



CHIROPOTES ALBINASUS MONITORING STUDY



CELESTIAL GREEN
Ventures

Author: Monica Gallego Peñalva
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Introduction

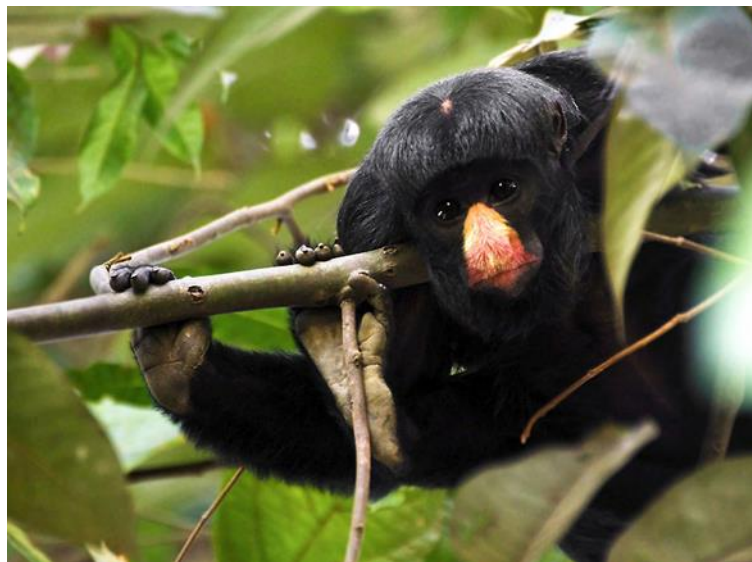
i. Biodiversity in the Project Area

The Trocano Araretama Project area is significant in terms of biodiversity value, as it is located in the tropical forest eco-region. Thus, it can be assumed that there is a high level of biodiversity present in the project area that is of high ecological importance. Alongside the carbon and social project benefits, another objective of the Trocano Araretama Project is to preserve the biodiversity of the project area. In order to accomplish this objective, we must first study the species that we have, in particular those that are endangered.

In order to identify the endangered species, we analysed a study regarding "The Medium and Large Mammals of Madeira River" written by Fabio Röhe (2007), which detected endemic species of mammals found in the region near the project area and its surroundings. From there we checked the threat status of each species on the IUCN Red List, and which revealed that the primates *Chiropotes albinasus*, and *Lagothrix cana* are endangered. The focus of this report is on the *Chiropotes albinasus*; we have produced a separate report regarding the *Lagothrix cana*.

1. *Chiropotes albinasus*: Description

Chiropotes albinasus, commonly known as the Bearded White-Nosed Saki (or occasionally Red-Nosed depending on its appearance), is a medium-sized primate with a bushy, fox-like, non-prehensile tail (Hershkovitz 1985; Peetz 2001) that moves predominantly on all fours (Fleagle and Mittermeier 1980; Walker 1996)¹.



Picture 1: *Chiropotes albinasus*. Source: Flickr

¹ Gron KJ. 2009 June 26. Primate Factsheets: Bearded saki (*Chiropotes*) Taxonomy, Morphology, & Ecology. <http://pin.primate.wisc.edu/factsheets/entry/bearded_saki/taxon>. Accessed 22nd May 2014.



During the first two months of life, the tail of the infant is prehensile, even though the tail of the adult is not (van Roosmalen et al. 1988). There are tufts of hair (coronal tufts) on both sides of the head, and the species has a thick beard (Hershkovitz 1985). The tufts and beard are longer and thicker in males than in females (Hershkovitz 1985). The ears are generally not visible as the fur is thick, and the shoulders and upper arms have longer hair than the rest of the body, often looking like a cape (Ankel-Simons 2007). *C. albinasus* males have a head and body length of 42.7cm (16.8 in) and females measure 41.8cm (16.5 in)².

In general, the different species of bearded sakis can be distinguished by pelage differences (Bonvicino et al. 2003). In the case of those found in the project area, *C. albinasus* is black overall, with light brown or reddish hair to mostly orange or ochre on its back and blackish limbs, ventrum, tail, and sides (Hershkovitz 1985; Peetz 2001; Bonvicino et al. 2003)³.

1.1 Distribution in Brazil

Chiropotes albinasus is mostly distributed in Brazil, south of the Amazon River from the west bank of the Xingu-Iriri River in Para west, to the Madeira River above the mouth of the Aripuanã River in the south of Radonia (Hershkovitz, P. 1985).



Map 1: Distribution of *Chiropotes albinasus*. Source: IUCN

² Ibid.

³ Ibid.



Some studies suggest that an ecological factor is the main limitation for their distribution as opposed to physical barriers (Ferrari et al 1999), possibly linked to competition with the region's other pitheciine species, *Pithecia irrorata*.

This species appears at low densities and appears to require large areas of continuous forest with high fruit productivity (Pinto and Setz 2005).

1.2 Habitat and Ecology

Although their preferred habitat is high *terra firme* forest, these monkeys have been observed occasionally in fragmented areas, inundated forests (Ayres 1981; Wallace et al. 1996; Ferrari et al. 2003), and vegetation at the transition between forest and savannah (Ferrari et al. 1999).

Their home range, i.e. the area in which an animal lives and travels, has been estimated at more than 1000 ha, one of the largest recorded for a Neotropical Primate. Their diet is heavily influenced by the availability of the food resource within its location. As a result, it is recognised that the monkeys have a preference for more productive plant species and will adjust their foraging patterns to adapt to the most widely available food source (Pinto et al 2008).

In terms of diet, bearded sakis are mostly frugivorous with a high dietary component of seeds making them seed predators (seeds are usually over half of the diet) (van Roosmalen et al. 1981; 1988; Kinzey & Norconk 1993; Norconk & Kinzey 1994; Norconk 1996; review in Peetz 2001; Peetz 2001). In fact, this reliance on seeds may largely exclude them from adverse effects of low rainfall on food availability (Norconk 1996), and this could be the reason why these monkeys can be found in both fragmented areas and inundated forest. Immature seeds and ripe fruit are also consumed, with a lesser reliance on flowers and leaf stalks (van Roosmalen et al. 1988; Port-Carvalho and Ferrari 2004). Between study sites, foods include seeds (50.7-74.8% of diet), fleshy fruit (0-52%), flowers (0-11.4%), leaves (0-16.1%), and insects (0.5-21%) (Reviewed in Norconk 2007). At a study site in Brazil, bearded sakis consumed more than one hundred species of plants (Veiga 2005)⁴.

Bearded sakis are diurnal primates, with activity beginning soon after sunrise and ending just before sunset. One study revealed that most of their time (n = 22,373 activity records) was spent traveling (36.3%) and resting (27.5%). Feeding represented 23.8% of the records and social activities 8.8% (Silva & Ferrari 2009).

They live in relatively large multi-male groups (several adult males, females, and offspring) with group size averages ranging from 2.3 to 32.7 individuals. Single groups have been seen numbering as high as 44 or more individuals (Vessey et al. 1976; Roosmalen et al. 1981; Branch 1983; Ayres 1989; Ferrari 1995; Norconk 1996; Bobadilla & Ferrari 1998; Ferrari et al. 1999; Norconk et al. 2003; Veiga 2005; Silva & Ferrari 2009). However, the average group size is generally between 10 and 30 members (Roosmalen et al. 1981; Mittermeier & van Roosmalen 1981; Johns & Ayres 1987)⁵.

⁴ Ibid.

⁵ Ibid.



1.3 Threats

Like most primates, loss of habitat represents the primary threat to the survival of the bearded sakis, which is continuing and widespread (Johns & Ayres 1987; Silva & Ferrari 2009). Mining and the railroads built for product extraction together with the associated development also threaten bearded saki habitats (Johns & Ayres 1987; Malacco & Fernandes 1989). Other threats to their habitat include forest clearance for agriculture, large-scale road projects, hydroelectric power generation, pastoral farming, and colonisation programmes (Malacco & Fernandes 1989; Bobadilla & Ferrari 2000)⁶.

However, some studies suggest that although habitat fragmentation is the main threat to this species, *Chiropotes albinasus* can adapt to this situation better than what was initially thought (Boyle et al, 2012). The study points out that when there are changes in the environment; monkeys adjust their diet due to plant species availability by comparing the prevalence of consumed items. Thus, living in small forest fragments, they are limited in their dietary choices as a consequence of the reduced number of plant species present, and therefore consume species that monkeys inhabiting continuous forests typically can ignore. In this way, the ability to consume a diverse diet that includes seeds and unripe fruit helps this species to survive in forest fragments, but it appears that these conditions are unviable unless connectivity increases among the forest fragments and continuous forest in the landscape (Boyle et al, 2012).

Another important threat to the bearded saki is hunting, as they are captured for food among other reasons (sometimes the tail is taken to be used as a souvenir or duster) (Johns & Ayres 1987; Ferrari et al. 1999). Hunting becomes more of a threat when coupled with habitat degradation and deforestation (Cormier 2000). Additionally, roads can increase hunting as they facilitate access to bearded saki populations (Johns & Ayres 1987)⁷.

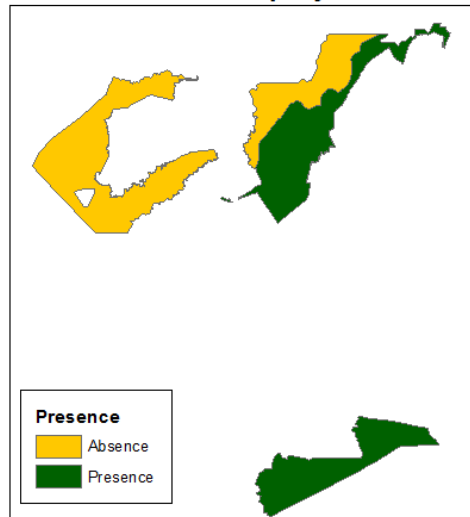
2. *Chiropotes albinasus* in Borba

It is very likely that *Chiropotes albinasus* resides in the project area, especially on the south bank of the Madeira River and in the southern project area according to the IUCN. This can be visualised in Map 2 below:

⁶ Gron KJ. 2009 June 26. Primate Factsheets: Bearded saki (*Chiropotes*) Conservation. <http://pin.primate.wisc.edu/factsheets/entry/bearded_saki/cons>. Accessed 22nd May 2014.

⁷ Ibid.

C.albinasus in the project area



Map 2: *Chiropotes albinasus* in Borba. Source: CGV

3. Monitoring *Chiropotes albinasus* in Borba

Although we already know that *C. albinasus* has been adapting to fragmented forest, we do not know for certain the exact special requirements that these monkeys have. Furthermore, we have yet to obtain information about the monkey's population in the project area, and in which proportion they have been decreasing. To overcome these setbacks, it is advisable that we should survey the project area and conduct population and density studies, so that we can determine how many there are, in which conditions they are in, and why. Aside from this, these monkeys can also live on flooded land, which means we should research *Chiropotes albinasus* in all habitat types, in order to learn about their behaviours more effectively.

Following this research, we would design a habitat conservation plan for the *C. albinasus*. As the main objective of the Trocano Araretama Project is to avoid deforestation, and the main cause of habitat loss is deforestation, these activities are synonymous in successfully conserving the habitat. Alongside this it would be necessary to study the habitat characteristics of the monkeys identified, as well as the habitat condition (if it is fragmented or not etc).

3.1 Drones

The density and fragmentation studies can be carried out using a conservation drone. The conservation drone is an autopilot system (APM) developed by an online community (diydrone.com). By combining the APM with open-source mission planner software (APM Planner), they convert off-the-shelf model airplanes into drones. They use inexpensive airframes so that the technology can be accessible to conservation organisations and researchers, who often do not have the funding to acquire and maintain drones (Lian Pin Koh et al, 2012).

In addition, locational data provided by GPS devices can be displayed using GIS packages generating mapping tools.



Finally, the high-resolution nature of the images taken by the drone would also allow us to detect the monkeys or signs of them in the photos, so that we could perform density and population studies as well as defining distribution maps, or even evaluate the real impact of hunting.

3.2 Traditional Monitoring Techniques

3.2.1 Direct Observations

A population study could also be developed in a traditional way although, as *C. albinasus* usually live in undisturbed inner lands, we would need a helicopter to access the area.

If we were to follow the same steps carried out by Peres in 1990 in the study called "Effects of Hunting on Western Amazonian Primate Communities," we would need to walk through measured transects already marked with coloured surveyor's tape, of 4-5 or 6 km several times, during a period of 15 minutes with stops every 100 metres (approximately every 20 seconds).

3.2.2 Camera Traps

Special cameras can also be used, which can be placed in remote locations and set to record when they detect motion. Later, we could return to review what has been recorded. These cameras would allow us to collect a species inventory, study activity patterns and estimate animal abundance.

Species accumulation curves suggest that it takes approximately 400-500 camera days⁸ to capture the majority of common species (Tobler et al, 2008). If the camera successfully captures images of all the species within an area, 86% of them will be recognised within a period of only two months. It is important to keep in mind that observation studies that aim to monitor the presence of a species, the community composition over time, or indeed compare species diversity between different areas require considerable effort and resources to register certain species, and a lack of photographic evidence does not necessarily conclude that the species is not present.

Furthermore, surveys for inventory purposes can be conducted on a relatively small trial system with a high camera density to achieve the required camera days. However, it is important to make sure all habitat types are accounted for (Tobler et al, 2008).

4. Conclusion

Chiropotes albinasus is listed as an endangered species according to the IUCN, as there is reason to believe that this species will decline by at least 50% over the coming 30 years (three generations) due mainly to the expanding agricultural frontier in this region, combined with the effects of hunting.

⁸ A camera day is defined here as the number of cameras used multiplied by the number of survey days



This monkey lives south of the Madeira River in the southern zone of the project. However, we do not know their population and density or their exact spatial requirements, so it is essential to study these as part of the Trocano Araretama Project's biodiversity monitoring activities. Previous research suggests that the white-nosed sakis are able to adapt to fragmented habitats better than initially thought, so it will be particularly useful to know the monkey's habitats in order to create a better understanding of their presence in Borba.

In order to successfully conserve this species, habitat degradation needs to be reduced, and this reduction is directly synonymous with the intent of the project to reduce deforestation, as deforestation is the main cause of habitat degradation.



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