

Losing threatened and rare wildlife to hunting in Ziro valley, Arunachal Pradesh, India

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Harvesting wild animals through hunting has become a major conservation issue, especially for large-bodied animals. We surveyed the Ziro valley in Arunachal Pradesh in order to assess the socio-economic status and dependence of indigenous people on wildlife species. We used structured questionnaire for the survey and houses were selected randomly. Species hunted include common leopard, clouded leopard, marbled cat, leopard cat, spotted linsang, otter sp., yellow-throated marten, orange-bellied squirrel, Malayan giant squirrel, sambar, barking deer, wild pig and birds. Hunting was carried out mainly for subsistence (55%), commercial purposes (25%) and medicine (10%). There is an urgent need to assess the impact of wildlife hunting and the sustainability of such practices on the hunted species to aid in adopting strategies to improve the protection measures and making informed conservation decisions.

Keywords: Apatani, Arunachal Pradesh, mammals, Wildlife hunting, Ziro valley.

ARUNACHAL PRADESH is the largest state in the northeastern region of India and forms 2.5% of the total geographical area of the country, 15.76% of the Indian Himalayan region and 43.62% of the biological hotspot of Eastern Himalaya¹. The state is inhabited by 26 major tribes and 110 sub-tribes. The vast majority of the indigenous inhabitants of the region are meat-eaters and many in the community are hunters². In spite of having 61.5% forest cover and being acclaimed as part of a biodiversity hotspot a protected area (Namdhapha Tiger Reserve) in Arunachal Pradesh was found to be 'empty'³⁻⁸. A recent study found that hunting was reported in 23 out of the 28 states and 7 Union Territories of India. Among the 350 mammal species, 114 are reported to be hunted in India⁹. Researchers have emphasized the existing knowledge gaps pertaining to wildlife hunting, their impacts and the sustainability in the northeastern states and Arunachal Pradesh in particular⁸⁻¹⁰. In certain tracts in India like those inhabited by the Bishnois there is a rich tradition of protecting wildlife and its habitats¹¹. However, this tradition is not prevalent in the northeastern states, where the indigenous communities have the tradition of obtaining meat from wild animals¹².

In Arunachal Pradesh, hunting is a widespread cultural practice that has probably led to low wildlife abundance¹³. This study reports on the hunting of 134 wild animals comprising mammals, birds and reptiles. A study on wildlife hunting in East Kameng, Lohit and Anjaw

districts of Arunachal Pradesh, reported a total of 33 mammal species being hunted, with 57% of these being endangered, threatened or vulnerable⁴. A study in West Kameng and Tawang districts of Arunachal Pradesh revealed that 26 mammal species were hunted locally¹⁴. Another study in Nagaland and Arunachal Pradesh reported about the hunting of 43 species of mammalian fauna. Studies on wildlife hunting in India and the North East region are particularly in infancy stage. Currently, we have documentation of only hunted species, hunting practices, etc. The exact impact of wildlife hunting

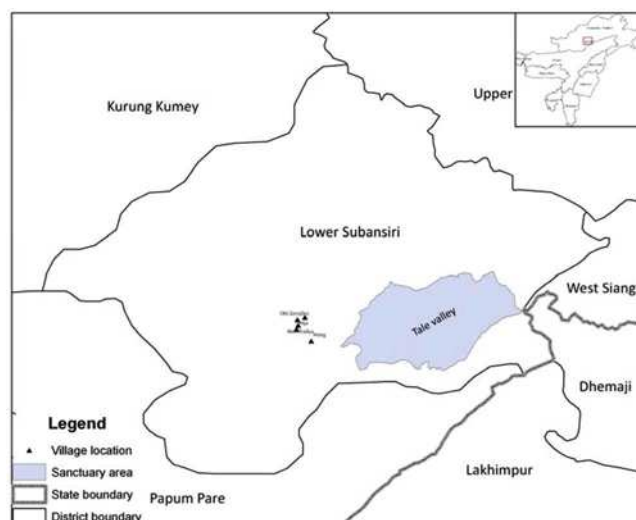


Figure 1. Map of surveyed villages around Tale Valley Sanctuary in Lower Subansiri District, Arunachal Pradesh.

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Table 1. Purpose of hunting, conservation status and season

Species	Purpose of hunting	Status			Season
		IUCN	IWPA	CITES	
Malayan giant squirrel	Meat	NT	Schedule II (Part I)	Appendix II	Winter, summer
Orange-bellied squirrel	Medicine, social ceremonies	LC	Schedule II	Not listed	Winter, summer
Barking deer	Skin, meat	LC	Schedule III	Not listed	Winter, summer
Sambar	Skin, meat	VU	Schedule III		Winter, summer
Yellow-throated marten	Meat, fur	LC	Schedule II	Appendix III	Winter
Wild pig	Meat	LC	Schedule III		Winter, summer
Marbled cat	Skin, meat	VU	Schedule I, Part I	Appendix I	Winter
Leopard cat	Skin, meat	LC	Schedule I	Appendix I	Winter
Black bear	Medicine, meat	VU	Schedule II (Part I)	Appendix I	Winter
Otter sp.	Skin, meat				Winter
Clouded leopard	Skin, meat	VU	Schedule I	Appendix I	Winter
Common leopard	Skin, meat	NT	Schedule I	Appendix I	Winter
Spotted linsang	Skin, meat	LC	Schedule I part I	Appendix I	Winter
Birds	Meat				Winter, summer
Reptiles	Meat				Winter, summer, monsoon
Primates	Cultural, fur				Summer

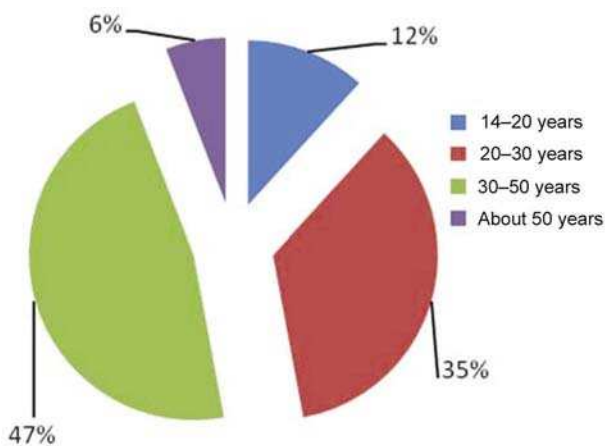


Figure 2. Age groups of hunting in Lower Subansiri district.

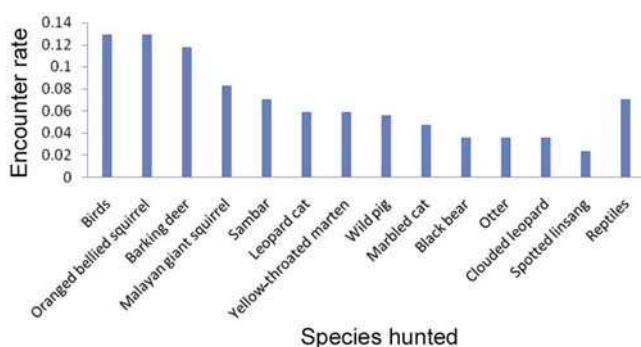


Figure 3. Wild animals' skin encountered during the survey in Lower Subansiri district.

and sustainability of these hunting practices have to be studied scientifically⁸.

In this background, we conducted a study to document wildlife hunting by the indigenous Apatani people in the Ziro valley, Lower Subansiri district, Arunachal Pradesh.

This study was part of the DST-sponsored dhole project in Arunachal Pradesh¹⁵. The Lower Subansiri district is located in the central western part of Arunachal Pradesh and lies between 26°55'–28°21'N and 92°40'–94°21'E (Figure 1). The Ziro valley is inhabited by the Apatani tribe whose unique land-use pattern, resource management and culture of conservation have made them a globally significant community^{16,17}. The valley has 35 villages¹⁸, with a population of 24,650 and a density of 23 people per sq. km¹⁸. The terrain is undulating, ranging from 1830 to 2900 m. The villages surveyed include Hija, Hong, Hari, Kalung, Nenchailya and Tajang. The survey was carried out twice between March and April 2011 and 2012. Interviews were conducted using a semi-structured questionnaire^{19,20}. Eighty-five households were randomly selected for interviews from each village. Village heads and hunters also were interviewed. Encounter rate of skin was calculated as the number of individual animal skins/total number of households surveyed.

Among the 85 households surveyed, 54.11% reported hunting for subsistence, 25% for commercial trade (often sold in markets), 10% for medicinal purposes and 4.7% reported hunting for pleasure. The major species hunted are mostly those protected by law (Table 1; large-bodied animals were mainly hunted for subsistence and Asiatic black bear hunting was reported for ethno-zootherapeutic purposes). The orange-bellied Himalayan squirrel is specifically hunted for medicinal purposes and social ceremonies²¹. About 55.3% respondents used guns, 35.3% used traditional traps and guns, and only 9.4% used traditional methods such as noose traps, glue traps, bow and arrow. The youngest hunter was reported to be 8 years old and to have hunted birds for consumption. Maximum hunting was observed in the age group between 30 and 40 years (47%), followed by 30% in the age group between 20 and 30 years. Hunting was generally performed twice

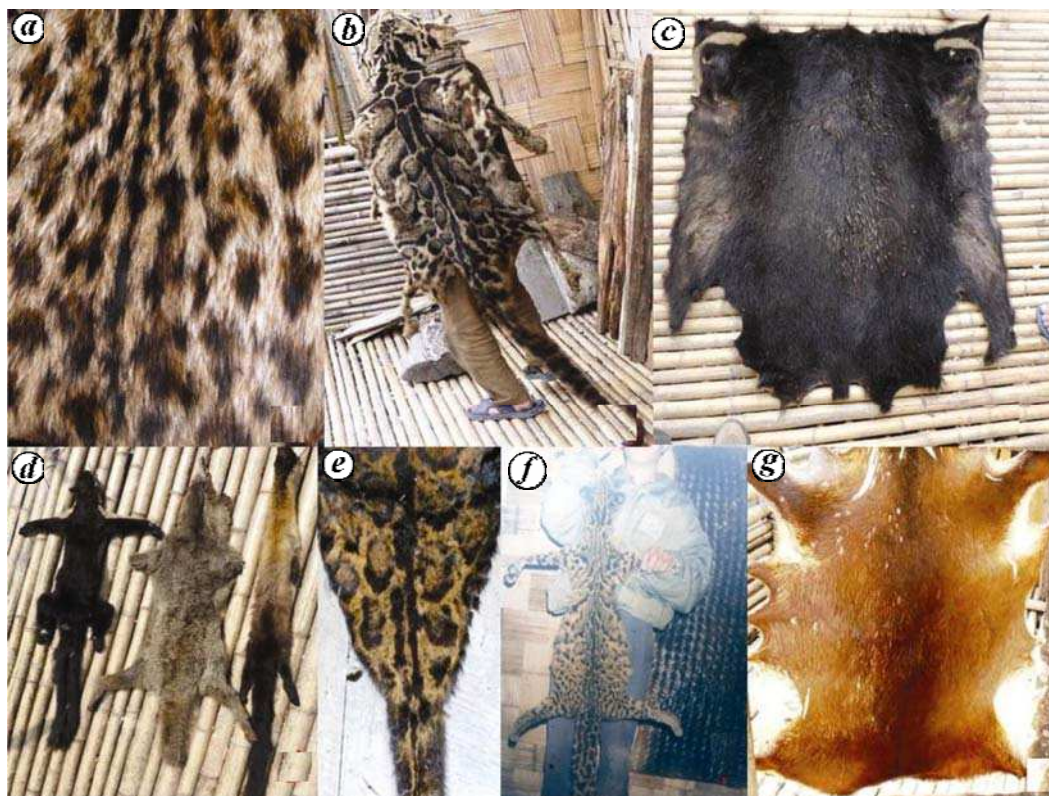


Figure 4. Trophies and skins encountered during the survey: *a*, Leopard cat; *b*, clouded leopard; *c*, black bear; *d*, Malayan giant squirrel, masked palm civet and yellow-throated marten; *e*, *f*, marbled cat, *g*, barking deer.

a year in winter and summer seasons, with an average eight hunters per group (Figure 2). Trophies and skins of birds, orange-bellied squirrel, Malayan giant squirrel, barking deer and sambar were frequently encountered during our survey (Figures 3 and 4).

The results of the survey revealed the hunting pressure on several rare and threatened mammalian species. Faunal depletion in tropical forests will have myriad consequences and a devastating effect on the forest ecosystem. The factors attributed to hunting include physical, geographical, biological, social, cultural, religious and economic²². Several positive impacts of wild meat harvesting and consumption to human health have been documented. Animal sourced food are generally known to be rich in energy, protein and micronutrients that have greater bioavailability than vegetable resources²³. Hunting and bush meat trade though ignored largely, play a vital role in the economy of numerous tropical forested countries²⁴. In a study conducted at Madagascar, a group of 77 children under 12 years of age were examined. On the contrary, severe negative impacts due to hunting have also been documented. Mass extinction of large-bodied animals due to hunting practices especially threatens the Southeast Asian region²⁵. The impact due to hunting on mammalian fauna is comparatively lesser in other tropical forests in Africa and the Amazon^{26,27}. The extirpation of mammalian fauna by hunting can lead to serious impact

on the forest structure and dynamics^{28–30}. Though wildlife is immensely valuable to humans, the impact of hunting causes several changes in the biological communities. As a result, there is loss of pollinators, seed predators, seed dispersers and predators, which finally results in an empty forest syndrome²².

Though hunting of wildlife is mostly done for subsistence in this region, access to the markets drives the hunters beyond their subsistence needs for additional income^{31,32} and this needs to be curtailed by enforcing strict protection to the wildlife. Social taboos traditionally provide a safeguard against overharvesting of certain species³³ and traditional customary laws of indigenous communities prevent overharvesting and helps conserve species²¹. There is an urgent need for Government agencies and conservationists to merge the traditional knowledge system with modern conservation methods and strengthen participatory conservation management²¹. Existing knowledge gaps on distribution, population status, and rate of change of species that are primarily hunted need to be filled. Sustainability of the existing hunting practices has never been assessed and such research needs to be expedited. Tackling wildlife hunting should be addressed from both the conservation and development perception, and will require an interdisciplinary approach cautiously incorporating social, economic, ecological and political components.

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