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Primate Densities in the Natural Reserve of Nouragues, French Guiana

Philip Kessler

Introduction

In December 1995, a new Natural Reserve of 100,000 ha was created around the Research Station of Nouragues (UPS 656/CNRS) near the Arataye river in French Guiana (Fig. 1). Seven primate species are known to occur in the reserve: *Alouatta seniculus, Ateles paniscus, Cebus apella, Cebus olivaceus, Pithecia pithecia, Saimiri sciureus* and *Saguinus midas*. The common squirrel monkey (*Saimiri sciureus*) has been observed along the Arataye and Approuague rivers, but never in the vicinity the Nouragues Research Station (Charles-Dominique, 1993). A number of studies have been conducted on primate ecology at Nouragues over the last 10 years (e.g., Julliot, 1992; Zhang, 1995; Kessler, 1995a). Two studies have reported on population densities for *Alouatta* and *Saguinus* at Nouragues, both derived from estimates of home ranges and group size during detailed studies (Julliot, 1992; Kessler, 1995b). Here I report on censuses carried out to obtain basic data on primate abundance in the region, a necessary basis for further studies and comparisons of primate ecology between Nouragues and other regions.

Methods

The census was conducted between June and October 1997 in the Natural Reserve of Nouragues in French Guiana. The area contains uninhabited primary rain forest. Data were collected using a transect census technique. A small, rarely used, forest trail was chosen as the transect line. A section of 4 km was marked every 20 m and censused once a week between 0700 and 1200 am, yielding a total of 15 censuses. For each census the observer walked quietly (average speed: 1 km/h) and stopped every 20 m to look and listen more intensively for monkeys. When a monkey group was detected, it was observed for up to a maximum of 10 minutes to determine the species and number of individuals. Animal-to-transect distance was calculated on the basis of the trigonometric relationship of animal-observer distance and sighting angle to the transect. The total strip width was determined by the maximal animal-to-transect distance of all first sightings for each species (National Research Council, 1981). Population densities expressed in individuals/km² and observed group sizes should be considered as minimal estimations because it is probable that not all group members could be detected during the 10 minutes of observation. Howler monkey densities are probably undestimated due to their discreet behaviour. Likewise, *C. apella* groups are often dispersed over up to 100 m, and therefore group sizes are probably underestimated.

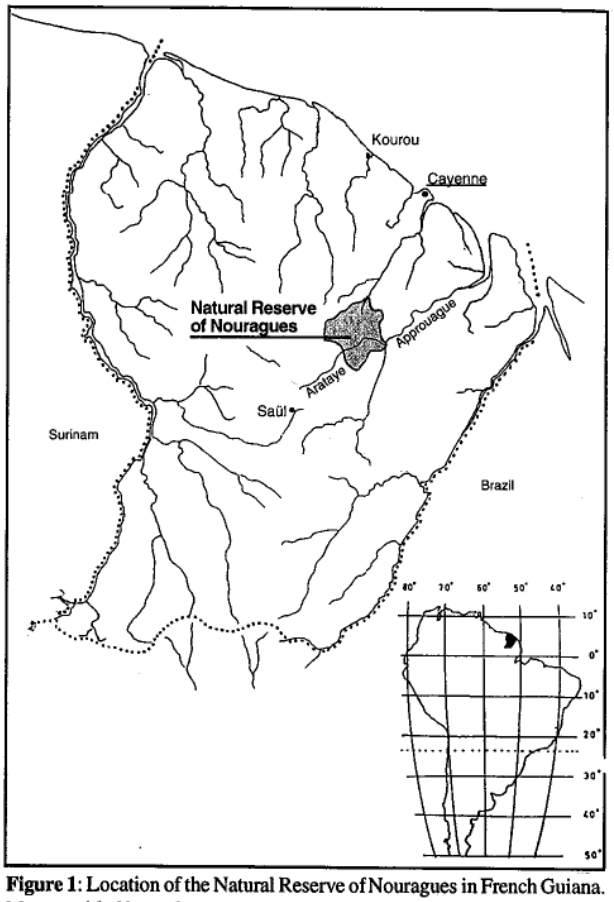

Figure 1: Location of the Natural Reserve of Nouragues in French Guiana. Map provided by author.

Results

Population density estimates and minimum group sizes are shown in Table 1. There are no data for *Pithecia pithecia* and *Cebus olivaceus*. These two species are present in the reserve, but were never seen during the 15 transect censuses. The data on group sizes for these two

Table 1: Estimation of minimal group sizes and population densities of the primate population in the Natural Reserve of Nouragues, French Guiana.

Species	No. of groups	Minimum group size[1]	Density[2] (groups/km²)	Density[2] (ind/km²)
A. seniculus	9	5.1 ± 1.4	2-3 (2.50)	11-15 (12.78)
A. paniscus	10	3.6 ± 1.8	2-3 (2.28)	7-10 (8.57)
C. apella	7	7.7 ± 2.9	1-3 (1.94)	13-17 (15.00)
C. olivaceus[3]	6	13.2 ± 4.4	-	-
P. pithecia[3]	4	2.8 ± 1.0	-	-
S. midas	13	4.2 ± 1.5	5-6 (5.42)	20-25 (22.92)

[1] mean ± standard deviation.
[2] range of 95% confidence interval, mean in parentheses.
[3] group sizes estimated by sightings outside transect censuses.

species are derived from other sightings.

Discussion

Minimum estimates of density and group sizes in *Saguinus midas* are similar to those found during intensive studies at the same study site by Kessler (1995b): 16.5 ind/km², 4.8±1.5 ind/group, n=4. Julliot (1992) calculated a higher density for *Alouatta seniculus* (17-22 ind/km², 6.3±2 ind/group n=6) than estimated in the present study. This is best explained by the fact that howler groups are often missed, and, when resting, are difficult to count. Estimates from another study site in the Guianan region (Raleighvallen-Voltzberg Reserve, Surinam) for *Alouatta seniculus* (17 ind/km²), *Ateles paniscus* (7.1 ind/km²) and *Saguinus midas* (23.5 ind/km²) are comparable to results of the present study (Mittermeier, 1977; Van Roosmalen, 1980).

Observed group sizes of *Ateles paniscus* refer to foraging units rather than to social units. Spider monkeys are known to form social groups of up to 15-20 individuals, but forage in small sub-groups of 2-3 animals (Klein and Klein, 1979; Van Roosmalen, 1980). This pattern was also typical at Nouragues. The lack of data for *Cebus olivaceus* and *Pithecia pithecia* probably reflects very low densities. *Pithecia* is also a very shy and quiet species, and difficult to detect (pers. obs.).

Hunting pressure evidently exerts the major impact on primate populations in French Guiana, especially along large rivers such as the Approuague. *Cebus, Ateles* and *Alouatta* are the most-hunted primates (Roussilhon, 1988). Comparing data from two localities, Raleighvallen-Voltzberg Nature Reserve and Brownsberg Nature Park in Surinam, with no hunting pressure, with a heavily hunted area in French Guiana (Saül) (Mittermeier *et al.* 1977), the population densities estimated for the Natural Reserve of Nouragues indicate that hunting pressure is absent or light.

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Temporal and Acoustic Properties of Long-distance Calls of the Masked Titi Monkey, *Callicebus personatus*

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Vocal communication is important for forest primate species with structural features of the environment limiting visual contact. Long-distance calls, often produced by primates and used in intra and inter-group signalling, may have spacing and other coordinative functions (Chivers, 1969).

The titi monkeys, genus *Callicebus*, are distributed in the Brazilian Atlantic coastal forest and forested areas of the basins of the Rios Amazonas, Orinoco and Paraguai (Kinzey, 1988). *Callicebus* monkeys emit loud calls de-