



23.0 Galliformes Hunting in India : The Bigger Picture

Hilaluddin¹ and Rahul Kaul²

¹29 D/ 3B, Ward No. 1, Neela Hauz Road, Mehrauli, New Delhi - 110 030

²Wildlife Trust of India, A-220, New Friends Colony, New Delhi 110 065
Email: rahul@wti.org

Introduction

Galliformes are viewed as significant source of easily accessible animal protein, as they often occur close to rural communities in many areas of India. In the Himalayan and the northeast states of India a significant portion of wild meat offtakes comprises of galliformes (Kaul *et al.* 2004; Hilaluddin *et al.* 2005a; 2005b, 2006). There are also high values attached to the subsistence use of, and the commercial trade of galliformes, making it an important source of livelihood, albeit illegal, for rural and urban traders in the northeast India and the eastern Indian Himalaya.

As human population is continuously burgeoning, pressures on natural resources and wildlife in India in general and northeast India in particular are becoming increasingly severe. Greater access to forest areas, the adoption of modern firearms and their continued use in hunting practices, and the increasing commercialization of hunting (Kaul *et al.* 2003 ;2004; Hilaluddin *et al.* 2004, 2005a; 2005b ; 2006) are critical factors driving exploitation of several pheasant species, specifically in the western Indian Himalaya (Hilaluddin 2006). The threat of extinctions of local galliformes populations from many areas of the Himalayan region and northeast India and associated declines in meat supplies for local communities are therefore concerns shared by those engaged in the conservation of biodiversity and those pursuing the betterment of human. History suggests that people switch to alternate sources of protein and livelihoods when wild meat is rare, but often at a point when recovery of a depleting wildlife species is too late (Rao and McGowan 2002). The recent most example in this context, is the local extinction of Green Peafowl (*Pavo muticus*) from parts of

southeast Asia (McGowan *et al.* 1998). Keeping the above in view, the present article reviews researches that were conducted on galliformes extractions in some areas of India, examines extent of the problem, exploring possibilities of future research that will help in the development of conservation action plans and forwarding ways for mitigating the problem.

Methods

Specific tribes from various states of Himachal Pradesh, Uttarakhand, North Bengal, Sikkim, Arunachal Pradesh, Nagaland and Mizoram were interviewed to determine the approximate extraction rates of wild meat within those communities. Structured questionnaires were used at the village and household levels to collect information on the species and the magnitude of the offtakes for each species. Numbers extracted per annum for each species was determined, which was then multiplied by the body weight of that species to give an approximation of the total wild meat offtakes. Since the survey was questionnaire based, it was assumed that minimum quantities of animals hunted were actually reported and that what was provided were the minimum quantities. It would also be important to note here that the figures provided are true for the communities for which the survey was conducted and may not necessarily represent the whole state. Therefore the reference made to the state below should be taken as that made to the particular tribe or the sampled area (Table 1).

Table 1 : The Surveyed Localities and Tribes

S.No.	Location/Tribe	State
1.	Chamba District	Himachal Pradesh
2.	Garhwal	Uttarakhand
3.	Nishis/ Hill Miris/Apatanis	Arunachal Pradesh
4.	Angamis	Nagaland
5.	Mizos	Mizoram
6.	Sherpas	West Bengal
7.	Kitam WS	Sikkim



Galliformes extraction rates and patterns

Studies on wildmeat harvest in the Indian Himalaya (Kaul *et al.* 2003, 2004; Hilaluddin *et al.* 2005c, 2006) and northeast India (Hilaluddin *et al.* 2005a and 2005b) have shown that at least 17 species of galliformes are commonly hunted in the sampled villages/ localities of these states. Hunters killed more galliform species (Table 2) in Nagaland (7), Himachal Pradesh (6), Sikkim (6), and Uttarakhand (6) as compared to Arunachal Pradesh (4), Mizoram (4) and north Bengal (4). The number of galliformes species that are hunted in the sampled localities is presented in Table 3.

Contribution of galliformes into wild meat off take

Galliformes contributed significantly to wild meat offtakes (Hilaluddin *et al.* 2005b) and their contribution was highest in the sampled areas/ localities of Himachal Pradesh followed by Uttarakhand, Arunachal Pradesh and Nagaland (Table 4). In the surveyed villages of Himachal Pradesh, a household extracted an average of approximately 268 kg wild meat annually, of which 8.46% was of galliformes origin. Species such as Koklass pheasant (*Pucrasia macrolopha*) and Chukar partridge (*Alectoris chukar*) made bulk of contribution into wild meat spectrum of galliformes origin. The threatened Western Tragopan (*Tragopan melanocephalus*) was also consumed. In Uttarakhand, a household on an average extracted 216 kg wild meat annually, of which 5.2% came from galliformes. Species such as Kalij Pheasant (*Lophura leucomelanos*) was the commonly hunted species. In North Bengal, Hill Partridge (*Arborophila torqueola*) and Kalij Pheasant contributed significantly to wild meat offtake (approximately 211 kg / annum) of a household. Blood Pheasant (*Ithaginis cruentus*) and Satyr Tragopan (*Tragopan satyra*) too were recorded commonly hunted in Singhalila National Park (NP). Both these species have restricted distribution within Indian territory. In Sikkim also galliformes were hunted for meat – species such as Indian Peafowl (*Pavo cristatus*) was reported to be commonly hunted in the vicinity of Ketam Wildlife Sanctuary (WS). A household of Arunachal Pradesh extracted a mean of approximately 409 kg wild meat annually, of which 5% came from galliformes. In Nagaland, the annual average household extraction was ca. 652 kg which includes 3.7% of galliform origin, and in Mizoram of the 278 kg of mean annual household extraction, galliformes contribute 1.74%.

Galliformes in the markets

Market assessment in the states of Nagaland and Arunachal Pradesh revealed that five species of galliformes were on sale (Hilaluddin *et al.* 2005b). While Hill-partridge, Grey Peacock Pheasant, Kalij Pheasant and Red Junglefowl were recorded from the market of Hapoli (Arunachal Pradesh), Hill Partridge, Kalij Pheasant and Red Junglefowl were openly being sold in the local markets of Kohima (Nagaland). A mean of 5.71-kg (± 1.4 SE) meat of galliformes origin was

sold every day in the market of Hapoli, whereas an average of 12.0 kg (± 4.0 SE) per day in the local markets of Kohima.

Follow up surveys in the markets of Dimapur and Kohima (Nagaland), Hapoli and Aizwal (Mizoram) in 2006-07 (unpublished data) recorded seven species of galliformes being openly sold. These species included Blyth's Tragopan (*Tragopan blythii*), Quail spp., Hill partridge, Chinese Francolin (*Francolinus pintadeanus*), Grey Peacock Pheasant, Kalij Pheasant, and Red Junglefowl. A Kalij Pheasant was sold @ INR 300-350; Grey Peacock Pheasant @ INR 350-400; a Blyth's Tragopan @ INR 500-600, a Red Junglefowl @ INR 250-300; a Hill partridge and Chinese Francolin each @ INR 200-250; Quail spp. @ INR 50-60.

Methods of hunting

Hunting is rarely considered a full time profession (except in case of commercial hunters) with most practitioners hunting in their spare time. The method of killing varies from traditional bow and arrows, spear, traps made from bamboo and iron wire and mist nests to modern firearms (air and smoke guns). Thirty-one percent hunters each used guns and traps, whereas 38% made use of other tools to kill galliformes in the surveyed villages across the Indian Himalaya and northeast India.

In northeast India and the Indian Himalaya (Kaul *et al.* 2003 and 2004; Hilaluddin *et al.* 2005a, 2005b, 2005c and 2006), respondents killed galliformes through regular snaring in the vicinity of villages, primarily for providing food for family. Sometimes they also organized hunting trips targeted mainly for galliformes in the nearby forests, mainly for subsistence requirements.

Our interviews with local communities included aspects such as the awareness of wildlife legislation, community hunting regulations, and the need for conservation. Forty percent hunters were prepared to stop hunting if domestic meat was supplied to them free of cost. A majority (58%) of our respondents were aware that hunting of wild animals is violation of the Wildlife (Protection) Act, 1972. The enforcement of this act had adversely impacted hunting intensities of 40% hunters. Ninety percent of our respondents admitted that customary laws of hunting that regulates animal killing did not exist within their community.

Impact of hunting on wild populations of galliformes

Recent study (Hilaluddin 2006) in the western Indian Himalaya has shown that pheasant densities, and metabolic and crude biomass varied between hunted and protected sites (PAs). In general, densities and metabolic and crude biomass of pheasant species were higher in protected sites as compared to hunted sites. Koklass pheasant and Kalij pheasant have shown statistically significant variations in



their densities in hunted versus protected sites. However, the densities of Cheer pheasant (*Catreus wallichii*) and Himalayan Monal (*Lophophorus impejanus*) did not show significant differences between hunted and protected forests although cheer pheasant were more often sighted in hunted forests than protected forests, whereas abundance of Himalayan Monal showed reverse trends. However, this is based on the assumption that PAs afford higher protection levels to galliformes *i.e.*, comparatively less poaching than areas that are outside PAs. Such an assumption may not be true in all cases, and a reverse situation is also possible.

Discussion

In the surveyed villages/ localities, 11 species of pheasants occurred and all of them were hunted commonly. Among these, Blyth's tragopan, Cheer pheasant, Red Junglefowl, Satyr Tragopan and Western Tragopan are of conservation concern. While Red Junglefowl is believed to be genetically threatened, others are listed in the Red Data List of IUCN (see IUCN 2004). Like other wild animal species in India, galliformes too are protected from hunting under the aegis of the Wildlife (Protection) Act, 1972 (WPA, 1972). All species of galliformes are listed in various schedules of the WPA, 1972. Despite enforcement of the law, it does appear that galliformes are harvested in pockets throughout their respective ranges at will, for subsistence and also for trade. They are also extracted for cultural reasons (Hilaluddin *et al.* 2005b), wild meat being perceived as 'superior' to the meat from domestic animals (Hilaluddin 2005a) and is recorded by the respondents as "*tastier*" (Hilaluddin 2005b and 2005c). This is apparent in the open wild meat markets where galliformes are sold at 2 to 3 times the price of a poultry fowl. In remote villages where access to open markets are limited, galliformes and other wild animals constitute a free resource, which is also exploited for trade (Hilaluddin *et al.* 2006).

It does appear that the arrival of modern firearms in the hands of forest dependent communities has given way to anarchic exploitation of galliformes to cater the demand of the city and town dwellers, with game. Galliformes extraction rates are too high to sustain burgeoning wild meat demand. With the advent of modernization and cash, tribal values of conserving and protecting non-human life seem to have eroded.

The galliformes extraction data also suggests that species, specifically Hill partridge, Kalij Pheasant and Red Junglefowl are most commonly hunted in every village where they occurred. Also, people from all professions hunted galliformes equally. The age and the educational status of the hunters also did not limit their extraction quantities because most of the galliformes species are found in vicinities of human settlements and therefore are easy to trap in snares. In the surveyed villages/ localities, staple food was mainly cereal and vegetable-based and therefore consumption of wild meat probably provides a supplementary source of animal

protein. Domestic consumption of livestock is usually limited to religious and/ or matrimonial ceremonies, specifically in the western Indian Himalaya. Thus, to supplement the animal protein intake, wild meat is consumed, because it can be harvested free from the forests. By and large, hunting is rarely considered a full time profession with most practitioners does hunting in their spare time only. A majority of young people seemed to have ample spare time at their disposal, which they utilize suitably for their benefit by indulging in hunting.

The data on impact of hunting on wild populations of pheasants in the western Indian Himalaya (Hilaluddin 2006) suggests that pheasants are at risk of local extinctions from many forests patches because hunting inverted the relative contribution of species to metabolic biomasses or relative energy consumption at hunted sites. The recent most example is the local extinction of Western Tragopan from Kiri Beat under Chamba Territorial Forest Division of Himachal Pradesh. Significant declines in densities of Cheer Pheasant, Kalij Pheasant, Koklass Pheasant and Himalayan Monal pheasant in the hunted sites were recorded. However, it remained unclear whether similar or reverse trends exist in the eastern Indian Himalaya and the northeast India. Also, abundance data for most of the galliformes species are lacking for the northeast India in general and the eastern Indian Himalaya in particular and therefore it is difficult to determine the sustainability of the species offtake in this mega-biodiversity hotspot of the world. This requires immediate investigation.

There are already documented findings that forest patches subjected to hunting undergo significant changes in vegetation structure and composition due to poor pollination and seed dispersal of dependent plant species (Cullen *et al.*, 2000). This is because changes in vegetation structure and composition may have adverse affect on structure and composition of dependent animal communities as documented in birds in many forest ecosystems across the world (Thiollay, 1999; Raman and Sukumar, 2002; Skowno and Bond, 2003; Kumar and Shahabuddin, 2006). This ultimately may lead to ecological extinction of species both in marine and terrestrial ecosystems (Conner, 1998; Dayton *et al.*, 1998; Estes *et al.*, 1998; Novaro *et al.*, 2000; Redford and Feinsinger, 2001). Galliformes too are no exceptions to such consequences. However, data on how hunting may affect the population dynamics of galliformes species are sorely lacking for Asia in general, and India in particular. Further, no information exists on population and demographics of hunted versus protected sites, impact of hunting on galliformes of different age classes, impact of galliformes hunting on vegetation characteristics and demographics of plant populations in hunted versus protected sites, ecological sustainability of galliform extractions, proportion of galliformes in the diet of households and seasonal variations in galliformes harvest.



The relationship between demand for wild meat consumption and the improved economic livelihoods is also not so simple. It can not be assumed that economic development in itself will reduce demand for galliformes consumption. It could easily enhance both in the short-term and the long-term as shown by Hilaluddin *et al.* (2005a). The long-term option may not be relevant for the species that are most threatened by hunting (Abernethy *et al.* 2003), for which extinction in the next decade is the real possibility (Nelleman and Newton 2002). Hence, it is imperative that development assistance to rural communities includes limiting the natural resources use, from the perspectives of both food security and conservation.

Thus, the government needs to recognize wild meat extraction as major problem and some innovative decisions need to be taken by the government to regulate/curtail wild meat extraction for if the present trends continue, there may not be much left to conserve.

Acknowledgements

This study was funded by a collection of small grants, one each from Wildlife Conservation Society, US through Centre for Wildlife Studies-India, Oriental Bird Club, UK, World Pheasant Association-International through its South Asia Field Office and British High Commission. The staff of Department of Forests and Wildlife of Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir, Mizoram, Nagaland, Sikkim and Uttarakhand actively participated in the survey. We are highly indebted to them.

References

Abernethy, K., Baker, M., Bennett, L. E., Boclmer, R. Brashanes, J., Cowlshaw, G., Elkan, P., Eves, H., Fa, J. E., Milner-Gulland, E. J., Peres, C., Roberts, C. Robinson, J. G., Rowcliffe, M and Wilkie, D. 2003. Wildmeat: the bigger picture. *Trends in Ecology and Evolution*, 18: 351-357

Conner, R. N., 1998. Wildlife populations: minimally viable or ecologically functional? *Wildlife Society Bulletin*, 16: 80-84

Cullen, L. Jr., Bodmer R. E. and Padua, C. V., 2000. Effects of hunting in habitat fragments of the Atlantic forests. *Biological Conservation*, 95: 49-56

Dayton, P. K., Tegner, M. J., Edwards, P. B. and Riser, K. L., 1998. Sliding baselines, ghosts, and reduced expectations in kelp forest communities. *Ecological Applications*, 8: 309-322

Estes, J. A., Duggins, D. O. and Rathbun, G. B., 1998. The ecology of extinctions in kelp forest communities. *Conservation Biology*, 3: 251-264

FSI., 2005. *The State of Forest 2003*. Uttranchal: Forest Survey of India, DehraDun, Uttranchal, India.

Hilaluddin, Kaul, R. and Ghose, D. 2005a. Conservation implications of wild animal biomass extractions in Northeast India. *Animal and Biodiversity Conservation*, 28:169-179

Hilaluddin, Kaul, R. and Ghose, D. 2005b. Galliformes extraction and use by indigenous people of Northeast India. In: proceedings of 3rd International Galliformes Symposium (R. A. Fuller and S. Browne eds.). WPA-International, U.K., pp. 72-76

Hilaluddin, Kaul, R. Pradhan, S. and Taylor, J. 2005c. Conservation significance of wild meat exploitation in the north Bengal Himalaya, India. *Making Conservation Work: Attempting Solutions to Biodiversity Loss in India*, pp. 2

Hilaluddin, Kaul, R. and Ghose, D. 2004. Extractions of galliformes by some tribes of Northeast India. Third International Galliformes Symposium 2004, pp. 61

Hilaluddin 2006. Ecological consequences of bushmeat hunting on wildlife of the western Indian Himalaya. U.K.: Oriental Bird Club and U.S.: Wildlife Conservation Society. Unpublished report.

Hilaluddin. 2005a. Illicit staple. *Down to Earth*, 13: 50-52

Hilaluddin. 2005b. Manipur: wild meat boom and wildlife bust. *Central Chronicle*, 17 January.

Hilaluddin. 2005c. Wildmeat boom and wildlife bust. *Kashmir Times*, 22 January.

IUCN., 2004. 2004 Red List of Threatened Species. IUCN, Gland, Switzerland.

Kaul R., Hilaluddin, Jandrotia, J.S. and McGowan, P.R.J. 2004. Hunting of large mammals and pheasants in the western Indian Himalaya. *Oryx*, 38:1-426-431

Kaul R., Hilaluddin and Jandrotia, J.S. 2003. Extraction of wild meat in the western Indian Himalaya: an assessment. U.K.: Oriental Bird Club. Unpublished report.

Kumar, R. and Shahabuddin, G., 2006. Effects of biomass structure, diversity and composition of forests in Sariska Tiger Reserve. *Environmental Conservation*, 32: 1- 12

McGowan, P. J. K., Duckworth, W., Xianji, W., Balen, S. W., Xiaojun, Y., Kahn, M, Yatim, H., Thanga, L., Setiawan, I. and Kaul, R. 1998. A review of the status of green peafowl *Pavo muticus* and recommendations for future action. *Bird Conservation International*, 8: 331-341

Nelleman, C and Newton, A. 2002. *The Great Apes: The Road Ahead*. Gland, Switzerland: UNEP.

Novaro, A. J., Fumes, M. C. and Walker, R. S., 2000. Ecological extinctions of native prey of a carnivore assemblage in Argentina Patagonia. *Biological Conservation*, 92: 25-34

Raman, T .R. S. and Sukumar, S., 2002. Responses of tropical rainforest birds to abandoned plantation edges and logged forests in the Western Ghats, India. *Animal Conservation*, 5: 201-216

Rao, M. and McGowan, P. J. K., 2002. Wildmeat use, food security, livelihoods, and conservation. *Conservation Biology*, 16: 580-583

Redford, K. H. and Feinsinger, P., 2001. The half-empty forests: sustainable use and ecology of interactions. In: *Conservation of Exploited Species*, 371-399 (J. D. Reynolds, G. M. Mace, K. H. Redford and J. G. Robinson Eds.). Cambridge University Press, Cambridge, U.K.

Skowno, A. I. and Bond, W. J., 2003. Bird community composition in an actively managed Savannah reserve: importance of vegetation structure and composition. *Biodiversity and Conservation*, 12: 2279-2294

Thiollay, J., 1999. Responses of an avian community to rain forest degradation. *Biodiversity and Conservation*, 8: 513-534


 Table 2 : Galliformes extraction rates and patterns (mean \pm S. E.) in the surveyed localities

Species		Number of birds hunted/ household/ annum								
Common name	Scientific name	Arunachal Pradesh	Himachal Pradesh	Mizoram	Nagaland	North Bengal	Sikkim	Uttarakhand		
Black Francolin	<i>Francolinus francolinus</i>	0	0	0	0	0	0	1.28 \pm 0.45		
Blood Pheasant	<i>Ithaginis cruentus</i>	0	0	0	0	1.67 \pm 0.06	0	0		
Blyth's Tragopan	<i>Tragopan blythii</i>	0.94 \pm 0.55	0	0	2.88 \pm 1.53	0	0	0		
Cheer Pheasant	<i>Catreus wallichi</i>	0	3.12 \pm 0.84	0	0	0	0	0.17 \pm 0.16		
Chinese francolin	<i>Francolinus pintadeanus</i>	0	0	0	0.06 \pm 0.02	0	0	0		
Chukar Partridge	<i>Alectoris chukar</i>	0	8.77 \pm 2.13	0	0	0	0	1.31 \pm 0.63		
Hill Partridge	<i>Arborophila torqueola</i>	11.03 \pm 3.5	0	0.59 \pm 0.52	14.9 \pm 3.89	4.23 \pm 0.08	0.73 \pm 0.02	0.19 \pm 0.1		
Quail sp.		0	0	0	0.2 \pm 0.1	0	0	0		
Grey-peacock Pheasant	<i>Polyplectron bicalcaratum</i>	0	0	0.19 \pm 0.13	0.39 \pm 0.36	0	0	0		
Himalayan Monal	<i>Lophophorus impejanus</i>	0	1.63 \pm 0.39	0	0	0	0.67 \pm 0.01	0		
Indian Peafowl	<i>Pavo cristatus</i>	0	0	0	0	0	0.18 \pm 0.01	0		
Kaleej Pheasant	<i>Lophura leucomelanos</i>	6.63 \pm 1.39	0	0.55 \pm 0.17	4.99 \pm 1.66	4.0 \pm 0.06	2.27 \pm 0.04	9.0 \pm 1.17		
Koklass Pheasant	<i>Pucrasia macrolopha</i>	0	7.96 \pm 1.94	0	0	0	0	0.55 \pm 0.23		
Red Jungle fowl	<i>Gallus gallus</i>	6.32 \pm 1.48	0	1.51 \pm 0.39	1.92 \pm 1.25	0	0.77 \pm 0.02	0		
Satyr Tragopan	<i>Tragopan styra</i>	0	0	0	0	1.86 \pm 0.06	0.94 \pm 0.03	0		
Snow Cock	<i>Tetraogallus himalayensis</i>	0	0.12 \pm 0.1	0	0	0	0	0		
Western Tragopan	<i>Tragopan melanocephalus</i>	0	1.02 \pm 0.21	0	0	0	0	0		

Source : Kaul et al. 2003 & 2004; Hiliuddin et al.2005b, 2005c & 2006



Table 3 : Galliformes distribution and their hunting patterns in the Surveyed States

Species	No. of surveyed states where species present	No. of surveyed states where species hunted (%)
Blood Pheasant	1	1 (100)
Blyth's Tragopan	2	2 (100)
Cheer Pheasant	2	2 (100)
Chukar Partridge	2	2 (100)
Grey-peacock Pheasant	2	2 (100)
Indian Peafowl	1	1 (100)
Koklass Pheasant	2	2 (100)
Satyr Tragopan	2	2 (100)
Western Tragopan	1	1 (100)
Common-hill Partridge	7	6 (85.71)
Kaleej Pheasant	7	6 (85.71)
Himalayan Monal	3	2 (66.67)
Red junglefowl	7	4 (57.14)
Black francolin	2	1 (50)
Snow Cock	2	1 (50)
Chinese francolin	2	1 (50)
Jungle bush quail	7	1 (14.2)

Table 4 : Contribution of Galliformes into wild meat offtakes (mean \pm S. E.) of households in the surveyed states

State	Extraction in kg/household/annum (in the sampled areas)		Percentage
	Wildmeat	Galliformes	
Arunachal Pradesh	409.09 \pm 57.37	20.38 \pm 4.13	4.98
Himachal Pradesh	267.75 \pm 48.18	22.67 \pm 2.86	8.46
Mizoram	277.7 \pm 71.84	4.83 \pm 2.25	1.74
Nagaland	651.7 \pm 178.11	23.38 \pm 9.64	3.59
North Bengal	211.36 \pm 76.59	6.57 \pm 1.54	3.1
Sikkim	131.67 \pm 24.57	3.79 \pm 0.75	2.87
Uttarakhand	216.17 \pm 19.48	11.32 \pm 1.99	5.23

Source : Kaul et al. 2004; Hilaluddin et al. 2005a, 2005b & 2006