

my elephant two or three times. Photography was rendered very difficult by the fact that in Nepal the elephants are trained to charge back at a rhinoceros. In spite of this commotion, and in spite of the waving arms of the excited and gesticulating elephant-driver, I managed to secure some photographs of the newly-born calf with its mother—they must be unique.

On our return along the north bank of the Rapti, we suddenly saw, peering out of the tangle of unburnt grass, the head and horns of a solitary bull gaur (*Bos gaurus*), which immediately made off. We then searched without success for rhinoceros in two *kholas*, which had water and evergreen forest suitable for these animals. When we were near camp I dismounted from the elephant, stalked and photographed on foot 5 of the rhinoceros seen by us on the previous day, as they lay in their wallows. There were also four sambar hinds within a mile of the village.

In the evening I visited a riverain area north-east of the camp with one elephant, and found 4 rhinoceros including a cow and a young calf. Three of these were in thick grass within one furlong of our tents. The experience of this day in this area, as in all the other areas I visited, show that rhinoceros and other wild animals prefer the vicinity of villages and cultivation to the unspoilt forests and grasslands. The existence of thick cover in the form of evergreen and thorny scrub forest enables them to do this. The probable reasons are firstly and mainly a predilection for man-grown crops, secondly a certain amount of safety from predators, both human and feline.

On the morning of 6th April, we struck camp and proceeded to the house of the captain of the Rhinoceros Protection Department, where I was shown some of the rhinoceros horns and personal possessions recovered from poachers. Thence back to the main road and eastwards past the proposed "Shooting Blocks" and "King's Reserve" to Hitaura. After discussions with the D.F.O., I returned the following day over the Simbanjong Pass to Katmandu. There I spent three days discussing my observations in the rhinoceros area, with the people whom I had met earlier. Finally I flew from Nepal to India on 11th April.

VII. STATUS, DISTRIBUTION AND FUTURE OF THE RHINOCEROS IN NEPAL

Status and Distribution.

It is difficult to obtain accurate information about the former range and distribution of rhinoceros in Nepal. W. T. Blanford,

in *The Fauna of British India, Mammalia*, Part II (1891), wrote of it as being found in 1850 “. . . along the base of the Himalayas in Nepal and as far west as Rohilkund ” (a district of India near the border of West Nepal). From information obtained in Katmandu it appears that the last rhinoceros in the Morang District of south-eastern Nepal was shot at the turn of the present century, and that the last rhinoceros in the area immediately east of Chitawan was killed in 1927. It would be safe to say that about 100 years ago rhinoceros were found all along the southern border of Nepal. Since 1930 they have been confined to the area covered by this Report.

Referring to the rhinoceros population of Nepal in 1942, E. A. Smythies wrote: “ It is estimated that at present the total number is between 300 and 400.” In 1953 the Forest Department of Nepal estimated that there were 1,000 rhino, and in 1957, 600. Considering the extent of the rhinoceros area and the thick cover of the riverain tracts into which the rhinoceros can and do retreat, these estimates are not beyond the bounds of probability. Unfortunately, however, no serious attempt ever seems to have been made to estimate the numbers scientifically by sample surveys, by studying seasonal migrations, and so forth. A census is not possible owing to the density of the riverain scrub forest.

In a Miscellaneous Note published in the *Journal* of the Bombay Natural History Society in August, 1957, P. D. Stracey, who is Director of Forest Education in India and had been on an official visit to Nepal in April of that year, gives an estimate in the region of 400. He based this figure on a brief visit to the area and on talks with Forest Officers and others. It appears to have been a reasonable figure, though the “ rhinoceros area ” map supplied to him was inaccurate.

In Katmandu, before my tour, I noted down the estimates of rhinoceros population made by various people. These included :—

General Kiran, S.J.B.R.	. . .	250–300
Chief Forest Officer	. . .	300–400
Captain Tej Jung Thapa	. . .	320

On arrival at the rhinoceros area, I was given the following estimates :—

Divisional Forest Officer	. . .	320
Captain Gyan Bahadur Basnayt	. . .	530
Lieutenant Gaj Raj Joshi	. . .	380

On the 13 elephant trips on which I saw rhinoceros, the number of elephants taken out averaged 2·15. This is important, as the larger the number of elephants used in such thick country, the more chance there is of rhinoceros being encountered. On these 13 trips I personally counted 43 rhinoceros, of which 9 were young calves. On the same trips, other members of the party on other elephants saw an additional 14, bringing the total to 57 rhinoceros seen, including 12 young calves. Visibility varied from between 5 and 20 yards in the thicker forest to between 20 and 100 yards in the more open areas; so the actual ground covered in each traverse was not great and I do not believe I actually saw one-tenth of the ground inhabited by rhinoceros.

From the detailed information supplied to me by the D.F.O., Chitawan, and by the officers of the Rhinoceros Protection Department and others, which I checked in sample surveys on 18 elephant trips in different parts of the rhinoceros area, I estimate that there are now about 300 rhinoceros in Nepal. I have marked their approximate distribution as in March-April, 1959, by black dots on Maps 2 and 3, each dot representing 3 rhinoceros. Should my figure of 300 be an overestimate—I do not think that it is—or an underestimate, which is quite possible, the numbers represented by each dot can be adjusted. The pattern of distribution would remain, subject to seasonal local migrations.

It will be noticed that the distribution of rhinoceros when I was there, the dry season of March and April when the burnt-off grassy areas were beginning to appear green with young shoots, was almost entirely in or very near the riverain tracts. This, I consider, was not so much due to scarcity of water and grazing in other areas, as to the thick cover provided by the evergreen and thorny scrub forest in these tracts. It will also be seen that rhinoceros in Nepal, as in North-East India, show a marked predilection for man-grown crops and vegetables, and therefore choose a habitat as near as possible to villages and cultivation. They do not object to sharing their grazing with domestic buffaloes and cattle, though it appears that in Nepal these common grazing grounds are grazed by domestic beasts by day and rhinoceros by night. In Kaziranga Sanctuary of Assam also, the regions of greatest density of rhinoceros population are nearest to the largest areas of cultivation and villages. It is an inescapable fact that whatever areas of unspoilt country may be set aside for rhinoceros preservation, they will probably continue to inhabit those riverain tracts which are nearest to

cultivated land. The presence of *tands* (look-out towers) and rhinoceros ditches in the fields and vegetable gardens over the whole area considered in this Report would alone prove the presence of rhinoceros—if such proof were needed in addition to tracks, dung and the animals themselves.

With regard to movements of rhinoceros, I was informed that there has been a noticeable shift from the area now being settled by the Rapti Valley Multi-Purpose Development Project to the Nawalpur district and to other parts of the Rapti Valley. From all accounts, the grasslands south-west of Bharatpur down to Salbas, along the east bank of the Narayani river, used to be the best tracts for rhinoceros; but they are no longer so. There is little or no information to be had on local migrations, though this seasonal movement is bound to take place each monsoon as the riverain tracts become partly or wholly flooded. The general direction of this movement would be away from the rivers towards the grassy tracts and *kholas* at the foot of the *sal*-forested hills. The most important line of migration, as has already been pointed out, is along the Khagri Khola and the belt of unspoilt country on its western bank. It is very desirable that local officers should study these seasonal movements.

The Future of the Rhinoceros in Nepal.

The great danger to rhinoceros from poachers, on account of the horns which are sold and commercialized as an aphrodisiac, exists and will continue to exist. It is being dealt with by the Rhinoceros Protection Department which is doing good work in difficult circumstances. In fact, it is surprising that more rhinoceros are not shot by poachers. The officers in charge possess no maps, and appear to have no instructions to observe or study the habits, distribution, numbers, or movements of rhinoceros. Many of the rhinoceros guards (sepoys) have received no training. The service conditions of these guards, Rs. 30 per month Nepal currency (£1 7s. 0d.) with no rations, no uniform and no accommodation, are inadequate and are below those enjoyed by the *hatisar* personnel. Some of the ammunition does not “go off”. No rewards or promotions appear to be awarded for good work, such as the capture of poachers or recovery of horns. As the value of these horns is very high—as much as Rs. 3135 Indian currency (£235) was paid to a poacher for a horn obtained in the Reu Valley—and the temptation to a lowly-paid guard very great, a system of promotion and rewards would have a stimulating effect.

But a danger to the rhinoceros of Nepal greater than that from poachers has arisen in the development and settlement of the grasslands of the Rapti Valley. As there is now increased competition for grasslands between human occupants and wild life, a decision will have to be made by the Government as to whether settlement of human population is going to occupy all the available land of the Rapti Valley, or whether water and soil conservation and wild life preservation will have their rightful place in development schemes. It is confidently to be hoped that as a matter of wise land-use the authorities will set apart the appropriate areas for these urgently necessary requirements.

Changed Habits.

The habits of the rhinoceros of Nepal have been affected by two main factors. Firstly rhinoceros have been shot for sport as well as by poachers for a very long time, if not since time immemorial. Secondly they have been pushed further and further back from their habitat and feeding grounds, particularly during the past four years, by the influx into the grasslands of both authorized and unauthorized settlers. Consequently they have become more and more hunted and persecuted, and like an outlawed political party have "gone underground", taking refuge in the thick scrub forest of the riverain tracts. They have become very scared, and if encountered in their hiding places frequently charge before rushing away to another hiding place. They have become very much more nocturnal than rhinoceros in India, and are rarely if ever to be found grazing in the open during day time. Their dung often consists of individual droppings, or very small dung heaps instead of the large dung heaps found in Assam, and this is probably due to their more furtive existence. Though Jungle Mynahs (*Aethiopsar fuscus*) settle on rhinoceros in Nepal, Cattle Egrets (*Bubulous ibis*) are never found in their company, though they are always so found in Assam; and this also is probably due to the rhinoceros' nocturnal habits and furtive existence.

The fact that so many rhinoceros cows were seen with young calves (12 young calves out of 57 rhinoceros seen by my party) goes to show that the rhinoceros of Nepal have become accustomed to the new conditions in which they have to live and are actually thriving.

The average horn I saw in Nepal was very much smaller than in Assam, and I saw no old rhinoceros. Both sportsmen and poachers look for large horns; furthermore the older rhinoceros (often with large horns) are the more easily shot.

At the present moment the position of the rhinoceros in Nepal is very insecure, especially considering the impending influx of 25,000 more authorized settlers, and an unknown number of unauthorized ones, into the Rapti Valley. An irrigation scheme also is proposed which would lead off the water of the Khagri Khola and other streams to the newly-settled area. If this is put into effect, it will drain to a dangerously low level the rhinoceros habitat in the region of Tikoli and southwards to the Rapti.

It is not too late even now to allocate certain areas in the catchments of the rivers and streams for strict protection as a necessary and urgent measure of water and soil conservation ; to demarcate clearly the boundaries of Reserved Forests and to prevent indiscriminate cutting and burning within them ; and to allocate sufficient areas for rhinoceros and other wild life to live in safety and security alongside human settlers.

Owing to the various pressures and peculiar circumstances affecting the status of rhinoceros in Nepal it is recommended that the policy governing the administration of the national park and wild life preservation in general be a flexible one. While adhering as far as possible to the principles accepted by leading nature conservationists in the world, it is possible that certain departures from these principles might prove advantageous for the preservation of the rhinoceros. For instance, this species' partiality for a habitat near villages might indicate that a few carefully selected and strictly controlled "forest villages" inside the national park could be allowed, in which rhinoceros guards would have assistance and protection in their operations against poachers. Also the fact that tigers prey on very young rhinoceros might render it advisable to control the numbers of tigers in the rhinoceros inhabited areas, should they become excessive. Any wild life management policy would naturally have to be based on ecological study.