26.0 Techniques for Monitoring Galliformes in India

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Introduction

Galliformes form an important component of the wildlife diversity in India and are well represented by Pheasants, Partridges, Quails, Francolins, Snowcocks and Megapode. They occur in a wide variety of habitats ranging from the hot and arid deserts of western India to the cold and wet high altitude forests in the Eastern Himalaya and northeast hills; and from the cold deserts in the north to the dry coastal plains in Peninsular India and the Islands. Many of the Galliformes are endangered or threatened due to poaching for meat/feathers, habitat degradation and habitat loss due to changing land use practices. They form a significant prey base for a variety of predators that includes large and small mammalian carnivores, raptors, and reptiles. They are good indicators of habitat quality as they depend substantially on ground layer vegetation for food and cover requirements, and water. The pheasants of India have been an integral part of humans for centuries as they are well recognized for their aesthetic, socio-cultural and religious values.

Long-term conservation of these galliformes, pheasants in particular, is of high priority for many states. In order to conserve and manage any wildlife species, basic information on its distribution, population, habitat use and behaviour are crucial.

Estimating distribution, abundance and monitoring of galliformes in India has been a difficult task due to the following reasons: (i) some of the galliformes inhabit dense, rugged and remote high altitude regions or dense forests with thick undergrowth; (ii) most of the galliformes are shy and cannot be observed easily due to their skulking or flushing behaviour (iii) All of them have specific habitat preferences that vary seasonally; and (iv) some of them occur in very low densities in nature.

Nevertheless, monitoring of galliformes is extremely crucial and to begin with information on presence / absence needs to be collected. After establishment of this information, relative abundance and monitoring of galliformes could be carried out. As galliformes are widely distributed throughout the country we require simple techniques for monitoring galliformes that could be used by field staff of forest and wildlife departments, amateur bird watchers, and other civil society members.

For estimating distribution, abundance and monitoring of galliformes in India, the following methods are proposed.

Presence/ Absence Mapping

Information on the presence/absence of a galliforme species could be recorded for a sampling unit of a given area Rodgers (1991). The forest and wildlife staff could record presence/absence of the different galliformes at the compartment or beat levels in a Forest Range of a Reserved Forest or Protected Area (PA). In case of non availability of compartment based maps, the area could be divided into grids or into small units based on natural features and information on presence/absence recorded. Similarly, for areas that are outside the PA network or Forest Divisions, one could record presence/absence of galliforme species at village, panchayat, gramsabha, blocks, taluks and district levels. Information on the presence/absence of Galliformes in defense land areas, institutional campuses and other private lands areas could be gathered by dividing such areas into small sampling units or grids. Details such as the name and exact location of the sites/localities where presence/absence of pheasants is being recorded should be maintained. The GPS location, altitude range and general forest or habitat types should also be recorded.

Confirmation of the presence of a galliformes species could be based on direct sightings or evidences such as feathers or calls and reliable secondary information based on

published information, departmental records and interviews with local people. The status of each species in each compartment or grid has to be assessed and recorded. Qualitative assessment could be: absent, very rare, rare, common, fairly common, abundant, but one should define the categories. For example, rare = 1 or 2 individuals seen occasionally; common = 5 or 6 individuals seen in 1 or 2 days of field work; abundant = over 10 individuals seen in one day's field work. It would be important to give information on the extent of the area surveyed. The assessment of the status could be based on field surveys or through reliable secondary information (from local villagers).

Encounter Rates

Encounter Rate (ER) is a simple index for abundance estimation and is expressed as number seen per unit effort. The unit effort could be time spent in intensively searching for animals in an area or it could be the distance traveled in an area intensively searching for animals. Number seen could be based on direct evidences (sightings) or indirect evidences such as calls, droppings and other signs such as digging signs for feeding. Gaston *et al.* (1981), Gaston & Garson (1992); Bibby *et al.* (1992), Sathyakumar *et al*. (1993), Ramesh *et al*. (1999), Ramesh (2003) Sathyakumar (2004, 2006), and Bhattacharya *et al.* (2007) have used ER for monitoring galliformes.

One could survey an area for galliformes by walking along existing roads, paths, trails, ridges, *nullahs* or along a predetermined bearing using a compass or GPS. Driving along roads is another way for surveying for galliformes in an area. If the distance traveled is measured, then one could use that as effort (ER = number seen/km walked). In cases when distance traveled is not known, one could use the time spent in searching that area as effort (ER = number seen/time spent). For example, if a person walked 2 km and sighted 4 Grey Francolin, then ER = 4/2, *i.e.,* 2 Grey Francolins/km walk. Similarly, if a person spent 2 hours in a forest area intensively searching for pheasants and sighted 1 Tragopan, then ER – 0.5 tragopan/hour search. Indirect evidences such as calls and droppings could also be used, but one should be very careful in identification of calls of different species and calls of different individuals of the same species. Similarly, care should be taken to identify dropping or other signs of a species. For example, 2 Black Francolin calls heard/km walk; 4 peafowl droppings/km walk.

Encounter Rates are good for monitoring the abundance of galliformes in an area, if done regularly (monthly/ seasonally/ annually). Comparison of ER of a species in two similar habitats located in different areas could be made. Adequate number of walks per month or season is necessary for calculating mean ER and standard errors. This technique is applicable for most of the galliformes.

Line Transects

Line transect (Burnham *et al.* 1980) is a simple, easy to execute method that can help in obtaining density estimate for galliformes in area. In this method, one walks along a straight line and counts animals on both sides of the line. Line transect could be permanently marked and vegetation trimmed for the observer to walk easily and carefully look for animals. In case of temporary transects, the observer walks in a straight line using a compass on a predetermined bearing. At least 2 or 3 transects of length ranging between 1 and 3 km to be laid each habitat/area and walked at least 2 or 3 times in a month during the early morning hours. For every sighting, species, number, age and sex (if possible), sighting angle and sighting distance are measured. This information will be useful in calculating the ER and Density of pheasants in an area. This technique is best suited for pheasants such as monal, Kalij, Red Junglefowl, Grey Junglefowl and the Indian Peafowl Sathyakumar *et al.* (1993), Sathyakumar (2004, 2006). Software such as Distance (Laake *et al.* 1993) could be used to analyse line transect data for obtaining ER and density estimates.

Call Counts

The abundance of some pheasants that have gregarious calling behaviour during breeding season could be estimated by using Call Count Technique (Gaston 1980, Rodgers, 1988, Kaul 1989, Ramesh *et al.* 1999; Ramesh 2003). During breeding season (April-May), males call during early morning hours (predawn period) to attract females and also to challenge rival males in the vicinity. In this method, one or two observers placed at least 500m apart along a line in a pheasant habitat count calls during predawn. This is an index of the number of calling males in an area and the call count is expressed as number of calling males / station. In ideal situation, every calling male would have a female. But in some cases, a calling male may not have a female or a calling male may have a female with juveniles also. No call heard in an area does not necessarily mean that there are no birds in that area One can playback a call in an area to get response from individuals in that area. Call count method is good for monitoring populations of calling males in an area over years. Additional information on the group sizes during the breeding seasons will help in understanding the population size in an area. This method is best suited for Tragopans, Koklass and Cheer.

Sample Data sheets for Monitoring of Pheasants are placed as Appendix I, II & III.

References

Bhattacharya, T., Sathyakumar, S., Rawat, G.S. 2007. Studies on Animal-Habitat Interactions in the Buffer Zone of Nanda Devi Biosphere Reserve. A Report to the Ministry of Environment & Forests. Wildlife Institute of India, Dehradun. 103pp.

Bibby, C.J., Burgess, N.D., & Hill, D.A. 1992 *Bird Census techniques*. Academic Press Limited. London. 114pp.

Burnham, K.P., Anderson D R and Laake J L I980 Estimation of density from line transect sampling of biological populations; Wildl. Monogr. 72 1-202

Gaston, A. J., Garson, P. J. and Hunter, M. L. 1981. The Wildlife of Himachal Pradesh, Western Himalaya, University of Maine. School of Forest Resources. Technical Report No. 82.

Gaston, A. J., and Garson, P. J. 1992. A re- appraisal of the Great Himalayan National Park. A report to the Himachal Pradesh. Dept of Forest Farming and Conservation, WWF- India. 80 pp.

Kaul R. 1989. Ecology of the Cheer pheasant *Catreus wallichii* in Kumaon Himalaya. Unpublished Ph.D. thesis. University of Kashmir, Srinagar

Laake, J.L., Buckland, S.T., Anderson, D.R. and Burnham, K.P. (1993). *DISTANCE user's guide, Version 2.0*. Colorado Cooperative Fish and Wildlife Research Unit, Colorado State University, Fort Collins, Colorado, USA.

Ramesh, K., S.Sathyakumar & G.S.Rawat. 1999. Ecology and Conservation status of Pheasants of the Great Himalayan National Park, Western Himalaya. *Forestry Research Education and Extension Project – Great Himalayan National Park (FREE-GHNP), Final Project Report, Wildlife Institute of India, Dehradun*. Vol. 1 to 6.

Ramesh K., (2003) An Ecological study on pheasants of the Great Himalayan National park, Western Himalaya, Ph.D. thesis. Forest Research Institute, Deemed University, Dehradun

Rodgers, W.A. 1991. Techniques for Wildlife Census in India: A field manual. Wildlife Institute of India, Dehradun

Sathyakumar.S, Prasad S. N., Rawat G.S., Johnsingh A.J.T (1993b). Ecology of Kalij and Monal Pheasants in Kedarnath Wildlife Sanctuary, Western Himalaya. *Pheasants in Asia1992*.-World Pheasant Association International. p83.

Sathyakumar S. 2004. Conservation status of Mammals and Birds in Nanda Devi National Park: An assessment of changes over two decades (IN) *Biodiversity Monitoring Expedition Nanda Devi 2003*.Pp. 1-14.

Sathyakumar, S. 2006. Habitat use by Grey Junglefowl *Gallus sonneratii* Temminck at Mundanthurai Plateau, Tamil Nadu. J. Bombay Nat. Hist. Soc. 103(1), Jan-Apr 2006: 57-61.

Appendix - I

MONITORING OF PHEASANTS

Data Sheet No. 1: Presence/absence survey

Year: ----------

Month: ----------

Date: ----------

Name(s) of observer/recorder: ----------

Name of Forest Division/Protected Area: ----------

Name of Range: ----------

Name of Beat: ----------

Area of Beat: ----------

Compartment No. or Area Name	Presence /Absence of Galliformes Species							Remarks
	Indian Peafowl	Red Junglefowl	Kalij Pheasant	Koklass Pheasant	Himalayan Monal	Western Tragopan	Cheer Pheasant	

- *Write '1' if the bird was SIGHTED or CALLS HEARD (with certainty) or if found any other evidences (e.g. feathers) during the survey. It is to provide personal confirmation of bird presence in the beat/compartment during the survey period. Indicate in the Remarks column if the confirmation is based on only calls or other evidences.*
- *Write '0' if there was NO sighting or call or any other sign of bird occurrence during the survey. It is to provide personal confirmation of bird absence in the beat/compartment during the survey.*
- *In the absence of any sign during the survey, but, if the observer believed the presence of any pheasants from his/her personal experience (sighted or heard recently during regular visit to the area) or by reliable information passed on to him/her by his colleagues or local people, write 'ID'. Indicate in the Remarks column the approximate time (e.g. within 3 months or before) when the bird was last sighted or heard by him/her or colleagues or local people.*

MONITORING OF PHEASANTS

Data Sheet No. 2: Abundance index by Encounter Rates

Year: ----------

Month: ----------

Date: ----------

Name(s) of observer/recorder: ----------

Name of Forest Division/Protected Area: ----------

Name of Range: ----------

Name of Beat: ----------

Area of Beat: ----------

Name of Survey Trail/Route: ——————————

Approximate distance (km):——————————

Name of Start Point: ——————————

Name of End Point: ——————————

Start Time: ——————————

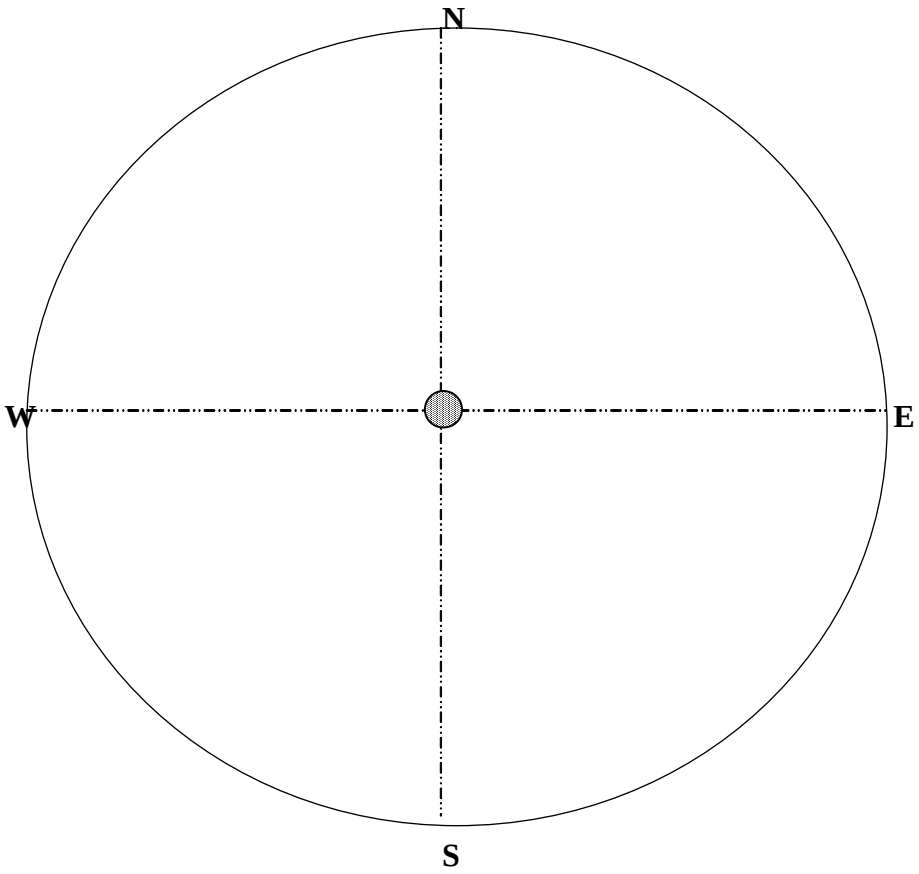
End Time: ——————————

S. No.	Time	Species	Direct record					Indirect record		Remarks
1			Total	Male	Female	Chicks	Unknown	Call	Feather	
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										

Appendix – III

Data Sheet No. 3: CALL COUNTS FOR PHEASANTS

Year: ----------	Name of Forest Division/ Protected Area: ---------
Month: ----------	Name of Range: ----------
Date: ----------	Name of Beat: ---------- Area of Beat: ----------
Name(s) of observer/ recorder: ----------	Name of call count point: ----------
	Start time: ---------- End Time: ----------



Observer *Approx.*