

## Population Dynamics of Cheer Pheasant (*Catreus wallichii*) in Jhelum Valley, Muzaffarabad, Azad Kashmir, Pakistan

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**Abstract:** A sum of 28 surveys were conducted from June 2002 to June 2003 in three main zones (Pir Chinasi, Lowasi-Ghari Dopatta and Chinari-Qazinag) of Jhelum valley Muzaffarabad to collect data on distribution and population status of Cheer Pheasant (*Catreus wallichii*). The three main zones were divided into 8 main localities, each main locality was further divided into sub-localities or calling sites of Cheer Pheasant. A cumulative total of 194 adults in 2002 and 126 in 2003 were estimated in two breeding seasons. The density indices show one calling site in Low Gali (0.05 km<sup>2</sup>), three in Kavashan (0.75 km<sup>2</sup>), four in Pir Chinasi (1.33 km<sup>2</sup>), four in Garang (1.6 km<sup>2</sup>), four in Cheetah, seven in Sangar Bari (1.75 km<sup>2</sup>), three in Shinger (1.5 km<sup>2</sup>) and two in Khatir Nar (0.80 km<sup>2</sup>). During present study the no. of calling sites and density indices at various areas showed that maximum value of density index i.e. 1.75 km<sup>-2</sup> recorded at Sangar Bari and minimum value of 0.50 km<sup>-2</sup> at Low Gali. By documenting the direct and indirect evidences i.e. Call Counts, fresh ground clutching, feathers, foot prints, shepherds (n=10), locals (n=8), hunters (n=5) and wildlife staff (n=5) the total adult population in these two localities is 36 and 8 birds, respectively. T-test shows that there is no significant difference (0.71790) between the means of adults Cheer population estimated in 2002 and 2003 breeding season. The major threats to the cheer pheasant population were determined to be hunting and habitat degradation due to human related activities.

**Key words:** Population, Cheer Pheasant, Jhelum Valley, Azad Kashmir, Pakistan

### INTRODUCTION

The Cheer Pheasant is distributed through the southern foothills of the Himalayas from Pakistan to Nepal, occurring in northern Pakistan, Azad Jammu and Kashmir, two states of India (Himachal Pradesh and Uttar Pradesh) and Nepal. An early account by Hume and Marshall<sup>[1]</sup> suggested that it was already locally distributed in the mid-nineteenth century. This appraisal is probably truer today, its range being very patchy as a result of specialised habitat requirements and an increase of threats throughout its range<sup>[2]</sup>.

The species is found sparingly at the fringes of Azad Jammu and Kashmir at Kazinag<sup>[3,4]</sup>, Kishtwar and the hills of the Jhelum valley, but not in "Kashmir valley"<sup>[5,6]</sup>. It also occurs at numerous sites in Himachal Pradesh<sup>[2]</sup> and Uttar Pradesh<sup>[7]</sup>.

Judging by earlier records<sup>[8,9]</sup> the species was always difficult to find in Pakistan. The fact that it was

nevertheless locally common is revealed by the 20 individuals flushed above Salkhala in December 1977<sup>[10]</sup> although no further sightings have been reported in this area and the species is possibly extinct there. It is scarce in the Neelum valley<sup>[11]</sup> indeed, possibly "at the brink of extinction"<sup>[12]</sup>. This does not appear to be the case given the lack of sightings during intensive fieldwork at the site in the 1990s<sup>[13]</sup>. Elsewhere, Burt<sup>[14]</sup> confirmed the presence of a small population (no more than 6-7) in the Pir Chinasi area of Jhelum valley and Islam and Crawford<sup>[15]</sup> encountered a small population in the Machiara area (Machiara National Park), alongside the Western Tragopan. Most significantly, Qayum<sup>[16]</sup> reported a population of about 150 birds in Muzaffarabad district, a population apparently still present in 1992. The general impression is that the Cheer Pheasant survives in very small numbers at very few scattered sites in Pakistan and is probably in imminent danger of extinction given high hunting levels and low success of re-introduction

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programmes. Some parts of Kohistan and the Neelum valley, however, have not yet been thoroughly surveyed and future fieldwork may disclose further populations.

The species is on the western limit of its range in Pakistan, occurring in mountains of eastern North-West Frontier Province and Azad Jammu and Kashmir.

Kamil Gali, west of Shahran, above the Nadi valley, one seen at 1,500 m, 1979<sup>[11]</sup>; around Kuwai, lower Kaghan valley, Hazara district, previously regular but extinct since 1970s 1979<sup>[11]</sup> and in the same district around Bansra Gali (untraced), reliably reported in the late 1960s<sup>[11]</sup>; near Garhi Habibullah, Pir Chela hills, late 1960s<sup>[11]</sup>.

In Muree hills, feathers found in 1833<sup>[17]</sup> with several later found near Dunga Gali, 2,400 m, July 1906<sup>[18]</sup> and present in the area until 1960s, particularly in lower ranges around Tret<sup>[19,11]</sup> Margalla hills (Margalla Hills National Park), immediately north of Islamabad, near Barakhao<sup>[19]</sup> with five seen above the Dhok Jiwan basin, November 1976<sup>[20,21]</sup> the park being the site of subsequent re-introductions.

On the Qazinag range<sup>[3]</sup> and on the outermost flanks of this range at Salkhala Wildlife Sanctuary, 1,850-2,300 m, 20 flushed, December 1977<sup>[22,10]</sup> Machiara National Park, 2,450 m, August 1977<sup>[22]</sup> and in the upper Machiara valley, west banks of the Neelum (Kishenganga) river, one, January 1983<sup>[11]</sup> Trakama pass, undated<sup>[11]</sup> Salampura, in the Neelum valley, Pir Chinasi, 1,400-3,500 m, a small population (possibly 6-7 birds), September 1986<sup>[23]</sup> and specifically at Keran and Chenari<sup>[4]</sup>.

The altitudinal range occupied by this species is generally 1200-3050 m and most commonly in a narrower band between 1,850 and 2,750 m<sup>[3]</sup>. It has apparently occurred down to 600 m in Pakistan<sup>[11]</sup> and up to 3,500 m<sup>[2]</sup> or even 4,550 m in Uttar Pradesh<sup>[24]</sup>. In Nepal, it has been encountered between 1,800 m and 3,150 m<sup>[25]</sup>. Its lowest descent tends to occur during periods of extremely cold weather<sup>[3]</sup> although there is less seasonal altitudinal movement than in most other montane galliforms<sup>[26,25]</sup>.

The species generally frequents outer hill ranges of the Himalayas, typically avoiding dense forest and favouring very precipitous terrain with scrub, tall grass and stunted trees, particularly where interspersed with rocky crags<sup>[7,11,26-29]</sup>. It is thus often found on steep rugged hillsides covered with long grass, *Berberis* scrub and oak forest, or in wooded ravines and hollows where it generally stays well hidden amongst undergrowth<sup>[26]</sup> with its favored locales described as "grassy hill-sides, with or without brushwood, or patches of the dwarf bamboo<sup>[30]</sup> "grassy hills, scattered oak forests, sites of deserted villages and long grass in precipices"<sup>[31]</sup> and steep hillsides with "a thick crop of spear-grass and studded with *Berberis* bushes"<sup>[32]</sup>.

## MATERIALS AND METHODS

A sum of 28 surveys were conducted from June 2002 to June 2003 in three main zones of Jhelum valley Muzaffarabad to collect the data on distribution and population status of Cheer Pheasant (*Catreus wallichii*). Surveys were carried out from dawn to dusk. The three zones were divided into 13 main localities, each of which were further divided into sub-localities or calling sites of Cheer Pheasant. With the assistance of local hunters, shepherds and wildlife staff, every effort was made to study Call Count Census<sup>[33]</sup> to locate Cheer Pheasant in the habitat. Direct counting of Cheer Pheasant was difficult but population estimation was possible by counting the calls, collection of fresh pellets, indirect evidences from local hunters, shepherds, flushing with the help of dogs and analyzing fresh feeding grounds through clutching. Evidences such as presence of pellets, feathers and foot prints were noted and photographed.

Cheer Pheasant calling is sporadic and irregular<sup>[34]</sup> but in case of pheasants the call count method is the only reliable source for estimation of population. About 6 diurnal hours were spent daily in each potential habitat of Cheer Pheasant during the survey. The Call Count Census included 6 members. They were stationed at fix sites at twilight and observations were taken for one to two hours at early dawn. On return to camp, results were pooled and total numbers of calls heard were noted. For dawn call counts, fix transects were observed for 44 minutes before and 60 minutes after sunrise. The directions of calls were noted with the help of compass. Calling at dusk were not included in results as for being less likely to be reliable time of observations<sup>[35]</sup>.

For density indices estimation, each calling site was treated as an individual data point. At each site height, aspect, slope, number of villages within one to two kilometer, their total population, livestock, presence of water body, cliff/ravine and cultivation within 600m were all noted. Land use practices with respect to cutting, burning within one year and grazing were also recorded.

Correlation co-efficient between estimated Cheer Pheasant Populations and various variables of habitats were carried out. The t-test for comparison of independent means of two variables that is between total estimated adult population in 2002 and 2003 were carried out.

**Study area:** The study area comprises of three main zones lying on the left side of the River Jhelum i.e. Pir Chinasi, Low Gali Gari Dopatta and Qazinag Chinari Ranges in the foothills of Pir Panjal mountains of Lesser Himalayas.

Pir Chinasi (33° 55' N 73° 38' E) lies about 32km from Muzaffarabad city at an elevation of 2700 m. A fair

metalled road leads to the study area. Saran (2430 m-2480 m) is the main habitat of the Cheer Pheasant in Pir Chinasi, having Hari Wala Par, Batangi Wala Par as sub-localities. The area is Himalayan sub-tropical pine forest with extensive east and north facing grassy steep slopes having scattered blue pine (*Pinus wallichiana*) trees. In Saran, shrub species are *plactranthus rugosus* and *Indigofera heterantha*. The ground cover includes *Fragaria indica*, *Elsholtzia ciliata*, *Eriophorum sp.* and *Themeda anathera*. In general, habitat supports extensive patches of tall grass at different places and irregularly subjected to grazing, cutting and burning. Summer residences of villagers of Gun Chatter are around Hari Wala and Batangi Wala Par. Grazing pressure in these three sub-sites is very extensive.

Low Gali is main locality in Gari Dopatta Range, 15 km from the historical famous town of Gari Dopatta. From Gari Dopatta, a fair metalled road leads to Awan Patti village. The potential habitat of Cheer lies in Low Gali, 3k m from Awan Patti Bala, at an altitude of 1930 to 2120 m. The study area is divided into two sub localities, i.e. Low Gali 1 and Belay Wala Par. Cheer habitat is characterizing by the presence of *Pinus roxburgii*, *Pinus wallichiana* and long grasses at slopes and shrub cover including *Plactranthus rugosus*, *Debregessia salicifolia*, *Indigofera heterantha* and *Berberis lycium*. The ground cover includes *Eriophorum spp.*, *Oenothera rosea*, *Onychium japonicum* and *Themeda anathera*.

Qazinag (35° 09' N 73° 58' E) Chinari Range lies 20k m from famous town of Chinari, located on the way to Srinagar, occupying foot hills of Pir Punjal Range. The study area is divided into seven main localities i.e., Kavshan (above village Bandi Bala), Garang (above village Nardajian), Shingar (above village Tararan), Cheetah (Left of village Jabra), Sangar Bari (below Singh Top) and Khatir Nar (left of Pandu).

Kavshan is main locality (Forest Compartment No.2) having two sub-localities i.e. Sokar Behk and Larguchi Behk (below Nanga Tuc) at the elevation range of 2450-2500 m. The potential habitat used by Cheer found at the left of Larguchi Behk (above village Kavshan) at 2500 m elevation, characterized by Himalayan sub-tropical pine forest. The habitat is steep grassy with patchy distribution of *Pinus wallichiana*. The shrub cover includes, *plactranthus rugosus*, while herbs include *Cyanoglossum lanceolatum*, *Saccharum rufipilum*, *Fragaria indica*, *Themeda anathera* and *Polystichum yunannense*. Other potential sub-locality in Kavshan is Sokar Behk (Co.1), located north east of Larguchi Behk at 2600 m elevation, having relatively thick tree cover of *Pinus wallichiana*. The area is steep with patchy distribution of long grass cover. There is an extensive

pressure of hunting, grazing, cutting and burning from the local community.

The second main locality is Garang (Co.2), located at 2 km from Nardajian village. The potential habitat of Cheer in this locality are Garang 1 (Tatta Pani) and Garang 2 (above village Gail) at 2220 m-2300 m elevation. Both sub-sites are open rocky, steep and very difficult to access dominated by *Plactranthus rugosus* shrub and patchy grasses.

Shinger is third main locality in Forest Compartment number 4, located 1 km from village Tararan parallel to Leepa Valley. Cheer habitat is characterized with open steep grassy area and scattered distribution of *Abies pindrow*. The shrub cover includes *Indigofera heterantha*, *Plactranthus rugosus*, *Berberis lycium*, *Viburnum nervosum* and *Clematis grata*. The ground cover includes *Eriophorum sp.*, *Saccharum rufipilum* and *Polystichum yunannense*.

Cheetah (Co.6), is located in front of Garang below village Loon Ban at an altitude of 2000-2120 m. The fragmented population of Cheer is present in two sub-localities in this area i.e., Cheetah-1 (below Loon Ban) and Cheetah-2 (above village Jabra) up to base of Sing Top. The area is characterized by open rocky, very steep similar to Garang with patchy distribution of grasses and rare tree cover. Shrub cover is more apparently dominant over tree and ground cover. The representative shrubs are *Salix tetrasperma*, *Indigofera heterantha* and *Plactranthus rugosus*.

The Sangar Bari (Co.7), is another potential habitat of Cheer Pheasant having sub-localities Batal Ka Daman (above village Loon Ban), Nar ka Daman (on left of Sang Bari behk) and Ratta Par (below Sing Top). The height ranges from 2650 m to 2500 m approximately. Grazing and cutting are most common activities in these sub-sites during summer season. Batal ka Daman is open grassy steep area with scattered *Pinus wallichiana*. *Plactranthus rugosus* and *Indigofera heterantha* are common shrubs while ground cover includes *Eriophorum sp.*, *Saccharum rufipilum*, *Themeda anathera*, *Poa angustifolia* and *Euphorbia cognata*. Nar Ka Daman is a relatively densely covered with *Pinus wallichiana*. The under story include *Plactranthus rugosus*, *Viburnum nervosum* and *Indigofera heterantha*. Ground cover includes *Saccharum rufipilum*, *Polystichum yunannense*, *Themeda anathera*, *Thymus serpyllum* and *Fragaria indica*.

Khatir Nar (Co.23, Co.24), another potential habitat of Cheer pheasant in Qazinag Range. There are two major sub-sites of Cheer in this locality i.e., Khatir Nar 1 (Co.22) at 2300 m elevation and Khatir Nar-2 (Co.23) at 2000 m above sea level. The sloppy ridge separates these two

sub-sites from each other. The Khatir Nar 1 (Thub) has open sloppy, precipitous, moist temperate forest with *Cedrus deodara*. Under story includes *Plactranthus rugosus* and *Indigofera heterantha*. Khatir Nar 1 (below Thub) is characterized by open, steep, grassy habitat with scattered *Abies pindrow* and *Cedrus deodara* while *Plactranthus rugosus* is the most common shrub.

## RESULTS

During survey a total of 28 calling sites were solicited at 8 main localities of the study area. The maximum density index of  $1.75 \text{ km}^{-2}$  was calculated at Sangar Bari, while minimum of  $0.05 \text{ km}^{-2}$  at Low Gali (Table 4). A maximum of 7 calling sites were recorded from Sangar Bari; in which, 4 from sub locality Nar Ka Daman (Left of Sangar Bari Behk) and 3 from Batal Ka Daman (above village Loon Ban). The minimum number of calling sites was Low Gali 1 of Low Gali recorded from its sub-site Low Gali1, having a single calling site. The total estimated adult Cheer Pheasant *Catreus wallichii* population in 2002 in these above mentioned localities was 8 (Table 1). One female sitting on 8 eggs in a nest was observed and flushed during study at Nar Ka Daman of Sangar Bari. Fresh clutching (n=3) were observed at 3 sites in Batal Ka Daman sub locality of Sangar Bari in July 8, 2002. Two male birds flushed at Low Gali, one from Low Gali-1 (in front of house) and one from Low Gali-2 (Belay Wala Par).

The second potential habitat of Cheer Pheasant in study area was Garang Nardajian having density index of  $1.6 \text{ km}^{-2}$  with 4 calling sites (Table 4). Two calling sites were recorded from sub-locality Garang1 (near Tatta Pani) and one from Garang2 (top right of village Gail) given in Table 1 and 2. Due to heavy livestock pressure (60%), the Cheer population in these two sub-localities were confined to ruggy, sloppy cliffs, stony rocks, with patchy distribution of grasses and stunted trees. The total estimated adult Cheer Pheasant population in these two sub-localities was 12 in 2002 and 14 in 2003 (Table 3). Evidence fresh clutching activity (n=4) was observed at two sub-sites of Garang.

A considerable population of Cheer was present in Shinger. Although the habitat is under strong pressure of hunting, grazing and cutting from the villagers of Tararan. The area shows density index of  $1.5 \text{ km}^{-2}$  with 3 calling sites (Table 4). Two calling sites were recorded, first one, near a small natural pond at Thera Gali and other, from just left of this site. Fresh droppings (n=16), feathers (n=10) have been observed and collected from natural pond at Thera Gali. Evidence of fresh clutching (n=15) was

observed at different sites near pond. A total of 30 birds were estimated in Shinger locality (Table 1). According to indirect information resources i.e. shepherds (n=5) hunters (n=3) locals (n=6), Cheer Pheasant population was fragmented into 6 small pockets Shinger, having total area of  $2 \text{ km}^2$ .

The minimum number of adult Cheer Pheasant population was estimated in Low Gali and Kavshan with the density indices of  $0.50 \text{ km}^{-2}$  and  $0.75 \text{ km}^{-2}$  respectively (Table 4). In Kavshan, the total area of potential habitat is  $4 \text{ km}^2$ . Total estimated Cheer population in this locality was 28 in 2002 and 20 in 2003 (Table 3).

Three calling sites, one from left of Larguchhi Behk and two from top of village Kavshan were recorded (Table 1 and 2). Three summer residences (Behks) are situated in this locality exerting hunting, grazing and cutting pressure on habitat and Cheer population. During survey, a pair of Cheer Pheasant flushed near the left of Larguchi Behk (Table 1). Indirect population estimates in this area were based on the information documented by local shepherds (n=5) as well as hunters (n=3) and evidences of fresh droppings (n=5) and clutching (n=4).

Two birds were flushed from Low Gali, one at the Belay Wala Par sub-locality and other from Low Gali 1. Feathers (n=2) and fresh droppings (n=3) were observed at Belay Wala Par sub-locality of Low Gali.

The density index of Cheetah was  $1.00 \text{ km}^2$  with 4 calling sites were recorded (Table 4) with total area of  $4 \text{ km}^2$ . Three calling sites were recorded from Cheetah-2 (above village Jabra) and one from Cheetah-1 (below village Loon Ban). According to the direct and indirect evidences, shepherds (n=60) hunters (n=5), locals (n=4), feathers (n=4), the total Cheer population in this habitat was 44 in 2002 and 40 in 2003 fragmented into 5 small pockets i.e. three in Cheetah 1 and two in Cheetah 2 (Table 3). The habitat of Cheetah also faces hunting, grazing and wood cutting pressures. The Cheetah habitat is steep, rocky, open grasses and patchy shrubs. Evidences of fresh clutching (n=7) foot prints (n=4), feathers (n=3), were observed at Cheetah 2 (above village Jabra).

Saran Pir Chinasi is another potential habitat having density index of  $1.33 \text{ km}^2$  (Table 4). Four calling sites were recorded at two sub-localities of Saran i.e. 2 from Hari Wala Par and 2 from Batangi Wala Par (Table 1 and 2). According to the indirect evidences i.e. shepherds (n=4) locals (n=5) hunters (n=3), the total estimated population in this locality is 16 in 2002 and 18 in 2003 (Table 3). A pair of Cheer Pheasant flushed by dog during survey at Hari Wala Par. One Behk (summer residence) of villagers of Gun Chatter is exerting cutting and grazing pressure on

Table 1: Population estimation of Cheer Pheasant in 2002

Sub-Locality	Forest Compt No.	Height (m)	Date	No. of calls	Calling sites	Survey area (km)	Physically seen	Total estimated population
Low Gali 1	19	1930	9/6/02	1	1	1	1	6
Low Gali 2 (Belay Wala par)	19	2120	10/6/02	-	-	1	1	2
Saran Pir Chinasi (Siki Wala Par)		2480	18/9/02	-		1		6
Saran Pir Chinasi (Hari Wala Par)	35	2430	30/6/02	2	2	1	2	10
Kavshan Below Nanga Tuc	2	2500	9/7/02	4	3	1	2	16
Sokar Behk	1	2600	9/7/02			1		12
Garang 1 Nardajian (Tatta Pani)	2	2220	9/7/02	4	2	0.5		12
Cheeta 1	6	1900	10/7/02			1		14
Cheetah 2 (top of village Jabra)	6	2120	7/6/02	12	3	1		30
Batal Ka Daman ( above village Loon Ban)	6	2450	11/7/02	5	3	1		16
Sangar Bari (Nar ka Daman+Ratta par)	7	2500	11/7/02	6	3	1	1	20
Thera Gali Shinger (above Traran village)	4	2700m	13/11/02	3	3	2		30
Khatar Nar 1 (Thub)	22	2300	14/11/02			0.5		10
Khatar Nar 2 (below Thub)	23	2000	14/11/02	2	2	2		10

Table 2: Population estimation of Cheer Pheasant in 2003

Sub-Locality	Forest Compt No.	Height (m)	Date	No. of calls	Calling sites	Survey area (km)	Physically seen	Total estimated population
Kavshan	2	2500	9/6/03			1		10
Sokar Behk	1	2450	10/6/03			1		10
Garang 1 Nardajian (Tatta Pani)	2	2220	8/6/03	3	2	2		14
Cheetah 1	6	1900	7/6/03	8	1	1		20
Cheetah 2 (above village Jabra)	6	2120	7/6/03			2		20
Batal Ka Daman ( above village Loon Ban)	6	2650	8/6/03			1		12
Sangar Bari (Nar ka Daman+Ratta Par)	7	2500	8/6/03	9	1	1		24
Saran Pir Chinasi (Hari Wala Par)	35	2420	20/12/02	2	2	1		8
Saran Pir Chinasi (Siki Wala Par)	35	2400	13/03/03			1		8

Table 3: Comparison of Cheer Pheasant (adults) population in two breeding seasons in study areas (2002 and 2003)

Sub-Locality	Locality	Height (m)	Date	2002		2003	
				Total Estimated Adults population 2002	Date	Total Estimated Adults population 2003	Date
Saran Pir Chinasi (siki wala par)	Pir Chinasi	2480	18/9/02	6	13/03/03	8	
Saran Pir Chinasi (Hari wala par)	Pir Chinasi	2430	30/6/02	10	5/04/03	8	
Kavshan (Below Nanga Tuc)	Kavshan	2500	9/7/02	16	9/6/03	10	
Sokar Behk	Kavshan	2600	9/7/02	12	10/6/03	10	
Garang 1 Nardajian (tatta pani)	Garang	2220	9/7/02	12	8/6/03	14	
Cheetah 1	Cheetah	1900	10/7/02	14	7/6/03	20	
Cheetah 2 (above village jabra)	Cheetah	2120	10/7/02	30	7/6/03	20	
Batal Ka Daman (above village loon ban)	Sangar Bari	2450	11/7/02	16	8/6/03	12	
Nar ka daman+Ratta par	Sangar Bari	2500	11/7/02	20	8/6/03	24	
Thera Gali	Shinger	2700	13/11/02	30	*	*	
Low Gali 1	Low Gali	1930	9/6/02	06	*	*	
Low Gali 2	Low Gali	2120	10/6/02	02	*	*	
Khatar Nar 1 (Thub)	Khatar Nar	2300	14/11/02	10	*	*	
Khatar Nar 2 (Below Thub)	Khatar Nar	2000	14/11/02	10	*	*	
Total				194		126	

\*=not surveyed

Table 4: Number of calling sites and density indices at various Areas Surveyed. (2002-2003)

Name of site	Height range (m)	No. of Calling sites	Area Surveyed (km <sup>2</sup> )	Density Index (calling sites/area surveyed km <sup>2</sup> )
Low Gali	1930-2120	1	1.999	0.50
Kavshan	2500-2600	3	3.999	0.75
Saran Pir Chinasi	2400-2480	4	2.99	1.333
Garang Nardajian	2000-2220	4	2.4999	1.6
Cheetah	1900-2200	4	3.999	1.00
Sangar Bari	2500-2650	7	3.999	1.75
Shinger	2500-2700	3	1.999	1.5
Khatar Nar	2000-2300	2	2.49	0.80

sub-locality Hari Wala Par and Batangi Wala Par. Evidence of fresh clutching (n=2) was observed near water spring at Hari Wala Par Saran.

The total estimated Cheer Pheasant population in Khatir Nar is 20 fragmented into 2 sub-localities i.e. Khatir Nar-1 (Thub) and Khatir Nar-2 (Below Thub) with a total density index of 0.80 km<sup>2</sup> (Table 4). Two calling sites were recorded from Khatir Nar 1 sub-locality. Evidence of fresh clutching (n=156) droppings (n=20), feathers (n=3) were observed in sub-locality of Khatir Nar 1.

In conclusion, cumulative total of 194 adults in 2002 and 116 in 2003 were estimated during two breeding seasons (Table 3).

The t-test shows non-significant difference (0.71790) between the means of adult Cheer Population estimated in 2002 and 2003 breeding seasons. This clearly reflects that the population trend is stable and any further pressure may leave drastic effects on natural population dynamics.

## DISCUSSION

Jhelum Valley situated on east of the Muzaffarabad, known as the potential habitat for Cheer Pheasant population. In the study area Cheer Pheasant (*Catreus walliachii*) distributed in eight main localities with total estimated population of 194 birds during June 2002 to June 2003. According to Osmoston<sup>[6]</sup> the Cheer pheasant was "a rather local bird" in Kashmir, perhaps "not uncommon towards the Kishan Ganga (River Neelum) and on the outer slopes of Pir Punjal Range". This view was repeated by Baker<sup>[3]</sup> whose informant had shot them in several areas including Pir Punjal. Qadri *et al.*<sup>[36]</sup> failed to find any in Kashmir, locals reported them from the Kishtwar and Qazinag areas. In present study, the Qazinag area (foot hills of Pir Punjal Range) i.e. the Sangar Bari is most favorite habitat of Cheer Pheasant with estimated total adult 36 birds (Table 3). The Sangar Bari is divided in two sub-localities Nar Ka Daman and Batal Ka Daman. By examining judging earlier records, the species was always difficult to find in Pakistan<sup>[8,9]</sup>. However it was nevertheless locally common as, reveal by the 20 individuals flushed above Salkhala in December 1977, although no further sittings have been reported in this area and the species is possibly extinct there<sup>[10]</sup>. Qureshi<sup>[37]</sup> also observed 8 pairs of Cheer Pheasant in Sangar Bari (outer flanks of Qazinag Game Reserve).

During present study, number of calling sites and density indices at various areas showed that the maximum

value of density index i.e. 1.75 km<sup>-2</sup> recorded at Sangar Bari and minimum value of 0.50 km<sup>-2</sup> at Low Gali (Table 4). By documenting the direct and indirect evidences, i.e. shepherds n=10, locals n=8, hunters n=5 and wildlife staff n=5 it is concluded that total adult population in these two localities is 36 and 8 birds, respectively (Table 3). Burt<sup>[14]</sup> confirmed the presence of small population (no more than six to seven) in the Pir Chinasi area of Jhelum Valley but present study reveals that the total estimated adult Cheer population is 16 with a density index of 1.33 km<sup>-2</sup> fragmented into three sub-localities of Saran Pir Chinasi namely Hari Wala Par, Batangi Wala Par and Sikki (Table 4). Kalsi<sup>[2]</sup> reported a total of 15 calling sites at Majathal wildlife sanctuary with the density index equated to 17 sites km<sup>-2</sup> in suitable habitat. According to him density index at Kaksthal and surrounding areas was three sites km<sup>-2</sup>. Kalsi<sup>[2]</sup> also reported density indices from two sites in Tunda Wildlife sanctuary and three sites in Thathana Reserve Forest were four and five sites km<sup>-2</sup>, respectively. The present study shows one calling site in Low Gali (0.05 km<sup>2</sup>), three in Kavshan (0.75 km<sup>2</sup>), four in Pir Chinasi (1.33 km<sup>2</sup>), four in Garang (1.6 km<sup>2</sup>), four in Cheetah (1.0 km<sup>2</sup>), seven in Sangar Bari (1.75 km<sup>2</sup>), three in Shinger (1.5 km<sup>2</sup>) and two in Khatir Nar (0.80 km<sup>-2</sup>) are given in Table 1. Garson<sup>[35]</sup> reported 24 pairs km<sup>-2</sup> in April, 1983 in Majathal Wildlife Sanctuary. There were 40 pairs of Cheer reported in April 1989, with a density on suitable habitat 6 pairs km<sup>-2</sup> in Chail Wildlife Sanctuary<sup>[38,34]</sup>.

A total of 28 calling sites were recorded in 9 main localities in Jhelum Valley. By the close of 19<sup>th</sup> century, the majority of surviving population were found in the Hills of Himachal Pradesh<sup>[34,38-40]</sup> where surveys revealed that almost majority of population were isolated and small, they were still "tolerably well distributed"<sup>[34]</sup> and Locally "quite common"<sup>[41]</sup>.

Apart from very few sites most supported fewer than 10 pairs<sup>[34]</sup>. Two exceptions were Chail Wildlife Sanctuary and Majathal Wildlife Sanctuary while in present study 18 pairs were estimated in Sangar Bari. In April 1989, there were approximately 40 Pairs of Cheer Pheasant at Chail at an average density of 6 pairs km<sup>-2</sup><sup>[38,34]</sup> one of the highest population densities recorded for the species was the Majathal Wildlife Sanctuary where Garson<sup>[35]</sup> reported 24 Pairs km<sup>-2</sup> in 1983 and Kalsi<sup>[42]</sup> estimating 17 calling positions km<sup>-2</sup> in suitable *Catreus walliachii* habitat in 1997. Encouragingly, further transect work in 1999 suggested that the population had increased despite extensive burning of grasslands in late winter<sup>[34]</sup> felt that

up to 50 pairs might survive in suitable habitat in Budhal Nalla, while in upper Beas Valley, the species was found in almost areas visited and population in that region was considered to be in the region of 100 of birds. *Jandrotia et al.*<sup>[43]</sup> heard 4 to 6 Cheers in January 1994 at Bhaatal and sited 8 Cheer in Sahara Reserve Forest in February 1995. In present study, 7 birds were physically observed in different localities in Jhelum Valley (Table 1). *Jandrotia et al.*<sup>[43]</sup> sighted 7 and heard 10-14 birds in Thathana Reserve Forest in March 1995.

In present study, two male birds were flushed at Low Gali (1930-2120 m) and one call heard from a calling site near Balay Wala Par sub-locality in June 09, 2002 (Table 1). In Pir Chinasi, 4 calling sites were recorded in September 18, 2002 (Table 1). A pair was flushed from Hari Wala Par Sara Pir Chinasi in June 30, 2002 (Table 1). Similarly, a pair of adult birds was flushed at Kavshan (2500 m) in July 9, 2002 (Table 1). One female sitting in nest near Sangar Bari Behk (near Nar Ka Daman 2500m). A total of 7 calling sites were recorded in two sub-localities of Sangar Bari, 3 from Batal Ka Daman and 4 from Nar Ka Daman sub-localities representing the most potential habitat of Cheer from all study sites.

The maximum adult Cheer Population i.e. 36 was estimated in Sangar Bari while minimum of 8 birds in Low Gali in year 2002 (Table 1).

T-test shows that there is no significant difference (0.71790) between the means of adult Cheer Population estimated in 2002 and 2003 breeding seasons. This clearly reflects that the population trend is stable and further pressure may leave drastic effects on natural population dynamics.

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