

SURVEY OF THE CHEER PHEASANT *Catreus wallichii* (Hardwicke, 1827) IN LOWER

KALIGADAKI VALLEY, MUSTANG, NEPAL

(Final Report)

**Submitted By
Raju Acharya (Sharma)**

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**King Mahendra Trust for Nature Conservation,
Annapurna Conservation Area Project, Nepal**

World Pheasant Association, U.K.

**School of Environmental Management and
Sustainable Development (SchEMS), Nepal
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Abstract

A study on threatened Cheer Pheasant *Catreus wallichi* was carried out from 14th May to 13th June 2004 in Ghansa of Annapurna Conservation Area. The Cheer Pheasant which is a vulnerable and listed in the Red Data Book of IUCN and Appendix I of CITES has been recorded in Ghansa area from 1982 to 1996 by many individual trekkers and birdwatchers. No record of Cheer Pheasant has been observed in the area except the preliminary study carried out in 2003. Recent literature describes the species is on the verge of disappearing in the area. In such a critical condition no systematic study has been carried out in the area.

Realizing the absent of baseline data in the Kali Gandaki valley, the study was design to survey in the Kobhang, Lete and Kunjo Village Development Committee (VDC). Sites within the VDC were new locations for exploring the Cheer Pheasant .The main objectives is to assess the abundance, distribution and physical threats in the area. For the equal representation of sample in the study area and to avoid the biasness in the field, the total area was divided into five blocks including one plot (4 km²) within each block. Plots were located randomly. Call point were identified within the plot for the execution of dawn call count census method recognized by World Pheasant Association. Additional 2 call points were also surveyed outside of the block.

Maximum of 17 calls were heard in the area. Altogether 14 birds were directly observed in three places. Total mean call of the study area was found 11.67 birds in the study area, using the factor derived by Young et al. (1987), the total breeding population was estimated to be 8.75 birds in the study area. And the bird density of breeding population in the study area found 4.42birds /km². Potential area for the Cheer Pheasant in the valley is about 22.16 km², if we extrapolate; it gives the 98 breeding birds

Descriptive statistics were done to represent the field data for appropriate interpretation. Detection rate with the pooled mean 1.67/ station (SD =1.04, n= 7 replicates and 3 repeated measures) and the number of calling counted per unit efforts (calling station) was estimated to range between 0.9 and 2.4 birds per station at 95% confidence limit. Based on the pooled mean and radius of 300 meter, the mean population density of the species in the study area was estimated to be 6 birds/ km² and the population density at 95% confidence limit ranged between 5 to 7 birds/ km². By applying the correction factor the mean density was 4 birds/km² and ranged 4 to 5 birds/km². With the help of potential habitat, we extrapolated the total population size of the species in the valley (covers three VDC of Kali Gandaki watershed) to be 113 to 148 birds (85 to 111 birds with correction factor).

The team was able to explore the nest of Cheer in the east of Kali Gandaki valley in Pudhar Kharka of Kunjo VDC. Cheer was also found upto 4 km east and 10 km north of Ghansa. All 5 plots are new area, where Cheer Pheasant has confirmed, however the most reliable place, Ghansa was not surveyed due to security reason. Although team has collected the data related to all Pheasant species found in the area, this report describes only Cheer Pheasant.

Hunting and snaring of mammals was common in Kali Gandaki Valley from the outsider however killing of Pheasants is by local students and shepherds. After the intervention of ACAP and handover of firearms by local people to security force trend of hunting is decreasing but still exist. Livestock grazing and slash and burn practices were recognized as threats. Surveys covering all Cheer habitats, regular population and ecological monitoring, control on grazing and burning, and raising conservation awareness among stakeholders are recommended.

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List of Acronyms and Abbreviations

KMTNC	King Mahendra Trust for Nature Conservation
ACAP	.....	Annapurna Conservation Area Project
CITES	.....	Convention on International Trade in Endangered Species of Wild Fauna and Flora
IUCN	.....	The World Conservation Union
WPA	.....	World Pheasant Association
VDC	.....	Village Development Committee
GPS	.....	Geographical Position System
NTFP	.....	Non -Timber Forest Product
PRA	.....	Participatory Rural Appraisal
ha.	.....	Hector
SD	.....	Standard Deviation
km	.....	Kilometre
CAMC	Conservation Area Management Committee
UCO	Unit Conservation Office

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Chapter- I

INTRODUCTION

The Cheer Pheasant is distributed through the southern foothills of the Himalaya from Pakistan to Nepal, occurring in northern Pakistan, three states of India (Jammu and Kashmir, Himanchal Pradesh and Uttar Pradesh) and Nepal (Birdlife International 2001).

Cheer Pheasants are extirpated from much of local ranges. Probably this bird is nationally extinct from Pakistan (Anonymous 2001). In case of Nepal their presence recorded in Annapurna Conservation Area, Dhorpatan Hunting Reserve and Rara National Park (Lilliott 1987, BPP 1995, Birdlife International 2001, Subedi 2003)

In Dhorpatan area its population has been estimated to be 50-100 birds with 31 heard in 1982 (Subedi 2003). Their status in Mustang is still unknown even though their regular occurrence has been documented from 1982-1996. It was always uncommon at Ghansa but it is rarely recorded there and must be on the verge of disappearing. No recent information is available from this area (Birdlife International 2001).

Preliminary survey (7-17 September 2003) carried out by Annapurna Conservation Area Project (ACAP) has identified twelve possible sites in three VDCs for the Cheer monitoring program, however the team confirmed the presence of Cheer only in a Thulomela of Ghansa area. The team heard three calls in two consecutive mornings at 5.35-5.45 AM.

The lower Kali Gandaki valley forms the border to demarcate east and west for the distribution of flora and fauna. This is the only known area in Nepal where all six species of resident Himalayan Pheasants (Cheer Pheasant *Catreus wallichii*, Satyr Tragopan *Tragopan satyra*, Blood Pheasant *Ithaginis cruentus*, Koklass Pheasant *Pucrasia macrolopha*, Himalayan Monal *Lophophorus impejanus* and Kalij Pheasant *Lophura leucomelanos*) are found (Inskipp and Inskipp 2003).

Due to the ever-increasing tourism in the area there is a high pressure on natural resource, thereby loosing its biodiversity. New developments projects such as road, high-tension lines of hydropower are also responsible for forest destruction directly or indirectly. Landslide and forest fire are also the common causes for depleting the biodiversity. There is also an informal report that these species is threatened by illegal hunting. All circumstances played negative role for Cheer Pheasant conservation.

Current status of Cheer is uncertain (Grimmet et al. 2000) and there is little information on their population status. No Pheasant surveys have been carried out in the lower Kali Gandaki area. There is at least a small population of the globally threatened Cheer Pheasant that still remains, although local people say that it is declining (Bräunlich 1987 and Gawn 1987 cited in Inskipp and Inskipp 2003). KMTNC/ACAP with the support from UNEP-WCMC had formulated a protocol for the monitoring of Cheer Pheasant in the area.

In summary, the main reasons for undertaking this study are:

- Baseline information is required for its conservation and habitat management.
- Cheer Pheasant is Vulnerable (Fuller and Garson 2000) and endemic to the Indian subcontinent.

The findings and recommendations gear up ACAP in the field of Cheer conservation.

1.1 Study area

Study area is located at Lower Kali Gandaki watershed (Map no 1), which lies in Mustang district of Dhaulagiri zone. This valley spreads from Latitude 28° 40' 00" N to Longitude 83° 37' 00" E. It includes temperate (Ghansa 2010 m) to nival eco-zones. This area is drained into Kali Gandaki river system. Survey was made in 7 sites of three VDC (Kobhang, Kunjo and Lete). These areas spread from 2300 m to 3200 m above the sea level.

"There are temperate and sub-alpine forests, sometimes with an extensive bamboo under-storey and often on steep slopes. These comprise mixed broadleaves and conifers (mainly pines), conifers and rhododendrons, and conifers with birch *Betula utilis* at higher altitudes. Grassland grows on some steep slopes and bamboo in gullies" (Inskipp and Inskipp 2003).

This area provides habitat for several mammal species such as Goral (*Naemorhedus goral*), Jharal (*Hemitragus jemlahicus*), Himalayan Black Bear (*Selenarctos thibetanus*), Barking Deer (*Muntiacus muntjak*), Common Leopard (*Panthera pardus*), Musk Deer (*Moschus chrysogaster*) etc.

All the settlements lie below the study area, inhabiting mainly by Thakali and disadvantage groups. Main occupation is related with tourism, animal husbandry and agriculture. Seasonal corral (Yak, Cow, Sheep and Goat) are still remaining within the study area.

1.2 Cheer Pheasant

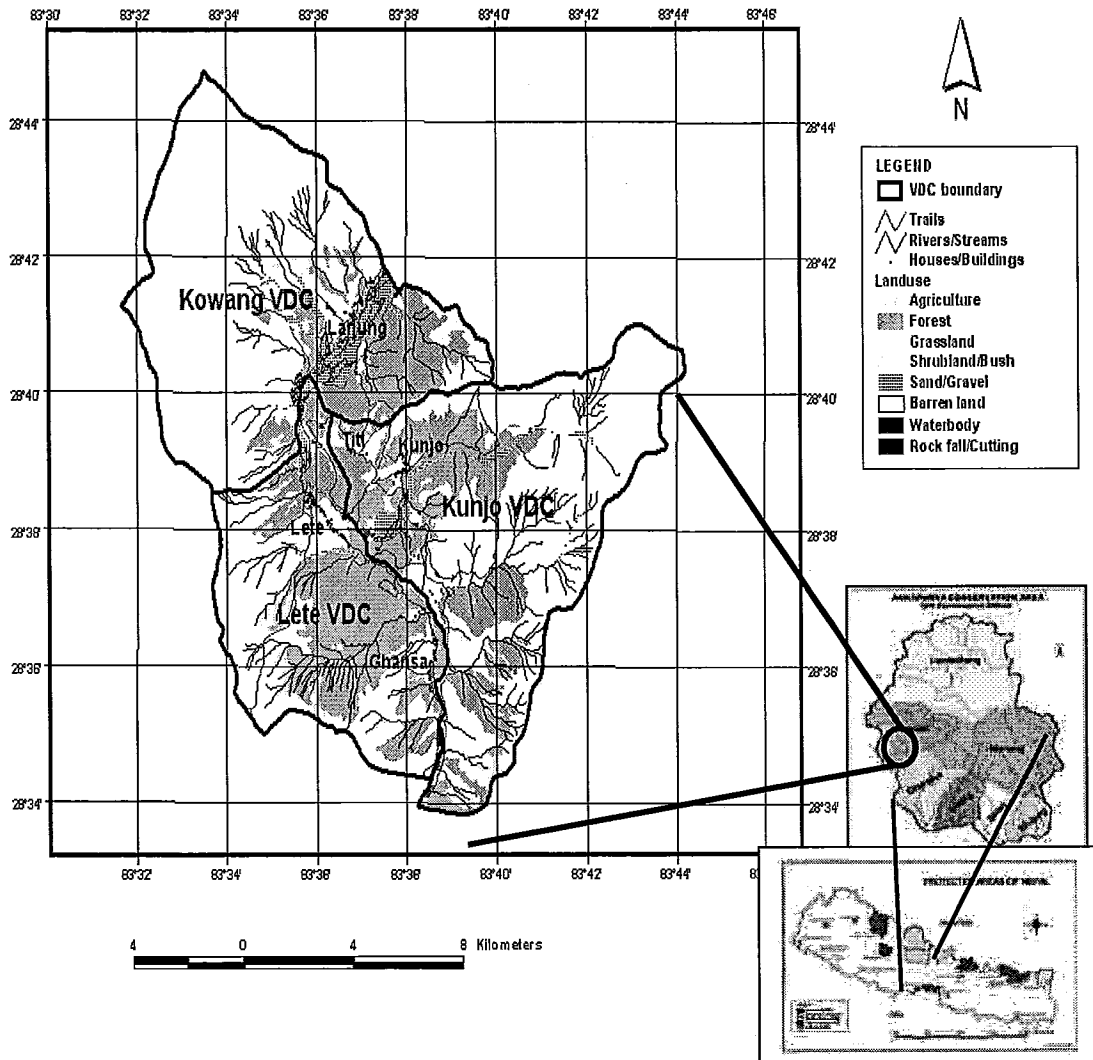
Cheer Pheasant is a relict and monotypic represented by single species in the genera *catreus* (Del Hoyo et al. 1994). It is a medium sized bird among the Pheasants. It is protected birds of Nepal under the National Park and Wildlife Protection Act 1973 (HMG 1973) and is listed among the vulnerable species of IUCN Red Data Book (Fuller and Garson 2000, Birdlife International 2001). Cheer has been observed in Rara National Park, Dhorpatan Hunting Reserve, Annapurna Conservation Area (ACA) and Jumla district. Cheer Pheasant is popular for its local name **Cheer** in all places within the study area of Kali Gandaki valley. It is vulnerable and endemic to Indian subcontinents.

1.2.1 Physical Character

It has long, broadly barred tail, pronounced crest and red facial skin. Male is cleaner and strongly marked than female with pronounced barring on mantle, unmarked neck and broader barring across tail (Grimmett et. al 2000).

The male is 90-118 cm and female is 61-76 cm in length. Typical views are flying downhill, when buff, grey and brown coloration and long broadly banded tail are diagnostic. Both sex are brown, have brown crest (longer on male) and red facial skin (Subedi 2003). Juvenile is like female but lacks crest and is less heavily marked (Grimmett et. al 1998).

Species is patchily distributed, shy and having soundless flight. Flight seems like the variegated laughing thrush (*Garrulax variegatus*) whenever short and bullet gliding towards the downhill whenever long span.



Map 1- Map of the study area

1.2.2 Calling behaviours

However unlike Koklass Pheasants, Cheer do not call regularly in a dawn chorus; instead their dawn crowing is irregular, sporadic and some time even absent (Lilliott 1982). Both male and female are vocal and gives loud calls in morning and evening (Young et al. 1987). They are reportedly call at dawn and dusk throughout most of the year except the immediate post breeding season (July-September) and counts of calling birds therefore be carried out twice daily. More than one bird may call from the single roosting site (Gaston 1980). The species was heard to have a varied vocal repertoire but the most commonly uttered call was a “Chock, Chock.... Cherweewa, Cherweewa with the “Wee” syllable called at higher pitch than the rest (Lelliott 1980). Five Characteristics of Cheer calls are recognized (Young et al. 1987) i.e. “ Chut”, “Chewewoo”, ”Staccato”, ”Cluck” and “ Flight”.

1.2.3 Distribution

Cheer found from the western boarder to the Kali Gandaki in the east. Existing distribution of the Cheer in Nepal are mention below.

District	Location	Sources
Mustang	Lete, Ghansa, Kopchepani	Subedi 2003 and Birdlife International 2001
Myagdi	Dhorpatan, Muri, Dana	Birdlife International 2001
Rukum		<i>Per. Comm.</i> With Titi Sainla a renowned hunter of lower Kali Gandaki valley (need to be confirmed later).
Jumla and Mugu	Rara National Park	Preliminary survey carried out by the OBC grantee Mr. Bharat Bahadur Budathapa and Birdlife International 2001

Chapter-III

OBJECTIVES AND SCOPE

3.1 Objectives

Objectives of the study program were,

- To find out the distribution and abundance of Cheer Pheasant.
- To established permanent research plots for future monitoring.
- To explore potential threats and recommend strategies for Cheer conservation.

3.2 Scope

Ghansa and Lete area where, many bird watchers have recorded Cheer Pheasant from 1982 to 1996 regularly and some of them thought that it is on the verge of disappearing. No scientific study has been carried out so adjacent areas of Ghansa were chosen for the study of Cheer. Although the Ghansa area is popular for Cheer but due to security reason this area has been discarded for survey. Due to the limitation of time and also additional days needed for the preparation of study in each block, team chosen single call point within the block. Although data related to all Pheasants were collected during field visit, but as per the objective of the proposal only Cheer Pheasant is described in this report. There are lots of methods for the population estimation of Cheer Pheasant; team applied the methodology accepted by World Pheasant Association. Sampling design is based on the protocol made by ACAP. On the basis ACAP protocol, five call points were identified and two call points were added out side of block during the field visit, total population range is described or extrapolated. The entire field related data were fed into the Geographical Information System (GIS), which was obtained through Geographical Position System (GPS). Out of five call points four call points were correctly located within the block but a call point of Bungha area dropped outside the block. Due to the time limitation and bad weather during the initial survey period, team applied call count in three consecutive mornings only. Afterward it was replicated for all other call points.

Chapter-IV

METHODOLOGY

4.1 Sampling design

4.1.1 Block division

Through literature Ghansa and Lete are two important sites for Cheer (Birdlife International 2001). To avoid the biases on the field total area of three VDC were divided into 6 compartments having the width of 2 kilometres (variation in area) and laying east to west. Such compartment did not fall on the area having elevation more than 3500 m. It has been done for the equal representation of the study area. The compartment near from the Ghansa was not surveyed due to the security problem.

4.1.2 Plot layout

In each compartment a 4-kilometer square block has been identified randomly with the help of random number of calculator. On the basis of random number, center point of the block was identified and on the basis of center point, boundary of block was drawn on the map of the area. The position of the center point and the four corners were saved into the GPS (Table 4.1, Appendix 4). The span between the each block maintained up to 1 kilometer. Block is avoided if it located near to next block or their area has represented river channel, settlement more than 50 percentages.

Table 4.1- Detail of the centre point.

Name of the plot	Latitude	Longitude
CMLMB1	28°36'51.06"	083°37'03.61"
CMLMB2	28°37'24.25"	083°39'13.73"
CMLMB3	28°39'19.15"	083°40'5.78"
CMLMB4	28°39'22.97"	083°36'11.56"
CMLMB5	28°41'16.59"	083°35'38.31"

4.2 Field implementation

4.2.1 Preliminary studies

A meeting with local people was held to know general location of the bird habitat within the block. Based on the information provided by the local people, and the information collected from literature review sites were identified for preliminary survey of the Cheer. Local trails to the sites were followed and information's were collected. On the basis of previous visit, available data, distribution of birds, local information and general habitat survey, call point was identified. Preliminary survey was carried out to confirm the call site, familiar with the route followed by next day, overview of surroundings and mark the sites.

4.2.2 Identification of call point

After adding center and four-corner location on GPS, blocks were identified in the study area. Within the block one vantage point (call point) was identified on the basis of preliminary survey, various literature, local information and habitat features. One day prior field visit was applied for the identification of call point. Identified call points were surveyed by dawn call count census method. The span between the call points was setup minimum of 600 meter from each other. At least one call point surveyed in single block. However team setup surveyed in five consecutive mornings in a call point, team applied three consecutive mornings call count in each call point. Detail about the call point is given in Table 5.8. Generally call points were identified in the vantage area so the heard from the surrounding would be clear. It was already setup that call can heard only from the area having the radius of 300 meter from the call site. Radius limitation was based on study carried out in Dhorpatan area.

4.2.3 Dawn call count census method

The detail study followed the dawn call count census method at all the call point of permanent blocks, which were identified during the preliminary survey. Call count was done on 3 consecutive mornings at each point. Count was not done in the adverse climate (only in case of heavy rainfall). Cheer Pheasant call count sheet developed by Gaston and Subedi with some modification was used to record data (Appendix 4). Dawn call count census method applied to the area except Ghansa. The total point was identified in such a way that these points were well spreaded and most likely represents independently spatial units.

4.2.4 Habitat analysis

At each point, measurements was taken on physical parameters (altitude, aspect, slope, rivers/streams etc.), habitat types, tree cover, shrub density, grass cover and the levels of human impact (hunting and snaring, trails, firewood and fodder collection, Non-Timber Forest Product (NTFP) collection, grazing, and fire) with the help of habitat analysis form (Appendix-1). Some ordinal divisions (none, some, and much) were made to note down the level of human disturbance. At least 4 days were spent in the each point (one day preliminary survey and 3 days for the call count if the Cheer has been recorded)

4.2.5 Transect walk

The team walked through the area to be covered, following a route designed to pass through all the different vegetation type represent, and counts the number of Pheasants distributed within the selected distance of path (50 meter is usually the maximum effective distance). Notes were drawn to identify the presence absence evidence of Cheer in the area i.e. feather, direct observation, nesting place.

4.2.6 Participatory Rural Appraisal (PRA)

Group discussions were carried out in most of the village and informal discussion with shepherds and hunters were made to get information about the habitat, species, threats and local conservation measures. Primary information related with lifetime achievement of hunter was collected and later

others verified it. Thirty years period is long and nobody have the exact data on his memory. So the hunting numbers are in round figure. This is based on the annual hunting number and later multiplies by years of involvement in hunting profession.

4.2.7 Equipment description

ACAP headquarters and Pokhara and Jomsom UCO provided all the field gears and the logistic support. Habitat scanning and species identification were made possible with the help of telescope (Searcher 20* & 40*60mm) and binocular (Nikon action 7*35 9.3⁰). Simple compass was used for the measurement of aspect and direction of sites. Thommen classic altimeter and GPS (Etrex Venture, Garmin) were also used to record the position of Cheer calling site. Simple 5 kg capacity weighing machine was used to weight the eggs of Cheer.

4.2.8 Confirmation of birds

A book on the birds of Nepal (Grimmet et al. 2000) was referred for field identification. Various literatures were referred before and after field trip to identify the habitat, confirm the call, methodology consistency, analysis etc. For the confirmation of call audiocassette provided by ACAP with copy right of the British Library National Sound Archive, England was used. PRA tools such as group discussion, informal discussion with local hunters were applied in the study area. The potential sites were confirmed through the direct observation, presence of dead part of the Cheer and call count in the area.

4.3 Marking of the area

Call points where team applied the dawn call count census method were permanently marked (Table 5.8). Data were noted on the field book. Marking was made on the permanent structure (stone, big tree) of the area. Yellow and red colour was used for marking.

4.4 Logistic supports

All the field gears were supported by the ACAP. Villagers and local institutions were informed 15 days prior the fieldwork so that they can choose good knowledgeable guide for the team as well as confirmed the habitat of Cheer Pheasant. All the police check post, Royal Nepal Army of the area were informed with detail schedule of the team however the area is safer and no records of human loss after the Maoist insurgency started in the country. The Hotel Himalayan of Larjung, Kobhang, provided some kitchen utensils.

4.5 Data Analysis

4.5.1 Breeding Population Estimation (BPE)

The survey was being conducted during May and June (prior to monsoon). Multiplying the number of calling sites detected before sunrise by a factors of 0.75 probably produces the best available estimate of the breeding population within the survey area (Young et al. 1987).

$$BPE = \sum \bar{x} \times 0.75$$

Where $\sum \bar{x}$ = Total Mean of the study area

4.5.2 Descriptive Statistics

The descriptive analysis was done to represent the collected data for the further interpretation. Since the sampling plot were repeated so that pooled mean, standard deviation and the variance were prefer to represent the overall status of the species in the area.

$$\bar{x} = \frac{n_1 \bar{x}_1 + n_2 \bar{x}_2 + \dots + n_7 \bar{x}_7}{n_1 + n_2 + \dots + 7}$$

$$\sigma = \sqrt{\frac{(x - \bar{x})^2}{N}}$$

$$\sigma^2 = \frac{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2 + \dots + (n_7 - 1)\sigma_7^2}{n_1 + n_2 + \dots + 7}$$

\bar{x} = Mean of the mean or pooled mean

\bar{x} = Mean of the each plot

σ = Standard deviation

σ^2 = Variance

n = Number of repeated measure in each station

4.5.3 Detection rate or encounter rate

Detection rate or encounter rate of Cheer Pheasant was calculated by summing the total number of calling birds recorded and then divided by the total number of survey station. This could be calculated for each calling site and the result could be represented as mean encounter rate with

measures of variance (Subedi, 2003). (Calculated by, $(\mu = \bar{x} \mp 1.96 \frac{\sigma}{\sqrt{n}})$ or $(\mu = 1.67 \mp 1.96 \frac{1.05}{\sqrt{7}})$)).

$$\text{Entire detection rate} = \frac{\sum \bar{x}}{\text{sample size}(7 \text{ days})}$$

$$\sum \bar{x} = \text{Sum of all mean}$$

4.5.4 Mean population density

The mean population density was estimation based on pooled (mean of mean) divided by the total area covered in each station, which has been calculated based on 300 meter radius. Population density could be calculated whether for the station or for the entire station. This estimate was then extrapolated for the entire population assuming that the sex ratio of species 1:1 (Subedi, 2003).

$$\text{Mean population density} = \frac{\sum \bar{x}}{A (\text{Entire area of station})}$$

Chapter-IV

RESULT AND DISCUSSION

Altogether 31 days were spent in the field and 5 call points in 5 blocks were surveyed and two additional sites were also surveyed to validate the information (Appendix 2). Later it was confirmed that call point of Bungla also did not fall on the block. Calls were absent in two call points. Local guide and porter were hired for the survey. The status and distribution of Cheer Pheasant were analysed. During the call count, a maximum of 17 calling birds were found in the study area (Table 5.5). Minimum call was found in Sekung area where as the maximum call heard in the Sarkhu of Jhipradeurali (Kunjo VDC). During the survey period 14 Cheer were seen in three different sites (Table 5.5). Although during the preliminary study (2003), 12 potential sites were identified for the study of Cheer but team would not able to confirm the species from those sites. Only Thulomela from the Ghansa has been confirmed for the Cheer.

5.1 Breeding population based on Young et al. 1987

Total mean call of the study area was found 11.67 birds, using the factor derived by Young et al. (1987), the total number of breeding population was estimated to be 8.75 in the study area. The total area of the seven plots is 197.89 ha. Which is equivalent to 1.98 square kilometres. So the bird density becomes 4.42 birds /km² (8.75birds/1.98 square kilometre). Potential area for the Cheer Pheasant in the study site is about 22.16 km², if we extrapolate; it gives the 98 breeding birds. Altogether 98 breeding population of Cheer Pheasant found within the total potential area of Three VDC.

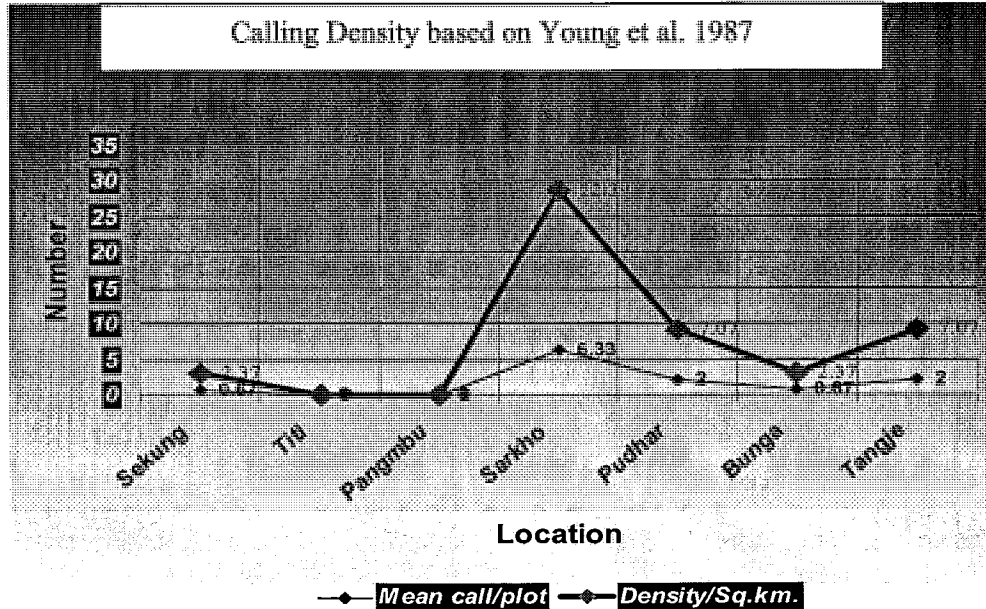


Figure 5.1

5.2 Descriptive analysis

5.2.1 Detection rate

Number of birds calling in each plots ranges from 0 to 7 in the study area. Detection rate with the pooled mean 1.67/ station (SD =1.04, n= 7 replicates and 3 repeated measures) and the number of calling counted per unit efforts (calling station) was estimated to range between 0.9 and 2.4 birds per station at 95% confidence limit

5.2.2 Density and population estimation

Based on the pooled mean and radius of 300 meter, the mean population density of the species in the study area was estimated to be 6 birds/ km² and the mean population density at 95% confidence limit ranged between 5 to 7 birds/ km². By applying the correction factor the mean density was 4 birds/km² and ranged 4 to 5 birds/km². With the help of potential habitat, we extrapolated the total population size of the species in the valley (covers three village development committee of Kali Gandaki watershed) to be 113 to 148 birds and with correction factor it was 85 to 111 birds.

Table-5.1 Description of variables

Name of station	Repeated Number	Max Number	Mean Number	Variance (σ^2)	Overall SD (σ)	Overall variance
Sekung	3	1	0.67	0.3	1.05	1.1
Titi	3	0	0.00	0.00		
Pangmu	3	0	0.00	0.00		
Sarkho	3	7	6.33	0.33		
Pudhar	3	4	2.00	3.00		
Bunga	3	1	0.67	0.33		
Tangje	3	4	2.0	4		

5.3 Global and local distribution

Global distribution of Cheer limited in Kali Gandaki to the east however the study confirmed the species east of Kali Gandaki. The study confirmed the occurrence of Cheer 4 kilometres (Aerial distance) east of Kali Gandaki valley named as Pudhar Kharka (N 28°37'30.1"E 083°39'53.2", 2660m and 3 hours from Jhipradeurali) of Kunjo VDC. The study also confirmed the occurrence of Cheer in the Tangtung of Jhipradeurali (Table 5.2) Trace number of Cheer also found above the Jhipradeurali which is the result of heavy burning last year (*Per. comm.* Hom Bahadur Sherchan, Kunjo VDC, ward 5). The study also confirmed the Cheer from the Thulomela of Kunjo through unusual call in 10.28 AM, which was out of the call point site.

Locally, species is confirmed from the Lete and Ghasna (based on previous observation) however team explore Cheer from the 5 new sites (Table 5.2) and there are other remaining sites to be confirmed in future. Tangje of Khanti area where Cheer has been detected (N 28°42'02.8"E 083°37'19.5") is 10 km (aerial distance) north from the Ghasna.

Table 5.2 Distribution of Cheer Pheasants with in the study area

VDC	Location	Means of verification	Previous site	New site	Remarks
Lete	Lete	Halberg, 1987 cited in Birdlife international	Yes	-	Not visited during survey
Lete	Bunga	Call	No	Yes	
Lete	Kopchepani	Gawn, 1987 cited in Birdlife international	Yes	-	Not visited during survey
Ghansa	Ratomate/ Kalobadal	Birdlife international	Yes	-	Highly sensitive
Kobhang	Whangkharka	Call	-	No	
Kobhang	Khanti/Tangje	Call	-	Yes	
Kunjo	Thulomela	Acharay, R.S and Thapa, S., 2003	Yes	Yes	East of Ghansa
Kunjo	Titi	Feather	-	Yes	See plate 5 (out of block)
Kunjo	Sarkho	Call and direct observation	-	Yes	
Kunjo	Pudhar Kharka	Call, Direct observation and photographs	-	Yes	See plate 1 and 2

5.4 Habitat feature

Cheers have been recorded in the sloppy area (average 36.9⁰) having ground cover of 70%-95% and crown cover found to be weaker (average 20-45%). Altogether 80% sites were affected by forest fire (Table 5.3). The forest fire does not affect the call point site near Sekung Lake where only one Cheer produced its call. During the survey period it is found that Cheer has some sort of symbiotic relationship with following factors.

Slope

The study team observed slope more than 27⁰ in the entire site where Cheer has been detected. The sloppiest site found in the Tangtung and Tangje where even team was not able to walk in the Cheers habitat.

Grassland

Grassland is very much essential for the Cheer to hide themselves and to find root and tuber from them. In all sites single species of Khar (*Gramineae thevedal*) is commonly found. Local people detected eggs of Cheer in the bottom of this Khar many times but the team did not find any nest below this grass. The young seedling of Khar is favourite food for livestock.

Scattered tree

Sadhan (*Desmodium elegaus*), Himalayan Cyprus (*Cupressus torulosa*) and Salla (*Pinus roxburghii*) are associated with the habitat of Cheer in the scattered form. Such trees were used by Cheer for roosting and as vantage point after morning call however there were other vegetations also in the area (Appendix 3).

Forest fire:

Local people set fires in the habitat of Cheer in dry season to get green shoot for their livestock. The forest fire in 80% area affected bamboo and Khar. Out of them 60% were blazed this year and 40% were blazed previous year.

Ghoral

Whenever Cheer finished their dawn call and started to feed on the area the Ghoral (*Nemorhaedus goral*) also stand up for the grazing. Many times survey team was scared when it suddenly came out from the unexpected area. 80% area of the Cheers calling site were shared by Ghoral (four sites have Ghoral in Cheers habitat out of five)

Table -5.3 Habitat parameter of the Cheer

	Average in Cheer detection site (5 site)	Average where Cheer didn't detected (2 site)	Remarks
Slope	36.9 ⁰	15.5 ⁰	
Temperature	11.9 ⁰ c	6.5 ⁰ c	
Ground cover	70-95%	50-75%	
Crown Cover	20-45%	0-25%	
Altitude			
GPS	2700	3019	
Altimeter	2572	2945	
Aspect	South/West/North	South	
Grazing Intensity	High- 40% Medium 60%	High-100%	
Forest fire	80%	50%	Site occupy pasture land and crop land
Livestock type	Sheep, Goat and Yak	Sheep, Goat, Mule and Yak	

5.5 Nest description

The study team was able to shoot out the female Cheer in it's nesting site through a camera probably this is the first time in Nepal (as well as rare photographs in wild condition) (Plate 1 and 2). Nest of Cheer was confirmed from the east of Ghansa. Nest of Cheer found in the open land near to the sheep corral however the previous thought was setup in base of grass or some inaccessible area. The nest was found just below to big stone and small whole shape structure where female Cheer was found while incubating on eggs (Table 5.4). The survey team observed the female Cheer from 3 meter away for 3 minutes.

5.6 Calling time and duration

Both male and female found to be calling at dawn however no record of dusk calling in all sites. At morning they first come from their nest and produce call and move upward simultaneously. In Pudhar Khark Female first move to vantage point and produced it's call but at same time dogs from the corral came out to chase and the Cheer flew away downhill even it is dawn period. Generally half hour period (4.45-5.15AM) is suitable for the call count method in Kali Gandaki valley (Table 5.6) but some unoccasional calls also heard in Sharkhu at 10.12 AM and 3.00 PM once from the camp site. Calling duration varies from few second to 3-minute. During the initial days the study team was unknown about the calling schedule of Cheer so study team visited the site in 3.30 AM. During the survey period we were confirmed that Cheer produces their call near quarter to five.

Table-5.4 Detail of nest of the Cheer

Parameter	Description
Site	Pudhar Kharka of Kunjo VDC
Aspect	South /west
Time of observation	1.10-1.13 PM
Position	N 28 ⁰ 37'21. 5", E 83 ⁰ 39"39.7"
Altitude	2631m(GPS) and 2480 (altimeter)
Number of Eggs	7
Weight of total eggs	250 gram (35.51gram/egg)
Position from Ghansa	2.82 km east (arial distance)
Distance	3 hours from Jhipradeurali
Size of the nest	30*30*10(depth) cm
Size of nesting place	70*40*50 cm
Habitat	Vantage point, Khar and small Sadhan tree block visibility
Slope	Nesting site was plain but slope is more than 35 ⁰ around the nest
Threats	30m.away from sheep corral, affected by forest fire

5.7 Sightings of Cheer Pheasants

Altogether 14 Cheer Pheasant were seen in various places (Table 5.5). Out of them detection was easier at Sarkhu where 10 were seen in three consecutive mornings. Observation was only for few second due to its shyness; exception 25 second in slope of Sarkhu both male and female flew from the Bachaino tree to the ground and hide to base of Utis (*Alnus nepalensis*) tree. We did not get time to watch this species from the binocular even; photography is almost difficult whenever in movement. Observation distance fluctuation was from 3 meter to 50 meter. The colour of grass (green) and Cheer (brown) do not match so it is not so hard to see probably due to the summer season.

Table-5.5 Calls and direct observation of Cheer

Number of call and direct observation	
Location	May-June, 2004
	15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 Seen
Sekung	
Titi	
Pangmbu	
Sarkho	
Pudhar	
Bunga?	
Tanje?	

♣ Additional call point

5.8 Relation with microclimate

Out of 25 days, we did not survey on four days due to heavy rainfall. In surveying period, twelve days were cloudy, six days were clear; two days were partly cloudy and single day were cloudy with

wind. The calling duration of Cheer depends on the weather (Table 5.7). Rainfall, overcast, wind and heavy cloudy decrease the calling frequency and duration.

Table 5.6 Calling behaviours of Cheer

Site	First morning	Second morning	Third morning	Median	Minimum duration of call	Maximum duration of call
	Starting time (ST)	ST	ST			
Sekung	4.54	5.20	-	5.26	3 Sec	3 Sec
Titi	-	-	-	-	-	-
Pangmbu	-	-	-	-	-	-
Sarkho	4.56	4.53	4.51	4.53	7 Sec	55 Sec
Pudhar	4.51	5.06	4.55	5.11	2 Sec	45 Sec
Bunga	-	5.44	4.54	5.04	5 Sec	20 Sec
Tangje	-	4.59	4.50	4.54	2 Sec	3 Min

Table-5.7 Relation of Call and weather

Location	Calling status				Mean call of the station	Weather		
	1 st day	2 nd day	3 rd day	1 st day		2 nd day	3 rd day	
Sekung	1	1	0	0.67	Cloudy	Cloudy	Clear	
Titi	0	0	0	0.00	Cloudy	Clear	Clear	
Pangmbu	0	0	0	0.00	Cloudy/Windy	Cloudy	Cloudy	
Sarkho	6	7	6	6.33	Cloudy	Cloudy	Cloudy	
Pudhar	4	1	1	2.00	Cloudy	Semi Cloudy	Cloudy	
Bunga	0	1	1	0.67	Cloudy	Clear	Semi Cloudy	
Tangje	0	4	2	2.0	Cloudy	Clear	Clear	

5.9 Permanent monitoring points

Positions, elevation, distance from the nearest settlement, aspect of call points were noted down and sites were painted by yellow and red colour (Table 5.8). Call sites were also shown by arrow in various places (Plate 12), which will help in future to reach in the area for the monitoring programme. Six sites were marked on the stone and remaining one marked on small tree.

5.10 Additional site observation

As per sampling design the team has to survey within the 5 blocks but the team added two additional sites (Table 5.9) beyond the block for the dawn call count census. Other two sites (Chayo and Thubo) were visited for the confirmation of Cheer. One-day call count was failed to confirm the species from the two sites (Chayo and Thubo).

5.11 Preparation of map

All map related to the study were prepared in the GIS section of the ACAP, Pokhara

Table-5.8 Description of the Call Point and marking of the area

Location	Block number	GPS Position	Elevation (meter)	Marking Symbol	Aspect	Marking place	Position of Base camp
Kobhang/Sekung/Pojho Kharka	CMLMB-5	N 28°40'56.7" E 83°35'09.5"	2840	CMB1-CP-1	West	Stone	N 28°41'00.7" E 83°35'53.5"
Kunjo/Titi/Lharkyo	CMLMB-4	N 28°39'29.2" E 83°36'39.8"	2740	CMB4-CP-1	South	Stone	-
Kunjo/Pangmbu	CMLMB-3	N 28°39'24.9" E 83°39'53.6"	3150	CMLMB-3 CP-1	South	Stone	N 28°39'27.5" E 83°39'51.9"
Kunjo/Sharkhyo/Tangtung	CMLMB-2	N 28°37'19" E 83°39'18.2"	2340	CMB-2 CP-1	South/ West	Stone	N 28°37'21.1" E 83°39'06.0"
Lete/Tikabang/Bungadanda	CMLMB-2	N 28°37'07.6" E 83°37'46.1"	2310	CMB-1 CP-1	North/ West	Small tree near dead tree	N 28°37'02.5" E 83°37'49.7"
Kunjo/Jhipra/Pudhar Kharka	Out of Block	N 28°37'30.1" E 83°39'53.2"	2550	NCP-1	South/ East	Stone	-
Kobhang/Khanti/Tangje	Out of Block	N 28°42'02.8" E 83°37'19.5"	2840	CMNB-CP-2	South/ West	Stone near abandoned field	N 28°42'05.4" E 83°37'18.5"

Table-5.9 calling status and additional site

Location	Calling status			Confirmation of call	Remarks
	1 st day	2 nd day	3 rd day		
Sekung	1	1	0	Call	
Titi	0	0	0	Feather	
Pangmbu	0	0	0	-	
Sarkho	6	7	6	Call and sight	
Pudhar	4	1	1	Call and sight	
Bunga*	0	1	1	Call	
Tangje*	0	4	2	Call	
Chayo♣	0	-	-	No	One morning was spent
Thubo♣	1	-	-	Yes	Calls from the east of Kali Gandaki which is 700 m far from the site

* Additional site for call point

♣ Additional confirmation site for Cheer

5.12 Off time information

- Although team has already given permission to survey in the area but team should informed to the security force when they move from one area to another.
- Altogether eight members were involved in the survey whenever team observed the Cheer first time small night party was organised in the forest.
- Main investigator was hanged in the steep while searching for the nest of Cheer. He survived even he was alone in that period.
- Women consume meat of Cheer during the delivery period.
- During study period a female of Cheer didn't fly when distance between observer and Cheer become 3 meter in nesting place.
- On the basis of peoples view in various places of Kali Gandaki valley seems like a paradise for the Cheer (found in every where) but it is not true.
- The feather of Cheer is also used in the tail of arrow bow.
- Lots of people in Mustang never seen Cheer; however it produced call around their home.

5.13 Transect

Transect walk was organized in the Tangje of Khanti area (3300 meter) from 7.30 AM to 9.30 AM. Two feather of Danphe and one feather of Cheer were collected during the walk. The initial mid and last position were recorded which are; (start) N28°42'05.4" E83°37'18.5", (mid) N 28°42'09.6" E83°37'13.7 and (last) N28°42'05.4" E83°37'18.5". Regular monitoring of transect will provide us the presence absence status of Cheer. Transect walk is also appropriate for those site where visit at dawn is risky due to security.

5.14 Discussion

5.14.1 Study of Cheer

5.14.1.1 Lelliott and Yonzon 1980

Study was carried out but failed to encounter the species in western part of Nepal.

5.14.1.2 Lelliott 1981

He reported 32 calling birds in between 2620m and 3170m altitude of Dhorpatan area with estimated population of 50 to 100 birds. He applied dawn call count census method in eight sites of the area.

5.14.1.3 Subedi 2003

He reported 127 to 212 birds in 21 km² of potential site of the same area where Lelliott had surveyed. He added additional nine points for the survey. Cheer population showed marginal decline in the long interval of 22 years but was statistically insignificant.

5.14.1.4 Acharya and Thapa 2003

Preliminary study was carried out in lower part of Mustang district namely Kowang, Lete and Kunjo VDC. During the visit to these areas, three calls were heard in two consecutive mornings at Ghansa (east of Ghansa). For further study of the Cheer in the area 12 sites have been identified. In Ghansa

and Kowang five permanent points have been fixed on the basis of field visit, local information, habitat analysis and literature review. This preliminary study outlined that livestock grazing, forest fires and snaring threaten the Cheer in the area.

5.14.2 Detail discussion

In Nepal Cheer Pheasant occurs from the western boarder to Kali Gandaki valley in east (Inskipp and Inskipp 1991). Lelliott 1982 has also reported that this species also occurs from Kasmir along the line of the Himalayas to central Nepal between 1400 and 3000 meters altitude. On the basis of quantity of snared bird sold in Kathmandu, it was not uncommon in the hill north of Kathmandu valley (Scully 1879 cited in Birlife International 2001). In 1894 Nepalese brought down live birds to Darjeeling but there have been no further reports to suggest that this might be the case (Roberts 1980 cited in Birlife International 2001). Distribution of Cheer Pheasant supposed to be limited in the Kali Gandaki for eastern part, however preliminary study carried out by the ACAP, the study team heard calls of Cheer in the east of Ghansa (Acharya and Thapa 2003). Although the area was east but it is just near to Kali Gandaki river (opposite of Florida Guest house Upper Ghansa). Bird Conservation Nepal team suspect presence of Cheer in Pipar (upper Seti and north from the Ghansa) (Baral et al. 2001) however further confirmation still waiting. Recent study found that the Cheer Pheasant is present at 4 km east of Kali Gandaki river. Sarkhu and Pudhar are the area of Kunjo VDC where team surveyed first time and recorded species through call and direct observation in nest. Only Lete and Ghansa (west part) are supposed to the potential habitat of Cheer in past and individual trekkers have seen Cheer from the 1982-1996. Five sites, where the study team confirmed the presence of Cheer, were not mentioned in the available literature.

It is vulnerable and endemic to Indian subcontinents. It is protected birds of Nepal under the National Park and Wildlife Protection Act 1973 (HMG 1973). Cheer is also protected bird of India. Local people do not know the importance of species as well as the legal status of this bird. This might be due to lack of adequate attention towards species conservation programme of ACAP.

In Ghansa area Cheer observation sites are verbally assigned to different hotels. Most hotels have their own local guide who rarely assists the guest of the other hotel during field visit to observe the Cheer (Acharya and Thapa 2003). Many trekkers and visitors visit the Ghasna area for the observation of Cheer however they did not visit the area beyond the Ghansa. Study team (2004) confirmed the occurrence of Cheer in the east and 10 km north of Ghansa (Tangje/Khanti/ Kobhang VDC). The occurrence horizon with in the Kali Gandaki valley has been increased so the eco-tourism could be promoted. Conservation of Cheer in the area only possible whenever this species could be relate with tourism.

The district administration office collected all the local guns so hunting is not major problem as before however local people have reported on illegal hunting through rope trap. (Acharya and Thapa 2003).

Wildlife depredation is the major source of people wildlife conflict in the area. A total economic loss \$54861 is reported from Kaligandaki valley, is due to wildlife predation on livestock and crop in 1999 (Acharya 1999). It has been found that mammals and birds are both responsible for the depredation. Total 13.73% depredation found in the study area (out of total area), which comprises 8.73% from the bird (Acharya 1999). However Cheer is not involved in depredation in the area. Army arrested illegal trader of cats in Jomsom (common leopard and leopard cat) with 22 pelts who

tried to supply them to Tibet via Lomanthang (Thapa 2003). This area is suffering from the hunting and snaring from the time immemorial (*Per comm.* Ratna Man Sherchan, Kowang). Not only professional hunters but also primary level students engage in killing of the Pheasants in the area. A twelve years child from an occupational caste showed us the portion of wing of Cheer, which he had killed last year by his catapult. People use the flesh of Pheasant during the delivery period with assumption of quick recovery. After the implementation of ACAPs activities in the area, the trend has been decreasing but not stopped.

Cheer Pheasant is still shot and snared for local consumption in India and egg stealing is common forcing pairs to renest or abandon nesting altogether (Kaul 1989 and Sharma et al. 1990 cited in Birdlife International). A total of 13 million birds were exported from India between 1970 and 1976. The export of live birds from India was banned in 1990. Most of the 17 species of Pheasant that occur in India are protected from capture by national and international legislation (Ghose et. al 2004). In the study area Cheers are threatened through out its habitat not only by hunting, snaring, and illegal trade; but also by the habitat destruction as well.

It was found at Ghansa on steep, craggy hillsides supporting scrub and stunted tree and at Dhorpatan it occurred in burnt, felled and cut over area with secondary growth in forest containing pine, juniper, fir and rhododendron (Lelliott 1982, Inskipp and Inskipp 1991). In general (Himanchal Pradesh) forest covers the slopes with a northerly aspect, while south facing slopes supports grassland, usually with patches of forest or scrub in gullies and depressions. The grasslands are probably dependent on regular cuttings and burnings continued existence (Gaston and Singh 1980). Slope more than 27°, scattered tree of *Pinus roxburghii* and *Cupressus torulos*, Grass, Cliff are the habitat of the Cheer Pheasant in the study area. Due to the slope and cliff it is safer than others habitat however burning is common phenomena of the area. Southern slope was found to be more adoptable for Cheer followed by west and north. Local people have analysed the Cheer is decreased in Khanti and Jhipradeurali area due to the burning. They burned the area to get green shoot for their livestock.

Given its patchy distribution and specialised habitat requirements, globally it is thought that number of Cheer less than 10000 individuals (McGowan and Garson 1995 cited in Birdlife International, 2001) and the total could conceivably be much lower perhaps fewer than 5000 individuals (Kalsi 1999 cited in Birdlife International) in isolated pocket of habitat, a circumstance with alarming implications for conservation management (McGowan and Garson 1995 cited from Birdlife International 2001). Many populations are now thought to contain fewer than 10 individuals in isolated pockets of suitable habitat (Islam and Rahmani 2002). The behaviours of Cheer Pheasants suggest that they normally occur in-group of up to dozen individuals. Density of Cheer is estimated to six pairs in a km² (Humes and Marshal 1887, Finn 1915, Ali and Ripley 1969). Population estimated between 50 to 100 birds in the Dhorpatan area (Lilliott 1982). Total population size in the valley to be 170-276 and with correction factor it was 127-212 birds (Subedi 2003). In study area (based on Lelliott) total mean call of the study area was found 11.67 birds, so the bird density becomes 4.42 birds /km². Altogether 98 breeding population found in the area. Descriptive analyses estimate the population of 85 to 111 birds in the Kali Gandaki valley. The potential site of the Kali Gandaki valley and the Dhorpatan is almost equal but population is fewer (more than 50%) in Kali Gandaki valley.

Cheer Pheasant, along with other birds can be tamed or grown in private sector legally. It requires Nrs. 5000 for wildlife farming permission charge and Nrs.5000 for seed bird charge (DNPWC

2003). This policy is useful for the conservation of species, which are threatened. Although Chail Wildlife Sanctuary has a good population of Cheer and it is facing tremendous biotic pressure from the inhabitants of 120 villages situated inside the sanctuary. Efforts to captive breeding of the species in the sanctuary have not yet been successful (Akhtar and Narang 2004). We should not forget the failure project in Pakistan, which was design for the reintroduction of Cheer. Government should confirm what to do, if people care and increase the Cheer Pheasant in their home.

The clutch size is eight and eggs are as big as the size of domestic fowl and of brownish/off white colour. The hatching success has been recorded as 78.12%, from which 51.79% chicks survive. Breeding and survival success were 40.63% and 59.11% respectively (Bista et al. 2004). High hunting and low breeding success seems to be involved in the decline of the Cheer population in these areas (Garwal Himalaya of India). The study team observed a Cheer nest with 7 eggs in Pudhar Kharka. The seven eggs were smaller than the domestic fowl, having approximately 35-grams/egg weights. Nest found in the base of big stone in vantage point of open habitat.

Clearly the only way to photographs a Cheer Pheasant would be combination of luck, tremendously hard work and infinite patient (Lelliott 1982). The study team tried to trap Cheer in the camera from the initial days. Covering a cameraman by leafs of tree is not possible because Cheer is very sensitive species. We were just able to see but not trapped in camera. We found Cheer incubating in the nest. It did not fly away even cameraman reach just 3 meters away from the nest. We have to confirme whether the photo is first for Nepal or not. But team confirmed that wild photos are rare in the world.

Preliminary survey (7-17 September, 2003) carried out by the ACAP has identified 12 potential sites within three VDCs of lower Mustang for the Cheer monitoring. However the presence of Cheer has been confirmed only in Thulomela of Ghansa area. Three calls were heard in two consecutive mornings (0535 to 0545 AM) during the preliminary survey in September 2003 (Acharya 2004). The four sites, which were identified during the preliminary survey (2003), were not visited due to the security reason. Monitoring of Cheer in the Ghansa area can be done after choosing the appropriate hotel from where call can be heard i.e. Eagle Nest Hotel of lower Ghansa and Florida Guest House of Upper Ghansa.

5.15 Physical Threats

5.15.1 Population pressure

Altogether 14580 people living in the study area and they have direct and indirect dependency with the Cheers habitat. Collection of grasses, livestock grazing, collection of bamboo shoots and collection of medicinal plant in those sites are common phenomena. Individual people occupy the land having area 0.014 Square kilometres in the area.

5.15.2 Forest cover increase

The impact of ACAP on forest conservation has already been observed. Forest cover in some of the watershed within the ACA, which had decreased by 10.7% between 1960 and 1978, went up by 15.4% between 1978 and 1999 (Poudel 2001). The abandoned areas have become greenery and the forest coverage increased in scattered area after the interruption of ACAP. ACAP has given the authority of forest protection and utilization to the local people through the Conservation Area Management Committee (CAMC). Detail study on the increase in the coverage of Kali Gandaki watershed has never been carried out. People have detected Cheer above the Kunjo village for many years but not now and the sites have more trees after the conservation area declaration (*Per. comm.* Suresh Thapa, ranger of ACAP Jomsom). It can be confirmed after the detail study in the area. As literature describes increases of coverage are not good for Cheer by its nature it required scattered tree.

5.15.3 Forest fire

Out of 7 sites 6 sites were found affected by the forest fire. Khar and Bamboo are very susceptible to fire. People fire on it in April to get green shoot for their livestock (Plate 7 and 16). It is interesting that Cheer only found in such burned area. Burning not only in such grassland is also common in the forest area. Jhipradeurali and Khanti losses it's Cheer population due to forest fire (*Per.comm.* Ratna Man Sherchan, Chairman of CAMC, Kowang).

5.15.4 Hunting and snaring

In our camp when small boys know that we are for the Cheer survey in their village he showed us the portion of wing of Cheer, which has been killed by his catapult (Plate 5). He is just 12 years old from disadvantage group from Titi village. We collect it for the museum specimen for the Jomsom museum. Amateur and curiosity hunting also threaten all Pheasants. Hunting from the gun is not found in the area because security force has collected all the guns from the village. So people mostly children and young use the catapult near village however shepherd placed snaring near the corral (*per. comm.* Hanse from the Jhipradeurali). No records of captive breeding in the area. Altogether 21 professional hunters were found in the area and now they told that they are passive in such hunting process due to the security reason of the country. Out of them one hunter spent about 30 years in this field and hunts lots of Pheasant during his life time only in a Kunjo VDC (Figure 5.2). The area has already loss lots of Pheasant number and team suspected that hunting still exists in the area.

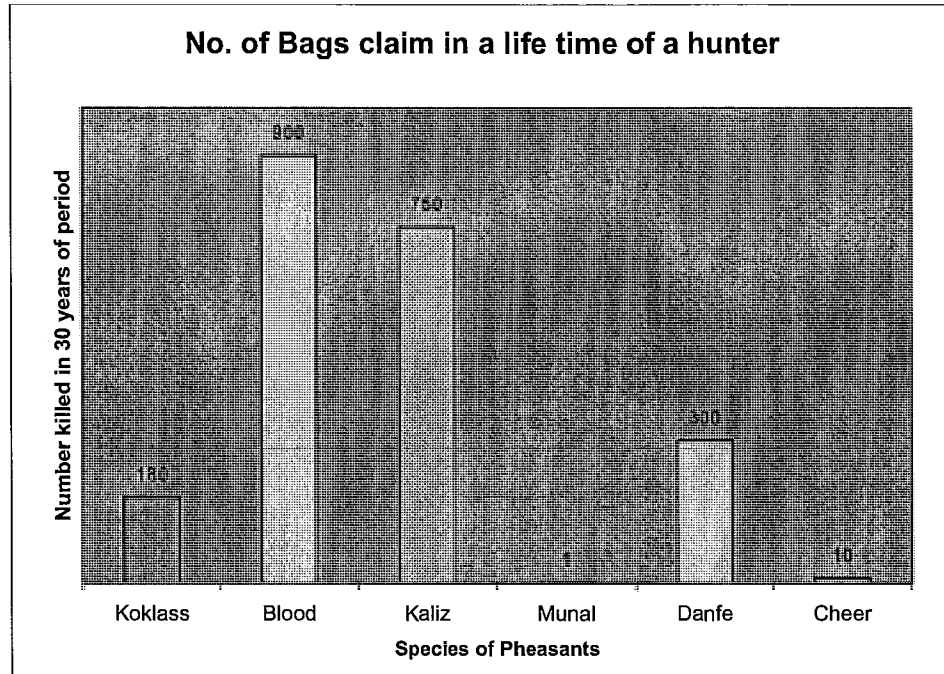


Figure-5.2 (Data based on PRA tools and related to Kunjo VDC only)

5.15.5 Livestock Grazing pressure

Whenever team shoot out Cheer through camera immediately herd of sheep entered into the nest and Cheer flew downward. Corral is just 30 meter away from the nest. In many place of Cheers habitat sheep and goat graze like Armyworm in the crop field so there is possibility of destroying nest and disturb their habitat (Plate 6, 7, 8 and 10). Sheep, Goat, Yak are the livestock, which directly affect to Cheer whereas other livestock has some indirect effect on Cheer (Table 5.10). The number of livestock should be control by providing them (local people) breed species. Until and unless number and grazing trend is documented in the area we will be unable to manage the habitat of Cheer in the area.

Table-5.10 Number of livestock

VDC	Number of livestock								Total
	G	S	C	B	H	M	Y	D	
Lete	715	1207	383	59	40	136	102	-	2642
Kunjo	535	542	546	7	13	69	-	-	1712
Kobhang	434	335	329	5	46	84	767	7	2007
Total									6361

Source: District Livestock Service Development Office, Jomsom, Mustang
District Agriculture Development Office, Jomsom, Mustang

Index

G- Goat S- Sheep C- Cow
B- Buffalo H- Horse M- Mule
Y- Yak D- Dzopa

Chapter-VI

RECOMMENDATIONS

6.1 Detail study and regular monitoring

Regular monitoring is needed to confirm the presence and absence of Cheer Pheasant in the lower Mustang. However, more intensive study is needed to get the confirmed knowledge on its abundance within the area. Some sites were even not surveyed such as Hwang Kharka near from Kokhetahnti, Thulomela of Ghansa (very sensitive for security), Ratomate of Ghasna (sensitive), and Above Tukuche. Renowned bird watcher of Ghansa Nabin Nepal's father has told us that he has heard Cheer from the Marpha and Dhumba tal (near by Jomsom). Call points identified during the study period and additional sites should be survey in future.

6.2 Demarcation of potential Cheers habitat

Cheers are patchily distributed in the area and most of them affected by the livestock grazing and forest fire. Whether the livestock pressure and forest fire affecting to species or not, will be answered when only two sites can be demarcated physically. This can be possible through the ACAP with the support from CAMC and local people. Such plot should survey at least two times in a year (April/May and November/ December).

6.3 Forest fire control training

Awareness on the effect of forest fires to the birds should be given to the shepherd. Training should focus on the local youth, student and shepherd of the area. Fire control and preventive work (i.e. fire line construction, additional forest guard), which can reduce the magnitude of effect, should be applied.

6.4 Conservation education

"Conservation education is at the heart of the ACAP programme, both for local people and visitors. ACAP has produced a 'minimum impact' code that encourages tourists to conserve firewood, stop pollution and to be a true guest – one who does not abuse the local environment or culture. The Conservation Education and Extension programme also includes conservation education classes in schools, conservation awareness camps, development of educational materials and mobile audio-visual extension programmes" (Inskipp and inskipp 2003).

This is not sufficient when we talk about the conservation of wildlife, mainly birds. ACAP has focused its formal education program in class 6, 7 and 8 where as we found that primary level student are involved in Pheasant hunting by catapult and also involve in a blazing forests. Nature hiking, which is applied in the field by ACAP, should slightly modify to make aware about birds important. Bird watching trip to school and youth club should be managed. Bird researcher always love the birds because they know the birds, they watch the bird and they enjoy with the bird so bird awareness programme and bird watching programme should be managed in such area.

6.5 Captive breeding

The birds release in the Margalla hill of Pakistan did not survive, despite the presence of abundant suitable habitat (Cited in Subedi 2003). After continuous efforts and the removal of some predators in 1986 and 1988, 10-15% survived for a full year or more (Cited in Subedi 2003). Although Chail Wildlife Sanctuary has a good population of Cheer it is facing tremendous biotic pressure from the inhabitants of 120 villages situated inside the sanctuary (Akhtar and Narang 2004). Efforts to captive breed the species in the sanctuary have not yet been successful. This is not the immediate task in the study area. Initially we have to obtain sufficient data on this species for several years, ACAP should think on it from now. The government of Nepal has recently published wildlife farming, breeding and research policy 2003 through this legal procedure ACAP should start to farm this species in a small scale. Farming should be done in the field not in Pokhara or Kathmandu. In case of species extinction or declining in the area, those birds can be release in its natural habitat.

6.6 Promotion of bird tourism

In Ghansa area Cheer observation site verbal ownership has been assigned to different hotel. Local guide related to one hotel rarely accompany to others hotels guest (Acharya and Thapa 2003). Most of visitors stay in Ghansa for Cheer observation but now it becomes more sensitive to move in the habitat of the Cheer. The site, which were identify during study are very safe and easy to reach. ACAP has prepared brochure for all VDC except Kunjo, in such village bird tourism could be promoted. ACAP should prepare brochure related to birds for Kunjo and Khanti area. The website of King Mahendra Trust for Nature Conservation should be rearranged and place bird information. Informative sign posting should be placed on potential habitat of the Cheer.

Chapter-VII

CONCLUSION

Data were collected and analysed and total mean call from the sites were multiplied by the factor of 0.75 derived by Young et al., produced the 4.42 breeding birds/km² in the lower Kali Gandaki valley of three VDC. Altogether 98 breeding population has been estimated.

On the basis of descriptive analysis, mean density was 4 birds/km² and ranged 4 to 5 birds/km² with applying the correction factor. With the help of potential habitat, extrapolated the total population size of the species in the valley (covers three VDC of Kali Gandaki watershed) to be 113 to 148 birds and with correction factor it was 85 to 111 birds.

The distribution of Cheer found to east and north of the Kali Gandaki river. Out of seven sites, Cheer was confirmed in five sites and all are new habitat for the Cheer in the area. Altogether 14 Cheer were observed and one female was captured by camera.

The habitat and the Cheer are threats by grazing pressure, burning and hunting and snaring. Educational programs, detail study, regular monitoring activities were recommended. ACAP should focus its awareness program to the local herders and student of primary level. Experience from the positive impact through snow leopard conservation committee from Manang district, ACAP could formed Pheasant conservation committee in the lower belt of Mustang district

Protocol for the survey of Cheer Pheasant made by ACAP needed slight modification. For the shy and patchily distributed species i.e. Cheer Pheasant, survey should focus wherever they found instead of division of area into many blocks and plots. The current protocol is appropriate for the species distributed evenly in the study area. On the basis of data obtained from the call count total population can be extrapolated. During the extrapolation process potential habitat should be find out, so that our result could not be overestimated or underestimated.

References

- Acharya, R.S. (1999). Wildlife depredation in Jomsom sector. Unpublished report submitted to Unite Conservation Office, Jomsom.
- Acharya, R.S. (2004). Survey of Globally endangered Cheer Pheasant (*Catreus wallichii*) in lower Kali Gandaki valley, Mustang, Nepal. A research study proposal submitted to School of Environment Management and Sustainable Development, Kathmandu, Nepal.
- Acharya, R.S. and Thapa, Suresh. (2003). Preliminary survey of Cheer Pheasant (*Catreus wallichii*) in lower Kali Gandaki valley, Mustang.
- Akhtar, N. and Narang, M.L. (2004). Status and distribution of Cheer Pheasant in Chail wildlife Sanctuary, Solan, Himanchal Pradesh. Abstract, Third International Galliforms Symposium, 5-10 April, India.
- Anonymous.(2001).<http://www.gbwf.net>
- Ali, S. and S. D. Ripley. (1969). *The birds of India and Pakistan*, Vol 2. Oxford University press, Bombay.
- Biodiversity Profile Projects.(1995). Biodiversity Profile of High Mountains and High Physiographic zones. Biodiversity Profiles Project Publication No. 14. Department of National Parks and wildlife Conservation, Ministry of Forest and Soil Conservation. His Majesty's Government of Nepal, Kathmandu
- Baral, H.S., Gurung, P.C., Kaul, R. and Ramesh, K.(2001). Santel Galliformes Survey: a possible extension of Pipar Pheasant Reserve, A report to the World Pheasant Association and Annapurna Conservation Area Project.
- Birdlife International. (2001). *Threatened Birds of Asia*. BirdLife International, Cambridge : 966-980.
- Bista, M.S., Kathiat, B.S. and Phurailatpam, S.(2004).Breeding success and conservation of Cheer Pheasant in Garwal Himalaya. Abstract, Third International Galliforms Symposium, 5-10 April, India.
- Del Hoyo J., Elliot, A. and Sargatak, J.(Eds.)(1994). Handbook of the Birds of the world. Vol.2. New World Vulture to Guinea fowl, Lynx editions, Barcelona.
- DNPWC. (2003). Wildlife farming, breeding and research policy. His Majesty Government, Ministry of Forest and Watershed Conservation. Kathmandu, Nepal.
- Finn, F. (1915). *Indian sporting birds*. Francis Edward, London.

- Fuller, R. A. and Garson, P. J. (eds.) (2000). Pheasants Status Survey and Conservation Action Plan 2000-2004. WPA/Birdlife/SSC Pheasant Specialist Group. IUCN, Gland. Switzerland and Cambridge, UK and the World Pheasant Association, Reading, UK. vii + 68pp.
- Gaston, A. J. (1980). Census technique for Himalayan Pheasant including notes on individual species, Journal of WPA. pp 40-53.
- Gaston, A. J. and Singh, J. (1980). The status of the Cheer Pheasant in the Chail wildlife sanctuary Himanchal Pradesh, WPA journal V, pp 68-73.
- Ghose, D., Menon, V. and Kumar, A. (2004). A review of the trade in Pheasant in India. Abstract, Third International Galliforms Symposium, 5-10 April, India.
- Grimmett, R., Inskipp, C. and T. Inskipp. (1998). *Birds of Indian subcontinent*. Christopher Helm, London.
- Grimmett, R., Inskipp, C. and T. Inskipp. (2000). *Birds of Nepal*. Prakash Books Depot. New Delhi India
- His Majesty Government. (1973). National Park and Wildlife Protection Act. His Majesty Government, Department of National Park and Wildlife Conservation, Kathmadnu.
- Hume, A.O. and C.H.T, Marshall. (1878). *The game birds of India, Burma and Ceylon*. Vol. 1 (Publish by authors), Calcutta.
- Inskipp, C. and Inskipp, T.P. (1991). A guide to the *Birds of Nepal*. Second edition, Christopher helm, London.
- Inskipp, C. and Inskipp, T. (2003). Bird conservation priorities of the Annapurna Conservation Area. Report to UNEP-WCMC/King Mahendra Trust for Nature Conservation/Annapurna Conservation Area Project
- Islam, Z.M and Rahmani, A.R. (2002) (compile and eds.). ENVIS newsletter: Avian Ecology and Inland Wetlands, Vol 7.No.1 and 2.2002, Bombay Natural History Society.
- Lelliott, T. (1980). Cheer Pheasant in the west central Nepal. Journal of WPA VI. pp 89-94.
- Lelliott, A.D. (1981). A report on 1981 field session in Nepal. Report submitted to WPA. UK (Unpublished)
- Lelliott, T. (1987). Censusing the Cheer, Notes and news, Cage and Aviary Birds. pp:24-25
- Lelliott, A.D. and Yonjan, P.B. (1980). Studies of Himalayan Pheasant in Nepal, Journal of WPA V. pp: 13-30

- Poudel, K.P. (2001). Resource Utilization and Management Strategy in the selected watershed of Annapurna region. Submitted as a Ph.D. Thesis to the Department of Geography, University of Delhi.
- Subedi, P. (2003). Status and Distribution of Cheer Pheasant (*Catreus wallichii*) in Dhorpatan Hunting Reserve, Nepal. Report Submitted to Department of National Park and Wildlife Conservation, Kathmandu.
- Thapa, K. (2003). Trade on Snow leopard in Manang, Report submitted to WWF Nepal.
- Young, L., Garson, P.J. and Kaul, R. (1987). Calling behaviour and social organization of Cheer Pheasant (*Catreus wallichii*): Implication for survey Technique. Journal of WPA 12:30-43

Plates

Plate 1: Female Cheer on nest, Pudhar Kharka of Kunjo



Plate 2: Female Cheer at 2631 meter



Plate 3: Survey team right from Raju Acharya, Suresh Thapa, Bishnu Paudel, Local guide and porters

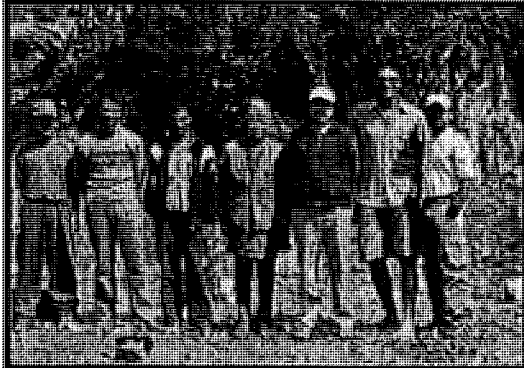


Plate 4: Discussion with local sheep herder for the confirmation of Cheer in the area



Plate 5: A 12 years old boy showing a portion wing of Cheer killed by him last year



Plate 6: Grazing goats in the Cheers habitat

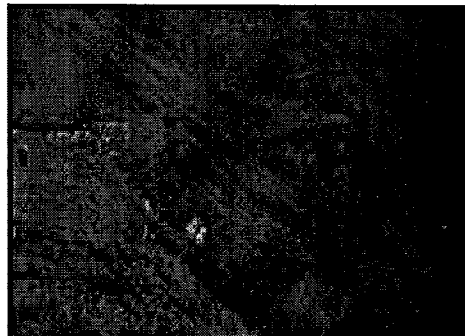


Plate 7: Forest fire and grazing are common in the area

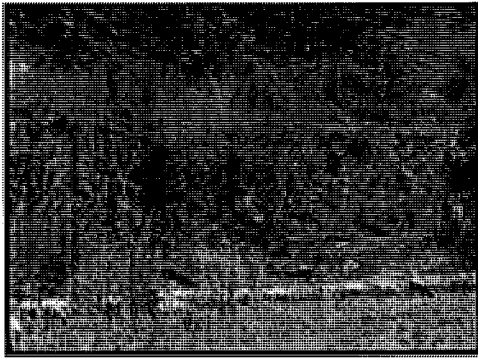


Plate 8: Yaks also share Cheers habitat

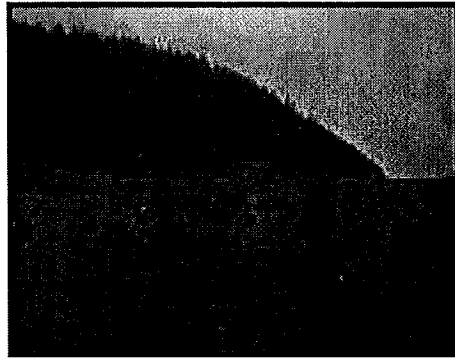


Plate 9: Eastern part of Ghansa



Plate 11: Survey team also faced the traffic jam by the sheep



Plate 10: Nest of Cheer was found just below the stone.



Plate 12: Study sites were marked permanently by colour and GPS

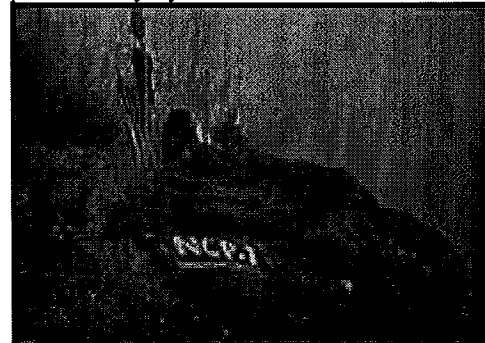


Plate 13: Team Scan the habitat of Cheer



Plate 14: Sit were affected by forest fire



Plate 15: Catapult is commonly used by local Children for killing birds



Plate 16: Researcher and local guide recording the call of Cheer



Plate 16: Forest fire Near the Yak corral in Kunjo

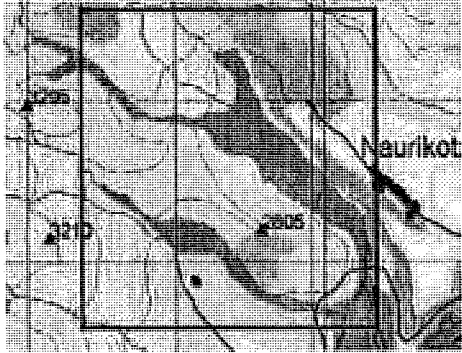


Plate 17: Habitat of Cheer, 10 km north of Ghansa in Khanti

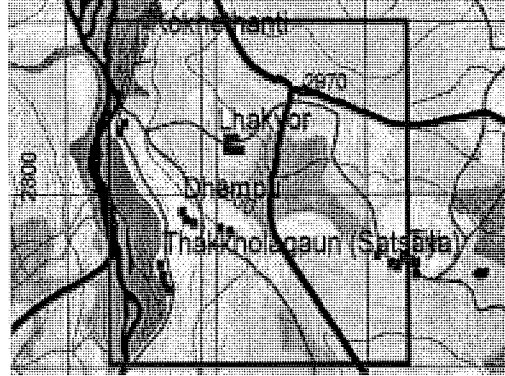


Cheer monitoring blocks

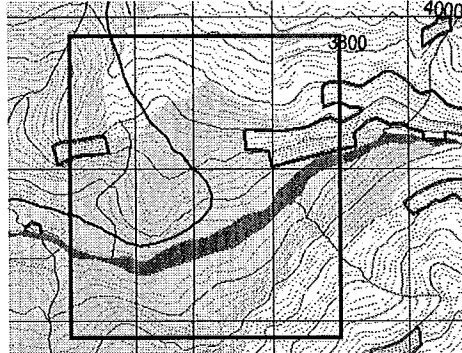
Block 1



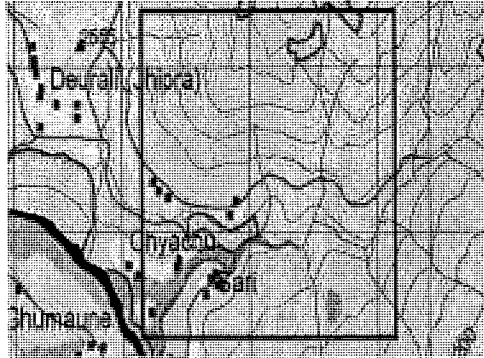
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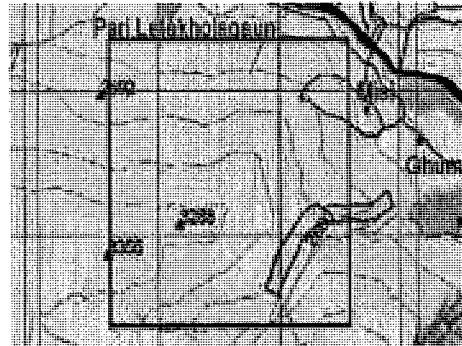
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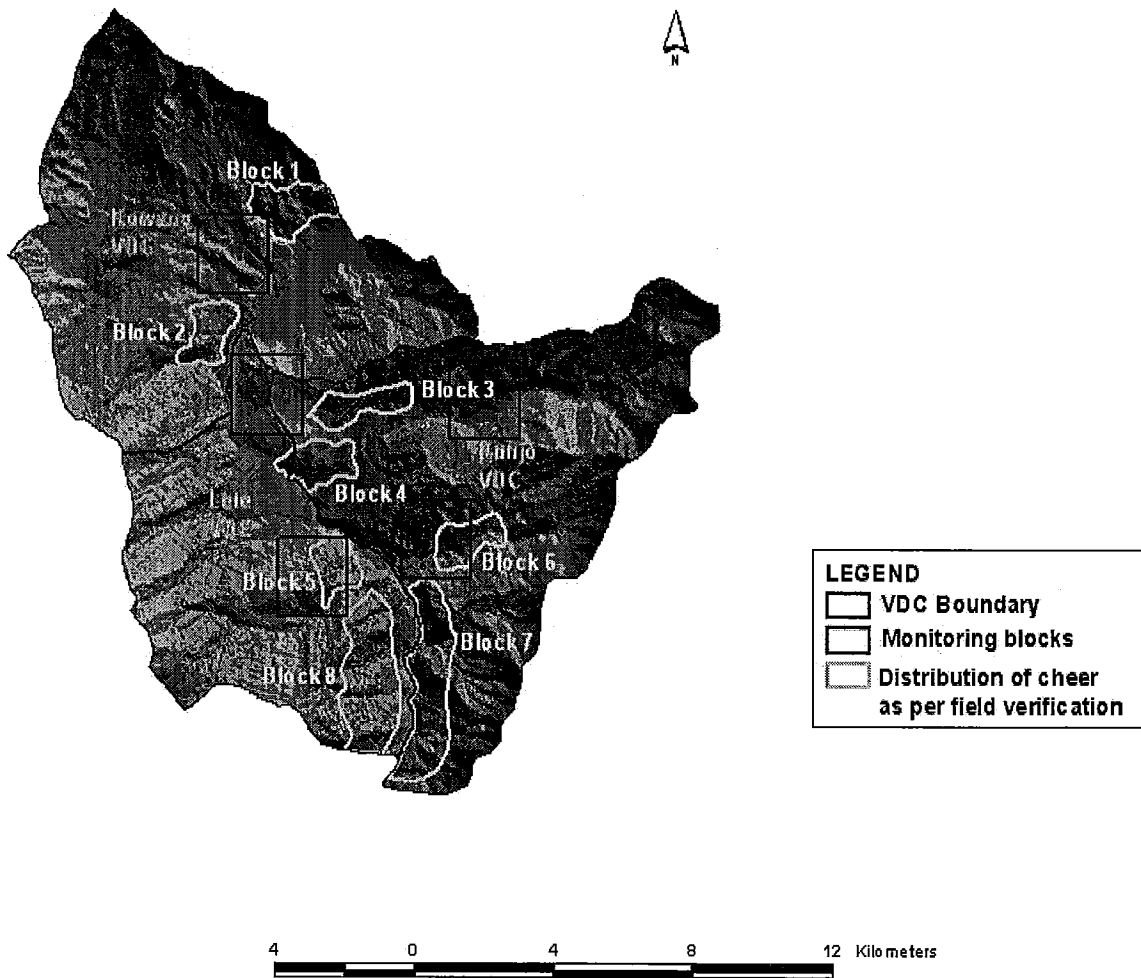
Block 4



Block 5



Cheer Monitoring Blocks and Distribution of Cheer as the field verification



Appendix-1

Habitat analysis form for Cheer Pheasant

Site code:Date: Area managed by:

Time: Investigator:

Physical Parameter

Altitude:

Latitude:

Slope:

Longitude:

Aspect

South.....North.....East.....West.....

Permanent River/Stream and its distance

South.....North.....East.....West.....

Habitat/Vegetation

Vegetation type

Barren:

Grassland:

Forest:

Other specify:

Shrub-land:

Percentage of crown cover

0-25

50-75

25-50

75-100

Percentage of ground cover

0-25

50-75

25-50

75-100

Terrain and land surface

Cliff

Summit/top

Stream bed

Rolling terrain

Broken terrain

Swampy/Marshy land

Bowl

Landslide

Level Ground

Types of Human Impact

Hunting/ Snaring

Fodder collection

Timber harvesting

Trail

Leaf litter/Forest residue

Firewood /Collection

NTFP collection

Fire

This year

Last year Medium

Earlier

None

Some

Much

Grazing intensity Light

Medium

Heavy

Livestock type

Cow/Buffalo

Horse/Mule

Goats/Sheep

Others

Human settlements around sites and distance

Permanent

Temporary

Goth (cattle cottage)

Summer village

Level of Human impacts

None

Some

Much

Major species of tree:

Major species of NTFP:

Other common neighbour birds:

Other common mammals:

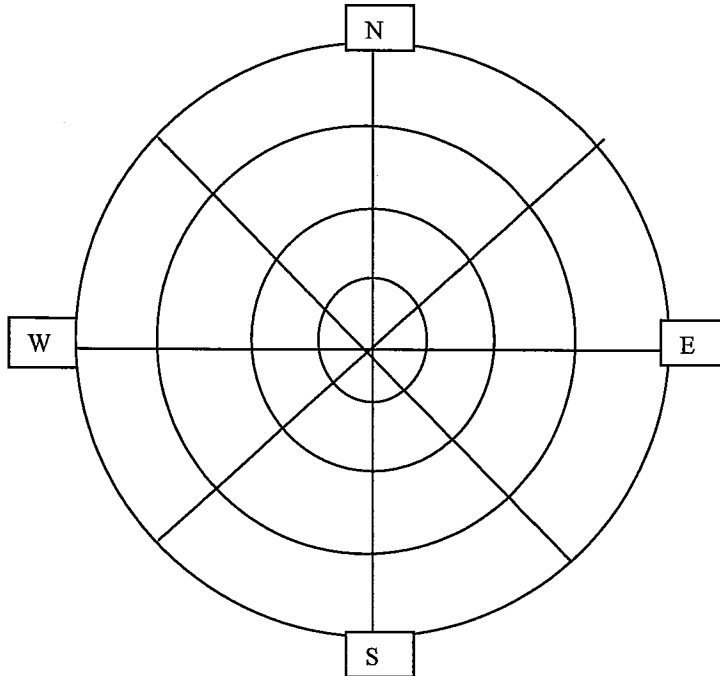
Appendix 2 Schedule of the study

S.N.		Date	Place	Activities
1	14	2/1/2061	Pokhara to Jomsom	Arrival and Planning for the field, arrangement of logistic support
2	15	2/2/2061	Jomsom to Kobhang	discussion about the Cheer site, rest
3	16	2/3/2061	Kobhang to Sekung Tal	Preliminary site visit, Identification of call point
4	17	2/4/2061	Sekung Tal	Survey by call count method
5	18	2/5/2061	Sekung Tal	Survey by call count method
6	19	2/6/2061	Sekung Tal	Rest
7	20	2/7/2061	Sekung Tal	Rest
8	21	2/8/2061	Sekung Tal to Nupsang Kharka	Survey and move to nest site
9	22	2/9/2061	Nupsang Kharka to Titi	Identification of Call Point
10	23	2/10/2061	Lharkyo of Titi	Survey by call count method
11	24	2/11/2061	Lharkyo of Titi	Survey by call count method
12	25	2/12/2061	Lharkyo to Pangbu	Identification of Call Point and rest
13	26	2/13/2061	Pangmbu	Survey by call count method
14	27	2/14/2061	Pangmbu	Survey by call count method
15	28	2/15/2061	Pangmbu to Chayo	Check whether Cheer present or not
16	29	2/16/2061	Chayo to Sarkho	Identification of call point
17	30	2/17/2061	Sarkho	Survey by call count method
18	31	2/18/2061	Sarkho	Survey by call count method
19	1	2/19/2061	Sarkho to Pudhar Kharka	Identification of call point
20	2	2/20/2061	Pudhar Kharka	Rest
21	3	2/21/2061	Pudhar Kharka	Survey by call count method
22	4	2/22/2061	Pudhar Kharka	Survey by call count method
23	5	2/23/2061	Pudhar to Kyuthumbe	Check wheather Cheer present or not
24	6	2/24/2061	Kyuthumbe to Bunga	Identification of call point
25	7	2/25/2061	Bunga, Tikawang	Survey by call count method
26	8	2/26/2061	Bunga, Tikawang	Survey by call count method
27	9	2/27/2061	Bunga to Larjung	Discussion about the Cheer site, rest
28	10	2/28/2061	Larjung to Tangje	Identification of call point
29	11	2/29/61	Tangje	Survey by call count method, Transect walk
30	12	2/30/61	Tangje	Survey by call count method
31	13	2/31/61	Tangje to Jomsom	

Appendix-3 Vegetation and mammals in the habitat of Cheer

Species	Pojho Kharka of Sekung	Lharkyu of Titi	Pangmu kharka of Kunjo	Tangtung, Sarkho	Pudhar	Bunga	Tanje
Vegetation							
<i>Pinus roxburghii</i>	√	√	√	√	√	√	√
Ghekar	√	-	-	-	-	-	-
<i>Quercus semicordata</i>	√	-	-	-	-	-	-
Gunyli	√	-	-	-	√	√	-
Bachaino	√	-	-	√	√	-	-
<i>Hippophae salicifolia</i>	√	-	-	-	-	-	-
<i>Taxus baccata</i>	-	√	-	-	-	-	-
<i>Cupressus torulosa</i>	-	√	-	-	-	-	√
Halko	-	√	-	-	-	-	-
Kisin	-	-	√	-	-	-	-
Tsuga spp	-	-	√	-	-	√	-
<i>Abies pindro</i>				√	-	-	-
Pangro				√	-	-	-
<i>Desmodium elegaus</i>	-	-	-	√	-	√	-
Rhododendron spp	-	-	-	√	-	√	-
<i>Juglans regia</i>	-	-	-	-	√	-	-
<i>Betula alnoides</i>	-	-	-	-	-	√	-
Bhakimlo	-	-	-	-	-	√	-
Goban	-	-	-	-	-	√	-
Lokar	-	-	-	-	-	√	-
Mammals							
Barking Deer <i>Muntiacus muntjack</i>	√	√		√	√	√	-
Jharal <i>Hemitragus jemlahicus</i>	√		√	√	√	-	-
Ghoral <i>Naemorhedus goral</i>	√	√	-	√	√	√	√
Musk Deer <i>Moschus chrysogastor</i>	√	-	-		-	-	-
Himalyan Serow <i>Naemorhedus sumatraensis</i>	√	-	√	-	√	-	-
Common Leopard <i>Panthera pardus</i>	√	-	√		-	-	-
Himalayan Black Beer <i>Selenarctos thibetanus</i>	√	√	√	√	√	-	-
Porcupine <i>Hystrix</i> spp	-	√	-		-	-	-
Common Langur <i>Presbytis entellus</i>	-	√	-	√	√	√	-
Blue Sheep <i>Pseudo nayur</i>	-	-	√	-	-	-	-

**Appendix 4 Dawn Call counts Census Method Lower Mustang
Format**



<i>Birds</i>	Calling time 1	Calling time 2	Calling time 3	Calling time 4	Minimum Call duration	Maximum call duration
C1						
C2						
C3						
C4						

<p>Date:</p> <p>Observers Name:</p> <p>Name of Location:</p> <p>Site/Point no:</p> <p>Starting time:</p> <p>Starting Temperature:</p> <p>Finishing time:</p> <p>End Temperature:</p>	<p><i>Weather: cloudy/rainy/windy</i></p> <p>Time of first call:</p> <p>Time of last call:</p> <p>Position:</p> <p>Altitude:</p> <p>Time/distance from the nearest Settlement:</p>
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Appendix 5, Coordination of the corner of each block**Block 5**

Corner	X	Y
1	83.58405186	28.68032952
2	83.58398060	28.69835806
3	83.60442788	28.69841938
4	83.60449564	28.68039080

Block 4

Corner	X	Y
1	83.593774868	28.64804458
2	83.59367917	28.66607322
3	83.61416351	28.66613314
4	83.61422952	28.64810445

Block3

Corner	X	Y
1	83.65740316	28.64715100
2	83.65734454	28.66517977
3	83.67782886	28.66523005
4	83.67788397	28.64720124

Block 2

Corner	X	Y
1	83.64349554	28.61505066
2	83.64343455	28.63310266
3	83.66389677	28.63315495
4	83.66395426	28.61510292

Block 1

Corner	X	Y
1	83.60721262	28.60621150
2	83.60714553	28.62424230
3	83.62763098	28.62430013
4	83.62769458	28.60626928

