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Articles

Edentata as a food resource: Subsistence hunting by Xavante Indians, Brazil

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The Xavante and the cerrado

The Xavante are one of the 197 remaining Brazilian Indian tribes, distributed through about 550 separate communities in the country. There are six Xavante reservations in the central west of Brazil, the Reserva Rio das Mortes being the most traditional. The principal Xavante village is Etenhiritipá, with approximately 340 people inhabiting 2.200 km^2 of cerrado. Before contact in 1946 the Xavante were semi-nomadic and exploited the natural resources over large areas. The Xavante are hunter-gatherers and depend on game for 95% and fish for 5% of their food. Agriculture has always been secondary and less diversified than traditionally sedentary Indians of the Neotropics. The Xavante depend strongly on the cerrado wildlife for their subsistence.

After 1946 colonists flooded into the region and deforested 85% of the natural areas bordering the reservation. The cerrado was turned into pasture and soya bean plantations. The Xavante changed from a semi-nomadic lifestyle to a sedentary one. This change, coupled with the gradual isolation of the reserve, caused a serious problem for wildlife. Game populations started declining around the 1980's, and the community sought help remedy the situation and initiate a more sustainable use of their natural resources.

The Xavante as hunters

The Xavante are keen hunters, fast, have eagle eyes and are excellent trackers. However, while the older men are especially adept at tracking down the giant anteater, "younger" hunters soon give up (after 10-15 minutes) because it has a very peculiar and confusing pattern of feeding and moving around.

In total, the Xavantes use eight edentata species. The hairy armadillo and most especially the giant anteater are the most frequently harvested (see Table 1).

Table 1. The number of different edentata species harversted on 33 months at Xavante village of Etenhiritipá

Taxa	Harvest in 33 months
Priodontes maximus	18
Euphractus sexcinctus	138
Cabassous uninctus	2
Dasypus novemcinctus	7
Dasypus septencinctus	14
Tolypeutus spp	24
Myrmecophaga tridactyla	322
Tamandua tetradactyla	18

The giant anteater (*Myrmecophaga tridactyla*)

The giant anteater is heavily hunted, and there is serious concern as to whether harvest of this species is sustainable. We collected data on this species, because the Xavante were interested in knowing whether populations of this and others species were declining. Since the Xavante are so dependent on wildlife for animal protein, they were anxious to secure the viability of their populations. However, data gathering turned out to be complicated or even impossible. Ovaries were eaten almost immediately after a kill in the field, and skulls were always seriously damaged, so biometric data were inconsistent. I encountered cultural resistence to collecting data for the determination of animal densities, because the hunters wished only to hunt and were not prepared to merely count the animals. Compensating hunters who participated in censusing populations with food did not work because hunters or their families preferred game. It is presently impossible to collect data on reproduction and density as hunting pressure continues to be high: In 2,200 km^2 of the Xavante reservation, 93 giant anteaters were harvested in 1991 during 11 months; 122 individuals in 1992 in 12 months; and 155 individuals in 1993 in 12 months.

Importance of Edentata

Weights could only be taken for *Euphractus sexcinctus*, and *Myrmecophaga tridactyla*. Edentates play an important role as a food resource, comprising 22% of the biomass of game meat annually consumed . The giant anteater (*Myrmecophaga tridactyla*) is the most important, comprising 20% of the total biomass consumption per year.

However, the majority of the smaller edentata were incompletely reported in the village. For these species weights were taken from literature, whenever possible from samples originating form cerrado habitats.

Dasypus sp., *Cabassous* sp., *Priodontes maximus*, and *Myrmecophaga tridactyla*. No special data were gathered, as these were consumed soon after the kill or collected in very small numbers.

Euphractus sexcinctus. No clearly juvenile animals were reported. Mean weight was 5.57 kg (N=7)

Mymecophaga tridactyla. Of the total harvest of 322 in 33 months, 42 brute weights were taken. Nine individuals weighed below 20 kg and were not considered in the mean weight calculation. Mean 33.6 kg (N=33). The mean weight of males was 36.4 (22-50 kg, N = 10) and females 32.4 kg (21-47 kg, N=23).

The question of giant anteater hunting

The yearly harvest of giant anteater would appear to be high in the Xavante reservation. Lack of data on population density and reproduction makes it impossible, however, to relate the harvest to such parameters.

In order to see whether hunting of the giant anteater is sustainable, we used a number of indicators, wich combined should help determine whether or not hunting is sustainable.

When calculating the potential harvest using the quotient of Banse and Moscher (1982), we came to a value of 0.08-0.16 individuals per km^2. The observed harvest in the reservation was 0.16, 0.14 and 0.13 per km^2 in 1991, 1992 and 1993 respectively, which depending on the carrying capacity of the area, is close to or above the maximum potential harvest.

During the three years, the sex-ratio was 1 male to 1.46 females. When splitting these data per year we come to a sex-ratio 1:1.8 (N=47) in 1991: 1:1.1 animals is derived from the sex ratio of 241 individuals of known sex which were harvested. The sex ratio for the latter was 1:1.47. The ratio in favor of the females may be an indicator of high hunting pressure, but we have no references of sex-ratios in areas without or with little hunting.

The change in hunting success, measured as the harvest per 1000 hunter days, could very well be an indicator of whether the species is declining. If it is declining and the hunting effort is the same, hunting success will show a decrease. The hunting success was 51, 82 and 47 per 1000 hunter days in 1991, 1992 and 1993, respectively. As the hunting range changed during these years, the increase in 1992 could reflect the fact that the area of 1992 was lightly hunted in the past (which in fact was not the case) or that the capacity of that area is considerably higher than other sub-regions.

Request for help, studies by students

We expect to continue collecting hunting data and hopefully obtain data on the relative abundance of the species. We will be monitoring 24 transects for tracks and sightings of wildlife, and hope to have sufficient data in 1-2 years to estimate population densities. If the Xavante community accepts students from outside, good data could be gathered on population densities and distributions. However, the working conditions will be rough and logistics complicated. The study area and the giant anteater could be extremely interesting as the focus of a graduate thesis. However any such study would need to incorporate practical applications that can be used by the Xavante for the management of their game species.

Survey of the Xenarthrans inhabiting Poço das Antas Biological Reserve

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Introduction

The Atlantic coastal rainforest of Brazil is one of the most endangered ecosystems in the world, with less than 5% remaining (Mori *et al.*, 1981). It is critical to assess the biodiversity of this system immediately, before further forests are lost and the inevitable extinction of their species. To this end, we conducted a survey of the xenarthrans at the Poço das Antas Biological Reserve in the state of Rio de Janeiro. Poço das Antas is located approximately 70 km north of Rio de Janeiro and contains large patches of Atlantic coastal rainforest (Kleiman *et al.*, 1986). The reserve has been the focus of conservation efforts directed particularly at the golden-lion tamarin, *Leontopithecus rosalia* (Kleiman *et al.*, 1986). However, almost no data exist on the xenarthrans occurring in the reserve. Our survey was designed to provide such data and generate a clearer picture of potential conservation needs for this group.

Methods

Poço das Antas is 5200 ha in size and consists primarily of steep hills separated by narrow valleys. There are four main habitat types (Camargo, 1996): 1) mata, or Atlantic coastal rain forest, 2) grassland, consisting primarily of *Imperata brasiliensis* and/or *Melinus minultiflora*, 3) disturbed woodland, which contains some grass but is