A Faunal Survey of Namdapha Tiger Reserve, Arunachal Pradesh, India

(October, 1996 & January – February, 1997)

by

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with contributions from

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I would appreciate being informed by people who have found the report useful in some manner. Suggestions and corrections to the report may be mailed to me at the addresses given below.

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1 Introduction

This report describes a faunal survey of Namdapha Tiger Reserve in south-eastern Arunachal Pradesh. The survey was conducted over 7 weeks during October, 1996, and January – February, 1997. The contents of this report reflect the motivations and expectations of the organisations which contributed to this project. The Oriental Bird Club and the World Pheasant Association were interested in the distribution and status of birds with emphasis on conservation aspects. The Arunachal Pradesh Forest Department was interested in documentation of fauna, suggestions for improving the wildlife information content of service provided to tourists and a trip report to help other visitors plan their visit. We, the survey team, were principally interested in identifying and observing birds, reptiles and butterflies, apart from other animals that happened to blunder into us.

1.1 Arunachal Pradesh

The north-eastern region of India, particularly the state of Arunachal Pradesh, is renowned for its biodiversity. Arunachal Pradesh is entirely mountainous and consists of the easternmost ranges of the Himalayas. The terrain rises from 100 m on its southern boundary (with Assam) to over 7000 m on the peaks towering over Tibet (China) to the north. It is bounded on the east and west by Myanmar and Bhutan respectively. The state is partitioned by many valleys carved by swift rivers which join to form the mighty Brahmaputra on the plains of Assam. These deep and broad river valleys and the tall intervening mountains have restricted the dispersal of many species and encouraged speciation. Zoogeographically, Arunachal is part of the Oriental region and lies at the junction of the Indian and Indo-Chinese subregions. The higher reaches of its mountains form the southern fringes of the Paleartic region. The climate varies from cold desert conditions on the northern facies and ranges with permanent snow to wet and humid southern slopes which receive 2500 – 5000 cm of annual rain. All these factors have resulted in Arunachal Pradesh being the home of the richest assemblage of flora and fauna in India. In fact, Arunachal Pradesh is listed among the 18 biodiversity hotspots of the world.

The low population of Arunachal Pradesh (about 10 people/km^2 compared to a national average of $\sim$275 people/km^2) is largely responsible for the survival of vast expanses of wilderness (about 60 % of the area). A large and rapidly growing populace have already accounted for much of the forests in other north-eastern states during the last few decades. Unfortunately, forests are the only resource of the people of this region. The timber industry forms the backbone of the economy and jhumming (shifting cultivation) is widely practised for subsistence as well as the market. In view of these severe pressures, which can only grow with time, it is imperative that viable conservation strategies which consider the requirements of people as well as conservation of wildlife are implemented. It is unlikely that the present extent of the wilderness will survive in Arunachal Pradesh. Therefore it is essential that key areas in terms of high diversity, endemism of species and viability of conservation, are identified for effective utilisation of available resources.

1.2 Previous Faunal Surveys

The remarkable biodiversity of north-eastern India was brought to light by the work of many naturalists prior to the middle of this century. However, the terrain and paucity of paths in the interior restricted their work to a few areas adjacent to the Brahmaputra valley. To take the example of snakes, the listed distributions of north-east Indian snakes in *The Fauna of British India on Reptilia and Amphibia : Vol. 3* (1943) are confined to the present day states of Meghalaya and Assam with hardly any information from areas which were later amalgamated to form the state of Arunachal Pradesh. Apart from the book on birds of the Indian subcontinent by Drs. Salim Ali and Dillon Ripley, all animal identification books which are comprehensive in nature are over half a century old. Though somewhat outdated, the best books are still the volumes of the above mentioned *Fauna of British India* series.

Organisations like the Zoological Society of India and the Bombay Natural History Society have undertaken a few surveys in Arunachal Pradesh in the last couple of decades. Much more needs to be done, and done in the near future. Unfortunately, the survey reports are not easily available, sometimes even to other Government departments including forest officials managing the area. The main aim of such surveys is the collection of museum specimens for taxonomy and area species lists and this is reflected in their reports. The few I have seen contain little information on status and habits of species and hence are less useful to the Forest Department in developing conservation strategies and assisting wildlife tourists.

Pratap Singh (Arunachal Forest Department) has recently published his bird records for Arunachal Pradesh during the period 1988 – 1994. His work, which covers most areas of Arunachal Pradesh though in a cursory manner, provides a broad picture of the birdlife of the state. The next step in documenting the avifauna of the state should be intensive surveys of specific areas over longer periods (a month or two in every place, at least). There are extant species lists for a few wildlife sanctuaries but more detailed information on habitat, altitude and abundance is available for few places, if any.

1.3 Namdapha Tiger Reserve

The Namdapha Tiger Reserve (TR) is situated at the south-eastern tip of Arunachal Pradesh and bounded on the south and west by the international boundary with Myanmar. The Dapha bum (bum = peak or ridge; pronounced “boom”) massif forms an immense barrier to the north separating Namdapha TR from the Kamlang wildlife sanctuary in the Lohit (pronounced “Luhit”) district of Arunachal Pradesh. The Reserve runs into the northern outliers of the Patkai range towards the south and south-west. The altitude ranges from the snow-clad reaches of the Dapha bum, pushed up to over 15,000 ft (4571 m) by the grinding of the Earth’s crust below, to the bleached flood plain of the river Noa Dihing at less than 300 m above sea level as it debouches out of the hills at the eastern boundary of the Reserve. The snows on Dapha bum look down on a 2162 km^2 Tiger Reserve containing one of the last great contiguous stretches of virgin forest and perhaps the most diverse assemblage of species in India.

The geography of the Reserve is dominated by the Dapha bum and the river valleys of the Noa Dihing and its tributary, the Namdapha. The terrain is extremely mountainous with hardly any flat area outside the flood plains of the two rivers. Serried ranks of ridges and peaks march down from the Dapha bum and away into the haze towards the main Patkai range far beyond. The substrate consists primarily of sedimentary rocks thrust up by the collision of the Indian and Asian tectonic plates and is relatively fragile; the area is very susceptible to erosion and landslides and the slopes are in general steep.

Despite the large altitudinal range within the Reserve, the heights which may be easily accessed are quite low. Within the tourist zone, very little of the accessible area is above 850 m. Nevertheless, an astonishingly diverse wildlife may be encountered within this limited altitudinal range. The easiest way to go really high (>2500 m) is outside the south-eastern boundary of the Reserve. However, that area is very close to Myanmar and permits are difficult to come by even for Indians.

The vegetation of the area is varied and includes tropical wet evergreen and semi-evergreen forests at lower elevations to temperate broad-leaved and conifer forests and alpine meadows at higher altitudes. In addition to these are secondary forests including bamboo etc in previously cleared areas and vast stretches of tall grass in the flood plains of the rivers.

The annual rainfall is about 2500 – 3500 mm with the peak precipitation occurring between June and September. The *rainy* season lasts from March to October. *Dry* and *Wet* are relative terms, however — one rarely experiences a sunny day during the rainy season while clear days are in a majority during the dry period. November is the only really dry month and rain may be expected any day during the other months. The temperature ranges from 5 – 35° C in the river valleys but remains sub-zero during most of the year on the Dapha bum.

The Reserve is drained by the Noa Dihing and Namdapha rivers. The Noa Dihing arises in the mountains on the India - Myanmar border and flows right across Namdapha TR before emptying into the Brahmaputra in the Assam valley. The Namdapha river collects the snow-melt from the Dapha bum slopes and is considerably colder than the Noa Dihing. While the flood plains and the flow of the Namdapha are more imposing visually, the narrower and the more placid Noa Dihing carries more water in its much deeper channel. Apart from these two major rivers, the entire area is criss-crossed by innumerable streams ranging from a gentle seepage under the leaf litter to raging mountain torrents which destroy bridges every year with monotonous regularity. The Deban and the Burma nullahs are two of the other important tributaries of the Noa Dihing. During the monsoon months, the slushy road and the swollen rivers become formidable, if not impossible, barriers against movement within the Reserve.

Namdapha TR does not have any resident human population within its boundaries. The dominant tribes around the Reserve are the Singphos, Mishmis, Tangsas and Yubins (Lisus). Others living on the periphery of the Reserve are Chakmas and Lamas who are political refugees from Bangladesh and Tibet respectively. The Reserve headquarters is at Miao, beyond the eastern boundary. Miao consists of several government offices and a market place which caters to the needs of the villages around and the timber industry which is the mainstay of the local economy. Some of the forest department staff live within the Reserve at the Deban and 10th mile camps.

A 98 mile road [1] once ran right across the Reserve connecting Vijoynagar, which lies beyond the south-eastern boundary, to Miao. Substantial stretches of the road are no longer navigable even on foot. Apart from the road, other signs of long term inhabitation are a few jhum (shifting cultivation) patches from the period prior to the notification of the Reserve. However, there is a great traffic of Lisus through the Reserve; the banks of the Noa Dihing provide them the sole path between Gandhigram and Miao, and that too only in the dry season.

[1] the Miao - Vijoynagar (MV) road; locations along the road are identified by their distance from Miao in miles by the local people (e.g. the 40th mile PWD IB, 17th mile PWD camp). 1 mile = 1.6 km.

2 The Faunal Survey of Namdapha Tiger Reserve

2.1 An Overview

The primary aim of this project was a bird survey covering a large altitudinal range. Additionally, other fauna including butterflies and snakes were also to be recorded. The survey was split into two periods : 24th September – 19 October, 1996, and 13th January – 9th February, 1997.

2.1.1 The October visit

We Proposed ... to survey the higher altitudes up to 2500 – 3000 m during this visit. The high altitudes in the area may be accessed only during October and November, i.e. during the period between the end of rains and onset of snow. The plan was to fly across Namdapha TR to Vijoynagar and reach Gandhigram by end September. Then, with the help of Lisus, we would survey the higher reaches of the Reserve and then trek back the 100 km across Namdapha to reach Deban and Miao by the 19th of October. I was accompanied by Mr. Ashok S. Captain, Ms. Vidya R. Athreya and Mr. Ambrish Kumar.

... But The Weather Gods Disposed The plans went as awry as they could, thanks to a spell of rotten weather. We could fly into Vijoynagar only on 3rd October and reached Gandhigram, 19 km away, the next day. We started on a trek up a nearby mountain (ridge at 3000 m) but two days of practically non-stop rains confined us to the tents. The steep path, made more treacherous by the heavy downpour, and a river in flood finally put paid to our high altitude ambitions.

The trek to Miao fared little better. We trekked till the 74th mile of the MV road (the Reserve boundary and Gandhigram are on the 80th and 87th miles respectively). The road, which was more of a stream, vanished into impenetrable thickets after the 79th mile and finally ended at a rotten log bridge over a raging torrent. The brimming Noa Dihing ensured that the path along its banks was not usable for long either. We finally returned to Vijoynagar and flew out on the sortie.

We were very successful with snakes, both in the field and with the museum collection at Miao. We identified and photographed no less than 9 species in the wild and another 11 species in the museum; and this was the result of an endeavour of just 2 days each in the field and the museum. We did not see any mammal, but then we didn't expect to see many either. The survey was a disaster as far as birds and butterflies were concerned. We did come across a few rare species but on the whole the records were rather poor. That animals are usually less active under overcast and wet conditions is well known; the delays due to the weather squeezed our schedule and this, I suspect, hurt the survey much more. The sunny periods were often *wasted* on essentials like drying equipment, breaking and pitching camps and in *running* from one place to another. All marches were races against time to get to the next campsite and prepare for the night before the next shower. Bird and butterfly watching are essentially conducted at a leisurely pace but leisure was a scarce commodity during the trip — during the entire 3 weeks, there were just 3 days during which I could watch birds without running about.

2.1.2 The January visit

I visited Namdapha TR again between 13th January and 8th February, 1997, and concentrated on the birdlife. Anyway, the cold winter temperatures did not allow for much invertebrate activity and only a half a dozen butterfly species and 2 snakes were seen. I confined myself to the circuit which goes round the tourism zone bounded by Deban, Firmbase and the MV road (between Miao and Burma nullah). This circuit ranges mostly between 300 m and 800 m (highest point on the path is ~900 m). It is about 55 km long and encloses an area of about 200 km^2.

As luck would have it, a depression settled in over north-east India on the 17th of January and the weather remained predominantly overcast with frequent rains during the rest of my stay. Nevertheless, I could aggregate several rain-free sessions of birdwatching in all the major localities (note the reduction of pass grade for a birdwatching session from ‘bright’ to ‘rain free’ — sunny days are a sinful luxury in Namdapha!). The number of days spent at each place took into consideration the altitude, vegetation and the number of birdwatching trails in the vicinity, the aim being an adequate sampling across the altitudinal range and the major habitats of the area.

The only casualty due to the rains was the stretch between Miao and Deban (between the 7th and 17th miles; nominally the 10th Mile area). I had to choose between one of the interior and the 10th Mile areas. Considering that the 10th Mile area is well sampled by all visiting birdwatchers, who have to pass through it, I decided to spend a couple of extra days in the interior.

2.2 Places visited

The places visited during October, 1996, were Miao $\rightleftharpoons$ Vijoynagar $\rightleftharpoons$ Gandhigram $\rightleftharpoons$ 74th mile, all of which lie along the MV road. During January - February, 1997, the survey route was Miao $\rightarrow$ Deban $\rightarrow$ Haldibari $\rightarrow$ Hornbill $\rightarrow$ Bulbulia $\rightarrow$ Firmbase $\rightarrow$ Embeong $\rightarrow$ 40th Mile PWD IB $\rightarrow$ 27th Mile Forest camp $\rightarrow$ Deban $\rightarrow$ Miao. A 2 – 4 m wide forest path runs from Deban to Embeong, passing through the places listed between them. The stretch from 40th Mile to Miao is along the MV road. Embeong and MV road are separated by the Noa Dihing and no regular path connects them. All paths, motorable or otherwise, have to be cleared of vegetation after every monsoon. A map of the area is provided on page 50.

2.2.1 **Miao** (260 m)

The Office of the Field Director, Namdapha Tiger Reserve, is situated in Miao. Permits to visit the Reserve may be obtained there. Miao is essentially a brief stop-over for most visitors to the Reserve. However, the museum and the orientation centre in the Forest Department complex is worth spending some time looking over. The museum boasts of a considerable number of specimens of various faunal groups obtained from the Reserve and its vicinity. The banks of the Noa Dihing and the rest of the area in and around Miao are good places for birds, snakes and insects.

Miao $\rightarrow$ Deban : Deban lies on the 17th mile (28 km) from Miao on the MV road. The journey may be made either on foot or in a jeep. (See also under Miao - Vijoynagar road).

2.2.2 **Vijoynagar** (1280 m)

Vijoynagar is situated on a plateau at the head of the Noa Dihing Valley. The Dihing is cold and swift as it emerges from the steep mountains on the Indo-Myanmar border and is not to be taken lightly while fording in spite of its small size. Vijoynagar is inhabited by a small civilian and military populace and consists of some buildings scattered along a couple of lanes. It is isolated from the rest of India by the Namdapha TR. The MV road no longer provides a passage to vehicles; even people on foot have to get down from the road and use the banks of the Noa Dihing for substantial stretches of the way. Essential supplies and passengers are ferried to Vijoynagar by an air sortie which operates about 10 times a month during fair weather. In fact, the place is completely cut off for weeks on end during the monsoon; the flooded river and the fog block both the land and air routes.

The area in and around Vijoynagar consists of meadows and secondary scrub. The mountains around are clothed with a mixture of jhummed patches and original forest. The Mugaphi peak, which at ~3600 m is the highest point in the vicinity, forms a magnificent backdrop to the broad open spaces of Vijoynagar. The lower end of the valley is settled by ex-army jawans (mostly of Nepali origin) and some Lisus.

Vijoynagar → Gandhigram : A broad footpath, which is actually the remains of the MV road, runs down from Vijoynagar along the Dihing valley through cultivation, degraded forests with secondary scrub and the occasional patch of original forest. It goes past the village of Ramnagar and on to the Lisu village of Gandhigram 19 km away (87th mile).

2.2.3 Gandhigram (1100 m)

The village of Gandhigram lies at the head of a wide section of the Noa Dihing valley before it enters the Reserve. Myanmar is only a few km away across the low hills to the south-west. The ridge to the north-east rises to over 2500 m. The flat land between the slopes spans several km^2 in area. The place is marshy and supports rice cultivation during the monsoon. The surrounding hills are extensively jhummed and hardly any of the original forests have survived.

The Lisus of Gandhigram

Gandhigram and its outlying areas are settled by the Lisu tribe. The couple of thousand Lisus there are the only ones in India apart from a handful scattered over the rest of the country. According to them, Lisus are found in large numbers (several hundreds of thousands) in southern China and Myanmar and also over most of south-east Asia. The Gandhigram Lisus migrated from Myanmar early this century in search of better fishing after having exhausted the stocks around their previous settlement. They realised they were in India only when an army patrol stumbled upon them in the 1960s.

The Lisus are surrounded by Myanmar on three sides and isolated from the rest of India by the vast expanse of Namdapha TR on the fourth side. Most facilities are non-existent at Gandhigram. The nearest school and medical facility (of the most elementary kind) is 19 km away in Vijoynagar while the nearest market, at Miao, necessitates a four day march over tough terrain. They have to depend on the forest for almost everything and as a consequence are unrivalled in their knowledge of the jungle and its denizens. They grow rice when the monsoon floods their fields and vegetables during winter on jhum land on the surrounding hills. They rear cattle, poultry and pigs but wild meat constitutes a good fraction of their diet. In recent years, the younger generation have increasingly utilised the temporary employment opportunities at Miao in winter and in Government sponsored development schemes.

Most Lisus are devout Christians. The compulsory reading of the Bible in their church has resulted in almost all Lisus being literate in the Lisu script. However, their religious beliefs, isolation, lack of medical facility and the compulsions of agriculture have resulted in very large families. The rapidly growing population has led to an acute paucity of wild animals and arable land (both for rice and jhumming) around their settlement. The long term survival of Namdapha TR will depend very much on schemes which will eliminate the critical dependence of Lisus on the forest and integrate them economically and socially with the rest of Arunachal Pradesh.

2.2.4 Miao - Vijoynagar road

Several years ago, a road was carved out of the hills along the Noa Dihing valley to provide vehicular access to Vijoynagar. Namdapha TR extends from approximately the 7th to the 80th mile along the road. Torrential rains, floods and the phenomenal regeneration of vegetation have made the road impassable even on foot between the 40th and 75th miles. The stretch between Miao and Burma nullah (41st mile) is maintained by the State Public Works Department (PWD). No efforts have been made in recent years to bridge the Burma nullah. The torrents have to be rebridged and the road cleared of vegetation every year. However, the heavy bulldozer required to clear landslides churns up the loose substrate and heavy rains (even during winter) and the many streams which cut across the road turn vast stretches of it into permanent slush. It is usually March by the time a vehicle can be run all the way to Burma nullah ... by which date the next monsoon is already knocking on the doors. Recurring landslides as a result of the road have opened up several large clearings in primary forest.

The PWD maintains several shelters, both temporary and permanent, at regular intervals for the road labourers. The first set of workers clear the road of vegetation in a couple of months after the rains. The second group firm up the road by clearing landslides, draining the slush and patching up the surface. The hiatus between the work of the two groups is the best period for watching wildlife along the road. The passage is quite difficult before the clearing operation and the noise generated while wading through the vegetation scares away most animals; the disturbance caused by the second group is considerable and protracted (several weeks at every stretch). There is considerable movement of people (either the labourers or people from Gandhigram - Vijoynagar area) between Deban and 40th Mile during the winter months.

7th (Mpen) – 17th (Deban) mile (260 – 400 m)

The area around the 10th Mile is called Gibbon's Land. A trail branches off the MV road at the 10th Mile check-post leading to Moti jheel (jheel = pond/lake). The Forest Department organises elephant rides from the 10th Mile camp into the surrounding forest. This stretch of the MV road usually does not pose problems for vehicles during winter though heavy rains can result in a couple of soft patches requiring 4-wheel drive vehicles. The vegetation in this area has been considerably modified by human endeavours over the decades. It consists mainly of dense shrubbery along the road and mixed forests of original trees and secondary growth. The single outing in the area suggested a rich birdlife; many of the birds of this area are unlikely to be seen in the denser forests of the interior.

22nd Mile camp (550 m)

The 22nd Mile camp consists of a largish hut in a small clearing. The road is easily navigable till the camp except for a couple of bad spots. Large stretches of the next 5 km are never exposed to direct sunlight and the permanent sludge there is an effective barrier to most vehicles. Even walking is tough on shoes and feet. The forest is of mixed type. The steep slopes restrict movement to the road in most places; in many areas, only the surface of the canopy is visible on the valley side and being confined to the road, peering up into the vegetation on the other side can literally get to be a pain in the neck!

22nd – 34th Mile (550 – 690 m)

After the 22nd Mile, there are habitable camps at the 27th and 34th Miles. The immediate neighbourhood of the road is quite disturbed by people working on it. Bamboo starts to dominate towards the 34th Mile. Much of the time while walking on this stretch went into picking a way through the slush; even making allowance for the hindrance, birds seemed to be less abundant there. Work on the road was going on in full swing on this stretch during the survey.

The Quarry road branches off to the left of the MV road about half a km before the 34th Mile camp (it is the only broad jeep track branching off between 27th and 34th Miles). This ancient and abandoned jeep track can only be traversed on foot now. After 4 – 5 km it reaches the banks of the Noa Dihing opposite Embeong. There used to be a ford for trucks across the river at that location.

40th Mile camp (810 m)

The 40th Mile camp is a sprawling settlement of close to a dozen structures spread over a clearing of several hectares. The principal structure is the PWD Inspection Bungalow (IB).

The road goes on to Burma nullah on the 41st mile. The nullah is a spectacular torrent of great volume and speed. The roar of its progress is audible for several km. The locals prefer fording Noa Dihing and Namdapha rivers to this nullah. Not a vestige remains of the motorable bridge that once spanned it ...... the nullah is very definitely the end of the road from Miao!

Vast stands of bamboo dominate the roadside between the 34th and 40th Miles. The stretch beyond, to Burma nullah, has less bamboo and more of other shrubbery. The rest of the area is a mixture of original forests and secondary growth. The road was a veritable stream bed over much of its length while I was there. The area was free of human activity to a large degree.

74th – 87th mile (800 – 1000 m)
The road beyond the 80th mile is regularly used by Lisus and their buffaloes which has churned the surface into ankle deep slush. However, the passage is open only along stretches used by the Lisus, the rest of the road being clothed in impenetrable bushes. The Lisus descend from the road to the banks of the Noa Dihing after the 80th mile during their march from Gandhigram to Miao.

Even while trekking on the road, one normally goes down to the river banks for a campsite. Apart from the proximity to water, the shingle/mud banks are usually dry, flat, stocked with dry driftwood and mostly leech free, the last mentioned being a very important criterion. Added attractions for the Lisus are the fish in the river and the numerous banana plants growing on the margin of the forest nearby. The huge banana leaves are used as groundsheets as well as a roof for the night's shelter.

The flood plains of the river exhibit various stages of reclamation by the forest. One can see a transition from tall grass to primary forest within a distance of 100 m. The hill slopes are rather steep and quite slippery after a rain and often studded with thorny cane brakes and bamboo. Dry channels along the sides of the valley are excellent places for both birds and butterflies.

2.2.5 Deban (350 m)

Deban nestles at the base of Deban hill above the confluence of Noa Dihing and Deban nullah. It consists of offices and residential quarters of the Forest Department staff who work within the Reserve, tourist facilities and a PWD camp for road labourers. The office of the Range Forest Officer is located there. The Noa Dihing may be crossed there on the boat operated by the Forest Department.

A large variety of habitats may be seen around Deban including cultivation around the villages across the river, a garden and open woodland with dense shrubbery at Deban, sand and shingle banks and tall elephant grass along the Noa Dihing and Deban nullah, highly degraded stands of original forest with secondary tree growth and scrub along the road to Miao, various successions of wild growth reclaiming large clearings (the sites of abandoned villages) in the midst of primary forest, stands of cane and bamboo along the MV road towards 22nd Mile and on the way to Haldibari, heavily overgrown stream banks and mossy boulders along the Lankhai nullah, mixed forests of primary and secondary growth across the river around Chidiya Poong and Lankhai nullah and primary forest along the road to Haldibari. All these areas are within a few km of Deban and lie between 300 and 500 m in altitude.

It should be possible to see more than a 100 birds within a couple of days in just that area. Two places particularly rich in birds are the Deban complex itself and the Lankhai nullah. Deban is also known to be rich in butterflies and snakes during the warm months.

Deban → Haldibari : Haldibari is about 5 km from Deban (an hour's brisk walk). The path starts at the confluence of Noa Dihing and Deban nullah; it follows the course of the Deban nullah atop a little cliff which forms the left bank of the nullah.

2.2.6 Haldibari (450 m)

Haldibari (Haldi = turmeric, bari = village) consists of a bamboo hut in a large clearing which was the site of a village some decades ago. A variety of habitats exist within a km radius of Haldibari. In fact, the path from Deban to Haldibari has along it small stretches (at least) of every kind of habitat that was encountered elsewhere in Namdapha TR during the January visit. The range of altitudes accessible around Haldibari is 400 – 550 m.

Haldibari → Hornbill camp : Hornbill camp is located 8 km further along the path from Haldibari. The path climbs up to the top of a broad ridge immediately after Haldibari and carries on along the crest to reach Hornbill camp. After the initial climb of 100 – 125 m during the first km, the path stays practically at the same altitude till Hornbill. This stretch is bordered by primary evergreen forest characterised by tall trees over 50 m and scanty undergrowth.

2.2.7 Hornbill camp (600 m)

Hornbill camp consists of a ramshackle five-roomed structure with gaps covering a larger area than the walls. The shack is in a small clearing above a stream and in the midst of one of the finest patches of evergreen forest seen in Namdapha TR.

The path between Haldibari and Hornbill, especially the last couple of km, is good for both mammal and bird sightings. A nullah which crosses this path about a km before Hornbill is particularly good. The small rock pools on the nullah bed, which is otherwise mostly dry, is a favoured haunt of many birds. A couple of forest trails branch off the main path in opposite directions near this nullah; one is supposed to lead to the Mishmi village situated several km upstream on the Deban nullah while the other is supposed to be a shortcut to Embeong.

Hornbill camp → Bulbulia : Bulbulia lies a further 2 km along the path beyond Hornbill. The forest bordering the road is more open than in the Hornbill area. Bulbulia lies about 100 m off the main path and is not visible from it. However, the fork is quite obvious; the branch to the right leads to Bulbulia while the left branch proceeds to Firmbase.

2.2.8 Bulbulia (700 m)

Bulbulia is a warm water sulphur spring in a large clearing of about 100 m diameter. The Lisus call the spring Aji-po-lo (the stream of bubbling water). The greyish-brown mud of the spring is quite soothing on insect bites. The area is often permeated by the pungent smell of the gas bubbling up from below. The area abounds with game tracks and is obviously a favourite haunt of mammals (particularly elephants). The clearing is in a depression and consequently quite boggy. The vegetation around Bulbulia consists largely of primary forest with very tall trees. The range of altitudes accessible in the area is 700 – 900 m.

A very high watchtower overlooks the clearing. The watchtower is the only man-made structure around and is habitable. However, it is open on all four sides and can get quite chilly in the wind. Its height and the lack of walls make it a very convenient place to observe canopy flitters without getting a crick in the neck. For visitors interested in mammals, it is recommended that the main camp be maintained at Hornbill and daily hikes be undertaken to Bulbulia to minimise disturbance around the watchtower.

Bulbulia → Firmbase : The path gradually climbs beyond Bulbulia along a ridge for about 5 km till it reaches ∼930 m and then goes down all the way to Firmbase (10 km from Bulbulia). Rani jheel (Alt.

$\sim$700 m), a largish pond in the forest, is located along this path about 3 – 4 km before Firmbase. After Rani jheel, the path descends steeply to Firmbase through dense and extensive stands of bamboo. The Bulbulia - Firmbase path intersects the Embeong - Dapha bum path about 0.5 km before Firmbase.

2.2.9 R. Namdapha (Embeong & Firmbase) (450 m)

Embeong and Firmbase lie on the banks of Namdapha river near its confluence with Noa Dihing. The flood plain of Namdapha is more than a km wide in that area. During winter, the flow is confined to a couple of channels and the exposed areas are covered by vast stretches of tall grass. The Namdapha is cold and swift and the stones on the bed hardly have any moss. The Noa Dihing, on the other hand, is narrower but runs deep. The water is less cold and the stones quite slippery with moss and algae. It is supposed to be richer in fish compared to Namdapha.

Embeong is located at the very junction of Namdapha and Noa Dihing while Firmbase lies a couple of km upstream. Firmbase refers specifically to the site of an abandoned army camp though the term is also used for the whole area. The large clearing in which the army camp was located is now overgrown with dense stands of elephant grass, rushes and other water plants. Though the ground was firm in February, there were indications that it gets soggy during the rains. There are no facilities for staying in the area.

Embeong - Dapha bum road : This road on the right bank of Namdapha passes through mixed forest consisting of original patches, clearings, secondary growth of bamboo, cane, bananas etc. and many streams. It only climbs by $\sim$100 m during the first 10 km from Embeong (up to which the path had been cleared by February). The path had been used by an army expedition to the Dapha bum some years ago.

Musathi : The left bank of the Namdapha rises in a steep cliff to a triple plateau. The area, called Musathi by the Lisus (3-plain-land), consists of parallel strips of table land at three different levels. The first level rises a 100 m above the river and is very flat with an average width of a few hundred metres. The third strip rises $\sim$75 m above the first and is vast in extent though the terrain is not very flat. I was told that a half hour's walk across the strip brings one to a stream bed which had been used by another army expedition to the Dapha Bum. The altitude of Musathi varies from about 450 m at its narrow southern tip at the confluence of the rivers to about 600 m on top of the 3rd level. The trees on Musathi are quite short (20 – 30 m or less) compared to those in other places in the Reserve. The first level is fairly clear of undergrowth. The ground is generally marshy and the area has several ponds. A path runs parallel to the cliff for a couple of km at least. Traversing the area is easy even where no paths exist. The undergrowth in the second and third level is quite tangled and there are extensive stands of bamboo and cane. Most paths in these levels peter out within 20– 30 m and cutting across the vegetation is extremely laborious and impractical. The area is believed to be very rich in mammals.

Embeong $\rightarrow$ 40th Mile PWD IB : The road from Deban terminates at Embeong. Reaching the 40th mile PWD IB from Embeong is not a trivial task, particularly without the assistance of knowledgeable locals. The point where the Quarry road (the one which comes down from the 34th mile on the MV road) hits the river is overgrown and not discernible as such. One other problem is that the Noa Dihing is many metres deep at places and has a strong current; it is a risky proposition to attempt a crossing without a good knowledge of the river. The distance between Embeong and 40th mile IB is $\sim$13 km along the Quarry and MV roads. However, the Lisus led me up by a more direct path saving us a couple of hours — we walked upstream along the Dihing for about a km, crossed it in waist deep water and cut straight up the mountain side on a barely discernible Lisu path to emerge on the MV road just about a km before the IB.

3 The Fauna of Namdapha Tiger Reserve

An overview of the fauna encountered in Namdapha TR is presented below. Species lists and notes are given in the appendices.

3.1 Birds

Some Highlights : Over 230 species of birds were recorded during the survey (207 species during January - February, 1997, and 96 during October, 1996). Two of the birds, Eastern Golden Plover and Painted Snipe, were the first records for Arunachal Pradesh (also an unconfirmed sighting of a Blackheaded Cuckoo-shrike which would also be a first). Some of the other rare or unusual birds were the Whitewinged Wood Duck, Blyth's Kingfisher, Austen's Spotted Babbler, Wedgebilled Wren, Rustybellied Shortwing, Rufousbellied Blue Robin, Bluefronted Robin, Green Cochoa, Lesser Brown Thrush, Whitetailed Eagle, Plainbacked Mountain Thrush, Dark Rosefinch and Scarlet Finch. The checklist of birds for the Reserve (including records of a few other birdwatchers) has 293 species.

The north-east is famed for the spectacular assemblage of birds of the family *Muscicapidae* (babblers, flycatchers, warblers and thrushes) and indeed, almost half the birds seen at Namdapha belonged to it. Mixed foraging parties containing several hundred birds of over 20 species (at times) were also a regular feature there. It was noticed that most species in a mixed party were of similar size. The species compositions in different varieties of flocks were : **(i)** The smallest babblers, flycatchers, leaf warblers, flycatcher-warblers, etc., **(ii)** parrotbills, Whiteheaded Shrike-Babblers and scimitar-babblers, **(iii)** minlas, Sultan Tits, drongos, nuthatches, minivets, cuckoo-shrikes, etc., **(iv)** sibias, drongos, woodpeckers, trogons, treepies, magpies, etc. and **(v)** laughing thrushes. However, the species composition was not rigid and birds of very different sizes were also seen in some flocks. The smallest species were also the ones most beset with wanderlust; all of a sudden one would find oneself in the midst of a swarm of these restless birds, popping out of the foliage in every manner, and as abruptly, the prodigal procession would vanish without a trace after a couple of minutes.

It is well known that the lower limit of the altitudinal range of a species tends to decrease as one goes east along the Himalayas. Namdapha is one of the easternmost points of India and indeed the bird sightings from this survey conform to that trend — over 10 % of the birds were recorded at or below the lowest altitude record for the species in India.

Birdwatching was the worst affected by the bad weather which plagued the survey. While bird activity (and hence also birdwatching) was low key during the many overcast and wet days even in January, I suspect the heavy weather did compensate to a little extent by drawing out some of the shier birds like Bluefronted Robins, Lesser Brown Thrushes, Pittas etc. on to the road. The stretch before the 40th Mile camp was particularly bountiful in this respect. The table below lists the time spent and the weather at each place.

Place	Period	Birding	Weather (while birding)
Gandhigram	5th Oct – 10th Oct, 14th Oct	5 hr	mostly bright.
80th Mile	11th Oct – 13th Oct	8 hr	equal mixture of rain and sun.
Vijoynagar	16th Oct – 17th Oct	10 hr	mostly bright.
Deban	14th Jan – 17th Jan	21 hr	predominantly dry and bright.
Haldibari	19th Jan – 22nd Jan	15 hr	equal mixture of rain and sun.
Hornbill	23rd Jan – 26th Jan	14 hr	predominantly wet or overcast.
Bulbulia	27th Jan – 28th Jan	10 hr	bright day.
Mb/Firmbase	29th Jan – 3rd Feb	18 hr	mostly wet or overcast.
40th Mile	4th Feb – 6th Feb	21 hr	predominantly wet or overcast.
MV road	7th Feb – 9th Feb	22 hr	mixture of sunshine and rain.

In January, birdwatching was difficult after 4.00 P.M. and it got really dark by 5.00 P.M in this easternmost region. Though the Sun does indeed rise early, birdwatching rarely got off the ground before 7.00 A.M. The cold and wet winter dampened the enthusiasm of man and bird alike. Even on clear days, the Sun took a long time to clear the tall eastern ridges. Most bird activity was confined to the top canopy, which was invisible from the ground, until sufficient light and warmth percolated down to the understorey. Often an hour or two of sunlight was required to burn the thick mist blanketing the area, particularly on the valley floor, and that would result in a rain as the ascending vapour hit the colder layers above. The worm seldom needed to worry about the early bird before 10.00 A.M. on overcast days!

While the first 100 species may be easily seen (and identified) within a day or two, a more successful visit requires some effort and preparation. The narrow paths, tall trees and dense foliage result in very few points from which a perched bird may be observed; often only bits and pieces of a bird are visible. Watching birds atop a tall tree from close to its base is more comfortable on the hands and neck when lying down on the ground; a small plastic sheet is useful in such situations for keeping dry on moist paths.

Birds of the tangled undergrowth and murky forest and those in the fidgety swarms are often missed and some of the ones seen go unidentified. A fellow birdwatcher would go a long way in improving the efficiency of sighting and identification (for both). A slow pace and sedentary habits also improve by a good amount the sighting of less common birds. It is strongly recommended that visitors with only a few days at their disposal stick to the area around Deban; running all the way to Embeong and back may actually result in fewer birds being seen.

The best localities for the different habitats encountered are 10th Mile (open woods and scrub), Hornbill - Bulbulia (primary forest), 40th Mile (bamboo) and Firmbase - Embeong (flood plains with elephant grass, sand and shingle banks). The vegetation around Deban, Haldibari and along the Embeong - Dapha bum road are of mixed type. Deban, Haldibari and 10th Mile are excellent places for seeing a large number of spectacular birds within a short period. However, the Hornbill - Embeong area is excellent for observing birds of the undergrowth (shortwings, wren-babblers, pittas, ground warblers, thrushes, etc.). Though these birds are also seen around Deban they are extremely wary there and difficult to identify. On the other hand, they are less timid and spend longer periods in the open in the Hornbill - Embeong stretch; I must have identified ground warblers by sight on more than 2 dozen occasions between Hornbill and Embeong compared to the single bird which deigned to show itself in the open at Deban.

Serious birdwatching requires a range of optics : powerful spotting scopes (in excess of 40x) are essential for the canopy flitters; The mid-ranges require a bright pair of binoculars (a good 10x50); lastly, a bright and very close focussing pair of binoculars is useful for shortwings and wren-babblers which scamper about in the gloom of the tangled vegetation a mere 2 m away (such places are too dim for the unaided eye but too close for the 10x50).

3.2 Snakes (by Ramana M. Athreya & Ashok S. Captain)

Some Highlights : We identified 20 species of snakes in all, including 11 species in the museum at Miao and 10 in the field. Many more species in the museum could not be identified due to lack of time. The most remarkable find was a museum specimen of *Lycodon laoensis*, known until recently from S.E. Asia only. The first specimen for India was collected from Namdapha by a ZSI team a few years ago; the Miao specimen, which was obtained from one of the surrounding houses, is probably the only other Indian specimen. Some of our identifications are among the few records of the species from Arunachal Pradesh.

Snakes were the redeeming feature of the October visit. During two days of sunshine we saw an amazing 11 snakes belonging to 8 species within the Gandhigram village. One more species was seen in Vijoynagar. We probably wouldn't have got a single snake without the assistance of Lisus; they ferreted out snakes from their kitchen gardens almost at will! It is even more remarkable that they did this in spite of a considerable fear of snakes (they believe that most snakes are poisonous). Three other snakes, which were unlike the ones we did identify, bolted before they could be identified. Only 2 species were seen during January, 1997.

We gathered from the Lisus that snakes are most often encountered during between April and early October but seldom in winter. They are particularly visible during April and during the 'dry spells' of a few days of sunshine in the midst of the long and wet monsoon.

3.3 Butterflies (by Vidya R. Athreya & Ramana M. Athreya)

Some Highlights : Eighty three species of butterflies were recorded in Namdapha TR. The Green Dragontail, Chocolate Jungle Queen, Branded Evening Brown and Tailed Labyrinth records are the first records for Arunachal Pradesh.

The list includes 55 species identified by us during this survey (October, 1996) and 40 species identified by Vidya R. Athreya [2] during an earlier visit in the winter of 1994 - 95. The number of species listed is rather low for the place. We saw many more species during October which could not be identified due to lack of time. So, we have not estimated abundances as for birds nor listed the locations of sightings.

Butterfly activity practically fell to zero during the winter months. This was also noticed during 1994 - 95 with butterflies being seen in October and March and not during the intervening months. The best time for butterflies is supposed to be the same as for snakes. i.e. April, October and the spells of dry weather in between. Butterflies are usually abundant in sun-drenched clearings in forests including paths and river banks. Many species are attracted by wet mud, animal dung, rotting animal and vegetable matter, oozing plant sap etc ... fewer butterflies visit flowers! In short, the Sun and fluids rich in minerals attract them. However, several species, particularly the Amathusiids and Satryrids stick to the gloom of dense forest and heavily shaded paths.

3.4 Miscellaneous Fauna (by Ashok S. Captain, Vidya R. Athreya & Ramana M. Athreya)

Other animals identified, including mammals, a couple of amphibians and some invertebrates, are listed in Appendix D. Mammals were identified by Vidya R. Athreya during the clouded leopard survey in 1994 - 95 and by myself in January, 1997. The invertebrates and amphibians were identified by Ashok S. Captain during the October visit and during another visit by him in March, 1997.

Casual observations suggest that mammal density in Namdapha TR is low (at least in the tourist area). However, the species diversity is quite high. In this respect, Namdapha TR is similar to other tropical evergreen forests in neighbouring south-east Asia. No mammals were seen during the October visit. According to the Lisus, mammals hardly move about in the monsoon. In fact, they said that mammals eat little during that period and lose much of their body fat (a telling evidence of the fury of the rains gods). Bulbulia and Hornbill areas appear to be excellent for mammals. Musathi is also supposed to be good for mammals. Mammals may also be seen on jeep drives after sunset along the Deban - 22nd Mile stretch.

[2] Athreya, V. R. & Johnsingh, A. J. T. (1995) *Survey of the Clouded Leopard in north-east India*, Wildlife Institute of India, Dehra Dun.

4 Wildlife Tourism, Education and Conservation

Apart from the faunal survey, I was asked to look into aspects of conservation and tourism by the funding agencies and the Forest department and provide feedback for necessary action. The word *Conservation* as such covers within its ambit many complex issues like protected area management (policing, habitat management, tourism, etc), partition of the natural resource among the various claimants including the fauna, research, education, etc. Given the complexity of the issues involved, a short duration visit like mine is often insufficient for making well considered suggestions. One area where I could legitimately make suggestions is tourism, having essentially been a wildlife tourist myself. Wildlife education of tourists to wildlife sanctuaries is, or should be, a very major focus of conservation programmes. I have made several suggestions which the Forest Department could scrutinise in greater detail for feasibility, efficacy and particularly, unintended adverse effects on protected areas.

4.1 Conservation education for students

I interacted with several Arunachalis, mostly of the younger generation, in and around Namdapha. Surprisingly, not one person, educated or otherwise, came across as being proud that one of India's finest National Parks was in his backyard. The attitudes ranged from disinterest, at best, to derision (*"... Can't see a single tiger in a tiger reserve"*) and resentment (*"... local people being stopped from utilising their local resource by outsiders"*).

Unless enormous progress is made in generating employment in the industrial or the service sector, it would be very difficult to deny the demand of people to exploit the forests. Educating the people of the necessity of conserving their unique heritage should be taken up on a war footing. The Forest Department should strive to target school children in particular for the above. The department does organise the Wildlife Week in Miao during October when lectures and art competitions based on wildlife themes are conducted in local schools. A stronger approach would be to organise visits to sanctuaries for school children; one day in the forest generates more interest in nature than a dozen lectures and competitions. It would be ideal if visiting wildlife sanctuaries were made a regular feature of the school curricula in Arunachal Pradesh. This may only be feasible in a state like Arunachal Pradesh with its low population and still abundant forests. It should be possible for every child to spend a few days in a sanctuary at least once before graduating from secondary school. I suspect that this would also result in tribal children, who are no strangers to forests, to look upon forests in a new way when in the company of their classmates. Such visits, if coupled with innovative inculcation of conservation values, may yield much better results in the long run.

4.2 Re-orienting Visitors

It is rather unfortunate that wildlife is still synonymous with mammals among the public and the Forest Department staff alike. It is unlikely that mammals of Namdapha will ever rival their cousins in well known sanctuaries in the rest of India (e.g. Corbett, Kanha, Mudumalai etc) in terms of tourist attraction. Namdapha will always be the Mecca for the committed wildlife tourist who knows that the occasional mammal seen there is actually a rare species not found in the rest of India; but the average mammal-fixated tourist who has 3 days of vacation to see a dozen mammals (preferably the large cats) is not going to get his money's worth. The only mammals that a visitor is guaranteed to see during a short visit, to the extent that mammal sightings may be guaranteed, are a couple of monkeys, the glinting eyes of a flying squirrel at night and perhaps a family of Hoolocks with a bit of luck. I emphasize again that Namdapha, like other tropical rain forests, has a remarkable assemblage of mammals but their density and encounter rates are low.

It is time that the mammal bias of tourism is corrected and Namdapha is one of the best places to do so. It has an amazing diversity of non-mammalian fauna of birds, reptiles, butterflies and other invertebrates. Birds in particular and butterflies to a certain extent are very visible given their brilliant colours and abundance. Apart from correcting an unhealthy skewed attitude, promotion of other faunal groups as targets for visitors will also ensure that fewer visitors go back disappointed. Any mammal sighting would be a bonus on top of a successful bird visit.

4.3 Promotion of Birds and other animals

As target species for visitors, birds score less when compared to mammals, at present. I have listed below some of the problems and suggested ways for tackling them.

- The smaller sizes of birds make for less visibility and ease of identification :

  Binoculars or telescopes, if made easily available, will make birds far superior to mammals in terms of visibility as birds greatly outnumber mammals.

- The absence of easily available bird identification books :

  Several books are available now; they have to be promoted vigorously.

- The lack of widespread knowledge of the natural history of birds makes them less interesting than, to take an extreme example, a tiger with its larger than life reputation. While most mammals do not have the reputation of the tiger, they do have a *Presence* which attracts visitors :

  I suspect that the only difficulty in making birds more attractive to visitors is that it has never been tried before. The splendour of bird plumages are a great advantage. Once visitors learn that such birds exist and can be clearly seen (for e.g. through a binocular), trogons, mesias and hornbills will supersede many of the commoner mammals on the visitors' lists.

The Forest Department could do several things to promote birds among visitors :

- Train the staff who accompany visitors into the Reserve to identify the commoner birds (at least). It would help to conduct short term classes where they learn the importance of birds in ecosystems, the bird diversity of the park and bits of bird natural history which visitors may find interesting. Binoculars and bird identification books may be made a part of the equipment issued to them so that they could use their field forays to get familiar with birds.

- Maintain a stock of binoculars and bird books that visitors could rent for the day.

- Set up a full fledged Orientation Centre at Deban. The activities could include films and books on wildlife in general and of Arunachal Pradesh in particular, exhibits of specimens from the area and large posters of 10 – 50 of the commoner species of birds, reptiles, butterflies and other invertebrates of Namdapha (the larger number for birds and butterflies). Mammals must also be included but the emphasis should be on birds and butterflies. The posters should include a photograph or a painting with sufficient detail to assist field identification and a brief sketch of the species' habits. The species may be chosen on the basis of ease of sighting, status (endangered species), colourful form, interesting behaviour etc. The Centre would also keep visitors occupied during the rains and the long dark evenings in winter.

4.4 New Bird Trails

Another useful task that the department could undertake is marking out new trails for birdwatching. Walking on leaf litter and trying to avoid shrubbery can be noisy and scares the birds away. The main paths are good for birdwatching but are too exposed for the liking of the shier birds of the undergrowth. There is a need for clean trails in dense primary forests and other vegetation types.

The trails would involve clearing 1 m wide strips. They should be laid without cutting existing trees and should merely involve clearing the ground litter regularly and a minimal clearing of low shrubbery which might impede silent progress. Ideally, a minimum of 15 m of the path should be visible from any point (i.e. not too frequent bends) so that birds may be watched without getting too close. A couple of km of trail at each place would considerably improve bird sighting.

One such trail is very much required along the Haldibari - Hornbill stretch. One hears an enormous amount of bird activity within the forest but the noise generated while trying to get into the forest and while circumventing the fallen trees, leaf litter and other shrubbery often drives the birds away. Creating a trail about 30 m off the main path and parallel to it would greatly facilitate the observation of pittas, partridges, pheasants, babblers, thrushes and many other birds of the primary forest.

Other places which require trails are the area behind the 40th mile camp, the hill slope above the MV road between Deban and 22nd mile camp (more than one trail, in fact) and Lankhai nullah.

4.5 Snake Park

The museums at Miao and Deban contain a large number of snake specimens, comprising primarily the snakes killed in the forest complex at either Deban or Miao. It is understandable that people react so violently to snakes; nevertheless, it is unfortunate that so many snakes, including very rare ones, are being killed.

No amount of exhortion by itself will stop people from killing snakes. However, they do refrain from killing it if they are assured that the snake will be removed from their vicinity. The snake park here at Pune routinely gets calls from all over the city to remove snakes from residences. In fact, people gladly pay the travel expenses of the park staff for removing the snake without harming it. With time, it also results in a kinder attitude and less fear towards snakes among the populace.

The same system can be organised at Miao. A couple of department staff may be trained to identify and catch snakes and people should be encouraged to call the Forest Department for removal of snakes from their houses. Catching snakes may be easily accomplished with a snake net (identical to a butterfly net) or stick without having to touch the snake at all. The process is easy and painless for the snake and the catcher alike! The Department could release the snakes in the reserve or maintain a small serpentarium where visitors can see live the species found in the Reserve. This would stop the killing of snakes and send the right message to the people of Miao and also provide a place for visitors to see some of the snakes of Namdapha.

Appendix A

Birds of Namdapha Tiger Reserve

— Ramana M. Athreya

The bird species recorded during the two visits to Namdapha Tiger Reserve (4th – 17th October, 1996, and 14th January – 8th February, 1997) are listed here along with notes on identification, habits and distribution. The main reference used for bird identification was the *Compact Handbook of the Birds of India and Pakistan* [3] by Salim Ali and S. Dillon Ripley (referred to hereafter as the Handbook).

The entry for each species is organised as follows :

				Jan–Feb '97	Oct '96	
####	ENGLISH NAME	***LATIN NAME***	....	**Altitude range**	**Altitude range**	$\mathcal{N}$
	Notes			(Frequency) Locations	(Frequency) Locations	

The sequence number (####) and the names are from *A Synopsis of the Birds of India and Pakistan*[4] by S. Dillon Ripley. The terms and notation used in the Notes are :

Fl.sz.	: Flock size.
HBk :	: The following sentence (one only) cited from the Handbook.
Parochial	: Regularly seen in the same neighbourhood or even on the same perch.
Primary forest	: Original dense wet evergreen or semi-evergreen forests (eg. Hornbill, Musathi).
Mixed forest	: Primary forests with less dense tree cover (perhaps due to past logging, steep gradients, landslides etc.); often with cane and bamboo (eg. MV road, Deban – Haldibari, ED road).
Open/Secondary forest	: Heavily thinned out areas with a dense ground cover of scrub (eg. 10th Mile, Gandhigram).

Bird records from this survey have been compared with the distributions in the Handbook. Though its contents are outdated by a decade or two, at least, the Handbook still remains the latest comprehensive work on Indian birds and particularly for the north-east where little subsequent work has been done. Bird records outside the geographical and altitudinal range listed in the work are highlighted in the notes and with a symbol in the last column. Others may have already recorded (and published) extensions of species' ranges that I have listed here; for e.g. the Handbook records for the Ibisbill (*Ibidorhynchus struthersii*, # 433) are all from the Himalayan foothills, i.e. north of Brahmaputra, whereas many birdwatchers have reported it from the Noa Dihing which lies south of Brahmaputra (the Brahmaputra is indeed a formidable barrier for species and many have been stopped by it; the separation between the north and south is not as trivial as the physical separation might imply). I regret my inability to cite the latest information on bird distributions. However, I have referred to the recent work of Pratap Singh [5]

The **Notation** ($\mathcal{N}$) used in the last column are :

$\mathcal{E}$	: Endemic species.
$\mathcal{F}$	: The first record for Arunachal Pradesh — not listed by Singh (1995).
$\mathcal{R}$	: Listed as rare in the Handbook or by Singh (1995).
$\mathcal{S}$	: Scanty records or recorded in Arunachal Pradesh only by Singh (1995).
$\overline{\Downarrow}$	: Recorded at an altitude lower than listed in the Handbook.
$\underline{\Downarrow}$	: Recorded around the lowest altitude listed in the Handbook.
$\overline{\Uparrow}$	: Recorded around the highest altitude listed in the Handbook.
$\underline{\Uparrow}$	: Recorded at an altitude higher than listed in the Handbook.

[3] Second Edition, 1987; Oxford University Press, New Delhi.

[4] Second Edition, 1982; Bombay Natural History Society and Oxford University Press, New Delhi

[5] Singh, P. (1995) Recent bird records from Arunachal Pradesh *Forktail* 10 : 65 – 104.

The **Frequency of Sighting** is indicated by a numerical code :

1	:	Seen on only one occasion.
2	:	A few (2–5) sightings during the survey .
3	:	One sighting every few (2–4) days.
4	:	A few (1–3) sightings a day.
5	:	Many sightings a day.
6	:	Many sightings a day and numerous birds.

The above grading is, of course, only an approximate one; in fact, 2 is interchangeable with 3 or 4 in cases where a bird was seen a few times at one location only or only once at each of several locations. Further, all species are not visible to the same extent and so the frequencies of sighting of species do not always indicate their relative abundance. The foliage and the lack of a spotting scope made identification of the canopy flitters difficult. As a result, the frequency of sighting of birds of the higher levels like raptors, woodpeckers etc. may underestimate their abundance.

The **Location of Sighting** is indicated by an alphabetical code. The altitudes (accurate to about 30 m) of the places are listed within parentheses. They consist of a nominal value (typically corresponding to the camp or shelter) followed by the range accessible in the immediate area to a birdwatcher. The codes are :

B	:	Bulbulia (730 : 700–800 m)
D	:	Deban (350 : 300–400 m)
E	:	Embeong-Daphabum road (500 : 450–550 m)
G	:	Gandhigram (1100 : 1050–1150)
G+	:	Above Gandhigram (1300–1500 m)
Hl	:	Haldibari (450 : 400–550 m)
Hn	:	Hornbill (600 : 550–650 m)
Mi	:	Miao : (260 m)
M	:	Musathi (500 : 450–600 m)
N	:	Namdapha River bed between Embeong and Firmbase (450 : 430–450 m)
R	:	Ramnagar (1200 : 1150–1200 m)
U	:	Ubiquitous
V	:	Vijoynagar (1280 : 1225–1280)
V+	:	Above Vijoynagar (1350 : 1250–1400 m)
10	:	7th–17th mile on the Miao-Vijoynagar (MV) road (300-350 m)
20	:	23rd–17th mile on MV road (450–600 m)
30	:	36th–23rd mile on MV road (600–725 m)
40	:	36th–41st mile on MV road (800 : 725–850 m)
80	:	74th–84th mile on MV road (900 : 800–1000 m)
P1-P2	:	On the path between (the adjacent places) P1 and P2
$\overleftrightarrow{\text{P1-P2}}$	:	All localities between and including P1 and P2 in the clockwise direction. (See sketch below).

Locations with different frequency codes are separated by semicolons; for e.g. :
(5;3) B,D; Hn : indicates 5 for Bulbulia and Deban and 3 for Hornbill.
(5-3) B; D : indicates 4-5 for Bulbulia and 3-4 for Deban.

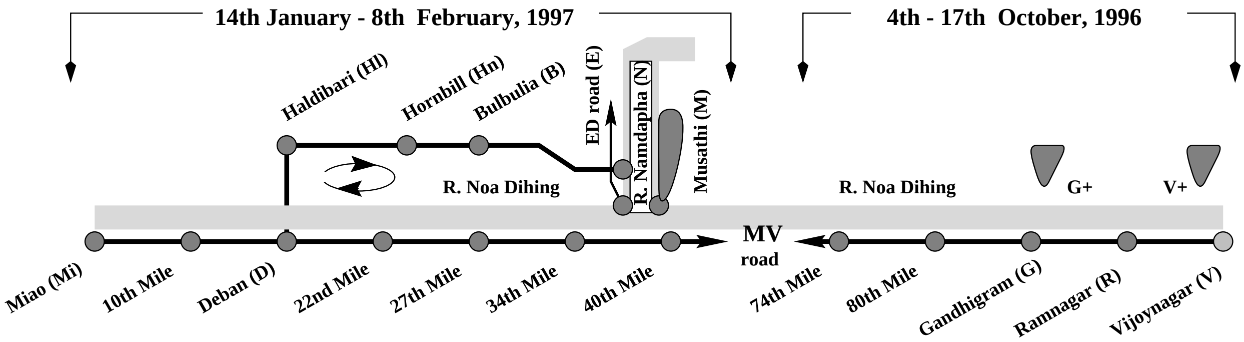

Figure 1: Schematic sketch showing the relative locations of the places visited.

No.	Species	Jan - Feb '97	October '96	
	Family : *Phalacrocoracidae*			
26.	CORMORANT ***Phalacrocorax carbo*** Fl.sz. : 1 – 15. All birds at Embeong were on Noa Dihing and none on Namdapha.	**300–450 m** (5;4) N; D	....	
	Family : *Ardeidae*			
33.	GREAT WHITEBELLIED HERON ***Ardea insignis*** Solitary and wary. At the river's edge. A bird usually seen flying downstream at dusk at Deban. In fact, many Mergansers and Cormorants also fly downstream at dusk — never the other way.	**300–450 m** (4) N,D	....	$\mathcal{R}$
38.	LITTLE GREEN HERON ***Ardeola striatus*** Solitary. By pools and flowing water. Diurnal on overcast days. One flew into a tree when flushed and kept jerking its crest erect every few seconds, for quite a while.	**300–450 m** (5;4) N; Mi	....	
	Family : *Ciconiidae*			
65.	BLACK STORK ***Ciconia nigra*** Fl.sz. 1 – 4. Perched on tall leafless trees beside the river or soaring.	**300–450 m** (5;3) N; 10	....	$\mathcal{S}$
	Family : *Anatidae*			
116.	WHITEWINGED WOOD DUCK ***Cairina scutulata*** A bird swimming along the banks of Noa Dihing in the open at 80th mile at 7 AM. A pair flying over Vijoynagar in the forenoon.	....	**800–1280 m** (2) 80,V	$\mathcal{R}$
121.	COMMON MERGANSER ***Mergus merganser*** Fl.sz. : 2 – 15. Most were ♀♀ or ⚲⚲ in eclipse plumage.	**300–450 m** (5) N,D	....	
	Family : *Accipitridae*			
144.	CRESTED GOSHAWK ***Accipiter trivirgatus*** Solitary or pairs. Always seen circling high above. Distinguished from Blyth's Baza (*Aviceda jerdoni*, #125) by pure white undertail coverts fluffed out on either side and particularly prominent in banking flight. Probably commoner than indicated.	**600–800 m** (4) Hn,40	**1100 m** (1) G-R	
148.	SPARROW-HAWK ***Accipiter nisus*** Solitary. Hunting pipits roosting in the bushes on the airfield in the evening.	....	**1280 m** (1) V	
158.	HODGSON'S HAWK-EAGLE ***Spizaetus nipalensis*** Solitary. Adult atop an emergent tree in primary forest; immature over Dihing.	**300–500 m** (2) Hl,D	....	
165.	RUFOUSBELLIED HAWK-EAGLE ***Hieraaetus kienerii*** Solitary. Flying across the river.	**450 m** (1) N	....	
172.	BLACK EAGLE ***Ictinaetus malayensis*** Solitary. Skimming the tree-tops in slow flight at the edge of clearings.	....	**1100–1500 m** (3) G	
172a.	WHITETAILED EAGLE ***Haliaeetus albicilla*** HBk : Vagrant from the sea coast — mostly known from north-west India; rarer to the east. Solitary. On the shingle bank.	**300 m** (2) D	....	$\mathcal{S}$
195.	SHORT-TOED EAGLE ***Circaetus gallicus*** HBk : Not from east of Bangladesh. Surprising record for so wet a place. Solitary. Over open meadows or in scrub behind the village.	....	**1100 m** (1) G	$\mathcal{S}$
196.	CRESTED SERPENT EAGLE ***Spilornis cheela*** Solitary. Parochial; usually on the same prominent perch near water	**300–700 m** (4) D,N	**1050–1200 m** (4) R-V,G	
	Family : *Pandionidae*			
203.	OSPREY ***Pandion haliaetus*** A pair. Parochial; along the Noa Dihing. Often on a tall bare tree on the bank.	....	**800 m** (4) 77	
	Family : *Falconidae*			
205.	WHITELEGGED FALCONET ***Microhierax melanoleucos*** Solitary. In the tourist complex on a tall dead tree.	**350 m** (1) D	....	
209.	PEREGRINE FALCON ***Falco peregrinus peregrinator*** Solitary. Over Noa Dihing and Namdapha.	**300–500 m** (2) D,N	....	$\mathcal{S}$
223.	KESTREL ***Falco tinnunculus*** Solitary. Parochial; on posts or on the ground on river banks and open fields.	**300 m** (4) D	**1000–1300 m** (4) V,G	

No.	Species	Jan - Feb '97	October '96	
	Family : *Phasianidae* Very shy birds. Commoner than recorded for sure.			
268.	COMMON HILL PARTRIDGE ***Arborophila torqueola*** HBk : Usually above 2200 m, south of Brahmaputra. A pair in primary forest.	**550 m** (1) Hn	....	⇩
272.	WHITECHEEKED HILL PARTRIDGE ***Arborophila atrogularis*** Flushed a bird 3 m away in scrub on the margin of primary forest; it flew up 2 m (and not away) into a branch and froze for a while.	**350–600 m** (2) D,Hn	....	
296.	KALIJ PHEASANT ***Lophura leucomelana lathami*** Pairs. All sightings were at dusk in primary or mixed forests.	**500–600 m** (3) Hl-Hn,20	....	
300.	RED JUNGLEFOWL ***Gallus gallus*** Flushed a bird in shrubbery at the edge of primary forest.	**500 m** 1) M	....	
309.	PEACOCK-PHEASANT ***Polyplectron bicalcaratum*** Saw a male displaying to 2 females. Primary and mixed forests. It kept its head dipped close to the ground and its rear raised and stayed that way for a couple of minutes, occasionally shivering its feathers. The Lisus say these birds take to low trees and hide behind screens of tangled vines when disturbed.	**500–650 m** (2) Hn,E	....	
	Family : *Charadriidae*			
368.	REDWATTLED LAPWING ***Vanellus indicus*** HBk : Upper limit 600 m, south of Brahmaputra. Calls at Gandhigram, Vijoynagar	**450 m** (2) N	**1050 m** ? G,V	⇧
369.	SPURWINGED LAPWING ***Vanellus spinosus*** Pairs. Parochial; on the river banks.	**300–450 m** (5;4) Mi,D; N	....	
373.	EASTERN GOLDEN PLOVER ***Pluvialis dominica*** A pair on the meadow along the main street at dusk on 16th Oct. Not seen during the next 2 days in spite of an intensive search — Passage?	....	**1280 m** (1) V	$\mathcal{F}$
397.	GREEN SANDPIPER ***Tringa ochropus*** Solitary.	**300 m** (4) D	....	
401.	COMMON SANDPIPER ***Tringa hypoleucos*** Solitary.	**300 m** (4) D	....	
	Family : *Rostratulidae*			
429.	PAINTED SNIPE ***Rostratula benghalensis*** A ♀ in the Gandhigram marsh	....	**1100 m** (1) G	$\mathcal{F}$
	Family : *Recurvirostridae*			
433.	IBISBILL ***Ibidorhyncha struthersii*** HBk : Not recorded south of Brahmaputra !? Fl.sz. : 2–4. Shingle banks.	**450 m** (4) N	....	
	Family : *Columbidae*			
493.	PINTAILED GREEN PIGEON ***Treron apicauda*** Fl.sz. : 2–20. Often seen sunning themselves on very high leafless branches.	**300–600 m** (4;3) 10,Hl; Hn,D	....	
494.	WEDGETAILED GREEN PIGEON ***Treron sphenura*** A couple of pairs at Burma nullah in open forest.	**800 m** (1) 40	....	
510.	IMPERIAL PIGEON ***Ducula badia*** Fl.sz. : 1 – 6. Usually seen flying high. Just before Bulbulia they are less shy and may be seen sitting on trees (above 10 m) hidden among the foliage.	**400–900 m** (5) B,U	**800 m** (4) 80	
517.	BLUE ROCK PIGEON ***Columba livia*** Around habitation.	**250-350 m** (5) Mi,D	**1280 m** ? V	
523.	ASHY WOOD PIGEON ***Columba pulchricollis*** HBk : below 1200 m only in two areas north of Brahmaputra. Fl.sz. : 8. On a tree 5 m above the ground in primary forest.	**730 m** (1) B	....	⇓
526.	BARTAILED CUCKOO-DOVE ***Macropygia unchall*** As for Imperial Pigeon (#510).	**450–900 m** (5;?) B; U	....	⇓
532.	RUFOUS TURTLE-DOVE ***Streptopelia orientalis*** Fl.sz. : 2 – 6. On or beside paths (2 – 4 m off the ground) in mixed and open forests.	....	**800–1300 m** (4-5) U	

No.	Species	Jan - Feb '97	October '96	
537.	SPOTTED DOVE ***Streptopelia chinensis*** Solitary or pairs. Around habitation.	**350 m** (4) Mi,D	....	
542.	EMERALD DOVE ***Chalcophaps indica*** Fl.sz. : 1 – 3. On broad paths in primary forest. Once saw a flock (or a temporary conglomeration) of a dozen birds scattering off the road at Embeong.	**300–800 m** (5;3) Hn·E; U	....	

Family : *Psittacidae*

No.	Species	Jan - Feb '97	October '96	
559.	EASTERN BLOSSOMHEADED PARAKEET ***Psittacula roseata*** Flocks flying about the village. Distinguished from *P. cyanea* only by location.	....	**1050 m** (2) G	*S*

Family : *Cuculidae*

No.	Species	Jan - Feb '97	October '96	
573.	COMMON HAWK-CUCKOO ***Cuculus varius*** HBk : Usually below 1000 m. Solitary. On a tree by a ravine in open forest.	....	**1200 m** (1) R-V	⇑
605.	LESSER COUCAL ***Centropus toulou*** Solitary. In tall grass on the forest margin. Prefers floundering through the grass to flying over it.	**450 m** (1) N	....	

Family : *Strigidae*

No.	Species	Jan - Feb '97	October '96	
612.	SPOTTED SCOPS OWL ***Otus spilocephalus*** Only calls.	....	**800–1300 m** (3-4) U	
635.	COLLARED PYGMY OWLET ***Glaucidium brodiei*** Solitary. Heard more often, than seen. In mixed bamboo and open forests. Diurnal. Lisus imitate this call to decoy other species.	**300–800 m** (3-4) U	**1200–1300 m** (4) R·V	
641.	BARRED OWLET ***Glaucidium cuculoides*** Solitary. Diurnal but very vocal at dusk. Found in bamboo, clearings and gardens, 1 – 15 m off the ground. The abdominal and lateral streaks which distinguish it from the Jungle Owlet (*G. radiatum*, # 636) are not always obvious in the field. Call : A rising sequence like that of *G. radiatum* but stops abruptly instead of fading away as in the latter species.	**300–800 m** (5-3) Hl; U	....	
662.	TAWNY WOOD OWL ***Strix aluco*** HBk : above 1200 m. Only calls — all through the one clear night only.	**600 m** (3) Hn	....	⇓

Family : *Caprimulgidae*

No.	Species	Jan - Feb '97	October '96	
668.	GREAT EARED NIGHTJAR ***Eurostopodus macrotis*** A flock of 3 birds flying above the river at dusk	....	**800 m** (1) 80	*S*

Family : *Apodidae*

No.	Species	Jan - Feb '97	October '96	
683.	HIMALAYAN SWIFTLET ***Collocalia brevirostris*** Fl.sz : up to 100 or more. When flying together over water, the swiftlets stay on top (10 m or higher), Nepal House Martins (# 932) occupy the middle level while Plain Sand Martins (# 912) stick to the bottom (about 1 m above the water).	**300–450 m** (4) D,Hl,N,Mi	**800–1300 m** (4) U	

Family : *Trogonidae*

No.	Species	Jan - Feb '97	October '96	
713.	REDHEADED TROGON ***Harpactes erythrocephalus*** Solitary or separated pairs. Common at the edges of clearings or along broad paths 2 – 7 m off the ground. The call of a male was accompanied by a spreading of the tail, showing the white retrices prominently, followed by an upward flick.	**300–800 m** (4-5) U	**800–1200 m** (4) 80,G-R	

Family : *Alcedinidae*

No.	Species	Jan - Feb '97	October '96	
718.	PIED KINGFISHER ***Ceryle lugubris*** Solitary or pairs. Open streams and rivers.	**300–450 m** (5;4) N; D	**800–1200 m** (3-4) U	
719.	LESSER PIED KINGFISHER ***Ceryle rudis*** Pairs on the river.	**300 m** (4) D,Mi	....	
721.	BLYTH'S KINGFISHER ***Alcedo hercules*** Solitary or pairs. Very little is known of this supposedly rare bird. It is, however, regularly encountered in Namdapha. It sticks to streams in dense forest occasionally showing itself on the exposed shingle banks of large rivers. Its beak appears relatively much heavier and longer than that of the similarly plumaged Common Kingfisher (*A. atthis*, # 723). Some birds had a jet black beak while others had a bright coral-red beak — sexual dimorphism? The size, particularly of its beak, the darker overall colour and its forest haunts are sufficient to identify the species (*A. atthis* was never encountered in dense forest). Other distinguishing features are not always visible in its dim habitat. The call is similar to that of *A. atthis*. The birds normally perch on or rather under a low bush overhanging a stream. When disturbed, they almost always first hop up into the middle of the plant and conceal themselves; if approached closer after this, they fly away along the stream to another perch.	**300–450 m** (4) N,D	**800 m** (5) 80	*R*

	Jan - Feb '97	October '96
723. COMMON KINGFISHER *Alcedo atthis*	**300–800 m**	**800–1200 m**
Solitary. Banks of streams and rivers in open areas.	(4) D,Mi	(4) 80,R·V
737. WHITEBREASTED KINGFISHER *Halcyon smyrnensis*	**300 m**	....
Solitary. Parochial; on a fallen tree on the sandbank across from Deban.	(4) D	

Family : *Upupidae*

766. HOOPOE *Upupa epops*	....	**1280 m**
Solitary or pairs. River banks in forested areas and open fields.		(4) V,G,80

Family : *Bucerotidae*

771. RUFOUSNECKED HORNBILL *Aceros nipalensis*	**300–800 m**	....
Fl.sz : 1 – 10. Totally absent in Embeong where hundreds of the next species are found. On top of tall trees.	(6-4) Hl·B; U	
772. WREATHED HORNBILL *Rhyticeros undulatus*	**300–800 m**	....
Fl.sz. : 1 – 10. Very common between the Namdapha river and the initial stretch of the Embeong - Dapha bum path. On top of tall trees.	(6-3) N-E; U; Mi	
776. GREAT PIED HORNBILL *Buceros bicornis*	**400 m**	....
Solitary. In mixed forest.	(1) D-Hl	

Family : *Capitonidae*

778. GREAT HILL BARBET *Megalaima virens*	**300–900 m**	**1300 m**
Mostly calls only; seldom seen.	(5-6) U	(5) V
787. GOLDENTHROATED BARBET *Megalaima franklinii*	**800 m**	....
Solitary. On a tree in the PWD IB clearing.	(1) 40	
788. BLUETHROATED BARBET *Megalaima asiatica*	**300–800 m**	....
Fl.sz. : 2 – more than 20. All habitats; commonest in mixed and open forests. Usually 5 – 30 m off the ground but often on very low bushes at Deban.	(6;5) D; U	

Family : *Picidae*

798. SPECKLED PICULET *Picumnus innominatus*	**450–650 m**	....
Solitary or pairs. Peck is distinctly "disyllabic" — the *'tutuk'* sound predominates, with only an occasional *'tuk'* in between. Consistent enough to separate the piculets aurally. On thicker stems than the next species.	(3) Hl,30,20	
801. RUFOUS PICULET *Sasia ochracea*	**450–810 m**	**1250 m**
Solitary. On slender stems — vines, bushes, bamboo; even bores into grass stalks! Margins of forests, clearings and secondary scrub.	(4) 40,20,Hl	(1) V
810. BLACKNAPED GREEN WOODPECKER *Picus canus*	**450–600 m**	**1200 m**
Solitary. Often with the next species. In all forest types.	(5;4) Hn; Hl,E	(1) G-R
813. LARGE YELLOWNAPED WOODPECKER *Picus flavinucha*	**300–750 m**	....
Fl.sz. : 2 – 4. Not seen at 40th mile camp. Commonest in mixed forest.	(5;4) 10·Hn; U	
815. SMALL YELLOWNAPED WOODPECKER *Picus chlorolophus*	**350–600 m**	....
Pairs. In mixed forest.	(5;3) D,Hl; Hn	
827. PALEHEADED WOODPECKER *Gecinulus grantia*	**600–800 m**	....
Solitary. All sightings on bamboo, even in mixed forest.	(4-5) 40,30	
857. REDEARED BAY WOODPECKER *Blythipicus pyrrhotis*	**300–800 m**	**800–1400 m**
Usually solitary. Oftener heard than seen. Rather shy and few visit roadside trees.	(5;4) Hl·Hn; U	(4) R-V,V+,80

Family : *Eurylaimidae*

864. HODGSON'S BROADBILL *Serilophus lunatus*	**450–650 m**	**1200 m**
Fl.sz. : 10 – 15. Moving along the edge of the road in primary forest 1 – 3 m off the ground. Calls : peculiar clicks and chirps, more like an insect or a mouse.	(4) Hn	
865. LONGTAILED BROADBILL *Psarisomus dalhousiae*	**600 m**	**1200 m**
Fl.sz. : 6 – 12. In primary forest and heavily logged areas.	(4) Hn,Hl,E,20	(1) R-V

Family : *Pittidae*

866. BLUENAPED PITTA *Pitta nipalensis*	**350–800 m**	....
Solitary. In undergrowth in primary and mixed forests. Very reluctant flier — trusts its legs better to get to safety! It flew a few metres only when encountered on the open road. One under a fruiting Ficus — attracted by the figs or insects?	(3-4) U	

		Jan - Feb '97	October '96	

Family : *Hirundinidae*

No.	Species	Jan - Feb '97	October '96	
912.	PLAIN SAND MARTIN ***Riparia paludicola*** Flocks of 3 – 20. Parochial. See under Himalayan Swiftlet (# 683).	**450 m** (5) N	....	
917.	SWALLOW ***Hirundo rustica*** On power lines in Vijoynagar.	....	**1280 m** (4) V	
932.	NEPAL HOUSE MARTIN ***Delichon nipalensis*** Flocks of 20 – 50. Parochial. See under Himalayan Swiftlet (# 683).	**300–800 m** (4) N; D,40,10	....	⇓

Family : *Laniidae*

No.	Species	Jan - Feb '97	October '96	
945.	GREYBACKED SHRIKE ***Lanius tephronotus*** Solitary, occasionally pairs. Parochial; in clearings and gardens, 1 – 4 m off the ground.	**300–800 m** (4) Hl,D,N,40	**1100 m** (4) G	
948.	RUFOUSBACKED SHRIKE ***Lanius schachtricolor*** Solitary. Parochial; on shrubs, posts and low branches of trees in open fields.	**450 m** (4) Mi,N	**1280 m** (4) V	
949.	BROWN SHRIKE ***Lanius cristatus*** Solitary. An immature bird. Parochial; on the bushes beside the lodge.	**350 m** (4) D	....	*S*

Family : *Oriolidae*

No.	Species	Jan - Feb '97	October '96	
958.	BLACKHEADED ORIOLE ***Oriolus xanthornus*** Solitary. In the garden on a tall tree.	**260 m** (1) Mi	....	
961.	MAROON ORIOLE ***Oriolus traillii*** Solitary oriole, but with other species. In primary and mixed forests.	**300–800 m** (4;3) Hn; D,E	**1100 m** (1) G-R	

Family : *Dicruridae*

No.	Species	Jan - Feb '97	October '96	
966.	GREY DRONGO ***Dicrurus leucophaeus*** Fl.sz. : 1 – 6. Commoner along the road and in more open forest.	**300–800 m** (4-5) U	**800–1200 m** (4) U	
971.	BRONZED DRONGO ***Dicrurus aeneus*** Fl.sz. : 2 – 6. Commonest drongo in the forest.	**300–800 m** (5-4) 40; U	**800–1200 m** (5;4) 80; G-R	
972.	LESSER RACKET-TAILED DRONGO ***Dicrurus remifer*** Fl.sz. : 1 – 4. All habitats. Often in mixed parties. Several birds seen without the racket. Commoner than the Greater Racket-tailed Drongo (# 976).	**300–800 m** (3-5) U	**900 m** ? 80	
973.	HAIRCRESTED DRONGO ***Dicrurus hottentottus*** Flocks of 2 – 6. Margins of primary and mixed forests. Often with other drongos.	**300–700 m** (4;3) D; U	**800–1000 m** (4) 80	
976.	GREATER RACKET-TAILED DRONGO ***Dicrurus paradiseus*** Fl.sz. : 1 – 2. Often with other birds of its size — treepies, drongos, sibias, etc. Commonest in primary and mixed forests.	**300–800 m** (3-5) U	**900 m** ? 80	

Family : *Sturnidae*

No.	Species	Jan - Feb '97	October '96	
1006.	COMMON MYNA ***Acridotheres tristis*** Fl.sz. : 2 - 4. Around the village.	....	**1100 m** (4) G	
1011.	JUNGLE MYNA ***Acridotheres fuscus***	**300 m** (4) Mi	....	
1015.	HILL MYNA ***Gracula religiosa*** Fl.sz. : about 6. On a tall tree in a clearing in mixed forest.	**400 m** (2) Mi,D-Hl	....	

Family : *Corvidae*

No.	Species	Jan - Feb '97	October '96	
1023.	GREEN MAGPIE ***Cissa chinensis*** Fl.sz. : 2 – 4. All habitats. Probably accounts for a great many calls of unknown origin and may be commoner than indicated.	**300–800 m** (4) U	**1150 m** (1) G-R	
1035.	BLACKBROWED TREE PIE ***Dendrocitta frontalis*** Fl.sz. : 1 – 4. Favours mixed bamboo forest.	**450–800 m** (3-4) 20-40,M	**800–1300 m** (3-4) U	
1038.	HIMALAYAN TREE PIE ***Dendrocitta formosae*** HBk : above 600 m. Solitary or pairs. Many in low shrubbery at edges of forest.	**400–700 m** (4-5) Hl-N	**800–1300 m** (4-5) U	⇓
1055.	JUNGLE CROW ***Corvus macrorhynchos***	**300–700 m** (4) Mi,N,D,B	....	

Family : *Campephagidae*

No.	Species	Jan - Feb '97	October '96	
1064.	PIED FLYCATCHER-SHRIKE ***Hemipus picatus capitalis*** Fl.sz. : 10 – 15. In mixed and open forests, 5 – 10 m off the ground.	**300–800 m** (3) 10·Hl,40,M	....	
1067.	LARGE WOOD-SHRIKE ***Tephrodornis (virgatus) gularis*** Fl.sz. : 12 – 20. In mixed and open forests, 5 – 10 m off the ground. They cling to tree trunks and branches at all angles.	**300–700 m** (5;4) D; 10·E	....	
1073.	LARGE CUCKOO-SHRIKE ***Coracina novaehollandiae*** Fl.sz. : 1 – 3. At the edges of forests and clearings in the top canopy.	**300–700 m** (4) D,N,B	....	
1077.	SMALLER GREY CUCKOO-SHRIKE ***Coracina melaschistos*** Solitary c-shrike but always in mixed flocks; usually seen following minivets.	**300–700 m** (4) 10·N	....	
1082.	SCARLET MINIVET ***Pericrocotus flammeus*** Fl.sz. : 3 – 10, usually with only one ♀ . Along roads, clearings and in open forests.	**300–800 m** (5) U	....	
1088.	YELLOWTHROATED MINIVET ***Pericrocotus solaris*** HBk : above 1500 m. Pair. At the edge of primary forest on the banks of Dihing.	....	**800 m** (1) 80	

Family : *Irenidae*

No.	Species	Jan - Feb '97	October '96	
1098.	COMMON IORA ***Aegithina tiphia*** About 6 birds on trees next to the check-post.	**300 m** (1) 10	....	
1106.	ORANGEBELLIED CHLOROPSIS ***Chloropsis hardwickii*** Fl.sz. : 1 – 25. Mostly in mixed forest and clearings, 3 – 15 m off the ground.	**350–650 m** (6-3) D; Hl; U	**800–1300 m** (3-4) U	
1108.	GOLDMANTLED CHLOROPSIS ***Chloropsis cochinchinensis*** Fl.sz. : 6 – 25. In open forests and clearings, 5 – 15 m off the ground.	**300–350 m** (5;3) 10; D,Hl	....	*S*
1109.	FAIRY BLUEBIRD ***Irena puella*** Fl.sz. : 6 – over 100 (at Hornbill). In primary and mixed forests from top canopy to low berry-laden bushes.	**350–800 m** (6-4) Hn; D·N	....	

Family : *Pycnonotidae*

No.	Species	Jan - Feb '97	October '96	
1115.	BLACKHEADED YELLOW BULBUL ***P. melanicterus flaviventris*** Fl.sz. : 2 – 6. Margins of clearings; bushes and low trees.	**300–450 m** (6;4) D; Hl,N	....	
1121a.	REDWHISKERED BULBUL ***Pycnonotus jocosus*** HBk : below 1100 m. Fl.sz. : 2 – 6. On grass, rushes at Firmbase. The red 'whiskers' are not visible in these birds — either absent or very minute.	**450 m** (4-5) N	**1000–1300 m** (4-5) G,V	
1131.	REDVENTED BULBUL ***Pycnonotus cafer***	**300–450 m** (5;4) Mi·Hl; N	**1000–1300 m** (4-5) G,V	
1140.	WHITETHROATED BULBUL ***Criniger flaveolus*** Fl.sz. : 12 – 20. Behaves more like a babbler! All habitats, low bushes to 5 m.	**300–900 m** (5-6) U	....	
1146.	RUFOUSBELLIED BULBUL ***Hysipetes mcclellandi*** Fl.sz. : 4 – 10. Edges of primary and mixed forests, 5 – 15 m off the ground.	**450–800 m** (3) Hn,N,40,30	....	
1147.	BROWNEARED BULBUL ***Hypsipetes flavalus*** Fl.sz : 6 – 20. Clearings, mixed and primary forests, 2 – 7 m off the ground.	**300–800 m** (4-5) Hn,D·40	....	
1151.	BLACK BULBUL ***Hypsipetes madagascariensis*** Fl.sz. : about 10. Canopies of tall trees in clearings in mixed and primary forests.	**350–600 m** (3-4) D·Hn,20	**1400 m** (1) G+	

Family : *Muscicapidae*

Subfamily : *Timaliinae*

No.	Species	Jan - Feb '97	October '96	
1156.	SPOTTED BABBLER ***Pellorneum ruficeps*** A pair. In undergrowth behind the lodge.	**350 m** (1) D	....	
1185.	LARGE SCIMITAR-BABBLER ***Pomatorhinus hypoleucos*** Solitary. Twice in mixed forest; both calling for over 10 minutes from within densely tangled vines in the canopy, 10 m and 20 m above. Call : loud and fluty *hoot - hoot - hooooot* (2 sec total) — a regular call and not an alarm call as HBk describes it.	**500–600 m** (2) E,M	....	

Jan - Feb '97 | **October '96**

1187. CORALBILLED SCIMITAR-BABBLER ***Pomatorhinus ferruginosus*** ..... Jan - Feb '97: **500–800 m** (5) 40·20,10? — October '96: **800 m** 80?

HBk : above 900 m. Had considerable trouble separating this and the next species. Though superficially similar they are easily distinguishable on a good view according to the book. However, in Namdapha, some (not all) *P. ferruginosus* had a mixture of the distinctive features of both species! I could identify these birds reliably only during the last couple of days and so am unable to estimate the frequency of sighting separately for the two. I confirmed my field key and the source of confusion in the BNHS skin collection : Ripley and Ali collected specimens from Namdapha in the early 1980s and ascribed it to a new subspecies, *P.f.namdapha*. They are much paler than *P.f.formosus* and closer to *P. ochraceiceps*. I suspect I saw both subspecies (i.e. with dark as well as pale underparts) , and intermediates too, in Namdapha.

P.f.formosus is deep ochraceous below except for a white chin and malar stripe. *P. ochraceiceps* is light buff below with a white throat (hence no malar stripe) and middle of underparts off-white; but *P. ferruginosus namdapha* also has a white throat and pale buff underparts! The beaks are also different : the longer, more slender and curved orange beak of *P. ochraceiceps* *contra* the shorter, stouter and straighter coral-red beak of *P. ferruginosus* but I suspect the colour difference is not constant — I did see short and stout orange beaks. On a good view, the difference between the beak shapes is obvious but the restless birds, profuse foliage and bamboo rarely give a good view.

One constant and easily visible difference is in the eye-stripe (not shown in the Pictorial Guide). The eye stripe expands behind the eye to cover the whole of the side of the head and neck and is jet black in both *P. ferruginosus* ssp. In *P. ochraceiceps* there is little change in the eye-stripe width and its colour changes from black in front of the eye to brown behind it.

Both species were always seen with *Gampsorhynchus rufulus* (#1347), *Paradoxornis atrosuperciliaris* (# 1246) and *Paradoxornis ruficeps* (# 1247) in groups of 10 – 20, except for a flock of *Pomatorhinus ferruginosus* by themselves. While *P. ochraceiceps* were always in the thick of the group, *P. ferruginosus* would occasionally be found a little separated from the main flock though they were obviously a part of it. All sightings in bamboo. One flock was exploring with their beaks the inter-spaces between the curled leaves around the banana plant. Calls (which species ... or both?) : a fluty *wrai*, a harsh ··· *kri-kri-kri* ··· or ··· *kshi-kshi-kshi* ··· as an alarm note; Also a fluty *cooo* from a bird separated from the flock by the road and my presence on it.

1190. LLOYD'S SCIMITAR-BABBLER ***Pomatorhinus ochraceiceps*** .... Jan - Feb '97: **450–800 m** (5) 40·20,E — October '96: ....

LONGBILLED SCIMITAR-BABBLER See under previous species.

1194. SHORTTAILED WREN-BABBLER ***Napothera brevicaudata*** .... Jan - Feb '97: **350–700 m** (4) Hl,B,D·M — October '96: ....

HBk : above 700 m. Pairs. In undergrowth in primary forest. Not shy and quite generous in making known its opinion of people in its vicinity; its scolding notes are often the first indication of its presence and continue long enough to facilitate identification! Calls : *Wee-wi-wi-wi-(wi)* (general), *chirrik-chirrik* or *chirr* (alarm), *wit* or *wit-tu* (contact notes between a foraging pair).

1196. SMALL WREN-BABBLER ***Napothera epilepidota*** .... Jan - Feb '97: **450–700 m** (4) Hl·M,30 — October '96: ....

Pairs. Less common and more silent than the previous species. Usually around fallen trees in primary forest. Calls : *Chirr* (alarm) and a distinctive very low nasal *weee*.

1199. LESSER SCALYBREASTED WREN-BABBLER ***Pnoepyga pusilla*** .... Jan - Feb '97: **350–800 m** (3) E,40,D,Hn — October '96: **800 m** 80?

Solitary. Mossy boulders on dry stream beds.

1208. WEDGEBILLED WREN ***Sphenocichla humei*** .... Jan - Feb '97: **800 m** (1) 40 — October '96: .... *S*

HBk : above 900 m. Fl.sz. : about 10. A flock in dense shrubbery beside the road on a steep scrubby hillside about 30 m from Burma nullah.

1212. GOLDHEADED BABBLER ***Stachyris chrysaea*** .... Jan - Feb '97: **400–800 m** (4) E·30,Hl — October '96: **800–1200 m** (5-3) 80; 80·R

HBk : above 900 m, south of Brahmaputra? **October** Fl.sz. : more than 25. In dense shrubbery, always with Yellowthroated Tit-Babblers (# 1378), less than 3 m off the ground. **January** Fl. sz. : perhaps fewer (?10) but always in large mixed flocks. In mixed, bamboo and primary forests. Usually in the mid and top levels of the flock. Very restless.

1217. BLACKTHROATED BABBLER ***Stachyrisnigriceps*** .... Jan - Feb '97: **400–800 m** (4-5) 40,Hl·E

Fl.sz. : 10 – 15; either in pure or huge mixed flocks. In bamboo, mixed and primary forests; in roadside shrubbery and undergrowth, below 2 m.

1218. AUSTEN'S SPOTTED BABBLER ***Stachyris oglei*** .... Jan - Feb '97: **400–800 m** (4) 40·20,Hl,B — October '96: .... *R E*

Fl.sz. : 10 - 25. Mostly at the base of large bamboo brakes in darkish ravines and once in undergrowth in primary forest. Very wary but take time off to scold from up close before pushing off. Alarm call : combination of many loud *chirr – chirr*, *chit*, *chirrik*. Sighted on every visit to good bamboo. Very little known of this species which is confined to Lohit and Changlang districts. HBk : (quoting native collectors) "the birds are rare, silent, skulking and do not move in flocks"; however in Namdapha they are not uncommon, vocal and move in largish flocks!

1228. YELLOWBREASTED BABBLER ***Macronous gularis*** .... Jan - Feb '97: **450 m** (1) Hl — October '96: ....

Fl.sz. : 6. With Piculets, a Flycatcher, Flycatcher-Warblers and Leaf Warblers. Spent a long time methodically working up and down a small leafy tree in the clearing.

No.	Species	Jan - Feb '97	October '96	
1242.	ORANGE PARROTBILL *Paradoxornis nipalensis* HBk : above 600 m. Fl.sz. : about 50. In bamboo early one misty morning — the only birds about.	**530 m** (1) 20	...	
1246.	LESSER REDHEADED PARROTBILL *Paradoxornis atrosuperciliaris* Fl.sz. : 10 – 25. Invariably in bamboo and with Whiteheaded Shrike-Babblers (# 1347); often also with Coralbilled and Lloyd's Scimitar-Babblers (# 1187, 1190) and the next species. This species appears to form the core of the mixed flock.	**500–900 m** (5;3) 40,30; B·20	...	
1248.	GREATER REDHEADED PARROTBILL *Paradoxornis ruficeps* Fl.sz. : 10 – 25. See under previous species. Also seen by themselves or with Scimitar-Babblers (# 1187, 1190) only. All sightings in bamboo.	**500–800 m** (5;4) 40,30; E·20	**800 m** (1) 80	
1250.	GREYHEADED PARROTBILL *Paradoxornis gularis* HBk : above 600 m. Fl.sz. : about 12. On trees at the margin of the forest on the banks of Dihing, 5 – 15 m off the ground (no bamboo).	**450 m** (1) N	...	
1256.	STRIATED BABBLER *Turdoides earlei* Fl.sz. : 6 – 10, scattered over the flood plain in tall grass; often only 1 or 2 visible. Often may be seen calling from an exposed perch on a tall swaying grass stalk or a small tree with the tail completely fanned out.	**450 m** (4) N	...	*S*
1276.	NECKLACED LAUGHING THRUSH *Garrulax monilegerus* Fl.sz. : 12 – 25. Very shy. Confirmed records from Deban and 10th mile only.	**300–350 m** (4) D,10,?U	...	
1278.	BLACKGORGETED LAUGHING THRUSH *Garrulax pectoralis* Fl.sz. : 10 – 30. All habitats except open fields. Very shy. Usually on the road or low bushes but up to 10 m off the ground.	**300–900 m** (6-4) 10·M; U	...	
1284.	WHITECRESTED LAUGHING THRUSH *Garrulax leucolophus* Fl.sz. : 10 – 30. All habitats except open fields. Less shy than the previous bird but still quite wary. Usually on the ground.	**300–900 m** (5-6) U	**800–1400 m** (5) U	
1288.	YELLOWBREASTED LAUGHING THRUSH *Garrulax delesserti gularis* HBk : above 1000 m. Fl.sz : 12 – 20. Understorey in primary and mixed forests.	**550 m** (2) E,M	...	
1296.	RUFOUSCHINNED LAUGHING THRUSH *Garrulax rufogularis* Pairs. In tangled shrubbery at the edge of a clearing in primary forest and in bamboo.	**650 m** (2) B-E,E	...	
1303.	RUFOUSNECKED LAUGHING THRUSH *Garrulax ruficollis* HBk : below 600 m south of Brahmaputra (rarely up to 1200 m). In tall grass on the flood plains (Namdapha) and in scrub by a meadow (Vijoynagar).	**450 m** (4) N	**1250 m** (1) V	
1319.	BLUEWINGED LAUGHING THRUSH *Garrulax squamatus* Fl.sz. : 2 – 4. In bamboo, 1 – 3 m off the ground.	**800–900 m** (2) B,40	**800 m** 80?	?
1334.	SILVEREARED MESIA *Leiothrix argentauris* HBk : above 700 m (!?), south of Brahmaputra. Fl.sz. : 20 – 50. All habitats. Usually close to the ground, but as high as 3–4 m.	**300–900 m** (6) U	**800–1300 m** (5) U	
1336.	REDBILLED LEIOTHRIX *Leiothrix lutea* HBk : above 600 m. Fl.sz. : 12 – 25. Commoner in primary forest; also found in scrub. Usually in bushes and low trees, occasionally in the top canopy.	**350–600 m** (4;3) Hn; D,E	...	
1341.	REDWINGED SHRIKE-BABBLER *Pteruthius flaviscapis* HBk : above 1200 m (300 m in Nepal). Fl.sz. : 4 – 10. In open forest on moss covered trees, 10 – 20 m off the ground.	**300–800 m** (4) 10,40	...	
1343.	GREEN SHRIKE-BABBLER *Pteruthius xanthochlorus* HBk : above 2100 m. Solitary. In shrubbery by the roadside.	...	**1200 m** (1) G-R	
1345.	CHESTNUT-THROATED SHRIKE-BABBLER *Pteruthius melanotis* HBk : above 700 m. Fl.sz. : 1 or 2. In huge mixed flocks.	**450–800** (4;3) 40,30; Hl	...	
1347.	WHITEHEADED SHRIKE-BABBLER *Gampsorhynchus rufulus* Fl.sz. : 1 – 25. See under # 1246. Also a solitary bird at the edge of Haldibari clearing for a long time and a few in a mixed flock of Sivas, Minlas etc.	**450–900 m** (5;3) 40·20; HL·M	...	
1350.	SPECTACLED BARWING *Actinodura egertoni* Fl.sz. : 10 – 20, pure flocks. In mixed, bamboo forests, 3 – 7 m off the ground.	**450–800 m** (3-4) 40,Hl·30	...	
1357.	REDTAILED MINLA *Minla ignotincta* Fl.sz. : 20 or more; in mixed flocks with Bluewinged Sivas and others. Very active bird. Mostly in primary forest about 10 – 30 m off the ground.	**450–600 m** (4) E,Hl,Hn,M	...	

No.	Species	Jan - Feb '97	October '96
1362.	BLUEWINGED SIVA *Minla cyanouroptera* ... HBk : above 1200 m, south of Brahmaputra (rarely 600 m). Fl.sz. : 20 or more. See under previous species.	**450–700 m** (4) Hl,Hn,B	....
1364.	WHITEBROWED YUHINA *Yuhina castaniceps* ... All Yuhinas unless specified otherwise :- Fl.sz. : 10 – 30; pure flocks only. On trees and bushes, 2 – 10 m off the ground. Very active birds; fleeting visits to any place.	**350–800 m** (4;3) N,D; Hl,40	....
1366.	WHITENAPED YUHINA *Yuhina bakeri* ... See under # 1364. Very common on the MV road but nowhere else.	**550–800 m** (5) 40·20	**1000 m** (1) 80
1370.	YELLOWNAPED YUHINA *Yuhina flavicollis* ... See under # 1364. Fl.sz. : 10.	**300–700 m** (4) 10·E	....
1374.	BLACKCHINNED YUHINA *Yuhina nigrimenta* ... See under # 1364. Appears to have a fixed daily route and schedule at Embeong.	**300–800 m** (4) Hn,U	....
1375.	WHITEBELLIED YUHINA *Yuhina xantholeuca* ... See under # 1364.	**550–750 m** (3-4) Hl·B,40·30	....
1378.	YELLOWTHROATED TIT-BABBLER *Alcippe cinerea* ... HBk : above 1000 m. Fl.sz. : over 25. Secondary shrubbery along the road, 1 – 3 m off the ground. Often with Goldheaded Babblers(# 1212).	....	**900–1200 m** (4-5) 80·R
1379.	CHESTNUTHEADED TIT-BABBLER *Alcippe castaneceps* ... Fl.sz. : at least 10. In large mixed flocks in mixed and bamboo forests, 2 – 7 m off the ground.	**500–700 m** (4;3) E; Hn,M	**1150 m** (3) G-R
1387.	REDTHROATED TIT-BABBLER *Alcippe rufogularis* ... Fl.sz. : 6 – 12. Commonest in primary forest; also in mixed bamboo forest. Usually within 1 m of the ground. A flock regularly visited a puddle near Hornbill to wash the day and the dust off their feathers at sundown.	**450–800 m** (5;4) Hn,Hl; E·30	....
1393.	NEPAL BABBLER *Alcippe nipalensis* ... Fl.sz. : 25 – ?. In huge flocks, both pure and mixed. Commonest Tit-babbler and the core of mixed flocks. In all habitats, 1 – 8 m off the ground.	**300–900 m** (5-6) U	**800–1200 m** (4-5) 80·R
1395.	CHESTNUTBACKED SIBIA *Heterophasia annectens* ... Fl.sz. : 1 – 12. In mixed flocks. Given to 'tree-creeping'. On tall moss covered trees, 10 – 30 m off the ground.	**300–800 m** (4-5) U	**950–1200 m** (3) 80,G-R
1400.	BEAUTIFUL SIBIA *Heterophasia pulchella* ... HBk : above 1200 m. Fl.sz : 2 – 12; more a loose conglomeration than a flock. All records at flowering silk-cotton trees. Very quarrelsome and much given to chasing away other species and their own kind too.	**300–800 m** (4;3) D,40; Hn,E	....
1401.	LONGTAILED SIBIA *Heterophasia picaoides* ... Fl.sz. : 4 – 10. All wooded areas; from top canopy to bushes a metre high.	**300–900 m** (5-6) U	**950–1200 m** (3) 80·R

Sub family : *Muscicapinae*

No.	Species	Jan - Feb '97	October '96
1414.	ORANGEGORGETED FLYCATCHER *Muscicapa strophiata* ... Solitary, occasionally pairs. On bushes, trees by the path, 2 – 3 m off the ground.	**300–900 m** (5-4) 40; U	....
1417.	RUFOUSBREASTED BLUE FLYCATCHER *Muscicapa hyperythra* ... Solitary. All males. On a stone or low twig at the edge of the path in primary forest; twice in secondary scrub (Deban). The first sight of a bird was often of it flitting into shrubs; however, a few minutes' wait a little way off usually found it back in its place. Rather sedentary and unflycatcher-like in its habits.	**300–730 m** (5;4) Hl·B; D	....
1428.	LARGE NILTAVA *Muscicapa grandis* ... Solitary or pairs. All sightings except one in or on the edges of primary forest — one in secondary scrub. Usually 1 – 2 m off the ground.	**300–900 m** (5;4) Hl·30; D,10	**1400 m** (1) V+
1430.	SMALL NILTAVA *Muscicapa macgrigoriae* ... Solitary. Mostly in scrub at the edges of clearings in primary forest.	**300–800 m** (4-5) U	**1100 m** (2) G
1432.	RUFOUSBELLIED NILTAVA *Muscicapa sundara* ... Solitary. Along forest paths and streams, 1 – 2 m off the ground.	**300–900 m** (5;4) Hn; U	**800–1300 m** (4-5) U
1439.	PALE BLUE FLYCATCHER *Muscicapa unicolor* ... Solitary. In dense tangled vines about 10 m up a tree at the edge of the clearing.	**450 m** (1) Hl	....
1447.	PYGMY BLUE FLYCATCHER *Muscicapa thalassina* ... Solitary. In bamboo, scrub and mixed forests, 2 – 7 m off the ground.	**300–750 m** (3) U	....

		Jan - Feb '97	October '96	
1448.	GREYHEADED FLYCATCHER *Culicicapa ceylonensis* .... Solitary. Usually one very excited bird in every mixed flock.	**300–800 m** (4-5) U	**800–1400 m** (4-5) U	
1450.	YELLOWBELLIED FANTAIL FLYCATCHER *Rhipidura hypoxantha* ...... Solitary. On bushes in all habitats, 2 – 3 m off the ground.	**300–900 m** (5) U	....	
1456.	WHITETHROATED FANTAIL FLYCATCHER *Rhipidura albicollis* .... Solitary or pairs. In mixed flocks or by themselves, looking very excited as they pirouette around. In bushes and short trees 1 – 7 m off the ground.	**300–900 m** (4-5) U	**800–1400 m** (4) U	

Subfamily : *Sylviinae*

		Jan - Feb '97	October '96	
1472.	SLATYBELLIED GROUND WARBLER *Tesia olivea* .... Solitary. In roadside bushes. Very vocal, but seldom seen. Much less shy between Hornbill and Embeong. Over a dozen Ground Warblers were visually identified but none of them were *T. cyaniventer.*	**300–900 m** (5;4) Hn·M; U	**800–1300 m** (4-5) U	
1473.	CHESTNUT HEADED GROUND WARBLER *Tesia castaneocoronata* ..... Solitary. In shrubbery by the road.	**400–600 m** (2) Hn,D	....	
1525.	YELLOWBELLIED WREN-WARBLER *Prinia flaviventris* .... Pairs. In tall grass on the flood plains.	**300–450 m** (5;4) N; D	....	
1530.	BLACKTHROATED WREN-WARBLER *Prinia atrogularis* .... HBk : above 900 m. Pairs. Only seen in tangled shrubbery adjacent to campsites.	**300–800 m** (4) D·B,40,20	....	
1537.	COMMON TAILOR BIRD *Orthotomus sutorius* .... Pairs. Around the garden fence.	**450 m** (4) D	....	
1541.	GOLDENHEADED TAILOR BIRD *Orthotomus cucullatus* .... Fl.sz. 1 – 4. **October :** Very vocal and by themselves. **January :** hardly any calls; always in mixed flocks. Calls : the basic phrase is *peepi - peeeee - pi* (2 sec duration); the song (?) consists of the phrase repeated thrice a few seconds apart, with increasing pitch. The 4th attempt is at a low pitch and disintegrates midway.	**500–800 m** (3-4) E·20,Hn	**800–1300 m** (5) U	
1548.	STRIATED MARSH WARBLER *Megalurus palustris* .... HBk : plains and foothills (no altitude). Solitary. Parochial; bushes on V.nagar airfield and around Miao Tourist Lodge. A loud, harsh and distinctive chatter heard often. Streaks on the back not prominent on the V.nagar bird.	**260 m** (4) Mi	**1280 m** (1) V	?
1599.	GREYFACED LEAF WARBLER *Phylloscopus maculipennis* .... In mixed flocks.	**450–750 m** (2) Hl,40	....	
1609.	BLYTHE'S LEAF WARBLER *Phylloscopus reguloides* .... Fl.sz. : 10 – ?. In mixed and pure flocks. Probably commoner than indicated.	**450–800 m** (?3) H,B,U?	....	
1613.	ALLIED FLYCATCHER-WARBLER *Seicercus affinus* .... See under Greycheeked Flycatcher-Warbler (*S. poliogenys*, # 1620).	**450 m** (3) 20,Hl,N,U?	**1100–1280 m** (4-5) G-R,U	
1615.	BLACKBROWED FLYCATCHER-WARBLER *Seicercus burkii* .... Solitary. In roadside bushes, 1 – 2 m off the ground.	**300–600 m** (3) D,E,Hn	**1100 m** (2) G	
1619.	GREYHEADED FLYCATCHER-WARBLER *Seicercus xanthoschistos* ..... Solitary? In mixed parties in bushes by the road.	**730 m** (1) B	**1100–1280 m** (2) G-V	
1620.	GREYCHEEKED FLYCATCHER-WARBLER *Seicercus poliogenys* .... Solitary or pairs. By themselves or in mixed flocks. On roadside shrubs in mixed forest, 1 – 3 m off the ground. Distinguishing this from *S. affinus* (# 1613) in the field was difficult — only a small fraction of the birds seen could be separated.	**300–900 m** (4-5) U	....	
1621.	CHESTNUT-HEADED FLYCATCHER-WARBLER *Seicercus castaniceps* .. Fl.sz. : 2 –6. In mixed flocks along roads, clearings in mixed and secondary forests.	**450–730 m** (4) Hl,B,30	**1150 m** (4) G-R	
1623.	YELLOWBELLIED FLYCATCHER-WARBLER *Abroscopus superciliaris* .. Fl.sz. : pairs; occasionally up to 6. Always in bamboo, 2 – 5 m off the ground.	**450–900 m** (4-5)B·20,Hl	....	
1626.	WHITETHROATED FLYCATCHER-WARBLER *Abroscopus albogularis* ... Fl.sz. : 15 – 30 (or more). In pure (usually) or mixed flocks. In most habitats; commonest in mixed forest and edges of primary forest; 2 – 7 m off the ground.	**300–800 m** (5-6;3) U; E·M	**1150 m** (2) G-R	
1636.	RUSTYBELLIED SHORTWING *Brachypteryx hyperythra* .... Solitary. A ♀ in bamboo (1 m off the ground) in mixed forest. Tail held half-cocked and wings drooping. A hint of a white supercilium on one side only.	**450 m** (1) E	....	R E

Subfamily : *Turdinae*

No.	Species	Jan - Feb '97	October '96	
1639.	LESSER SHORTWING ***Brachypteryx leucophrys*** Solitary. In undergrowth in primary and mixed forests.	**500–550 m** (3-4) E,M	....	
1640.	WHITEBROWED SHORTWING ***Brachypteryx montana*** Solitary. In undergrowth, dry nullahs in primary and mixed forests. V.nagar birds were ♂♂ in proper plumage; January birds were either ♀♀ or ♂♂ in ♀ plumage. One or both supercilia often invisible. Calls : only heard in October; a peculiar but distinctive juxtaposition of notes of contrasting quality and pitch.	**500–800 m** (4) M,E (3) Hn,40	**1300–1400 m** (4) V+	
1655.	ORANGEFLANKED BUSH ROBIN ***Erithacus cyanurus*** Solitary. On the road in mixed forest with bamboo.	**600–800 m** (4-5) 40·20	....	
1660.	RUFOUSBELLIED BUSH ROBIN ***Erithacus hyperythrus*** Solitary. Along streams next to a clearing or road; on twigs below 1.5 m.	**600–730 m** (4) B,30	....	$\mathcal{R}$
1663.	MAGPIE-ROBIN ***Copsychus saularis*** Pairs. In the garden.	**350 m** (4) D	....	
1674.	HODGSON'S REDSTART ***Phoenicurus hodgsoni*** Solitary. Parochial; on the river bank.	**300–450 m** (4) D,N	....	
1677.	DAURIAN REDSTART ***Phoenicurus auroreus*** Solitary. In the garden.	**350 m** (4) D	....	
1679.	PLUMBEOUS REDSTART ***Rhyacornis fuliinosus*** Solitary. Along streams, rivers. Occasionally on roads, about 20 – 50 m from water.	**300–550 m** (5;4) D,N; 20	**800–1200 m** (4-5) U	
1681.	WHITETAILED BLUE ROBIN ***Cinclidium leucurum*** Solitary or pairs. Undergrowth in primary forest, bamboo, on stems below 3 m.	**400–800 m** (5;3) E·30; Hn,Hl	**1250 m** (4) V+	
1682.	BLUEFRONTED ROBIN ***Cinclidium frontale*** HBk : only from Nepal, Sikkim and Darjeeling; little-known. Superficially like a Large Niltava (# 1428) with bright blue on shoulders and forehead. However, its ground habits and carriage (stands high on its feet) are good pointers. Solitary. Quiet. Parochial; on the road in mixed forest with bamboo. 2 birds each at 34th mile camp and about the 38th mile. They seldom fly, never more than a few metres (more of a long hop), even when approached close. Most birds were not shy; could get to within 4 m. Seen off the ground only once (on a low twig). Alarm call : similar to that of Redbreasted Flycatcher's (*M. parva*, # 1411) — a very faint *tch - tch - tch - tch . . .* (2–3 per second) with drooping wings and cocked tail. Occasionally bobs and curtsies like Brown Rock Chat (*Cercomela fusca*, # 1692), without raising the tail as high.	**700–800 m** (4) 40-30	....	$\mathcal{R}$
1684.	LITTLE FORKTAIL ***Enicurus scouleri*** Pairs. By flowing water.	**300–550 m** (4) D,N,20	**800–1200 m** (4) U	
1686.	SLATYBACKED FORKTAIL ***Enicurus schistaceus*** Solitary or pairs. Commoner along open rivers and streams. See next species.	**300–800 m** (4-6) U	**800–1200 m** (5) U	
1687.	LESCHENAULT'S FORKTAIL ***Enicurus leschenaulti*** HBk : below 300 m south of Brahmaputra. Solitary, occasionally pairs. Common along streams or on roads in thick forest. See previous species.	**300–900 m** (5-3) Hn·20; 10	....	
1691.	GREEN COCHOA ***Cochoa viridis*** HBk : above 700 m (no winter records?). Solitary. On high branches above clearings; once in bamboo. Much given to vocalising (harsh notes), flying about, flycatching on the wing and tit-like searching under leaves. May be commoner than indicated with some mistaken for Fairy Bluebirds at a distance or in silhouette.	**300–700 m** (4) E,10,30 (3) Hl,N	....	$\mathcal{R}$
1696.	STONE CHAT ***Saxicola torquata*** Solitary or pairs. On grass on flood plains.	**300–450 m** (5-4) N,Mi; D	**1280 m** (4) V	
1705.	DARK GREY BUSH CHAT ***Saxicola ferrea*** Pairs. On the margin of the flood plain in open scrub.	**300 m** (4) D	....	
1716.	WHITECAPPED REDSTART ***Chaimarrornis leucocephalus*** Solitary. Along rivers, streams and roads near streams.	**300–700 m** (5) D,N (4-3) 20,Hn,B	**800–1200 m** (4-5) U	
1724.	CHESTNUTBELLIED ROCK THRUSH ***Monticola rufiventris*** Solitary males. At the edge of clearings.	**300–800 m** (2) D,40	....	
1726.	BLUE ROCK THRUSH ***Monticola solitarius*** Solitary males. On shingle banks.	**300–450 m** (2) D,N	....	

No.	Species	Jan - Feb '97	October '96	
1729.	HIMALAYAN WHISTLING THRUSH ***Myiophonus caeruleus*** .... Solitary. All habitats.	**300–900 m** (5) U	**800–1400 m** (5) U	

Genus : Zoothera

The Miao-Vijoynagar road, between 25th and 40th miles, is a remarkably good place for this genus. The birds can be observed for long periods as they slowly hop ahead. Solitary, but several birds may hop along together for a while — I have had 3 species within a single binocular field on several occasions!

No.	Species	Jan - Feb '97	October '96	
1739.	PLAINBACKED MOUNTAIN THRUSH ***Zoothera mollissima*** .... HBk : above 1300 m. See under the genus. This and the next species were very tame and occasionally got inside the minimum focus of binocs; had a tough time getting them to fly to check their wing-bar (getting within 50 m of the birds on their summer grounds is a trying experience)! They flew down the road and not off it when approached too close. Seldom is a bird out of sight on that stretch; they are very useful as mobile standards for size and colour. *Z. mollissima* has no wing-bar on the closed wing but a dark buff wing-bar on the upper wing and a white one below are conspicuous in flight; one bird had 2 white wing bars above. The two species may be easily separated by the pattern around the eye and ear-coverts. The wet, slushy road in dense mixed bamboo forest is quite different from the habitat listed in HBk (open fields, hillsides etc during winter). One bird pulled out an earthworm over 40cm long! Unfortunately, this was the only shy bird of the lot and I could not observe how it managed the mega-lunch!	**600–800 m** (5) 40,30	....	
1740.	LONGTAILED MOUNTAIN THRUSH ***Zoothera dixoni*** .... HBk : above 1500 m. See under the genus.	**450–800 m** (5-3) 40,30,Hn; Hl	....	
1741.	GOLDEN MOUNTAIN THRUSH ***Zoothera dauma*** .... See under the genus. Rather shy. Tends to fly off the road than along it when disturbed. On the path in dense forest; once on the open flood plain.	**600–800 m** (4;3) 40,30,Hn; N	....	
1746.	LESSER BROWN THRUSH ***Zoothera marginata*** .... Solitary. Two sightings in the same locality, late evening and early next day. Much shier than previous 3 species. A nearby *Z. mollissima* (# 1739) greatly facilitated the identification. Two striking features, which indicated its identity even in low light, were its extremely nervous movements (compared to the measured hops of *Z. mollissima*) and a posture with neck hunched forward and body axis held somewhat parallel to the ground (*contra* upright carriage of *Z. mollissima*). Other differences are its shorter legs and tail, smaller size, markings on the underside, warmer brown above with very little olive and different pattern on ear coverts (all in comparison with *Z.mollissima*). Its forehead was quite muddy — probably probes under the mud for food. It was a pleasant surprise to see it out on the open road — it usually sticks to densely overgrown streams in thick forest ... but then, the road was a passable imitation of a stream!	**700 m** (2) 30	....	*R*
1747.	BLACKBREASTED THRUSH ***Turdus dissimilis*** .... Fl.sz. : 4 – 30. Mostly in primary forest; once on the Namdapha flood plain and in Deban garden (several birds on 9th Feb but none during 13th – 18th Jan). Mostly ♀♀ . Shy (except at Deban) but tend to fly around in the same area even when disturbed. Alarm call : ... *chok - chok - chok* ..., 2 – 3 per second.	**350–600 m** (5;3) Hn; N,D	....	
1750.	GREYWINGED BLACKBIRD ***Turdus boulboul*** .... Solitary. In the campsite clearing on a couple of days.	**600 m** (2) Hn	....	

Family : *Cinclidae*

No.	Species	Jan - Feb '97	October '96	
1776.	BROWN DIPPER ***Cinclus pallasii*** .... Solitary. On the river.	**300–450 m** (4) N,D	**800 m** (4) 80	

Family : *Paridae*

No.	Species	Jan - Feb '97	October '96	
1789.	SULTAN TIT ***Melanochlora sultanea*** .... Fl.sz. : 2 – 6. In pure or mixed flocks. Edges of forest, 2 – 5 m off the ground.	**300–800 m** (5) U	....	
1799.	GREENBACKED TIT ***Parus monticolus*** .... Fl.sz : about 10. On the margin of the flood plains.	**300 m** (1) D	....	?
1812a	BLACKSPOTTED YELLOW TIT ***Parus spilonotus*** .... Fl.sz. : 2 – 4. In mixed flocks. Secondary forest and bamboo. Usually above 5 m.	....	**1100–1200 m** (4) G-V	

Family : *Sittidae*

No.	Species	Jan - Feb '97	October '96	
1829.	CHESTNUTBELLIED NUTHATCH ***Sitta castanea*** .... Fl.sz. : 2 – 6. In mixed flocks. On moss covered branches, 10 – 30 m off the ground. Probably commoner than indicated.	**300–800 m** (3) U	....	
1837.	BEAUTIFUL NUTHATCH ***Sitta formosa*** .... Fl.sz. : 3. With Sivas, Drongos, Tits around the watch-tower for about an hour.	**730 m** (1) B	....	

No.	Species	Jan - Feb '97	October '96	
	Family : *Motacillidae*			
1853.	INDIAN TREE PIPIT ***Anthus hodgsoni*** Fl.sz. : 6 – 12. Around habitation, flood plains and other open areas; up to 5 m.	**300–800 m** (4-5) D,N,40	**1100–1300 m** (4-5) $\overleftrightarrow{\mathrm{G{\cdot}V}}$	
1884.	GREY WAGTAIL ***Motacilla cinerea*** Solitary. Along the river.	....	**800–1300 m** (4) U	
1885,7	WHITE WAGTAIL ***Motacilla alba*** Fl.sz. : 2 – 20. Oct : Only *M.a.dukhenensis*; Jan : only *M.a.alboides*. Shingle banks.	**300–450 m** (6) D,N	**800–1100 m** (6) G,80	
	Family : *Dicaeidae*			
1905.	FIREBREASTED FLOWERPECKER ***Dicaeum ignipectus*** Solitary. A ♀ in mixed bamboo forest, 2 m off the ground.	**750 m** (1) 40	....	
	Family : *Nectariniidae*			
1926.	BLACKBREASTED SUNBIRD ***Aethopyga saturata*** Solitary, pairs. Commoner in open areas, 2 – 7 m off the ground. Nowhere numerous.	**300–800 m** (4-5) U	....	
1932.	STREAKED SPIDERHUNTER ***Arachnothera magna*** Solitary. Usually around clearings and along roads, 3 – 15 m off the ground.	**300–800 m** (4-5) U	....	
	Family : *Ploceidae*			
1944.	TREE SPARROW ***Passer montanus***	**260 m** (5) Mi	....	
1967.	WHITEBACKED MUNIA ***Lonchura striata*** Fl.sz. 4 - 10. On flood plains and forest clearings.	**300–800 m** (4) D,40,Hl,30	**1050–1280 m** (3-4) V,G	
1975.	SPOTTED MUNIA ***Lonchura punctulata*** Fl.sz. : about 8 birds. In tall grass and bushes by the road next to a marshy area.	....	**1280 m** (1) V	
1977.	BLACKHEADED MUNIA ***Lonchura malacca*** HBk : Recorded from the plains only? Fl.sz. : about 8. With the previous species.	....	**1280 m** (1) V	⇧
	Family : *Fringillidae*			
2015.	NEPAL ROSEFINCH ***Carpodacus nipalensis*** HBk : above 2700 m (rarely 1400 m). 2 males feeding on banks of Bulbulia stream.	**700 m** (1) B	....	⇩
2034.	SCARLET FINCH ***Haematospiza sipahi*** Solitary. A ♀ calling from a bare tree; about 30 m off the ground.	**550 m** (1) 20	....	⇓
	Family : *Emberizidae*			
2056.	LITTLE BUNTING ***Emberiza pusilla*** Solitary. On bushes by the path in the village.	....	**1100 m** (1) G	

Uncertain Identifications

No.	Species	Jan - Feb '97	October '96	
	EGRET Fl.sz. : about 10. On short trees in the midst of the Gandhigram marsh.	....	**1100 m** (1) G	
658.	HIMALAYAN BROWN WOOD OWL ***Strix leptogrammica*** Solitary. In mixed bamboo forest next to a ravine. Perched under an overhang of bamboo by the road at dusk.	**400 m** (1) Hl	....	
670/5	JUNGLE/LONGTAILED NIGHTJAR ***Caprimulgus indicus macrurus*** Solitary. Flying over the river at dusk in the rain.	**450 m** (1) N	....	
1079.	BLACKHEADED CUCKOO-SHRIKE ***Coracina melanoptera*** Solitary. In scrub at Vijoynagar.	....	**1250 m** (1) V	$\mathcal{F}$
1169.	SLATYHEADED SCIMITAR BABBLER ***Pomatorhinus schisticeps*** Pair. On two consecutive days at dusk at the same place. In tangled shrubbery next to the nullah. Very noisy.	**580 m** (2) Hn	....	
1410.	FERRUGINOUS FLYCATCHER ***Muscicapa ferruginea*** Solitary. In scrub at the margin of the flood plain.	**330 m** (1) D	....	
1440.	BLUETHROATED FLYCATCHER ***Muscicapa rubeculoides*** Fleeting glimpse of a miniature Rufousbellied Niltava (# 1432); edge of a clearing.	**400 m** (1) Hl	....	

Checklist of Birds of Namdapha Tiger Reserve

This list has been collated from the bird records of Per Alstrom *et al.* [6] (during February, 1994; list supplied by Pratap Singh), Pratap Singh (1988 – 1994; from Singh 1995), Vidya R. Athreya (winter of 1994 - 95; from Athreya and Johnsingh 1995) and from this survey. Bird species recorded in only one of the above lists have the observer's initials against them.

The list of Per Alstrom *et al.* and that from this survey are somewhat complementary as evidenced by the large number of species seen only by one or the other — this is because they covered the 10th Mile area which I had to skip, but they did not visit the Rani jheel - Namdapha river - 40th Mile areas where I spent a considerable fraction of my time.

Family : *Phalacrocoracidae*

26. CORMORANT *Phalacrocorax carbo* ....

Family : *Ardeidae*

33. GREAT WHITEBELLIED HERON *Ardea insignis* ....
38. LITTLE GREEN HERON *Ardeola striatus* ....
42. POND HERON *Ardeola grayii* .... PA
49. LITTLE EGRET *Egretta garzetta* .... PA
46. LARGE EGRET *Ardea alba* .... PA

Family : *Ciconiidae*

65. BLACK STORK *Ciconia nigra* ....

Family : *Anatidae*

90. RUDDY SHELDUCK *Tadorna ferruginea* .... PA
116. WHITEWINGED WOOD DUCK *Cairina scutulata* .... RMA
121. COMMON MERGANSER *Mergus merganser* ....

Family : *Accipitridae*

124. BLACKWINGED KITE *Elanus caeruleus* .... PA
144. CRESTED GOSHAWK *Accipiter trivirgatus* .... RMA
148. SPARROW-HAWK *Accipiter nisus* .... RMA
158. HODGSON'S HAWK-EAGLE *Spizaetus nipalensis* ....
165. RUFOUSBELLIED HAWK-EAGLE *Hieraaetus kienerii* ....
172. BLACK EAGLE *Ictinaetus malayensis* ....
172a. WHITETAILED EAGLE *Haliaeetus albicilla* ....
177. HIMALAYAN GREYHEADED FISHING EAGLE *Ichthyophaga nana* ....
195. SHORT-TOED EAGLE *Circaetus gallicus* .... RMA
196. CRESTED SERPENT EAGLE *Spilornis cheela* ....

Family : *Pandionidae*

203. OSPREY *Pandion haliaetus* .... RMA

Family : *Falconidae*

205. WHITELEGGED FALCONET *Microhierax melanoleucos* ....
209. PEREGRINE FALCON *Falco peregrinus peregrinator* .... RMA
213. HOBBY *Falco subbuteo* .... PA
223. KESTREL *Falco tinnunculus* ....

Family : *Phasianidae*

268. COMMON HILL PARTRIDGE *Arborophila torqueola* .... RMA
272. WHITECHEEKED HILL PARTRIDGE *Arborophila atrogularis* .... RMA
296. KALIJ PHEASANT *Lophura leucomelana lathami* ....
300. RED JUNGLEFOWL *Gallus gallus* .... RMA

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309. PEACOCK-PHEASANT *Polyplectron bicalcaratum* ....

Family : *Charadriidae*

364. THE LAPWING *Vanellus vanellus* .... PA
368. REDWATTLED LAPWING *Vanellus indicus* ....
369. SPURWINGED LAPWING *Vanellus spinosus* ....
373. EASTERN GOLDEN PLOVER *Pluvialis dominica* .... RMA
380. LITTLE RINGED PLOVER *Charadrius dubius* .... PA
396. GREENSHANK *Tringa nebularia* ....
397. GREEN SANDPIPER *Tringa ochropus* ....
401. COMMON SANDPIPER *Tringa hypoleucos* ....
406. PINTAIL SNIPE *Gallinago stenura* .... PA
409. FANTAIL SNIPE *Gallinago gallinago* .... PA
417. TEMMINCK'S STINT *Calidris temminckii* .... PA

Family : *Rostratulidae*

429. PAINTED SNIPE *Rostratula benghalensis* .... RMA

Family : *Recurvirostridae*

433. IBISBILL *Ibidorhyncha struthersii* ....

Family : *Glareolidae*

444. SMALL INDIAN PRATINCOLE *Glareola lactea* .... PA

Family : *Laridae*

453. GREAT BLACKHEADED GULL *Larus ichthyaetus* .... PA

Family : *Columbidae*

493. PINTAILED GREEN PIGEON *Treron apicauda* ....
494. WEDGETAILED GREEN PIGEON *Treron sphenura* ....
499. GREYFRONTED GREEN PIGEON *Treron pompadora* ....
510. IMPERIAL PIGEON *Ducula badia* ....
517. BLUE ROCK PIGEON *Columba livia* ....
523. ASHY WOOD PIGEON *Columba pulchricollis* .... RMA
526. BARTAILED CUCKOO-DOVE *Macropygia unchall* ....
532. RUFOUS TURTLE-DOVE *Streptopelia orientalis* .... RMA
537. SPOTTED DOVE *Streptopelia chinensis* ....
542. EMERALD DOVE *Chalcophaps indica* ....

Family : *Psittacidae*

559. EASTERN BLOSSOMHEADED PARAKEET *Psittacula roseata* .... RMA

Family : *Cuculidae*

573. COMMON HAWK-CUCKOO *Cuculus varius* .... RMA
585. RUFOUSBELLIED PLAINTIVE CUCKOO *Cacomantis merulinus* .... PA
591. KOEL *Eudynamys scolopacea* .... PA
594. LARGE GREENBILLED MALKOHA *Rhopodytes tristis* .... PA
601. COUCAL *Centropus sinensis* ....
605. LESSER COUCAL *Centropus toulou* ....

Family : *Strigidae*

612. SPOTTED SCOPS OWL *Otus spilocephalus* ....
616. SCOPS OWL *Otus sunia* .... PA
624. COLLARED SCOPS OWL *Otus bakkamoena* .... PA/PS
635. COLLARED PYGMY OWLET *Glaucidium brodiei* ....
640. JUNGLE OWLET *Glaucidium radiatum* ....
641. BARRED OWLET *Glaucidium cuculoides* ....
662. TAWNY WOOD OWL *Strix aluco* .... RMA

Family : *Caprimulgidae*

668. GREAT EARED NIGHTJAR *Eurostopodus macrotis* .... RMA

Family : *Apodidae*

683. HIMALAYAN SWIFTLET *Collocalia brevirostris* ....
708. PALM SWIFT *Cypsiurus parvus* .... PA

Family : *Trogonidae*

713. REDHEADED TROGON *Harpactes erythrocephalus* ....

Family : *Alcedinidae*

718. PIED KINGFISHER *Ceryle lugubris* ....
719. LESSER PIED KINGFISHER *Ceryle rudis* .... RMA
721. BLYTH'S KINGFISHER *Alcedo hercules* ....
723. COMMON KINGFISHER *Alcedo atthis* ....
730. STORKBILLED KINGFISHER *Pelargopsis capensis* .... VRA
737. WHITEBREASTED KINGFISHER *Halcyon smyrnensis* .... RMA

Family : *Apodidae*

753. BLUEBEARDED BEE-EATER *Nyctyornis athertoni* ....

Family : *Coraciidae*

757. INDIAN ROLLER *Coracias benghalensis* ....
758. BROADBILLED ROLLER *Eurystomus orientalis* .... VRA

Family : *Upupidae*

766. HOOPOE *Upupa epops* ....

Family : *Bucerotidae*

770. WHITETHROATED BROWN HORNBILL *Ptilolaemus tickelli* ....
771. RUFOUSNECKED HORNBILL *Aceros nipalensis* ....
772. WREATHED HORNBILL *Rhyticeros undulatus* ....
776. GREAT PIED HORNBILL *Buceros bicornis* ....

Family : *Capitonidae*

778. GREAT HILL BARBET *Megalaima virens* ....
784. LINEATED BARBET *Megalaima lineata* .... PA/PS
787. GOLDENTHROATED BARBET *Megalaima franklinii* .... RMA
788. BLUETHROATED BARBET *Megalaima asiatica* ....

Family : *Picidae*

798. SPECKLED PICULET *Picumnus innominatus* ....
801. RUFOUS PICULET *Sasia ochracea* ....
803. RUFOUS WOODPECKER *Micropternus brachyurus* ....
810. BLACKNAPED GREEN WOODPECKER *Picus canus* .... RMA
813. LARGE YELLOWNAPED WOODPECKER *Picus flavinucha* ....
815. SMALL YELLOWNAPED WOODPECKER *Picus chlorolophus* ....
827. PALEHEADED WOODPECKER *Gecinulus grantia* ....
829. HIMALAYAN GREAT SLATY WOODPECKER *Mulleripicus pulverulentus* ..... PA
845. FULVOUSBREASTED WOODPECKER *Picoidesmacei* ....
857. REDEARED BAY WOODPECKER *Blythipicus pyrrhotis* ....

Family : *Eurylaimidae*

864. HODGSON'S BROADBILL *Serilophus lunatus* ....
865. LONGTAILED BROADBILL *Psarisomus dalhousiae* ....

Family : *Pittidae*

866. BLUENAPED PITTA *Pitta nipalensis* ....

Family : *Alaudidae*

873. BUSH LARK *Mirafra assamica* .... PA
891. SAND LARK *Calandrella raytal* .... PA
907. EASTERN SKYLARK *Alauda gulgula* .... PA

Family : *Hirundinidae*

912. PLAIN SAND MARTIN *Riparia paludicola* ....
917. SWALLOW *Hirundo rustica* ....
925. REDRUMPED SWALLOW *Hirundo daurica* .... PA
932. NEPAL HOUSE MARTIN *Delichon nipalensis* .... RMA

Family : *Laniidae*

945. GREYBACKED SHRIKE *Lanius tephronotus* ....

948. RUFOUSBACKED SHRIKE *Lanius schachtricolor* ....
949. BROWN SHRIKE *Lanius cristatus* ....

Family : *Oriolidae*

958. BLACKHEADED ORIOLE *Oriolus xanthornus* ....
961. MAROON ORIOLE *Oriolus traillii* ....

Family : *Dicruridae*

962. BLACK DRONGO *Dicrurus adsimilis* .... PA
966. GREY DRONGO *Dicrurus leucophaeus* ....
971. BRONZED DRONGO *Dicrurus aeneus* ....
972. LESSER RACKET-TAILED DRONGO *Dicrurus remifer* ....
973. HAIRCRESTED DRONGO *Dicrurus hottentottus* ....
976. GREATER RACKET-TAILED DRONGO *Dicrurus paradiseus* ....

Family : *Sturnidae*

987. GREYHEADED MYNA *Sturnus malabaricus* .... PA
1006. COMMON MYNA *Acridotheres tristis* ....
1011. JUNGLE MYNA *Acridotheres fuscus* ....
1015. HILL MYNA *Gracula religiosa* ....

Family : *Corvidae*

1023. GREEN MAGPIE *Cissa chinensis* ....
1035. BLACKBROWED TREE PIE *Dendrocitta frontalis* ....
1038. HIMALAYAN TREE PIE *Dendrocitta formosae* ....
1055. JUNGLE CROW *Corvus macrorhynchos* ....

Family : *Campephagidae*

1064. PIED FLYCATCHER-SHRIKE *Hemipus picatus capitalis* ....
1067. LARGE WOOD-SHRIKE *Tephrodornis (virgatus) gularis* ....
1070. COMMON WOOD-SHRIKE *Tephrodornis pondicerianus* .... PA
1073. LARGE CUCKOO-SHRIKE *Coracina novaehollandiae* ....
1077. SMALLER GREY CUCKOO-SHRIKE *Coracina melaschistos* ....
1084. SHORTBILLED MINIVET *Pericrocotus brevirostris* ....
1082. SCARLET MINIVET *Pericrocotus flammeus* ....
1088. YELLOWTHROATED MINIVET *Pericrocotus solaris* ....

Family : *Irenidae*

1098. COMMON IORA *Aegithina tiphia* ....
1106. ORANGEBELLIED CHLOROPSIS *Chloropsis hardwickii* ....
1108. GOLDMANTLED CHLOROPSIS *Chloropsis cochinchinensis* ....
1109. FAIRY BLUEBIRD *Irena puella* ....

Family : *Pycnonotidae*

1115. BLACKHEADED YELLOW BULBUL *Pycnonotus melanicterus* ....
1121a. REDWHISKERED BULBUL *Pycnonotus jocosus* ....
1131. REDVENTED BULBUL *Pycnonotus cafer* ....
1140. WHITETHROATED BULBUL *Criniger flaveolus* ....
1146. RUFOUSBELLIED BULBUL *Hysipetes mcclellandi* ....
1147. BROWNEARED BULBUL *Hypsipetes flavalus* ....
1151. BLACK BULBUL *Hypsipetes madagascariensis* ....

Family : *Muscicapidae*

Subfamily : *Timaliinae*

1156. SPOTTED BABBLER *Pellorneum ruficeps* .... RMA
1166. TICKELL'S BABBLER *Trichastoma tickelli* .... PA
1185. LARGE SCIMITAR-BABBLER *Pomatorhinus hypoleucos* ....
1187. CORALBILLED SCIMITAR-BABBLER *Pomatorhinus ferruginosus* .... RMA
1190. LLOYD'S SCIMITAR-BABBLER *Pomatorhinus ochraceiceps* .... RMA
1192. SLENDERBILLED SCIMITAR-BABBLER *Xiphirhynchus superciliaris* .... PA
1194. SHORTTAILED WREN-BABBLER *Napothera brevicaudata* ....
1196. SMALL WREN-BABBLER *Napothera epilepidota* ....
1199. LESSER SCALYBREASTED WREN-BABBLER *Pnoepyga pusilla* ....

1206. SPOTTED WREN-BABBLER *Spelaeornis formosus* .... PA/PS
1208. WEDGEBILLED WREN *Sphenocichla humei* .... RMA
1209. REDFRONTED BABBLER *Stachyris rufifrons* .... PA
1212. GOLDHEADED BABBLER *Stachyris chrysaea* ....
1217. BLACKTHROATED BABBLER *Stachyris nigriceps* ....
1218. AUSTEN'S SPOTTED BABBLER *Stachyris oglei* ....
1228. YELLOWBREASTED BABBLER *Macronous gularis* ....
1242. ORANGE PARROTBILL *Paradoxornis nipalensis* .... RMA
1246. LESSER REDHEADED PARROTBILL *Paradoxornis atrosuperciliaris* ....
1248. GREATER REDHEADED PARROTBILL *Paradoxornis ruficeps* ....
1250. GREYHEADED PARROTBILL *Paradoxornis gularis* ....
1256. STRIATED BABBLER *Turdoides earlei* .... RMA
1276. NECKLACED LAUGHING THRUSH *Garrulax monilegerus* ....
1278. BLACKGORGETED LAUGHING THRUSH *Garrulax pectoralis* ....
1284. WHITECRESTED LAUGHING THRUSH *Garrulax leucolophus* ....
1286. YELLOWTHROATED LAUGHING THRUSH *Garrulax galbanus* .... VRA
1288. YELLOWBREASTED LAUGHING THRUSH *Garrulax delesserti gularis* ....
1296. RUFOUSCHINNED LAUGHING THRUSH *Garrulax rufogularis* .... RMA
1303. RUFOUSNECKED LAUGHING THRUSH *Garrulax ruficollis* ....
1319. BLUEWINGED LAUGHING THRUSH *Garrulax squamatus* ....
1334. SILVEREARED MESIA *Leiothrix argentauris* ....
1336. REDBILLED LEIOTHRIX *Leiothrix lutea* .... RMA
1341. REDWINGED SHRIKE-BABBLER *Pteruthius flaviscapis* ....
1343. GREEN SHRIKE-BABBLER *Pteruthius xanthochlorus* .... RMA
1345. CHESTNUT-THROATED SHRIKE-BABBLER *Pteruthius melanotis* ....
1347. WHITEHEADED SHRIKE-BABBLER *Gampsorhynchus rufulus* ....
1350. SPECTACLED BARWING *Actinodura egertoni* ....
1357. REDTAILED MINLA *Minla ignotincta* ....
1362. BLUEWINGED SIVA *Minla cyanouroptera* ....
1364. WHITEBROWED YUHINA *Yuhina castaniceps* ....
1366. WHITENAPED YUHINA *Yuhina bakeri* ....
1370. YELLOWNAPED YUHINA *Yuhina flavicollis* ....
1374. BLACKCHINNED YUHINA *Yuhina nigrimenta* ....
1375. WHITEBELLIED YUHINA *Yuhina xantholeuca* ....
1378. YELLOWTHROATED TIT-BABBLER *Alcippe cinerea* .... RMA
1379. CHESTNUTHEADED TIT-BABBLER *Alcippe castaneceps* ....
1387. REDTHROATED TIT-BABBLER *Alcippe rufogularis* ....
1393. NEPAL BABBLER *Alcippe nipalensis* ....
1395. CHESTNUTBACKED SIBIA *Heterophasia annectens* ....
1398. BLACKCAPPED SIBIA *Heterophasia capistrata* .... PA
1400. BEAUTIFUL SIBIA *Heterophasia pulchella* ....
1401. LONGTAILED SIBIA *Heterophasia picaoides* ....

Subfamily : *Muscicapinae*

1412. REDBREASTED FLYCATCHER *Muscicapa parva* .... PA
1414. ORANGEGORGETED FLYCATCHER *Muscicapa strophiata* ....
1417. RUFOUSBREASTED BLUE FLYCATCHER *Muscicapa hyperythra* ....
1420. LITTLE PIED FLYCATCHER *Muscicapa westermanni* .... PA
1422. WHITEBROWED BLUE FLYCATCHER *Muscicapa superciliaris* .... PA
1423. SLATY-BLUE FLYCATCHER *Muscicapa leucomelanura* .... PA
1426. SAPPHIRE FLYCATCHER *Muscicapa sapphira* .... PA
1428. LARGE NILTAVA *Muscicapa grandis* ....
1430. SMALL NILTAVA *Muscicapa macgrigoriae* ....
1432. RUFOUSBELLIED NILTAVA *Muscicapa sundara* ....
1439. PALE BLUE FLYCATCHER *Muscicapa unicolor* ....
1447. PYGMY BLUE FLYCATCHER *Muscicapa thalassina* ....
1448. GREYHEADED FLYCATCHER *Culicicapa ceylonensis* ....
1450. YELLOWBELLIED FANTAIL FLYCATCHER *Rhipidura hypoxantha* ....
1456. WHITETHROATED FANTAIL FLYCATCHER *Rhipidura albicollis* ....

Subfamily : *Sylviinae*

1471. DULL SLATYBELLIED GROUND WARBLER *Tesia cyaniventer* .... PS

1472. SLATYBELLIED GROUND WARBLER *Tesia olivea* ....

1473. CHESTNUT HEADED GROUND WARBLER *Tesia castaneocoronata* ....

1525. YELLOWBELLIED WREN-WARBLER *Prinia flaviventris* .... RMA

1530. BLACKTHROATED WREN-WARBLER *Prinia atrogularis* .... RMA

1537. COMMON TAILOR BIRD *Orthotomus sutorius* ....

1541. GOLDENHEADED TAILOR BIRD *Orthotomus cucullatus* ....

1548. STRIATED MARSH WARBLER *Megalurus palustris* ....

1591. YELLOWBROWED LEAF WARBLER *Phylloscopus inornatus* .... PA

1596. PALLAS' LEAF WARBLER *Phylloscopus proregulus* .... PA/PS

1599. GREYFACED LEAF WARBLER *Phylloscopus maculipennis* ....

1601. LARGEBILLED LEAF WARBLER *Phylloscopus magnirostris* .... PA/PS

1609. BLYTHE'S LEAF WARBLER *Phylloscopus reguloides* ....

1612. BLACKBROWED LEAF WARBLER *Phylloscopus cantator* .... PA

1613. ALLIED FLYCATCHER-WARBLER *Seicercus affinus* ....

1615. BLACKBROWED FLYCATCHER-WARBLER *Seicercus burkii* ....

1619. GREYHEADED FLYCATCHER-WARBLER *Seicercus xanthoschistos* ....

1620. GREYCHEEKED FLYCATCHER-WARBLER *Seicercus poliogenys* ....

1621. CHESTNUT-HEADED FLYCATCHER-WARBLER *Seicercus castaniceps* ....

1623. YELLOWBELLIED FLYCATCHER-WARBLER *Abroscopus superciliaris* ....

1626. WHITETHROATED FLYCATCHER-WARBLER *Abroscopus albogularis* ....

1627. BROADBILLED FLYCATCHER-WARBLER *Abroscopus hodgsoni* .... PA

Subfamily : *Turdinae*

1636. RUSTYBELLIED SHORTWING *Brachypteryx hyperythra* .... RMA

1639. LESSER SHORTWING *Brachypteryx leucophrys* .... RMA

1640. WHITEBROWED SHORTWING *Brachypteryx montana* .... RMA

1655. ORANGEFLANKED BUSH ROBIN *Erithacus cyanurus* ....

1660. RUFOUSBELLIED BUSH ROBIN *Erithacus hyperythrus* .... RMA

1663. MAGPIE-ROBIN *Copsychus saularis* ....

1674. HODGSON'S REDSTART *Phoenicurus hodgsoni* .... RMA

1677. DAURIAN REDSTART *Phoenicurus auroreus* ....

1679. PLUMBEOUS REDSTART *Rhyacornis fuliinosus* ....

1681. WHITETAILED BLUE ROBIN *Cinclidium leucurum* ....

1682. BLUEFRONTED ROBIN *Cinclidium frontale* .... RMA

1684. LITTLE FORKTAIL *Enicurus scouleri* ....

1686. SLATYBACKED FORKTAIL *Enicurus schistaceus* ....

1687. LESCHENAULT'S FORKTAIL *Enicurus leschenaulti* ....

1689. SPOTTED FORKTAIL *Enicurus maculatus* ....

1691. GREEN COCHOA *Cochoa viridis* .... RMA

1696. STONE CHAT *Saxicola torquata* ....

1705. DARK GREY BUSH CHAT *Saxicola ferrea* .... RMA

1716. WHITECAPPED REDSTART *Chaimarrornis leucocephalus* ....

1724. CHESTNUTBELLIED ROCK THRUSH *Monticola rufiventris* ....

1726. BLUE ROCK THRUSH *Monticola solitarius* ....

1729. HIMALAYAN WHISTLING THRUSH *Myiophonus caeruleus* ....

1739. PLAINBACKED MOUNTAIN THRUSH *Zoothera mollissima* ....

1740. LONGTAILED MOUNTAIN THRUSH *Zoothera dixoni* .... RMA

1741. GOLDEN MOUNTAIN THRUSH *Zoothera dauma* ....

1746. LESSER BROWN THRUSH *Zoothera marinata* .... RMA

1747. BLACKBREASTED THRUSH *Turdus dissimilis* .... RMA

1750. GREYWINGED BLACKBIRD *Turdus boulboul* .... RMA

1758. GREYHEADED THRUSH *Turdus rubrocanus* .... VRA

1764. REDTHROATED THRUSH *Turdus ruficollis* .... VRA

Family : *Cinclidae*

1776. BROWN DIPPER *Cinclus pallasii* ....

Family : *Paridae*

1789. SULTAN TIT *Melanochlora sultanea* ....

1799. GREENBACKED TIT *Parus monticolus* .... RMA

1812a BLACKSPOTTED YELLOW TIT *Parus spilonotus* .... RMA

1819. REDHEADED TIT *Aegithalos concinnus* .... PA

Family : *Sittidae*

1829. CHESTNUTBELLIED NUTHATCH *Sitta castanea* ....
1837. BEAUTIFUL NUTHATCH *Sitta formosa* ....
1838. VELVETFRONTED NUTHATCH *Sitta frontalis* .... PA/PS

Family : *Motacillidae*

1853. INDIAN TREE PIPIT *Anthus hodgsoni* ....
1859. PADDYFIELD PIPIT *Anthus rufulus* .... PA
1865. VINACEOUSBREASTED PIPIT *Anthus roseatus* .... PA
1884. GREY WAGTAIL *Motacilla cinerea* ....
1885,7 WHITE WAGTAIL *Motacilla alba* ....

Family : *Dicaeidae*

1896. YELLOWBELLIED FLOWERPECKER *Dicaeum melanoxanthum* .... PA
1905. FIREBREASTED FLOWERPECKER *Dicaeum ignipectus* .... RMA

Family : *Nectariniidae*

1926. BLACKBREASTED SUNBIRD *Aethopyga saturata* ....
1932. STREAKED SPIDERHUNTER *Arachnothera magna* ....

Family : *Zosteropidae*

1933. INDIAN WHITE-EYE *Zosterops palpebrosa* .... PA

Family : *Ploceidae*

1938. HOUSE SPARROW *Passer domesticus* .... PA
1944. TREE SPARROW *Passer montanus* ....
1967. WHITEBACKED MUNIA *Lonchura striata* ....
1975. SPOTTED MUNIA *Lonchura punctulata* .... RMA
1977. BLACKHEADED MUNIA *Lonchura malacca* .... RMA

Family : *Fringillidae*

2015. NEPAL ROSEFINCH *Carpodacus nipalensis* .... RMA
2034. SCARLET FINCH *Haematospiza sipahi* .... RMA

Family : *Emberizidae*

2056. LITTLE BUNTING *Emberiza pusilla* ....

Appendix B

Snakes of Namdapha Tiger Reserve

— Ramana M. Athreya & Ashok S. Captain

The species were identified with the key provided in *The Fauna of British India on Reptilia and Amphibia, Vol. III* [7] by M. A. Smith. An effort has been made to provide the latest nomenclature. The nomenclature (both latin and english) and the sequence follows the most recent (only ?) checklist of Indian snakes given in *Common Indian Snakes — A Field Guide* [8] by Romulus Whitaker. In cases where the name differs from that used by Smith, the Smith name has been given within parenthesis. Two snakes have not been listed in the checklist in *Common Indian Snakes* :- *Lycodon laoensis*, which is a recent addition to the Indian list, and *Ptyas korros*, possibly an oversight.

We have listed under each species their identifying features (used by us), the location of the sighting and, if different, their previously known distribution as listed in Smith. Subsequent works have, no doubt, resulted in the revision (i.e. extension) of the ranges of some species; they are, however, widely scattered in herpetological journals and not easily available. We regret that we are unable to cite the latest information on the distributions. However, considering the general paucity of information, particularly on north-east Indian snakes, we doubt if many of the distributions have been drastically revised. A detailed description of characteristics has been provided only for snakes seen in the wild. The characteristics of the Miao museum specimens are listed only in case of variations from the norm listed in Smith. Photographs of 9 species of snakes seen in in the wild are included in this report to facilitate identification.

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1. LARGE WORM SNAKE ***Typhlops diardi*** (Miao museum)

2. ***Lycodon laoensis*** (Miao museum)

   Scales in 17:17:15 rows, smooth and with an apical pit; Ventrals 197; Anal divided; Caudals 70, paired; loreal long, not touching the eye or the internasals; 1 preocular, reaching the top of the head and touching the frontal; 2 postoculars; 2+2(or 3) temporals; 9 supralabials —3rd, 4th and 5th touching the eye; 9 or 10 infralabials.

   Only one other specimen known from India (recently collected by ZSI from Namdapha).

3. KHASI KEELBACK ***Amphiesma (= Natrix) khasiensis*** (Gandhigram, Vijoynagar - 3 specimens) (Photograph enclosed)

   Scales 19:19:17, keeled, except for the outer row which is very faintly keeled; Ventrals 145, 146 and 143 (3 specimens); Anal divided; Caudals >65, >40, 99; internasals truncate anteriorly; 1 loreal, squarish; 2 preoculars; 3 postoculars; 1+2 temporals; 9 supralabials, 4th, 5th and 6th touching the eye; 10 infralabials.

   The identification of this species involved considerable confusion due to its similarity with *Natrix modesta*. A substantial fraction of the tails of two of the snakes was missing and the caudal count is one of the main distinguishing feature between the two species. The caudal count of the snake with the complete tail matches that of *N. khasiensis*. While the colour pattern of the snakes suited the description of *N. khasiensis* better, the presence of 3 postoculars put them among *N. modesta* (*N. khasiensis* is supposed to have 1 or 2 postoculars according to Smith). The matter was finally settled by examining the museum specimens at BNHS. It turned out that all the specimens of *N. khasiensis*, including the co-types collected by Col. Wall had either 2 postoculars (2 specimens) or 3 postoculars (11 specimens) and matched the colours of the snakes that we had seen in the field. The "1 or 2 postoculars" of *N. khasiensis* in Smith should actually be "2 or 3 postoculars". There were, however, no specimens of *N. modesta* in the BNHS collection for comparison.

   Previously reported only from Meghalaya (Khasi hills) and Myanmar. One of the snakes was seen with a small frog in its mouth along the PWD IB fence during the forenoon.

4. HIMALAYAN KEELBACK ***Rhabdophis (= Natrix) himalayana*** (Gandhigram) (Photograph enclosed)

   Scales 17:19:17; Ventrals 165; Anal divided; Caudals 83, paired; internasals truncate anteriorly; 1 loreal; 1 preocular; 3 postoculars; 2+2 temporals; 8 supralabials — 4th and 5th touching the eye; 10 infralabials; Nuchal groove present with the scales bordering it narrower than the surrounding ones.

   An extremely docile snake.

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[7] First Edition, 1943; Taylor and Francis Ltd. Reprint, 1981; Today and Tomorrow's Printers and Publishers, New Delhi.
[8] First Edition, 1978; Macmillan India Ltd.

5. CHECKERED KEELBACK WATER-SNAKE ***Xenochrophis* (= *Natrix*) *piscator*** (G.gram - 3, Embeong - 1 specimens)

Scales 19:19:17; Ventrals 153; Anal divided; Caudals 81, paired; internasals pointed anteriorly; 1 loreal; 1 preocular reaching the top of the head; 3 postoculars; 2+3 temporals; 9 supralabials — 4th and 5th touching the eye; 10 infralabials.

One specimen at Gandhigram was moulting (Oct, 96). The Embeong snake was under a stone in water at the edge of the Namdapha river (Jan, 1997).

6. ASSAM TRINKET SNAKE ***Elaphe frenata*** (Gandhigram) (Photograph enclosed)

Scales 19:19:17 rows, feebly keeled; Ventrals 194, with lateral keels; Anal divided; Caudals 122, paired; No loreal; 1 preocular; 2 postoculars; 2+2 temporals; 9 supralabials — 4th, 5th and 6th touching the eye; 10 infralabials; Snout projecting; Pupil round. The black streak through the eye and the absence of the loreal distinguish it from the very similar *Elaphe prasina*.

A rare snake; reported only from Meghalaya. The ventral count of this specimen is outside the range (201–235) listed in Smith.

7. COPPERHEAD TRINKET SNAKE ***Elaphe radiata*** (Miao museum - 2 specimens)

8. STRIPED TRINKET SNAKE ***Elaphe taeniura*** (Gandhigram) (Photograph enclosed)

Scales 23:23:19, not keeled; Ventrals 261; Anal divided; Caudals 90, paired; 1 loreal; 2 preoculars; 2 postoculars; 2+2 temporals; 8 supralabials — 4th and 5th touching the eye; 11 infralabials; The specimen measured over 2.1m in length.

The snake was found on top of a small tree.

9. BLACKBANDED TRINKET SNAKE ***Elaphe porphyracea porphyracea*** (Miao museum)

Known to occur in Abor hills of Arunachal and in the Sadiya area.

10. INDO-CHINESE RAT SNAKE ***Ptyas korros*** (Miao museum)

The specimen had only 1 loreal.

11. STRIPEDNECK SNAKE ***Liopeltis frenatus*** (Deban - 5 specimens) (Photograph enclosed)

Scales 15:15:15; Ventrals 156, 163, 165, 152 and 151 (5 specimens); Anal divided; Caudals 101, 90, 99, 97 and 100; 1 preocular; 2 postoculars; 1+2 temporals; 7 supralabials — 3rd and 4th touching the eye, 6th largest; 8 infralabials.

Saw 5 young snakes ($<$ 300 mm), collected by some Lisus near Deban in a bamboo container. They had come across the bunch at the base of a bamboo clump.

12. MOCK VIPER ***Psammodynastes pulverulentus*** (Gandhigram) (Photograph enclosed)

Scales 17:17:15; 2 preoculars; 3 postoculars; 2+3 temporals; pupil vertical; head markings distinctive (see figure in Smith).

The snake was rather ready with its strike and bit a steel spoon on which some fluid dribbled on to the spoon. The snake resembles the vipers and the cat snakes (genus *Boiga*).

13. SHORTNOSED VINE SNAKE ***Dryophis prasinus*** (Miao museum - 3 specimens)

14. LARGESPOTTED CAT SNAKE ***Boiga multimaculatus*** (Miao museum - 3 specimens)

Smith reports this only from Sylhet (Bangladesh) in the Indian subcontinent.

15. BLACK KRAIT ***Bungarus niger*** (Miao museum)

The caudal count of 57 of this specimen is marginally outside the range of 49-56 listed in Smith. Very pale specimen (due to formalin, perhaps?).

16. MACCLELLAND'S CORAL SNAKE ***Callophis macclellandi*** (Miao museum)

17. MONOCELLATE COBRA ***Naja (naja) kaouthia*** (Miao museum)

18. MOUNTAIN PIT VIPER ***Trimeresurus monticola*** (Gandhigram and Miao museum) (Photograph enclosed)

Scales 23-25 at mid-body; internasals separated by 1 scale; large supraoculars, with 8-9 scales on a line between them; subocular broken up into smaller shields. First labial completely separated from the nasal.

Flattening its thick body against the ground when disturbed and occasionally strikes.

19. STEJNEGER'S/POPE GREEN PIT VIPER ***Trimeresurus stejnegeri/popeorum*** (Gandhigram) (Photograph enclosed)

A dead and mutilated juvenile identified from its colour; difficult to distinguish between the two species in the absence of a whole specimen. The smooth shields (as against keeled) in the temporal region points to *T. stejnegeri*. We could not count the number of ventral and caudal scales.

20. JERDON'S PIT VIPER ***Trimeresurus jerdoni*** (Vijoynagar) (Photograph enclosed)

Scales 21:21:19; Ventrals 182; Anal single; Caudals 72, paired; nasal distinct from 1st supralabial; 7 (or 8) supralabials, 2nd fused with the anterior pit shield; 1 large scale between supraocular and internasal; large internasals separated by 2 small scales; supraoculars large, separated by 7 small scales, the central 3 of which are larger; 1 long subocular, flush against the supralabials; temporals larger than the surrounding scales.

The snake was not in the least bit aggressive despite prolonged handling.

Appendix C

Butterflies of Namdapha Tiger Reserve

— Vidya R. Athreya & Ramana M. Athreya

The species were identified using *Butterflies of the Indian Region* [9] by M. A. Wynter-Blythe and *The Butterflies of Sikkim* [10] by Meena Haribal. The nomenclature and sequence of listing follows Haribal; where different, names from Wynter-Blythe are also given in parenthesis with an '=' sign. The names of butterflies not described by Haribal are from Wynter-Blythe. The list includes species seen by us during this survey (October, 1996) and by one of us (VRA) during an earlier visit (October, 1994, to April, 1995). The letter codes against the species are :

$\mathcal{F}$: This may be the first record for Arunachal Pradesh.
$\mathcal{R}$: Listed as rare by Wynter-Blythe (1957).
$\mathcal{V}+$: Species seen in 1994 – 95 and 1996.
$\mathcal{V}$: Species seen in 1994 – 95 only.

Family : *Papilionidae*
Sub family : *Papilioninae*

1. BROWN GORGON ***Meandrusa gyas*** .... $\mathcal{R}$
2. COMMON BLUEBOTTLE ***Graphium sarpedon*** ....
3. GLASSY BLUEBOTTLE ***Graphium cloanthus*** ....
4. COMMON WINDMILL ***Atrophaneura polyeuctes (= Trosphiloxenus)*** .... $\mathcal{V}$
5. BIRDWING sp. ***Troides sp.*** .... $\mathcal{V}$
6. LIME BUTTERFLY ***Princeps (= Papilio) demoleus*** .... $\mathcal{V}$
7. SPANGLE ***Princeps (= Papilio) protenor*** ....
8. REDBREAST ***Princepsalcmenor (= Papilio rhetenor)*** ....
9. COMMON MORMON ***Princeps (= Papilio) memnon*** .... $\mathcal{V}+$
10. GREAT MORMON ***Princeps (= Papilio) polytes*** ....
11. RED HELEN ***Princeps (= Papilio) helenus*** .... $\mathcal{V}+$
12. GREEN DRAGONTAIL ***Lamproptera meges*** .... $\mathcal{F}$

Family : *Pieridae*
Sub family : *Pierninae*

13. SPOTTED SAWTOOTH ***Prioneris thestylis*** ....
14. CHOCOLATE ALBATROSS ***Appias lyncida*** .... $\mathcal{V}$
15. SPOT PUFFIN ***Appias lalage*** ....
16. LESSER GULL ***Cepora (= Huphina) nadina*** .... $\mathcal{V}$
17. GREAT WHITE ORANGETIP ***Hebomoia glaucippe*** .... $\mathcal{V}+$
18. HILL JEZEBEL ***Delias belladonna*** ....

Family : *Lycaenidae*
Sub family : *Curetinae*

19. TOOTHED SUNBEAM ***Curetis dentata*** ....
20. BI-SPOT ROYAL ***Ancema (= Pratapa) ctesia*** ....

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[9] First Edition, 1957; Bombay Natural History Society. Reprint, 1982; Today and Tomorrow's Printers and Publishers.
[10] First Edition, 1992; Sikkim Nature Conservation Foundation, Gangtok.

Sub family : *Theclinae*

21. BLUE TIT *Chliaria kina* ...
22. ORCHID TIT *Chliaria othona* ... $\mathcal{V}$

Sub family : *Lycaeninae*

23. PURPLE SAPPHIRE *Heliophorus epicles* ... $\mathcal{V}+$
24. GREEN/POWDERY GREEN SAPPHIRE *Heliophorus androcles/tamu* ...

Sub family : *Polyommatinae*

25. TRANSPARENT 6-LINE BLUE *Nacaduba kurava* ...
26. COMMON LINE BLUE *Nacaduba nora* ...
27. ELBOWED PIERROT *Caleta* (= *Castalius*) *elna* ...
28. ASSAM PIERROT *Taracus* (*venosus*) *dharta* ... $\mathcal{V}$
29. PLAIN HEDGE BLUE *Celastrina* (= *Lycaenopsis*) *lavendularis* ...
30. HILL HEDGE BLUE *Celastrina* (= *Lycaenopsis*) *argiolus* ...
31. COMMON HEDGE BLUE *Acetolepis* (= *Lycaenopsis*) *puspa* ...

Sub family : *Riodininae*

32. PUNCHINELLO *Zemeros flegyas* ... $\mathcal{V}$
33. DARK JUDY *Abisara fylla* ... $\mathcal{V}$

Family : *Nymphalidae*

Sub family : *Amathusiinae*

34. COMMON FAUN *Faunis canens* ...
35. MANIPUR JUNGLE QUEEN *Stichopthalma sparta* ... $\mathcal{R}$
36. CHOCOLATE JUNGLE QUEEN *Stichopthalma nourmahal* ... $\mathcal{R}$, $\mathcal{F}$
37. JUNGLE GLORY *Thaumantis diores* ... $\mathcal{V}$

Sub family : *Satyrinae*

38. DARK EVENING BROWN *Melanitis phedima* ... $\mathcal{V}$
39. BRANDED EVENING BROWN *Cyllogenes suradeva* ... $\mathcal{R}$, $\mathcal{F}$
40. COMMON WOODBROWN *Lethe sidonis* ...
41. TAILED LABYRINTH *Neope* (= *Lethe*) *badra* ... $\mathcal{R}$, $\mathcal{F}$
42. HIMALAYAN FIVE-RING *Ypthima sakra* ...

Sub family : *Charaxinae*

43. TAWNY RAJAH *Charaxes polyxena* ... $\mathcal{V}$
44. YELLOW RAJAH *Charaxes marmax* ...
45. COMMON NAWAB *Polyura* (= *Eriboea*) *athamas* ...

Sub family : *Apaturinae*

46. PURPLE EMPEROR *Apatura ambica* ... $\mathcal{V}$
47. BLACK PRINCE *Rohana* (= *Apatura*) *parisatis* ... $\mathcal{V}$
48. EASTERN COURTIER *Sephisa chandra* ...
49. COURTESAN *Euripus halitherses* ... $\mathcal{V}$
50. CIRCE *Hestina nama* ... $\mathcal{V}+$
51. POPINJAY *Stibochiona nicea* ... $\mathcal{V}+$

Sub family : *Nymphalinae*

52. YELLOW KAISER *Penthema lisarda* ... $\mathcal{V}$ $\mathcal{R}$
53. TABBY *Pseudergolis wedah* ... $\mathcal{V}+$
54. COMMON CASTOR *Ergolis merione* ... $\mathcal{V}$
55. LARGE YEOMAN *Cirrochroa aoris* ...
56. INDIAN FRITILLARY *Argyreus* (= *Argynnis*) *hyperbius* ...
57. YELLOW PANSY *Precis hierta* ... $\mathcal{V}+$
58. BLUE PANSY *Precis orithiyia* ... $\mathcal{V}$
59. LEMON PANSY *Precis lemonias* ... $\mathcal{V}$
60. PEACOCK PANSY *Precis almana* ... $\mathcal{V}$

61. GREY PANSY *Precis atlites* ....

62. CHOCOLATE PANSY *Precis iphita* .... $\mathcal{V}+$

63. COMMON JESTER *Symbrenthia lilaea (= hippoclus)* ....

64. BLUETAILED JESTER *Symbrenthia niphanda* .... $\mathcal{V}$ $\mathcal{R}$

65. ORANGE OAKLEAF *Kallima inachus* .... $\mathcal{V}$

66. COMMON MAP *Cyrestis thyodamas* .... $\mathcal{V}+$

67. MAPLET *Chersonesia sp.* .... $\mathcal{V}+$

68. BLACKVEIN SEARGENT *Parathyma (= Pantoporia) ranga* .... $\mathcal{V}$

69. SMALL STAFF SEARGENT *Parathyma (= Pantoporia) zeroca* .... $\mathcal{V}$ $\mathcal{R}$

70. COMMANDER *Moduza (= Limenitis) procris* .... $\mathcal{V}$

71. COMMODORE *Limenitis danaya* .... $\mathcal{V}$ $\mathcal{R}$

72. GREEN COMMODORE *Limenitis daraxa* ....

Sub family : ***Heliconiinae***

73. CRUISER *Vindula (= Cynthia) erota* ....

74. LEOPARD LACEWING *Cethosia cyane* ....

75. RED LACEWING *Cethosia biblis* .... $\mathcal{V}+$

Sub family : ***Danainae***

76. COMMON TIGER *Danaus genutia (= Danais plexippus)* ....

77. STRIPED BLUE CROW *Euploea mulciber* ....

78. MAGPIE CROW *Euploea radmanthus (= diocletiana)* .... $\mathcal{V}$

Family : ***Hesperiidae***

Sub family : ***Coeliadinae***

79. COMMON BANDED AWL *Hasora alexis* ....

80. COMMON AWL *Hasora badra* ....

Sub family : ***Pyrginae***

81. TRICOLOUR PIED FLAT *Coladenia indranee* .... $\mathcal{V}$

Sub family : ***Hesperiinae***

82. GRASS DEMON *Udaspes folus* ....

83. COMMON REDEYE *Matapa aria* ....

Appendix D

Miscellaneous Fauna of Namdapha Tiger Reserve

— Ashok S. Captain, Vidya R. Athreya & Ramana M. Athreya

We concentrated on birds, reptiles and butterflies during the survey. Other animals recorded during the survey are listed below.

The mammal records are from the January, 1997, visit (Ramana M. Athreya) and the winter of 1994 - 95 (Vidya R. Athreya, during the clouded leopard survey). The names are from *The Book of Indian Animals* [11] by S. H. Prater.

Amphibians and invertebrates were identified by Ashok S. Captain during the October visit and during another visit in March, 1997. Few of the invertebrates were identified even to the genus level. The names used here may not conform to the latest standard.

- **Mammals**
  1. HOOLOCK GIBBON ***Hylobates hoolock*** ... common in Haldibari – Hornbill area; very vocal.
  2. RHESUS MACACQUE ***Macaca mulatta***
  3. ASSAMESE MACACQUE ***Macaca assamensis***
  4. STUMPTAILED MACACQUE ***Macaca speciosa***
  5. PIGTAILED MACACQUE ***Macaca nemestrina***
  6. CAPPED LANGUR ***Presbytis pileatus***
  7. TIGER ***Panthera tigris***
  8. LEOPARD CAT ***Felis bengalensis***
  9. LARGE INDIAN CIVET ***Viverra zibetha***
  10. SMALL INDIAN CIVET ***Viverricula indica***
  11. HIMALAYAN PALM CIVET ***Paguma larvata***
  12. BINTURONG ***Arctictis binturong***
  13. CRAB-EATING MONGOOSE ***Herpestes urva***
  14. WHITE-TAILED MOLE ***Talpa sp.***
  15. GIANT FLYING SQUIRREL ... common at Hornbill camp, Bulbulia watch-tower and Deban.
  16. MALAYAN GIANT SQUIRREL ***Ratufa bicolor***
  17. ORANGEBELLIED HIMALAYAN SQUIRREL ***Dremomys lokriah***
  18. HOARYBELLIED HIMALAYAN SQUIRREL ***Callosciurus pygerythrus***
  19. HIMALAYAN STRIPED PALM SQUIRREL ***Callosciurus macclellandi***
  20. INDIAN ELEPHANT ***Elephas maximus***
  21. SAMBAR DEER ***Cervus unicolor***
  22. BARKING DEER ***Muntiacus muntjak***
  23. WILD PIG ***Sus scrofa***

  We also came across tracks of WILD DOGS (*Cuon alpinus*) and GAUR (*Bos gaurus*) and PORCUPINE (*Hystrix/Atherurus sp.*) quills.

- **Amphibians**
  1. ***Rhacophorus (maximus ?)***
  2. ***Bufo melanostictus***

[11] 3rd Edition, 1971; Bombay Natural History Society and Oxford University Press, New Delhi.

- **Arthropods** [12]
  1. RED TREE ANT Family : ***Formicidae***; ***Oecophylla*** (***smaradgina*** ?)
  2. GROUND BEETLE Family : ***Carabidae***
  3. NETWINGED BEETLE Family : ***Lycidae***
  4. STEM-BORER (LONGHORNED) BEETLE Family : ***Cerambycidae***
  5. ASSASSIN BUGS Family : ***Reduviidae***
  6. PENTATOMID BUG Family : ***Pentatomidae***
  7. WATER MEASURER BUG Genus : ***Hydrometra***
  8. CICADAS Family : ***Cicadidae***
  9. CRANE FLIES Family : ***Tipulidae***
  10. MOLE CRICKET Family : ***Gryllotalpidae***; Genus : ***Gryllotalpa***
  11. DRAGONFLIES and DAMSELFLIES Order : ***Odonata***
  12. EARWIGS Family : ***Forficulidae***
  13. GADFLY Family : ***Tabanidae***; Genus : ***Pangonia***
  14. LANTERN FLIES Family : ***Fulgoridae*** ... A few ***Pyrops candelaria*** and hundreds of another species
  15. LONGHORNED GRASSHOPPERS Family : ***Tettigoniidae***
  16. PLANT HOPPER Family : ***Fulgoridae*** ... one belonged to Genus : ***Aphana***
  17. MAYFLY Order : ***Ephemeroptera***
  18. PRAYING MANTIDS Family : ***Mantidae***; Genus : ***Creobroter***
  19. SCALE INSECT Order : ***Hemiptera***
  20. WEEVIL Family : ***Curculionidae***

  21. SOIL CENTIPEDE Order : ***Geophilomorpha***
  22. STONE CENTIPEDE Order : ***Lithobiomorpha***
  23. CENTIPEDE Order : ***Scolopendromorpha***
  24. LONGLEGGED CENTIPEDE Order : ***Scutigeromorpha***

  25. PILL MILLIPEDE Order : ***Glomerida***
  26. FLAT MILLIPEDE Order : ***Platydesmida***

  27. HARVESTMAN Order : ***Opilones***
  28. SCORPION Order : ***Scorpionida***
  29. SCHIZOMID Order : ***Schizomida*** ... Rare
  30. SPIDERS Order : ***Araneae***
- **Leeches**
- **Slug**

[12] Plural english names indicate more than one species.

Appendix E

Planning a Visit to Namdapha Tiger Reserve

- **Getting There**

  One has to pass through either Miao or Vijoynagar to reach Namdapha Tiger Reserve. The Miao route is the usual one for visitors. Visiting Vijoynagar area requires special permits and visits other than for research purposes are not encouraged.

  Guwahati, in Assam, is the gateway to north-eastern India. It is connected to other Indian cities by air, rail and road services. Private buses are the most popular means of transport in the north-east and Guwahati is the hub of the bus network. A host of bus operators have their counters on the street immediately behind the main railway station. Advance booking is not essential but is advisable during winter (tourist season); booking 2 – 6 hours in advance is usually sufficient. Several direct buses operate between Guwahati and Itanagar, the capital of Arunachal Pradesh. The road from Guwahati to Miao passes through Dibrugarh, Tinsukia, Margherita and Jagun. Many buses ply between Guwahati and all places up to Jagun. Dibrugarh and Tinsukia are also on the rail map. Dibrugarh has a civilian airport but very few flights visit the town. Jagun is a small Assamese village 36 km from Miao. Overnight buses also ply between Itanagar and Jagun. All buses to Jagun from Guwahati and Itanagar start between 3 and 5 P.M. Buses ply between Miao and Jagun every 3 – 4 hours. Private taxis can also be hired at Jagun. The return journey from Jagun to Guwahati (all buses start around 3 P.M.) may be booked in advance at Jagun.

  The tourist complex within the reserve at Deban is 26 km from Miao on the Miao – Vijoynagar road. The journey may be made on foot or by vehicle. Four-wheel drive vehicles are sometimes essential to ford a couple of soft patches after heavy rains.

  Vijoynagar is located beyond the south-eastern boundary of the Reserve. It may be reached either by walking the 130 km across the sanctuary from Miao or by flying in on an air sortie. The Arunachal Pradesh government operates about 10 helicopter sorties every month between Mohanbari in Assam and Vijoynagar. Mohanbari is located about 10 km from Dibrugarh, off the Dibrugarh – Tinsukia highway. These sorties operate only during fair weather; no flights are possible for weeks on end during the monsoon. The sortie has a limited carrying capacity; only about 5 passengers and 20 kg of baggage per passenger are allowed on every flight. An application for excess baggage has to be submitted at least a couple of days in advance. A seat on the sortie requires authorisation from the District Commissioner, Changlang. The permission of the Circle Officer, Vijoynagar, is also required for the return flight. The flight takes about an hour each way. The sortie leaves Mohanbari in the morning and returns immediately (the halt is often as little as a couple of minutes) after offloading at Vijoynagar. The final decision to fly a sortie is taken only a few hours before the flight after confirming clear weather at Vijoynagar. Consequently, one may have to wait many days to catch a flight. On the way back from Vijoynagar, we wasted 4 days waiting for the sortie — we couldn't even move anywhere in the surrounding forests as we had to be in the vicinity of the airfield till 9 A.M. every day to see if there would be a flight that day.

- **Permits**

  Inner Line Permits are essential for entering Arunachal Pradesh for all Indians from outside the north-eastern states. Provisional ILPs may be obtained from New Delhi (Office of the Resident Commissioner, Arunachal Pradesh Bhavan, Chanakya Puri, Kautilya Marg, New Delhi : 110 021. Phone : 301 3915) and Guwahati (Office of the Deputy Resident Commissioner, Government of

Arunachal Pradesh, R. G. Baruah Road, Guwahati : 781 021. Phone : 62859). These permits are issued for one or two weeks. Their validity may be extended by The Sub-Divisional Officer, Miao Sub-Division, Miao, Changlang District, Arunachal Pradesh or by The Under Secretary (Political), Home and Political Department, Government of Arunachal Pradesh, State Secretariat, Itanagar : 791 111. It would greatly help if the application for extension of ILP is forwarded through the Forest Department. Recently instituted rules require proof of nationality and residence (photocopy of passport/ration card/voter's ID etc), 3 photographs and a day's processing (at least) before ILPs are issued. Postal applications are also processed. The applications have to be on the standard form which may be obtained from any of the above offices by post. A convenient way of obtaining an ILP is to send the application by post and personally collect it during the few hours' stay at Guwahati.

Foreign nationals need permits from the Union Ministry of Home affairs in New Delhi. Only a few places in Arunachal are open to foreign nationals; Namdapha is one of them. Permits are issued to groups of not less than 4 people who have to go through registered tour operators. The permit costs $55 (US) plus expenses per day (or $150 inclusive of all expenses). The exact procedure and details for visiting Arunachal Pradesh may be obtained from The Ministry of Home Affairs (Foreigners' Division), Lok Nayak Bhavan, Khan Market, New Delhi.

Forest Permits are required for visiting Namdapha TR. Routine tourist permits are issued by the Office of the Field Director, Namdapha Tiger Reserve, Miao. The office of the Principal Chief Conservator of Forests is located in Itanagar. The Chief Conservator of Forests (Wildlife), whose office is in the same building (Office of the Principal Chief Conservator of Forests, Forest Department, Govt. of Arunachal Pradesh, Itanagar : 791 111) has to clear all research projects, including short surveys like this one, long term research projects or ones with special requirements, i.e. anything other than routine tourist visits.

- **Season**

  The Reserve is open to visitors all through the year but most of the area is inaccessible during the rainy season (April – September). The flooded Noa Dihing isolates Deban from the bulk of the tourism zone which lies on the opposite bank. Dense vegetation and slush on the MV road hinder movement along it. Furthermore, most animals stick to cover during the heavy rains. Nevertheless some groups of animals may be observed only during the rains. A visit during winter (October – March) is favoured by most tourists; the weather is relatively dry and mammals and birds are sighted more often; November is probably the best month for birds and mammals. April is the best time for cold blooded animals - the days are warm, the paths still open and the worst of rains yet to come; however, floods as a result of depression over the area can leave one stranded on the wrong side of the river! October is also good for cold blooded animals, with rains on the wane, but the weather is colder than in April and the paths not yet cleared of vegetation after the monsoon.

- **Guides and Porters**

  Visitors to the interior localities in the tourist zone have to be accompanied by Forest Department staff. In addition, local guides and porters may be hired from the Chakma and Lama bastis (basti = village) and from among the Lisus (some of the Lisus spend the winter in Miao in a few houses near the Tourist Home). The Forest Department staff may be requested to assist in this matter.

- **Living in the Reserve**

  The main tourist complex within the Reserve is at Deban. The lodging facility consists of a Tourist Lodge (5 rooms), 4 transit lodges (1 room each) and a dormitory. The kitchen attached to the tourist lodge provides meals at standard rates on prior intimation. Solar cells provide light only at the tourist lodge for a few hours each night. The other regular lodge in the Reserve is the Inspection Bungalow at the 40th mile PWD camp. There are a half-a-dozen other shacks in the area in various stages of decrepitude. They provide basic shelter only — a roof, walls and rickety cots (in some). The structures are usually damp and require a bit of cleaning.

Habitable shacks also exist at Haldibari, Hornbill, 22nd mile and 27th mile. These shacks are located in clearings next to a stream. They can accommodate at least half-a-dozen people comfortably and more than a dozen at a pinch. Though rainproof, they allow free access to the wind and can get chilly at night. The Bulbulia watch-tower is also used for staying. The 34th mile camp is more a location than a structure. Temporary sheds are erected during winter to house PWD workers. Tents may also be pitched at all these places. There are no structures of any kind at Firmbase/Embeong and between 40th mile and Gandhigram. Camping in the forest can be uncomfortable — the ground is often soggy and infested with leeches. Sandy banks of rivers make for good camp sites.

Staying at the PWD IBs in Gandhigram and Vijoynagar requires the permission of the Circle Officer at Vijoynagar. Rooms at the Tourist Home, Miao, may be booked through the Office of the Field Director.

Provisions and utensils have to be carried to all places beyond Deban. Visitors and locals normally use the dead wood lying about for fuel. None of the camps, except Deban and the 40th mile IB, have permanent residents even during the winter months.

- **Equipment**

Apart from the usual equipment required during a visit to a forest, the wet conditions at Namdapha necessitate the following, particularly during visits of a few weeks or longer :

Leech socks : Socks of tightly woven cotton or synthetic fabric which reach above the the calves and worn over the regular socks and trouser legs to keep out the hordes of leeches which stalk every square inch of Namdapha. They are available with the tailors on the Miao market lane and are locally called 'joke moja'.

Plastic fly sheet : A large plastic sheet (3×4 m) with a couple of end-poles is more convenient for camping out than a conventional tent. The accumulation of water vapour breathed out while sleeping and the high external humidity results in heavy sweating on the inside of the tent walls and on many metal surfaces. Keeping camera equipment, binoculars, books and sleeping bag dry requires good ventilation, low density of people per fly sheet and constant care. Packing a conventional tent in wet weather is another disadvantage. A large plastic sheet has the added advantage that it can be spread over the gaps in the walls at Hornbill, Haldibari, etc.

Plastic bags : For keeping clothes, books, cameras etc. dry. Every item has to be tightly wrapped in an individual bag (or two) and religiously packed away when not being used.

The cold and humid conditions, frequent rains, the short duration of direct Sun and lack of drying space at campsites in the interior result in an abundance of wet clothes, wet equipment and damp morale. Fungi are an ever present threat to costly equipment. Unless adequately stocked with sufficient waterproofing, one can end up spending a large fraction of the time cleaning and drying the equipment. This is something that long term visitors and researchers have to take into account to improve efficiency.

This would not affect visitors who stick to the immediate vicinity of Deban or stay only a few days though adequate rain gear would help.

- **Market**

It is recommended that all equipment (particularly electronic, optical, camping, special wear and such other) be brought in from outside the north-east states. While some of these may be available in Guwahati and other major towns, they may prove expensive in terms of time, money and effort ... and it is not worth risking non-availability.

Much of the shopping is likely to be done in Guwahati and Miao. The articles available in these two places include food, utensils, plastic ware, ropes (NOT for tree climbing!), essential stationery, torches, dry cells, toiletries, linen, general medicine (for common problems), plastic sheets and bags for waterproofing, warm clothing etc. In short, most essentials for tiding over an emergency are available.

Miao should be the final stop for all purchases. There is a small shop at Deban which stocks essential provisions like rice, pulses, salt etc and a snack item or two ... but is not to be depended on. There is a similar shop in Vijoynagar which is even less dependable than the one at Deban, which in fact, is its nearest neighbour (separated by all of 100 km and 7 days, at least)! Availability of stock in Vijoynagar is dependent on the air-sortie and hence on the vagaries of weather. We landed at Vijoynagar during a period of rice and salt shortage and scraped through on the hospitality of our Lisu friends. Furthermore, commercial freight costs Rs.15/- per kg on the sortie and prices in Vijoynagar are often marked up by 30 – 200 %.

A few fresh vegetables may be bought at the Chakma and Lama bastis near Deban and at Vijoynagar and Gandhigram. Knowledgeable tribals can procure from the forest several edible green vegetables and conjure up delicious chutneys from tender bamboo and cane, banana pith and sour plants rich in vitamin C! These plants are usually found near abandoned sites of habitation.

There are several emporia in the vicinity of the Guwahati railway station which sell the traditional handicrafts and textiles of the tribes of all the north-eastern states. There is also a museum and an Arunachal Pradesh handicraft emporium in Itanagar. The museum is well maintained and very informative with the exhibits covering a wide range including history, traditions and the lifestyle of the numerous tribes of Arunachal Pradesh. Many publications on these topics are available for sale.

- **Services**

  Miao provides most essential services including a market, hospital and drug store, post office, telephone (including direct international dialing), police, cars for hire etc.

- **Expenses**

  The bus journey between Guwahati and Jagun is about Rs. 200 each way. The Jagun – Miao trip costs very little. Jeeps and cars charge about Rs. 8 per km. The air-sortie between Vijoynagar and Mohanbari costs about Rs. 700.

  The Tourist Lodge at Deban costs about Rs. 50 per person per day; the dormitory costs much less. Lodging in the camps in the interiors is free. The Tourist Lodge charges Rs. 10 per breakfast and Rs. 18 each for lunch and dinner. The basic food in the interior costs about Rs. 20 per day per person.

  The fee for the forest guard accompanying visitors into the forest is Rs. 55 per day. Local porters and guides charge between Rs. 50 and Rs. 100 per day (driven by market forces!) and carry about 20 kg in addition to their own provisions and belongings. In addition to these, one has to pay entrance and camera fees at the Mpen check-post while entering the Reserve.

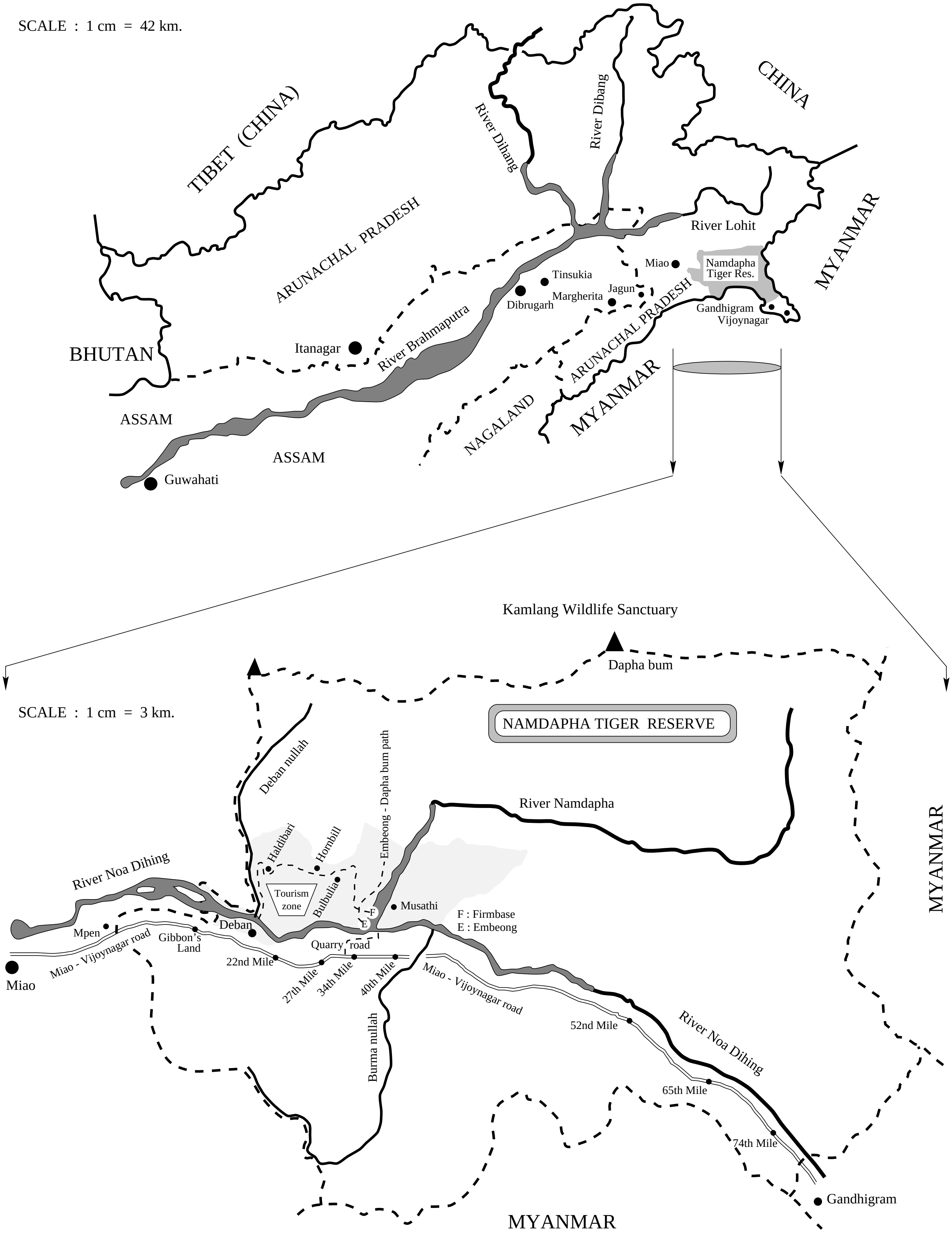

Figure 2: Namdapha Tiger Reserve (Adapted from maps provided by the Forest Department).