

A study on the status, distribution, key threats & related conservation aspects
of Red-breasted Hill-Partridge (*Arborophila mandellii* Hume)
in Singalila National Park and Buxa Tiger Reserve, West Bengal

FINAL REPORT



World Pheasant Association – India
March 2011

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key threats & related conservation aspects
of Red-breasted Hill-Partridge
(*Arborophila mandellii* Hume)
in Singalila National Park
and Buxa Tiger Reserve, West Bengal**

March , 2011

Study conducted by:
World Pheasant Association India

Supported by :
**Critical Ecosystem Partnership Fund (CEPF)
and
Ashoka Trust for Research in Ecology
and the Environment (ATREE)**

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ACRONYMS / ABBREVIATIONS

ATREE	: Ashoka Trust for Research in Ecology and the Environment
BTR	: Buxa Tiger Reserve
NTFP	: Non-Timber Forest Produce
CEPF	: Critical Ecosystems Partnership Fund
CF	: Conservator of Forests
Co-PI	: Co-Principal Investigator
DFO	: Divisional Forest Officer
DGHC	: Darjeeling Gorkha Hill Council
MSL	: Mean sea level
PI	: Principal Investigator
SNP	: Singalila National Park
SSB	: Sashastra Seema Bal
SPAWN	: Society for Preservation and Awareness of Wildlife & Nature
WPA-India	: World Pheasant Association – India

FOREWORD

India is fortunate in having the second highest number of galliform species in the world, after China. One of them, the Blue Peafowl, has been designated as the National Bird. However, many of the species found in India inhabit remote hill areas and knowledge is required about their precise geographical distribution, breeding habits and ecological requirements. World Pheasant Association - India has undertaken or supported some studies of this nature, including the present one. We are thankful to the Critical Ecosystem Partnership Fund (CEPF) for funding this study, and to the Ashoka Trust for Research in Ecology and the Environment (ATREE) for their encouragement.

The Red-breasted Hill-Partridge has been classified as 'Vulnerable' in the IUCN Red List of 2010. It appears that the small population is declining and becoming increasingly fragmented. This can pose threats to the Population Viability of this species. The present study covered two separate areas in north Bengal. The study has for the first time confirmed the presence of the Red-breasted Hill-Partridge in the Singalila National Park (SNP), which is the westernmost known limit of this species.

The field visits were undertaken during times of socio-political disturbance in the region which to some extent hampered the collection of data. The team is to be complimented for its dedication in pursuing the task despite these difficulties.

The study has brought out the varied and serious ecological and other threats that this species faces. For instance, Nepal lies to the north of the SNP and clearance of the forest for agriculture on the Nepal side up to the border has brought pressures on SNP in the form of wood and fodder cutting and ingress. In the upper reaches of the Buxa Tiger Reserve there are eight villages within the Reserve and the poverty of the inhabitants results in considerable disturbance, clearance of forest patches for grazing and sustained trapping and snaring of the species of Hill-Partridges and other game birds found there. The report has suggested Action Plans for both locations. But it is clear that the overall conservation efforts will require inputs and cooperation by Government agencies, stakeholders and the local population on a long term basis.

It is hoped that this study will stimulate interest in the further study of this endangered species and the acquisition of knowledge of its ecological requirements.

D. K. Chetsingh
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Executive Summary

The Red-breasted Hill-Partridge (*Arborophila mandellii* Hume), one of the lesser known Galliform species found in the Eastern Himalayas and adjoining areas of South-East Tibet, has been categorized as 'Vulnerable' in the IUCN Red List (IUCN 2010). Singalila National Park (SNP) lies within the 'Kanchenjunga-Singalila Complex' corridor and Buxa Tiger Reserve (BTR) is one of the 'Priority sites outside priority corridors' as defined by the CEPF's revised background notes on Eastern Himalayas, India for Small Grant Programs. The present study, with support from CEPF & ATREE, aimed at determining the status and distribution of the Red-breasted Hill-Partridge *Arborophila mandellii* in the SNP located in Darjeeling district and upper reaches of the BTR located in Jalpaiguri district of West Bengal, India. Other objectives were to assess the key threats to the survival of the species and a gross assessment of the conservation status of its habitat. The study commenced from October 15, 2009 and despite socio-political disturbances in the Darjeeling hill district, the field work could be successfully completed by the end of March, 2011.

METHODOLOGY :

Literature Survey: Study of available literature.

Field Survey: Collection of secondary evidences (such as what could be gathered from local fodder or fuel-wood gatherers' / traditional hunters' knowledge base), direct observation [through (a) Visual sighting and counting ; (b) Taking note of primary field evidences; and (c) Recording vocalization and use of play-back method]; general habitat study, through direct observation and secondary field survey .

Ten study trips have been conducted, five in each of the study areas. In all, 52 days were spent in the field. Total man-distance covered during the survey was 520 km (approx.).

RESULTS:

Arborophila mandellii was sighted thrice during the study. On 21st November, 2009, in SNP at around 11.15 a.m.. Other direct sightings were made in the upper reaches of Buxa Tiger Reserve twice, on March 10, 2011 at around 10.15 a.m. and on March 12, 2011 at 9.35 a.m.. However, a recognizable photograph of the target species could not be taken. It could be inferred that the target species Red-breasted Hill-Partridge occurs in both SNP and BTR.

During the survey, a number of calls of Hill-Partridges could be recorded from different locations of both the study areas. None could be ascertained to be the call of *A. mandellii*.

It could be conclusively gathered from the local people that Hill-Partridges are often trapped and consumed. The species has no market demand as a cage bird. The bird as a whole or any of its body parts does not possess any medicinal or otherwise social value.

Habitat Study:

Most favorable habitat for Hill-Partridges in SNP extends from Gairibas downward to almost up to a line joining Maneybhanjang to Palmajua. The key threats at the habitat of SNP are – (i) Exploitation of forest for fodder & firewood. (ii) Grazing at certain places. (iii) Pollution & disturbance due to vehicular movement. (iv) Pollution due to garbage disposal by tourists including trekkers, local villagers and SSB staff. (v) Lack of machinery for proper disposal of garbage is a big problem in SNP.

The habitat in Buxa Tiger Reserve is suitable for different species of Hill-Partridges along an area extending upward from Sadar Bazar up to Rupang Valley in the North and up to Pamsey Danda in the North East. The key threats to the habitat are: (i) Indiscriminate extraction of fire-wood and fodder, over grazing and trapping. (ii) Department's inability to exercise adequate administrative control in remote areas. (iii) Pollution due to garbage disposal by tourists including trekkers, local villagers and SSB staff. (iv) Ill-developed poorly managed tourism. (v) Forest fire. (vi) Water scarcity.

Awareness generation Activities:

The WPA-India team created a representative illustration of the species for use in different awareness materials. This illustration was used to produce wall-calendars, pocket calendars,

back-gumming stickers and front-gumming stickers and all these materials were distributed widely in both the study areas. Primarily the purposes of distribution were: (a) to make people aware about the then ongoing project, (b) to arouse their inquisitiveness about the species and (c) to keep a long-run impression of the target species among the local people. School children were interacted with the aid of pictorial guides and stickers were given to them. Four nos. low-cost binoculars and a few books on bird identification were distributed among four school teachers, two guides, two interested youths and one hotelier from the study area.

RECOMMENDATIONS:

Recommended Action Plans, species-specific and separately for both the study areas are given below. Action Plans should be trans-boundary in nature to produce desired result.

ACTION PLAN for both SINGALILA NATIONAL PARK and UPPER REACHES OF THE BUXA TIGER RESERVE :

To protect the existing habitat following actions are recommended:

(i) To effectively reduce extraction and consumption of firewood and fodder. (ii) Control grazing. (iii) To have a clear account of the number of hotels/home-stays and to restrict the number of accommodation to its present number. (iv) To discourage and control disposal of non-biodegradable garbage within forest area.

To minimize future habitat loss and to secure long term survival of the target species, following actions are recommended:

(i) Taking up and implementation of long term trans-border program to elevate the livelihood status and living quality of the local residents. (ii) To encourage alternate income generation of local villagers. (iii) To expand and boost revenue generating controlled eco-tourism, keeping stringent check on disposal of additional garbage and additional firewood consumption. (iv) Taking up large scale plantation program for fast-growing firewood producing plants. Joint Forest Management practices may help. (v) Developing a properly functioning income generating garbage disposal system involving local villagers. (vi) Large scale awareness

generation programs to be taken up to induce school children in disposing garbage at proper dumping points and learn to observe animals.

ACTION PLAN for SNP in particular:

(i) To divert the vehicular traffic passing through National Park area via alternate routes through Nepal. (ii) To enforce existing rule of cooking in LPG in tourist accommodations within the National Park area. (iii) Inclusion of as much reserved forest areas as possible contiguous to the National Park towards the eastern side of the National Park. (iv) Awareness generation campaign to be designed and taken up involving Satyr Tragopan, Blood Pheasant, Red-breasted Hill-Partridge and Red Panda as flagship species.

ACTION PLAN for Upper Reaches of BTR in particular :

(i) To stop further encroachments, setting of temporary cow sheds, expansion of residential area within forest land, etc. (ii) To stop infiltration of Bhutanese population with livestock and setting temporary cowsheds (*Gothh*) within forest areas. (iii) To step up to control trapping and stray cases of illegal tree felling. (iv) To control people from burning undergrowth in summer months.

Species-specific ACTION PLAN :

(i) To design and conduct extensive survey on the present distribution, status and eco-behavior of *A. mandellii* in entire Eastern Himalayas, through its known range of distribution. (ii) To make people aware that the species is 'Vulnerable' and also data deficient. (iii) If in some pocket the number of *A. mandellii* is found to be above comfortable limit and density, capturing and captive rearing of the species can be tried out. (iv) It should be placed to the proper authority that *A. mandellii* with all due justifications deserves to be included in Schedule I, Part III of the Indian Wildlife (Protection) Act, 1972. 

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1. 0 Introduction

The Red-breasted Hill-Partridge (*Arborophila mandellii* Hume), one of the lesser known Galliform species found in the Eastern Himalayas and adjoining areas of south-east Tibet, has been categorized as 'Vulnerable' in the IUCN Red List (IUCN 2010) owing to its limited available data, which suggest that this partridge has a small declining population that is becoming increasingly fragmented. The Red-breasted Hill-Partridge is endemic to the eastern Himalayas where it occurs north of the Brahmaputra only. It is known from **Bhutan**, West Bengal (Darjeeling district only), Sikkim and Arunachal Pradesh, north-east **India**, and south-east Tibet, **China**. There are recent records from several sites including Thrumshing La National Park, Bumdeling Wildlife Sanctuary and Shemgang area in Bhutan. It is perhaps locally common in the remaining forests of Arunachal Pradesh (BirdLife International 2011). The species has been reported recently from Mehao and Dibang Wildlife Sanctuaries (Arunachal Pradesh). Recent sightings (in late Nineties and early last decade) also confirmed its presence in the upper reaches of Buxa Tiger Reserve of Jalpaiguri District West Bengal adjoining the Bhutan hills (Allen *et al.* 1996; Sivakumar *et al.* 2006). Its presence in Singalila National Park (West Bengal) was unconfirmed (BirdLife International 2001).

Singalila National Park lies within the 'Kanchenjunga-Singalila Complex' corridor and Buxa Tiger Reserve is one of the 'Priority sites outside priority corridors' as defined by the CEPF's revised background notes on eastern Himalayas, India for small Grant Programs. Three species of Hill-Partridges are reported from this area : the Red-breasted Hill-Partridge *Arborophila mandellii* Hume, 1874, Common Hill-Partridge *Arborophila torqueola* (Valenciennes, 1826) and the Rufous-throated Hill-Partridge *Arborophila rufogularis* (Blyth, 1849). The Red-breasted Hill-Partridge *A. mandellii* is distinguished from Rufous-throated Partridge *A. rufogularis* by more rufescent crown and head-sides, white gorget and entirely chestnut upper breast and from Common Hill-Partridge *A. torqueola* by a thin black line below the white gorget, entirely chestnut upper breast as against grey and light chestnut of the throat above the white gorget.



They are difficult to distinguish from each other, unless photographed or encountered from close quarters. The calls are presumably distinctive but the differences are yet to be studied in depth. Red-breasted Hill-Partridge is also widely referred in literature as Chestnut-breasted Partridge or Chestnut-breasted Hill-Partridge.

The Red-breasted Hill-Partridge, like most of the hill-partridges, is a shy and elusive bird that often escapes notice of even the most attentive birdwatchers. It is also quite difficult to distinguish the species from other closely allied species of Hill-Partridges. A. O. Hume (1874) mentioned in *Stray Feathers*, 'Field naturalists here do not seem to be able to distinguish these species, as I am continually receiving specimens misnamed,...'. It is known to be heard from quite a long distance, but difficult to be seen among the dense foliage of the steep ravines which is a favored habitat of the species. The bird spends most of its time foraging on the ground. Whenever it feels the presence of someone nearby, it stays motionless among the fallen leaves or disappears in a flash either by running swiftly through undergrowth or in an extreme emergency flying away from the location.

The study aimed at determining the status and distribution of the Red-breasted Hill-Partridge *Arborophila mandellii* within or around the Singalila National Park and upper reaches of the Buxa Tiger Reserve of West Bengal, India. Other objectives were to assess the key threats to the survival of the species and a gross assessment of the conservation status of its habitat. Thrust was given to locate at least a few surviving wild specimens and study their habits / eco-behavior as far as practicable.

The one-year study commenced from October 15, 2009. Due to socio-political disturbances in the Darjeeling hill district, the fieldwork schedule got interrupted from time to time. An extension of the study period by six months was requested for and was approved by ATREE, the coordinating and monitoring institution for the CEPF Small Grant Projects in Eastern Himalayas. Finally the committed number of field days could be successfully completed within the extended study period, ie. by the end of March, 2011.



2.0 Study Area

Singalila National Park (SNP): Singalila National Park located in the Darjeeling district of West Bengal [27°01' N to 27°13' N; 88°00' E to 88°07' E] was chosen as the priority study site. The National Park lies along the Indo-Nepal border in the north-west tip of West Bengal [MAP I and MAP II]. Singalila ridge, running in a north-westerly to north direction roughly separates Ilam district of Nepal from Darjeeling district of India. The area of the National Park is 79 Sq. Km. and is under the jurisdiction of Wildlife Division I of the Forest Department, Govt. of West Bengal.

MAP I : Showing location of SNP & BTR in West Bengal, India.





MAP II : Showing different beats and area of Singalila National Park.

The altitude within the Park varies from about 2400 m. to 3636 m. Temperature varies from sub-zero to about 25°C. The area is overall moist receiving heavy rainfall during monsoon months and occasional light to heavy snowfall mostly during the late winter months but even up to late-March / early-April. Due to altitudinal difference and different micro-climatic conditions prevailing across different hill slopes the area harbors different kinds of forest cover, ranging from wet temperate to subalpine types. During the survey, the team stationed at 6 different locations : Maneybhanjang [26°59'17"N; 88°07'13"E], Tumling [27°01'52"N; 88°04'09"E], Gairibas [27°02'57"N; 88°01'52"E], Sandakphu [27°06'18"N; 88°00'04"E], Molley [27°09'42"N; 88°01'56"E] and Gorkhey [27°11'19"N; 88°04'22"E]. Maneybhanjang and Tumling are outside the south-eastern boundary of the National Park, Gorkhey is the only forest village inside the park located near the north-western tip, Gairibas, Sandakphu & Molley are located inside the park.

TABLE I shows the temperature and humidity ranges recorded from different stations during the survey (other than Maneybhanjang which is far outside the National Park boundary, hence data were not brought into consideration):



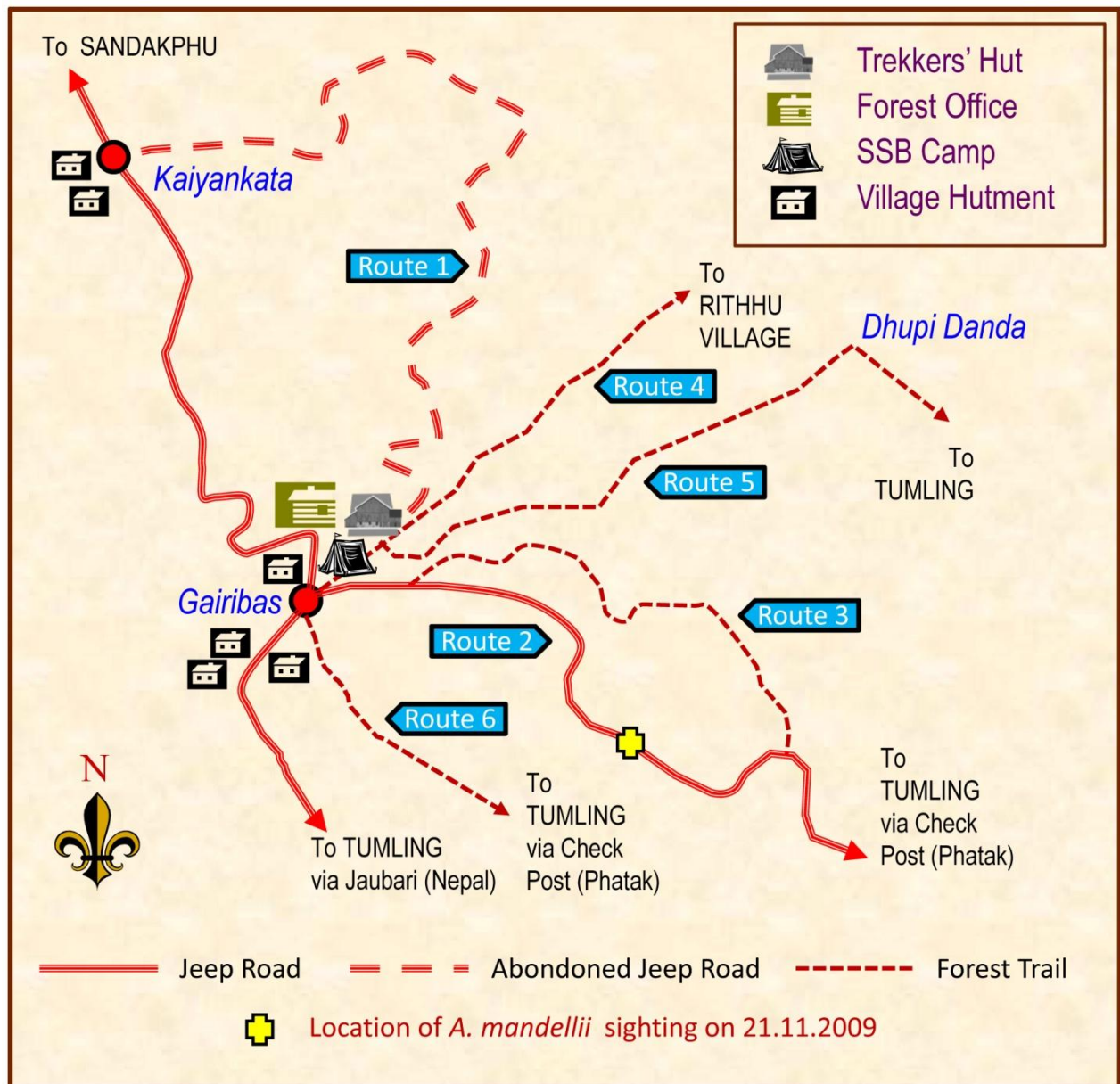
TABLE I

Location	Altitude m. (feet)	Month	Temperature (°Celsius)		Relative Humidity (%)	
			Maximum	Minimum	Maximum	Minimum
Gairibas	2465 (8093)	April, 10	18.9	10.5	99	72
		Nov, 10	14.2	5.3	99	18
		March, 11	9.3	5.5	99	90
Sandakphu	3581 (11748)	April, 10	11.5	3.9	99	36
		March 11	2.0	- 0.6	90	55
Molley	3406 (11175)	April, 10	14.6	5.3	99	73
Gorkhey	2279 (7477)	May, 10	18.2	9.9	87	65
Tumling	2902 (9520)	Nov, 09	11.9	0.1	89	50

After a preliminary survey across the park, the forest area around Gairibas was selected for intensive study. From Gairibas, observation trips on foot were made along six well defined tracks: 1. Old road route to Kayiankata originating from behind the DGHC Trekkers' Hut, 2. Jeep-road from Gairibas leading to Phatak (SNP Check Post near Tumling), 3. Foot-trail originating from Gairibas plantation area and meeting with Gairibas-Tumling jeep-road at about 2 Km. away from Gairibas, 4. Foot-trail originating from Gairibas leading to Rithhu village, 5. New trek route originating from Gairibas running along National Park boundary towards Tumling via Dhupi Danda and 6. Foot-trail leading to Phatak running almost parallel between Gairibas-Joubari jeep-road and Gairibas-Tumling jeep-road. All six trails are shown in **[MAP III]**.



MAP III : Showing selected observation-trails around Gairibas.

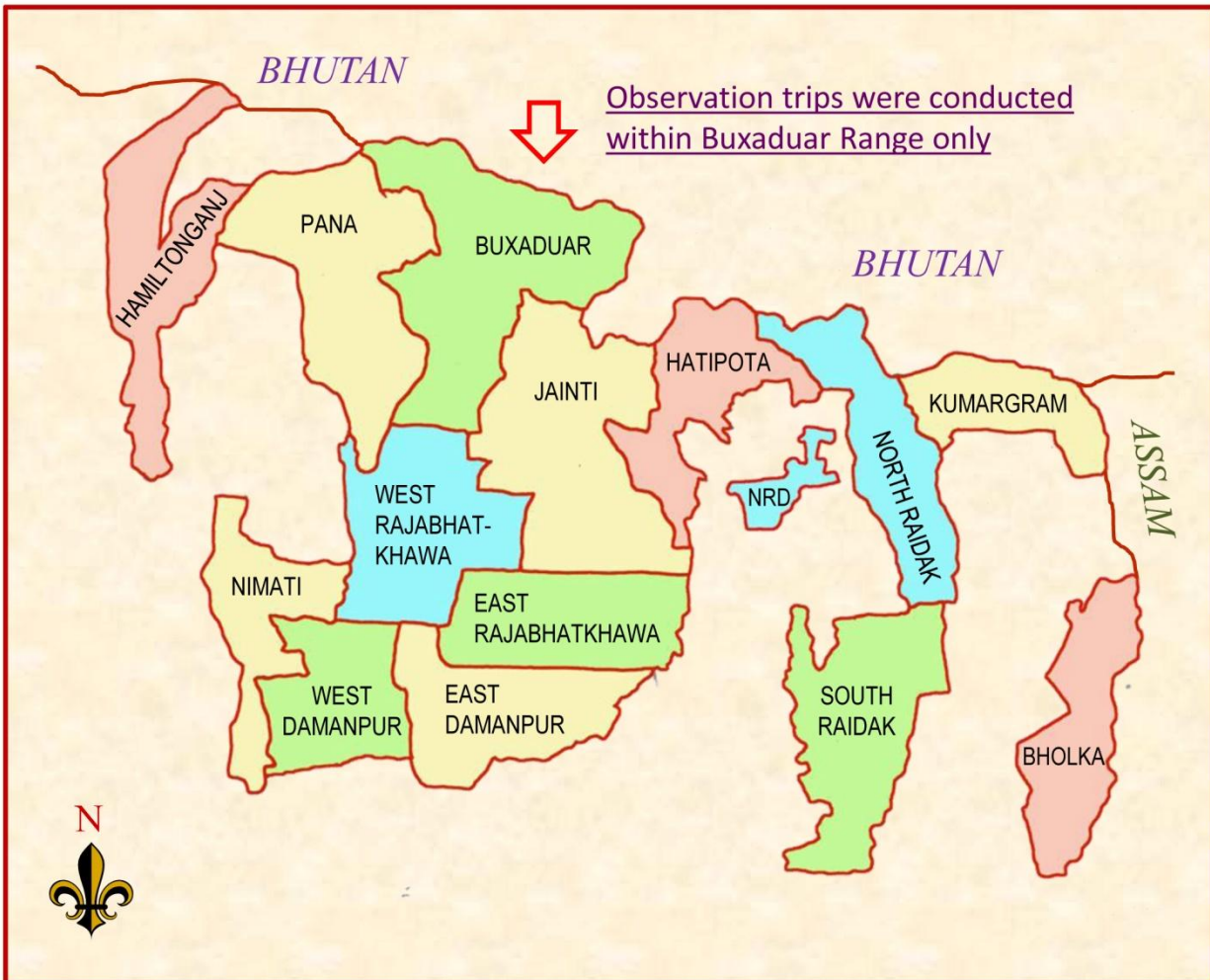


Upper reaches of Buxa Tiger Reserve(BTR): Buxa Tiger Reserve [23°30' N to 23°50'N; 89°25' E to 89°55' E] is located in Jalpaiguri district of West Bengal [MAP I and MAP IV]. The reserve is spread over a total area of 760.87 sq. Km. Altitude within BTR ranges from 125 m. to 1750 m.



above MSL. The hilly region of the north-western part of this Tiger Reserve provides a good habitat for Hill-Partridges.

MAP IV : Showing administrative Ranges and area of the BTR in West Bengal, India.

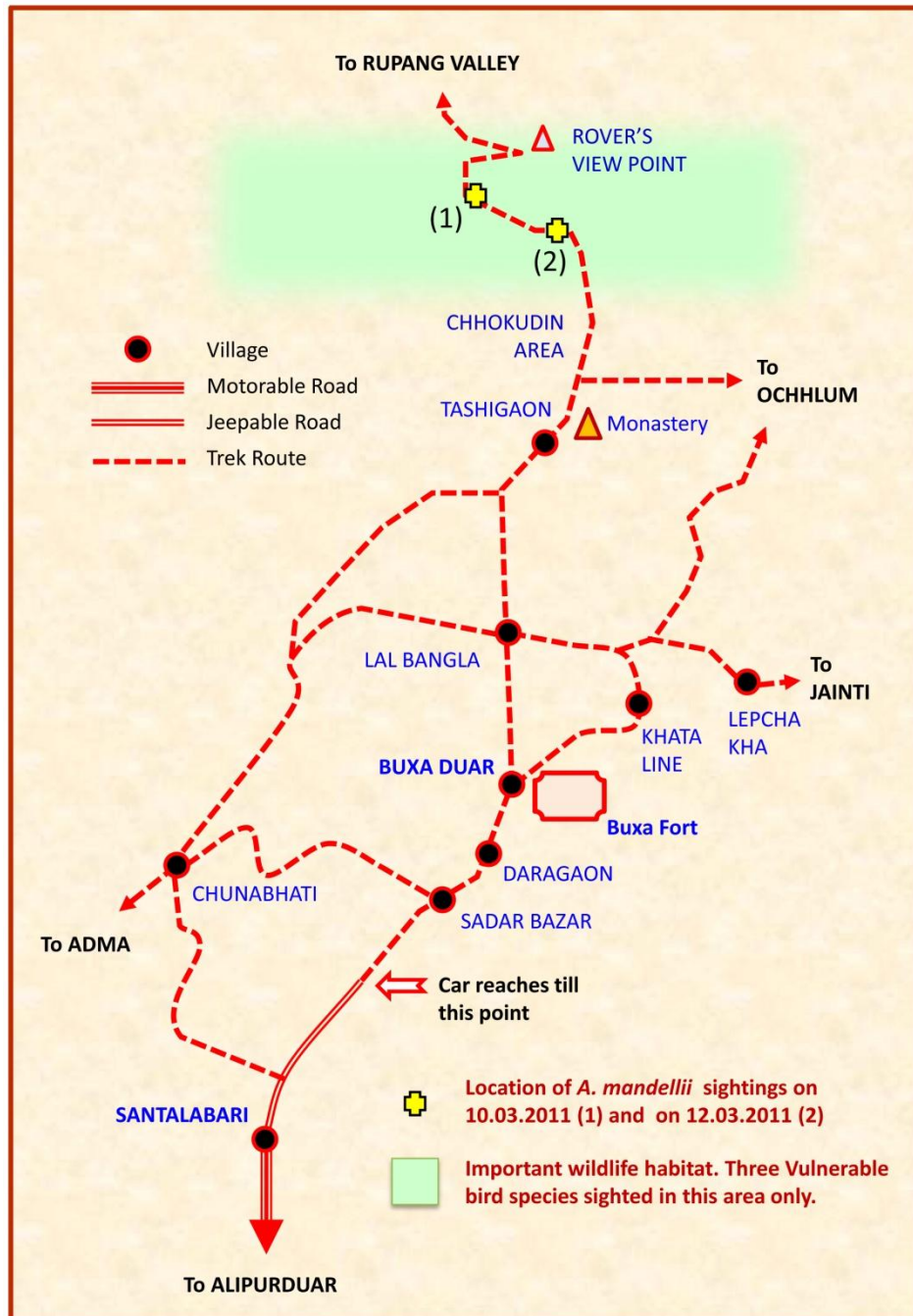


An old cart road (originating from Santalabari in the foothills leading to Rupang Valley in Bhutan) cuts through a section of this habitat. This old stone-paved road which was basically a horse track in old days, is no longer existing along the entire stretch. Beyond the village Tashigaon, it is now rather a foot-trail used by local villagers for movement between villages and for transportation etc. to and from areas around Rupang Valley of Bhutan. On this particular road route, a 4 km. stretch from Buxaduar to Rover's Point and a few branch trails



were selected for the study [MAP V]. All these tracks are open to general tourists and observation trips were conducted along these routes only.

MAP V : Showing study area and observation-trails in Upper Buxa.





During all five survey trips, the team was stationed at the small hamlet 'Dilchhoka' adjacent to the ruins of Buxa Fort and Buxaduar Post Office. To avoid confusion, henceforth this place will be referred as Buxaduar.

TABLE II shows the temperature and humidity ranges recorded at Buxaduar during the survey :

Location	Altitude m. (feet)	Month	Temperature (°Celsius)		Relative Humidity (%)	
			Maximum	Minimum	Maximum	Minimum
Buxaduar (Dilchhoka)	626 (2054)	Jan, 10	25.6	12.3	82	43
		March, 10	29.2	15.6	99	53
		May, 10	32.8	19.7	97	68
		Dec, 11	27.3	11.4	95	40
		Mar, 11	30.9	15.8	91	13

Both the study areas form part of Eastern Himalayas. The elevation of surveyed localities ranged from 625 m in the upper reaches of the Buxa Tiger Reserve to 3636m in Singalila NP. The climate of the areas was tropical monsoon in Buxa and mountain type in Singalila. Usually the annual temperature ranges from 6° C in winter (minimum) to 35°C in summer (maximum) in upper Buxa while it is below freezing to 25° C in Singalila. During the survey period, the WPA-India study team encountered temperature ranges -0.6 °C to 18.9 °C in SNP [from **TABLE I**] and 11.4 °C to 32.8 °C in BTR [from **TABLE II**].

Rainfall is quite heavy in the area ranging from 3500 - 5600 mm annually. Most rainfall is received during June to September. The natural vegetation ranged from tropical semi-evergreen in Buxa to subtropical and temperate forests in Singalila.



3.0 Methodology

Literature Survey: Extensive literature survey has been done through physical search of different reference materials from libraries and other personal collections. Thorough searching of different web sites has been made to locate relevant information and references from different publications.

Field Survey: The study has commenced on and from October 15, 2009. Ten study trips have been conducted, five in each of the study areas. In all, 52 days were spent in the field excluding journey days and days otherwise wasted (**TABLE III**). Observation in the study area was made on foot. After preliminary reconnaissance trips, two particular zones in each of the study areas were selected for intensive field work. Then following field methods were adopted:

1. Collection of secondary evidences (such as what could be gathered from local fodder or fuel-wood gatherers' / traditional hunters' knowledge base). This has been done through elaborate personal interaction in the field.
2. Direct observation :
 - Visual sighting and counting
 - Taking note of primary field evidences
 - Recording vocalization of any species of Hill-Partridges that could be heard
 - Playing back recorded calls to invoke response from individuals within audible range, recording response (play-back method)
 - Attempt to observe any specimen that could be located in the field.
3. General habitat study, through direct observation.
4. Secondary Field Survey: A survey was conducted through extensive public interaction with open-end questions and accompanying reference aid with colour illustrations of the target species and other closely resembling species. This was to gather information on the target species and to assess the extent and nature of key threats to the habitat.

Note : The waveforms and the spectrograms used to analyze / represent the recorded calls have been created using **Raven Lite 1.0**. For more information, visit the Raven Lite website: www.birds.cornell.edu/raven or www.RavenSoundSoftware.com. Also refer to Charif (2006).



TABLE III: Showing a brief account of the field trips conducted.

Period	Area of survey
November 17 to 25, 2009	Singalila National Park
January 06 to 11, 2010	Upper reaches of Buxa Tiger Reserve
March 26 to April 02, 2010	Upper reaches of Buxa Tiger Reserve
April 15 to 25, 2010	Singalila National Park
May 02 to 09, 2010	Upper reaches of Buxa Tiger Reserve
May 23 to 30, 2010	Singalila National Park
November 04 to 13, 2010	Singalila National Park
December 05 to 17, 2010	Upper reaches of Buxa Tiger Reserve
March 06 to 18, 2011	Upper reaches of Buxa Tiger Reserve
March 23 to 31, 2011	Singalila National Park

A total distance of 120 km and 140 km was covered on foot along different well defined and newly cut trails in Singalila and Buxa respectively. Since every time at least 2 persons moved, the total man-distance covered was 520 km (approx.). *(It is essentially a conservative estimate. Total man-distance covered in reality is much more, since in most of the cases three persons moved, at times separately in varied directions).*



Photograph I : Heerak Nandy, one of the Co-PIs interviewing local expert Tenzi Sherpa in SNP



4.0 Results

4.1 Literature Survey:

Study of available literature produced little result because only few works have been done on any of the Galliformes species in the Kanchenjunga-Singalila Complex and none particularly on Red-breasted Hill-Partridge (*Arborophila mandellii*). In fact this was for the first time that a species-specific study on Red-breasted Hill-Partridge has been conducted in India. Limited available data from different publications has been compiled and utilized for the purpose of the survey.

Among the Hill-Partridges found in India, Red-breasted Hill-Partridge is perhaps the most elusive one and the rarest. In his famous journal 'Stray Feathers', Allan Octavian Hume included this species under 'NOVELTIES' (Hume, 1874) and described it. Successive references could be found in Fauna of British India (Baker, 1928), (Baker, 1935) and then from work of Ali and Ripley (1987). Most of the Fact Sheets developed in recent years, e.g. BirdLife International (2001), BirdLife International (2011), etc., on *Arborophila mandellii* are derived from these earlier references. A species account could be found in the IUCN Red List of Threatened species (2010). However, no literature could be found that included further study of the species' behavior or other scientific aspects.

A recent publication contained a comparative analysis of the wing tip of Himalayan Quail *Ophrysia superciliosa* and Red-breasted Hill-Partridge *Arborophila mandellii* (Potapov, 2003). The analysis suggested that both being essentially a resident species, both have a remarkable resemblance in wing pattern.

Interestingly, none of the publications carried a photograph of *Arborophila mandellii* in the wild or even in captivity.

Considering study areas, the only major work done on some particular species of Galliformes in SNP was by Khaling (1999a). While doing her Ph.D. thesis, she worked on 'Certain aspects of ecology and behaviour of the Satyr Tragopan, *Tragopan satyra*' in SNP. With R. Kaul and G. K.



Saha she also conducted another survey during the period 1995 to 1997, when call counts of Satyr Tragopan were made in the Singalila NP (Khaling *et al.*, 1997 & 1999). Khaling (1999b & c) also worked on diet of Satyr Tragopan in the same region.

In Upper Buxa, so far no survey has been undertaken on Galliformes in particular, therefore no such literature could be found.

Three recent publications (Allen *et al.* 1996; Sivakumar and Prakash, 2003; Sivakumar *et al.*, 2006) mentioned recent sightings of *Arborophila mandellii* at the upper reaches of BTR.



Photograph II : Mountain view from Singalila National Park, one major attraction for visiting tourists.



4.2 Species study:

Direct Observations :

Sightings: The most significant observation during the study was made on 21st November, 2009, when a pair of birds could be sighted in Singalila National Park. On that day, the survey team encountered a pair between Tumling and Gairibas within the National Park area. Around 11.15 a.m., a local villager, named Tenzi Sherpa who was acting as guide and one of the team leaders (Anwaruddin Choudhury) could notice some movement on the ground just below the road. Two galliformes could be seen but could not be identified owing to vegetation cover. The birds soon crossed over to the other side of the *nullah* (stream course) under the cover of vegetation but were disturbed by a group of road-workers who had just landed there for repairing of the road. The birds then flew back when two were seen by Anwaruddin Choudhury and also identified to be *Arborophila* sp. Then one bird moved up, on the forest floor above the road when other two team members (Heerak Nandy and Judhajit Dasgupta) could also see it. The bird then took off and in fact flew directly towards the slope where team leader (Anwaruddin Choudhury) was positioned. He could see the bird from front and then side with its reddish breast very conspicuous. It was a Red-breasted Hill-Partridge. The other one remained on the lower slope. The location was at 27°02'43"N; 88°02'21" E, and elevation was 2707 m. (8882 feet).

However, a photograph could not be taken.



Photograph III: A section of oak-rhododendron-bamboo association forest at the location of the only sighting of *A. mandellii* at SNP.

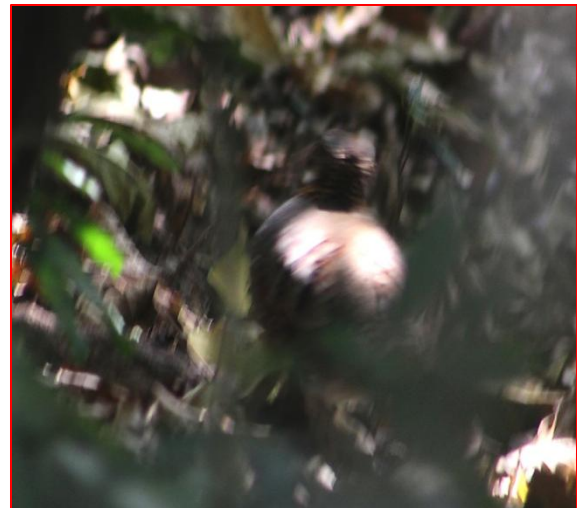


Other direct sightings were made in the upper reaches of Buxa Tiger Reserve twice, on March 10, 2011 at around 10.15 a.m. by Heerak Nandy and Ayan Banerjee [Location 26°46'18"N; 89°35'10"E, Altitude 1260m. (4133 feet)] and on March 12, 2011 at 9.35 a.m. by Ayan Banerjee [Location 26°46'13"N; 89°35'17"E, Altitude 1170m. (3837 feet)]. On both the occasions, the birds disappeared very quickly, once by taking cover in the undergrowth and flying away on the other occasion. However, in both the cases, the observers could notice (though fleetingly) a pronounced chestnut patch on the breast region. On March 10, a single bird was identified to be *A. mandellii* but it was one of a foraging pair. On March 12, the identified *A. mandellii* was one of four in a covey.

On March 12, Ayan Banerjee attempted to photograph the sighted birds. Due to unfavorable conditions, he could not take the photographs properly and the shots got blurred (**Photographs IV and V**).



Photograph IV



Photograph V

So only the presence-absence status could be determined. There was no question of studying the eco-behavior directly.

Nevertheless, as reflected in this study, it would be scientifically justified to infer that the target species Red-breasted Hill-Partridge occurs in both SNP and BTR.



Rufous-throated Hill-Partridge could be sighted thrice, once in Singalila National Park and twice in Buxa Tiger Reserve. Common Hill-partridge was not sighted during the study, but in Singalila National Park calls of Common Hill-Partridge could be recorded on different occasions.

In the upper reaches of BTR Hill-Partridges (*Arborophila* sp.) could be sighted several times as the undergrowth was relatively less dense as compared to that in SNP. But the sighting instances were so fleeting or the light condition/visibility was so poor, that in most of the cases the species could not be ascertained.

Some direct observations evident from these sightings are given below:

- When they felt human presence near them, the birds except on two occasions were seen disappearing in the undergrowth running swiftly away from the intruder. Only twice, when almost cornered from at least three sides they took to their wings, that too when approached up to a very close distance, in both the cases within 5 to 10 meters.
- Maximum number in one covey was observed to be five in BTR. In SNP only twice Hill-partridges could be observed. In both the occasions the birds were in pair.
- On two occasions in upper reaches of BTR, Hill-Partridges were seen to be foraging around in association with a pair of Kaleej Pheasants.
- On two occasions, once in SNP and once in BTR, *A. mandellii* was observed in flight. The flight was a quick diagonally upward spurt, then straight, considerably fast, with rapid wing beats.

Another important point to note is that the presence of Hill-Partridges could be recorded from as low as Buxaduar region (from calls) or from secondary data. The survey team sighted Hill-Partridge around Chhokudin, a point a little above Tashigaon (See **MAP V**). But most of the Hill-Partridges observed below or around Chhokudin seemed to be belonging to the species *Arborophila rufogularis*. But from a point little above 1000 m. on the Rupang Valley route, the observed partridges seemed to be a little different in appearance and both the *A. mandellii* sightings have been made in this particular region. Interestingly, Allen *et al.* (1996) and Sivakumar and Prakash (2003) reported sighting instances of *A. mandellii* in 1992 and 2001



respectively from the same area and same altitudinal range. Allen *et al.* (1996) mentioned 'A group of partridges seen briefly on four occasions near the viewpoint, appeared to show a white crescent on the breast and were probably referable to this species.' Sivakumar and Prakash (2003) observed the species at about 1200 m. between Buxaduar and Rupang Valley. They have not specified the exact location, but since only this part of the Buxaduar-Rupang Valley route passes through the altitudinal range 1200 m., it is obvious that they also have observed the species in this area only. It seems that at least a pocket population of *A. mandellii* is surviving in this particular area.

Vocalization: During the survey, a number of calls of Hill-Partridges could be recorded from different locations of both the study areas. The calls were analyzed but it could not be determined whether the calls were definitely from the target species or not. Rather most of the calls resembled closely with that of Rufous-throated Hill-Partridge (*A. rufogularis*) and/or Common Hill-Partridge (*A. torqueola*).

For play-back purpose and for comparative analysis two calls of *Arborophila mandellii* were downloaded from the site www.xeno-canto.org. It has been marked that in the calls available from www.xeno-canto.org, a trill could be noticed at the beginning of each whistling note. This trill was missing in any of the calls recorded from the field during the present study. Only two exceptions were two separate calls coming from very deep down the gorge that could be heard and noted by PI Subhendu Shekhar Saha standing on the Maneybhanjang–Rimbik road-route just outside the National Park. Even in those two calls the trill seemed to be heard at the beginning, but not continuing with the following notes.

During different seasons the play-back method was tried, but unfortunately no response was received during the study.

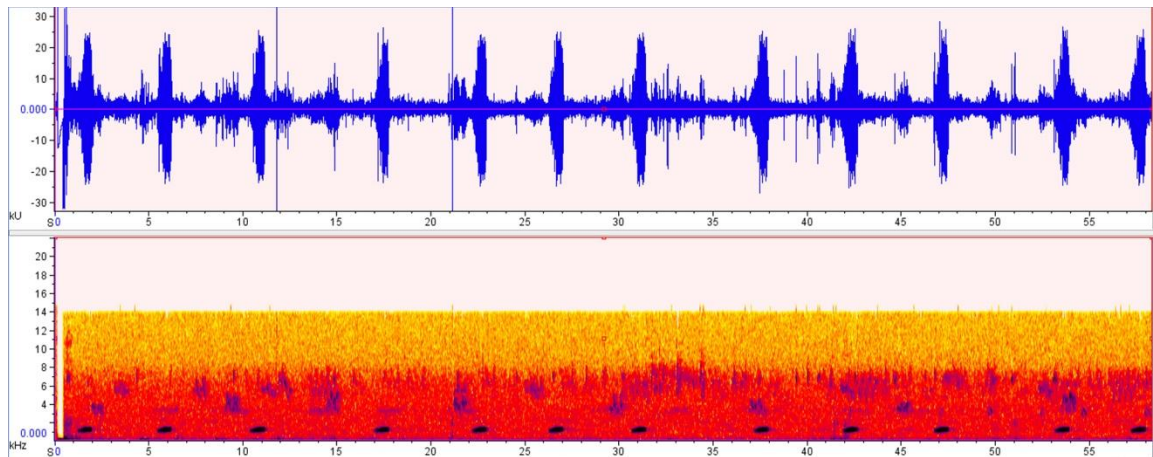


Following are some observations regarding Hill-Partridge (*Arborophila* spp.) calls heard during the survey:

- Calls were heard mostly in the morning, relatively on much less occasions in the evening.
- No call could be recorded before 5.30 a.m. or after 5.30 p.m.
- During March to early June, occasional calls were heard almost throughout the day.
- During March to May, frequency-wise Hill-Partridge is perhaps one of the top few most vocal birds that can be distinctly heard from a distance in upper reaches of BTR.
- In March 2011, one particular Hill-Partridge in SNP (from analysis of call identified to be *A. torqueola*) was heard calling continuously for more than one hour at a stretch.
- The frequency of number of calls was the highest between the period 6.0 a.m. to 9 a.m..
- The well known double note (bob-white) ascending calls were heard more sporadically. Such calls started and ended abruptly and never repeated from one fixed position. Whereas single note whistling calls were continuous, repeating many a times generally from one fixed position, continuing quite often for five to ten minutes or more, unless disturbed. It seems that the single note whistling call is rather a territory indicating call and the 'bob-white' call is communicative in nature. Particularly during the period March to May, more single whistle calls could be heard all through the day coming from one fixed position. Possibly during the mating season, this particular call is indicative of individual territory of the male bird and also means to invite mates. During one instance in upper reaches of BTR the survey team caused to separate two individual birds foraging in pair. One bird flew away and after a few minutes uttered the 'bob-white' call from a distance (from the location where it landed). The other bird immediately responded. It was obvious that the birds were indicating their respective locations to find each other.
- Significantly frequent morning calls of Hill-Partridge could be heard from Gairibas even in the month of November, presumably much after their reported breeding season.
- **FIGURE I** depicts the waveform and the spectrogram of a typical Hill-Partridge call recorded from SNP (near Gairibas). This matches closely with that of an *A. torqueola* call. Such calls are commonly heard in SNP.

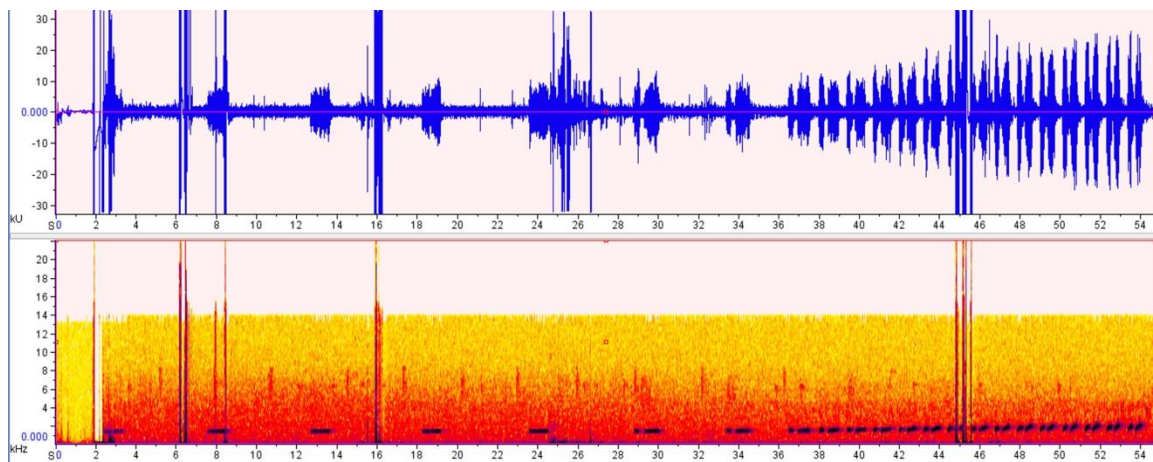


FIGURE I



- **FIGURE II** depicts the waveform and the spectrogram of a particular Hill-Partridge call recorded in upper reaches of BTR. The call had two prominent features. The beginning started with 6 single whistling notes. Then the double-noted part began and repeated 17 times in reaching the crescendo. The call seemed to be coming from an *A. rufogularis* but could not be confirmed by a visual sighting.

FIGURE II





Secondary data:

Secondary data on the species received from the local people have also been documented. But those are descriptions of Hill-Partridges in general, as local people even traditional hunters were not at all concerned about which particular species of Hill-Partridge they were looking at or even consuming. They consider all species of Hill-Partridges to be one single bird, namely *piura* in local language (Pronounced as *pee-woo-ra*). So documentation of secondary data on the species is scientifically weak in species-specific validity.

However, what could be gathered from the local people about the species is mentioned below:

- Those villagers who enter the forest to collect fodder, firewood and other NTFP, rarely encounter Hill-Partridge from close quarters. At times they observe Hill-Partridge suddenly flying away from the ground as close as 3m. from their respective moving positions. It implies that these birds stay motionless to avoid detection and when accidentally the distance reduces below a critical length, they fly away to a safer place.
- The breeding season starts from April-May in upper reaches of BTR and from May in SNP. Late August onwards, Hill-Partridges are seen moving in covey with young ones.
- Nobody could give a clear description of the eggs. Only one cow-herder reported that he saw a Hill-Partridge sitting over eggs on the ground. He and another old man known to be a very good trapper commented that Hill-Partridge lay 4-6 eggs.
- Hill-Partridges roost in lower branches of bushy trees.
- Weight of a full grown Hill-Partridge is about 600-700 gms. and its meat is quite palatable.
- The target species has no market demand as a cage bird. Normally, it can not be kept as a pet and nobody really attempted to do so.
- There is no such belief that the bird as a whole or any of its body parts possesses any medicinal or otherwise social value. Hill-Partridge does not have any specific commercial demand. But hunter-gatherers often look for these birds for meat only.
- There is no reason to believe that Hill-Partridges are least migratory in nature, rather secondary observations suggest that these bird are strictly resident. The work by Potapov (2003) is in conformity with this inference drawn on secondary data. They move away only temporarily if their immediate habitat gets destroyed by ground fire during peak summer months.



4.3 Habitat Study:

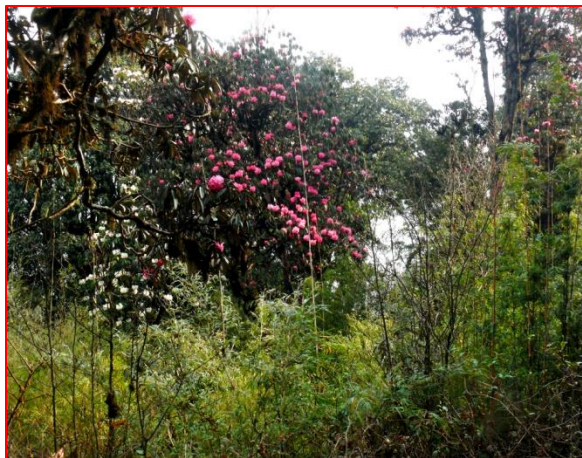
Singalila National Park:

Most favorable habitat for Hill-Partridges in Singalila National Park extends from Gairibas downward to almost up to a line joining Maneybhanjang to Palmajua. This section of the forest can be termed as mildly degraded forest with patches of healthy primary vegetation. In SNP, the presence of Hill-Partridge could be located almost everywhere where this type of vegetation extends along favorable contours.

Near Gairibas, the area where the team concentrated for intensive study, the vegetation consists mainly of wild bamboos of various kinds (*Arundinaria maling*, *A. aristata* and other spp.) intermixed with oak *Quercus pachyphylla*, and other *Quercus* spp. different species of rhododendrons (*Rhododendron arboretum*, *R. barbatum*, *R. falconeri*, *R. grande*, *R. griffithianum* and other species), *Castanopsis tribuloides*, *Acer* spp., *Sorbus cuspidata*, *Magnolia campbellii*, *Daphne* sp. etc.. At many places the forest patches are monotypic, where only malinga or ringal bamboos (*Arundinaria* spp.) or rhododendrons flourish. Hill-Partridges



Photograph VI: Quercus-bamboo association forest.
Good habitat for Hill-Partridges.



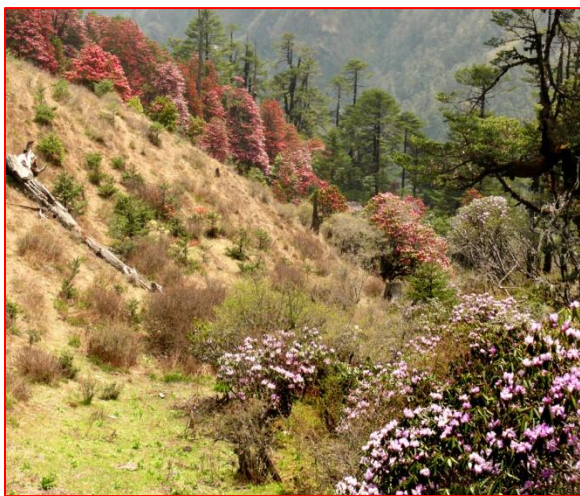
Photograph VII: Rhododendron-bamboo association forest. Good habitat for Hill-Partridges.

are found to be particularly fond of malinga bamboo forests. The team observed fully mature climax forest patches of malinga bamboo in the area (grown up to 15-20 feet from the ground). These monotypic forest patches are almost devoid of undergrowth, any kind of shrubs or herbs



Photograph VIII: Monotypic bamboo forest.
Ideal habitat for Hill-Partridges.

Partridges. As the Hill-Partridges in SNP prefer this kind of monotypic bamboo forest almost devoid of any undergrowth, it can be assumed that at least in this particular habitat their diet consists mostly of insects and other invertebrates.



Photograph IX: High altitude rhododendron-conifer association forests with grassy slopes. Habitat not usually preferred by Hill-Partridges.

occur above 3000m. (approx. 10,000 feet). However, even from certain points above 3000 meters, Hill-Partridge calls could be heard from deeply forested ravines far below the point of observation.

excepting perhaps a few species of ferns in very small number (See **Photograph VIII**). Fallen leaves of both bamboo and rhododendron make a thick carpet on soil that does not allow other undergrowth to grow (due to delayed degradation and other reasons). Particularly the malinga bamboo patches are very dense (20 to 30 stumps per sq. m. at places) making the understory almost impenetrable. The *Quercus-Rhododendron-Arundinaria* association forest of the area is also much favored by the Hill-

During observation trips to other areas of SNP, presence of Hill-Partridges could not be detected above Bikheybhanjang. The sub-alpine conifer forest and/or the open grassy slopes around Sandakphu, Molley and Phalut do not seem to support any population of Hill-Partridges. The other way round, it seemed to be true that Hill-Partridges do not find such kind of habitats favorable to their existence. Conclusively, the team could not document any primary or secondary evidence to infer that Hill-Partridges



Hill-Partridges share the habitat around Gairibas with Kaleej Pheasant and Satyr Tragopan. The team sighted both these Galliform species while on observation trips. The natural enemies to Hill-Partridges in this habitat are weasels, martens and lesser cats. As Hill-Partridges rarely come out of the dense understory, their risk of being attacked by hunting birds is presumably minimal.

In Singalila National Park, the principal threats determined are anthropogenic pressure mostly from adjoining villages of Nepal and ill-managed tourism. However, the habitat in Singalila is definitely in a far better state than that in the upper reaches of the Buxa Tiger Reserve.

The key threats at the habitat of Singalila National Park are –

- Exploitation of forest for fodder & firewood: This is mostly from the Nepal side. The only forest village lying inside SNP is Gorkhey. There are some other villages namely, Gurdum, Rithhu, Samanden etc. lying outside the eastern fringe of SNP. But these villages are surrounded by forest areas, and excepting Gorkhey these forests lie under Darjeeling Division Reserved Forest area adjacent to SNP. Villagers from these villages procure most of their forest product requirements from this territorial forest area. But the villagers lying in the adjacent area of Ilam district of Nepal have to depend on the western forest section of SNP for their livelihood.

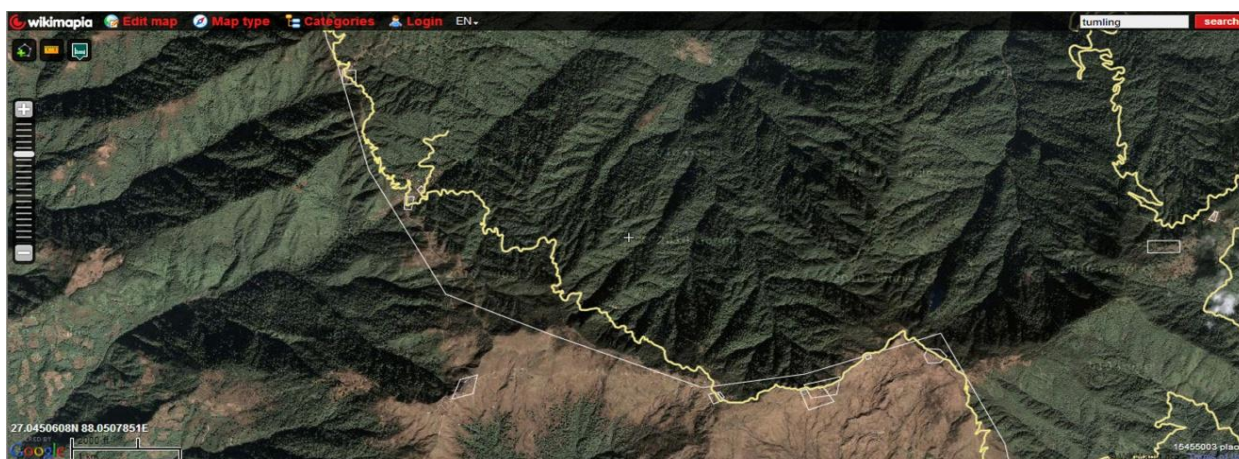


Photograph X: Gorkhey, the Forest Village of SNP.



Even a casual look to **FIGURE III**, which is actually a satellite imagery downloaded from www.Wikimapia.org, will give an idea of what is the true picture across the border. The area on the Ilam side across the Nepal border is almost void of vegetation, whereas the forest cover on the Indian side still retains an appreciable density. This striking contrast in forest cover can be observed almost all along the western boundary of SNP.

FIGURE III : The thin white line roughly represents the international border between India and Nepal. Below and west of the line lies the Ilam district of Nepal and above lies the protected area of SNP and Darjeeling Division Reserved Forest.

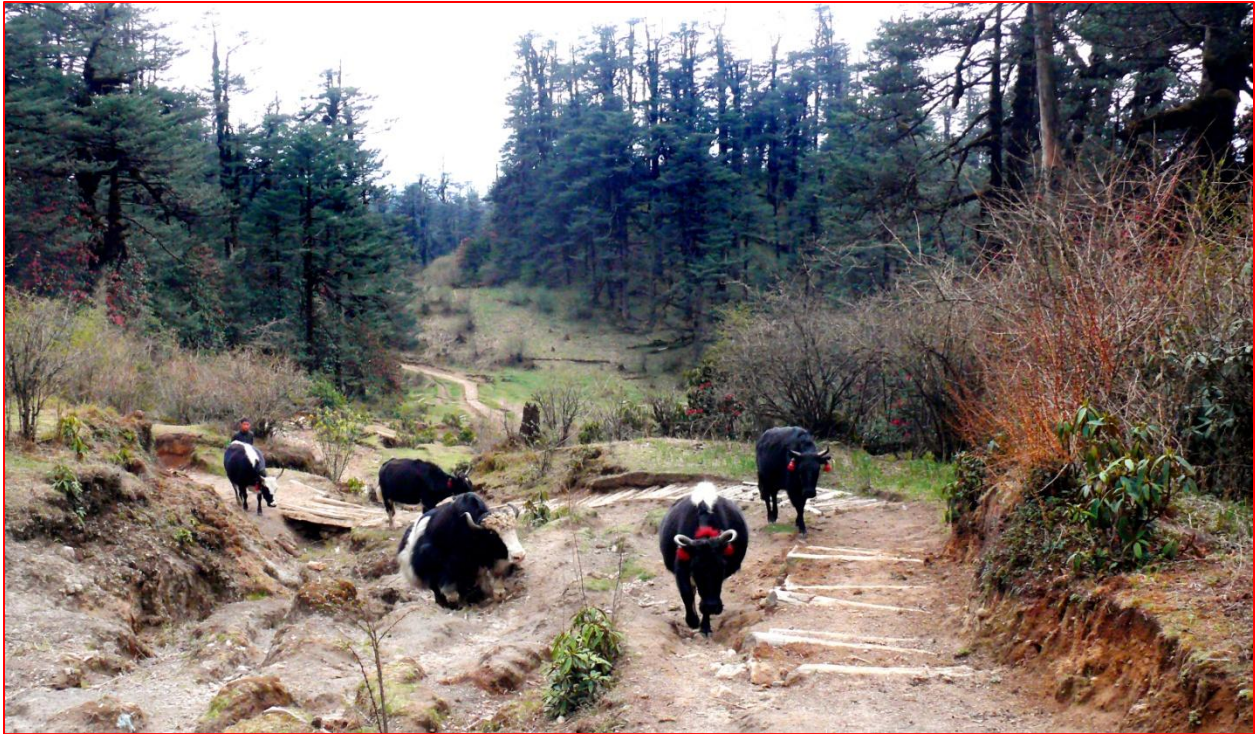


Source : www.wikimapia.org

Collection of fodder and firewood is banned from within the SNP territory. But there is a pressure from Ilam district for both. There are few hotels and home-stay located inside Ilam district. Though use of LPG is mandatory for all tourist accommodations inside the Indian territory and it has been encouraged in the adjacent home-stay/hotels of Nepal, local people for convenience and cost effectiveness depend on firewood harvesting from SNP.

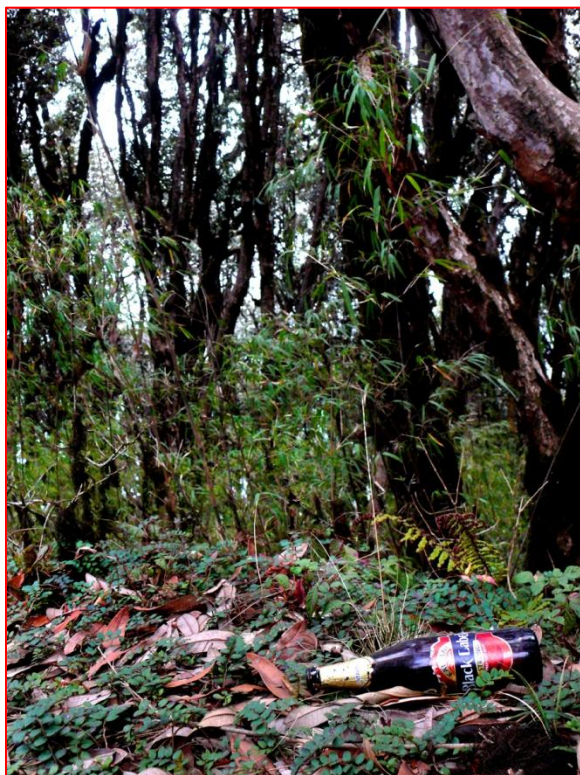


- Grazing at certain places: Grazing of yak, cow and other livestock is a problem mostly along the border of Ilam district.



Photograph XI : grazing of yak, cow and other livestock cause much disturbance to the habitat in SNP.

- Pollution & disturbance due to vehicular movement: Pollution from auto-emission and sound is a threat to the habitat. For movement inside SNP along the road-route leading to Phalut and Molley from Maneybhanjang, mostly land rovers manufactured before World War II are used. The road condition is worse than anybody can imagine. It is nothing better than a cart road made of medium-sized boulders running up and down steep slopes at varying angles. The emission is by no means negotiable with even the wildest believable pollution norms having the least environmental consideration. The sound of movement is also beyond tolerable limits and certainly disturbing to the animal community. The team studied the nature of disposed garbage along a selected section of road that cuts through the prime habitat near Gairibas. Two packets of motor parts and oil spills at 3 places could be found within this 100m. stretch.



Photograph XII: Disposal of non-biodegradable garbage/waste is a major conservation problem.

- Pollution due to garbage disposal by tourists including trekkers, local villagers and SSB staff: Lack of machinery for proper disposal of garbage is a big problem in SNP. The same study on the nature of disposed garbage along a selected 100 m. stretch of jeep road found: plastic bottle – 1, motor-parts packet – 2, snacks & biscuit wrappers – 3, cigarette butt – 1, chewing gum/lozenge/toffee wrappers – 2, pan-masala/tobacco sachets (foil) – 2. Another study was conducted in a selected stretch on a forest foot-trail leading from Gairibas to Rithhu village.

The study found: torn old jacket – 1, chewing gum/lozenge/toffee, wrappers – 3, snacks and biscuit packets – 3, food packet – 1, misc plastic – 3, piece of foil – 1. The collection was made from on the jeep-road area (about 3m. wide) and from on the foot-trail area (about 1m. wide) only. It has to be kept in mind that after a few days a significant portion of the garbage is carried inside the forest either by wind, or by flowing rain water. If this garbage can not be removed or better still can not be prevented from dumping, it will continue to be a major threat to the prime habitat. The process of disposal has to be reviewed. Accumulation in pits is a solution but burning the accumulated garbage is again a menace in the form of air-pollution.

Reportedly, the area is now almost free from trapping and snaring. Chance of forest fire can not be ruled out, but it is a remote possibility particularly for the forest type around Gairibas.



Buxa Tiger Reserve:

The habitat in Buxa Tiger Reserve is suitable for different species of Hill-Partridges along an area extending upward from Sadar Bazar up to Rupang Valley in the North and up to Pamsey Danda in the north-east. But the forest is heavily degraded around the Buxa Fort region, considerably degraded around Tashigaon area and though less but partially degraded from beyond Tashigaon up to the India-Bhutan border.

The forest surrounding Buxa Fort and Tashigaon is of mixed deciduous type gradually changing to moist temperate type with gain in altitude. Some of the major tree species of vegetation are: Katush (*Castanopsis indica*), Sirish (*Albizia lebbek*), Chilauni (*Schima wallichii*), Lali (*Amoora wallichii*), Lasuni (*Dysoxylum binectariferum*), Sal (*Shorea robusta*), Bepari (*Elacocarpus robustus*), (*Ostodes pomiculata*), Panisaj (*Terminalia myriocarpa*), Lampate (*Duabanga*



Photograph XIII: A section of the forest trail leading to Rupang Valley from Tashigaon.

sonneratioides), Madar (*Erythrina* spp.), Shimul (*Bombax ceiba*) etc. Unlike the patches of monotypic habitats in SNP, here more diverse undergrowth consisting of different species of shrubs, herbs including grass and sedges apparently provide more vegetarian food for birds throughout the year. Interestingly, the vegetation of that particular area where the Hill-Partridges were observed by the WPA-India team in 2011, Allen *et al.* (1996) in 1992 and Sivakumar and Prakash (2003) in 2001, which are presumably those belonging to the species *Arborophila Mandellii*, has sporadic patches of *Arundinaria* spp.. *Arundinaria* spp. is not very common in other areas around Buxa Fort. In fact

the habitat of this particular area is still significantly rich in flora of fauna. During the survey the WPA-India team sighted two other 'Vulnerable' bird species namely the Beautiful Nuthatch



Sitta Formosa Blyth, 1843 and the Rufous-necked Hornbill *Aceros nipalensis* (Hodgson, 1829) from this area only.



Photograph XIV: A view of the habitat between Chhokudin & Rover's View Point where *A. mandellii* has been sighted.

There are different types of plantations including pine and also scattered patches of orange orchards between Lal Bangla and Tashigaon. Presence of Hill-Partridges can be felt everywhere in BTR from around and above Sadar Bazar (589 m., 1934 ft.). During the survey, occasionally the presence of Hill-Partridges could be detected even within 100 m. distance from the village limits. Though very rarely seen by the resident villagers, it is obvious that particularly Rufous-throated Hill-Partridges make use of the degraded habitat around the village localities quite efficiently (from calls heard, Hill-Partridges common around Buxa Fort region seemed to be of *A. rufogularis*).



In the upper reaches of BTR, Hill-Partridges share the habitat with Red Jungle Fowl and Kaleej Pheasant. The team sighted both these Galliform species while on observation trips. Here, just as in SNP, the natural enemies to Hill-Partridges are weasels, yellow-throated martens and lesser cats.

In the upper reaches of Buxa Tiger Reserve the key threats to the habitat are:

- Indiscriminate extraction of fire-wood and fodder: In Buxa, within and around the selected habitat area, there are eight small villages. The villagers mostly belong to the Dukpa (Origin : Drukpa) community and also some Nepali families settled in pockets. Dukpas are generally Buddhist and Nepalis are Hindu by religion. But there are also a significant number of villagers who are believers of Christianity. The area is not hospitable in many senses. The soil is fertile, but full of rocks and debris. Water crisis is a big problem during winter and summer months. Villagers do not gain much from agriculture. The principal agricultural produce is ginger and squash. Once some villagers started planting orange trees and were earning some money from the crop. Since it involved illegal encroachment on forest land, more than a decade ago most of these plantations were destroyed overnight by the Forest Department. A few years later, the surviving patches of orange orchards became almost unproductive due to some alleged infection. Orange orchards are no longer a good source of income for the villagers. Their economic condition is so bad that the majority of the villagers around have to survive on forest products only. This dependence is behind the ongoing degradation of the entire habitat. Firewood and fodder harvesting have gone beyond reasonable limits. Members of almost every household are involved in these activities.



Photograph XV: Indiscriminate collection of firewood is a major problems in BTR



- **Grazing:** Cattle grazing is a big problem in the area. There is constant pressure from the village cattle roughly up to a point a little beyond Tashigaon. Occasionally nomadic groups enter this rarely patrolled hill region of upper Buxa and set temporary cowsheds (*Gothh* – ‘o’ pronounced as in more) within the forest area. These sheds demand clearance, firewood and other means of living, mostly extracted from the forest around.
- **Poaching:** Trapping and snaring of Galliforms is a big threat in this area. Some of the villagers (usually non-Buddhist Nepalis) who regularly enter the forest for firewood and fodder collection, set traps at different places frequented by Galliformes species, meant for Red Junglefowl, Kaleej Pheasant and Hill-partridges. Quite often, as reported by the local villagers, Hill-Partridges get trapped in those live or death-traps and are consumed by the trappers. These traps are usually set with material procured from the forest only

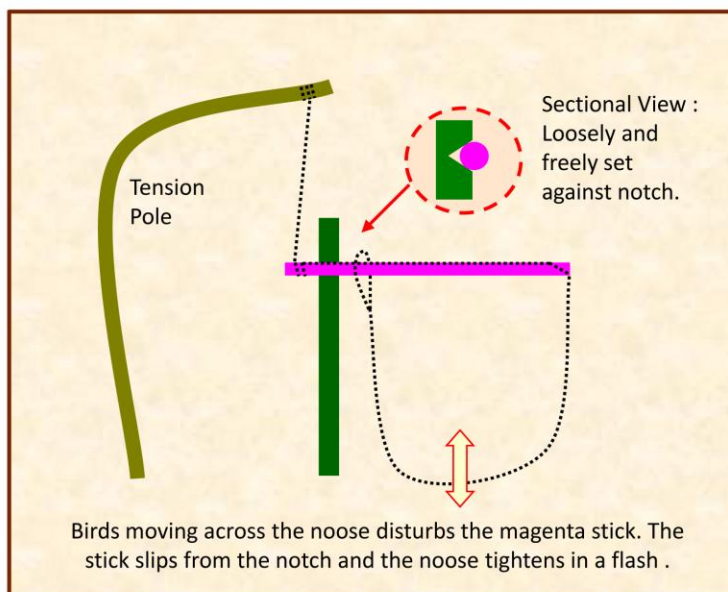


FIGURE IV: Showing the mechanism of ‘Ankushe Passo’ or ‘Surke Passo’.

exception being the long string that forms the noose. For example, ‘*Ankushe Passo*’ or ‘*Surke Passo*’ is one such very effective noose-trap for Galliforms. To set this kind of trap, at first the birds’ probable trail is identified. Then the improvised trapping mechanism is set across the trail creating minimum

disturbance to the surroundings. The sides are blocked carefully with small branches so that the bird, if it wishes to keep to the trail has to pass through the hanging noose. With the slightest pressure applied on the string or the stick holding the string, the noose sharply tightens around the neck or body of the bird. Usually the quarry dies [FIGURE IV].



'Chor Passo' or 'Khunte Passo' is a similar kind of trap. The major difference is that the noose lie flat on the ground [**Photograph XVI**] and it often uses a bait.



Photograph XVI: Showing Chor Passo or Khunte Passo.

Another kind of death trap 'Japalo' is shown in **FIGURE V**. Here the quarry almost invariably and instantly dies.

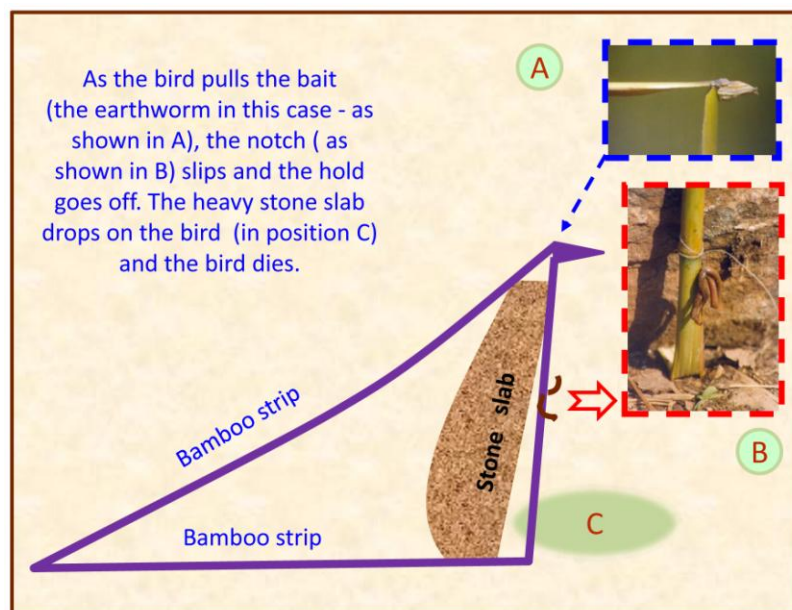


FIGURE V: Showing mechanism of Japalo.



The villagers particularly Nepalis also use the slingshot (catapult or '*Katis*' in local language) at random. Buddhists generally do not kill birds or animals directly. But Nepali Hindus or Christians kill them. Young villagers and boys are expert in killing birds using slingshot. This is why birds at Buxa are relatively more wary and sensitive to human presence than the way they behave at SNP. In SNP use of *katis* is not that widespread among school children or local youth. But in Buxa it is considered to be a pastime and also a means of procuring bushmeat. Other than during the monsoon, the trappers are always active.

- Department's inability to exercise adequate administrative control in remote areas : The vast hilly terrain of upper Buxa is controlled from Santalabari only from where it is not at all feasible to ensure proper protection. This lack of infrastructure is another big drawback behind the rapid deterioration of the forest habitat.
- Pollution due to garbage disposal by tourists including trekkers, local villagers and SSB staff: It is again a big problem in upper reaches of BTR. The nature of disposed garbage was studied along a selected 700 m. stretch of the cart road between Lal Bangla and Tashigaon. The team collected: snacks & biscuit wrappers – 73, chewing gum/lozenge/toffee wrappers – 114, pan-masala/tobacco sachets (foil) – 118, mouth-freshener sachets – 43, misc plastic – 197, food packet / sachets – 14, fruit juice tube – 6, cold drinks bottle – 3, soft drink sachets – 9. The collection was made from on the card-road surface area (about 3m. wide). If we compare the collection with that done in SNP it will at once show that the problem is far more acute in upper reaches of BTR. A couple of points would be interesting to note. Pan masala/tobacco pouches, chewing gum/lozenge/toffee wrappers and snacks & biscuit packets contribute most to the trek route pollution. Village garbage is usually dumped within the village area. School children, tourists and pan masala/tobacco pouch users are the groups most responsible for this pollution.
- Ill-developed poorly managed tourism: The tourism in upper reaches of BTR is totally disorganized. Recently a community group formed at Santalabari has started providing



guides and porters to the tourists. The guides are not at all trained to handle nature-oriented tourists. During post monsoon, winter and early summer months a large number of tourists visit Buxa Fort which is considered to be a State Heritage Site. The Fort, originally a small citadel of the Bhutan Kingdom, served as a detention centre for freedom fighters during the British period. A section of these tourists often spend a few days in home-stay or other accommodation around Buxa Fort. Though in much smaller number, nature-loving tourists also visit this area and trek to different points of Upper Buxa. Rupang Valley trek is one route popular among a section of adventure-minded tourists. At least three/four nature camps for school children are held in this area every year. Despite its eco-tourism potential, the sector is largely neglected in BTR.

- Forest fire: In upper Buxa, incidence of forest fire is regular during summer months, unless early monsoon sets in. Forest fires are generally (almost in all cases) man-made, be it intentional or caused by carelessness. For easy movements through undergrowth and for better growth of fodder grasses, villagers often initiate forest fire in the area.
- Water scarcity: Starting from late winter months (January-February) to late summer (till middle of May or late May) the upper reaches of BTR suffers from acute water crisis. Even game birds or other animals have to suffer a lot.
- Landslides: The area is noticeably slide-prone at places. During monsoon, this often leads to loss of forest chunks and heavy soil-erosion.



Photograph XVII: Lal Bangla village on Buxaduar-Rupang Valley trail.



4.4 Awareness Generation Activities:

At the beginning of the project, it was strongly felt that not only the common people, but even a large section of wildlife-lovers, naturalists, conservationists, wildlife photographers, forest

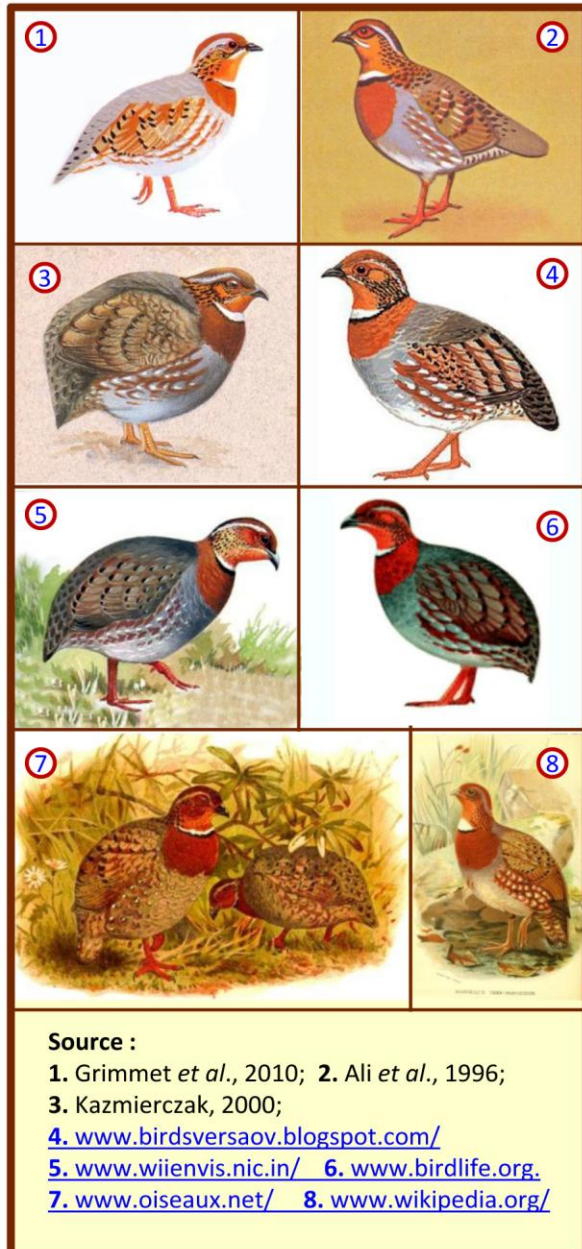


FIGURE VI

administrators and scientific workers in the field are not at all aware of the species or about its 'Vulnerable' status. Since only a few lucky birdwatchers or naturalists have knowingly observed the species in the wild and till date no photograph is known to have been taken from the wild (could not be located through thorough search and communication), there is no clear representative picture of the species available as reference in existing literature or in the web. **FIGURE VI** depicts some of the paintings of the species available from web sources and published pictorial guides. The figure will at once show how confusing is the overall appearance of the bird to all. All the paintings & drawings showing the distinctive features of the species used in different publications and well known websites, vary greatly in appearance. Even to the mind of the illustrators who imagined / derived from early descriptions / or have drawn with reference to the type specimen, the overall appearance of the species occurred differently.



One primary concern of the survey team was therefore to make people aware of the species. With the same intention, the WPA-India team developed a separate computer generated painting of the species for use in various awareness materials (**FIGURE VII**). The illustration was made particularly contrasting and brightly coloured so that it can readily draw the attention of the passerby and onlookers.



FIGURE VII

This illustration was used to produce:

- about 100 nos. 2010 wall-calendars (4-leaf) [**ANNEXURE I**]
- 100 nos. 2011 wall-calendars (4-leaf), [same layout as of 2010 wall-calendar]
- 400 nos. 2011 wall-calendars single leaf, [**ANNEXURE II**]
- 400 nos. 2011 pocket calendars, [**ANNEXURE III**]
- 2000 back-gumming stickers and [**FIGURE VIII**]
- 500 front-gumming stickers [same layout as of the back-gumming stickers].



FIGURE VIII: Showing the sticker layout (Size 1:1)

Apart from the scientific name and the common English name of Red-breasted Hill-Partridge, the awareness materials also carried the Bengali and the Nepali/Hindi name of the species. The local names had to be extended to specify the species. The generic name for partridges is *titir* in Bengali and (as mentioned earlier) *piura* in Nepali. *Lal-book* in Bengali and *Rato-chhati* in Nepali/Hindi have been added to specify 'Red-breasted' and *pahari* in both Bengali and Nepali (pronounced a little differently) has been added to mean 'Hill-' in the prefix of 'Partridge'.



Photograph XVIII: Showing front gumming sticker on window pane.

All these materials were distributed widely in both the study areas. Back-gumming stickers were distributed among school children and general people and front-gumming stickers were distributed mostly among car drivers and shops with glass counters [Photograph XVIII]. Calendars were distributed to general village households, hotels, trekkers' huts, shops, churches, temples, SSB Camps, forest offices and check posts throughout the area.



Primarily the purposes of distribution were:

- to make people aware about the then ongoing project
- to arouse their inquisitiveness about the species
- to keep a long-run impression of the target species (of its existence and importance) among the local people

The survey team was always conscious to spread the news among the local people that the study is going on, so that the common villagers think that the species has some extraordinary importance. Wherever possible, local school children were asked if they know anything about *piura*. School children were interacted with the aid of pictorial guides and stickers were given to them [**Photograph XIX**].



Photograph XIX: Ayan Banerjee interacting with school children.

Under the awareness generation activities, 4 nos. low-cost binoculars were distributed in the field: 2 nos. to two local guides who operate around the Buxaduar-Rupang Valley region and another 2 nos. to two interested local youths of Upper Buxa region.



One copy of **OXFORD Pocket Guide to the Birds of the Indian Subcontinent** (by Richard Grimmet, Carol Inskipp, Tim Inskipp) has been given to Smt Kesri Gurung, a young lady of Tumling, who has shown positive interest towards learning about birds. She has been

encouraged to learn and disseminate whatever knowledge she can acquire in future through nurturing her own interest, to the local children. One copy of **The book of Indian Birds** (by Salim Ali) has been given to Smt Neela Gurung of Tumling. She is a teacher at Meghma School and she has been requested to encourage her students to learn about birds. Another copy of the same book **The book of Indian Birds** (by Salim Ali) has been given to Shri Tendu Dukpa of Buxaduar, who is an Asst. Teacher at the school at Lepcha Kha, with the same motive that he will encourage his pupils to study birds . Incidentally Shri Tendu Dukpa is the first graduate from the Dukpa community of Duars. Four copies of **Common Birds** (by Salim Ali & Laeeq Futehally) were distributed to one school teacher,

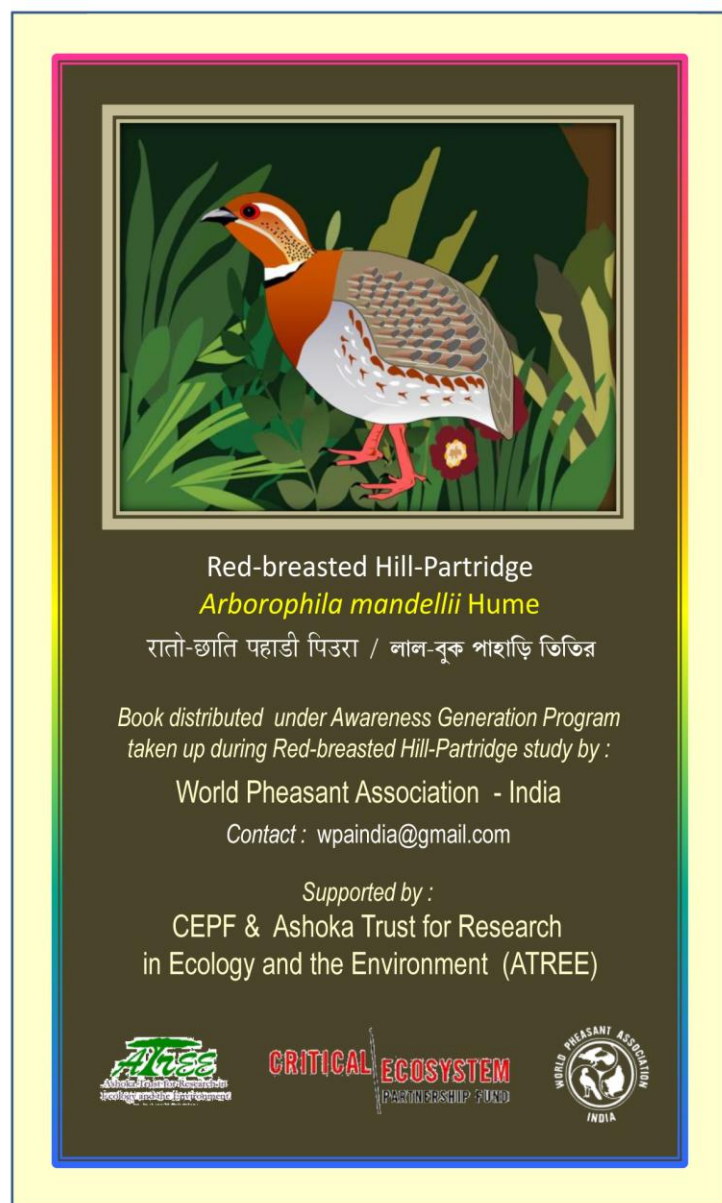


FIGURE IX

one hotelier (homestay-owner of Sadarbazaar) and two guides of the Buxaduar region. **FIGURE IX** shows the design of the sticker-label that has been put on the first blank page of each distributed book.



4.5 Objective-wise performance

TABLE IV

Objective (planned performance)	Actual performance
1. Determine the presence-absence status and mapping distribution of the red-breasted hill-partridge (<i>Arborophila mandellii</i>) in SNP and upper reaches of the BTR, West Bengal, India.	Accomplished. Target species sighted once in SNP and twice in upper reaches of BTR.
2. Attempt to understand the ecology of the target species within the selected study area and generate new data/information on the species.	Partially accomplished, based on documentation of secondary data only.
3. Determine the key threats to the survival of Red-breasted Hill-Partridge (<i>Arborophila mandellii</i>) and its habitat, to assess the overall habitat quality and to determine the critical requirements for conservation of overall biodiversity of the habitat lying within the defined study area. Eventually to contribute towards generating an 'in-situ conservation strategy and action plan' for the habitat thus securing the ecological future of the landscape.	Accomplished. Key threats determined and studied. Recommendations made. Action Plan drawn.
4. Help raising awareness on the urgency of conserving the red-breasted hill-partridge (<i>Arborophila mandellii</i>) through developing awareness materials and facilitating propagation of the same in collaboration with other stakeholders and civil bodies. Identification of a network of concerned stakeholders for possible involvement into conservation action around the study area and communicating with them exploring the possibility of capacity building of local civil bodies and interested individuals for taking up future initiatives to conserve the target species.	Accomplished. Awareness on species status generated among local people. Stakeholders identified. After submission of the final report, findings and summary will be circulated among Govt. organizations, NGOs, Institutes, tourists and birdwatchers, tour operators and other stakeholders.



5.0 Discussion

This survey has confirmed for the first time the presence of the Red-breasted Hill-Partridge in SNP. BirdLife International (2001) had earlier mentioned of unconfirmed reports from the park. Two occasions of sightings in upper reaches of BTR strengthened the claim of earlier sighting instances by observers Allen *et al.* (1996), Sivakumar and Prakash (2003).

Among Hill-Partridges, from recorded calls and other secondary evidences, it seemed to be obvious that in both the selected study areas the relative abundances of Common Hill-Partridge (*A. torqueola*) and Rufous-throated Hill-Partridge (*A. rufogularis*) are much higher than that of Red-breasted Hill-Partridge (*A. mandellii*). *A. mandellii* population in both these areas are probably pocket populations with few surviving individuals.

It has to be kept in mind that Red-breasted Hill-Partridge is considered to be a VULNERABLE species under IUCN criteria C2a(i) ver 3.1. It means that [C] the global population size of *A. mandellii* estimated to number fewer than 10,000 mature individuals, [2] a continuing decline, observed, projected, or inferred, in numbers of mature individuals and [a] the population structure is in the form of : [i] no subpopulation estimated to contain more than 1000 mature individuals. The present study findings are definitely in no way contradictory to the criteria, rather tend to conform to the last section [i] to be holding true for the selected study areas.

Another important point, there is no specimen of *A. mandellii* in the National Zoological Collection kept at the Zoological Survey of India (ZSI). No reference could be found that indicates any captive population of *A. mandellii* is surviving anywhere in the world. The type specimen is however preserved in the British Museum (Natural History), Warren and Harrison (1973).

Degradation of forest as a result of fodder and firewood harvesting and clearance for grazing grounds of yak is an increasing problem in Singalila. However, further surveys are required to know the relative abundance of the species in the park, which is potentially a good habitat for the species. In Buxa, similar anthropogenic pressure exists in amplified quantum. Snares set for galliforms in general may also be responsible for the deaths of a few Red-breasted Hill-



Partridges in upper reaches of BTR. High incursion rates from trekkers, tourists and grazers and extensive grazing across Singalila are threats for the species. The newly set up camps of SSB personnel are causing additional anthropogenic interference in both Singalila and Buxa. The patrol parties normally take along domestic dogs, which are threats for galliforms.

Joint Forest Management is not yet a well understood, properly practiced or adequately implemented concept in either of the study areas.

A quick look at **TABLE V** will at once give an impression of the comparative acuteness of different types of threats in SNP and upper reaches of the BTR, The habitat in BTR seemed to be far more fragile and vulnerable than the surveyed habitat within Singalila National Park.

TABLE V

Nature of threat	Singalila NP	Upper reaches of Buxa TR
Illegal tree felling	Very Low	Low
Collection of Firewood	Medium	High
Collection of fodder	Medium	High
Collection of NTFP	Negligible	Low
Grazing	Medium	Medium
Encroachment	Negligible	Low
Poaching/trapping	Negligible	High
Water scarcity	No	High
Forest Fire	Low	High
Tourism	Low	Medium
Garbage disposal	Medium	High

The Conservation Action Plan in SNP has to be trans-boundary. The location of SNP is such that most of the exploitation activities are carried out from across the border, i.e. by the fringe villagers from adjoining areas of Ilam district of Nepal.



Same is true even for the upper reaches of BTR. It would be better to draw a trans-boundary Conservation Action Plan as the area in question is under exploitation and use from people of Bhutan as well as the resident population from India. Here people from Indian side exploit the area more than their Bhutanese counterparts who use the area mostly for transportation and transit purposes only.

Major challenges faced during running of the project were:

- Socio-political disturbance in Darjeeling Hills. A number of prescheduled trips had to be postponed or shortened due to repeated and prolonged *Bandhs* (general strike) called in the region.
- Lack of knowledge of the local people and even the forest staff on the whereabouts and importance of the species. Before briefing by the study team, they were not at all concerned about species variation among Hill-Partridges.
- Inclement weather condition during some field trips both in SNP and the upper reaches of BTR.

Besides local population in general and Forest Department, the major stakeholders in and around SNP are tour operators, hoteliers, home-stay owners, local guides, guide association and land rover association of Maneybhanjang, guide association of Rimbik, students of school, college and university, researchers and few local NGOs. Not many NGOs are actively working in and around SNP except perhaps FOSEP, ATREE and WWF-India from Indian side and a few other NGOs in the Nepal side. NGO like HNAF of Siliguri, that occasionally conduct nature camp in SNP, occasionally come out with garbage cleaning program etc.. But these are scattered efforts having not much lasting effect on people's mind or activity. In upper reaches of the BTR the number of tour operators is much less and the tourism sector is not at all organized. Even NGOs do not have an eye to this area. Thus only local people are the true stakeholders and only an overall uplift in their livelihood, can provide and ensure long term protection of the area.

There had been no collaborating partner in the project. But however NGOs such as SPAWN, Jalpaiguri, or ACT, Siliguri are well aware of the study. Members of SPAWN assisted in the



fieldwork in Buxa Tiger Reserve. To sustain (at least partially) the effort that has been given to locate the bird or to photograph it in the wild, after submission of the final report a brief note on the study will be distributed among selected NGOs of Darjeeling and Jalpaiguri districts. Attempt to photograph the target species will continue on behalf of WPA-India. Moreover, soon after the submission of the final report, within the month of June, 2011, wildlife photographers across the region will be intimated by WPA-India about the importance of photographing the species in the wild with its description and distribution. Similar intimation will be disseminated also through WPA-India website and other social network sites. Some guides and schoolteachers from study area had been motivated to pursue bird-watching. They will also be encouraged to keep track of the target species and to intimate WPA-India any information they can possibly gather on it. All future projects of WPA-India taken up in the region will continue to keep up the effort to photograph the species or otherwise document any information available on it.





6.0 Recommendations

Conducting follow up surveys in the forested areas of Darjeeling district to determine its distribution and conduct intensive studies at key sites such as Gairibas and upper Buxa to provide detailed information on its ecology, is a necessity. Recent sightings are being reported from Bhutan and Arunachal. It would be justified to design a more extensive survey including all species of Hill-Partridges and extending the area of coverage through the Eastern Himalayan foothills and middle hill forests up to 3,300 m. (11,000 feet approx.) up to the eastern districts of Arunachal Pradesh.

Recommended Action Plan for both the study areas separately are given below. A general species-specific Action Plan is also given following the area specific plans.

ACTION PLAN for SINGALILA NATIONAL PARK :

To protect the existing habitat following actions are recommended:

- To effectively reduce collection and consumption of firewood and fodder by the local villagers. Control grazing inside the National Park area.
- To have a clear account of the number of hotels/home-stays along the southwestern-western border of SNP. To restrict the number of accommodation to its present number.
- To discourage and control disposal of non-biodegradable garbage within forest area. Guides accompanying tourist parties to be instructed to prevent tourists from disposing non-biodegradable waste on trek routes.
- To divert the vehicular traffic through Tumling-Jaubari-Gairibas route avoiding use of the 7km. road through National Park unless in emergency.
- Similarly to divert vehicular traffic through the via Nepal route from Kalapokhri to Bikheybhanjang.
- To enforce existing rule of cooking in LPG in accommodation within the National Park area.



- SSB personnel should be regularly motivated on conservation and should be discouraged to take dogs along with them while on patrol duty.

To minimize future habitat loss and to secure long term survival of the target species, following actions are recommended:

- Taking up and implementation of long term trans-border program to elevate the livelihood status and living quality of the local residents of areas under Ilam district adjacent to the southwestern-western border of SNP.
- To encourage alternate income generation of local villagers (Indian or Nepalese). Raising of commercially profitable medicinal plant species nurseries can be thought of.
- To expand and boost revenue generating controlled eco-tourism, keeping stringent check on disposal of additional garbage and additional firewood consumption. Right to expand accommodation and other infrastructure to be restricted among local villagers only. Land rovers are the only means of vehicular movement along the border road leading to Phalut from Maneybhanjang. Though the vehicles are much polluting, but these serve as a heritage tourism product. Removal of these land rovers is not required, as long as those can survive in least operating state. But increase in vehicular traffic along this road route is discouraged. Getting this road black-topped may be avoided.
- Inclusion of as much as reserved forest areas possible contiguous to the National Park towards the Eastern side of the National Park. For example the forest blocks on both sides of the (about 4 km) foot-trail leading to Rithhu village from Gairibas should better be included within the National Park as the habitat is still very favorable for the target species as well as other galliforms.
- Taking up large scale plantation program for fast-growing firewood producing plants (diverse species, monoculture to be avoided) to be taken up on degraded open pastures particularly on the denuded Nepal side adjacent to National Park border. Joint Forest Management practices may help.



- Developing a properly functioning income generating garbage disposal system involving local villagers. Garbage dumping points to be increased. Accumulated garbage should not be burnt, inside the National Park.
- Large scale awareness generation programs to be taken up to induce school children in disposing garbage at proper dumping points and learn to observe animals.
- Awareness generation campaign to be designed and taken up involving Satyr Tragopan, Blood Pheasant, Red-breasted Hill-Partridge and Red Panda as flagship species. The same campaign may be used to draw more tourists to the area.

Key challenge to be faced towards conserving the habitat in SNP:

- to stop exploitation of the forest from Nepal side.

ACTION PLAN for UPPER REACHES OF THE BUXA TIGER RESERVE :

To protect the existing habitat following actions are recommended:

- To effectively reduce collection and consumption of firewood and fodder by the local villagers. Control grazing.
- To stop further encroachments in the form of clearing and cultivation of forest land, setting of temporary cow sheds, expansion of residential area within forest land, etc. To stop infiltration of Bhutanese population with livestock and setting temporary cowsheds (*Gothh*) within forest areas.
- To step up vigil and increase frequency of forest patrolling to control trapping, poaching and stray cases of illegal tree felling.
- To control people for burning undergrowth in summer months.
- To discourage and control disposal of non-biodegradable garbage within forest area.
- SSB personnel should be regularly motivated on conservation.



To minimize future habitat loss and to secure long term survival of the target species, following actions are recommended:

- Taking up and implementation of long term trans-border program to elevate the livelihood status and living quality of the local residents of Buxaduar region and also villagers from Rupang Valley area who uses the Santalabari-Rupang Vally trek route for transportation of necessities and mildly exploit the area for forest resources.
- To encourage alternate income generation particularly for resident Indian population. Raising of commercially profitable medicinal plant species nurseries can be thought of. Assistance in proper processing, timely drying and marketing of ginger (the principal cash crop of this area) may help.
- To develop revenue generating controlled eco-tourism, keeping stringent check on disposal of additional garbage and additional firewood consumption. Use of subsidized LPG to cater tourists and also for domestic cooking to be encouraged. Buxa Fort will be supportive as a heritage tourism product. Developing a network of home-stay system in household of local villagers is preferred.
- Taking up large scale plantation program for fast-growing firewood producing plants (diverse species, monoculture to be avoided) to be taken up on degraded open pastures. Joint Forest Management practices may help.
- Taking up plantation program with suitable soil-binding flora in slide zones.
- Developing a properly functioning income generating garbage disposal system involving local villagers. Large scale awareness generation programs to be taken up to induce school children in disposing garbage at proper dumping points, abstain from hunting with slingshots and learn to observe animals.

Key challenge to be faced towards conserving the habitat in the upper reaches of BTR:

- to improve the economic condition of local villagers and to reduce their dependence of forest effectively.



SPECIES-SPECIFIC ACTION PLAN

- To design and conduct extensive survey on the present distribution, status and eco-behavior of *A. mandellii* in Sikkim, West Bengal (Singalila National Park, Senchal Wildlife Sanctuary, Neora Valley National Park and upper reaches of BTR), Bhutan, and Arunachal Pradesh.
- To make people aware that the species is Vulnerable and data deficient. To motivate wildlife enthusiasts, photographers to attempt taking photograph of *A. mandellii* and also other Hill-Partridges.
- More thrust to be given to record and analyze vocalizations of Hill-Partridges including *A. mandellii*. Visual authentication of the calling bird is needed. There are much confusion regarding the vocalizations.
- After careful determination of status in different areas in its anticipated range, if in some pocket the number of *A. mandellii* is found to be above comfortable limit and density, two pairs of *A. mandellii* to be captured, studied and to be tried out for captive rearing. This has to be done with utmost scientific care and priority in any of the high altitude zoological garden. India does not possess any captive stock or even preserved specimen of the bird. If the species gets lost in the wild, it is lost forever. Some species of Galliforms survive well in captivity. There is no harm in trying captive rearing and breeding of *A. mandellii* and also other species of Hill-partridges.
- Despite being mentioned as a Vulnerable species in IUCN Red List, *A. mandellii* by name has no mention in The Indian Wildlife (Protection) Act, 1972 [as amended up to 1993] Schedules. All Partridges (covering Hill-Partridges) are included as a group namely 'Partridges (Phasianidae)' under Schedule IV. This point has to be taken up and it should be placed to the proper authority that *A. mandellii* with all due justifications deserves to be included in Schedule I, Part III of the said Act.



7.0 Publications on the study

So far there had been no major publication on the study. After submission of the final report the findings may be put forward for publication in different print media and will be posted in websites. Any future publication on the study will be notified to the coordinating and monitoring agency in due course.

A brief note on the study (**FIGURE X**) was however published in the IUCN–CEM Newsletter. See link : http://cmsdata.iucn.org/downloads/ecosystem_mar_2010.pdf



The World Pheasant Association - India study on the status, distribution, key threats & related conservation aspects of Red-breasted Hill-Partridge (*Arborophila mandellii* Hume) in Singalila National Park and Buxa Tiger Reserve, West Bengal supported by 'Critical Ecosystem Partnership Fund (CEPF)' and 'Ashoka Trust for Research in Ecology and the Environment (ATREE)' has commenced from October 15th, 2009. During the first reconnaissance-cum-survey trip in Singalila National Park, the team recorded a single instance of sighting of the target species in the wild. Further intensive survey around the selected areas has been planned to be conducted

during the period late March to middle of May, 2010. Red-breasted Hill-Partridge is a globally Vulnerable bird species with distribution confined in and around the Eastern Himalayas and not much is known about its habit and eco-behaviour. [Contact](#)

FIGURE X

Also a section of a trip report from a bird lover posted through internet is intriguing and definitely indicative of the effectiveness of WPA-India's awareness campaign around the upper reaches of the Buxa Tiger Reserve. The link and the relevant extract is given below :

Internet Link :

http://groups.google.com/group/delhibirdpix/browse_thread/thread/71133657b0937b0

Relevant extract :

While discussing about birds, I came to know that an old man often comes to this place and he searches for the Red-breasted Hill-Partridge (*Arborophila mandellii*) in the hill forests. This bird is considered to be vulnerable by the IUCN Red Data List...and has been sighted in the upper reaches of Buxa hills recently. This bird is also known as the Chestnut-breasted Partridge. The old gentleman had also given a painting calendar of the bird to many villagers to spread awareness. The shopkeeper showed me the calendar, and we were surprised to learn that these hills are home to this rare beauty. Many villagers have heard the calls of the bird...but it's difficult to observe and study the habits of the species due to its secretive nature. Moreover it is found in the most inaccessible parts of the hills.



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Note :

- The common & scientific names of the bird species used in this report are according to the 'Standardised common and scientific name list of the birds of the Indian Subcontinent' published in BUCEROS, Vol. 6, No. 1 (2001) Envis Newsletter : Avian Ecology & Indian Wetlands. The list was compiled by Ranjit Manakadan & Aasheesh Pittie with support from many ornithologists and different organizations working in the field.
- Some location names are pronounced differently and/or have different spellings. In this report, the better known names and spellings are selectively chosen and used. The names known to have alternate spellings (**shown within bracket and in blue font colour**) are mentioned below:

Singalila (**Singhalila**), Gairibas (**Gairibans**), Gorkhey (**Gorkey**), Bikheybhanjang (**Bikhaybhanjang**, **Bikaybhanjang**), Santalabari (**Santrabari**), Sandakphu (**Sandakpur**), Rupang Valley (**Rupam Valley**) and Darjeeling (**Darjiling**).



ANNEXURE : I

4-leaf
Wall Calendar
Size : 11.5"X24"

100 nos.
produced in 2010
And 100 nos. in
2011 for
distribution in
and around both
the study areas,
i.e. upper
reaches of the
Buxa Tiger
Reserve and
Singalila National
Park. Only the
caption at the
bottom of the
main illustration
was different for
respective areas.



People of Darjeeling Hills are proud to possess
this VULNERABLE bird at Singalila National Park

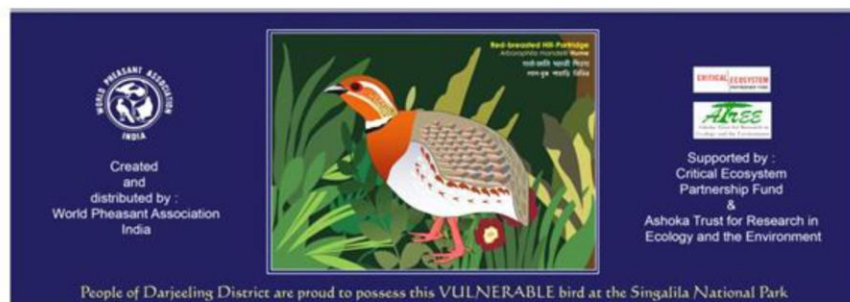


Created & distributed by : World Pheasant Association - India
Supported by : Critical Ecosystem Partnership Fund &
Ashoka Trust for Research in Ecology and the Environment



Jan '11	SUN	MON	TUE	WED	THU	FRI	SAT
Notes	30 द्वारदी ३०	31 ब्रह्मदेवी ३१	23rd Notaji Birthday	26th Republic Day	6 द्वारदी २३	7 पुर्णिमा २२	1 पौर्णमासी २०
01	2 ब्रह्मदेवी २९	3 ब्रह्मदेवी २८	4 अमावस्या २७	5 पौर्णमासी २६	13 नवमी २३	14 दशमी २२	8 सप्तमी २०
	9 पंचमी २८	10 शनि २७	11 सप्तमी २६	12 अष्टमी २५	20 सप्तमी २३	21 द्वारदी २२	15 एकदशी २०
	16 द्वारदी २७	17 ब्रह्मदेवी २६	18 सप्तमी २५	19 सप्तमी २४	27 अष्टमी २२	28 नवमी २१	22 पुर्णिमा २१
	23 सप्तमी २७	24 पंचमी २६	25 शनि २५	26 सप्तमी २४			29 राशौ/एकदशी २८
SUN	MON	TUE	WED	THU	FRI	SAT	Feb '11
6 पुर्णिमा २२	7 सप्तमी २१	1 कानून २९	2 अमावस्या २८	3 अमावस्या २७	4 सप्तमी २६	5 द्वारदी २५	Notes
13 दशमी २३	14 एकदशी २२	8 सौम्य २८	9 शनि २७	10 सप्तमी २६	11 अष्टमी २५	12 नवमी २४	02
20 द्वारदी २३	21 पुर्णिमा/सप्तमी २२	15 द्वारदी २१	16 ब्रह्मदेवी २०	17 सप्तमी २०	18 सप्तमी २१	19 सप्तमी २०	
27 दशमी २८	28 एकदशी २७	22 पंचमी २६	23 शनि २५	24 सप्तमी २४	25 अष्टमी २३	26 नवमी २२	
		29 शनि २८	8th Saraswati Puja	16th Faleha Doaz Daham			
Mar '11	SUN	MON	TUE	WED	THU	FRI	SAT
Notes	6 द्वारदी २२	7 पुर्णिमा २१	1 कानून २९	2 ब्रह्मदेवी २८	3 सप्तमी २७	4 अमावस्या २६	5 कानून २५
03	13 अष्टमी २३	14 नवमी २२	8 पुर्णिमा २०	9 सप्तमी २१	10 पंचमी २०	11 शनि २१	12 सप्तमी २०
	20 पौर्णमासी २३	21 द्वारदी २२	15 दशमी २१	16 एकदशी २०	17 दशमी २१	18 सप्तमी २०	19 दशमी २१
	27 अष्टमी २८	28 नवमी २७	22 पुर्णिमा २६	23 सप्तमी २५	24 पंचमी २४	25 शनि २३	26 सप्तमी २२
			29 दशमी २८	30 एकदशी २७	31 द्वारदी २६	19th Dol Jatra / Holi	

ANNEXURE : II



১৪১৭ JANUARY পৌষ-মাঘ 	১৪১৭ FEBRUARY মাঘ-ফাল্গুন 	১৪১৭ MARCH ফাল্গুন-চৈত্র
১৪১৮ JULY আষাঢ়-শ্রাবণ 	১৪১৮ AUGUST শ্রাবণ-ভাদ্র 	১৪১৮ SEPTEMBER ভাদ্র-আশ্বিন
১৪১৮ OCTOBER আশ্বিন-কার্তিক 	১৪১৮ NOVEMBER কার্তিক-অগ্রহায়ণ 	১৪১৮ DECEMBER অগ্রহায়ণ-পৌষ
JANUARY 23rd Netaji Birth Day 26th Republic Day FEBRUARY 8th Saraswati Puja 16th Fateha-Doaz Dahum	MARCH 19th Dol Jatra APRIL 1st Yearly Bank A/c 15th Bengali New Years Day 22nd Good Friday	MAY 1st May Day JUNE / JULY XXX AUGUST 15th Independence Day
2011 HOLIDAYS 22nd Janmastami 31st Id-ul-Fitr SEPTEMBER 27th Mahalaya 30th Half Yearly Bank A/c OCTOBER 2nd Gandhi Birth day 3rd To 6th Durga Puja 11th Laxmi Puja 26th Shyama Puja NOVEMBER 7th Id-ul-Zohra 10th Guru nanak Birthday DECEMBER 6th Muharram 25th Christmas Day		

© BAP-1136

Single leaf Wall Calendar (Sizes : 12"X23"& 16"X22"):
 400 nos. produced in 2011 for distribution in and around
 both the study areas.

ANNEXURE : III

nurture
nature



Red-breasted Hill-Partridge
Arborophila mandellii Hume
রাতো-ছাতি পহাড়ী পিউরা / লাল-বুক পাহাড়ি ভিতির

Created & distributed by :
World Pheasant Association - India
Supported by : CEPF & Ashoka Trust for Research
in Ecology and the Environment (ATREE)
Contact : +91-11- 41752143
wpaindia@gmail.com

JANUARY							FEBRUARY							MARCH								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
30	31				1					1	2	3	4	5				1	2	3	4	5
2	3	4	5	6	7	8	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
9	10	11	12	13	14	15	20	21	22	23	24	25	26	27	28							
16	17	18	19	20	21	22																
23	24	25	26	27	28	29																

APRIL							MAY							JUNE								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
					1	2	1	2	3	4	5	6	7						1	2	3	4
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11	12	
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18	19	
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25	26	
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30				

JULY							AUGUST							SEPTEMBER							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
31					1	2	1	2	3	4	5	6							1	2	3
3	4	5	6	7	8	9	7	8	9	10	11	12	13	4	5	6	7	8	9	10	
10	11	12	13	14	15	16	14	15	16	17	18	19	20	11	12	13	14	15	16	17	
17	18	19	20	21	22	23	21	22	23	24	25	26	27	18	19	20	21	22	23	24	
24	25	26	27	28	29	30	28	29	30	31				25	26	27	28	29	30	31	

OCTOBER							NOVEMBER							DECEMBER							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
30	31				1							1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10	11
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24	25
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31	

2011 HOLIDAYS

Month	Day	Event
Jan	23rd	Netaji Birth Day
Feb	8th	Saraswati Puja
Mar	19th	Dol Purnima
Apr	1st	Yearly Bank Closing Day
Apr	15th	Bengali New Years Day
May	1st	May Day
Jun & Jul	xxxxx	Nil xxxxxx
Aug	15th	Independence Day
Sep	27th	Mahalaya
Oct	2nd	Gandhi Birth Day
Oct	3rd-6th	Durga Puja
Nov	7th	Id-Ul-Zoha
Nov	10th	Guru Nanak B'Day
Dec	6th	Muharram
Dec	25th	Christmas Day

VISHAL

Pocket Calendars of two different looks
(Sizes - 1:1 as shown) 200 nos. of each produced in 2011
for distribution in and around both the study areas.

nurture
nature



Red-breasted Hill-Partridge
Arborophila mandellii Hume
রাতো-ছাতি পহাড়ী পিউরা / লাল-বুক পাহাড়ি ভিতির

Created & distributed by : WPA - India
Supported by : CEPF and ATREE
Contact : +91-11- 41752143
wpaindia@gmail.com

JANUARY							FEBRUARY							MARCH										
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S				
30	31				1					1	2	3	4	5						1	2	3	4	5
2	3	4	5	6	7	8	6	7	8	9	10	11	12	6	7	8	9	10	11	12				
9	10	11	12	13	14	15	13	14	15	16	17	18	19	13	14	15	16	17	18	19				
16	17	18	19	20	21	22	20	21	22	23	24	25	26	20	21	22	23	24	25	26				
23	24	25	26	27	28	29	27	28						27	28	29	30	31						

APRIL							MAY							JUNE								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
					1	2	1	2	3	4	5	6	7						1	2	3	4
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11	12	
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18	19	
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25	26	
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30				

JULY							AUGUST							SEPTEMBER							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
31					1	2	1	2	3	4	5	6							1	2	3
3	4	5	6	7	8	9	7	8	9	10	11	12	13	4	5	6	7	8	9	10	
10	11	12	13	14	15	16	14	15	16	17	18	19	20	11	12	13	14	15	16	17	
17	18	19	20	21	22	23	21	22	23	24	25	26	27	18	19	20	21	22	23	24	
24	25	26	27	28	29	30	28	29	30	31				25	26	27	28	29	30	31	

OCTOBER							NOVEMBER							DECEMBER							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
30	31				1							1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10	11
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24	25
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31	

2011 HOLIDAYS

Month	Day	Event
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Apr	1st	Yearly Bank Closing Day
Apr	15th	Bengali New Years Day
May	1st	May Day
Jun & Jul	xxxxx	Nil xxxxxx
Aug	15th	Independence Day
Sep	27th	Mahalaya
Oct	2nd	Gandhi Birth Day
Oct	3rd-6th	Durga Puja
Nov	7th	Id-Ul-Zoha
Nov	10th	Guru Nanak B'Day
Dec	6th	Muharram
Dec	25th	Christmas Day

VISHAL

ANNEXURE : IV

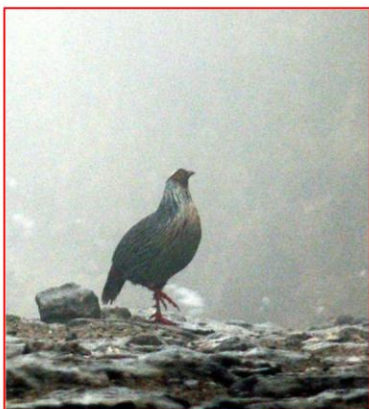
Some important wildlife sighting records during the survey :

Singalila National Park

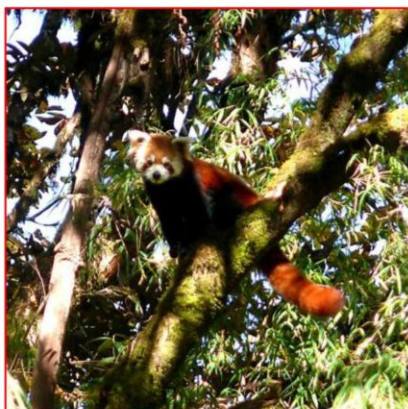
Species (No. of individuals)	Date	Location	Observer/s
Mainland Serow (1) <i>Naemorhedus sumatraensis</i>	Nov 08 2010	On roadside overhang, Gairibans-Kaiyankata old road	Partha Sen Ayan Banerjee
Red Panda (1) <i>Ailurus fulgens</i>	Nov 09 2010	On roadside tree, Gairibans –Tumling Jeep Road, about 1.4 km. away from Gairibans	Heerak Nandy Ayan Banerjee
Satyr Tragopan (1) <i>Tragopan satyra</i>	Apr 20 2010	On Gairibans-Kaiyankata old road, about 1.3 km. away from GairibansTrekks' Hut	Anwaruddin Choudhury
Satyr Tragopan (1) <i>Tragopan satyra</i>	Mar 29 2011	About 200 m. inside forest from Gairibans-Tumling Jeep Road, 2km. from Gairibans	Heerak Nandy
Kaleej Pheasant (2) <i>Lophura leucomelanos</i>	Mar 29 2011	About 400 m. from Gairibans Trekker's Hut, beside Gairibans-Tumling Jeep Road	Heerak Nandy
Blood Pheasant (2) <i>Ithaginis cruentus</i>	Mar 28 2011	On Sandakphu-Kalapokhri Jeep Road, about 500 m. away from Sandakphu	Subhendu Shekhar Saha Heerak Nandy

Upper reaches of the Buxa Tiger Reserve

Species (No. of individuals)	Date	Location	Observer/s
Yellow-throated Marten (2) <i>Martes flavigula</i>	May 04 2010	Beside trek route to Chunabhati from Lal Bangla	Heerak Nandy
Himalayan Weasel (1) <i>Mustela sibirica</i>	Mar 09 2011	Near wooden bridge on way to Tashigaon from Lal Bangla	Ayan Banerjee
Beautiful Nuthatch (1) <i>Sitta formosa</i>	Jan 09 2010	On way to Rovers' View Point from Tashigaon about 350 m. before Rover's	Anwaruddin Choudhury
Rufous-necked Hornbill (2) <i>Aceros nipalensis</i>	Mar 10 2011	On way to Rovers' View Point from Tashigaon about 550 m. before Rover's	Ayan Banerjee
Kaleej Pheasant (2) <i>Lophura leucomelanos</i>	Mar 10 2011	On way to Rovers' View Point from Tashigaon about 500 m. before Rover's	Heerak Nandy
Kaleej Pheasant (2) <i>Lophura leucomelanos</i>	Mar 16 2011	On way to Rovers' View Point from Tashigaon about 500 m. before Rover's	Heerak Nandy Ayan Banerjee



Blood Pheasant photographed on 28.03.11 during snowfall



Red Panda photographed on 09.11.10



Satyr Tragopan photographed on 29.03.11 amidst morning mist

ANNEXURE : V

List of butterflies recorded during the survey

Buxa Tiger Reserve

Hesperiidae

Common Snow Flat (*Tagiades japaetus*)
Fulvous Pied Flat (*Pseudocoladenia dan*)
Himalayan White Flat (*Seseria dohertyi*)
Restricted Demon (*Notocrypta curvifascia*)
Spotted Snow Flat (*Tagiades menaka*)
Tricoloured Pied Flat (*Coladenia indrani*)

Lycaenidae

Angled Sunbeam (*Curetis acuta*)
Blue Imperial (*Ticherra acte*)
Blue Tit (*Chilaria kina*)
Common Hedge Blue (*Acytolepis puspa*)
Common Tit (*Hypolycaena erylus*)
Dark Judy (*Abisara fylla*)
Fluffy Tit (*Zeltus etolus*)
Lime Blue (*Chilades laius*)
Monkey Puzzle (*Rathinda amor*)
Pea Blue (*Lampides boeticus*)
Punchinello (*Zemeros flegyas*)
Purple Sapphire (*Heliophorus epicles*)
Quaker (*Neopithecops zalmora*)
Tailed Judy (*Abisara neophron*)

Nymphalidae

Autumnleaf (*Doleschallia bisaltide*)
Banded Treebrown (*Lethe confusa*)
Black-vein Seargent (*Athyma ranga*)
Blue Tiger (*Tirumala limniace*)
Chestnut Tiger (*Parantica sita*)
Common Earl (*Tanaecia julii*)
Common Evening Brown (*Melanitis leda*)
Common Jester (*Symbrenthia lilaea*)
Common Lascar (*Pantoporia hordonia*)
Common Map (*Cyrestis thyodamas*)
Common Nawab (*Polyura athamas*)
Common Palmfly (*Elymnias hypermnestra*)
Common Prince (*Rohana parisatis*)
Common Sailer (*Neptis hylas*)
Cruiser (*Vindula erota*)
Gaudy Baron (*Euthalia lubentina*)
Great Eggfly (*Hypolimnas bolina*)
Grey Count (*Tanaecia lepidea*)
Indian Red Admiral (*Vanessa indica*)
Indian Tortoiseshell (*Aglais cashmiriensis*)
Large Threering (*Ypthima narede*)
Large Yeoman (*Cirrochroa aoris*)
Lemon Pansy (*Junonia lemonias*)
Peacock Pansy (*Junonia almana*)
Popinjay (*Stibochiona nicea*)

Nymphalidae continued...

Red Lacewing (*Cethosia biblis*)
Small Yellow Sailer (*Neptis miah*)
Striped Blue Crow (*Euploea mulciber*)
Tailed Red Forester (*Lethe sinorix*)
Yellow Rajah (*Charaxes marmax*)

Papilionidae

Common Bluebottle (*Graphium sarpedon*)
Common Mormon (*Papilio polytes*)
Common Rose (*Atrophaneura aristolochiae*)
Common Windmill (*Atrophaneura polyeuctes*)
Paris Peacock (*Papilio paris*)
Tailed Jay (*Graphium agamemnon*)
Yellow Helen (*Papilio nephelus*)

Pieridae

Chocolate Albatross (*Appias lyncida*)
Common Grass Yellow (*Eurema hecabe*)
Common Gull (*Cepora nerissa*)
Indian Cabbage White (*Pieris canidia*)
Tree Yellow (*Gandaca harina*)
Yellow Jezebel (*Delias agostina*)
Yellow Orange Tip (*Ixias pyrene*)

Singalila National Park

Nymphalidae

Indian Tortoiseshell (*Aglais cashmiriensis*)
Queen of Spain Fritillary (*Issoria lathonia*)

Pieridae

Indian Cabbage White (*Pieris canidia*)
Dark Clouded Yellow (*Colias fieldii*)

Note: The list has been compiled by Shri Judhajit Dasgupta, with a few additional inputs from other team members. He is the author of the book *Pashimbanglar Projapati* (the most authentic book on Butterflies of West Bengal) and is considered to be a specialist on the subject.



ANNEXURE : VI

Some relevant reference documents: Annexure VI to XII

New species of bird exhibited and characterized by Mr. A. O. Hume,
C.S., C.B.

I beg to exhibit specimens of a few, as I believe, new species of birds....

1.....

2.....

Then we have a most lovely *Arboricola*, the most beautiful of the group, which I owe to that indefatigable ornithologist, L. Mandelli, Esq. and which I propose to name after him.

(3) *Arboricola Mandellii*. Very few words will suffice to characterize this species. It belongs to the same type, as *rufogularis*, Hodg. and *intermedia*, Blyth, in that the feathers of the upper back and interscapular region, are neither barred nor fringed with black. The forehead is a deep maroon chestnut, the crown and occiput a rich ruddy olive. The chin, throat, ear-coverts and sides of the neck bright chestnut, the two latter streaked with black; a broad black line sharply defines the chestnut of the throat; in the centre of the base of the throat, there is a snow white patch, immediately above the black border line. Below this latter the breast is a rich maroon chestnut.

The rest of the bird closely resembles the species already referred to. Length about 8.5; wing 4.75.

Excerpts from :
Proceedings of the Asiatic Society of Bengal
For May, 1874. pp 106-107.

ANNEXURE : VIIa.

are both more or less reed and grass-haunters. I would separate them as *Schaniparus*.

Arborophila Mandellii, Hume. *Pro. A. S. B.*, May 1st, 1874.

Belongs to the same type as rufogularis, Hodg., and intermedia, Blyth, in that the feathers of the upper back and interscapular region are neither barred nor fringed with black; the forehead is a deep maroon chestnut; the crown and occiput a rich ruddy olive; the chin, throat, ear-coverts and sides of the neck bright ferruginous, the two latter streaked with black; a broad black line sharply defines the ferruginous of the throat; in the centre of the base of the throat there is a snow white patch, immediately above the black border line. Below this latter the breast is a rich maroon chestnut.

EIGHT well-marked and distinct species of *Arborophila* or (if the subgenus *Peloperdix* be deemed worthy of retention) of *Arborophila* and *Peloperdix* occur within our limits. There are very likely more, but these are all that I have been able to meet with.

Field naturalists here do not seem to be able to distinguish these species, as I am continually receiving specimens misnamed, and a short key to the eight species may be useful. This key is purposely not framed on scientific lines, but simply on plain practical characters, that every sportsman who shoots may at once understand.

Upper back and interscapular region.	1. Breast pale uniform grey.	Top of head greyish olive, more or less black spotted.	<i>A. atrogularis</i> , Bly. (Assam, Sylhet, Tipperah).
	2. Breast uniform, tawny, or ferruginous olive.	Middle of throat palefawn color, densely black spotted.	<i>A. brunneopectus</i> , Tick. (Pegu, N. Tenasserim).
	3. Breast rufescent olive, barred black.	Chin, throat and sides of neck white, spotted black, bounded below by a rufous torque.	<i>A. chloropus</i> , Tick. (Pegu, N. Tenasserim).
	4. (a.) Breast pale ashy, surmounted by a broad white band.	Top of head uniform bright chestnut. ♂	<i>A. torqueola</i> , Valenc. (Himalayas).
I. Feathers conspicuously barred or fringed with black.	(b.) Breast grey, tinged rusty.	Middle of throat unspotted rufous ♀	

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ANNEXURE : VIIb.

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NOVELTIES.

II. Feathers unbarred and unfringed, or scarcely perceptibly fringed darker.	1. Lower margin of rufous of throat sharply defined by a black line, breast grey. 2. Lower margin of rufous of throat sharply defined by a black line, breast maroon-chestnut. 3. Lower margin of rufous of throat meeting grey of breast without any intervening black line.	<i>A. rufogularis</i>, Hodg. (Kumaon and Eastern Himalayas, Tenasserim). <i>A. Mandellii</i>, Hume, (Bhotan Doars).
III. Feathers freckled and mottled with darker brown, shafts pale buffy.	1. Chin, throat and sides of neck white, spotted with black spots, no rufous torque.	<i>A. intermedia</i>, Bly. (Arracan). <i>A. Charltoni</i>, Eyton. (Tenasserim and Malay Peninsular).

This beautiful species is another that we owe to that indefatigable ornithologist Mr. L. Mandelli. He obtained the specimen in the Bhotan Doars.

The following are the dimensions (taken from the dry skin) and a description of a *presumed* male:—

Length, 8.5 ; wing, 5.0 ; tarsus, 1.5 ; mid toe and claw, 1.75 ; bill, from gape, 0.9 ; bill, at front, 0.65 ; height, at front, 0.3 ; tail, from vent, 1.5.

Lores, forehead, sinciput a rich deep brownish chestnut red ; a faint, very narrow yellowish streak under the anterior portion of the lores ; crown, occiput and nape a rich deep rufescent olive brown ; a broad grey supercilium, continued backwards over the ear-coverts, and partly round the nape ; chin, throat, cheeks, ear-coverts, sides of neck and the basal portion of the back of the neck, except exactly in the centre, a very rich bright ferruginous, spotted everywhere, except on the chin and throat, with velvet black, a band of which clearly defines the ferruginous across the base of the throat. Immediately above this black band, in the centre of the base of the neck in front, is a conspicuous pure white patch about 0.8 long and 0.35 to 0.4 deep. Below the black band the breast and sides of the breast are rich, slightly ferruginous maroon. I should mention that on either side of the upper portion of the throat a very narrow mandibular white stripe, about 0.6 long runs down from the base of the lower mandible ; the abdomen and rest of lower parts pale slatey grey, each feather with a small irregular central white spot near the tip ; the flank feathers tinged with rusty ; the vent and lower tail-coverts strongly tinged with

ANNEXURE : VIIc.

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dull olive, the coverts moreover having the white spot nearer the tips and expanded into a bar; wing lining about the carpal joint a rich hair brown, the rest a pale grey brown (much the color of the lower surface of the quills), a little tipped with white.

Upper back and interscapular region plain olive, some of the feathers *very* narrowly and inconspicuously fringed with black; lower back, rump and upper tail-coverts a rather browner and brighter olive, some of the feathers *very* narrowly fringed with black, and most of them with conspicuous, hastate, subterminal, velvet black spots; coverts and scapulars and tips of tertiaries similar, (the black spot varying in shape from a sort of lunule on the scapulars to a linear lanceolate dash on some of the coverts), but the feathers more or less tinged towards the margins with deep ferruginous; the primaries plain uniform, hair brown; secondaries similar, but freckled and mottled more or less on the outer webs and at the tips with ferruginous.

A. O. H.

Messrs. Slater and Finsch's

Index to the Ornithological Literature of 1872.

IN Messrs. Slater and Finsch's Index to the Ornithological Literature of 1872, which has appeared as a Supplement to the last volume of the *Ibis*, I notice the following entry in regard to a paper of mine:—

“10.—OTOCARIS (*sic!*) Elwesi, &c.”

Now if the evil genius of every Indian writer, the indigenous “devil” had really disfigured my pages with this ghastly misprint, I confess that I should, even then, have failed to discover much wit in the *very* novel and biting sarcasm traditionally involved in placing “*sic!*” after the supposed error; but the fact simply is that the misprint in question is none of mine, but belongs entirely to the learned compilers.

This may seem incredible, but I ask my readers to verify the fact for themselves. The article in question occurs at pages 36-38 of Vol. I of “STRAY FEATHERS,” and a reference to these will show that in every one of the five places in which the genus *Otocoris* is referred to, it is spelt *Otocoris* and not *Otocaris*. Perhaps Messrs. Slater and Finsch will kindly explain on what grounds they accuse me of spelling the name *Otocaris*.

ANNEXURE : VIII

(1966) *Arborophila mandellii*.

THE RED-BREASTED HILL-PARTRIDGE.

Arborophila mandellii Hume, Str. Feath., ii, p. 449 (1874) (Bhutan Duars).

Arboricola mandellii. Blanford & Oates, iv, p. 128.

Vernacular names. *Pao-er* (Chulikatta Mishmi).

Description.—**Male and female.** Lores, forehead and fore-crown dull chestnut, shading into brown on the hind-crown and nape; pure dark grey superciliary stripes from the eye meeting on the upper neck; lower neck and extreme upper back chestnut-ferruginous with black spots; back, rump, upper tail-coverts and tail olive with narrow black edges and all but the back with bold black central spots to the feathers; scapulars and wing-coverts like the back but with still finer black bars; wing-quills brown; inner secondaries and greater coverts with chestnut edges, faint grey patches and bold black terminal spots; chin and throat pale olive-chestnut, followed by white and black rings; a small white moustachial streak; sides of head darker chestnut, forming a collar with the chestnut on the neck and spotted with black in the same way; upper breast rich deep chestnut; lower breast to vent grey, the flanks marked with chestnut in varying degree and more or less spotted with white; centre of abdomen paler and sometimes tinged with ashy; under tail-coverts olive with white spots and rufous tips and mottlings; thigh-coverts and posterior flanks sometimes olive with black centres and rufous markings.

Colours of soft parts. Iris brown to red-brown; bill black; legs reddish.

Measurements. Wing 133 to 145 mm.; tail 56 to 58 mm.; tarsus 43 to 45 mm.; culmen 19 to 20 mm.

Distribution. Hills North of the Brahmapootra from Sikkim and Bhutan to Eastern Assam. Bailey obtained it in the Upper Dibong Valley and Needham in the hills above Sadya.

Nidification. My collectors sent me four eggs with the skin of a female, trapped on the eggs which were taken on the 3rd June in the Chambi Valley at an elevation of about 8,000 feet. The eggs were laid on a pad of grass under shelter of a rock in evergreen-forest composed of oak and rhododendron-trees, the ground very steep and rugged, much split up into small ravines and very wet and humid. The eggs measure about 44.0 x 34.4 mm. and are probably rather unusually large.

Habits. Those of the genus. This species is supposed to keep between 1,000 and 6,000 feet but evidently often ascends much higher than this. The Arbors knew it and said they habitually snared them in summer on some hills above Sadya which ran between 8,000 and 10,000 feet. It was obtained at over 7,000 feet in the Mishmi country and Macdonald trapped it at 8,000 feet in the Chambi Valley. It appears to be a rare bird, keeping to dense evergreen-forest.

ANNEXURE : IX

273. **Redbreasted Hill Partridge.** *Arborophila mandellii* Hume

Arborophila Mandellii Hume, 1874, Stray Feathers 2: 449 (Bhutan Duars)

Baker, FBI No. 1966, Vol. 5: 395

Plate 19, fig. 5

LOCAL NAME. *Pao-er* (Chulikatta Mishmi).

SIZE. Grey Partridge —; length c. 28 cm. (11 in.).

FIELD CHARACTERS. A typical dumpy hill partridge.

Male and Female. *Above*, crown and nape dull chestnut-brown. Dark grey superciliar stripes from eyes continued behind to meet on upper hindneck. A small white moustachial streak. Lower hindneck (all round) and upper back reddish chestnut with black spots. Rest of upperparts olive, spotted and narrowly scalloped with black. *Below*, chin and throat pale olive-chestnut separated from deep chestnut upper breast by a double gorget of

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GALLIFORMES

black and white. Lower breast to vent grey marked on flanks with chestnut and white. Under tail-coverts olive with white spots and rufous mottling.

STATUS, DISTRIBUTION AND HABITAT. Resident. Sikkim and Bhutan duars, and Assam hills north of Brahmaputra river east through NEFA. Occupies an altitudinal zone between c. 350 and 2450 metres, possibly somewhat higher. Affects dense undergrowth in evergreen forest.

Extralimital. Presumably SE. Tibet.

GENERAL HABITS, FOOD. Nothing specifically recorded.

VOICE AND CALLS. Putatively a loud, rich, long-drawn *quack* followed by a series of ascending double notes leading to a climax. Similar in pattern to call of *A. torqueola* (267), but distinct (SA).

BREEDING. The only reliably known nest was taken at c. 2400 m. alt. in Sikkim on 3 June. It contained 4 fresh eggs measuring about 43 × 33 mm. (Baker). No other data available.

MUSEUM DIAGNOSIS. For details of plumage see Baker, loc. cit.

Feathers of upper back and interscapular region finely barred with black. Lower margin of rufous throat sharply demarcated from breast by a black line with a white one above it. See also Key to the Species.

MEASUREMENTS

	Wing	Bill (from feathers)	Tarsus	Tail
♂ ♀	133-145	19-20	43-45	56-58 mm. (Baker)

COLOURS OF BARE PARTS. Iris brown to red-brown. Bill black. Legs and feet reddish.

ANNEXURE : X

ORNITHOLOGICAL IMPORTANCE OF THE AREA

There is little previously published information for the area, but Inglis *et al.* (1920) summarized the vertebrates recorded in Jalpaiguri District, and mentioned the Buxa Duars frequently. Inglis (1952-1969) provided details of a few extra species from the Buxa area. Stevens (1923-1925) visited Bhotan Ghat on the Raidak river in January 1922 and noted a number of species. There is a printed list of the 'Avifauna - Buxa Tiger Reserve' (Anon. undated), comprising 213 species, which we were kindly given by the Jainti Beat Officer. We found many apparently previously unrecorded species - mostly from the higher elevations. In nine days we recorded nearly 200 species of birds, and the final total was 227, of which 130 do not appear on the reserve list, and 50 of these latter species are not mentioned by Inglis *et al.* (1920), Stevens (1923-1925) or Inglis (1952-59). Seven additional species were recorded by R. Singh (pers. comm.), one by Law (1953) and one by Sanyal (1995) giving a total of 359 species for the area (Appendix). Species listed by Inglis *et al.* (1920) for Jalpaiguri District are included in the Appendix with indications of status where these were given.

SELECTED SPECIES OF INTEREST

Threat categories are from Collar *et al.* (1994).

CHESTNUT-BREADED PARTRIDGE *Arborophila mandellii* (VU) A group of partridges seen briefly on four occasions near the viewpoint, appeared to show a white crescent on the breast and were probably referable to this species. Inglis *et al.* (1920) noted that 'specimens have been obtained in the Bhutan duars in April, probably in this district, though we have been unable to get it.'

RUFIOUS-NECKED HORNBILL *Aceros nipalensis* (VU) One pair was seen above the fort at c. 1,000 m. Inglis *et al.* (1920) record a specimen which had been purchased live at Buxa by Mr J. R. Phillips in 1918. It was listed by Anon. (undated).

BEAUTIFUL NUTHATCH *Sitta formosa* (VU) Two (- four) birds were seen near the ridge at 1,400 m, feeding 3-6 m from the ground on large trees (15+ m), and loosely associated with White-browed Scimitar Babblers, Lesser Yellownapes and Lesser Racket-tailed Drongos. A soft contact call: 'whuck' or 'whit' was noted.

LONG-BILLED WREN BABBLER *Rimator malacoptilus* (LR: nt) A pair was seen at c. 1,500 m (J.A.). Inglis *et al.* (1920) noted that 'O'Donel met with a pair at about 4000 ft.', and Inglis (1952-1969) added that this was 'above Baksa Duar.'

ANNEXURE : XI

Site records of Yellow-throated Bulbul *Pycnonotus xantholaemus* (Jerdon, 1844) in the Nallamala Hills

C. Srinivasulu

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NOTE

ZOOS' PRINT JOURNAL 18(3): 1052

RECENT SIGHTING OF RED-BREASTED HILL-PARTRIDGE *ARBOROPHILA MANDELLII* FROM BUXA TIGER RESERVE, WEST BENGAL, INDIA

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The Red-breasted Hill-Partridge (*Arborophila mandellii*) is one of the nine threatened members of the suite of 19 bird species that are entirely restricted to "Eastern Himalaya Endemic Bird Area" (Birdlife International, 2001). Forest cutting, shifting agriculture and hunting for food are presumably among the deleterious pressure on population of this species (McGowan *et al.*, 1995). The Red-breasted Hill-Partridge has recently been determined as present in three protected areas, of which Singhalila National Park in West Bengal, Mehao Wildlife Sanctuary and Dibang Valley Wildlife Sanctuary in Arunachal Pradesh are considered irreplaceably important to the long-term conservation of Galliformes in East Asia (McGowan *et al.*, 1999).

The species was seen once during one of two visits to Buxa

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Tiger Reserve, West Bengal (ca. 1200m). The place of sighting was between Buxaduar and Rupam during our bird watching trip in March 2001. Allen *et al.* (1996) have seen a group of this partridge briefly on four occasions in the same area of the Reserve. The habitat in Buxaduar-Rupam area is very suitable for this vulnerable bird species. The ecological territory of this area extends further into Bhutan. Such a vast hilly terrain can definitely hold a good population of this vulnerable species. We think that a concerted effort to locate this species might yield positive results. There could be moderate disturbance from some nomadic human population at the Indo-Bhutan border here. However, if there is no hunting, the movement of these people cannot be considered a threat.

Acknowledgements

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ANNEXURE : XII

– to provide another possibility, in samples collected during migrations or winterings, to differentiate local birds from migrating or wintering ones (PAVLOVA 1988; TSVELYKH 1993; TSVELYKH & MALANDZIA 1994).

The following examples illustrate the first three points.

Rufous Warbler – *Cercotrichas galactotes* L. Collected specimens of two subspecies have been studied, one of them living in the Transcaucasus, another

Himalayan Quail – *Ophrysia supercilialis* L. – an extinct species with almost unknown biology. The species inhabited steep grassland foothills of the Himalayas and had an extremely narrow range. The last specimen was collected in 1876. It is a close relative to Himalayan forest partridges of the genera *Arborophila* and *Bambusicola*. Wing shape is almost identical to that of the strictly sedentary species, *Arborophila mandelli*, which does not migrate even on a seasonal basis (Fig. 4b). The examination of wing shape in the extinct species allows us to suppose

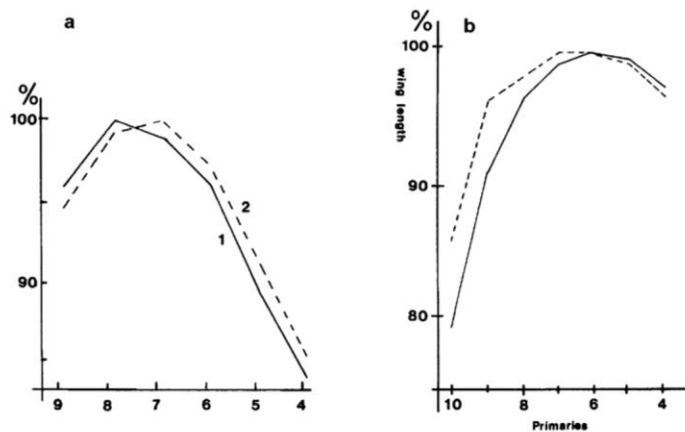


Fig. 4: The shape of the tip of the wings:

a: in two populations of *Agrobates galactotes*, Turdidae (from POTAPOV 1967): 1 - Transcaucasian population with short distance of migration (not exceeding 1000 km) 2 - Eastern Middle Asian population with long distance of migration (more than 1600 km). Wing length - in %; 1, 2... numbers of primaries.

b: in two sedentary species of Himalayan partridges:
1 - *Ophrysia supercilialis*
2 - *Arborophila mandelli*

that this species was also non-migratory and flew exclusively between the slopes to avoid threats. HUME & MARSHALL (1879) supposed that the species was a wintering guest at its collection sites, being a migrating species from unknown breeding places. But the shape of the wings tells us that the flight was of an explosive, vertical type with sequences of short wing beats interrupted by gliding. The wing of *Ophrysia* was broader than in *A. mandelli* – 83.6% and 79.2% of the wing length of the latter.

Applications of the proposed method may be much wider, in particular for the study of the ontogenetic development of flight characteristics of different species or to discover intersexual differences in life style etc. In comparative analyses one should use specimens with the same degree of abrasion of feathers and in comparisons between populations one should take into account that differences in the wing shape will be stronger in more isolated populations. In recent years, special formulae have been developed which can help to calculate the degree of sharpness (TSVELYKH 1983). When someone uses such formulae he should take into consideration that such a formula neglects many peculiarities of wing shape, and this may lead to loss of important information.

this character was not regularly examined, so that phylogenetic studies only rarely mentioned this feature (for instance, for the reconstruction of phylogenetic relations of the family Tetraonidae (POTAPOV 1965)).

The variability of foot scalation, in particular within the ancient order Galliformes forced us to examine the diversity of this trait for different taxa. This work is still far from completion, but some conclusions can already be ruled out. The scalation of the leg proved indeed to be very stable within a species or within a genus (provided that monophyly of a genus is evident). A complete absence of variation in leg scalation was shown within the genera *Alectoris*, *Arborophila*, *Tetraogallus*, *Perdix*, as well as for the entire family of Tetraonidae and, with one or two exceptions, in the families Numididae and Odontophoridae. On the other hand, within the largest genus of Galliformes, *Francolinus*, we discovered several types of scalation (Fig. 5), which is already published (POTAPOV 1999). This fact supports the polyphyletic origin of the genus (CROVE et al. 1992). Currently, we are preparing a special publication on this subject.

WPA-India (World Pheasant Association-India) was established in 1979 as a society under the Societies Registration Act 1860. As a national body, WPA-India is an affiliate of the World Pheasant Association (WPA) with headquarters in the UK.

India has special significance for WPA because it is home to 17 out of a total of 52 pheasant species found worldwide. The Indian species include the magnificent Blue Peafowl, the National Bird of India, and the Red Junglefowl, the progenitor of all domestic fowl and easily the most useful bird in human history. The other beautiful species include the Himalayan Monal, “the bird of nine colours”, the Kaleej and some Tragopans. India is undoubtedly the richest country in pheasant species, apart from China.

WPA-India aims at creating awareness in the country about the ecological, economic and aesthetic importance of Galliformes in general, and Pheasants in particular, and works to arouse interest and support for their conservation from all sources, including government and non-government bodies and individuals. It also carries out and encourages studies and research on the distribution, population status, and other aspects of individual species in their natural habitats, aimed at improving the conservation status of the species in the country.

