




Community-Based Ecotourism and Primate Watching as a Conservation Tool in the Amazon Rainforest

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Abstract

Community-based tourism is a participatory approach implemented to support the economic and social development of local communities. Here, we present the preliminary results of an initiative of primate tourism in the Mamirauá Reserve for Sustainable Development (Mamirauá SDR), Amazon rainforest, Brazil. Between January and December 2019, we monitored the sighting rate of bald uakaris (*Cacajao calvus calvus*) by Uakari lodge tourists aiming to identify the main variables influencing the records of this primate that could be used as a baseline for a primate-watching program. During 334 days, tourist guides provided data on 602 tourist outings, with 190 sightings of uakari groups (109 in the morning and 81 in the afternoon). These values correspond to a mean of 0.57 sightings/day and 0.32 sightings/outing while the mean number of uakaris sighted per outing was 6 individuals (± 6.6 SD; min = 1; max = 30). Uakaris were mostly traveling (55%) or feeding (35%), and less frequently resting (9%). Uakari sightings varied monthly, with 73.4% of the tourists reporting seeing uakaris at least once during their stay, while 26.6% did not. The marked seasonal variation in the water level, food availability, and the socioecological strategies of uakaris are parameters that

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may have facilitated the detectability of these primates by tourists in Mamirauá SDR. We concluded that primate tourism in Mamirauá SDR has a high potential to strengthen the synergism between traditional and scientific knowledge and promote social and economic benefits for local communities and new conservation actions for primates.

Keywords Amazonian primates · Neotropical primates · Pitheciinae · Primate conservation · Sustainable development reserve

Ecotourism can be an important conservation tool and tourism initiatives based on watching primates in their natural habitats are a popular and lucrative economic activity in parts of Africa and Asia. However, there are only a handful of such initiatives in South America. In particular, although the Amazon rainforest has the greatest primate diversity in the world, its potential for primate-watching ecotourism is often overlooked.

The Mamirauá Sustainable Development Reserve (Mamirauá SDR) in Brazil is a 1,124,000-ha protected area in the central Amazonian flooded forests created and managed with the support from the Mamirauá Institute for Sustainable Development (MISD, a research unit subsidized by the Brazilian government) and traditional peoples who inhabit the reserve, thus providing a successful conservation model where scientific knowledge and the involvement of local people drive the appropriate management of natural resources (Queiroz 2011). One of the programs used to provide economic and social development for local people in Mamirauá SDR is community-based tourism. This initiative started in 1998 when the Uakari Lodge opened and has since been comanaged by local people and the Mamirauá Institute for Sustainable Development (Peralta 2012). Since then, ecotourism packages offering contact with nature and the interaction with local people have attracted visitors from all over the world and have generated *ca.* US\$ 1 million of economic revenues to local communities. Although one of the reasons for creating the reserve was the urgent need to conserve the flagship and endemic primate species, the white bald uakari (*Cacajao calvus calvus*), no specific programs in Mamirauá SDR yet involve tourism and primate conservation.

Ecotourism relies on the probability of detecting the target species and knowledge of the socioecological behaviors of primates is essential to increase the chances of a successful primate-watching tourism program. With this in mind, we monitored the sighting of white bald uakaris by Uakari Lodge guides and tourists between January and December 2019, to evaluate the potential for a primate-watching ecotourism program in this area. We asked local tourist guides to use standardized data forms to record whether they saw uakari groups on each tourist outing, the number of uakaris seen, and note their behavior. We also recorded whether tourists saw uakaris during their stay at the Lodge. We informed guides and guests about the collection of data and they consented to the results being disclosed for scientific purposes. We did not collect any personal identification or information about the participants, and all data were anonymized.

For the 334 days on which the lodge was open in 2019, tourist guides provided data on 602 tourist outings, with 190 sightings of uakari groups (109 in the morning and 81 in the afternoon), corresponding to a mean of 0.57 sightings/day and 0.32 sightings/outing. The mean number of uakaris sighted per outing, when uakaris were detected,

was 6 individuals (± 6.6 SD; min = 1; max = 30). Uakaris were mostly traveling (55%) or feeding (35%) when they were sighted, and less frequently resting (9%). Of the 655 tourists that offered information on uakari sightings, 73.4% reported seeing uakaris at least once during their stay, while 26.6% did not, with considerable monthly variation (Fig. 1a).

Seasonal variation in rainfall has a marked influence on river water levels and forest productivity in Mamirauá SDR (Queiroz 2011), and white bald uakaris use different socioecological strategies to optimize their access to resources over the year in that region (Ayres 1989). During the high-water season (February–July), they travel and forage in large groups (*ca.* 30 individuals, sometimes hundreds), and are generally more detectable. In contrast, during the low-water season (August–January), fewer fruits are available and uakaris split into small social foraging units (<10 individuals) and travel less than during the high-water season, which is likely to hinder tourist sightings. In line with these socioecological patterns, the probability of seeing uakaris during outings increased as the river water level rose (logistic regression: $z = 2.19$; estimate = 0.057; $P = 0.03$) (Fig. 1b), and the number of uakaris sighted per outing in which uakaris were detected was higher during the high-water season than in the low-water season (generalized linear model t -value: -3.07 , estimate low-water season: -0.43 , $P = 0.002$, family of distribution: Negative Binomial) (Fig. 1c). The proportion of uakari sightings was particularly high in May, June, and August; during these months, guides take tourists into the flooded forest on small canoes, facilitating closer approaches to trees and quiet observation. Therefore, the knowledge of the socioecological behaviors of primates is essential to increasing the chances of a successful primate tourism program.

The high sighting rates of uakaris by the guides and the overall high proportion of tourists that reported seeing uakaris at least once (73.4%) suggest that a primate-watching ecotourism program in Mamirauá SDR is feasible and has high potential to promote primate conservation and bring social and economic benefits for local people. If successful, this program could serve as a model for the development of similar initiatives in other Amazon reserves, especially nearby protected areas such as Amanã Sustainable Development Reserve and Tefé National Forest, which are home to a great diversity of primate species, making a combined visit to these three protected areas attractive to wildlife observers.

Under the current scenario of political and economic instability in the Amazonian countries, initiatives that guarantee the governance of local people and the conservation of biodiversity are urgent (Garber and Bicca-Marques 2021). Primate tourism programs must be carefully designed and monitored to ensure that their positive effects (e.g., economic revenues, the involvement of local people in conservation programs) outweigh their potential negative effects on wildlife (e.g., disease transmissions, behavioral alteration) (Russon and Wallis 2014). Well-designed community-based tourism programs at conservation-oriented sites such as Mamirauá SDR—where local people co-manage the tourism program, and only a limited number of tourists can access the area yearly—may alleviate potential risks of tourism to primate populations while strengthening the environmental and social benefits of this practice.

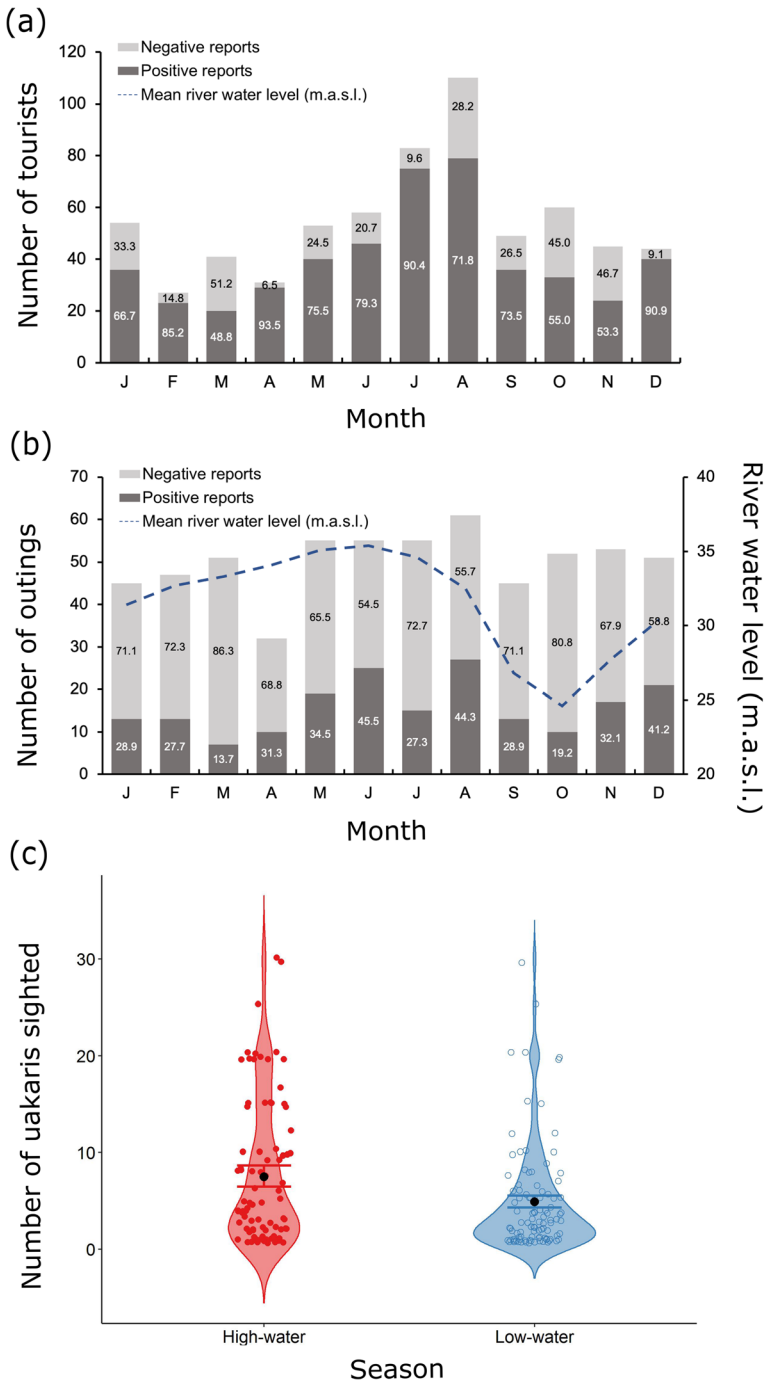


Fig. 1 White bald uakari (*Cacajao calvus calvus*) sightings at Uakari Lodge in Mamirauá Sustainable Development Reserve, Brazil. **(a)** Monthly numbers of tourists that did and did not sight uakaris. **(b)** Monthly numbers of tourist outings with and without sightings, with the water level. **(c)** Number of uakaris sighted per outing in which uakaris were sighted in high-water and low-water seasons. Numbers in the bars in **(a)** and **(b)** are percentages, while the black point and whiskers in **(c)** are the mean and confidence intervals, respectively

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