Short Communication

DIRECT HUMAN-CAUSED WILDLIFE MORTALITIES IN GERALLE NATIONAL PARK, SOUTHERN ETHIOPIA: IMPLICATIONS FOR CONSERVATION

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ABSTRACT: This paper aims to report records of direct human-caused wildlife mortalities in the Geralle National Park of southern Ethiopia during the last five years (2013-2017). Our data showed that a total of 102 carcases of wild mammals were recorded during the period under report, representing 13 species most of which are currently globally threatened. On average 21 ± 5 animals were killed each year and nearly three-fourth of affected species and individuals killed were carnivores. Causes of mortality for all the cases reported were identified as deliberate gun-shooting (n=72, or 71% of the total) or car accident (n=30; 29%). The main reasons why the local people were motivated to commit deliberate killing of carnivores using rifles were in revenge to livestock depredation and that of ungulates to meet their demand for bushmeat. Although the motivation behind road killing was not clearly understood, lack of awareness or accidents due to high speed driving could be possible reasons. In addition to mammals, 33 carcases of four bird species were recorded during the study period, including the vulnerable Somali Ostriches (*Struthio camelus*) and the critically endangered African White-backed vulture (*Gyps africanus*), the latter due to unintentional poisoning. The data in this study pointed out that direct human-caused wildlife mortalities are one of the major threats to several wildlife species in the park, which may hold true in other protected areas of the country as well. Thus, awareness raising education on the consequences of direct human-caused wildlife killing on the species involved and ecosystem and implementation of effective law enforcement should be viewed as an urgent management intervention to curtail such wildlife mortalities in the park. Specific recommendations that are assumed to be practically applicable are also provided.

Keywords/ phrases: Geralle National Park, Poaching, Poisoning, Traffic kill, Wildlife mortality

INTRODUCTION

Human-induced actions have been one of the most catastrophic threats to survival of wildlife globally (IUCN, 2018). Humans affect wildlife populations directly through poaching, disturbance, intentional and unintentional poisoning, and indirectly through habitat alteration, encroachment and fragmentation. The major causes for alteration, encroachment and fragmentation of wildlife habitats are increased settlements, cultivation, overgrazing by livestock and developments of public infrastructures in and around protected areas (Addisu Asefa, 2008; IUCN, 2018). Such human-induced threats to wildlife are more exacerbated in developing countries like Ethiopia due to the high overlap in distributions of wildlife and human occupancy, leading to frequent contacts between wildlife and humans, as well as between wildlife and human properties (Anagaw Atickem *et al*., 2010). This frequent contact often leads to increased exposure of (i) livestock to wild carnivores, (ii) cultivated lands to crop-raiding, and (iii) people to dangerous animals (Jacobs and Schloeder, 2001; Anagaw Atickem *et al*., 2010). The ultimate consequences of such close contacts are escalation of human-wildlife conflicts, which in turn cause people to develop negative attitude towards wildlife and kill them indiscriminately in revenge to properties lost (Jacobs and Schloeder, 2001). The increased frequency of contacts between humans and wildlife also results in increased wildlife poaching by people

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to meet their demand for wildlife products like bush meat, horns, tusks and skins (Jacobs and Schloeder, 2001; EWCA, 2015). Such human-induced mortalities of wild animals are one of the most determinant factors negatively affecting the population dynamics of wildlife species, leading the rare ones to extinction (Sillero-Zubiri and Macdonald, 1997; Addisu Asefa, 2008; EWCA, 2015). It is, therefore, important to regularly assess the extent of human-caused wildlife mortalities in protected areas and identify area-specific sources of conflict for better management and conservation of wildlife populations.

Here, we report recent data collected on mortality of mammals and birds in Geralle National Park (GNP), southern Ethiopia. GNP is an important protected area for a number of globally recognized conservation concern wildlife species, including the African elephant (*Loxodonta africana*) (EWCA, 2015). However, limited budget and human capacity within Ethiopian Wildlife Conservation Authority (EWCA) and Somali National Regional State have been major challenges for effective conservation and management of the park (EWCA, 2015). Thus, like the case of other protected areas of the country, the number of human and domestic animals, and associated infrastructure developments such as road-network constructions, in and around the park are increasing rapidly ((Jacobs and Schloeder, 2001; Anagaw Atickem *et al.*, 2010; EWCA, 2015). Consequently, wildlife mortalities caused by direct human actions have been increasing and they were frequently reported by park managers and ecologists. However, this information has not been systematically compiled and analyzed thus far. In this study the accumulated data obtained from GNP management office (GNP, unpublished data) was analysed to understand the magnitude of human-related wildlife deaths and identify causes and species that are most vulnerable and targeted.

MATERIALS AND METHODS

Study area

GNP (Location: 3°35'-4°52' N and 39°26'-40°00' E) is situated in southern Ethiopia in the Ethiopian Somali National Regional State. It was established in 2006 to protect remnant populations of several conservation significant wildlife species, including African Elephant (*Loxodonta africana*), African Hunting Dog (*Lycaon pictus*), Cheetah (*Acinonyx jubatus*), Lion (*Panthera leo*) and Giraffe (*Giraffa camelopardalis*) (EWCA, 2015). The National Park has an area of ~1800 km^2 and altitude in the area ranges from 800 to 1380 m a.s.l. GNP consists of four major vegetation types: grassland, savanna land, bushland and mountainous rocky areas with sparse vegetation. It is bordered by the Dawa River in the north and east and by Kenyan boarder in the south. So far, about 36 mammal species and 183 bird species have been recorded from the park (EWCA, 2015).

Methods

For each specimen of dead mammals reported by park ecologists, game rangers and local people to the park management office post-mortem examinations have been carried out and data recorded on datasheet prepared for this purpose. For each carcass, the following data were recorded: date, estimated time since death (based on decomposition status of a specimen), locality of kill, type of species, cause of death by looking at signs (e.g. signs of accident, poaching, wounds, etc). However, data on age/sex identity and measurement of different body parts were not available, as the primary aim of collecting post-mortem data was to know which species are killed by people and means of killing (Pers. Comm. with Adem Mohammed, park warden). Moreover, informal discussion was also conducted with key informants (district and village government officials, elders, development agent workers) from among the local people to assess the reason why people kill wildlife.

RESULTS AND DISCUSSION

A total of 102 carcases of mammals, representing 13 species, were recorded during the period under report (Table 1). On average 21 ± 5 animals were killed per year (Figure 1). Except three ungulates, all of the other species were carnivores. Reasons of wildlife mortality for all the cases reported here were either due to gun-shooting (n = 72, or 71% of the total cases) or car accidents (n = 30; 29%) (Table 1). According to informal discussions made with 11 key informants, the two main underlying causes that motivated the local people to kill wildlife were in revenge to livestock depredation (six carnivore species) and to meet the demand of bush meat

(the three species of ungulates). However, the reasons behind road killings were not identified, but lack of awareness or accidents due to high speed driving, especially during night time, could be possible reasons.

Table 1. Mammal species, numbers, method and reasons of killing in the Geralle National Park.

Common name*	Scientific name	Means of killing		Total	Reason for killing**
		Using gun	Car accident		
Cheetah[VU]	*Acinonyx jubatus*	3		3	In revenge*
Caracal[LC]	*Felis caracal*	2	3	5	In revenge
Aardwolf[LC]	*Proteles cristata*		2	2	Unknown
Aardvark[LC]	*Orycteropus afer*		5	5	Unknown
Bat-eared Fox[LC]	*Otocyon megalotis*	3	2	5	In revenge
Black-backed Jackal[LC]	*Canis mesomelas*	4	1	5	In revenge
Spotted Hyena[LC]	*Crocuta crocuta*		15	15	Unknown
African Civet[LC]	*Civettictis civetta*		2	2	Unknown
Lion[CR]	*Panthera leo*	25		25	In revenge
African Wild Dog[CR.]	*Lycaon pictus*	3		3	In revenge
Giraffe[NT]	*Giraffa camelopardalis*	2		2	For bush meat
Lesser Kudu[NT]	*Tragelaphus imberbis*	25		25	For bush meat
Gerenuk[NT]	*Litocranius walleri*	5		5	For bush meat
Total		72	30	102	

* Abbreviations indicated as superscript following species common names are their respective global threat status category and are defined as follow: CR = critically endangered; VU = vulnerable; NT = near-threatened; LC = Least concern [for definition of each threat category, see IUCN (2018)]
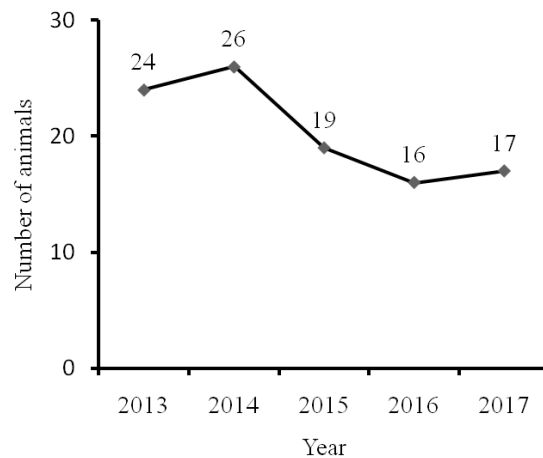
* * In revenge to livestock depredation

Figure 1. Trends of number of mammals killed by the local people in the GNP between the years 2013 and 2017.

Similar to our results, studies across several African countries have reported the disastrous consequences of wildlife poaching on the survival of many species. The current data also add support to previous reports (e.g. Sillero-Zubiri and Macdonald, 1997; Addisu Asefa, 2008) from Ethiopia concerning the seriousness of accidental and deliberate traffic kill of wildlife in the country along highways, especially inside and outside protected areas where such highways pass across.

In addition to mammals, birds were also victims of human-caused mortality in GNP. Thirty-three individuals of four bird species were

recorded during the study period. This included six Somali Ostriches (*Struthio camelus*) killed by gun (two birds in 2104 and four in 2015) for the purpose of traditional medicine. Furthermore, 12 African White-backed Vultures (*Gyps africanus*), along with several doves and weavers, were unintentionally poisoned on 20 February 2014 upon feeding on anti-malaria chemical-baited cow carcass which was disposed around Hudet town. Reports indicate that both non-target poisoning of vultures from poison bait laid for carnivores and targeted poisoning by poachers have been the major threats to Africa's vultures (Thiollay, 2007; Ogada *et al.*, 2012). As a result, four of the seven vulture species occurring in Africa, including the African White-backed Vulture, have been treated as Critically Endangered since 2015 (BirdLife International, 2018).

CONCLUSION AND RECOMMENDATIONS

In general, the results of this study highlighted that direct human-caused wildlife mortalities is a major threat to several species of mammals and birds in the GNP. The need to develop and implement effective mitigation measures is therefore not only because of the incidences of wildlife mortality is high in the study area, but also because most of the species subjected to direct human-caused mortality are currently globally threatened (Table 1; see also IUCN, 2018). Thus, awareness raising education on the consequences of wildlife mortalities on the species involved and the ecosystem due to indiscriminate use of poisons, traffic killing, demand for bush meat and in revenge to property lost should be urgently undertaken to curtail wildlife mortalities seen at present. In addition, implementation of effective wildlife law-enforcement activities should be in place. Finally, construction of vehicle speed-break at traffic killing hotspot areas along the main roads passing across/around the park is also needed to mitigate the problem of road kill.

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