

Can cultural values associated with turacos be used to enhance biodiversity conservation in Cameroon?

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Abstract Turacos are birds used as status symbols in certain African cultures. Despite this cultural value, turacos are increasingly threatened by habitat loss and illegal hunting. We tested the hypothesis that the high cultural value associated with turacos means local people are willing to conserve them and their habitats. To this end, we examined the traditional uses of turacos and how their cultural value could facilitate conservation interventions. We administered an open-ended questionnaire to 180 households during January 2017–November 2019. We found the feathers of three species of turacos to be associated with qualities such as social esteem and power: Bannerman’s turaco *Tauraco bannermani* (categorized as Endangered on the IUCN Red List), green turaco *Tauraco persa* (Least Concern) and great blue turaco *Corythaëola cristata* (Least Concern). People were generally supportive of efforts to protect turacos because of a strong connection between these birds and the local culture, supporting our hypothesis. This particularly applied to people of high social standing such as chiefs and village elders who use turaco feathers to gain public distinction. Feathers were also used by herbalists for traditional medicine, and hunters used the birds’ calls as a time indicator. Feathers are generally obtained through opportunistic collection and a sustainable, traditional hunting system, but we also found that some people hunt turacos to sell them as pets. We recommend that conservation interventions make use of the cultural values associated with these iconic species, together with implementing alternative sources of livelihoods, to promote behaviours that help achieve conservation objectives in the area.

Keywords Cameroon, conservation interventions, cultural values, feathers, prestige and power, turacos

Supplementary material for this article is available at doi.org/10.1017/S0030605322000059

Turacos (family Musophagidae) are birds that feature heavily in certain African cultures as status symbols of royalty (Soh, 1984; Brewer, 2018). There are 23 species of turacos occurring in Africa south of the Sahara (Fry et al., 2004), two of which are categorized as globally threatened on the IUCN Red List: Bannerman’s turaco *Tauraco bannermani* (categorized as Endangered; BirdLife International, 2016) and Ruspoli’s Turaco *Tauraco ruspolii* (Vulnerable; BirdLife International, 2016). In West Africa, wearing turaco feathers in a black hat indicates the position of an individual as a traditional council member, and in the Lebialem Highlands in Cameroon, red turaco feathers are handed out to people to bestow public distinction and esteem (Collar et al., 2007).

Despite this high cultural value, turacos are increasingly threatened by habitat loss and illegal hunting (Borghesio & Ndag’ang’a, 2003; Tamambang, 2018). We tested a hypothesis that the high cultural value of turacos increases the willingness of local people to conserve them and their habitats. We aimed to understand local uses of turacos and how their role as cultural symbols could facilitate conservation interventions.

We carried out this study in the Tofala Hill Wildlife Sanctuary in the Lebialem Highlands in south-west Cameroon (Fig. 1). Ten ethnic communities occupy this area and the main livelihoods are hunting, farming and fishing. The area has a rich biodiversity, with > 400 plant species (42 of which are categorized as threatened on the IUCN Red List), two great apes (the Critically Endangered Cross River gorilla *Gorilla gorilla diehli* and Endangered *Pan troglodytes elliotii*, the rarest subspecies of chimpanzee), several species of monkeys, eight globally threatened bird species and three endemic species of amphibians (Ekinde & Khumbah, 2006).

We (SNN, BTN, MNY) conducted a survey during January 2017–November 2019 with the assistance of a local guide who translated questions into the local Mundani language. We surveyed four villages (Bangang, Bechati, Besali and Fossimondi) whose inhabitants rely heavily on the forest. We used an open-ended questionnaire to collect information (Supplementary Material 1), with a pre-test conducted in each village to ensure that the questionnaire could be fully understood by all respondents (De Vaus, 1996). We visited village chiefs to explain the objectives of our study, which facilitated the process of obtaining free, informed consent from participants. We visited the respondents’ houses during 06.00–10.00, before people left for their daily activities, or in the evening during 17.00–19.00, when they returned home. Each interview lasted c. 30 minutes and questions focused on socio-demographic

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Received 12 August 2021. Revision requested 19 October 2021.

Accepted 24 January 2022. First published online 30 May 2022.

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Oryx, 2023, 57(1), 129–131 © The Author(s), 2022. Published by Cambridge University Press on behalf of Fauna & Flora International doi:10.1017/S0030605322000059

<https://doi.org/10.1017/S0030605322000059> Published online by Cambridge University Press

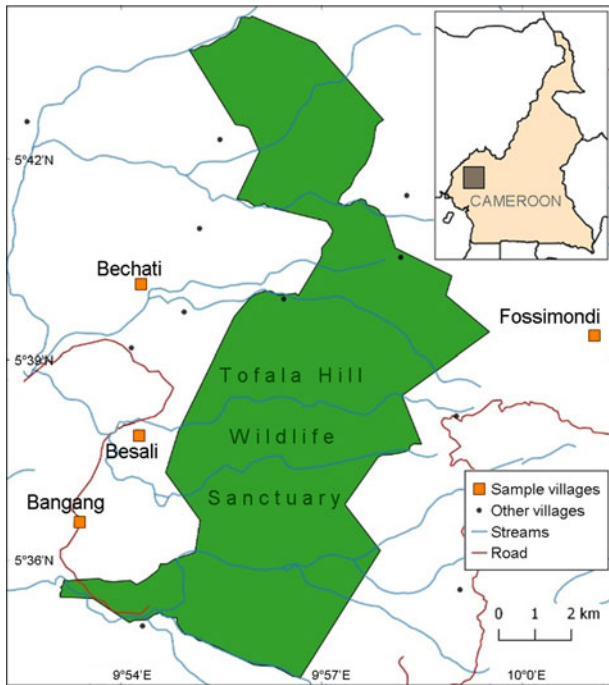


FIG. 1 Location of the Tofala Hill Wildlife Sanctuary and study villages in the Lebialem Highlands in south-west Cameroon. Source: World Resources Institute, 2020.

characteristics and the general backgrounds of respondents, knowledge and local perceptions of turacos, and willingness to conserve these birds and their habitats. To facilitate species identification, we used photographs of the three species

present in the area: Bannerman’s turaco *Tauraco bannermani*, green turaco *Tauraco persa* (Least Concern; BirdLife International, 2016) and great blue turaco *Corythaeola cristata* (Least Concern; BirdLife International, 2017). We used a χ^2 test of association to examine the relationship between people’s social rank and the use of turaco feathers for public distinction. We used logistic regression to model the influences of age group, occupation and level of education on the willingness to conserve turacos. We carried out these analyses using R 4.0.2 (R Core Team, 2020).

We interviewed 180 households across the four study villages and found respondents were farmers, hunters, traders, students, teachers or herbalists (Table 1). The majority (88%) of respondents could easily distinguish between the three species of turacos from the photographs presented. Feathers of the great blue turaco were used more frequently (65.2%) than those of Bannerman’s turaco (21.7%) and the green turaco (13.0%). The use of turacos differed between respondents, depending on their social rank ($\chi^2 = 40.037$, $df = 3$, $P < 0.001$) and occupation (Fig. 2): red tail feathers and green wing feathers were used by chiefs and elders for public distinction, and black feathers by herbalists, with these feathers burnt and the resulting smoke then inhaled for 15 minutes per day for 3 days to treat chest pain and cough. Farmers and hunters relied on turaco calls as a time indicator, with early morning calls indicating the time to start their activities, calls at midday the time for their lunch break and evening calls the time to return home. Six of the 24 hunters interviewed reported hunting turacos opportunistically to sell them as pets; these were the

TABLE 1 Socio-demographic characteristics of interviewees in villages near the Tofala Hill Wildlife Sanctuary (Fig. 1) in the Lebialem Highlands in south-west Cameroon.

	Village				Number of responses (%)
	Bangang	Bechati	Besali	Fossimondi	
Gender					
Male	14	29	24	48	115 (63.9)
Female	6	10	13	36	65 (36.1)
Age (years)					
0–20	2	5	8	11	26 (14.4)
21–40	10	20	17	33	80 (44.4)
41–60	6	9	8	22	45 (25.0)
> 60	2	5	4	18	29 (16.1)
Occupation					
Farmer	4	17	22	45	88 (48.9)
Hunter	9	5	4	6	24 (13.3)
Trader	1	5	1	9	16 (8.9)
Student	2	9	10	14	35 (19.4)
Teacher	1	3	0	6	10 (5.6)
Herbalist	3	0	0	4	7 (3.9)
Education					
None	5	11	6	39	61 (33.9)
First School-Leaving certificate	12	17	25	29	83 (46.1)
Ordinary Level certificate	3	6	4	10	23 (12.8)
Advanced Level certificate	0	3	2	6	11 (6.1)
University studies	0	2	0	0	2 (1.1)

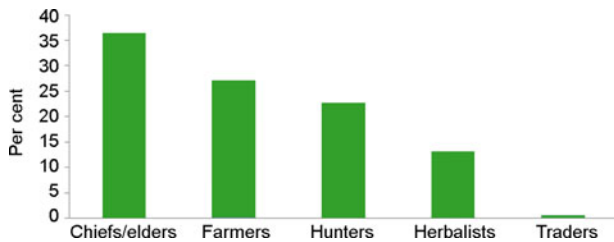


FIG. 2 Frequency of turaco species usage according to respondents' social categories in the Tofala Hill Wildlife Sanctuary (Fig. 1).

youngest amongst the interviewed hunters (< 30 years of age). Willingness to conserve turacos and their habitats was linked to age group ($t = 2.2461$, $P = 0.0437$) and level of education ($t = 2.5342$, $P = 0.0233$), with older people (> 50 years of age) showing the greatest willingness to conserve turacos and their habitats. The overall support for conservation, which increased with age and level of education, could have been because of an ongoing conservation initiative in the area run by the Rainforest Trust. The turacos that were used by chiefs and elders for public distinction, and by herbalists to treat chest pain and cough, were either carcasses found in the forest or individuals obtained via traditional hunting. The latter is regulated through a customary governance system allowing a few turacos to be hunted annually using traditional bows, as opposed to modern hunting using shotguns. Turacos sold as pets were caught at night from the trees in which they sleep.

Our findings show that there is a strong connection between turacos and traditional uses, with an overall support within the local community for the conservation of turacos and their habitats. This willingness to conserve turacos was linked to the cultural values associated with these birds, supporting our hypothesis. Turaco feathers are used locally as a traditional medicine to treat chest pain and cough, and as status symbols for local chiefs and elders. These local rulers associate turacos with prestige and power and ensure the sustainability of the use of this resource through customary governance. There is empirical evidence that natural resources associated with cultural values tend to be well managed locally (Roe et al., 2009; Infield et al., 2018). However, young hunters in the area reported hunting turacos illegally to sell them as pets, whereas older hunters only mentioned using turaco calls to determine time of the day.

Our research demonstrates the high cultural and economic value of turacos, and highlights the need for income-generating activities for the increasing young population. We recommend that conservation interventions should emphasize the high cultural value of turacos, together with promoting alternative income-generating activities, to foster behaviours that help achieve conservation objectives.

Author contributions Study design: SNN; data collection: SNN, BNT, MNY; data analysis: EDN, SNN; writing: EDN, SNN, with contributions from all co-authors.

Acknowledgements We thank the village heads around the Tofala Hill Wildlife Sanctuary and the local population for their support and peaceful collaboration throughout the study; and our local guide, Pa Solomon, who translated questions into the local language.

Conflicts of interest None.

Ethical standards This study abided by Oryx guidelines on ethical standards and conforms to the standards set out by the Association of Social Anthropologists of the Commonwealth. It received clearance from Cameroon's Ministry of Wildlife and Forestry which then issued a research authorisation/permit to undertake the study.

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