



Short Communication

Bushmeat use is widespread but under-researched in rural communities of South Africa

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ABSTRACT

Bushmeat hunting and consumption is common throughout sub-Saharan Africa. Yet, a recent review indicated that the prevalence and nature of bushmeat hunting was little researched or understood in southern African savannas. Here we present information from a number of rural livelihoods studies in South Africa that indicate that bushmeat consumption is common, with typically between 30 and 60% of rural households in the communal tenure regions stating that they consume it. Yet there are only five studies in the country explicitly investigating bushmeat hunting practices, motivations, offtake and target species. A review of the five studies indicates that bushmeat hunting is largely a male activity and that motivations and practices vary between sites. Hunting with dogs is the most common method, targeting multiple small and medium-sized species. With such widespread consumption, it is possible that bushmeat hunting may have significant effects on the population status of some target species and consequently requires urgent and in-depth research of both practices and effects.

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1. Introduction

Bushmeat is important to rural communities around the globe, both for household consumption and trade (Bennett and Robinson, 2000; Fa et al., 2002). The term, however, has come to be associated with people living in tropical forested regions of the world, where bushmeat is often a mainstay of the local diet, largely due to the lack of alternative sources of protein and culture (Wilkie and Carpenter, 1999). Unregulated harvesting of bushmeat may result in population losses of sensitive species, which can lead to local extinctions (Hayward, 2009) in particular socio-economic and governance settings. On the other hand, human food insecurity and poverty are global crises, especially in poorer countries. The relationship between bushmeat hunting and food security in rural areas is complex and, in some settings, there can be conflict between local subsistence and cultural needs and broader conservation requirements (van Velden et al., 2018). In many settings the complexity and potential for conflict is exacerbated by multiple contextual factors, including habitat loss and land transformation, urban demand for bushmeat, improved hunting technologies, poverty, increasing human populations and a scarcity of alternative sources of protein (Jones-Bowen and Pendry, 1999). Unsustainable offtake is likely to effect not only the species being hunted, but also the functions they play in the wider community ecology, such as dispersers of fruits and seeds or roles in nutrient cycles through grazing, browsing and defecation (Shackleton et al., 2018). Studies from western and central Africa show that species conservation is important to achieving ecological sustainability (Bennet and Robinson, 2000), yet bushmeat hunting is also

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vital for the wellbeing of different communities given its role in human nutrition, health, welfare and culture (Nasi et al., 2011). Though bushmeat is an important food source for humans worldwide (Ripple et al., 2016), it has been shown that approximately three-fourths of human emerging infectious diseases are caused by zoonotic pathogens (Wolfe et al., 2005). Viruses including HIV-1 and 2, Ebola and the influenza virus can be transmitted to humans during direct exploitation of bushmeat (Wolfe et al., 2005; Ripple et al., 2016). Addressing this complex human-wildlife conflict situation requires both ecological and social insights and bringing them together to promote sustainable use of targeted species and the broader ecosystem.

The recent systematic review by van Velden et al. (2018) concluded that bushmeat use in the savannas of southern Africa was “severely understudied”. Even though they identified South Africa as the country in the region with the highest number of published studies on bushmeat hunting, they still regarded it as low and insufficient. This echoed Grey-Ross et al. (2010) who previously stated that the “extent and effects of bushmeat hunting” in South Africa have hardly been examined. Whilst van Velden et al. (2018) focused specifically on savanna habitats, a more comprehensive picture can only be derived at a country level if the review or summary is across all biomes. A more national assessment also allows for debate regarding appropriate national policy responses. Here we complement the review of van Velden et al. (2018) by assessing the literature on bushmeat hunting in South Africa as a whole, and highlight the relatively poor state of knowledge. In particular, we include quantitative livelihoods studies (quantitative household surveys inventorising all natural resources, including bushmeat, contributing to cash and non-cash income of households) in communal areas, which were overlooked by the review of van Velden et al. (2018). In contrast to the bushmeat literature, South Africa boasts rich literature on commercial hunting of high value game birds (e.g. Kerley et al., 2000) and mammals (e.g. van der Merwe et al., 2014), mostly on privately owned lands. The purpose of this short communication is to provide a profile of bushmeat use in South Africa and to highlight the gaps in knowledge and data.

2. The prevalence of bushmeat harvesting by rural households in South Africa

Natural resource use and valuation by rural communities in South Africa has been a widely researched topic. Results from various parts of the country show that most rural households make use of one or more natural resources extracted from local landscapes for energy, shelter and construction, food, medicines, weaving fibres and for culture (Twine et al., 2003; Shackleton and Shackleton, 2004; Mugido and Shackleton, in press). This literature also shows that natural resource use represents considerable value to rural households via cash saving through the provision of ‘free’ goods, cash income through the sale of wild products and as a safety net in adverse times. These same livelihood and household surveys are also useful sources of information regarding the prevalence of bushmeat consumption, and a few provide some details of species and quantities. These studies indicate that generally 30–60% of rural households attest to consuming bushmeat (Table 1), with

Table 1
Reports on the prevalence of bushmeat hunting in South African communal land tenure areas.

Province & area	Site/village	Biome	% of households using	Comments	Reference
Eastern Cape, Wild Coast	Cwebe	Forest	8	Mean use was 210 kg per year per user households; 11 spp.	Shackleton et al. (2007)
Eastern Cape, Nombanjana	Ntubeni	Forest	50		White (2004)
Eastern Cape, Wavecrest-Kobonqaba	Nombanjana	Forest	92% of men & 86% boys	Widespread consumption but mostly by adolescent boys for tradition and sport rather than the need for meat. Only 8% of adult men hunted	
	Nxaxo	Forest	75% of males		
Limpopo Province, Mameetja	Finale A	Savanna	47	Mean consumption was 0.9–5.0 kg per household per year across all households (users and non-users)	Twine et al. (2003)
	Mabins B	Savanna	53		
	Willows	Savanna	67		
Limpopo Province, KwaZulu-Natal	Hagondo	Savanna	31	–	Shackleton et al. (2002)
Limpopo Province, KwaZulu-Natal	Kwajobe	Savanna	55	–	Hansen (1998)
Limpopo Province, KwaZulu-Natal	Bushbuckridge	Savanna	32	–	
	Nkandla	Savanna	33	There was a positive correlation with hunting frequency and no. of adolescent boys in the household	Kaschula and Shackleton (2012)
	KwaDlangezwa	Savanna	31		Kaschula and Shackleton (2009)
Eastern Cape, Mt Frere district (4 villages)	Moloweni, Mbodweni, Lubhacweni, Mvusi Green	Grassland	32	Random household survey reported 32% of households actively hunted. Rest of the study was on hunting practices and offtake	Grey-Ross et al. (2010)
KwaZulu-Natal	Wartburg, Estcourt, Creighton	Grassland	82	–	Kaschula and Shackleton (2012)
Eastern Cape, KwaZulu-Natal	Mount Frere	Grassland	51	There was a positive correlation with hunting frequency and no. of adolescent boys in the household	Shackleton et al. (2002)
	Msunduzi	Grassland	30		
Eastern Cape, Kat River Valley	Fairbairn	Thicket	39	Mean consumption was 28–259 kg per household per year across all households (users and non-users)	Shackleton et al. (2002)
	Ntilini	Thicket	28		
	Tidbury	Thicket	47		

over 80% in some settings. However, these figures are likely to be conservative because (i) some households are unlikely to affirm eating bushmeat because it is regarded as illegal (for larger species) and they could be fined, (ii) some regard it as a sign of poverty which they would not wish to share with an outside researcher, (iii) they hunt in neighbouring protected areas and do not wish to reveal that, or (iv) they hunt species for specific medicinal or cultural purposes which they are unwilling to reveal to outside researchers.

3. The nature of bushmeat hunting in South Africa

Given that bushmeat hunting in communal lands outside protected areas is so widespread amongst rural communities in South Africa, it obviously needs detailed study on the species targeted, hunting practices, motivations and effects. However, there have been only five studies that provide any of these sorts of details, and one on foraging for rodents, small mammals and birds by children (McGarry and Shackleton, 2009a; b). We have drawn from them to present a picture of current research knowledge about bushmeat hunting in South Africa, but acknowledge that it is limited and draws from only a handful of sites. Thus, much of the likely variation is missing.

Generally, hunting is gender differentiated, being done mostly by men or adolescent boys (White, 2004; Kaschula and Shackleton, 2009; Grey-Ross et al., 2010). However, some young girls may participate in opportunistic foraging for small species such as insects, birds and small rodents alongside boys when out at play (McGarry and Shackleton, 2009a; Alexander et al., 2015). Hunting may be via wire snares, or groups of men and boys venturing out with hunting dogs to run down the prey, which is then beaten with clubs when cornered (White, 2004; Hayward, 2009; Kaschula and Shackleton, 2009; Grey-Ross et al., 2010). There are reports of guns being occasionally used, usually not attributed to locals, but rather urban residents going hunting for the day, or visiting their rural relatives for a weekend (White, 2004; Hayward, 2009). White (2004) observed that within a hunting group the level of experience differed, with some being serious hunters and some social hunters and if a hunt was successful the meat would usually be cooked and eaten by all participants in or near the forest rather than taken home. However, for smaller hunts involving just one or two men with dogs, the kill was usually taken home for the whole family. The preferred method of hunting was pursuing animals with dogs and the use of snares and traps was uncommon (White, 2004; Kaschula and Shackleton, 2009, 2012; Grey-Ross et al., 2010). According to White (2004) 11% of boys used guns and a further 5% used traps as the preferred hunting method. Hunting with dogs was favored, with 81% and 46% of hunters using dogs reported by Kaschula and Shackleton (2009) and Grey-Ross et al. (2010), respectively.

Hayward (2009) revealed that ungulates were the preferred target species of bushmeat hunters. In contrast, White (2004) reported that hunters caught anything they came across, including, common duiker (*Sylvicapra grimmia*), blue duiker (*Philantomba monticola*), bushbuck (*Tragelaphus scriptus*), scrub hare (*Lepus saxatilis*), bushpig (*Potamochoerus pocus*), vervet monkey (*Cercopithecus aethiops*), large grey mongoose (*Herpestes ichneumon*), water mongoose (*Atilax paludinosus*), and large spotted genet (*Genetta tigrina*). Young boys hunted small birds which were then roasted and eaten in the forest. McGarry and Shackleton (2009b) reported extensive hunting of several species by children, including two red list species (giant petrel (*Macronectes giganteus*) and giant golden mole (*Chrysospalax trevelyani*)). Bushmeat hunting or poaching within protected areas is likely to be for trade purposes as in these locations hunters tend to target larger ungulate species (Hayward, 2009).

Over and above specific hunting trips, opportunistic killing of animals occurs when out collecting other resources (such as construction timber, medicinal plants) from local landscapes or herding livestock, as well as trapping of animals raiding crops (Shackleton et al., 2002; White, 2004). Habitat fragmentation due to agricultural practices results in several wildlife species being regarded as agricultural pests as they prey on livestock and raid crops. Birds of prey were perceived to be the most common livestock predator (on young chickens), though mongooses, black-backed jackal and caracal (*Felis caracal*) were also cited as problem species in the communities surveyed by White (2004). Species like jackal and caracal are hunted as they are perceived as pest species, and probably not consumed (but there are reports of people eating jackals (e.g. Kaschula and Shackleton, 2009)), though their skins may be kept as mats, ornamental displays or sold (pers obs). Animals most often reported as damaging crops are vervet monkeys, bushpigs, porcupines and various bird species, and the frequency or extent of damage is directly related to the degree of proximity of the fields to wooded patches (Shackleton et al., 2002; White, 2004; Herd-Hoare, 2018).

The motivations underlying bushmeat hunting appear to be a mix of tradition, sport and need (Grey-Ross et al., 2010), but there are too few studies to be able to differentiate these in relation to local context or respondent characteristics. Hayward (2009) argued that bushmeat use in South Africa was largely driven by poverty and it being a free resource, sentiments echoed to some degree by Grey-Ross et al. (2010). In contrast, Shackleton and Shackleton (2006) reported that self-reported amounts of bushmeat consumption were higher amongst rich households than poor ones in the Kat River Valley of the Eastern Cape (Table 1), which challenges the poverty hypothesis. Moreover, Kaschula and Shackleton (2009) reported that households with hunters were not statistically any poorer than non-hunting households. However, McGarry and Shackleton (2009a;b) showed higher consumption of wild foods, including bushmeat, by children from households with high proxy scores for HIV/AIDS relative to households with low proxy scores, a finding reported by other authors in relation to wild plant foods (Ncube et al., 2016), resulting from a complex interplay of changing household labour composition and dynamics, cash earning capabilities and the relative ease of acquisition of some wild foods. Three studies that report the quantity of meat consumed (Shackleton et al., 2002, 2007; Kaschula and Shackleton, 2009) indicate that it is low compared to other regions, such as central or West Africa, suggesting that it is not an important poverty mitigation strategy. However, Kaschula and Shackleton (2009) posit that it is still high enough, both in terms of meat eaten per year, and the high percentage of those

engaging, to be concerned about it from a species conservation perspective. Moreover, when expressed in monetary terms relative to household income it can represent a considerable cash-saving (Kaschula and Shackleton, 2009). White (2004) and Grey-Ross et al. (2010) reported a mix of motivations underlying the practice. When large parties of hunters were involved, it appeared that sport and kinship was the primary impetus. However, nearly all young boys are introduced by their peers to hunting from an early age (Alexander et al., 2015), and thus, in some regions, there is a strong cultural element too, which reinforces notions that many regard bushmeat as tastier than meat from domestic livestock (Bennett, 2002). However, White (2004) reported that most respondents in her survey preferred to eat mutton, pork or chicken over bushmeat.

There is a total dearth of information on the extent of any bushmeat markets in South Africa. None of the literature reports on such and we have not seen bushmeat for sale on local village markets most likely because it is deemed an illegal activity. However, households can place direct orders with hunters, who will then supply the requested meat, for a price, within a few days. Although not for bushmeat purposes, there is literature on the sale of animals and animal parts on urban, traditional medicinal markets (e.g. Williams et al., 2014; Williams and Whiting, 2016).

4. Conclusion

The recent review by van Velden et al. (2018) presented two conclusions pertinent to this paper. First, that southern Africa is under-researched with respect to studies on bushmeat harvesting in savannas. Second, that priority has been given to researching bushmeat hunting within formal protected areas (so-called poaching), with relatively little being conducted on bushmeat hunting in communal or traditional lands. Kaschula and Shackleton (2009) provided a list of 17 hunted species, with the most common being hares (*Pedetes capensis*), jackals (*Canis mesomelas*), bushbuck (*Tragelaphus sylvaticus*), duiker (*Philantomba monticola*), rock hyrax (*Procavia capensis*) and porcupines (*Hystrix africaeaustralis*). Although the literature search terms used by van Velden et al. (2018) meant that most livelihood studies were not included by their review, we can corroborate their findings that understandings of bushmeat use and hunting in South Africa is limited even when spanning all biomes and not just savannas. However, the livelihoods literature provides quantitative data indicating that bushmeat consumption is widespread in the communal tenure areas. If so, then there is an obvious need to try to understand the nature of bushmeat hunting in these areas. Also, what the effects of hunting might be on the distribution and population viability of hunted species relative to and perhaps in synergy with other possible pressures, such as land transformation, also require investigation. Alongside this would be the requirement to understand the role of urban dwellers in either hunting practices or bushmeat demand because South Africa is a rapidly urbanising country. Thus, a dynamic picture is required indicating longer-term drivers and effects and short-term changes in local and wider contexts that influence hunting motivations, practices and effects on prey populations and community ecology.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.gecco.2019.e00583>.

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