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NOTES ON HUMAN- HYENA (*Hyaena hyaena*, Linnaeus 1751) CONFLICT IN JAJARKOT, KALIKOT AND MAHOTTARI DISTRICTS OF NEPAL

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ABSTRACT

Striped hyena is one of the large carnivores of the forest and grassland ecosystem. This paper deals with the distribution and human hyena conflict status in Jajarkot, Kalikot, and Mahottari districts of Nepal. Questionnaire and sign survey methods were used to collect information on human-hyena conflict. This study indicated that human hyena conflict was high in the selected district. Eight striped hyenas died in between 2015-2016 due to the human-hyena conflict. Livestock depredation by striped hyena was one of the major reasons of the human-hyena conflicts in Nepal. The goat was the most preyed species by the striped hyena. This study shows that the distribution of striped hyena was recorded from lowland to mid hills region of Nepal. The conservation outreach programs should be formulated to conserve the habitat and maintain the prey population of the striped hyena which would be helpful for long term conservation of the striped hyena in Nepal.

Keywords: Striped hyena, Conflict, Conservation, Livestock, Distribution.

INTRODUCTION

Globally there are four members of the Hyaenidae family; striped hyena, spotted hyena, brown hyena, and aardwolf (Mills & Hofer, 1998). These magnificent animals are playing an important role for maintaining forest and grassland ecosystem (Mills & Hofer, 1998; Abi-Said & Abi-Said, 2007). Historically, striped hyenas were distributed in Sudan, Eritrea, Somalia, Qatar, Kuwait, and the United Arab Emirates (Cunningham, 2004; Mills & Hofer, 1998) and now it has patchy distribution, extending from north of Africa, including the Sahel, east and northeast Africa south to central Tanzania, through the Middle East and Arabian Peninsula, Turkey, the Caucasus, Central Asia, and the Indian subcontinent (Abi-Said & Abi-Said, 2007). The abundance, distribution and population structure of the striped hyena in Indian subcontinent are stable and populations are considered to be declining (Singh *et al.*, 2010; Akay *et al.*, 2011; Sharma *et al.*, 2011; Jnawali *et al.*, 2011). However, little is known about its past and present occurrence in Nepal (Mills & Hofer, 1998). Furthermore, its distribution pattern in Nepal is unknown as well. Striped hyena has been listed as near threatened category by International Union for the

Conservation of Nature (IUCN). The global population size of striped hyena is estimated to be below 10,000 mature individuals (Abi-Said & Abi-Said, 2007). There are many records of continuous declining of its population and this is attributed to the decrease of its prey population in its natural habitats (Abi-Said & Abi-Said, 2007; Alam *et al.*, 2015). The other causes for decline of striped hyena population are the habitat degradation, human-hyena conflict (poison, poaching, and persecution), besides depletion of prey population and wildlife diseases (Dejene *et al.*, 2016). Moreover, its conservation threats have to be studied for balancing the forest and grassland ecosystems. Conflict between human and wildlife populations is emerging as a major conservation issue in Nepal. Therefore human-striped hyena conflict is a big issue to save its remaining population in this country. There are large gaps in our knowledge on several aspects of the striped hyena behavior and its ecology such as competition with other carnivores, effect of habitat degradation and climate change. Particularly the population dynamics and ecological niche of striped hyena is urgently needed to document in Nepal. Our study explored notes on distribution information and scenario of human-

hyena conflict. Furthermore, it opens the ideas for detail scientific studies and conservation of this large carnivore in Nepal.

MATERIALS AND METHODS

This study was conducted in Jajarkot, Kalikot, and Mahottari districts of Nepal (Figure 1). We employed sign (pugmark, scat and kill study) and questionnaire survey methods (Bhandari *et al.*, 2015; Bhandari & Chalise, 2016; Alam & Khan

2015). We followed published guidelines (Baral & Shah, 2008; Jnawali *et al.*, 2011; Alam & Khan, 2015; Bhandari *et al.*, 2015) for striped hyena’s sign and identification. Questionnaires were asked with the key persons (community forest staffs and users) to collect current information of the striped hyena and 100 persons were asked during the survey. Moreover, we also surveyed literatures (reports, articles and books) to get current and past information on the striped hyena in Nepal.

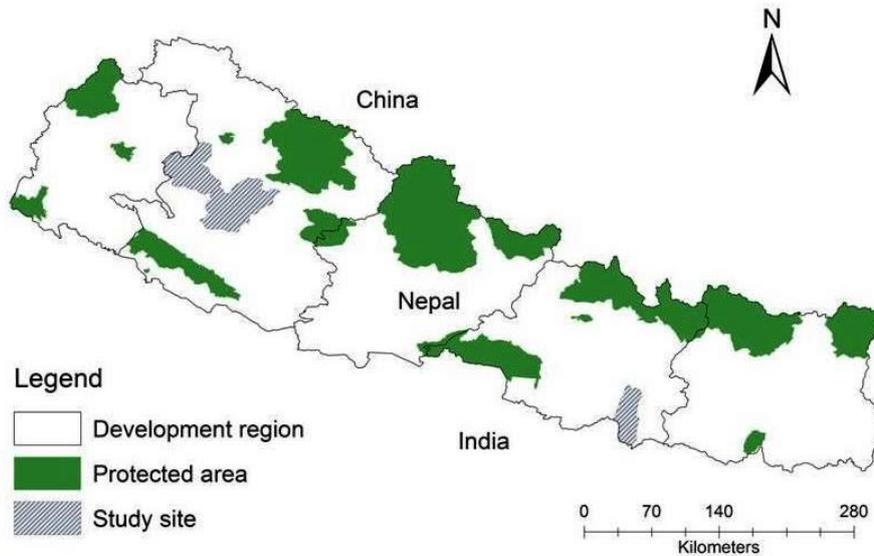


Fig. 1. Study site location.

RESULTS

Human-striped hyena conflict was found very high in the mid hill region such as Jajarkot and Kalikot districts of Western, Nepal. Six striped hyenas were killed in between 2015-2016 due to human-hyena conflict. Moreover, in the Mahottari, two striped hyenas were killed using poison by the local people in between 2015-2016 (Table 1). The major reason for human-striped hyena conflict was the livestock predation by striped hyena. Most of the respondents argued that, goat was the most preyed animal and dog was least preyed animal by the striped hyena (Figure 2).

Distribution range of striped hyena in Nepal was found wide. It was distributed from lowland (around 100 m) including protected areas and few other places to the mountainous region (up to 1750 m above the sea level) (Table 2). The striped hyena signs were recorded from mid hills (mountainous regions) the Jajarkot and Kalikot districts. Altogether, 35 signs of striped hyena were found from Jajarkot Kalikot and Mahottari districts (Figure 3). Its habitats continue to shrink and fragment due to the anthropogenic pressure and human-hyena conflict in its distributed range of Nepal.

Table 1. Loss of striped hyena in the study site.

Location	Number of died hyena		Reason	Remarks
	Year 2015	Year 2016		
Jajarkot	1	3	Human-hyena conflict	Poisoned
Kalikot		2	Unknown	-----
Mahottari	1	1	Human-hyena conflict	Poisoned

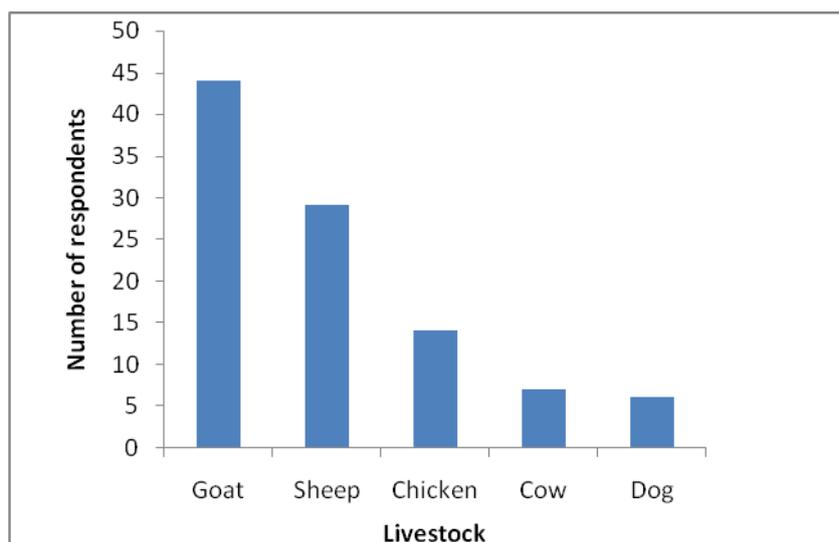


Fig. 2. Livestock preyed by striped hyena in the study site (n = 100).

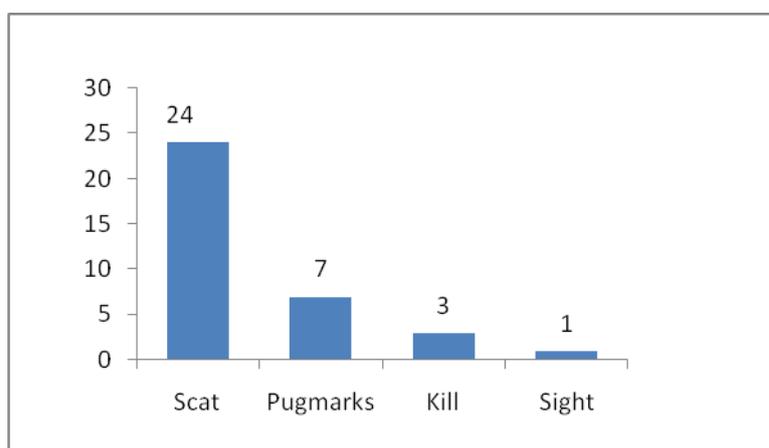


Fig. 3. Signs of the striped hyena in the study site.

Table 2. Records of striped hyena in different regions of Nepal.

Regions	Methods used to survey	References
Lowland (<1000m)	Sign survey	Bhandari <i>et al.</i> 2015 Bhandari and Chalise 2016
Mountainous region (>1000m)	Sign survey	Majupuria and Majupuria 2006 Our study

DISCUSSION

Anthropogenic pressure, human population growth coupled with expansion of agriculture resulted in habitat degradation through the loss of vegetation cover of the country (Mills and Hofer, 1998; Kruuk, 1976; Alam *et al.*, 2014). In this study, the major threats for the hyena were hunt and

deforestation. However, higher level of human hyena conflict recorded in mid hill district (Jajarkot) is probably due to lack of conservation awareness and mitigation program for this species.

Comparing to eastern part of Ethiopia (Dajene *et al.*, 2016), existence of large population density of spotted hyena in highly human populated areas was

attributed to the availability of livestock prey and domestic waste disposal (Dejene *et al.*, 2016). Similar situation may be prevalent in populated districts of Nepal but further study is needed to focus on the correlation of human population, livestock situation and population of striped hyena. The high killing of livestock (goat) in our study sites increases human-hyena conflict. Studies analyzing human wildlife conflict in many parts of the world showed that the rate of tolerance among local communities toward predators mostly depends on the degree of predation on their domestic animals (Kolowski & Holekamp, 2006; Holmern *et al.*, 2007).

Therefore, human-hyena conflict is one of the major challenges to save the remaining population in Nepal. Authors, Frank (1998 cited in Dejene *et al.*, 2016), Ogada *et al.* (2003) and Dejene *et al.* (2016) suggested that livestock loss by wildlife as a cause for human wildlife conflict and wildlife is accountable for the loss of 3% of livestock per year (Jackson & Nowell, 1996). Our questionnaire survey also indicated the low awareness status of the local people about conservation of wildlife including striped hyena. Bhandari & Chalise (2016) reported that people's perceptions toward striped hyenas and its conservation were overall positive in lowland districts of the eastern Nepal.

CONCLUSION

To minimize the hyena –human conflict in Jajarkot, Kalikot and Mahattori district, suitable mitigation and outreach programs should be conducted in local areas. In most conflicting sites compensation programs should be launched that would be helpful to save striped hyena's population in Nepal. There is large gap in our knowledge on several aspects of the striped hyena behavior and its ecology such as competition with other carnivores, effect of habitat degradation and climate change. The population dynamics and ecological niche of striped hyena is urgently needed to be documented in Nepal. Moreover, the prey population should be conserved and habitat destruction should be controlled.

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