 9). When a bear is sighted, it is persecuted and frequently killed. Most people did not make any particular reference to bear hunting and their reports concentrated on other aspects (behavior, tales, predation, etc.). On the other hand, most of the people who talked about bear hunting said that they either had killed a bear in the past or would kill it if they met one. It is important to point out that a very small fraction (2 informants) said that they would not kill bears because it was forbidden by law, though it is probable that these comments were based on the suspicion that this is what the investigators wanted to hear.

DISCUSSION

This study was designed to test a method for gathering information rapidly and economically. It does not require elaborate training, and it allows for coverage of a relatively large area. The data from this study provide a preliminary interpretation of the spatial distribution of spectacled bears and the problems they face in western Venezuela. This information is now available to efficiently focus time and resources on

detailed studies in the most critical areas. This method was also tested by Goldstein (1988) and Yerena (1988a).

The methods used in this study are not commonly used in wildlife management. Much of the resultant information is anecdotal and involves sociological and anthropological methods. Because conservation problems are generally under severe time and budget limitations, it is important to incorporate methods that will make efficient use of resources for developing appropriate conservation proposals.

The results of this method of interviewing local people indicate most of the hunting pressure to which spectacled bears are subject is due to 2 main reasons (in order of importance): cattle predation and myths or legends. Neither of the 2 is based on extensive quantitative data, but on beliefs of the people and limited direct evidence such as the presence of cattle carcasses. Cattle predation by spectacled bears has been documented (Peyton 1980, Suárez 1986, I. Goldstein, Wildl. Conserv. Int., pers. commun.). These practices have been demonstrated to increase probability of livestock losses to predators (Fritts 1982).

The fact that bears prey on cattle is of great importance for bear conservation proposals. Despite the low number of cows actually killed by bears, every bear found in the vicinity of cattle-raising areas is suspected of being a predator and probably killed, regardless of the presence of evidence to the contrary. As long as extensive cattle-raising continues and spectacled bears are present, there will be predation risks and bears will suffer mortality by human hunters. Educational activities should be oriented toward changing cattle-raising systems and in trying to modify the popular beliefs and misunderstandings that underlie many of the bear killings.

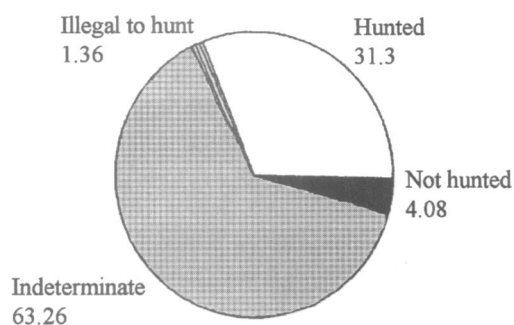


Fig. 9. Spectacled bear hunting frequency (numbers are percentages.)

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