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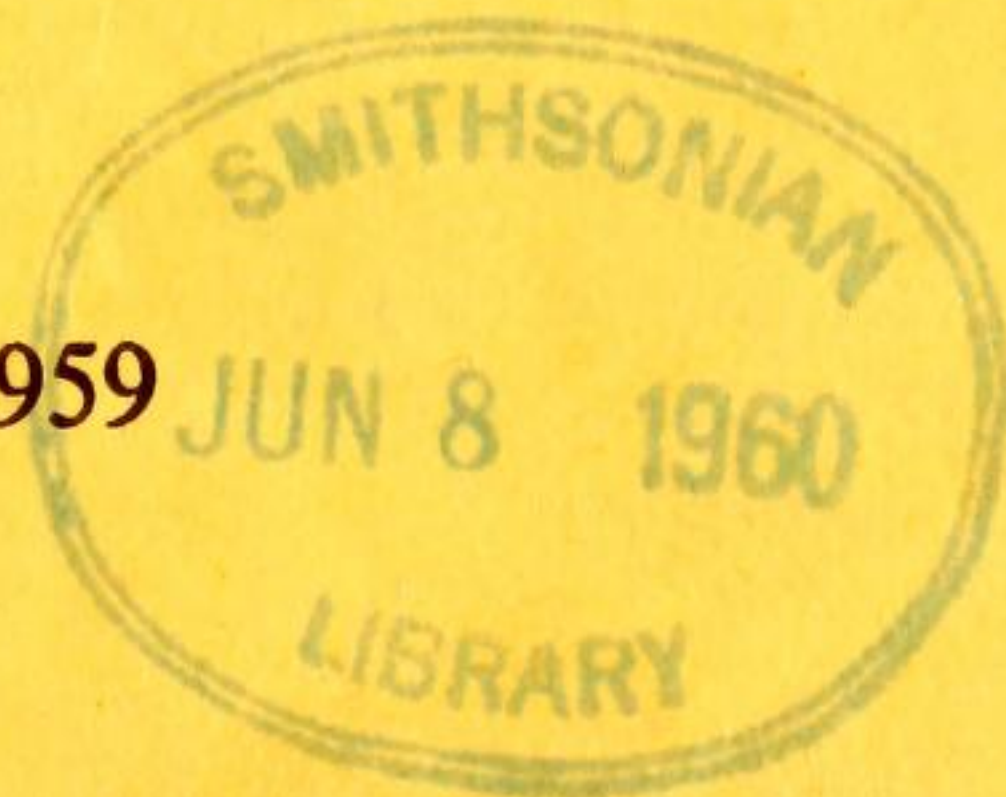
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The Great Indian Rhinoceros (*R. unicornis*) in Nepal¹

Report of a fact-finding Survey, April-May 1959

BY

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(With 3 plates and 3 maps)

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I. INTRODUCTION

Chitawan and neighbouring areas of Nepal have long been famous for their abundance of big game, including the Great Indian One-horned Rhinoceros, *Rhinoceros unicornis*, which is now one of the vanishing species of the world. For many years this part of southern central Nepal was the strictly guarded shooting preserve of the rulers of that country; but with the advent of democracy and unsettled political conditions in 1951, the exact status of the area and of the rhinoceros in it has not been clear to the outside world. Reports were in circulation of alarming slaughter by poachers in recent years, especially in the year 1958-59; but lack of authentic information prompted the Survival Service Commission of the International Union for the Conservation of Nature to ask me to investigate the distribution and status of the Rhinoceros in Nepal, and to suggest measures for the preservation of this species in Nepal.

¹ The Bombay Natural History Society, as a token of its deep concern in the reportedly serious plight of the rhinoceros in Nepal, had contributed towards the expenses of Mr. Gee's survey promoted by the Survival Service of the International Union for the Conservation of Nature and Natural Resources. This report, first published in *Oryx*, the journal of the Fauna Preservation Society, is here reproduced by courtesy of the editor, the IUCN, and the author.—EDS.

As it was not possible for me to visit the area concerned until the end of March, 1959, which is the start of the hot weather, when dust, heat, and flies render camping difficult, and as facilities for investigating the problems were somewhat restricted due to the short notice given, the duration of the survey was not extensive. Sufficient time was, however, found to spend two and a half weeks in the Rapti Valley, to traverse almost the whole area, to visit typical localities within the rhinoceros area, both inhabited and uninhabited by rhinoceros, and to obtain first-hand information about the administrative and ecological aspects of the problem.

Having had considerable experience of the Great Indian Rhinoceros and its preservation in Assam and Bengal, I found it most interesting to study the same animal and its habitat in Nepal—where conditions turned out to be very different from those in India.

II. GENERAL REVIEW AND SUMMARY OF REPORT

The rhinoceros area in Nepal covers approximately 1250 square miles, comprising the valleys of the rivers Narayani, Rapti, and Reu. Although it is *dun* country, it contains most of the sub-tropical vegetation usually associated with *terai* country, and can roughly be divided into (1) riverain, (2) grassland above flood level, and (3) *sal* forest. The hills are almost entirely under *sal* (*Shorea robusta*), a valuable hardwood.

During the cold weather months from November to April, the rhinoceros live mostly in the thick tree and scrub forest of the riverain tracts, whereas in the rainy season from June to September, many of them move away from the partly flooded riverain tracts into grassland or forest. Competition between human settlers and wild life for the grassland area has reached a critical stage, in which wild life has retreated further and further into the unexploited parts of the area and into the thick riverain scrub forest.

As the result of many years of being shot both by sportsmen and poachers and of being driven by villagers from cultivated areas, the rhinoceros of Nepal has adopted a mode of existence and a temperament different from those observed in north-east India where, during the present century, rhinoceros have been strictly protected in their natural habitat. In Nepal they have become nervous, frightened of the sight of human beings, and almost entirely nocturnal. A number of years of strict protection and the allocation of 'living space' in riverain and grassland tracts are needed to enable them to settle down to a normal and peaceful existence.

Poaching remains a serious problem, although the rhinoceros receive much protection from the thick cover, which is not their real habitat, and from the Rhinoceros Protection Department. But a more serious problem is that of increased and increasing influx of both authorized and unauthorized human settlers from the hilly regions of Nepal into the plains which form the rhinoceros area.

I consider that the position is not nearly so hopeless as recent reports had made it out to be, and that in spite of poaching, the number of rhinoceros is in the region of 300.

The Nepal Government has wisely constituted a national park and has plans for a wild life sanctuary. But, unfortunately, the national park in its present form is not an ecological unit in which the animals would have full scope to behave normally, nor is it of sufficient area to include a reasonable amount of rhinoceros habitat and their lines of seasonal and local migration. Apparently the wild life sanctuary now proposed by Government would not enjoy the permanency so necessary for nature conservation. While immediate human needs of land for cultivation and grazing are paramount, the essential long-term need for water and soil conservation and for a specified area to be set apart for the preservation of wild life in its natural habitat, as a wise form of land-use, must not be lost sight of. It is not too late for these very necessary steps to be taken. The area proposed in Section VIII of this Report, to be added to the present national park, contains the greatest possible number of rhinoceros in their natural habitat. At the same time it is almost entirely free from human occupation and consequently there would be a minimum of administrative work.

III. HISTORY OF THE RHINOCEROS AREA

The present rhinoceros areas of Nepal, in fact the whole of that country, have been up till recent times a closed book to foreigners. Visits by outsiders were discouraged, even forbidden. Perhaps the first foreigner to tour in the Nawalpur, Chitawan, and Reu Valley areas was Mr. E. A. Smythies who, during World War II was Forest Adviser to the Nepal Government. In the course of his duties Smythies visited almost all the submontane tracts along the 500 mile *sal* belts of the Nepal *terai*.

There is some historical evidence that the Rapti Valley, as Chitawan is usually known, was once much more thickly populated than at the beginning of this century, and it is possible that malaria was the chief reason for any subsequent depopulation of the area.

The Rapti Valley has remained closed even to most prospective Nepali settlers, not only because of malaria, but because it was strictly protected as the special shooting preserve of the rulers of Nepal, whose huge camps and elephant beats were known the world over. Up till recent years almost the only people living in the area were simple 'Plains Nepalis'—the Tharus, who appear to have become immune to malaria and who incidentally provide practically all the elephant drivers of that country. These people also provided the labour required for making rough cross-country tracks in the dry cold-weather months and for preparing shooting camps.

A special department of armed men has existed for many years to protect the rhinoceros, tiger, and other game. At the time of my visit it consisted of: 1 Commander (Captain), 1 Assistant (Lieutenant), 4 Subedars, 24 Havildars, and 122 Rhino Guards.

Mr. E. A. Smythies in his book, *BIG GAME SHOOTING IN NEPAL* (1942), and his wife Olive, in her *TIGER LADY* (1953) speak in glowing terms of their trips to the Narayani, Rapti, and Reu valleys in the years 1941-1945. They found that, whereas in the rest of the Nepal *terai* there was practically no game left, here was still a sportsman's paradise, with uncounted numbers of rhinoceros and other big game, and comparatively unspoiled habitat.

In 1951 as a result of the political upheaval in which the Rana regime came to an end and democracy came into being, the area underwent a change. Poaching increased to an alarming extent—in fact this seems to have been the peak year for illegal slaughter of rhinoceros.

From 1951 onwards the weakening of protection in the big game reserve meant that malaria was now the main, if not the sole, deterrent to settlers coming from the hills into the Rapti Valley. It was not possible in such a mountainous country as Nepal to prohibit indefinitely the influx of human settlers into grasslands suitable for cultivation of crops. 'Hills Nepalis,' Gurungs, Magars, and others, started to come down into the Rapti Valley unofficially; and officially the Rapti Valley Multi-purpose Development Project began in 1955 to settle cultivators from the hills in the western portion of Chitawan south of Narayangarh, at the rate of 2500 persons a year. By March, 1959, 12,000 persons had been settled on grasslands once occupied only by rhinoceros and other species of wild life, and 52½ square miles had been thus opened up and developed. It is proposed to settle a further 25,000 persons in the Rapti Valley in the near future.

A new gravelled road from Hitaura to Bharatpur and Narayangarh has been constructed jointly by the United States Operations Mission

and the Nepal Government, and this was completed by March 1959, except for a bridge and the big causeway near Hitaura. It was claimed that recent malaria control measures had succeeded in making the valley considerably safer for human occupation.

Besides the 12,000 persons officially settled by the R.V.M.-P. Development Project, a large unspecified number of people from the hills have settled unofficially in various parts of the Rapti Valley during the last few years. It is obvious that if the influx of human settlers continues unchecked wild life will ultimately disappear from this renowned place.

The Nepal Government has been aware of this danger, and during the winter of 1957-58 steps were taken to allot a part of the north of the valley as a national park. In January, 1959, the Mahendra Mriga Kunja (Mahendra Deer Park), or Mahendra National Park, of 68 square miles was formally opened by King Mahendra. It is proposed that a 'Wild Life Sanctuary' (possibly for 10 years only, after which it may revert to shooting blocks) shall be created south of the national park to include most of the rhinoceros area as well as cultivation and grazing areas. Another area has been allotted as 'King's Reserve' and another as 'Shooting Blocks' (see map No. 2).

IV. GEOGRAPHY AND ECOLOGY

The present rhinoceros area comprising the valleys of the rivers Narayani, its tributary the Rapti, and the Rapti's tributary the Reu, is often loosely spoken of as part of the Nepal *terai*. *Terai* in northern India and Nepal is, strictly speaking, moist country a few miles from the base of the Himalayas, below the *bhabar*, which is dry country with a subsoil of boulders right at the foot of the Himalayas. Chitawan, or the Rapti Valley, is a *dun*—a plateau or flat valley inside the foothills of the Himalayas; its altitude is between 900 and 1000 feet above sea-level, and it has most of the typical vegetation of the *terai* which is usually at 350 to 600 feet.

The *dun* of the Rapti Valley is approximately 40 miles long from east to west, and varies from 4 miles wide at Ramoli at the eastern end, to about 16 miles at its widest, in the west near the Narayani River. This is the main rhinoceros area, bounded on the north by range upon range of the Mahabharat (Himalayas) and on the south by the Churia Range (Siwaliks). Another area with similar vegetation lies west of the Narayani River and down the bank of that as far west as Tamashpur. A third area is the Reu Valley which is divided from the Rapti Valley by a ridge of the Churia Range. The scenery,



Sal trees in the *dun* of the Rapti Valley, with Himalchuli (25,800 ft.) in the distance.



The River Narayani (or Gandak) near Deoghat in the Mahendra National Park.

Photos : E. P. Gee



Indian rhinoceros in typical grassland habitat in Nepal.



Cow and calf rhinoceros in typical grassland habitat in Nepal.

Photos : E. P. Gee

climate, and vegetation of the Rapti *dun* is very similar to that of the beautiful Corbett National Park of Uttar Pradesh in India.

Records of rainfall for this area are scanty, and have only been kept during the past three years. It appears that 65-70 inches, falling mainly between June and September, is the normal rainfall of Bharatpur at the western end of Chitawan.

The terrain of these three valleys can be conveniently divided into riverain, grassland, and timber forest:

1. **Riverain**, comprising all the low-lying strips along the river beds as well as the islands in the river beds.

2. **Grassland**, above flood level, most of which is either being or is about to be occupied, cultivated, and grazed by human settlers.

3. **Timber forest**, mainly on the higher undulating portions of the *dun*, and covering most of the hills of the area.

Riverain

The Narayani (or Gandak) is a huge river, and occasionally washes a live rhinoceros down into India. In this area it widens out to a mile or two and has islands (*tapoos*). To get over it one often has to cross three, four, or five channels as well as the islands in between, and this takes about half a day. In addition to this mile or more of channels and islands, there runs along each bank a strip of riverain forest and savannah which varies in width up to a mile or more. The low lying islands in the river, which could be classed as sand banks, become flooded during most of the rainy season, June to September. The higher islands and most of the low-lying strips of forest and savannah along the banks get flooded during peak floods of the monsoon. All this area is excellent rhinoceros habitat, containing the water, grasses, reeds, and forest cover they need—particularly during the dry weather, November to May.

The Rapti River is small compared with the Narayani, and in the dry weather can be crossed by jeep at many places where its shingly bed widens out. It too has islands, particularly in its lower reaches, and strips of riverain forest and savannah on either bank, varying in width from a furlong to a mile or so. The Reu, main tributary of the Rapti, is much the same as the Rapti but very much smaller, and the valley very much narrower.

The vegetation of the riverain tracts consists of tree forest and savannah.

Tree Forest.—The trees are mainly of flood resisting species such as *simul* (*Salmalia malabarica*), *sheesham* (*Dalbergia sissoo*), and

khair (*Acacia catechu*). There is a tangled mass of undergrowth, much of which is evergreen and much of which is also thorny, affording the fullest shelter for rhinoceros during the day time, especially in the dry weather.

Savannah.—The vegetation of the savannah varies a great deal according to whether it is above or below the river level of normal rains. It consists mainly of the reeds and grasses usually found in this part of the world, viz. *ekra* (*Erianthus* spp.), *khagri* (*Phragmites karaka*), *nal* (*Arundi donax*), and *thatch* (*Imperata cylindrica*). Frequently there is an intermingling of forest and savannah, forming dense scrub thickets with plenty of cover.

Nearly all the savannah areas of the riverain tracts are burnt off annually by the local villagers to improve the grazing for their cattle—and incidentally, for the wild herbivorous animals. This has been taking place, at least to some extent, for thousands of years, and has become part of the ecological pattern.

Whenever a small stream, known locally as a *khola*, flows out of the hills, or through grassland into a river, there is to be found a small riverain tract usually thickly forested, of varying width according to the size of the tributary. These *kholas* provide corridors for movement of game away from the main rivers as well as thick cover during day time.

Hardly any of the riverain tracts of the three rivers contain houses or even cultivation, as they are liable to flooding during the monsoon months. Practically all of them are made use of by villagers for firewood-cutting, thatch-cutting, and grazing. The thickest of the tree forest and scrub forest areas are seldom interfered with, due to thorns and impenetrability.

Grassland

On leaving the low-lying riverain tracts one finds flat grasslands above flood level stretching for a furlong or two in the Reu Valley, for a mile or two on the west bank of the Narayani River at Sandhna, and for anything up to seven or eight miles in the *dun* north of the Rapti River. These grasslands contain the same reeds and grasses as the savannahs of the riverain tracts, with the addition of other high-ground vegetation which is not flood resistant. The soil is richer and more suitable for the growing of crops at the eastern end than at the western end, where it is lighter and more sandy in composition.

Nearly all the grasslands of the whole rhinoceros area have either been occupied by human settlers for cultivation or grazing, or are

just about to be, with the notable exception of the south bank of the Rapti from Jaimangala village westwards past Darbar (a disused shooting lodge built for King George V when he visited Nepal in 1911) towards the junction of the Reu River and southwards to the Churia range. This is so far mostly unspoiled by human settlers.

Of the grasslands which have for some time been occupied by settlers, in some places the effects of continuous annual burning, overgrazing, cattle-tread, and exposure to increased evaporation, are becoming evident from decreased fertility and increased desiccation.

Timber Forest

In this area the sub-montane timber forest is mainly *sal*, which is to be found growing on some of the well-drained higher grassland, as well as on most of the surrounding hills. It is a tree of great beauty of form and colour, and contributes much to the aesthetic enjoyment of the place, especially when the snows of the Himalayas some 50-80 miles away are visible. The *sal* forests of the area are mostly virgin and contain some of the best trees of this species in the world, rising to 160 feet, especially in the north of the Rapti Valley, in what is now the Mahendra National Park. The *sal* is being exploited by the Forest Department only in the east towards Hitaura. At present there is no exploitation west of Debichor, except some cutting by new settlers.

Most if not all of the *sal* forests are under the jurisdiction of the Forest Department, and are regarded as Reserved Forests. Unfortunately, however, it appears that the boundaries of some of these Reserved Forests have not been clearly demarcated, and unauthorized persons are said to be settling in parts of them with the usual accompaniment of felling and burning for cultivation and grazing. If this is true, it deserves the urgent attention of the authorities, especially as there are so many parts of these forested hills which, forming the catchments of the streams and rivers, need careful conservation in order to avoid soil erosion and desiccation.

V. ADMINISTRATIVE AND POLITICAL

Administration will be considered only as far as the rhinoceros and its preservation are concerned. Three different divisions of the Forest Department are involved. The Rapti Valley is under the Divisional Forest Officer of Chitawan residing at Hitaura; the Nawalpur area (west of the Narayani River) is under the D.F.O of that district residing at Parasi, a journey of some distance from the rhinoceros area with

no roads for travelling; the Reu Valley is under the D.F.O. of Birganj. From the rhinoceros preservation aspect it is unfortunate that this area of Nepal should fall under the jurisdiction of three different D.F.Os., under two separate Circle Conservators, with no means of communication between them except via Kathmandu. The D.F.O., Chitawan, residing at Hitaura, is in charge of the whole Rhinoceros Protection Department which operates in all the three areas; but he is unable officially to visit the Nawalpur or the Reu Valley areas except by arrangement with the D.F.O. of the district concerned. All this is not a criticism of the Forest Department: it merely states the position as it happens to be today. The Narayani River is possibly too great a physical barrier for both sides of it to be under one D.F.O.

P o a c h i n g o f R h i n o c e r o s

The Rhinoceros Protection Department, the personnel of which has already been given, mans 42 *chowkis* (posts), 26 in the Chitawan area, nine in the Reu Valley, and seven in Nawalpur. Poaching, as has been said, was probably at its peak during 1951. Accounts differ as to the intensity of poaching during the years 1952-58: some people informed me that the position was static, becoming no better and no worse, while others said that during the last three years there has been a slight improvement. Probably official statistics do not give a true picture of the actual amount of poaching during any particular year.

I was told that in 1958, 60 rhinoceros were officially listed as poached: 52 in Chitawan, 6 in Reu Valley, and 2 in Nawalpur. Of these 60 rhinoceros killed by poachers, 24 horns were recovered, and 13 persons arrested and gaoled. In 1959, twelve cases had been detected by the end of March—Chitawan 6, Reu Valley 2, and Nawalpur 4. Of these eight horns had been recovered and seven men arrested.

I had discussion with many people, particularly with the Divisional Forest Officer of Chitawan, who had been for four years in charge of that division, and with Captain Gyan Bahadur Basnait who had been for two years in charge of the Rhinoceros Protection Department, and there appears to be no evidence of any real organization behind the poachers. Most of the poachers of the Nawalpur area are said to come from the hills, while many of the poachers of Reu Valley and Chitawan come from the south, including India. Some of the poachers are also said to be new settlers from the hills in the Rapti Valley, Magars, Gurungs, and others. The Tharus, 'plains Nepalis', and original inhabitants of this area, are mostly simple and innocent folk,



Cow rhino with her newly born calf in the Rapti Valley, Nepal.



Rhino guard stands near the carcass of a rhinoceros killed by poachers. (Note the skull with horn removed.)

and are believed not to be involved to any great degree in the poaching of rhinoceros.

Most of the rhinoceros poachers in Nepal take refuge first of all in the hills, and then make their way to India, where the horns probably pass through the port of Calcutta to the Far East, particularly to China. The possession and sale of rhinoceros produce is illegal in India—if the place of origin is Bengal or Assam. But if the origin is Nepal, it is probable that its transit through and export from India would not be considered illegal under existing laws and rules. I therefore recommended, while in Kathmandu, that the Government of Nepal should try to effect greater co-ordination of protective measures with the Government of India, in order to prevent this traffic. I now suggest also that the Excise Posts on the India-Nepal border should be kept constantly on the watch for the same purpose.

Development

The last bridges and causeways of the fine gravelled motor road from Hitaura in the east to Bharatpur and Narayangarh in the west are nearing completion. Apart from this there are no all-weather roads. In the dry weather (November to May) all villagers and even isolated houses are connected by bullock-cart tracks which are motorable for jeeps and other high-clearance vehicles.

Since 1955 the Rapti Valley Multi-Purpose Development Project has opened up 53½ square miles of grassland, formerly the home of rhinoceros and other wild life, for 12,000 human settlers, mostly from the hills (see Map No. 2). The implementation of the proposal to settle a further 25,000 persons in the Rapti Valley, combined with the influx of unauthorized settlers, if allowed to continue at its present rate, would mean that hardly any part of this once famous big-game preserve will be left for wild life.

The Mahendra National Park

In its present size and shape, this national park contains about 50 square miles of hills and almost virgin *sal* forest, with a few *kholas* which are dried up in their middle reaches from March till June, and about 18 square miles of mixed evergreen and deciduous forest and grassland with plenty of water in the *kholas* and swamps.

There are villagers with their houses, cultivation, and cattle at Narayangarh, Tikoli, Jirwan, and Jurpani, who still have to move from the national park to alternative sites, with promised assistance from Government. The D.F.O. informed me that he was experiencing some difficulty in enforcing this order, and that the matter was

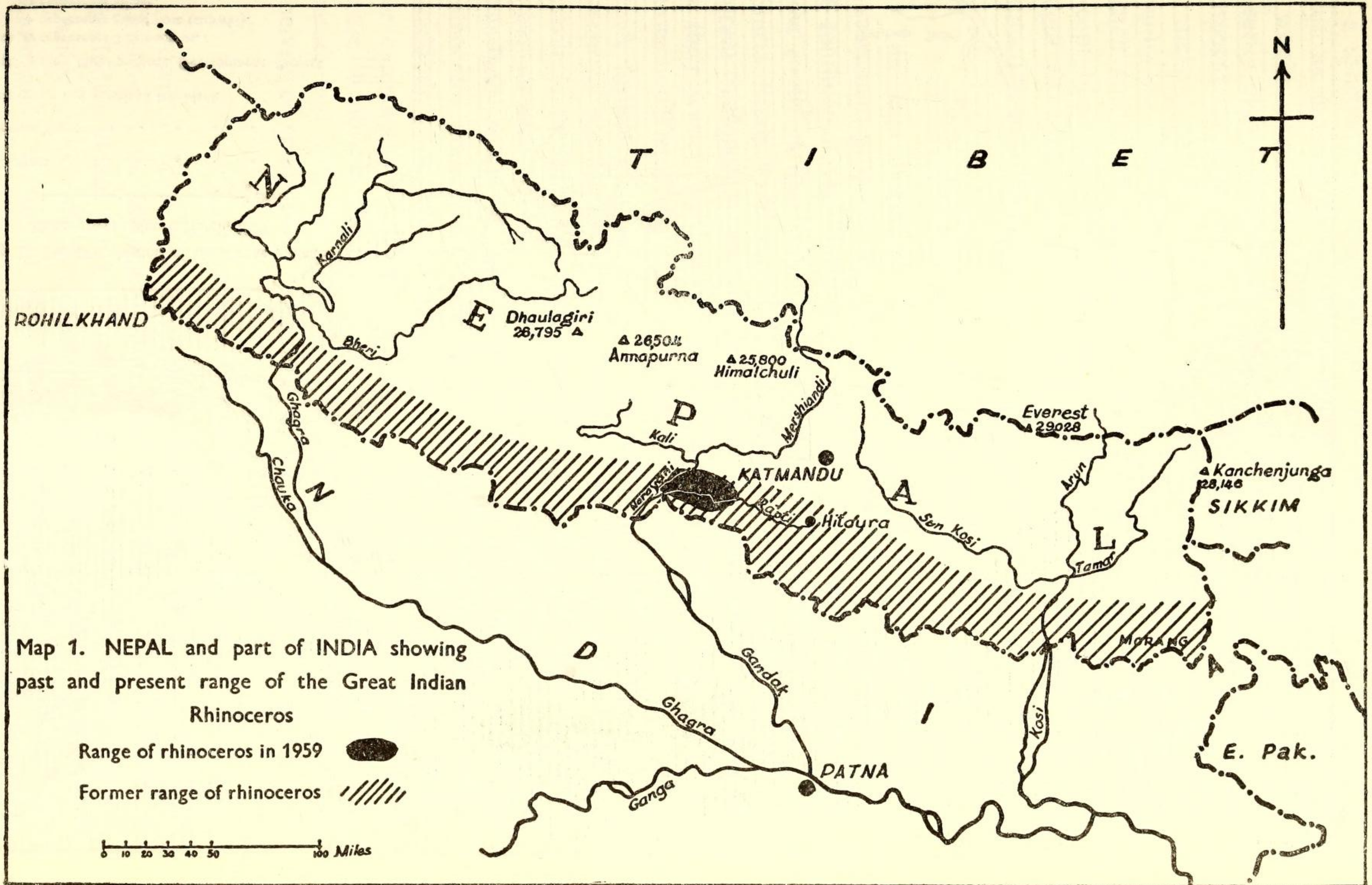
urgent in view of the approaching season for seed-sowing. While I was there the Tikoli villagers expressed their willingness to leave the park area if they were given some of the areas to be re-settled near by. I duly passed on this information to the authorities on my return to Kathmandu.

Necessary additions to the Park.—North of Narayangarh up to Deoghat, the road runs along the river bank from which the mountain and river scenery is very beautiful. When I was there the red-flowering bush *Woodfordia floribunda* was in full bloom, as were several flowering trees; and the *kusum* tree, *Schleichera trijuga*, was in new leaf, shimmering in pale mahogany—all these as well as the *sal* trees in their transition stage from old to new foliage added to the beauty of the scene. But the majestic and unspoiled sal-forested mountains on the opposite bank west of the Narayani and north of the confluence of the rivers Kali Gandaki and Mershiandi, although they contain numbers of gaur, deer, and other wild life, have not been included in the national park. As these parts are mountain and virgin forest almost totally unoccupied by human settlers, they would make a very fine addition to the park without the difficulty of removing human inhabitants.



South of the park, from where the new road forms the southern boundary at Tikoli, there is a four to six mile wide strip of comparatively unspoilt *sal* forest and grassland along the Khagri Khola stream down to the Rapti River, where the majority of the rhinoceros are. This strip forms a natural corridor for local seasonal migration of rhinoceros and other animals—but it has not been included in the park.

Without these two additions—the southward corridor for wild life movement along the Khagri Khola to and from the Rapti, being far the more important—the national park is not a viable ecological unit. But if this corridor be included, then it is only one step further to extend it southwards, to include both some of the best rhinoceros country south of the Rapti River and also the upper reaches of the Reu Valley. If this were done, a large percentage of Nepal rhinoceros population would be included in the national park (see Map No. 3). A further advantage of this north-south extension, fully protected under national park rules, would be that wild life could move into it, as the land to the east and west becomes occupied by settlers.

The 'Wild Life Sanctuary' which the Government of Nepal proposes to establish south of the Mahendra National Park (see Map 2) cannot be regarded as a potentially true sanctuary, for a considerable amount of it is already under human occupation, cultivation, or



Map 1. NEPAL and part of INDIA showing past and present range of the Great Indian Rhinoceros

Range of rhinoceros in 1959 
Former range of rhinoceros 

0 10 20 30 40 50 100 Miles