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Research Paper

SEASONAL VARIATION IN POPULATION AND GROUP SIZE OF WHITE CRESTED KALEEJ PHEASANT *Lophura leucomelanos hamiltoni* IN MANDAL VALLEY, GARHWAL HIMALAYA, INDIA

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Abstract

The present study deals with population dynamics of Kaleej pheasant in Garhwal Himalaya, India during January 2014 to December 2014. A total of 902 individuals of kaleej in 228 groups were recorded. Average group size, largest group and sex ratio across the seasons were recorded 8.75±2.84, 9.55±0.40 and 2.18:1 respectively. Significant variation was also observed in population and group size. Maximum values of group size and largest group were recorded during the monsoon and post monsoon season while minimum for same were recorded during summer and spring season.

Key words: Population, Group Size, Sex Ratio, Kaleej Pheasant, Garhwal Himalaya.

INTRODUCTION

An understanding of population dynamics is essential when considering the conservation and management of wildlife species. Long term monitoring programmes can provide information on the status and change in population size and factors responsible for these changes. White Crested Kaleej *Lophura leucomelanos hamiltoni* is one of the most widely distributed and common Himalayan race, found from Indus River of Pakistan in the Western Himalayas, east ward through northern India to Nepal (Ali and Ripley 1980, Delacour 1977, Dewar 1979, Gaston *et al.* 1981,). It inhabits all types of habitats from 300-3600m altitude with dense under growth and thickly over grown steep gullies, usually not far from water source and human settlements and move to lower altitudes during winters (Hume and Marshal 1879, Ali and Ripley 1983, and Bohl 1971). In India, Kaleej is distributed in the north western, western central and eastern Himalaya viz., Jammu and Kashmir, Himanchal Pardesh , Uttarakhand, Sikkim, Arunachal Pradesh and North West Bengal and in the hills of northeast India viz., Assam , Meghalaya, Manipur, Mizoram Nagaland and Tripura (Satayakumar and Kaul 2007). In Garhwal Himalaya (which is a part of Western Himalaya) Kaleej is commonly Known as “Kala Murgi or Kukera” in the local Garhwali dialect .British Naturalist Hume and Marshal (1879) also reported the distribution of Kaleej in Garhwal and Kumaun Himalaya. In the last few years’ cumulative effect of stated factors, decline in Kaleej population has recorded in hill of Garhwal region by Bisht *et al*. (2005) and Bisht and Dobryal (2002). The present study has been carried out to document seasonal variation in population and group size for one year in Mandal valley, Garhwal Himalaya.

STUDY AREA AND METHODOLOGY

Intensive study was carried out on residential populations of Kaleej in wild for one year (January2014 to December 2014) at Mandal Valley, District chamoli, Garhwal Himalaya. The study area lies between 1660-1950m altitude on North-East facing slope. The study site comprised of Himalayan mixed temperate forests of *Quercus sp. Rhododendron sp. Myrica sp. Cedrus deodara*, *Berberis, Rhush, Rosa, Rubus sps.* The climate is temperate and humid. The maximum and minimum temperature varies from 12.8 Cº to 22.3 Cº and 6.4 Cº to 18.5 Cº respectively from January to June and July to December. Fixed trails, laid by villagers for daily fodder and fuel collection, and line transect (Javed and Kaul 2002) method were used for the study. Every month, study site was visited for 7-15 days and trails walked silently in morning and evening. Average 4-5 hours at dawn and dusk were spent every day and records maintained on number of Kaleej sighted, groups, male and female ratio etc. The study area was scanned thoroughly to ascertain good estimate of individuals per unit area. The data were expressed as Group size, largest group and sex ratio (mean ± s. e.). The fluctuation in population and other parameters were tested using standard statistical methods ('t' test and One-way ANOVA) (Snedecor and Cochran 1968).

RESULTS

Kaleej is a social bird live in group during non breeding period and some time two or more than two groups (Up to 14 Individuals) constitute a large group depending upon availability of food. Total 228 groups were observed across different seasons. Overall average group size was recorded as 4.82±1.16. Remarkable fluctuations in mean group size were observed during June (1.16±1.65) to October (8.75±2.84). Decline in average group size ranged from February (3.92±0.52) to June (1.65±1.16) and thereafter increase in group size was noticed ($P<0.001$, October vs. June). Significant difference in mean group size across seasons winter, spring, summer, and winter 5.40±1.15, 3.35±0.63, 2.97±0.76 and 7.58±2.04 respectively, were recorded Both monthly and seasonal records of largest and smallest group size ranged from 1.40±0.16 in June to 9.55±0.40 in November ($P=9.40$, NS, November vs. June) while smallest group size ranged from 1.23±0.16 in May to 6.55±0.91 in October. The largest group size 9.55±0.40 was recorded in November while smallest group size comprising 1.23±0.16 individuals was observed in May.

Sex-ratio determines the breeding pairs which ultimately influence population distribution in a particular habitat. Both monthly and seasonal variations in sex-ratio were recorded. Minimum sex-ratio (1:1) was noticed in June and maximum in March 2.18:1.

Table 1. **Records of group size and sex ratio of White crested Kaleej *Lophura leucomelanos hamiltoni* at Mandal valley, Garhwal Himalaya.**

Months	Total individuals	Total groups	Group Size mean ± s. e			Sex ratio (M:F)
			Av. group size	Largest group size	Smallest group size	
January '14'	76	19	4.00 ± 0.71	4.33 ± 0.37	3.00	1.44:1
February	86	27	3.92 ± 0.52	4.11 ± 0.11	2.44	1.51:1
March	38	12	4.25 ± 1.08	4.75 ± 0.70	3.50	2.18:1
April	32	17	1.88 ± 0.30	2.00 ± 0.21	1.71	1.28:1
May	56	25	1.84 ± 0.21	1.84 ± 0.19	1.23	1.19:1
June	21	12	1.65 ±	1.40 ±	1.40	1:1

			1.16	0.16		
July	86	20	5.90 ± 0.41	6.08 ± 0.74	3.83	1.8:1
August	101	18	6.72 ± 1.69	7.75 ± 0.41	3.87	1.81:1
September	113	21	7.28 ± 1.73	7.77 ± 0.36	4.40	1:1.04
October	111	16	8.75 ± 2.84	8.90 ± 0.40	6.55	1.23:1
November	93	19	6.31 ± 1.50	9.55 ± 0.40	4.22	1.12:1
December	89	22	5.90 ± 1.25	7.11 ± 0.26	3.66	1.20:1
Total/Average	**902**	**228**	**4.82±1.16**	**5.47±0.36**	**3.32**	**1.40:1**

Table 2. **Seasonal group size and sex ratio of White crested Kaleej *Lophura leucomelanos hamiltoni* at Mandal valley, Garhwal Himalaya.**

Seasons	**Total individuals**	**Total groups**	**Av. group size**	**Largest group size**	**Smallest group size**	**Sex ratio (M:F)**
Winter (Nov. to Jan.)	258	60	5.40±1.15	6.70±0.34	3.63	1.25:1
Spring (Feb. to Apr.)	156	56	3.35±0.63	3.62±0.34	2.55	1.66:1
Summer (May to July)	163	57	2.97±0.76	3.11±0.36	2.15	1.33:1
Monsoon and post monsoon (Aug. to Oct.)	325	55	7.58±2.08	8.14±0.39	4.94	1.35:1.01

DISSCUSSION

Present findings revealed that kaleej pheasant is common birds in mandal valley of Garhwal Himalaya. The monthly records on population and group size reveled a seasonal pattern in kaleej pheasant presence (Table 2). During January 2014 to December 2014, a total 902 individuals were sighted in 228 groups. Seasonal variations in population and group size are related to biological and environmental factors. Less number of birds in the population and group as recorded from February to May (Spring and Summer seasons) could be due to the reproductive behaviour and breeding season. During the breeding period, when pairs are formed and territories are marked, birds disperse. After egg laying, females incubate eggs into nest. As a result, kaleej are reduced during three months. During post monsoon and winter season (September to December), high number of individuals and relatively larger group size were recorded due to merging of small coveys with newly hatched juveniles as reported in other game birds (Shah et al., 2002; Kaul, 1990). With the arrival of monsoon, availability of food supply increase and become abundant in the form of seed, grains, insects etc. which attracts individuals and forms large flocks.

Records on the distance covered by Kaleej pheasant revealed that this population does not show seasonal movements in the habitats studied in contrary as reported earlier (Hume and Marshall, 1879; Ali and Ripley, 1983) that kaleej descends to low altitude during the winter . In our study

area, birds were never observed descending beyond a range of 200m. Availability of a protection cover as the grass could ensures the birds uses the larger area during monsoon period and post monsoon period while during spring and summer a necessity of drinking water source, these birds reduces their home range and remain close to water.

CONCLUSIONS

The present study area represents one of the highly bird species rich region in Garhwal Himalaya but under population expansion pressure and habitat degradation continually going on. The study suggested that Garhwal Himalaya need special conservation strategies that are still lacking which otherwise would further endanger important species. In spite of this study, no current report is available on community structure of bird fauna of temperate habitats. Our knowledge about bird fauna of this habitat is little till date. Present investigation is an attempt which could serve as a benchmark for management point of view and further habitat level research investigation.

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