

SHORT COMMUNICATION

MOUNTAIN NYALA AND ETHIOPIAN WOLF MORTALITIES IN THE NORTHERN SIDE OF BALE MOUNTAINS NATIONAL PARK, ETHIOPIA

Addisu Asefa¹

ABSTRACT: Post-mortem data collected on the mortalities of two endangered endemic mammal species, Mountain Nyala *Tragelaphus buxtoni* and Ethiopian Wolf *Canis simensis* during 2002-2007 in the northern Bale Mountains National Park, Ethiopia, were analysed. These data were used to study the proportion of age/sex groups of the dead species, and the proportion of dead individuals by different causes of mortality. Thirty-nine mortality cases were reported for Mountain Nyala, of which more than half (59%) were adult males. Fighting with each other among adult males and dog predation on juveniles were the main causes of mortality of this species. Mortality of four individuals of wolves was reported during the above five years period. Two of them were killed by poisoning and the other two by car accident. This includes a pregnant and the only female among the Gaysay subpopulation. It is revealed that human-induced actions are contributing the major threat for the survival of these two species in the area.

Key words/phrases: Bale Mountains National Park, Ethiopian Wolf, Mountain Nyala, Wildlife mortality.

INTRODUCTION

Mortality is one of the primary factors that affects population size/density of a given species (Krebs, 1985). Unnatural death through human-induced causes is, particularly, the most determinant factor shaping the population dynamics of wild species leading the rare ones to extinction (Sillero-Zubiri and Macdonald, 1997). Therefore, for a given protected area, establishing a long term wildlife mortality monitoring programme is essential to understand the trend in populations of threatened species for conservation planning (Sillero-Zubiri and Macdonald, 1997). Bale Mountains National Park (BMNP) is one of such areas that needs intensive regular wildlife mortality monitoring.

The two charismatic mammal species of BMNP, the endemic endangered Mountain Nyala, *Tragelaphus buxtoni* and the Ethiopian Wolf, *Canis simensis*, occur in restricted ranges of highland habitats. They share this

¹Bale Mountains National Park, PO Box 107, Bale-Goba, Ethiopia. Email: adde_bird@yahoo.com

ecologically very important area with humans and associated domestic animals. The ever-increasing human population in the BMNP has caused habitat fragmentation that has resulted in increasing contact of wildlife with human and domestic animals (Sillero-Zubiri and Macdonald, 1997; Stephens, *et al.*, 2001). The ultimate consequences are: (1) increased exposure of livestock to wild carnivores and crop raiding of wild herbivores resulting in escalation of human-wildlife conflicts; (2) changes in behaviour of wildlife (e.g. Mountain Nyala population in the headquarters of the park are becoming nocturnal; Befekadu Refera and Afework Bekele, 2002); and (3) increased contact of dogs with wildlife resulting in a potential disease transmission and hunting of wildlife (Sillero-Zubiri and Macdonald, 1997; Stephens, *et al.*, 2001). The present study was aimed to get data on mortalities of the different age/sex groups of the Ethiopian Wolf and Mountain Nyala and the causes of deaths in the northern side of BMNP during September 2002-September 2007.

MATERIALS AND METHODS

The study area

The BMNP is situated in the southeast highlands of Ethiopia at 6° 30'- 7°10' N and 39° 30'- 39° 55' E, about 400 km away from Addis Ababa, the capital city of Ethiopia. It encompasses an area of 2200 km². The area contains a landscape ranging from 1500 to 4377 m asl. Five vegetation zones are observed in this National Park: the northern grasslands (Gaysay Valley), the northern woodlands, ericaceous forest, the Afro-alpine moorland and grassland, and the southern Harena forest. Seventy-eight species of mammals and 278 species of birds have been recorded from the area; of which 17 mammal and 6 bird species are endemic (Addisu Asefa, 2005).

The area experiences two rainy seasons; a heavy rainy season from July to October, with the highest peak in August, and a short rainy season from March to June, with the peak in April. The present study encompassed only the northern section of the Park (in the northern woodlands and the northern grasslands; N = 7° 00'-7° 10' and E = 39° 30'- 39° 55') where many large mammals of the Park are found and relatively most effective wildlife monitoring and conservation is practised.

Data collection and Analysis

Every discovered specimen of dead mammals reported by Park scouts/game rangers and post-mortem examinations carried out by Park Biologists was assessed. Information obtained through this (e.g. date and locality of kill,

species of specimen, age/sex identity, measurement of different body parts and causes of mortality) were recorded on standardized post-mortem data sheets. For the present study, only information on Mountain Nyala and Ethiopian Wolf were used. In order to compare with previous work of Hillman (1986), data on mortality was summarized by classifying the age/sex categories of the species into three broad categories: adult male (includes 'sub-adult' and 'old age adult' males), adult female (includes 'sub-adult' and 'old age adult' females) and juveniles (includes 'infants' and 'juveniles' of both sexes). The different causes of mortality were also summarized into broad groups (Table 1), and were expressed in percentage of the animals that died of a particular cause to the total animals dead.

RESULTS AND DISCUSSION

Mountain Nyala

Thirty-nine mortality cases were reported for Mountain Nyala; implying that, with 95% confidence interval, 8 ± 2 (n=5) Nyalas were estimated to die each year. Adult males contributed more than half (59%) of the total death (Table 1). When compared to the earlier report (Hillman, 1986), the current proportion of dead adult males almost doubled (from 30% to 59%), while that of the juveniles was reduced by almost half (from 45% to 23%) and that of the females was reduced by one-fourth. Different types of mortality causes mostly operated on either of the sex/age categories. For instance, 16 (70%) of the cases reported for the adult males were due to fighting with each other; whereas that of the juveniles was exclusively predation, of which about 88% was by feral/domestic dogs (Table 1).

Table 1. Number and percent of the three age/sex groups of Mountain Nyala that died due to different causes.

Causes of mortality	Age/sex category			Total	Percent
	Adult male	Adult female	Juvenile		
Predation by					
Feral/domestic dogs			8	8	21
Others	1	1	1	3	8
Disease	2	2		4	10
Old age	1	2		3	8
Fighting	16			16	41
Other natural*	3	2		5	13
Total	23	7	9	39	100
Percent	59	18	23	100	

*Starvation (during long duration of dry season periods), old age and man-made infrastructures like falling into wells, electrocution and wire fences.

Adult males of Mountain Nyala form a dominance hierarchy, which is maintained by ritualized, rutting displays that sometimes end in a fierce, brief clash of horns (Hillman, 1986; Befekadu Refera and Afework Bekele, 2002); the present data demonstrated mortality occurring as a result of such conflicts. It is common to see adult males of this species fighting and some animals bearing partially or completely broken-off horns. The case is assumed to be a conflict for mating; a behaviour that might be induced as a result of limited access to mating opportunities. However, the underlying factor that could limit mating access is unclear and requires a comparative study on the current and past general ecology and behaviour of this species. Nonetheless, it is possible that sex-ratio imbalance (higher proportion of adult males to females than is usual) and/or shrinkage of their habitat could lead to mating access limitation. Due to the less available habitat, both the 'female-led' (groups of females and their calves) and 'bachelor' (groups of sub-adult and adult males) groups may be forming larger congregations than the past, and thus males interact, by threat behaviour or physical combat, to drive away other males to gain access to more females. Such competition among individuals for mates is an ecological consequence of natural selection (Krebs, 1985).

Domestic dogs are present throughout the BMNP, but only very few of them are fed or looked after; rather they are feral (Gottelli and Sillero-Zubiri, 1992). Though the data span is not indicated, Hillman (1986) reported that about 20% of wildlife mortalities recorded in the area was due to predation in which many were by feral/domestic dogs. The present report also showed similar result (Table 1), implying the consistent occurrence of the catastrophe.

The Ethiopian wolf

Four individuals of wolves (3 adult males and an adult female) were found dead at Gaysay area during the period of study. Two of the adult males were killed by poisoning and the remaining two by car accident. The wildlife poisoning in 2002 was the first record in BMNP when in a bout of poisoning at Gaysay area, allegedly targetting Spotted hyaenas (*Crocuta crocuta*); two Ethiopian wolves were also killed in addition to five Spotted hyaenas and a Common jackal (*Canis aureus*). Bornfree (2002) reported that the use of poisons to kill predators is widespread in Africa, and has led to the near eradication of lion (*Leo leo*) and Spotted hyaena in the lowlands of Ethiopia and northern Kenya

Deliberate traffic kill has also been posing a significant threat to the

prestigious wildlife in BMNP (Sillero-Zubiri and Macdonald, 1997). In the present study, a pregnant, the only female Ethiopian wolf of the Gaysay sub-population, with 5-7 total individuals, was crushed by a car accident in 2006. Given the current absence of corridor to move to other places in search of their mates from other sub-populations, their future seems to be bleak.

In addition to the aforementioned cases, the Ethiopian wolf population in the BMNP has been severely threatened by canid diseases like rabies and Canid distemper, which are transmitted from infected dogs, whereby individuals of over 70 in 2003 and 30 in 2006/07 were wiped out (Randall, *et al.*, 2004; Malcolm, 2007).

CONCLUSIONS

This study revealed that human-induced actions are contributing the major threat for the survival of the Mountain Nyala and Ethiopian wolf in the BMNP. However, the underlying factors that could contribute to the heightened fighting among the adult male Mountain Nyalas are not understood. Therefore, a comparative study on the current and past general ecology and behaviour of this species would be invaluable to develop and implement appropriate mitigating actions. Further, public awareness and education on the consequences of indiscriminate use of poisons, direct/indirect wildlife persecution in general (e.g. traffic kills) and implementation of a local dog control regulation, including vaccination of dogs against the canid diseases, are required to curtail the mortalities caused through these causes.

ACKNOWLEDGEMENTS

All the BMNP experts and scouts are duly acknowledged for their participation in the data collection. BMNP office is also thanked for permitting publication of the processed data.

REFERENCES

- Addisu Asefa (2005). The Mountain Nyala as a seed dispersal agent of *Solanum marginatum* L. (Solanaceae) in the Mountains National Park, Ethiopia. *Ethiop. J. Biol. Sci.* **4**(2): 215-218.
- Befekadu Rafera and Afework Bekele (2002). Diurnal activity pattern of Mountain Nyala in Bale Mountains National Park, Ethiopia. *Ethiop. J. Biol. Sci.* **1**(1): 63-72.
- Bornfree (2002). Ethiopian wolf deaths. <http://www.bornfree.org.uk/wolf/wolfnews004.htm>
- Gottelli, D and Sillero-Zubiri, C. (1992). The Ethiopian wolf - an endangered endemic canid. *Oryx* **26**: 205-214.
- Hillman, J.C. (1986). **Bale Mountains National Park Management Plan**. Ethiopian Wildlife Conservation Organization, Addis Ababa. 245 pp.
- Krebs, J.C. (1985). **Ecology: The experimental analysis of distribution and abundance**.

- 3rd ed. Harper Collins Publishers, Inc., New York, USA. 800 pp.
- Malcolm, J. (2007). **Ethiopian Wolf Conservation Programme (EWCP) - 2006/2007 Annual Report**. EWCP, Dinsho. 30 pp.
- Randall, D.A., Williams, S.D., Kuzmin, I.V., Rupprecht, C.E., Tallents, L.A., Zelalem Tefera, Kifle Argaw, Fekadu Shiferaw, Knobel D.L., Sillero-Zubiri, C., and Laurenson, M.K. (2004). Rabies in endangered Ethiopian wolves. *Emerg. Infect. Dis.* **10**: 2214-2217.
- Sillero-Zubiri, C. and Macdonald, D.W. (1997). **The Ethiopian wolf – Status survey and conservation action plan**. IUCN, Gland. 123 pp.
- Stephens, P.A., d'Sa, C.A., Sillero-Zubiri, C. and Leader-Williams, N.L. (2001). Impact of livestock and settlement on the large mammalian wildlife of Bale Mountains National Park, Southern Ethiopia. *Biol. Conserv.* **100**: 307-322.