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THE THREATENED TERAI

by Asad R. Rahmani and Qamar Qureshi

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Fire protection measures were first introduced in the terai by the British in 1874. Nevertheless, fire still remains a prime hazard, taking a terrible toll of wild habitats and wild animals, such as this ground dwelling turtle (above, inset) which succumbed to a blaze. The author believes that the granting of tree and grass patta rights, and not land titles to communities instead of individuals, who live in forested belts would provide communities with an incentive to resist poachers, fight forest fires and generally live in harmony with their environment. The practice of using naturally grown trees to make charcoal (bottom, inset) is a major cause for forest destruction in the terai and indeed throughout India.

Qamar Quereshi

Asad R. Rahmani

*A flat, alluvial, often marshy, strip of land, the terai is a biologically rich region which is home to some of the subcontinent's most exciting and threatened fauna and flora. The Indian rhinoceros (**above right**) is one among many 'indicator' species whose presence suggests that the terai grasslands are healthy. The terai is a genetic store-house for many species of plants, such as the wild turmeric (**left**) whose colourful flowers dot the landscape. At a damp patch , a small party of Spot swordtail butterflies (**right**) suck in vital, dissolved, mineral salts from the soil.*

Asad R. Rahmani

That the forests of India are dying is common knowledge. Few, however, realise how badly our grasslands are doing. The terai, *situated just south of the massive Himalaya, harbours some of the finest Indian forests and grasslands. Tragically, the value of such habitats has not been half understood. When Nehru took charge of India over four decades ago, for instance, he saw the conversion of grasslands to agriculture as an ideal way of utilising 'wastelands'. To a degree such land use was inevitable, but the extent of conversion was so massive that the very viability of rain-fed India — its ability to sustain agriculture, for instance — is now in question. Grasses protect our soils and water systems in much the same way as do forests. Today both are in disarray. In spite of the benefit of hindsight, however, today's planners persist in their antiquated attitudes to the Earth's most vital resources.* Asad Rahmani *was till very recently the Principal Investigator of the* Bombay Natural History Society's Grassland Ecology Project. *He now works with the* Centre for Wildlife and Ornithology, *at the* Aligarh Muslim University. Qamar Qurieshi *works with the* Wildlife Institute of India, *Dehra Dun and has extensively studied the swamp deer and its habitat in Dudhwa. Both write of the tremendous worth of the* terai *through this overview of the Indian* terai. *They also urge that tree plantations in natural grassland, almost a national disease these days, is probably the worst way of promoting 'nature'. In the coming decade India will be forced to pay greater heed to the advice of such individuals. Today, politicians and bureaucrats who know virtually nothing of the processes of fragile habitats such as the* terai, *hold sway.*

A voyage of discovery

Our wait was over, but it was the longest forty minutes of our life! A black, largish form catapulted out of the tall grass and rose to a height of over four metres. As though in slow motion it then descended, seeming almost to float upon the air, to settle quite a distance away from its take off point. The display leap of the Bengal florican we had just seen ended our search for a second home of this endangered bird in Uttar Pradesh. In 1985 we had been successful in locating a healthy and stable population of floricans in the Dudwa National Park. Ever since, we have been on the lookout for another sighting elsewhere in the vicinity. Sections of the grasslands of the Kishanpur Wildlife Sanctuary, about 30 km southwest of Dudwa, seemed a perfect place to search. Yet, five hope-filled visits revealed not one florican! When last we combed the habitat in 1988, we had come to the conclusion that our next effort should be in the Madha grassland of Kishanpur. Three years later, on 2 May, 1991 to be precise, that is exactly where we found the bird.

In high spirits, early the next morning, together with Satish Kumar, a young research scholar who had only recently joined the Grassland Ecology Project of the BNHS, we returned to Madha. In short order we were again able to locate the male florican, a strongly territorial bird. As we intensified our search, nearby grasslands revealed the presence of another two birds. That made a count of three! Not bad going, considering the fact that the total world population was probably in the vicinity of 400! By any measure, the Grassland Ecology Project had gotten off to a terrific start.

At a time when so much effort is squandered in our country on account of a lack of coordination, or worse, petty jealousy, the Bombay Natural History Society (BNHS) and the Wildlife Institute of India (WII), through their joint surveys of the Indian *terai* have demonstrated the wisdom of cooperation. Our aims were similar, and so were our geographical areas of work. Joint surveys were, therefore, logical. Earlier, in 1988, along with Parikshit Goutam, now a research scholar of the WII, we had surveyed the *terai* and the Assam valley. The new survey brought us still closer and we made an excellent team. Unfortunately, Parikshit could not accompany us now as he was busy studying the bird life in the submergence zone of the Narmada Sagar Dam. Other than Satish and Salim Javed, research scholars of the Grassland Ecology Project who joined us for short periods, we were thus mostly on our own.

Political problems in Assam made field trips impractical. We decided, therefore, to concentrate on the grasslands of the north Indian *terai*. After one month of planning, and securing the requisite official permission, we set out on 23 March, 1991 from our base camp at Dudwa to survey the terai of Uttar Pradesh and Bihar.

Paradise lost

The *terai* is a flat, alluvial, often marshy, strip of land about 1,600 km long and 50 to 60 km wide. It lies between the Himalayan foothills and the Gangetic plain and in the Assam Valley. It extends through UP, Nepal, parts of Bihar, northern West Bengal and Assam. The soil of the *terai* is clayey, boulderless and has a high moisture content. The water table is high, and the rainfall varies from 1,000 mm in the west, to over 2,000 mm in the east. In some places,

extensive patches of elephant grass, interspersed with tracts of dense forest, dominated by sal *(Shorea robusta),* still exist.

In bygone days, the *terai* was largely inhabited by tribals called *Tharus.* A virulent form of malaria prevented colonisation of vast tracts of the land. The British loathed the area, despite the fact that the sal here was first grade and the grasslands provided the finest tiger hunting. Thus the *Tharus* (who had developed a rough immunity to malaria) and the wildlife, were left in relative peace. However, the discovery of DDT, which controlled malarial mosquitos, suddenly opened the *terai* to colonisation in the early 1950s. Within a decade, extensive tracts of virgin forests and grasslands were put to cultivation. Villages and small towns sprang up and sugarcane fields replaced natural grasslands. Soon, the *Tharus,* the original owners of the land, became landless labourers, victims of the wily farmers who usurped the land. Needless to add, most of the wildlife was devastated.

Amongst mammals and birds the swamp deer, Indian rhino, hispid hare, Bengal florican and swamp francolin can be considered as major 'indicator' species of the health of the *terai* grasslands. Except for the rhino, which became extinct a hundred years ago in UP (but was recently reintroduced in Dudwa), the rest of the above-mentioned species hang tenuously on to survival. We saw evidence of their presence in some of the areas we surveyed. Locating key species is one of the most effective ways to assess the condition of grasslands — their presence indicating health and their absence from areas in which they were once recorded suggesting decay. We also needed to make an inventory of existing grasslands, and to study the biotic pressures on them. To estimate the population and status of herbivores, we decided to conduct pellet counts in selected grasslands. All in all, field research is a painstaking affair, contrary to the image some young people have of it as a glamourised 'wildlife' adventure.

The swamp deer, locally called gond, has suffered greatly due to the agricultural expansion in the *terai.* In the early 1960s the UP forest department took half-hearted measures to protect the dwindling populations of this deer and four tiny sanctuaries were declared. Except for the Sonaripur Gond Sanctuary (39 sq km) which was later expanded and became the Dudwa National Park, the remaining three — Jaulasal (34 sq km) in the Haldwani Division, Maldhan (11.52 sq km) and Tanda (7.5 sq km) in the Tarai and Bhabar Divisions — were neglected. The swamp deer population disappeared. However, the deer managed to survive in parts of Pilibhit, Lakhimpur-Kheri and Bahraich.

We began our survey in the Pilibhit forests, which we had earlier visited in 1988. The North Pilibhit division consisting of Nainital and Pilibhit, now has an area of about 55,000 ha under forest cover. After the Nepali settlers were removed from Kumaon in 1815 by the Britishers, the Surai forest was taken over. In 1874 fire protection measures were started. In 1882, these forests were reserved for fuel and grazing and in 1899, declared as reserve forests. During the British period, much of the area was under private control. However, in 1952, private forests were nationalised. Expectedly there was considerable opposition and before the forest could be handed over to the government, the former owners clear-felled large tracts.

Water and wildlife

The Sharda Canal was constructed in 1928 and runs for hundreds of kilometres. At a point, 45 km from its start, it splits into the Hardoi and Kheri main branches. The Sharda Sagar reservoir was constructed between 1953 and 1957. Because of its canal system, nearly 3,500 ha in the Pilibhit forest were inundated by seepage. Sal trees worth crores were ruined, but nature makes the best of adversity and now the hispid hare, about 100 swamp deer and innumerable francolin have colonised the marshlands. Human disturbance makes the deer very difficult to see, nevertheless, during our four day stay, we spotted six of them. Swamp francolins were heard in seven areas and seen in one, and we also found characteristic faecal pellets of the elusive hispid hare.

As in so many other parts of the country, here too the wildlife department is under-staffed. In the entire Rohilkhand region (Barielly, Pilibhit, Shahjehanpur, Rampur and parts of Nainital) just 15 people are expected to cover a 21,364 sq km area. Since the finest, and also the most extensive, forests exist in Pilibhit district, 11 of the 15 guards and assistant guards are posted there, the remaining four in the Nainital range. No one mans Rampur and Shahjehanpur. As for transport, only the two assistant wildlife wardens have motorcycles, the guards use bicycles to patrol hundreds of sq km. Little wonder their morale is low. We were told that while the territorial staff gets official quarters, the wildlife staff rent their own houses; an impossible task on account of their unpopularity in the villages they

patrol. Hunters and poachers don't help. They add fuel to fire by rabble rousing among locals against the guards. Understandably, appropriate compromises with poachers results in a relatively hassle-free life for the wildlife staff, but certainly not to better wildlife protection.

The marshes of the Pilibhit forests are commercially exploited, and this greatly disturbs wildlife, especially when hundreds of people descend in crowds upon the wetlands to fish or to cut grass. We recorded major human disturbance in most of the marshes where we searched for swamp deer. This is not to say that the grass should not be harvested, merely that it should be sustainably extracted. *Narkul (Arundo donax)* and *patera (Typha elephantina)* are used by Bengali settlers to make up to 10 mats per family, per day. Once the grass is exhausted, the marshes are used for fishing. Wild animals get some respite only during the monsoon, when most of the marshes are unapproachable. However, to add to the animals woes, even the highlands where they move during severe flooding are being increasingly occupied by humans. The intricate relationship between natural vegetation and water systems has not been properly appreciated by our land managers. By supervising the demise of our forests, we are simultaneously causing our rivers, swamps and aquifers to shrivel.

Land use, or abuse?

Grasslands are called *chander* in Pilibhit. Both, natural and man-made grasslands exist here. The natural ones are present chiefly in the old river beds of the Mala and Chauka (Sharda) rivers. These are perfect for swamp deer, hog deer and swamp francolin. The man-made grasslands are found either in old abandoned settlements or in clear-felled areas. Generally on higher grounds, these suit the Bengal florican and hispid hare. We recorded the size, origin, floral composition and fauna of each *chander*. Some of these are quite large, up to 1,000 ha in extent. Tragically, most have been planted with eucalyptus, shishum, jamun and teak and whatever grasslands are left are either occupied by graziers in small settlements called *khutis* or *gaurhis*, or are being readied for future plantations. Either way, they are not going to remain suitable for the endangered grassland fauna of the *terai*.

According to a forester in compartment Bagha 54 in the Mahauf range, a 500 ha grassland was occupied by 500 families in 1976-77 under the *taungya* system under which, after clear-felling, the forest department leases the land to local people for agricultural use for two years. Earlier, this system was common, but has now virtually stopped. Agricultural activities make the soil suitable for tree planting. In the third year, trees are planted in wide rows and for another three years people are allowed to grow crops in the space between the rows. According to an agreement, they have to protect the trees and vacate the land once the trees become large and inhibit good growth of crops. The *taungya* system ensures that plantations are quite successful, compared to direct plantation in the *phantas* or *chanders*.

Taungya was common in Gorakhpur, Gonda and Bahraich, as labour was easily available. In other districts such as Pilibhit and Lakhimpur-Kheri, some of the *Tharu* villages were developed deep inside forest to get cheap labour for *taungya*. Today, in Bagha when the forest department asked farmers to vacate the land, they took the help of politicians and refused to move. Now the village, called Bagha 54, is actually in the possession of some retired military persons, reportedly through *benami* (false title) transactions. This illegal village in the middle of forest will be a major hurdle for the development of a national park which is being proposed for Pilibhit forest. Unable to solve the encroachment problem being sponsored by politicians, the *taungya* system, which once benefited both people and forests has now been stopped.

Asad Rahmani

Grass-cutting is a major commercial activity in the marshes of Pilibhit. Grass is widely used for fodder, thatch, rope and mat-making ***(above)*** *and once it is exhausted, the marshes are over-fished, thus disturbing the wildlife*

Lagga Bagga

One of the areas which we were very keen to visit was a small, 11 sq km, reserve forest adjoining the Sukla Phanta sanctuary of Nepal. Christened with the quaint name of Lagga-Bagga, we had toured the area in 1988 and found it important for all the endangered species which were the target of our current survey. Sukla-Phanta has the largest population of swamp deer in the world (1,200), and the largest population of Bengal florican in Nepal. Carol and Tim Inskipp of the International Council for Bird Preservation (ICBP), United Kingdom, in 1982 found 15 male floricans in the Sukla Phanta grasslands. In 1990, David Weaver, a British ornithologist, on a survey for the Oriental Bird Club, noted that the florican population is stable. As the grasslands of Sukla Phanta and Lagga-Bagga are more or less continuous, we are certain that this bird is present on the Indian side as well. After our 1988 visit, therefore, the first author submitted a proposal to the UP forest department to declare Lagga-Bagga a Bengal florican sanctuary. As of now we understand the proposal is under 'active consideration'.

Our visit to Lagga-Bagga on 25 March, 1991, however, was quite depressing. Since 1988, conditions had deteriorated considerably. If urgent measures are not immediately taken, it is likely we will completely lose this wonderful forest. We found large-scale encroachment and fresh ploughing in the grassland. Politicians, ever in search of cheap publicity at the cost of India, have promised villagers that they will regularise encroachments once they start cultivation. Thirty years ago, when the area had been declared a reserve forest, due to some administrative problems, several hundred acres were left which came under the *gram samaj*. As the area was remote and cut off by Sharda river for seven to eight months in a year, no one was willing to occupy the land. However, with the recent hunger for land, people are willing to colonize even flood-prone areas. This is tragic land management. It can only spell tragedy for man and animal.

As we traversed the survey area, we saw innumerable, small, flimsy grass huts. No one lived in these makeshift dwellings. But lopped trees were a com-

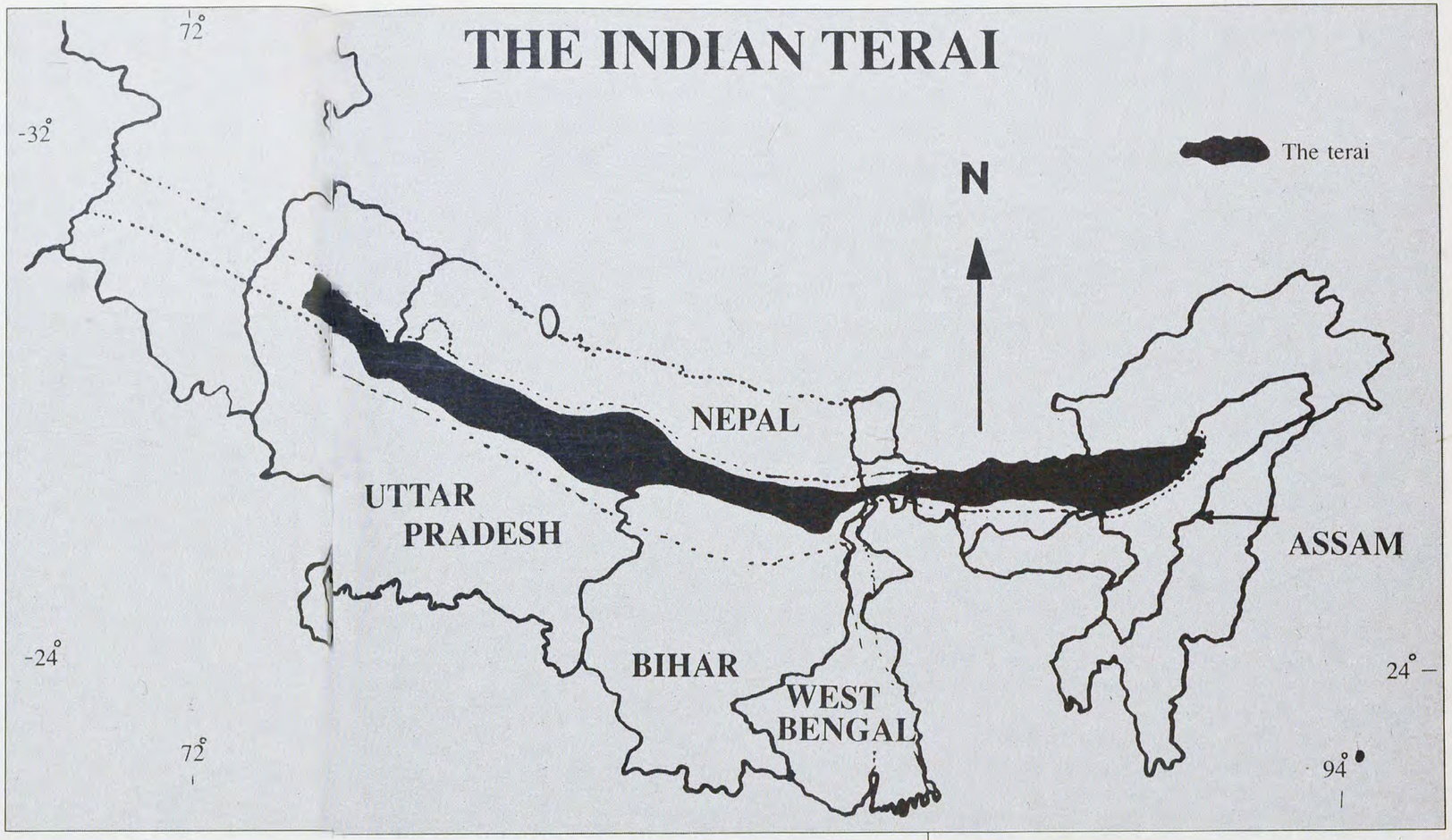
mon sight around these huts. The modus operandi seems simple. By giving Rs 500 to the *patwari* or *pradhan*, it is possible for people to get some land allotted to them. And when someone is apprehended for encroachment or tree cutting, the mere mention of a local politician's name prevents the authorities from taking action. Politicians, after all, have promised to distribute the land — 3.25 acres per family! We actually saw a village which had been established only last year, after it had been encroached.

Yet another problem in Lagga-Bagga is livestock grazing, the bane of all Indian forests. In winter, cowherds establish the small settlements, called *jhalas* or *gaurhis*. We were told that there are about 15 such settlements, with 500 buffaloes and 500-600 cows (underestimate?). Another problem which is becoming increasingly common is tree-cutting and poaching. People come from as far as 10 km and take away timber on bullock carts. Parties of up to 50 people with nets and guns in search of game are not uncommon. The wildlife guards blame Nepali poachers for decimating the wildlife of Lagga-Bagga. However, when we visited Sukla Phanta in Nepal a month later, wildlife authorities there blamed Indian poachers for killing *their* animals! Straddling an international border, the animals get a raw deal from both sides.

While surveying Lagga-Bagga, we came across a herd of 50-60 semi-feral cows which, instead of running away, formed a tight pack and were ready to attack us. The guard told us that these cows are quite dangerous and occasionally even trample a tiger or a man who approaches them very close. One of the guards picked up a stick and started making sounds like a cow-herd and skillfully manoeuvered the herd away from us. The cows seemed determined to attack us and a wrong step could have been dangerous! I doubt that either of us would have lived down the ignominy of being wounded by cows after a lifetime spent in wild places!

Katerniaghat

In the Bahraich district lies the Katerniaghat Wildlife Sanctuary. About 40 km by road from the eastern boundary of Dudwa, Katerniaghat has the potential to be declared a national park. Besides 414 sq km of good sal forest, a riverine sanctuary for gharial and dolphin on Girwa river, there is also an excellent wetland here in the Girija reservoir, where, during the mid-winter waterfowl count in 1986, we saw thousands of duck. The swamp deer is still found in small numbers in some of the marshlands, although it is extremely difficult to see. The Bengal florican has disappeared during the last 10 to 15 years. However, if the grasslands are protected and managed properly, we are sure it will reappear because Dudwa is not very far. Earlier, Dudwa and Katerniaghat were connected by a narrow corridor on the Indo-Nepal border but now this area is totally degraded and it is unlikely that larger mammals can freely move between these two protected areas. Nevertheless, the prize 'catch' of Katerniaghat is the appearance of rhino during the last two years. Three rhinos came from Thakurdwara in Nepal and after few months one female gave birth. They are living in a very difficult and unapproachable area, but Dr. S.P. Sinha of WII, who is monitoring the introduced rhino population of Dudwa, was able to see two as recently as March 1991.



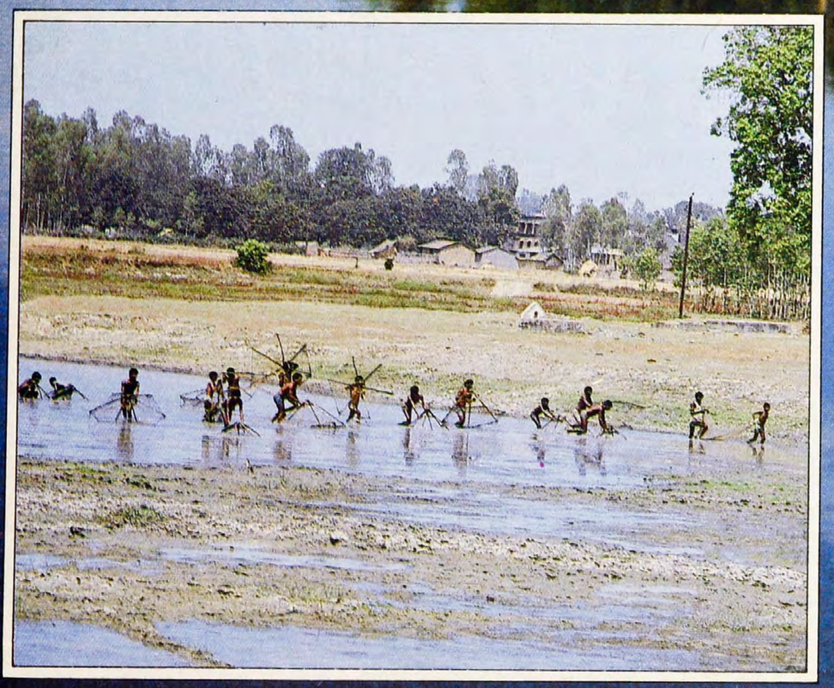
Despite biotic pressures like grazing and poaching Katerniaghat is rich in wildlife. Ironically, some species such as blackbuck survive only because livestock keep the vegetation low. We saw 40 of these antelopes, though the forest department estimates there are 80. The chital is abundant in the open woodland around Katerniaghat rest house. In an evening's drive we counted nearly 500. Nilgai, hog deer, sambar, barking deer, jackal, hare, tiger and leopard are also found. Except for tiger, however, no other species has been censused by the forest department. The many marshes, a large reservoir, a long meandering river, grasslands, open woodlands and dense forests provide ideal habitat for birds. In five visits, we recorded nearly 200 species in Katerniaghat. Swamp francolin, our target species, was very much present, along with grey and black francolins.

A major draw at Katerniaghat are the gharial, mugger and dolphins which swim the Girwa river. For the last 15 years fishing has been banned in Girwa as a measure of protection for gharial. Today, it is possible to see gharial of varying sizes and ages, indicating that the animals are breeding successfully. Sandy banks and islets provide ideal habitat for nesting. Such islets are also used for breeding by riverine birds such as river terns, small Indian pratincoles, little ringed plovers, Indian skimmers, spur-winged plovers and blackwinged stilts.

Katerniaghat reportedly suffers from poaching from across the adjoining border of Nepal. From our experience, however, such observations most often constitute excuses for administrative failures. Tree-cutting too is a problem, especially in the Charda and Chakkia ranges. And there are five villages inside the sanctuary. According to the management working plan, only 2,000 to 2,500 cattle should be allowed, but nearly ten times as many graze in Katerniaghat. To promote the return of natural vegetation, plantations were first stopped in Katerniaghat compartments One and Two, and then slowly in the entire sanctuary from 1989 onwards. Earlier, up to 500 ha were leased out to private parties under the *taungya* system.

The wildlife warden in Bahraich is of the opinion that Katerniaghat should be declared a tiger reserve. For this, nine villages will need to be relocated. Of these, four are revenue villages and five are forest villages. None have any timber or grazing rights. If the resettlement issue is handled sensitively, after taking people into confidence and ensuring that they participate in the preparation of alternative sites, there is no reason why it may not actually improve their condition. Today the grass is auctioned every year, but what required are clearly demarcated buffer and core areas, with planned exploitation of the buffer. Grass is a vital resource for people who require it for fodder, rope and mat making or for thatch. To protect grasslands and benefit people, India needs a clear cut policy on grassland management. Such a policy would need to be evolved together with the people so that it truly represents their interests and the long term interest of the habitat which supplies the resource for use of both humans and wildlife. At

Asad R. Rahmani



Asad R. Rahmani

Asad R. Rahmani

The Sharda canal, hundred of kilometres long, was constructed in 1928. Seepage led to massive damage of sal habitats, but nature converted adversity to advantage for some of its wards. Today, endangered species such as hispid hare and swamp deer (above, inset) have colonised the marshlands created by the introduction of water. Over-utilisation of the terai's productivity is now a cause for concern. Eventually it is, for instance, the fishermen (bottom, inset) who will suffer most if uncontrolled fishing in the wetlands continues unabated.

The U.P. Terai

According to the Forest Statistics of UP State, the *terai* is found in Pilibhit, Lakhimpur-Kheri, Bahraich, Gonda, Basti, Gorakhpur, Deoria, Rampur, Moradabad, Bijnor, Barielly and Saharanpur districts. However, in the last six districts, the *terai* forest has largely vanished. Presently, the extant *terai* forest is about 6,503 sq km, mainly in the Pilibhit, Lakhimpur-Kheri, Bahraich, Gonda and Gorakhpur districts.

The total forest area of UP is 51,266 sq km, of which the forest department controls 40,687 sq km. Most of this forest is either in the *terai* and Siwaliks, or in the southern regions bordering Madhya Pradesh. The central part of UP, also called the Gangetic Plain, is one of the most thickly populated regions in the world, with a history of human occupation going back to several thousand years. There are practically no natural forests left in this fertile plain. Apart from some wetlands such as Nawabganj in Unnao, Samaspur in Rai Bareli and Lakh-Bahosi in Farrukhabad districts, there is no wildlife refuge in the Gangetic Plain. However, the *terai* and *bhabar* can be seen in the famed Corbett and Dudhwa National Parks and the many declared Sanctuaries of which Katerniaghat, Kishanpur, Sohagi Barwa and Rajaji *(Sanctuary Volume XI. No. 3)* are some. The scope to add to this protected area network is great and areas such as Suhelwa in North Gonda and Lagga-Bagga in North Pilibhit, for instance, require urgent notification.

issue here is land. Would the declaration of land as a protected tiger reserve be in the national interest? Moreover, would such a declaration impinge on the rights of those who live in and around the forest? The first question is easily answered. Natural habitats, apart from conserving biological diversity, also help to harvest water. In the coming years such protected areas will be recognised for their value to the ecological food security of India and there is no question but that a tiger reserve would be in the national interest. To the second question, one of rights, the issue is more complicated. It is true that in the past neither the rights of people, nor their potential role in forest protection were properly recognised. Today, however, more and more foresters have begun to advocate the granting of tree and grass *patta* rights (not land titles) to communities (not individuals) who live in forested belts. This would create a vested interest in the survival of the forest and provide communities with an incentive to resist poachers, fight forest fires and generally live in harmony with their environment. After all, it is only through the survival of the forest that tribal people will be able to protect their culture and human rights. If social workers, who should know better, continue to champion the right of people, any people, to destroy the forest, they would be doing a disservice first to the tribals and also to the nation.

Suhelwa

From Katerniaghat we went further east to the North Gonda reserve forests. The proposed Suhelwa Wildlife Sanctuary here does not lie in the true *terai,* largely because much of the original *terai* has been appropriated by cultivation. As an old register kept in the ancient rest house revealed, Suhelwa was once an area rich in wildlife. Legal hunting of chital and nilgai was allowed till 1983 and some visitor had seen wild dogs, while the last of the blackbuck was

sighted by a DFO in March 1978. Most hunters had noted that the red jungle fowl, for which Suhelwa was renowned, has drastically decreased in number. Although we did not seen any, we did hear the bird on two occasions.

The proposed Suhelwa sanctuary is divided into four ranges: Suhelwa East, Suhelwa West, Bankatwa and Barha. Two wildlife guards are present in each range, along with the regular forest staff. Sal dominates the drier areas while *Syzygium cumuni* is found along the water-logged areas. Other important trees seen here were *Bombax ceiba, Acacia catechu and Terminalia tomentosa.* Teak and eucalyptus have been planted in the grasslands while lantana (called *bun-genda* locally) which invaded this forest a decade ago run amok today.

To exploit India's natural resources, the British had built rest-houses where the 'sahibs' could camp in comfort. The Suhelwa rest-house was built in 1882, and even today, with its thick walls and strategically placed windows, it remains cool inside during the scorching summer heat. Barely a couple of kilometres from the rest house, the *bund* of the Rampur Sarovar Irrigation Dam starts. Constructed in 1957 on the Madhaira *nala,* which comes from Nepal, the reservoir is used for irrigation and is virtually empty by December-January. Even after this, patches of water remain in the deeper spots for animals — both domestic and wild. As the water is used up, the resulting grassland is used by livestock. Crop fields start just below this dam on the southern side, while to the north lies the reserve forest. The dam serves to attract a large number of waterfowl in winter.

There are no extensive natural grasslands left in Suhelwa, most having been converted to cultivation. Gabhapur *phanta* in West Suhelwa too has suffered the same fate. We had visited the area in 1988, and again this year, but were unable to locate any florican or hispid hare. Moreover, livestock grazing we saw was rampant. While most of the *terai's* sanctuaries are like islands, lost in a sea of agriculture, Suhelwa is, fortunately, contiguous with other forests. Clear evidence of animal movement was visible to us. Most of the characteristic wildlife species of the *bhabar* grasslands are seen here, yet it appears the authorities have forgotten the sanctuary proposal. During our first visit in 1988, the local ranger had informed us that work on the proposal was progressing fast, there was no talk of the sanctuary when we returned in 1991. We can only hope that the Suhelwa sanctuary proposal will be revived and this excellent habitat will not go the way of the sanctuary in the Maharajganj district.

At one time, dense, contiguous *terai* forests existed in north Gorakhpur (recently separated as Maharajganj district). Only small patches now remain. Gorakhpur is one of the most populated districts of UP, with a human density of 605 per sq km, and a livestock density of 223 per sq km (1981 census). Ninety per cent of the population is rural and depends on agriculture. Due to scarcity of land, people often migrate to Bihar and other neighbouring states in search of work. The forest cover in this district is barely 8.7 per cent, mainly in the north, with only a small forest patch called Pakri surviving near the town of Gorakhpur.

Sohagi Barwa

In June 1987, the UP forest department declared the 428 sq km Sohagi Barwa Wildlife Sanctuary. There are many patches of grasslands, locally called *chaaphi* or *majhaar* but most have been planted with teak, shishum, and eucalyptus. Water-logging and uncontrolled fires have rendered most of the plantations unsuccessful, yet regular plantation work continues. Annual tree plantation targets are set for each district and each range, though enough land is not available for these bloated targets. A few years ago, UP had even earmarked a target of planting ten crore trees! Today, ironically, the only land available are the failed plantation lands, or grasslands. This has naturally increased the pressure on grasslands, which some forest officials even consider as blanks which should be put to better use, not quite understanding that grasslands are as important as forest. India can ill afford such warped priorities.

We surveyed Sohagi Barwa in 1985, 1988 and 1991 and every visit saw an increasing extent of natural grasslands coming under plantations. We found that the adjoining Compartments, numbers 16 of Nagwa and 31 of Sunari in Madhauli range had a contiguous grassland of about 262 ha and which was ideal for the florican. Chitwan in Nepal, northeast of Sohagi Barwa, is the nearest area where floricans are found, and we think if the grasslands are properly managed, there are chances that the bird will reappear in Sohagi Barwa. For a strong flier like the Bengal florican, a distance of 30 to 50 km is nothing. We did, in any event, locate many grassland birds such as the streaked fantail warbler, fantail warbler, pied bushchat, collared bushchat, black francolin, grey francolin and a pair of pied harriers. In the wetter

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regions, near streams we also located the swamp francolin, locally called *kaker*.

During our short visits, it was not always possible to actually see the swamp francolin, so most often we kept a sharp ear out for its characteristic call as evidence of its presence. The monitoring display or alarm calls of pheasants and francolins is a well known census method. However, the calls can occasionally be quite confusing as we discovered, much to our dismay. In the Kankai Road forest tract of the Doma beat, we were surprised to hear calls which we at once identified as those of the swamp francolin. But the habitat was most unsuitable for this bird, and this, more than anything else aroused our suspicions, prompting us to investigate further. After two minutes, we heard the call again, from deep in dense forest. However, this time, the call was followed by a babbler-like call, and then came the familiar metallic notes of the racket-tailed drongo. Now we knew the answer. The long-tailed drongo is famed for its mimicry of other bird's calls! Here, in the *terai,* it had added the swamp francolin's calls to its already vast repertoire. Describing the vocal mimicry of this drongo, the late Dr Salim Ali wrote that many intriguing and unexpected bird-calls in forest may often be traced down to a single sportive racket-tail, a fact which stresses the importance of visual evidence in support of 'diagnostic' calls in drongo-ridden areas. How true the grand old man of Indian ornithology was.

Phulai phanta in the Doma Beat area of Nichlaul Range is a large grassland in Sohagi Barwa, but the area was intensively planted in 1985-86. Every year a new portion is planted. On the day of our visit, pits were being dug up. We noticed instances of severe grazing in almost every plot, although there is a trench-cum-mound wall (TCM) to protect the young saplings. According to forest rules, for five years after plantation, grazing is not allowed but then this rule is followed only on paper. Also, we discovered that cane-brakes have almost completely disappeared here, no doubt due to over-exploitation, while they are still seen in the adjoining Valmiki Wildlife Sanctuary of Bihar.

Sohagi Barwa also contains the Singhrana *taal* (lake), one of the prettiest wetlands in the *terai*. Nearly 2.3 km in length and 200 mt wide, this wetland in the midst of the forest has water all year round even in summer when other wetlands run dry. Understandably, a host of water birds converge here and we were able to count 50 sarus cranes in 1988. Other birds seen by us included storks, egrets, herons, ibises, purple moorhens, lesser whistling teal, spotbills, nukta or comb duck and cotton teal, among others! Singhrana *taal* is surrounded by *Barringtonia acutangula* and is choked with water hyacinth as well. And where hyacinth is absent, *Lotus Nelumbo* and *makhana (Euryale ferox)* survive.

We had first heard about Singhrana *taal* in 1985 from Mr. R.S. Bhadauria, now the Chief Wildlife Warden of UP, who has taken a keen interest in the state's wetlands. A dacoit-ridden terrain, which is difficult to visit, it supports hundreds of waterfowl in lotus covered waters. One look at it and we determined to return. Fortunately, in 1988, the dacoit problem was somewhat under control. We spent a serene day here with the birds taking pictures and making notes. As we watched a pair of blacknecked storks sedately examining the waters for fish, a flock of lesser whistling teal squabbling gently among themselves and a sarus pair immersed in their beautiful dance, we realised that there was little more a naturalist could ask for than the solitude and joy of being alive in a haven such as this.

Things changed in 1991. The entire *taal* was invaded by fishermen. After a ban for the past few years, the *taal* was opened for fishing in 1991, ostensibly to control water hyacinth. Could no one have struck upon a less disturbing way to control this pernicious weed. The cure seemed worse than the disease. The fishermen did indeed remove the hyacinth, but so haphazardly that it disturbed the entire habitat for the birds. Heaps of hyacinth now lie rotting at the water's edge and adversely affects water quality. With better coordination and planning, after extraction of the hyacinth fishing could have been controlled from one edge to another in this elongated *taal*. Moreover, surely the wildlife department should have a say as to the mesh size of the fishing nets. We were horrified to see nylon nets through which even mosquitos would be unable to pass being used. In the clean sweep every living thing — fish fry, fish egg, frogs, snails, and even water insects — succumbed. Worse, after the bigger fish had been taken, the rest of the organisms were left to rot and die. The minimum stipulated mesh size, we learnt was 50 mm, but even the wildlife guards who accompanied were unaware of this rule. Needless to add, no action was taken against the erring fishermen.

The Valmiki Tiger Reserve

From Uttar Pradesh we moved to Bihar. In the West Champaran region of Bettiah district lies the Valmiki

Wildlife Sanctuary, adjoining Sohagi Barwa. Recently declared a Tiger Reserve, this 462 sq km forest boasts a mixed bag of semi-evergreen and moist deciduous forest, along with alluvial grasslands, riverine communities and wetlands. Sal is present in all ranges except Madanpura, where, thanks to the powerful Gandak river, flooding occurs for four months. Grasslands constitute nearly 20 per cent the Valmiki area, mainly in the Madanpura range. But here too, most of the natural grasslands have been converted to woodland by extensive plantation!

North Bihar is a densely populated region. The only district where some decent forest still survives is West Champaran, with 17 per cent of the district area (two per cent of the geographical area of North Bihar) being forested. The West Champaran forests were famed for their tiger and wild buffalo. The area where Valmikinagar town is located today was known as Bhaisalotan (wild buffalo wallow) on account of the number of wild buffaloes found there. However during the construction of a dam on the river Gandak, between 1964 and 1975, a town was established for engineers and labourers after cutting down thick forest. It was named after the saint Valmiki who is believed to have spent some years in this forest. It is ironic that no one saw the dichotomy in remembering Valmiki through the destruction of the forests which were once his home.

Wildlife has been considerably disturbed here. Till recently, in fact, it was presumed that the wild buffaloes which once roamed free here, had become locally extinct. In 1985, however, unconfirmed reports mentioned three animals which were shot, two in Juminia and one in the Thori range. The Indian rhino too is presumed extinct in the Valmiki belt, but Chitwan in Nepal, harbours nearly 350 animals. There is always the possibility that some of these giant animals may return to Valmiki, as we saw happen in Katerniaghat. Mr. P. K. Bhagat, the RFO of Madanpura informed us that in 1980-81, a male rhino had entered in the Chutaha range from the Nepalese side and stayed on for a whole year! It had reportedly become quite tame and was eventually caught and sent to the Patna zoo where it now goes by the name of Raju! Recently, Bhagawat found rhino dung and other evidence in some forest compartments bordering Nepal and UP. The habitat could become suitable if human disturbances are curtailed. And recently, Valmiki was declared a tiger reserve. It could possibly be considered as another area for rhino re-introduction or natural colonization, provided, of course, no one decides to put the animals into a zoo again!

TheDudhwaTigerReserve

From Valmikinagar, we returned to our base camp at Dudhwa. We took our earlier route, because we wanted to observe and photograph sarus cranes near Pharenda town. On 5 April, 1991, while driving to Sohagi Barwa from Suhelwa, we had seen nearly 150 to 200 sarus about six kilometres before Pharenda. The birds had been foraging on fallen wheat in freshly harvested fields, but since the light was poor we could not photograph them that day. Even an accurate count was out of the question in the dim dusk light. We suspected there would be many more sarus in the surrounding fields and were keen to return. However, on 8 April 1991, we discovered, however, that the cranes had spread out over a wider area. The reason was obvious. With every passing day, more and more wheat fields were being harvested. The sarus thus broke up into scattered flocks of 30 to 50 birds for at least a couple of kilometres on either side of the road.

Throughout our survey we made notes on all major species such as storks, spoonbill, ibis, ducks, cranes and raptors. Special focus was devoted to wetlands. Such observations often delayed us, but also kept our spirits high, particularly on long trips through monotonous croplands. The second part of our survey started on 2 May, 1991. The Kishanpur Wildlife Sanctuary, about 30 km southwest of Dudhwa, is now a part of the Dudhwa Tiger Reserve and shares much of the flora and fauna. We hoped to observe many of the species we had targeted for our research, particularly the 450 swamp deer known to inhabit Kishanpur.

Barely four kilometres from the Kishanpur rest house lies Jhadi *taal,* an important *terai* wetland. Here we discovered a fair number of waterbirds and swamp deer and, as in Banke *taal* of Dudhwa, a pair of blacknecked storks with three juveniles. Both, Jhaadi and Banke *taals* are well protected and stocked with fish, the principal food of blacknecked storks. We also saw 15 lesser adjutants, yet another indicator of the health of the wetland. However, the best indicator of the undisturbed nature of Jhaadi *taal,* we observed, was the complete absence of water hyacinth.

Sathiana, in Dudhwa, is renowned for its swamp deer. But the numbers of this ungulate have been declining over the years. Dr. V.P. Singh of Lakhimpur Kheri town, who earned his Ph.D. for his work on the swamp deer in the late 1970s, was the first to bring this decline to public notice. Later, Ravi Sankaran, of the BNHS, working on the florican project between

1985 and 1989, confirmed that the numbers had fallen still further. Our census in the summer of 1991 revealed that barely 160 deer remained in Sathiana, 100 less than in 1989. (In 1972-73 the deer population was 1,200). In Jhaadi *taal*, however, the deer are doing quite well and we counted some 250 here in 1991. Unlike Sathiana, where a paucity of wetland and highland areas forces the deer to move out during the monsoon, the deer of Kishanpur are relatively secure round the year. In the Salukapur area of Dudhwa (where rhinos were reintroduced) too, thanks to the presence of suitable micro-habitats most of the deer stay in the protected areas all year round.

Nepalese adventure

Each time we visited Lagga-Bagga, we planned to enter the adjoining Sukla Phanta sanctuary in Nepal. One could literally walk across, but were dissuaded by wildlife guards who informed us of the zeal with which the army in Nepal protected their forest. It appears poachers are ruthlessly treated and as we had no desire to get into unnecessary trouble, we chose to visit Sukla Phanta through the proper channels.

Entering Nepal was not at all difficult, just slow. After declaring our equipment at the checkpost, the Indian Customs officers condescendingly waved us on, after putting us through a gruelling search. Their Nepalese counterparts, of course, had to out-do 'big brother'! They took even longer! We filled three complicated forms and answered each query four or five times before we were cleared. But once we reached the sanctuary at Majhgaon, the affable wildlife guards made us forget every bureaucratic hurdle we had faced. Indeed, when they discovered we were wildlife researchers and had specially come to see Bengal floricans and swamp deer, they were all willing to accompany us though we could not accommodate more than one in our vehicle!

Sukla-Phanta lies to the southwest of Nepal, and has the most extensive *terai* grasslands of that country. It is bounded by the Sharda (called Mahakali in Nepal) which, with some of its tributaries, marks the Indo-Nepal border. The sanctuary currently extends over 155 sq km, but there is a proposal to double the area, mainly along the eastern wing. Along with Lagga-Bagga in India, Sukla Phanta has the potential to become one of the best protected *terai* habitats in the subcontinent. According to Carol and Tim Inskipp of the International Council for Bird Preservation (ICBP), it has the largest population of Bengal florican in Nepal and is also vital to other grassland species such as swamp francolin, grass owl, large grass warbler and striated marsh warbler. In this small reserve, the Inskipps found 22 breeding species of birds which are considered at risk in Nepal.

Amongst mammals, Sukla Phanta is famed for swamp deer and hispid hare. In four hours, we saw up to 400 deer. Sighting the elusive hispid hare in the tall grass habitat was, of course, out of the question. The larger carnivora of Sukla Phanta include tiger and leopard, while a relict population of between 10 and 20 elephants survives here, occasionally moving towards the Pilibhit forests in India.

From Majhgaon, the Sukla Phanta grasslands are 24 km distant. In between, one sees stands of not so thick sal forest. The under growth was thin here, possibly because of the many fires set by villagers. Grass, however, seemed to be growing well. This open woodland habitat is perfect for chital, of which we saw nearly 1,000. There is a small wetland, Rani *taal*, where elephants are often seen. In winter large flocks of waterfowl rest here. Again, we saw no hyacinth — a good sign. But despite the army presence and protection, there are problems here. Such as fish poisoning and illegal burning. In a stream we found hundreds of dead fish floating by, presumably poisoned. Was such disturbance in the hitherto pristine forest the first sign of the dawn of democracy in this land-locked country? We only hope that democracy comes hand in hand with learning and respect for the Earth.

A bleak future?

Our next halt was at Haldwani where we collected information about grasslands — hardly any left! Even the forest department officials did not know that there used to be Jaulasal swamp deer sanctuary. Most of the low-lying grasslands have long been occupied, although forest in the bhabar and Siwalik hills is still intact. After a night halt at Lal Kaun, once densely forested but now a bustling, polluted industrial town, we went to Corbett via Pantnagar and Kashipur, all the while hoping to see Finn's Baya — an endangered species which has been neglected since the work of V. C. Ambedkar and Dr. Salim Ali in the late 1950s. In 1959, Dr Salim Ali and J. H. Crook found nesting colonies, some having up to 200 nests on silk cotton trees near Rudrapur in Rampur district. Later, V. C. Ambedkar, who was Salim Ali's first student, found them breeding on reed beds. Now the whole area has been converted to cropland. We have no recent information of this endangered bird from the U.P. *terai*.

The Dhikala grassland in Corbett is too well known to merit excessive mention. After collecting floral and faunal data from here, we proceeded to the little-known Hastinapur Wildlife Sanctuary in the Gangetic plain, where some swamp deer are still present. Although called a wildlife sanctuary, Hastinapur is not a true sanctuary in terms of protection as 95 per cent of its area of 2,073 sq km is under human use. It was declared a sanctuary in July 1986 to give more effective protection to a small herd of swamp deer which had survived in marshes near the historical town of Hastinapur in Meerut and some areas of Ghaziabad, Muzzaffarnagar, Moradabad and Bijnor districts. Five forest ranges of these districts were incorporated into the sanctuary.

On 7 April, along with two wildlife guards, we surveyed the land adjoining the Madhya Ganga Canal. For a stretch of 10 km we saw jheels on one side and high, sandy, undulating ground called *khala* on the other. During the day swamp deer remain hidden in dense and tall grasses. At night occasionally they can be seen crossing the canal to reach *khala* or to graze in the crop fields. This is when nocturnal poachers pick them off with powerful searchlights. No shikari worth his salt would ever have stooped so low in the days when shikar was still a 'sport'. Fortunately, however, the wildlife guards have the situation under control. There are very few poaching instances reported now.

A 500 metre wide strip of forest runs along one side of the canal with *jheels* along the other side. Because it is leaking, cement lining work is being carried out along the canal by the irrigation department. Wild animals such as sambar and hog deer are unable to negotiate the steep and slippery banks. This adds to their problems. There is so little we seem to do which actually benefits wild animals.

With such a high human population, expectedly Hastinapur is facing all sorts of problems. Most of the *jheels* belong to gram panchayats which annually auction the grass. In fact, this need not be very destructive for the swamp deer if the grass cutting is done properly. Instead we see that haphazard cutting coupled with burning results in needless and continuous disturbance to the jungle. The forest department has not been able to provide a management plan to satisfy the needs of both the villagers and the forest. There is a strong case for carrying out a holistic ecological and socio-economic study in Hastinapur. Within a couple of years, it isquite possible that a sound management plan to save the swamp deer population could emerge.

On the last leg of our survey we met with Nawab Syed Zaheer Alam of the Sambalkhera village of Jansath tehsil, in the Muzzaffarnagar district. An old zamindar who lives in a crumbling *haveli* which must have seen better days, he belongs to a breed of naturalist-*shikaris* not seen around today. He has maintained meticulous diaries of hunting and natural history incidents. He provided us with valuable information on the local wildlife he had observed over the past five decades. Unlike most shikaris who unendingly boast of their 'glorious' hunting days, Nawab Zaheer was discreet and cautious. We dwelt on his every word. He told us that swamp deer were first seen in this area in 1938. And that they possibly came with the flood waters from Kotdwara. As soon as he came to know about sighting of swamp deer, he arranged a beat and flushed out two females, which he did not shoot. The *jheel* from which he flushed the deer was Gawnri near Qasimpur khala, close to the barrage in the Meerapur range. Even today swamp deer are found there. In 1939, a male swamp deer was killed thus conforming species identity. Slowly a small population was able to establish itself in the area and Nawab Zaheer saw that they were well protected, though a few were shot annually by his friends and guests. Sambar, he informed us were first seen in 1928 in Kalapur khala, and cheetal came in Qasimpur and Tipperpur khalas in 1950. Earlier leopards were very common but the last one was shot on 14 January, 1963. The pug marks of a tiger were spotted in 1966. He was sad that even the imperial sandgrouse, very common earlier has stopped coming to his area. The last imperial sandgrouse he shot was way back in 1941. It was a real pleasure talking with him and going through his old diaries, which he lovingly kept in an antique cupboard in a back room.

Few people realise the debt of gratitude we owe to the shikari-naturalists of yesteryear. If not for them, perhaps all our wilderness area would have succumbed to the plough and axe. Moreover, estates and kingdoms had shikar departments which maintained shooting and natural history records. Such records are now an important part of our culture and also provide valuable information for research. Though we accept that shikar no longer has any relevance as a modern sport, we do feel it has been an intrinsic part of Indian history. It would be in the order of things if a museum and library were to be established where shikar records can be preserved. Like old historical palaces, many such records are in a state of crumbling disrepair. As we headed home we could not help but feel that the *terai* and the old breed of shikari/naturalist faced the same bleak future.