

Rhinos—and other Problems— in Nepal

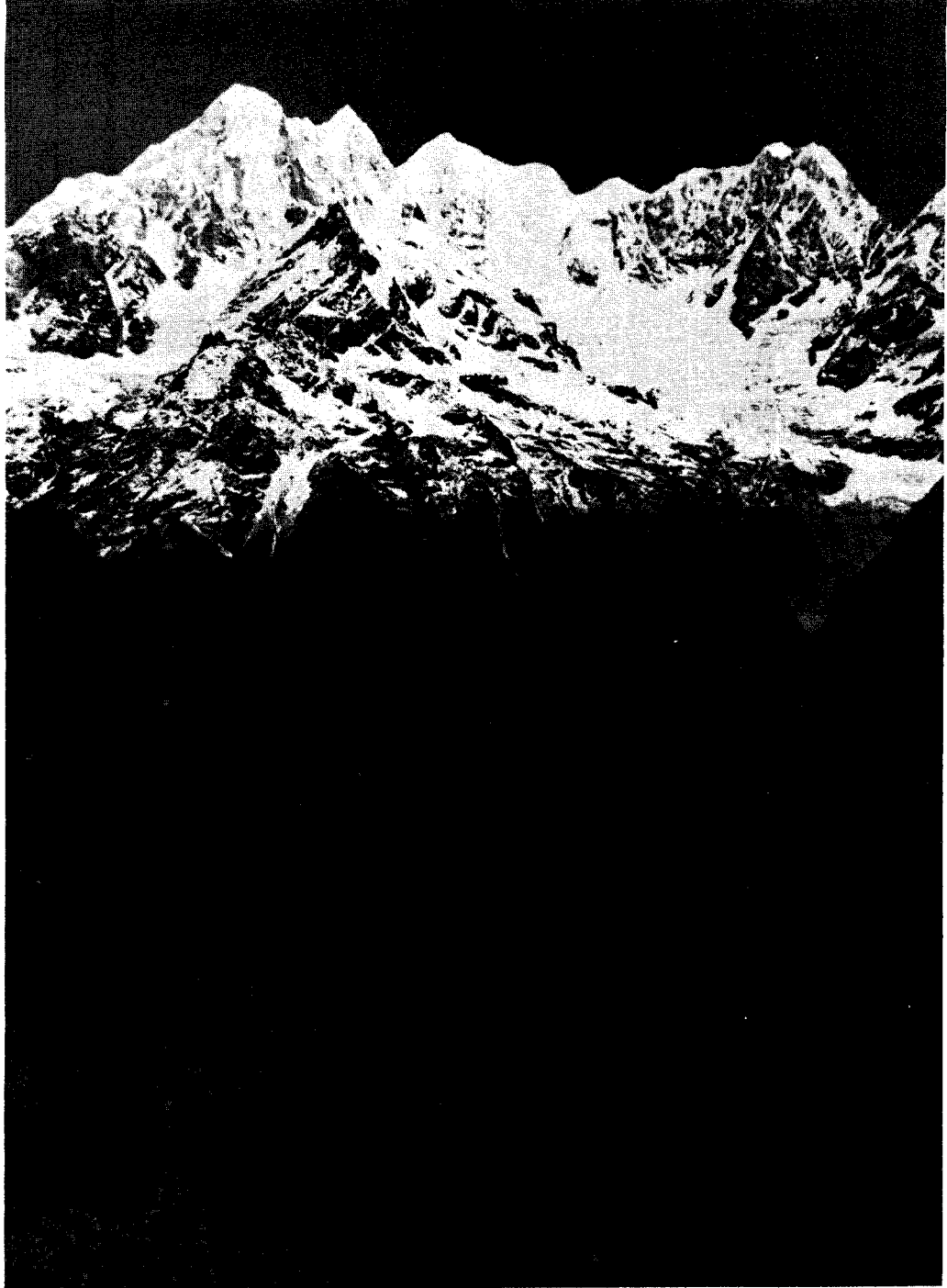
John Blower

Ten million cattle and $4\frac{1}{2}$ million sheep and goats, all increasing by nearly 2 per cent every year, combined with a rapidly increasing human population, pose severe problems for good land management in Nepal. But this small country, not much larger than England but with a dramatic and unique range of habitats, from low-lying swamps to the highest mountains in the world, has now embarked on a conservation programme aided by the United Nations Development Programme and the World Wildlife Fund. Plans have been drawn up for four new national parks, covering over 1000 square miles—one including Everest has been approved by the Government—and four new wildlife reserves. Between them these would ensure the survival of most of Nepal's endangered species, including Indian rhino and elephant, tiger, gaur, and both snow and clouded leopards. The author, well known for his conservation work in Africa, has been since 1970 FAO Adviser to the Nepal Government on national parks and wildlife management, under the UN Technical Assistance Programme.

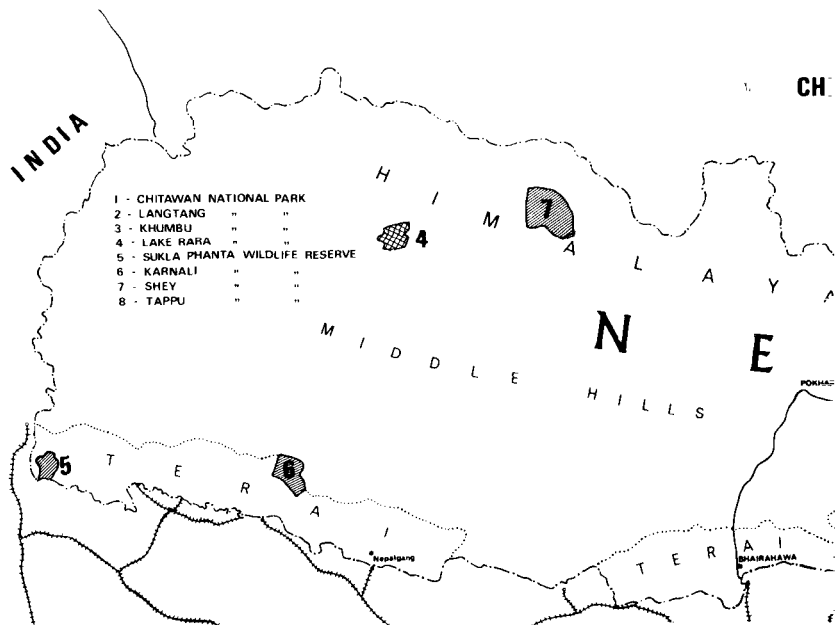
Roughly rectangular in shape, about 500 miles from east to west, and averaging 120 miles in width from north to south, Nepal has a land area of 54,000 square miles—rather larger than England and roughly the same size as Florida. To the north lies the Tibet Province of China, to the south and west India, and to the east Sikkim. The human population is estimated at 11.29 million (1970/71), which, at the present growth rate, will double in the next thirty years.

The central Himalayas extend in a chain of massive snow peaks across the northern part of the country, broken only by the few great rivers such as the Karnali, Kali Gandaki and Arun, which have channelled their way southwards from Tibet or near the border through immensely deep gorges, eventually to join the Ganges in the plains of northern India. By contrast the terai, the narrow belt of low-lying country in the south, is only a little above sea level; part of the fertile Gangetic plain, this is the most productive agricultural and forest land in the country. Including these extremes, Nepal can be divided into seven distinct topographical and ecological zones. From south to north these are:

1. **Terai:** a belt of alluvial plains about 30 miles in width at an elevation of 300-700 ft;
2. **Siwaliks:** the outermost range of the Himalayan foothills, 2000-3000 ft high, but in places reaching 6000 ft;
3. **Mahabharat Lekh:** a precipitous mountain wall 6000-10,000 ft high, extending almost the whole length of the country from east to west;
4. **Middle Hills:** a broad belt of rolling hilly country at 2500-10,000 ft,



THE LANGTANG MASSIF IN THE HIMALAYAS
Photographs by John Blower



intersected by meandering river valleys which occasionally broaden into fertile basins, such as that of the Kathmandu valley;

5. **Himalayas:** the main Himalayan range, a series of great massifs rising steeply to peaks of 24,000 to 29,000 ft, separated by immense river gorges the bottoms of which are sometimes as much as 20,000 ft below the peaks;

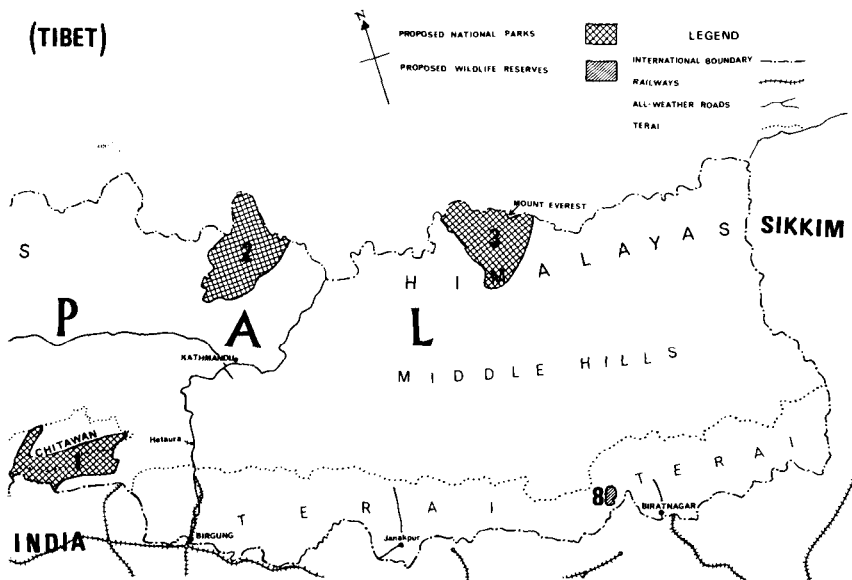
6. **Inner Himalayas:** consisting of broad valleys, usually running in an east-west direction at 8000 to 12,000 ft, and separated by mountain ranges generally lower than the main range;

7. **Trans-Himalaya:** broad rolling hills and valleys at 12,000 to 15,000 ft, with mountain ranges rising to about 20,000 ft separating the Himalayas from the southern limits of the great Tibetan plateau to the north.

Nepal thus displays unique altitudinal variations, ranging within little more than 100 miles from flat plains at near sea level to the snow and ice-covered crests of the highest mountains in the world—Mt Everest is 29,028 ft. Ecologically the biomes encompassed within these extremes range from tropical evergreen forest in the south, through the temperate broad-leaved and coniferous forests of the midlands, to the various alpine associations of the high Himalayas and the treeless steppes of the trans-Himalayan region beyond. In addition to the influence of altitude changes on the ecology, there are also marked east-west variations due to climatic factors, notably the decrease in monsoon rainfall towards the west.

These widely differing habitats carry a diverse fauna ranging from the tiger, elephant, gaur, one-horned rhinoceros and other species characteristic of the Oriental Region in the south, to the wild sheep, musk deer, snow leopards and marmots of the Palaearctic Region north of the Himalayas. But, as Caughley pointed out (1969), there is a distinct east-west species gap in the Himalayan fauna, and the number of species occurring in the central Himalayas is lower than in the areas to both east and west. For example the range of

(TIBET)



markhor, ibex, wild goat and urial, which are all found in the western Himalayas, does not extend to Nepal, nor does that of the takin which is found in Bhutan, North Burma and Yunnan to the east. The list on pages 274 and 275 gives some of the more important mammal species occurring or formerly occurring in Nepal, together with their approximate range and status where known.

Resident and Migrant Birds

Nepal also has a rich and varied avifauna, including not only numerous resident species but many migrants, some moving south from their breeding grounds in Tibet and elsewhere to winter in Nepal and India, and others moving north from India to breed in summer in Nepal. Residents include eight species of pheasant, of which the spectacularly colourful Himalayan monal *Lophophorus impeyanus*, peafowl *Pavo cristatus* and red junglefowl *Gallus gallus* are still common in the terai forests. Migrants include the bar-headed goose *Anser indicus* which in October moves in great numbers down its regular flyways along major rivers such as the Karnali and Kosi, returning northwards in March to its breeding grounds on the great Tibetan lakes.

But in the past twenty years Nepal's wildlife has been greatly depleted, despite its relatively wide range of species, as a result of indiscriminate hunting and habitat destruction following the enormous spread of human settlement. In former times most of the terai was wild forest country, with few human inhabitants apart from the indigenous Tharus; the forest and its wildlife were effectively protected both by the ruling Rana regime, who guarded it as a royal hunting reserve, and also by malaria which discouraged incursions by the hill-dwelling peoples from the north. But with the overthrow of the Ranas in 1950 followed by the eradication of malaria and opening of the country to settlement, large numbers of land-hungry people from the hills moved down into the fertile terai

Some Mammals in Nepal

Species	Range	Status
TERAI		
Tiger	Chitawan, Bardia	80–100
<i>Panthera tigris</i>	Kanchanpur and other isolated areas	Endangered
Rhinoceros	Chitawan	120–150
<i>Rhinoceros unicornis</i>		Endangered
Elephant	Small isolated groups in central & south-western terai	20–30
<i>Elephas maximus</i>		Endangered
Buffalo	Kosi River (Tappu),	40
<i>Bubalus bubalis</i>	Eastern Terai	Endangered
Gaur	Siwalik Hills, probably now confined to Chitawan District	100–200?
<i>Bos gaurus</i>		
Sambar	Terai and Siwaliks	Widely distributed and fairly plentiful
<i>Cervus unicolor</i>		
Chital	Terai and lower slopes of Siwaliks	Widely distributed and fairly plentiful
<i>Axis axis</i>		
Hog deer	Grassland areas of the terai	Small isolated populations
<i>Axis porcinus</i>		
Swamp deer	An area of about 20 sq miles in the Sukla Phanta Royal Hunting Reserve, western terai	About 1200
<i>Cervus d. duvauceli</i>		
Four-horned antelope	Western terai	Rare
<i>Tetracerus quadricornis</i>		
Blackbuck	Western terai	Probably extinct
<i>Antelope cervicapra</i>		
Blue bull (nilgai)	Isolated populations in western and eastern terai	Moderately plentiful in areas where it occurs
<i>Boselaphus tragocamelus</i>		
Sloth bear	Terai and Siwaliks	Fairly common in most forest areas
<i>Melursus ursinus</i>		
Clouded leopard	Terai and possibly elsewhere	Rare and probably endangered
<i>Neofelis nebulosa</i>		
Pygmy hog	Terai	Probably extinct
<i>Sus salvanius</i>		
HIMALAYAS		
Blue sheep	Mainly inner and trans-Himalayas	Fairly numerous in certain isolated localities
<i>Pseudois nayaur</i>		
Great Tibetan sheep	Unconfirmed reports from Humla and Charkabhot only	Rare and endangered
<i>Ovis ammon hodgsoni</i>		
Himalayan tahr	Throughout in areas of suitable habitat between about 10,000 and 15,000 ft.	Fairly common
<i>Hemitragus jemlahicus</i>		
Serow	Forested valleys between 6000 and 12,000 ft.	Fairly common
<i>Capricornis sumatraensis</i>		
Goral	Throughout in areas of suitable habitat up to about 10,000 ft.	Common
<i>Nemorhaedus goral hodgsoni</i>		

BLUE SHEEP



Musk deer <i>Moschus moschatus</i>	Isolated populations in areas of suitable habitat at 10,000–13,000 ft.	Becoming increasingly rare due to intensive commercial hunting
Wild yak <i>Poephagus grunniens</i>	Reported to have occurred until recent years in certain trans-Himalayan areas, e.g. Charkabhot	Probably extinct
Snow leopard <i>Panthera uncia</i>	Distribution scattered, generally above tree-line (12,000–15,000 ft.)	Rare and probably endangered
Red panda <i>Ailurus fulgens</i>	Forests between 8000 and 12,000 ft.	Fairly rare though not yet endangered
Himalayan marmot <i>Marmota bobak</i>	Inner and trans-Himalayas at 12,000–16,000 ft. in west only	Fairly abundant in widely separated colonies
Mouse hare <i>Ochotona roylei</i>	Widely distributed throughout between 11,000 and 14,000 ft.	Common
TERAI, HIMALAYAS and suitable intermediate areas		
Himalayan bear <i>Selenarctos thibetanus</i>	Throughout in most forest areas up to tree line, but commoner in Himalayan valleys	Fairly common
Leopard <i>Panthera pardus</i>	Throughout up to tree line	Not yet endangered but becoming increasingly rare
Barking deer <i>Muntiacus muntjak</i>	Throughout in forest areas up to about 8000 ft.	Fairly common
Wild boar <i>Sus scrofa</i>	Throughout up to about 10,000 ft.	Common
Wild dog <i>Cuon alpinus</i>	Throughout up to about 12,000 ft.	Status unknown but probably becoming rare
Rhesus monkey <i>Macaca mulatta</i>	Throughout up to about 10,000 ft.	Common
Langur monkey <i>Presbytis entellus</i>	Throughout in forest areas up to about 12,000 ft.	Fairly common

plains and cleared much of the valuable forest for agricultural settlement, so that now there are only isolated patches separated by extensive tracts of cultivated land interspersed with towns and villages, and even the few surviving forest areas are being steadily eroded through cultivation encroachment and the combined effects of burning and grazing.

In the mountains also the ever increasing population pressure, combined with extensive livestock grazing and inefficient agricultural methods, results in progressive deforestation, which in turn leads to erosion, loss of soil fertility and flood damage, destroying agricultural land which in turn leads to the clearing of more forest to replace it. Thus, though the need for wildlife conservation is urgent, it must be viewed in the broader perspective of overall environmental management. There can be few countries in the world where the natural environment is more vulnerable than in Nepal, and where its continued abuse will have more calamitous repercussions. The sal *Shorea robusta* forests of the terai are the country's most valuable commercially exploitable natural resource by far, but, if present trends continue, in 20 or 30 years they will have disappeared. Similarly the last protective remnants of pine, fir, spruce, oak and other forest cover clothing the steep Himalayan mountainsides, reducing run-off, delaying snow-melt and binding the soil, will also have gone. The results of deforesting watersheds and catchment areas are already only too apparent in the yearly more disastrous landslides in the mountains, in the flood damage and silting of dams and barrages in the lowlands, which affects not only Nepal but also adjoining areas of northern India.

Fortunately the Government is becoming increasingly aware of the urgency of these problems, and, with assistance from FAO and other sources, is now taking active measures in various fields of environmental management, including erosion control, forestry, establishment of national parks and the conservation of wildlife resources. But no efforts in these directions can achieve any lasting success unless the basic problems of reducing the population growth, limiting the domestic livestock numbers, and increasing agricultural productivity are also tackled quickly and effectively.

The enormous numbers of domestic livestock are the most serious obstacle to both forest and wildlife management. Cattle and buffalo are currently estimated to total 10 million, and sheep and goats $4\frac{1}{2}$ million, both numbers increasing at an average rate of nearly two per cent a year. Cattle, in particular, are generally of inferior quality and largely unproductive, but cannot be slaughtered for food, despite the chronic protein shortage in many areas, because the cow is sacred, Nepal being a Hindu country. Increasing grazing pressure exacerbates erosion and prevents forest regenerating so that even forest which is not deliberately cleared is gradually replaced by grassland and worthless scrub.

Poaching is widespread. To hunt legally requires a licence, but very few Nepalīs trouble to get one, and there is much indiscriminate shooting of chital, sambar and other species for meat. But the most destructive poaching is commercial, and the most serious the



RHINOS IN THE CHITAWAN SANCTUARY

SWAMP DEER IN THE SUKLA PHANTA RESERVE



continued killing of rhinoceros for the horn. Unless this is soon brought under control it is likely to exterminate the rhino in Nepal within a very few years. Since 1950 numbers in Chitawan have been reduced from 800 to approximately 120, and killings by poachers still average about ten per year. The tiger is now strictly protected by law, but a certain number are being taken by poachers, frequently using Folidol, a tasteless but very toxic agricultural pesticide used to poison cattle and other carcasses killed by tiger. There is also extensive illegal hunting and trapping of musk deer, which, although the species is not in immediate danger, must inevitably threaten its survival if continued at the present level.

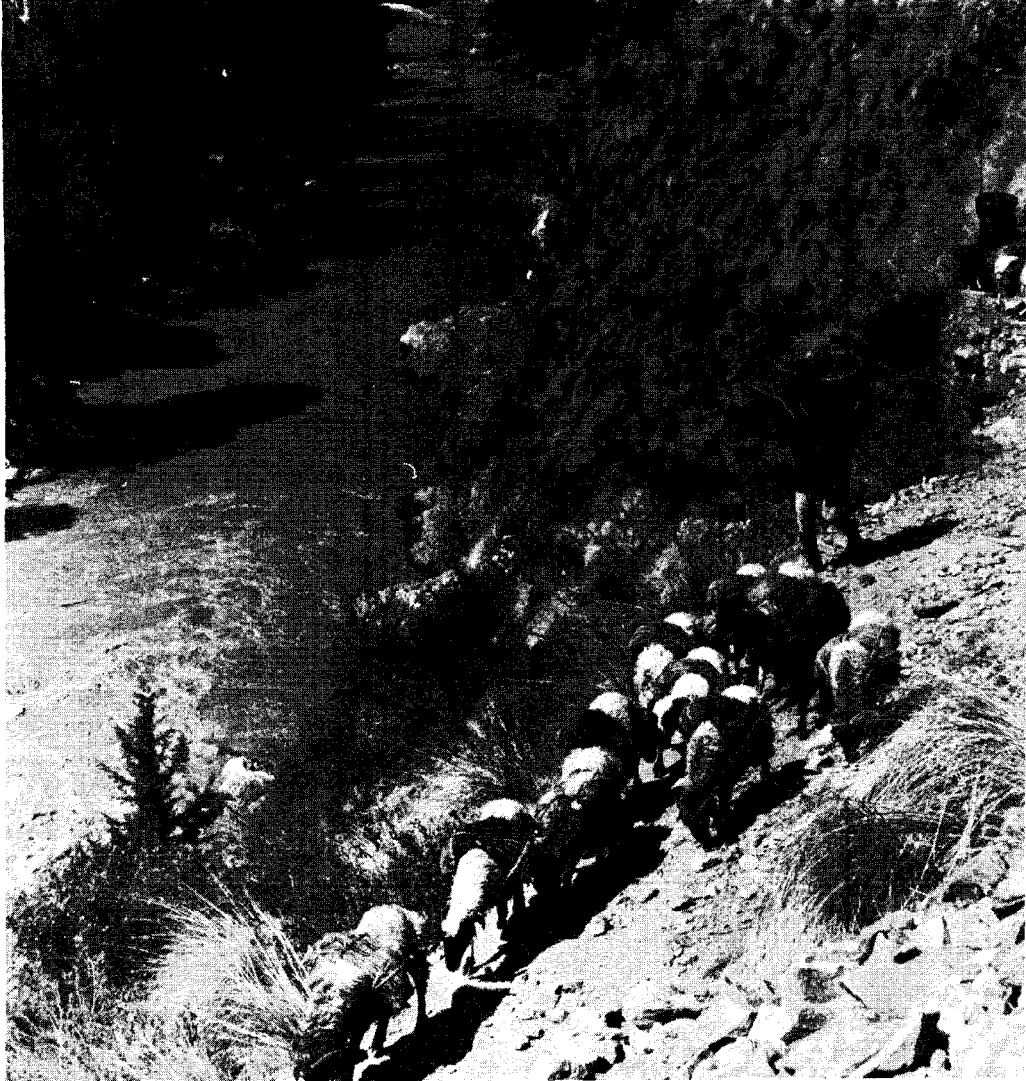
Clearly conservation measures are urgently needed. The Nepal Government has now initiated a conservation programme with assistance from FAO and the World Wildlife Fund. A National Parks and Wildlife Act has been passed, based on extensive surveys carried out in the past three years, in both the terai and the Himalayas, to a National Parks and Wildlife Conservation Section of the Forest Department established. Several Nepalis have completed overseas training in wildlife management under FAO/UN fellowships. Four national parks and four reserves have been proposed, and one in the Khumbu (Everest) area, has been approved by the Government and given high priority.

Proposed national parks

Chitawan (approx. 210 sq. miles) would include a part of the Siwaliks and of the intervening riverine grasslands or 'duns' which are the typical rhino habitat—about 120 remain in the area—and would protect also tiger, gaur, sambar, chital, hog deer, Gangetic dolphin (found in the Narayani River) and other species. The boundaries have been demarcated and development work has started, and, although poaching and grazing by domestic livestock are still serious problems, Chitawan is expected to be officially declared a national park in the near future.

Langtang (approx. 500 sq. miles), a mountain park in the Himalayas north of Kathmandu, would include the scenically attractive alpine Langtang Valley, the Gosainkund plateau with its group of sacred cirque lakes, and the headwaters of a number of rivers rising on the flanks of the Langtang-Gosainkund massif. This park would be particularly valuable in protecting forested catchment areas, as well as conserving Himalayan tahr, musk deer and other species, and for developing tourism. It has been officially approved and the boundaries demarcated, but not yet gazetted.

Khumbu (approx. 320 sq. miles), a mountain park in eastern Nepal, that has been approved by the Government. This includes Mount Everest and several other high peaks, together with the valley of the Imja Khola, which rises on the Khumbu glacier below Everest. The main objectives here are to protect the rapidly diminishing forest and its wildlife, to provide suitable facilities for the increasing numbers of tourists, and to guard against undesirable commercial development.



GOATS AND SHEEP used as pack animals in the Himalayas

Lake Rara (approx. 40 sq. miles) in western Nepal at 10,000 ft, is the country's largest lake and connected with the Karnali river system. The park would include the whole lake and its surrounding catchment area, together with an area of hill country to the south known as Chuchamara Dara, and would protect Himalayan bear, serow, goral, Himalayan tahr, musk deer, red panda and other species, while the lake itself is an important resting place for migratory waterfowl. This park has been approved and development will start later this year.

Wildlife Reserves

Sukla Phanta (approx. 60 sq. miles), which includes extensive areas of grassland and forest bordering the Muhakeli River in the western

terai, is of special importance as the last remaining swamp deer habitat in Nepal; other major species include tiger, leopard, bear, sambar, chital, hog deer and blue bull (nilgai). A particularly attractive area, where wildlife is easy to see, this might eventually be upgraded to national park status.

Karnali (approx. 100 sq. miles) in Bardia District of the terai, on the east bank of the Karnali River, is mostly sal forest which has been effectively protected for many years as a royal hunting reserve. Wildlife includes the largest remaining population of tiger in Nepal, also bear, leopard, sambar, chital, hog deer and nilgai.

Tappu (approx. 12 sq. miles), on the east bank of the Kosi River in the eastern terai, a relatively small area of riverine flood plain, holds Nepal's last surviving population of wild buffalo (approx. 40), also one or two tigers, sambar, chital, hog deer and nilgai.

Shey (approx. 160 sq. miles), a trans-Himalayan area in Dolpo District (north-western Nepal) at 12,000-18,000 ft, has an unusually large population of blue sheep *Pseudois nayaur*, also Himalayan marmots, snowcock *Tetraogallus himalayensis* and other characteristic species.

These parks and reserves would be only a beginning as far as Nepal's conservation programme is concerned, but their effective protection and management would safeguard viable examples of most of the more important biomes and should ensure the survival of the endangered rhinoceros, tiger, swamp deer, gaur and wild buffalo. Though there is relatively little wildlife in the proposed mountain parks and reserves, they would be of considerable scientific value as gene pools for the Himalayan flora, as study areas for ecological, physiological and other high altitude research, and as controls for environmental planning and management in the Himalayan region as a whole. But perhaps the greatest short-term benefit national parks can bring to Nepal is tourism, on which the country's economy is likely to become increasingly dependent.

Nepal is not a wealthy country, but the government is now providing fairly substantial funds for the conservation programme. The UN Development Programme and the World Wildlife Fund are providing financial and technical assistance, while a further large-scale UNDP/FAO national parks and wildlife conservation project has been approved and is likely to start in the near future. This will provide assistance in the development of national parks over an initial three-year period, including technical advice, provision of equipment and training of local personnel.

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