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RAPID SURVEY OF ENDANGERED HISPID HARE, *CAPROLAGUS HISPIDUS* IN NORTH BANK LANDSCAPE, NORTH- EAST INDIA

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ABSTRACT

This rapid survey was the first ever attempt to find out the status and distribution of hispid hare in north-east India within the North Bank Landscape which covered nine protected areas within Assam and Arunachal Pradesh. The survey finds out evidence of hispid hare's presence in three of the protected areas *i.e.*, Barnadi Wildlife Sanctuary, Nameri Tiger Reserve and D'Ering Wildlife Sanctuary. A preliminary assessment of grassland habitats within the study sites was conducted using GIS and RS technology. The survey further identifies the potential threats to tall grassland habitats available in all the protected areas including the sites where evidence of hispid hare reported.

Key words: Hispid Hare, Distribution, Threats, Conservation.

Introduction

Hispid hare (*Caprolagus hispidus*) is an endangered lagomorph (IUCN, 2010) which is listed in the Schedule-I of the Indian Wildlife (Protection) Act, 1972. It is also one of the only two lagomorph species which is listed by the CITES, the United States Endangered Species Act and the IUCN Red List. Habitat destruction due to overgrazing, unsustainable thatch grass cutting, annual dry season burning (Maheswaran, 2002), succession of grasslands into woodlands, invasion of weeds and local traditional hunting (*per.obs.*) are the threats which jeopardizing the future of hispid hare. Further, lack of baseline information has created a large gap in conservation activities and status evaluation of this highly precarious species. Except few occasional capture reports during 1970's and 80's (Chapman and Flux, 1990), no information is available on hispid hare in north-eastern India and no effort was even made to study the species in the past. The present study was the first ever attempt to carry out a rapid status survey of hispid hare in the north bank landscape, north-east India during the year 2008- 09 (October- March).

Material and Methods

Study area

The north bank landscape comprises a geographical area of about 84,000 km^2 in the north-east Indian states of Assam and Arunachal Pradesh. The landscape consists of both vast river plains and Himalayan mountain ranges. The Brahmaputra, one of India's magnificent rivers, defines the southern boundary of this landscape, while the foothills of Eastern Himalayas border the north. Due to varied topographic and climatic conditions and its unique geographic location in the Eastern Himalayas at the junction of the Indo-Malayan, Indo-Chinese, and Indian sub-regions, there is a high level of species diversity in the landscape. The landscape's Eastern Himalayan broadleaf forest remains largely intact and contiguous. The landscape, therefore, presents an ideal opportunity for proactive conservation measures aimed at ensuring it remains intact in the long term. Since 1972, 65% of the lowland Brahmaputra Valley semi-evergreen forest in Assam has been destroyed, indicating the severe reality of forest destruction that has been swiftly approaching the Himalayan foothills. Protecting this area will provide a potential “tide breaker” that could protect the upper Himalayan slopes from the wave of forest conversion rapidly moving up the slopes from the plains. The continued loss of forests will have adverse consequences for both humans and wildlife. The North Bank Landscape is a safe haven for many animals, including Bengal tigers, Asian elephants, Greater Asian One-horned Rhinos, Clouded leopards, Golden cats, Red pandas, Himalayan black bears, Pygmy hogs, Hispid hares, White-winged wood ducks, and the greater adjutant stork. The main threats to wildlife across this landscape are poaching, illegal logging, encroachment, development, forest conversion, human population growth, and shifting agriculture (WWF, 2004).

Methodology

Ground level forest staff and local community of the fringe villages around protected areas have a close relationship with the forest including knowledge of many conspicuous animal species reside in the forest. I

Evidence of Hispid Hare's presence found in three out of nine sites surveyed, identified multiple threats critical for the species' survival, riquire urgent consideration.

communicated with the fringe villagers and forest guards regarding all the hare species of their knowledge in general and hispid hare in particular. The communication included both formal questionnaire following standard datasheets prepared in advance and informal conversation. The questionnaire was designed to be highly visual and followed high resolution hispid hare photographs for easy and quick identification of the species besides few closed objective and open ended questions. I also used pellet samples of hispid hare during the interview which were shown to local people and asked if they had seen in the locality or not.

Besides interview, field survey was also carried out in the potential grasslands within the study sites in search of both direct and indirect evidence of hispid hare. Since direct sighting of hispid hare is very difficult unless animals are captured using traps, mostly indirect method was followed by manual searching of pellets (Burnham *et al.*, 1980; Buckland *et al.*, 1993).

Prior to the field survey, grassland areas of all the study sites were extracted using Geographic and Information System (GIS) and Remote Sensing (RS) following unsupervised classification method (ESRI, 1999).

During this study, the protected areas surveyed were Barnadi Wildlife Sanctuary (1), Sonai-Rupai Wildlife Sanctuary (2), Nameri Tiger Reserve (4), Zamzing-Sengajan Reserve Forest (6) and Dibru-Saikhowa National Park (7), in Assam; Eagle's Nest and Sessa Wildlife Sanctuary (3), Pakke Tiger Reserve (5), D'Ering Wildlife Sanctuary (8) and Mehao Wildlife Sanctuary (9) in Arunachal Pradesh (Fig. 1). Detail of the grasslands surveyed is given in Appendix 1.

Results and Discussion

Out of the nine protected areas surveyed only seven sites have tall grassland habitat that presumed to be of potential for the hispid hare occurrence as the species predominantly prefers tall grasslands as habitat. These sites include Barnadi Wildlife Sanctuary (grassland 29.6%, n= 7.7km^2), Nameri Tiger Reserve (grassland 5%, n= 22.3km^2), Sonai-Rupai Wildlife Sanctuary (grassland 20%, n= 41km^2), Dibru-Saikhowa National Park (grassland 28.75%, n= 111.33km^2), Zamzing-Sengajan Reserve Forests (grassland 20%, n= 20.7km^2) D'Ering Wildlife Sanctuary (grassland 64.43%, n= 123.15km^2) and Pakke Tiger Reserve (grassland 2%, n= 20.2km^2).

During the field survey, physical evidence (pellet) of hispid hare was found only in two of the study sites, Barnadi Wildlife Sanctuary and D'Ering Wildlife Sanctaury.

In Barnadi Wildlife Sanctuary field survey was carried out in two grassland areas, near Alongjhar camp (26^0 47' 54.5'' N; 91^0 45' 15.2'' E) and near Nalapara camp (26^0 48' 38.7'' N; 91^0 46' 40.1'' E). An area of 1800 m^2 has been surveyed and a total of three pellet piles (one fresh and two old) of hispid hare were recorded. The general habitat where the pellets were found was wooded grassland with no water body nearby. The grassland was dominated by *Saccharum* spp. The mean pellet length of these three pellet piles were 15.1mm, 16.4mm and 16.1mm respectively.

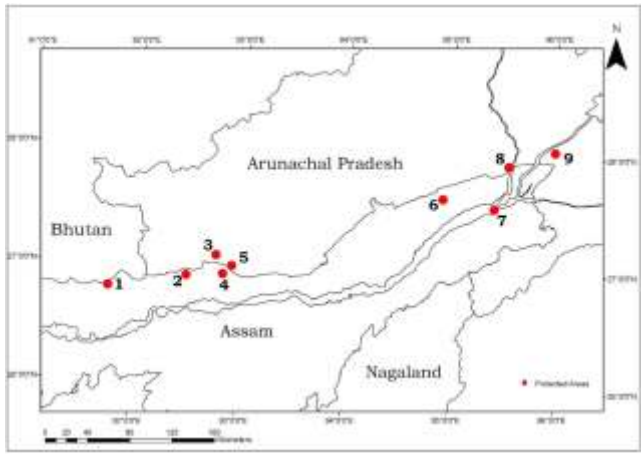

Fig. 1 : Map showing the location of the protected areas surveyed.

In D'Ering Wildlife Sanctuary an area of 1400 m^2 was surveyed in the 'Jeepghat' grassland (27^0 51' 02.4'' N; 95^0 24' 07.4'' E) and only one old pellet pile of hispid hare was recorded. The general habitat where the pellets were found was wooded (*Zizyphus mauritiana* association) grassland with water body nearby. The grassland was dominated by *Saccharum narenga.* The mean pellet length was measured 14.7mm.

I did not find any physical evidence of hispid hare in Nameri Tiger Reserve however, during the interview survey the respondents informed sighting of the species in 'Mekahi Tapu' until the sudden devastating flood came down the Jia Bhoroli river when North East Electric Power Corporation Ltd. (NEEPCO) released its surplus water on 27th October/2008 (Pradeep Das *pers.com.*). The local forest staffs told that during this flood large scale destruction occurred to not only the aquatic lives but also to some land animals inhabits the riverine grasslands.

Threats identified in the study sites

Major threats to hispid hares in Barnadi Wildlife Sanctuary is severe biotic pressure in the form of thatch harvesting, overgrazing, hunting and habitat degradation due to invasion of weeds like *Lantana* and *Eupatorium*. There are 23 fringe villages within the radius of 5 km. from the sanctuary boundary consisted of tribal communities Bodo, Garo, Koch and tea garden laborers who traditionally hunt wild animals for meat. They also

collect thatch illegally for housing construction. In the absence of grazing reserves, they also let their unproductive cattle inside the sanctuary for grazing which degrades the habitat and cover for wild animals particularly the cover dependent species like hispid hare and pygmy hog. Unscientific grassland burning practice was another major threat to hispid hare. Fire is sometimes also set by the local graziers to create new patches for their cattle grazing which could be detrimental to hispid hare as breeding season of this species is reported to be coincided with this dry season grassland burning.

The grassland habitat in Sonai-Rupai is threatened by encroachment and overgrazing. A major portion in the south-western part of the Sanctuary has been degraded due to severe biotic activities. The local community was mostly dominated by the 'Bodo tribes' who are traditionally linked with hunting practices. These people also harvest forest produces like fuel wood, timber, thatch grass etc. illegally from the forest.

Nameri is threatened by the potential encroachers. Balipara and Naduar, two of the major reserve forests of Nameri Tiger Reserve have already been cleared up and completely encroached. The northern side of the Jia Bhoroli river, the Nameri National Park is comparatively safer as the river acts as a natural barrier. However, small scale hunting occurs occasionally. The major threat to hispid hare and its grassland habitat in Nameri is possibly the flood as majority of the grasslands are situated along the River *Jia Bhoroli*. These grasslands are affected by both natural annual flood as well as artificial flood which sometimes caused by the North East Electric Power Corporation Ltd (NEEPCO).

Zamzing reserve forest is under heavy anthropogenic pressure. Almost 90% of the area has been destroyed for seasonal cultivation of paddy and mustard which also includes permanent human settlements in the north and north-western part of the reserve. The Sengajan reserve is also under pressure but still have some grassland patches left to the south near the Brahmaputra river which are gradually being cleared up for seasonal cultivation. The local people are mostly dominated by the tribes belong to the Bodo and Miching community who are traditionally hunters and kill wild animals for meat. They mostly use traps and snares to catch small animals and birds and sometimes also use domestic dogs during hunting. Wild animals in these two Reserves now are almost nonextant (except bird species) due to severe biotic pressure and excessive hunting. Encroachment for seasonal cultivation, reclamation of wetlands for agriculture, conversion of grasslands for crop cultivation, livestock grazing and hunting are the major threats in Zamzing and Sengajan Reserve Forest.

Grasslands of Dibru-Saikhowa National Park are threatened by both natural and anthropogenic disturbances. Natural disturbances include floods, erosion, and siltation while anthropogenic disturbances are overgrazing, fire (*i.e.*, uncontrolled grassland burning) and land clearance for agriculture. Anthropogenic disturbance basically comes from the two forest villages Dodhia and Laika and the fringe village Erasuti. Major occupation of the villagers is cattle rearing; hence grazing pressure is detrimental for the grassland habitats in Dibru-Saikhowa National Park.

In Pakke Tiger Reserve, grasslands that are located along the Pakke river are observed facing heavy grazing pressure. These grasslands are affected by flood during monsoon season. However, the grasslands in Khari area were comparatively safer as these grasslands are not easily accessible by the locals and situated quite far from the settlement areas. Despite protection and awareness activities, small scale opportunistic hunting by local tribal communities (Nishi) still persists. These people hunt mainly for subsistence and local consumption although sometimes they hunt to supplement their cash income.

Grazing, fire, flood and traditional hunting are the major threats to hispid hare and its habitat in D'Ering Wildlife sanctuary. The southern forest boundary (which is inter-state boundary with Assam) of the sanctuary is porous, and is the main doorway for the cattle population. Grazing pressure basically comes from the villages located to the east of the Sanctuary and also from Assam. The cattle arrive early in the morning, graze within the sanctuary whole day and leave the sanctuary in the late afternoon. However, there are some resident cattle also which belong to the 'Khutis' (cowsheds set up illegally inside the sanctuary). Every year during the dry season fire breaks out taking a big toll of wild animals and their habitat which is mostly done by the illegal cattle graziers. Slow moving animals and cover dependent species including hispid hare are particularly vulnerable to such unscientific burning practices. Flood is another major threat. During rainy season every year the Sanctuary faces devastating flood which causes large scale damage to wildlife and its habitat. Except few higher regions, almost majority of the islands get submerged during the flood time. The fringe villages around D'Ering Wildlife Sanctuary are represented by 'Minyong' and 'Padam' sub tribes of 'Adi' who are traditional hunters. Most of their festivals are linked with hunting of wild animals and exchange of wild meat. Community hunting itself is a festive occasion, a social

practice linked with culture. So, excessive hunting could cause severe wildlife crisis in near future if hunting is not controlled or a sustainable way of hunting is not adopted immediately. Local fringe people also collect thatch grass illegally for housing construction. Thatch is in heavy demand and there had been incidents of smuggling of thatch in large quantities in the past.

There is no grassland inside Mehao Wildlife Sanctuary, however along the rivers, in the foothill areas there are few patches of grassland which are affected by various human activities. Cattle grazing, harvesting of grasses and traditional hunting are the major threats to these grasslands and the animal species. Invasion of weed (*Eupatorium odoratum*) is another major threat which was observed in 'Nijamghat' grassland.

Conclusion

Hispid hare is a data deficient species, so extensive surveys should be carried out in the potential tall grassland areas throughout the country to find out its actual status and distribution. Detail ecological studies should be carried out in areas where presence of hispid hare is already known, to generate information on its population status, about its habitat requirements, habitat utilization pattern, behavioral ecology, reproductive biology and effect of disturbance factors like burning, grazing, thatch collection and flood. Since, hispid hare is threatened by multiple factors like habitat loss, dry season grassland burning, flood, hunting etc., a comprehensive action plan should immediately be developed for conservation of hispid hare and effective management of its tall grassland habitats.

उत्तरी बैंक भूदृश्य, उत्तर-पूर्व भारत में संकटापन्न दृढ़लोमी खरगोश, *कैप्रोलेगस हिस्पिडस* का त्वरित सर्वेक्षण

नाबा के. नाथ

सारांश

उत्तरी बैंक भूदृश्य, जो असम और अरूणाचल प्रदेश के भीतर नौ संरक्षित क्षेत्रों को कवर करता है, के भीतर उत्तर-पूर्व भारत में दृढ़लोमी खरगोश के स्तर और वितरण का पता लगाने के लिए यह त्वरित सर्वेक्षण पहला प्रयास था। सर्वेक्षण से संरक्षित क्षेत्रों में से तीन, यथा- बारनदी वन्यजीव अभयारण्य, नमेरी टाइगर रीजर्व तथा डी, इरिंग वन्यजीव अभयारण्य में दृढ़लोमी खरगोश की उपस्थिति के प्रमाण का पता चला। जी आई एस और आर एस प्रौद्योगिकी का उपयोग करके अ‍ेयन स्थलों के भीतर घासभूमि आवासों का प्रारम्भिक मूल्यांकन किया गया। इस सर्वेक्षण में उन स्थलों, जहा दृढ़लोमी खरगोश के प्रमाण सूचित किए गए, सहित सभी संरक्षित क्षेत्रों में उपलब्ध लम्बे घासभूमि आवासों के लिए संभावित संकटों की पहचान की गई है।

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Appendix 1

Location of the grasslands surveyed in the protected areas within the North Bank Landscape, north-east India.

Sl. No.	Name of the protected area	Grassland cover km^2 (%)	Name of grassland	GPS location
1	Barnadi WS	7.77 (29.6%)	*Alongjhar*	26° 47 ' 54.5'' N; 91° 45 ' 15.2'' E
			Nalapara	26° 48 ' 38.7'' N; 91° 46 ' 40.1'' E
2	Sonai-Rupai WS	41 (20%)	*Gelgeli*	26 ° 54 ' 48.6'' N; 92° 29 ' 28.6'' E
			1 no. Kherbari	26° 53 ' 33.7'' N; 92° 31 ' 41.5'' E
3	Nameri TR	22.3 (5%)	*Potasali*	26 ° 56 ' 13.8'' N; 92° 50 ' 22.6'' E
			Mekahi Tapu	26° 54 ' 18.7'' N; 92° 49 ' 20.3'' E
			Morisuti-Bogoritapu	26 ° 54 ' 05.5'' N; 92° 51 ' 10.2'' E
			Upper Dickroi-Kachutoli	26 ° 58 ' 48.7'' N; 92° 49 ' 23.3'' E
4	Zamzing-Sengajan RF	20.7 (20%)	*Sittang*	27° 39 ' 02.4'' N; 94° 54 ' 29.3'' E
			Sampong	27° 38 ' 45.5'' N; 94° 54 ' 55.4'' E
			Ramnala	27° 37 ' 43.4'' N; 94° 55 ' 55.7'' E
5	Dibru-Saikhowa NP	111.33 (28.75%)	*Kundaghat*	27° 36 ' 12.4'' N; 95° 22 ' 12.2'' E
			Kolomy	27° 36 ' 28.9'' N; 95° 19 ' 33.6'' E
6	Pakke TR	20.2 (2%)	*Majunala*	26° 57 ' 15.1'' N; 92° 59 ' 35.7'' E
			Khari-river	26° 58 ' 87.6'' N; 92° 55 ' 05.9'' E
			Khari-duimukh	27° 00 ' 15.3'' N; 92° 55 ' 00.2'' E
			Khari-tinimukh	27° 00 ' 35.1'' N; 92° 54 ' 59.6'' E
			Khari-pukhri	26° 59 ' 15.2'' N; 92° 54 ' 56.1'' E
7	D'Ering WS	123.15 (64.43%)	*Jeepghat*	27° 51 ' 02.4'' N; 95° 24 ' 07.4'' E
8	Mehao WS	-	*Apipani*	28° 08 ' 06.8'' N; 95° 43 ' 23.3'' E
			Difunala	28° 03 ' 39.2'' N; 95° 58 ' 36.3'' E
			Nijamghat	28° 12 ' 57.4'' N; 95° 44 ' 42.5'' E