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Local knowledge, uses, and conservation status of the African golden cat *Caracal aurata* in Central Cameroon

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Acknowledgments

We thank the Cameroonian Ministry of Forestry and Wildlife (research permit N°1050), the Ministry of Scientific Research and Innovation (research permit N°00000025), and the University of Yaoundé 1 for research attestation. We thank the conservator of the Mpem et Djim National Park and the council of Yoko for the facilitation during the survey. We thank Linda G. S. Guiadem, Marcelle N. Mbadjoun, Line T. Keboun and Drs Alain C. Wandji, Laurel A. D. Nkwala, Armand R. F. Nzoko, for their participation in data collection. We also acknowledge those who participated as translators. We express our sincere gratitude to Dr Dan Challender for providing valuable comments and insights on the early version of this paper. We thank all anonymous respondents who participated in the survey.

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Abstract

The African golden cat *Caracal aurata* is one of Africa's least known felids, and little is understood about local people's knowledge and uses of this cat. Questionnaires were completed with 454 people from 15 villages near Mpem et Djim National Park and the Council Forest of Yoko to assess local knowledge, uses, and perceived conservation status of this felid. Only 35% of respondents recognized the species, and older people were more likely to do so. Locals stated that the golden cat population is currently low, that the species is considered a totemic animal, a sign of power and grandeur, and that their pelts are an ornamental asset. Hunting with guns and snares was stated to be the greatest threat to golden cats. Locals urged restricting hunting to protect the species, and both chicken and pig farming were suggested as alternatives to hunting. Our study is the first community-based evaluation of the golden cat in Cameroon.

Keywords: Bushmeat, carnivore, felids, hunting, illegal wildlife trade, local communities

Introduction

Hunting wildlife for food and income is vital in rural economies and culture (Koster, 2011; van Vliet et al., 2018). In areas with limited or non-existent protein alternatives (domestic meat, seafood), the meat of wild animals (“wild meat”) is often the major source of protein (Ingram, 2020). Use of wild animals can also underpin the identity and cultural practices of traditional communities (Alves et al., 2018). However, growing human populations, economies, and improvements in hunting technologies have led to widespread and excessive harvesting, threatening some species of wildlife (Ingram et al., 2021).

African golden cat *Caracal aurata* (Order: Carnivora; hereafter “AGC”) is a medium-sized forest felid (Kingdon et al., 2013), classified as “Vulnerable” on the IUCN Red List of Threatened Species (Bahaa-el-din, Mills, et al., 2015). This species, is considered to be very sensitive to deforestation and snare hunting (Bahaa-el-din, Henschel, et al., 2015; Bahaa-el-din, Mills, et al., 2015; Simo et al., 2019). Although not typically targeted by hunters, the AGC is commonly killed as bycatch in snares (Bahaa-el-din, Henschel, et al., 2015). Its distribution is restricted to equatorial forests where an increasing rate of deforestation (for commercial and illegal logging, clearing by farmers, and construction of dams, roads, and mining) and hunting with snares threatens many species (Bahaa-el-din, Henschel, et al., 2015; Wilkie & Carpenter, 1999). This pervasive hunting for bushmeat drives the remaining forests toward an “empty forest” state (Sayer, 1992).

Across the AGC range, local people display diverse beliefs and uses of the species. Body parts of the AGC are thought to have medicinal properties in some countries (T. Davenport & G. Ngandjui, pers. comm.). The AGC, has cultural importance in some regions, the skin being utilized either in traditional rituals or for wrapping valuable

objects (e.g., gold weights (Van Mensch & Van Bree, 1969). Although there is some insight into cultural uses, no study has specifically investigated how local communities utilize this felid in their environment. While the AGC has been recorded at bushmeat markets (e.g., Angola; De Beer et al., 2021), there is no clear pattern of how the meat of this felid is viewed among bushmeat consumers, or how it may be used for other non-dietary purposes (e.g., traditional medicine, totemic value). Undertaking a community survey to understand the local utilization of the AGC will, therefore, help inform a more holistic conservation management approach. The AGC is a CITES Appendix II species and is classified as a Class A species under the Cameroonian wildlife legislation, meaning it is prohibited from hunting and possession.

Local Ecological Knowledge (LEK) refers to environmental knowledge acquired through interactions with the natural environment (Gilchrist et al., 2005). It is a particularly useful tool for rare and elusive species and can be used to collect a variety of data, including occurrence, natural history, cultural usage, threats and conservation status (Turvey et al., 2014). Incorporating LEK into wildlife management is also an efficient strategy to implement species conservation while respecting local people's cultural rights (van Vliet et al., 2018). Here, we gathered information on LEK and cultural use of the AGC in local communities in central Cameroon through a semi-structured questionnaire focused on: 1) knowledge and the perceived cultural and ethno-zoological value of the AGC; 2) consumptive and non-consumptive uses of the AGC; 3) the main threats to the AGC as perceived by locals; and 4) conceivable initiatives to reduce dependence on bushmeat hunting.

Methods

Study sites

The study was conducted around the Mpem et Djim National Park (MDNP) and the Council Forest of Yoko (CFY; see Fig. 1). Both are located in the Centre Region of Cameroon, in the Mbam et Kim Division and Yoko Subdivision. Local peoples of this landscape are *Vouté* and *Baveuck* (Difouo et al., 2020) who are mostly involved in agriculture, hunting, fishing, and harvesting of non-timber forest products (NTFPs), as well as small-scale trade. There are also large cocoa and cucumber farms and several logging companies operating in the Forest Management Units (FMUs).

Mpem et Djim National Park (5° - 5°20' N / 11°30' - 12° E; 976 km²; average altitude 640 m) is located about 300 km north of Cameroon's capital, Yaoundé. The rough terrain and bordering rivers make access difficult. Poverty and a lack of formal income-generating activities drive illegal wildlife hunting.

The Council Forest of Yoko (4°53' - 5°1' N / 12°5' - 12°20' E; 297 km²; average altitude 606 m) was classified a Council Forest by Decree N°2011/0038/PM of 14 January 2011. Following the Law No. 94/01 of 20 January 1994 on the regime of forests, wildlife and fisheries, any forest of the permanent forest domain that has been the subject of a classification act on behalf of the council concerned or that has been planted by it is considered a Council Forest (Article 30). The act of classification sets out the boundaries and management objectives of the forest as well as rights of use by local populations.

Both MDNP and CFY lie within the forest-savanna transition area of Cameroon. They host tropical closed canopy, gallery forest, and grassland-adapted species. The climate is a classic Guinean regime with four seasons per year. Average annual rainfall varies between 1,800 and 2,000 mm. Annual temperature averages 22-29 °C (Tsalefac et al., 2003).

We obtained a national level research authorization from the University of Yaoundé I, a research permit from the Ministry of Scientific Research and Innovation and from the Ministry of Forest and Wildlife (N°0819/PRBS/MINFOF/SETAT/SG/DFAP). The study was approved by the GIZ Ethics Committee (reference number ProFE/N0679/DB/IK). Prior to visiting each village, the village chief was informed of our survey and goals. Respondents gave verbal agreement before proceeding (Free Prior Informed Consent). Respondents were not incentivized to participate in the survey, and were told that participation was optional and interviews were anonymous. Only adults over 18 years old were interviewed.

Questionnaire survey

The fieldwork was carried out between June 5 and June 12, 2021 in the vicinity of the MDNP, and July 13 to July 20, 2021 in the vicinity of the CFY. We selected 15 villages (5 around the MDNP and 10 around the CFY) based on their accessibility and inclusion in the management plan. In each community, 20 to 40 people were expected to complete the questionnaire to capture adequate response variability (Guest et al., 2006; Nash et al., 2016).

Prior to conducting field data collection, a training day was convened for enumerators to deliberate on the methodology and interpretation of survey questions. The aim was to establish a standardized survey approach and mitigate potential enumerator bias. A local guide assisted with translation and selection of participants through a snowball sampling approach. Each participant individually completed a semi-structured questionnaire with the enumerator which lasted less than one hour (Newing, 2010). The questionnaire was loaded onto the tablets and smartphones of enumerators in KoBoCollect (KoBoToolbox, 2018). It was structured into different sections addressing: (i) socio-demographic information of respondents, (ii) Local Ecological

Knowledge of the AGC, and (iii) conservation status and threats of the AGC. We asked respondents to identify a series of animal photos (in their local language and in French). This identification phase began by checking the reliability of the responses. We used a negative and a positive control (Turvey et al., 2014). Our negative control was a photo of a tiger (*Panthera tigris*) which is not native to Africa. Our positive control was a photo of the blue duiker (*Philantomba monticola*), a native and common species in the region. Those who failed this test (two respondents) were, subsequently, not considered in the analysis. We then presented a photo of the AGC to respondents before starting to complete the questionnaire (Nash et al., 2016). If a respondent was able to identify the AGC, we measured attitudes of respondents through their level of agreement towards different environmental statements using a five-point Likert-type scale. A subsequent series of questions about the AGC were asked, including the name of the species in the local and French languages, whether they had ever seen it, the last time they had seen it, the location, the perceived demographic trend, whether they had ever eaten it, the main perceived threat to the species, and possible ways to reduce these threats.

Data analyses

We used univariate analyses to describe the socio-demographic structure of respondents as well as certain aspects of the use of the AGC (knowledge, cultural value, conservation status, threats, trade, and consumption), hunting methods (i.e., rifle/trap) and hunting frequency. The total population of the 15 villages was obtained from the most recent Council Development Plan from the Council of Yoko, which reported a total population size of 11,483 individuals. The sample size was calculated using Slovin's formula, wherein $n = \text{required sample size}$ [$n = N/(1+Ne^2)$] with 95% CI and 5% margin of error which yielded a sample size of 386. We added a 20% margin to the calculated sample size to account for measurement errors. This led to a required

sample size of 463 respondents. Incomplete questionnaires (a total of nine) were excluded from the analysis. Allocation of respondents between the MDNP and the CFY was to ensure equitable representativeness of each site. Differences in frequencies between the modalities were assessed using Chi-square tests. All statistical analyses were performed in R 4.0.5 (R Core Team, 2020) and statistical significance was set at the 5% probability level.

Prior to the inferential analysis, some levels of the categorical variables were grouped together to ensure adequate sample size at each level and improve interpretability. We classified ethnic groups as native to the study area (*Vouté, Baveuck, Tikar*) or non-native (*Bayangui, Betsi, Bassa, Manguissa, Sanaga, Mbororo, Bamiléké, Bafia, Yambassa, Bansock, Mambila*). We used the geographical distribution and the total proportion of each ethnic group (natives are more numerous in each survey area) to distinguish between natives and non-natives. Education levels were grouped into None, Primary, and Secondary+ (which includes respondents with secondary and higher education). The age of respondents was grouped to reflect different physical hunting abilities of people in the area: younger participants (18-34 years), middle-aged participants (35-54 years), and older participants (55 years and older), with hunters' peak productivity reported between 30 and 35 years old (Koster et al., 2020).

Occupations were grouped into two categories: "Outside workers" whose work include contact with or a high possibility of contact with wildlife (e.g., hunters, fishermen, farmers), and "Inside workers" whose work include no contact or a low possibility of contact with wildlife (e.g., schoolchildren, students, carpenters, shopkeepers, barbers).

We applied a logistic regression model using the Generalized Linear Model (GLM) function from the *nnet* package with a binomial error structure and a logit link function to investigate variables influencing whether respondents recognized the AGC. We

tested for excessive dispersion in our model by fitting two models, one with a binomial error structure and the second with a quasibinomial error structure. We then used the Chi-square test to compare the two models and the model was considered overdispersed if the resulting p-value was significant ($p < .05$). Once the model assumptions were met, we applied a stepwise regression method with the direction argument set to 'both' to automatically select the set of covariates to be included in the 'best' model (Zhang, 2016). When the response variable was an ordered categorical variable, such as the perceived trend of the population (decreasing, stable, or increasing), we applied an ordinal logistic regression model using the polr function in the MASS package in R (Venables & Ripley, 2002) in conjunction with a Brant test (Brant, 1990) to check whether the final model met the proportional likelihood assumptions. Respondents who did not answer the questions forming the response variables were removed from the dataset before running the models. The independent variables tested are: gender, age category, ethnicity, and job category.

Results

Socio-demographic characteristics

We surveyed 454 people spread across the MDNP and CFY landscapes (Table 1). Ninety-four people declined to participate in the survey. Native people made up the majority of respondents (81.93%, $n = 372$) while non-natives (18.06%, $n = 82$) were a minority.

Local Ecological Knowledge of the African golden cat

Few respondents (34.8%) claimed to know the AGC ($\chi^2[X = 1, n = 158] = 9.2416$, $p < .05$), while the majority (65.2%; $n = 296$) did not. Further analysis revealed that including gender ($\chi^2 = 17.67$, $df = 1$, $p < .0001$) and age group ($\chi^2 = 6.47$, $df = 2$, $p < .05$) in a GLM significantly improved model fit. Men were significantly more likely

to recognize the AGC than women (GLM: $OR = 2.62$, 95% $CI [1.6, 4.24]$, $p < .0001$). Additionally, younger respondents were significantly less likely to recognize the AGC than middle-aged respondents (GLM: $OR = 0.64$, 95% $CI [0.41, 1.00]$, $p < .05$). Similarly, there was a non-significant tendency for older respondents to recognize the AGC than middle-aged respondents (GLM: $OR = 1.26$, 95% $CI [0.65, 2.43]$, $p < .05$).

Among those who claimed to know the AGC ($n = 158$), a large proportion (40.51%; $n = 64$) stated that the AGC was called *Sopdou* in the *Vouté* language, the native and dominant group around MDNP and CFY. While 22.79% ($n = 36$) indicated being unaware of the AGC name in their native language, and 13.29% ($n = 21$) referred to the AGC as *yem*, which is the *Vouté*'s term used to refer to the leopard. A wide range of other names was also proposed among a few respondents. Association was found between naming the AGC as "Sopdou" and factors such as age ($\chi^2 = 16.52$, $df = 2$, $p < .0001$), education level ($\chi^2 = 5.47$, $df = 2$, $p > .05$), and ethnicity ($\chi^2 = 9.41$, $df = 1$, $p < .05$). Younger individuals (GLM: $OR = 0.19$, 95% $CI [0.8, 0.43]$, $p < .001$) and non-natives (GLM: $OR = 0.12$, 95% $CI [0.02, 0.5]$, $p < .05$) were less likely to name the AGC as *Sopdou*. Switching to the French name of the AGC, only a small percentage of respondents (5.06%; $n = 8$) were able to provide the exact name *chat doré*. The majority (44.94%; $n = 71$) referred to the AGC as *chat tigre*, while others mentioned names such as *panthère* (9.49%; $n = 15$), *chat sauvage* (4.43%; $n = 7$) or *chat gris* (0.63%; $n = 1$). No clear predictors were found for the French name of the AGC.

Furthermore, we explored the respondents' sighting experiences of the AGC. The majority of those who claimed to know the AGC reported having seen it at least once (86.08%; $n = 136$). Factors such as gender ($\chi^2 = 5.15$, $df = 1$, $p < .05$) and occupation ($\chi^2 = 4.85$, $df = 1$, $p < .05$) were found to significantly influence the likelihood of having seen the AGC. Men were more likely to have seen the AGC compared to

women (GLM: $OR = 3.29$, 95% $CI [1.18, 8.87]$, $p < .05$), and "Outside workers" were more likely to report sightings compared to "Inside workers" (GLM: $OR = 0.34$, 95% $CI [0.13, 0.88]$, $p < .05$). Among those who had seen the AGC once, most ($\chi^2 = 37.985$, $df = 3$, $p < .0001$) reported their last sightings occurred before 2018, with fewer recent sightings (MDNP (%): prior to 2018 = 32.58, y2019 = 8.33, y2020 = 9.09, y2021 = 5.3; CFY (%): prior to 2018 = 18.94, y2019 = 6.82, y2020 = 5.3, y2021 = 13.64). In 2021, more AGC sightings were reported around the CFY compared to the MDNP ($\chi^2 = 3.6724$, $df = 1$, $p < .05$). The locations where the AGC was observed varied, with the forest (52.21%; $\chi^2 [df = 6, n = 71] = 133.99$, $p < .0001$) being the most frequently mentioned location. The rest included the village (20.59%; $n = 28$), followed by the forest-savanna transition zone [(the ecotone) (10.29%; $n = 14$)], the savanna (7.35%; $n = 10$), the market (2.94%; $n = 4$), and finally the farm (2.21%; $n = 3$). When asked about the specific locations where the AGC was observed, the main cited places include "in traditional traps" (25.96%, $n = 37$), on trees (25%, $n = 36$), and next to watercourses (7.69%, $n = 8$).

Of those who reported on the status of the AGC population ($n = 131$), the majority (77.09%; $\chi^2 [df = 2, n = 101] = 29.231$, $p < .001$) considered it to be low, whereas a smaller proportion (23%, $n = 30$) reported it as abundant (Fig. 2a). When asked about the trend in the AGC population over the last 5 years ($n = 134$), the majority (55.97%; $\chi^2 [df = 2, n = 75] = 49.62$, $p < .0001$) perceived it as decreasing while 19.4% ($n = 26$) had no idea, 17.91% ($n = 24$) thought it as increasing and 8.33% ($n = 9$), believed it remained stable (Fig. 2b). Notably, in MDNP, respondents were more likely to think that the AGC population had increased over the last five years (14.18%, $\chi^2 [df = 1, n = 134] = 6.0913$, $p < .05$) compared to the CFY. Similarly, in MDNP, a higher proportion of respondents considered the AGC population to be abundant (14.5%, $\chi^2 [df = 1, n =$

131] = 4.229, $p < .05$) compared to the CFY, although no predictors were found among respondents for both the current and past perceived trends in the AGC population.

Uses of the African golden cat

Of those who gave their opinion on the consumption of the AGC ($n = 149$), 60.40% ($n = 90$) claimed to have eaten its meat at least once, while 39.6% ($n = 59$) had never. Inclusion of respondents' sex ($\chi^2 = 05.17$, $df = 1$, $p < .05$) and age ($\chi^2 = 9.92$, $df = 2$, $p < .05$) in a GLM significantly enhanced model fit regarding whether respondents had eaten the AGC meat. Men were significantly more likely to have consume the AGC meat than women (GLM: $OR = 2.86$, 95% $CI [1.16, 7.48]$, $p < .05$). Younger respondents were less likely to have eaten the AGC meat (GLM: $OR = 0.44$, 95% $CI [0.21, 0.93]$, $p < .05$); older respondents showed a non-significant tendency to have consume the AGC meat compared to middle-aged respondents respectively (GLM: $OR = 2.13$, 95% $CI [0.67, 8.24]$, $p > .05$). Among respondents who have never eaten the AGC meat, the main reasons for abstention included the lack of opportunity (55.17%, $\chi^2 [df = 3, n = 58] = 61.466$, $p < .001$), cultural beliefs (29.31%, $n = 17$), disinterest in AGC meat (10.35%, $n = 6$), and religious reasons (5.17%, $n = 3$). Of the respondents who had eaten the AGC meat more than once, the majority (70.12%, $\chi^2 [df = 3, n = 87] = 109.1$, $p < .0001$) reported obtaining it through hunting, either by hunting themselves or from another hunter. Other sources included markets (11.5%), villages (11.5%), and restaurants (6.9%) (Fig. 2c). However, more people reported sourcing the AGC from the village in the MDNP area (9.2%, $\chi^2 [df = 1, n = 87] = 6.133$, $p < .05$) compared to the CFY.

Of those who expressed their opinion on the cultural use of the AGC ($n = 121$), 53.71% ($n = 65$) stated that the AGC held cultural importance for them. The most common belief was considering the AGC as a totemic animal (28.99%, $n = 20$), while

some mentioned its use in ornamentation, primarily the skin (26.09%, $n = 18$).

Totemism related to the AGC was more prevalent in the CFY area (21.13%, $\chi^2 [df = 1, n = 71] = 22.972, p < .0001$) compared to the MDNP area. Other responses emphasized AGCs role as a symbol of nobility, luxury meat, ingredient in traditional medicine or fetishes, and even as a poison (Fig. 2d). Three respondents, from the *Vouté* ethnic group (ages 46, 38, and 52) reported that the AGC's whiskers, saliva, and claws are poisonous. In the *Baveuck* culture (Centre, Cameroon), only the village chief alone is reserved the right to consume the AGC meat. Hunters offer it to the chief as a sign of respect and to gain favor. Newly enthroned chiefs ritually consume the AGC meat to embody the prestige associated with their chieftaincy. The AGC, along with other felids like the leopard and serval, is a sacred animal (totem) for certain *Vouté* people.

Anecdotes and personal experiences

Some respondents mentioned that encountering the AGC in the wild, signifies an important event in the community; one respondent (*Vouté*, age 55) stated that hearing the AGC meow indicates an impending death of an important person in the village. Anecdotal reports suggested that the AGC whiskers, claws, and saliva were considered poisonous. One hunter reported that injured AGC that escape snares, unknowingly self-poison by licking their wounds and die. In one village, some people mentioned that the AGC skin is usually hung on top the chief's chair as a symbol of power. Two *Baveuck* respondents (youth under 30 and adult 45+), recounted that the skin of the first AGC consumed by the chief after enthronement is used annually for a sacrificial ritual, during which the chief sits on the AGC skin to symbolize power. One *Vouté* (age, 45) stated that notables in another village wear the AGC skin during the chief's enthronement for the same purpose. Another *Vouté* (age, 57) mentioned usage of the AGC skin to make quality tam-tams. In one village, AGC skins were used for house

ornamentation, with two skins (grey and golden/red morphs) observed hanging in a house (Fig. 3).

African golden cat parts such as the tail, head, and paws are used in the treatment of childhood diseases. No further information was obtained on the specific diseases targeted or the methods of use. The paw bones of the AGC were used to massage the feet of children, with the aim of strengthening them. Medicinal usage was reported by only few respondents (< 10).

Conservation status and threats

Most respondents (84%, $\chi^2 [df = 1, n = 383] = 65.154, p < .0001$) were supportive of the idea that presence of wildlife officers helps protect wildlife (Fig. 4). Most (73%, $\chi^2 [df = 1, n = 330] = 30.204, p < .0001$) also believed that the majority of hunters would fear wildlife officers. Many respondents (62%, $\chi^2 [df = 1, n = 95] = 16.791, p < .0001$) strongly support the opinion that most locals make a living through hunting. The majority (57%, $\chi^2 [df = 1, n = 86] = 11.578, p < .0001$) strongly disagreed that all hunters have killed an AGC before, while 26%, ($n = 40$) strongly opposed this statement.

Of those who gave their opinion on the AGC conservation ($n = 118$), the majority (68.64%, $\chi^2 [df = 1, n = 81] = 13.907, p < .001$) thought that the AGC was at risk of extinction in their environment, with the main threats identified as being hunting with guns (MDNP = 21.48%, CFY = 14.07%) and traps (MDNP = 16.3%, CFY = 14.07%). Other reasons cited included habitat destruction (MDNP = 7.41%, CFY = 8.15%), trade and bushfire (MDNP = 0.74%, CFY = 0.74%). Of those who gave an opinion on their willingness to conserve the AGC ($n = 120$), the majority (86.66%, $\chi^2 [df = 1, n = 104] = 53.778, p < .0001$) were interested in the conservation of the AGC while 13.33% ($n = 16$) of respondents were not. The main reasons why people said they were interested in

AGC conservation included that it is an endangered species (32.28%, $n = 41$), a natural heritage for future generations (25.2%, $n = 32$) and an important species in their culture (19.69%, $n = 25$). Other reasons cited included maintaining biodiversity (11.02%, $n = 14$), AGCs contribution as a regulator of rodent populations (8.66%, $n = 11$), as a source of protein (2.36%, $n = 3$), and as a tourism asset (0.79%, $n = 1$). Regarding the protection status of the AGC, most respondents (85%, $\chi^2 [df = 2, n = 119] = 120.47, p < .0001$) knew that hunting and trading the AGC was prohibited, while 6.4% ($n = 9$) thought that the AGC was not a protected species, and 8.5% ($n = 12$) did not know.

The majority of respondents suggested chicken farming (57.05%), cocoa farming (53.69%), pig rearing (51.01%), and food crop cultivation (42.95%) as alternative income-generating activities to replace hunting. Fewer respondents mentioned fish farming (18.79%), state employment (4.03%), small business (2.68%), goat farming (2.01%), cow farming (1.34%), sheep farming (1.34%), and transportation (0.67%). Among those who proposed an alternative to hunting ($n = 139$), the majority (92.08%, $n = 128$) thought that the proposed activities were more profitable than hunting.

Local people mainly suggested restricting overhunting (40.91%, $n = 63$), awareness raising activities on the value of the AGC (27.27%, $n = 42$) and employment of youth (15.58%, $n = 24$) to improve AGC conservation. Other suggestions recorded included protection of the AGC habitat (11.69%, $n = 18$), domestication of the AGC (3.9%, $n = 6$), and valorization of the tradition (0.65%, $n = 1$).

Discussion

Our study used the LEK survey approach to gather information about the AGC near MDNP and CFY, its population trends, and local uses. Our findings show that the AGC meat is prestigious, consumed by chiefs and leaders. We also gained insights into local

views on the AGC conservation status, threats, and measures to strengthen conservation planning in local communities.

The relatively low number of participants (~35%) who recognized the AGC may be due to several factors. The species' rarity (Bahaa-el-din, Henschel, et al., 2015) means few participants were expected to be familiar with it. Additionally, the diverse range of AGC color morphs (Simo et al., 2019, 2021; Massoh et al., in prep), could have contributed to recognition challenges. Confusion of names was common. Some people misidentified the AGC as a leopard, lion, or tiger cat. "Tiger cat" was a generic term locals used for various medium-sized spotted carnivores, including civet, genet, serval, and the AGC (Simo T. Franklin Pers. Obs.). A civet skin was misidentified as an AGC skin by elders in one surveyed village. Given the AGC's low population and rare human encounters (Bahaa-el-din, Henschel, et al., 2015; Bahaa-el-din, Mills, et al., 2015), it is likely that only hunters and frequent forest-goers recognize it. To minimize misidentification, future studies should include photos of various known morphs and spot densities to enhance accurate identification.

Younger people in our study exhibited less ability to recognize and name the AGC, which may reflect a decline in the AGC population over time, reduced involvement of younger participants in outdoor activities, or inefficient transmission of LEK or the difference in reference terms between generations. As LEK is acquired during the life experience (Gilchrist et al., 2005), a decreasing AGC population implies a reduced likelihood of encountering the animal over time. Similar trends were observed for pangolin identification in Cameroon (Difouo et al., 2020). The last sightings of the AGC reported by the local people were mostly in 2018 and earlier, perhaps reflecting the general species rarity or a declining population, likely due to increasing commercial use of wild animals and subsequent bycatch of the AGC in snares. In 2017, a snared

AGC was observed in MDNP (Simo et al., 2019). The results and observations indicated concern about snares as contributing to potential local mortality of AGC.

The AGC was reported most often in forested habitat, but several sightings in the savanna were recorded as well. Although a forest specialist (Bahaa-el-din, Henschel, et al., 2015; Bahaa-el-din, Mills, et al., 2015), the AGC may enter savannas, particularly along riparian forests (Macdonald & Loveridge, 2010). Recent studies in MDNP and CFY recorded the AGC in savanna habitats (Simo et al. 2019, 2021; Massoh et al., in prep). Broken and uneven canopies in forest savanna mosaic areas like MDNP and the CFY is thought to facilitate hunting of arboreal prey such as monkeys by carnivores species (Gilby et al., 2006). While the survival of the AGC in savanna habitats is unknown, those habitats could potentially help the species to persist in forest savanna areas amid deforestation.

Specific microsites where the AGC was often seen included trees. Early naturalists even described the AGC as an arboreal species (Dekeyser, 1945; Halternorth & Diller, 1980). Many arboreal habits of the AGC are known, such as lying down (Boy, 2003) and sleeping (Bahaa-el-din, Henschel, et al., 2015) in trees, or giving birth and caring for cubs in tree cavities (T. Davenport & G. Ngandjui, pers. comm.). This arboreal habit indicates a species dependence on forested habitats and a subsequent vulnerability to deforestation. The AGC also has been reported being captured in snare traps as, like human hunters, they frequently travel on roads and tracks to increase their hunting success (Bahaa-el-din, Henschel, et al., 2015), which increases AGC exposure to snares and hunters. One hunter in a village around MDNP reported that AGCs often target live trapped animals in hunters' snares, further increasing their vulnerability.

Most respondents who recognized the AGC admitted having eaten its meat. Considered a luxury by village chiefs and notables, its consumption was male-biased.

While carnivore meat is less appreciated than ungulates (Doughty et al., 2015; Noss, 1998), the depletion of preferred species from commercial hunting leads to a shift toward consuming and trading less desirable animals like carnivores (Doughty et al., 2015). The AGC has been recorded in bushmeat markets in Cameroon (T. Davenport & G. Ngandjui, pers. comm.) and Angola (De Beer et al., 2021), and ranked 7th/15 of the most traded carnivore species in Gabon bushmeat markets (Bahaa-el-din et al., 2013). Conversely, in Uganda, AGC consumption is considered taboo (B. Mugerwa, pers. Comm.). While AGC consumption is uncommon and not typically cited as a concern to its survival, increasing popularity of the AGC with bushmeat consumers could further threaten the species.

Cultural belief-based strategies may discourage consumption. In our study area, totemism was the primary obstacle to AGC consumption, with the belief that killing a totem animal leads to its owner's death. Cameroonian authorities and civil society organizations could work with local leaders to promote traditional beliefs that benefit species conservation, such as totems. The use of the AGC skin in local ornamentation also indicates its visual appeal and association with power, as notables in certain villages wear the AGC skin garments during ceremonies to signify their kingdom's power. This practice, resembling the use of the leopard *Panthera pardus* skins in most grassfield kingdoms in western Cameroon (Carmona et al., 2019), elevate personal status (Macdonald & Loveridge, 2010). In areas where leopards are extinct, the AGC is often the largest carnivore (Bahaa-el-din, Henschel, et al., 2015; Mills et al., 2012) and its pelts could substitute for the leopard's. It was reported in our study area that hunters offer the AGC skin to the village chief as a sign of allegiance and to gain favors. Increased demand for the AGC pelts could negatively impact the species if not regulated.

The AGC was used in traditional medicine to treat childhood diseases, for fetishes, and as poison. Felid products are believed to have curative properties, ward off misfortune, and bring good luck (Macdonald & Loveridge, 2010). Recordings from cities including Yaoundé (Cameroon), Kampala (Uganda), and Pointe-Noire (Republic of Congo), indicated AGC skins being found alongside medicinal herbs and fetishes (Bahaa-el-din, Mills, et al., 2015). Forest people have been reported to carry the AGC tails as good luck charms during hunting trips and to use its skin in circumcision rituals (SPECIES, 2016). These observations, together with allegations of poisonous usage of the AGC whiskers, claws, and saliva recorded in our study, raise concerns about the impact of traditional practices on AGC populations and emphasize need for awareness regarding the potential risks associated with using the AGC parts in traditional medicine and rituals.

Many people recognized that AGC numbers were declining, with the main threat being hunting, and more particularly snares (Bahaa-el-din, Henschel, et al., 2015; Simo et al., 2019). Hunting the AGC with gun was popular among hunters, likely for commercial purposes as the area of Yoko was said to be a primary source for two principal bushmeat markets in Yaoundé (Edderai & Dame, 2006). Declines in trapping success due to wildlife depletion have induced a shift to firearms (Doughty et al., 2015). The increased use of guns for hunting in Cameroon adds to the concerns (Willcox & Nambu, 2007). However, local communities around MDNP and CFY have shown interest in alternative livelihood options such as chicken and pig husbandry, which can help alleviate pressure on the AGC. Pigs, snails (Order: *Stylommatophora*), and cane rat (*Thryonomys* sp.) were mentioned in local projects aimed at addressing unsustainable wild meat hunting (Willis et al., 2022); pig production programs have

been implemented in Uganda as a strategy to reduce the threats to the AGC (Badru Mugerwa Pers. Comm.).

Conclusion

Questionnaire surveys were an efficient and cost-effective means to gather LEK data about a hard-to-study and rare species. While the AGC holds significant cultural value as a symbol of power among the elders in our study areas, it is possible that they were selectively hunted for consumption. Its status as a sacred animal (totem) can serve as a deterrent for widespread hunting, but this does not stop mortality from snares. This underlines the role that local communities and traditional taboo systems can play in wildlife conservation. Because local people perceive the AGC as a service that nature is providing to them, a social-ecological approach that considers cultural values should be considered. Then, formal rights to use the species in a locally regulated manner (if it is not threatened) may be a primary incentive to ensure sustainable use of the species. Local people could contribute to conservation efforts by, for example, providing sighting information to a central repository of location information. This could also include further examination of the rights and rules around species use to determine optimal configurations of governance and management.

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Table 1

Demographics of the Respondents Surveyed in Villages Surrounding the Mpem et Djim National Park (MDNP) and the Council Forest of Yoko (CFY), Cameroon.

<i>Demographics</i>		<i>MDNP (46.91%; n=213)</i>	<i>CFY (53.08%; n=241)</i>	<i>Total (n=454)</i>
<i>Gender</i>	Male	72.77 (155)	61.83 (149)	66.96 (304)
	Female	27.23 (58)	38.17 (92)	33.04 (150)
<i>Age</i>	Younger (19-34)	55.39 (118)	58.92 (142)	57.27 (260)
	Middle (35-54)	35.68 (76)	27.39 (66)	31.28 (92)
	Older (55 and above)	8.92 (19)	13.69 (33)	11.45 (52)
<i>Ethnicity</i>	Native	82.16 (175)	81.74 (197)	81.93 (372)
	Non-native	17.84 (38)	9.69 (44)	18.06 (82)
<i>Religion</i>	Christian	81.69 (174)	85.06 (205)	83.48 (379)
	Muslim	17.37 (37)	14.11 (34)	15.63 (71)
	Animist	0.94 (2)	0.83 (2)	0.88 (4)
<i>Occupation</i>	Outside workers	68.08 (145)	77.18 (186)	72.91 (331)
	Inside workers	31.92 (68)	22.82 (55)	27.09 (123)
<i>Level of Education</i>	None	5.16 (11)	4.56 (11)	4.85 (22)
	Primarily	40.86 (87)	49.79 (120)	45.60 (207)
	Secondary+	53.99 (115)	45.64 (110)	49.56 (225)

Numbers in brackets represent frequencies and numbers outside the brackets represent percentages.

Figure 1

Location of villages surveyed around the Mpem et Djim National Park and the Yoko Council Forest in the Central Region, Cameroon

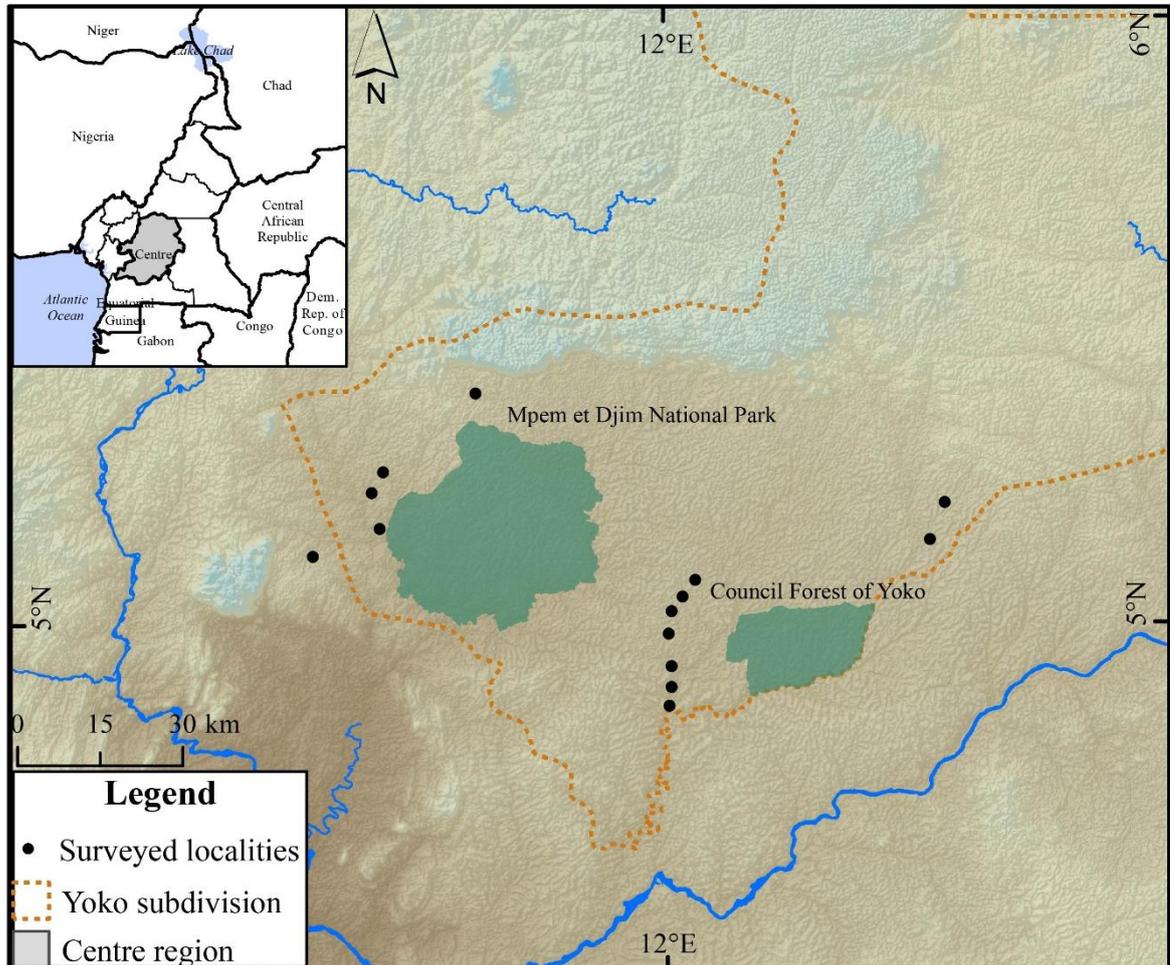


Figure 2

Current (a) and past five-year (b) perception of the African golden cat population by local residents. (c) Supply locations of the African golden cats for consumption. (d) Cultural usage of the African golden cat among the respondents

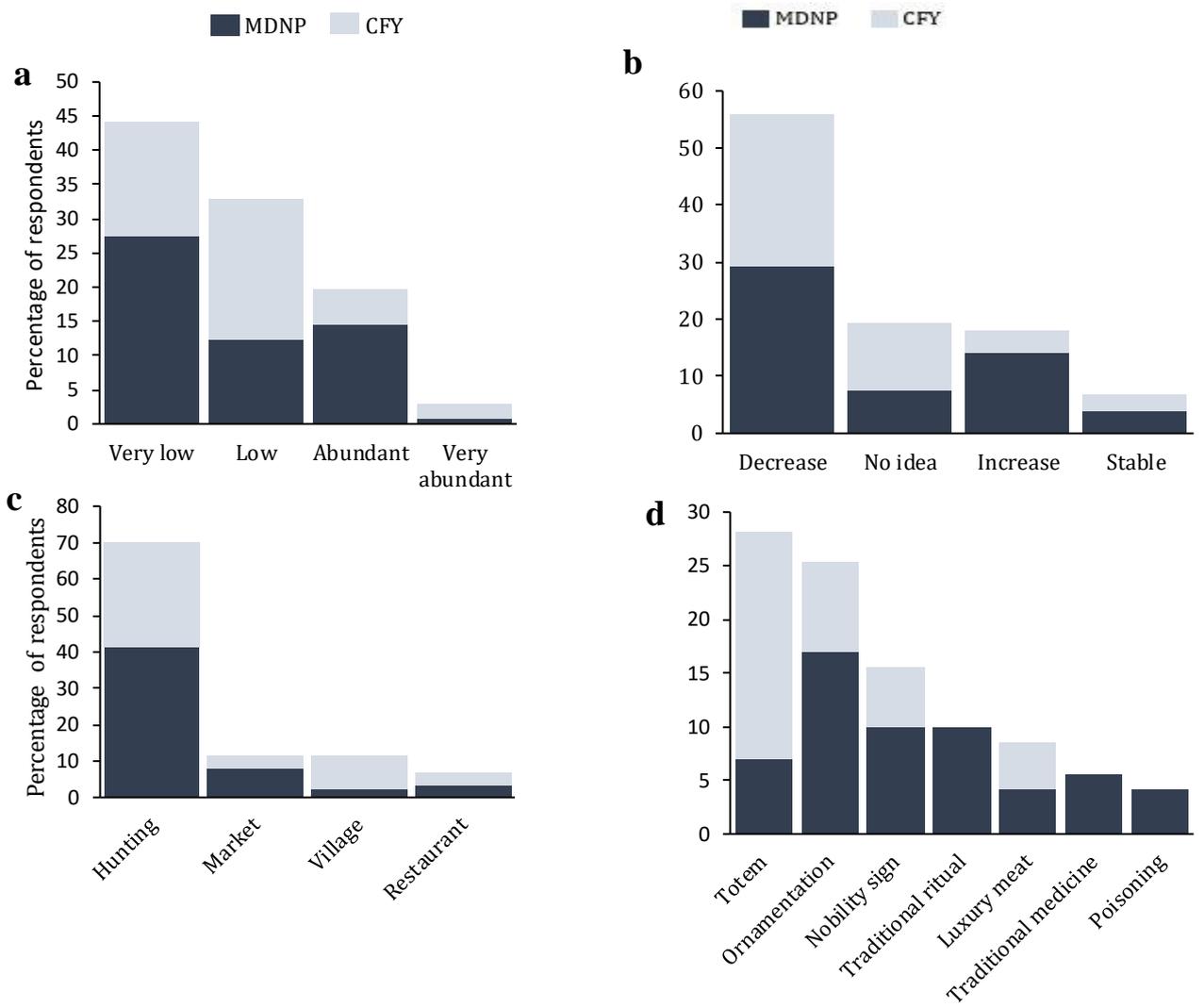


Figure 3

Skins of the African golden cat found in two villages around the Council Forest of Yoko (a) golden phase; (b) grey phase © Franklin T. Simo



Figure 4: Attitudes of the population towards wildlife officers and hunting

