

U N E S C O

Convention concerning the Protection of the World Cultural and Natural Heritage
NOMINATION TO THE WORLD HERITAGE LIST

Name: ROYAL CHITWAN NATIONAL PARK

Identification No: 284

Date received by WH Secretariat: 3.8.83

Contracting State Party having submitted the nomination of the property in accordance with the Convention: NEPAL

Summary prepared by IUCN (March 1984) based on the original nomination submitted by Nepal. This original and all documents presented in support of this nomination will be available for consultation at the meetings of the Bureau and the Committee.

1. LOCATION: Southern central Nepal on the border with India.

2. JURIDICAL DATA:

Owned by the Government of Nepal, and managed by the Department of National Parks and Wildlife Conservation. The area had been well protected for hunting purposes from 1846 to the early 1950s. Park proposals were made as early as 1959 and the park itself was established in 1973 under the National Park and Wildlife Conservation Act. A total of 22,000 settlers were moved out of the area. Substantial additions were made in 1978, and there are proposals for a further eastward extension which would increase the park area by another 40%.

3. IDENTIFICATION:

Royal Chitwan National Park covers 932 sq km of sub-tropical lowland, wedged between two east-west river valleys at the base of the Siwalik range of the outer Himalayas. The rocks of this range are predominantly composed of sandstones, conglomerates, quartzites, shales and micaceous sandstones. The altitude varies from 150 to 760 m. Monsoon rains, when nearly 2,000mm fall between June and September, cause dramatic floods, large changes in river character and often significant changes in the river courses. Seasonal climatic changes are profound, and in the winter, dry northerly winds reduce temperature and humidity considerably.

The park is dominated by almost monotypic stands of sal forest which occupy 60% of the total area and is a remnant of the lowland Terai which stretched across the foot of the Himalayas through India and Nepal. Riverine forest and grasslands form a mosaic along the river banks maintained by seasonal flooding. On the hills are pines and scattered palms, and moister slopes support bamboos.

The park contains the last Nepalese population (estimated at 400) of the endangered great one-horned Asian rhinoceros which is the second largest concentration of this species to occur after Kaziranga in India. Royal Chitwan is also one of the last strongholds of the Royal Bengal tiger. Other threatened mammals occurring in the park include leopard, wild dog and gaur which are listed by IUCN as vulnerable, and the sloth bear. Other mammals include sambar, chital, hog deer, barking deer, wild pig, monkeys, otter, porcupine, yellow-throated marten, civet, fishing cat, jungle cat, jackal, striped hyena and Indian fox. Aquatic species include the gangetic dolphin,

the mugger crocodile (listed by IUCN as vulnerable) and the endangered gharial. Over 350 reported bird species including greater hornbill, Bengal florican, peafowl, crested serpent-eagle, Himalayan grey-headed fishing eagle and white-back vulture. Ruddy shelduck and bar-headed goose winter on the rivers. The threatened Indian python also occurs within the park, and some 99 fish species inhabit the rivers and oxbow lakes.

4. STATE OF PRESERVATION/CONSERVATION:

Field management of the park was begun in 1971 and a Management plan for the period 1975-9 was prepared. The park has been attractive for scientific investigators and many field studies have been carried out. A visitor centre with displays is open to an increasing number of visitors to the "Tiger Tops" lodge.

The principal disturbances are fire, grass-cutting by the local population for thatch grass (the park is opened for 15 days each year for grass cutting) and tourism. There is antagonism against the park due to lost grazing and wood collection rights, crop damage (though there is now some compensation) and deaths caused by park animals. An increased education programme and better control on access along the northern boundary are current management priorities. Proposed construction of pulp mills in the region may cause a problem through downstream effects of effluent particularly on the gharial and planned usage of the park's grasses as a source of raw material.

5. JUSTIFICATION FOR INCLUSION ON THE WORLD HERITAGE LIST:

The Royal Chitwan National Park nomination, as presented by the Government of Nepal, provides the following justification for designation as a World Heritage property:

- a) Cultural property -- not applicable
- b) Natural property
 - (i) Earth's evolutionary history. The Churia Valley is an important watershed for northern India because of its unique topographical location.
 - (ii) On-going geological processes. The park is one of the last undisturbed examples of this type of habitat in south Asia and retains a high diversity of species.
 - (iii) Exceptional natural beauty. Wildlife viewing with the Himalayas as a backdrop attract relatively large numbers of visitors to the park.
 - (iv) Habitats of rare and endangered species. There are a number of threatened and endangered species (Bengal tiger, Asian one-horned rhinoceros, guar, Asiatic wild dog, sloth bear, gharial, Indian python) found in the park. With the proposed extension of boundaries, the park will become the largest protected area of its kind in south Asia.

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1. DOCUMENTATION:

- (i) Nomination form and maps
- (ii) IUCN Data Sheets
- (iii) Consultations: P. Jackson, J. Blower, J. McNeely
- (iv) Literature Consulted: Bolton, M. 1975. Royal Chitwan National Park Management Plan 1975-79. FAO Report.
IUCN Project Files
Milton, J.P. and G.A. Binney. 1980. Ecological Planning on the Nepalese Terai. Threshold Report to WWF and Sierra Club.
Mishra, H.R. 1982. Balancing Human Needs and Conservation in Nepal's Royal Chitwan Park. Paper presented at the World Congress on National Parks, Bali, Indonesia.

2. COMPARISON WITH OTHER AREAS

Within the Nepal Terai there are three other protected areas: the Karnali Wildlife Reserve, the Sulkaphanta Sanctuary and the Kosi Tappu Sanctuary. None of these areas contain rhino or the species diversity of Royal Chitwan. Further, all are of much smaller size and have lesser legislative protection.

Comparable areas in India are the Kaziranga National Park and the Corbett National Park. Kaziranga has a higher population of the endangered Asian one-horned rhino but is in a different Biogeographical Province with a different mix of species, and does not contain gharials. Corbett is in the same province but has fewer numbers and less diversity of species.

Chitwan's tall grass/riverine forest wild ungulate biomass density (18,590 kg/sq km) is reported to far exceed that reported anywhere else on the Indian subcontinent and approaches that found in some of the reserves of Africa. Chitwan is the largest and least disturbed example of natural Sal hill forest and associated communities of the Terai. It also has the longest period of protection dating back to its use as a Royal Hunting Preserve in the early 1800s. The scientific values of the area, especially in terms of research on rhino and tiger have provided a model for many other areas.

3. INTEGRITY

Royal Chitwan is managed to a high standard with a staff that includes a professional warden and 450 armed guards. Indexes of the success of the national park programme have been the four-fold increase in the rhino population and the revegetation and stabilization of the banks of the Rapti River which has had important erosion and flood control benefits. Boundaries are well defined and the park has a management plan, although it needs updating. Extensions to the park are being considered by the Government.

Threats to the park include some subsistence poaching of vegetation and fuelwood along the boundaries and intensive fishing in the bordering rivers. Collection of thatch grass in the park by villagers is well controlled and is not seen as a

negative impact. Local villagers harbour a significant resentment to the existence of the park primarily due to crop damage by wildlife. By allowing thatch grass collection and by provision of conservation education and other public relations programmes, these problems are being addressed by the National Parks Office.

Currently some 8000 tourists visit the park annually with an average stay of 3 nights. This provides a significant economic justification for the park and the facilities developed are a model of appropriate park accommodation.

The major threat to the integrity of the park is the proposed establishment of two pulp mills on the Narayani River upstream of the park. Apart from the park being a potential source of raw material, the effluent could seriously affect the riverine ecology, particularly for the endangered gharial.

4. ADDITIONAL COMMENTS

Nepal's commitment to protected area management is strong and is reflected in the increased management input that has gone into Sagarmatha National Park since it was given World Heritage status in 1979.

IUCN/WWF concern for Chitwan has been demonstrated in the over US\$500,000 provided for assistance to the park. FAO has also supported Chitwan since 1970 under the National Parks and Wildlife Conservation Project.

5. EVALUATION

Royal Chitwan meets three criteria for World Heritage natural properties. The park is an outstanding example of geological processes and biological evolution as the last major surviving example of the natural ecosystems of the Terai region (criteria ii). The research on the natural history of the area has been an important contribution to man's knowledge of ecological systems in the Terai.

The park also contains superlative natural features of exceptional natural beauty in terms of its scenic attractions of forested hills, grasslands, great rivers and views of the distant Himalayas (criteria iii). Additionally, the park provides critical and viable habitat for significant populations of several rare and endangered species, especially the one-horned Asian rhino and the gharial (criteria iv). The current management of the park is of a high standard and the Government of Nepal has clearly demonstrated that it recognizes the value of the park as an important part of Nepal's heritage.

6. RECOMMENDATIONS

Royal Chitwan National Park should be added to the World Heritage List. The Committee should note and support efforts to extend the park's western border. The Committee should also express its interest in being kept informed of the possible construction of pulp mills on the Narayani River and its potential impact on park resources.

NEPAL-Royal Chitwan National Park

NEPAL

NAME Royal Chitwan National Park including Parsa Wildlife Reserve

IUCN MANAGEMENT CATEGORY II (National Park)
X (World Heritage Site: Criteria: ii, iii, iv)

BIOGEOGRAPHICAL PROVINCE 4.08.04 (Indus-Ganges Monsoon Forest)

GEOGRAPHICAL LOCATION Chitwan lies in the lowlands or Inner Terai of southern central Nepal on the international border with India. The park's boundaries extend from the Dauney Hills on the west bank of the Narayani River eastward 78km to Hasta and Dhoram rivers. The park is bounded to the north by the Narayani and Rapti rivers and to the south by the Panchnad and Reu rivers and a forest road. 27°20'-27°40'N, 83°52'-84°45'E

Parsa is contiguous with the eastern boundary of the park and extends as far eastwards as the Bheraha and Bagali rivers. 27°15'-27°35'N, 84°45'-84°58'E

DATE AND HISTORY OF ESTABLISHMENT Chitwan was declared a national park in 1973, following approval by the late King Mahendra in December 1970. The bye-laws (Royal Chitwan National Park Regulations) were introduced on 4 March 1974. Substantial additions were made to the park in 1977 and the adjacent Parsa Wildlife Reserve was established in 1984. The habitat had been well protected as a royal hunting reserve from 1846 to 1951 during the Rana regime. An area south of the Rapti River was first proposed as a rhinoceros sanctuary in 1958 (Gee, 1959), demarcated in 1963 (Gee, 1963; Willan, 1965) and later incorporated into the national park. Chitwan was designated as a World Heritage site in November 1984.

AREA Chitwan was enlarged from 54,400ha to its present size of 93,200ha in 1977. Parsa Wildlife Reserve covers 49,900ha. There was a proposal to further enlarge the protected areas complex by establishing the 25,900ha Bara Hunting Reserve (Wegge, 1976; Smith and Mishra, 1981), adjacent to and east of Parsa Wildlife Reserve, but this has been dropped (B.N. Upreti, pers. comm., 1986).

LAND TENURE State

ALTITUDE Altitude ranges from 150m to 815m on the Churia Range.

PHYSICAL FEATURES Chitwan is situated in a river valley basin or dun, along the flood plains of the Rapti, Reu and Narayani rivers. The Someswar and the Dauney hills form the southern catchment and both drain into the Narayani. The Churia Hills bisect the park, their northern face falling within the catchment of the Rapti and southern side forming the catchment of the Reu. The Rapti is bounded by the Mahabharat Range on the north. Both the Rapti and Reu flow westwards and drain into the Narayani, which meanders southwards for about 25km through a narrow gorge between the

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Someswar and Dauneey hills until it reaches the Nepal-India border. Here it is dammed near Tribenighat. The Narayani is also called the Gandaki and is the third largest river in Nepal. It originates in the high Himalaya and, after joining the Ganges in India, drains into the Bay of Bengal. The Churia, Someswar and Dauneey hills constitute part of the Siwaliks which are characterised by outwash deposits carried from the north. All the rocks are of Pliocene or Pleistocene, fluvial origin, and consist mainly of sandstones, conglomerates, quartzites, shales and micaceous sandstone. The Siwaliks show a distinctive fault pattern that has produced steep cliffs on the south-facing slopes, where vegetation cover is poorer than the northern slopes. The Mahabharat Range consists of severely eroded pre-Siwalik quartzites, phyllites and sandstones. The flood plains comprise a series of ascending alluvial terraces laid down by the rivers and subsequently raised by Himalayan uplift. The terraces are composed of layers of boulders and gravels set in a fine silty matrix. There is a rough gradient from the higher-lying boulders and gravels to sands and silts and then to the low-lying silt loams and silty clay loams (Bolton, 1975; Laurie, 1978). The wetlands are described by Scott (1989).

CLIMATE Conditions are subtropical with a summer monsoon from mid-June to late-September, and a relatively dry winter. Mean annual rainfall is 2400mm with about 90% falling in the monsoon from June to September. Monsoon rains cause dramatic floods and changes in the character and courses of rivers. Temperatures are highest (maximum 38°C) during this season and drop to a minimum of 6°C in the post-monsoon period (October to January), when dry northerly winds from the Himalaya and Tibetan Plateau are prevalent (Bolton, 1975; Laurie, 1978).

VEGETATION The climax vegetation of the Inner Terai is sal Shorea robusta forest, which covers some 70% of the park (Laurie, 1978). However, floods, fires and riverine erosion combine to make a continually changing mosaic of grasslands and riverine forests in various stages of succession. Purest stands of sal occur on better drained ground such as the lowlands around Kasra in the centre of the park. Elsewhere, sal is intermingled with chir pine Pinus roxburghii along the southern face of the Churia Hills and with tree species such as Terminalia belerica, Dalbergia latifolia, Anogeissus latifolius, Dillenia indica and Garuga pinnata on northern slopes. Creepers, such as Bauhinia vahlii and Spatholobus parviflorus, are common. The understorey is scant with the exception of grasses such as Themeda villosa. Riverine forest and grasslands, which form a mosaic along the river banks, are maintained by seasonal flooding. Khair-sissoo Acacia catechu-Dalbergia sissoo associations predominate on recent alluvium deposited during floods and in lowland areas that escape the most serious flooding. Semal-bhellar Bombax ceiba-Trewia nudiflora, with understorey shrubs Callicarpa macrophylla, Clerodendrum viscosum and Phyllanthus emblica, represent a later stage in succession. Two other types of riverine forest (Eugenia woodland and tropical evergreen forest) occur in areas outside the present boundary of the park. Laurie (1978) identified seven major grassland types, which constitute about 20% of the park's area: Themeda villosa forms a tall grass cover in clearings in the sal forest; Saccharum-Narenga associations grow as mixed and pure stands of tall grass

(Saccharum spontaneum is one of the first species to colonise newly created sandbanks); Arundo-Phragmites associations form dense tall stands along stream beds on the flood plain and around lakes; Imperata cylindrica grows prolifically in areas within the park which were occupied by villages prior to their evacuation in 1964; various short grasses and herbs grown on exposed sandbanks during the dry months and become much more prolific with the outset of rain in May (e.g. Polygonum plebeium, Persicaria spp. and sedges such as Cyperus, Kyllinga and Mariscus spp.); Cynodon dactylon and Chrysopogon aciculatus and other short grasses grow in highest areas near riverine forest all the year round; and low-lying stands of Saccharum spontaneum, which are destroyed by repeated flooding early in the monsoon. A list of plant species is given by Laurie (1978).

FAUNA A detailed account of the park's fauna is given by Gurung (1983). Over 40 species of mammals have been recorded. Prior to its re-introduction to Royal Bardia National Park in 1986, the park contained the last Nepalese population of the Indian rhinoceros Rhinoceros unicornis (E). This had increased from about 300 in 1975 (Laurie, 1978, 1982) to about 350 in 1986 (Anon., 1986). It is currently estimated at 375-400 (Dinerstein, 1989). Tiger Panthera tigris (E) is present and has been the subject of a long-term study begun in 1974. The population increased from an estimated 25 in 1974 to 70-110 in 1980, of which 24-30 are resident breeders at any one time (Smith et al., 1983), but has recently crashed. Half of the resident tigers in the western portion of the park disappeared during the 1990 monsoon and two-thirds of dependent young were also missing (McDougal, 1991). Leopard Panthera pardus (T) is widespread and other threatened mammal species include wild dog Cuon alpinus (V), sloth bear Melursus ursinus (I), Ganges river dolphin Platanista gangetica (V), and gaur Bos gaurus (V). Hispid hare Caprolagus hispidus (E) is also present (Oliver, 1985). The sloth bear population totalled 50-60 in 1979 (Laurie and Seidensticker, 1977). The river dolphin population may have declined following the construction of a dam towards the Indian border. Seven were recorded in 1980 but none in 1990 (T.M. Maskey, pers. comm.). Wild elephant Elephas maximus (E) occasionally pass through the Churia Hills. Other mammals include rhesus macaque Macaca mulatta and common langur Presbytis entellus, smooth-coated otter Lutra perspicillata, yellow-throated marten Martes flavigula, ratel Mellivora capensis, spotted linsang Prionodon pardicolor, large Indian civet Viverra zibetha, small Indian civet Viverricula indica, common palm civet Paradoxurus hermaphroditus, Himalayan palm civet Paguma larvata, mongoose Herpestes spp., fishing cat Felis viverrina, leopard cat F. bengalensis, jungle cat F. chaus, jackal Canis aureus, striped hyena Hyaena hyaena, Indian fox Vulpes bengalensis, sambar Cervus unicolor, hog deer C. porcinus, spotted deer C. axis, Indian muntjac Muntiacus muntjak, wild boar Sus scrofa, Chinese pangolin Manis pentadactyla, five-striped palm squirrel Funambulus pennanti, Indian porcupine Hystrix indica and Indian hare Lepus nigricollis. The wild ungulate biomass within riverine/tall grass habitats has been estimated at 18,590 kg/sq. km. (Seidensticker, 1976), far exceeding that reported anywhere else in the Indian sub-continent. Most mammals found in the park also occurs in Parsa Wildlife Reserve with the exception of hog deer. Four-horned antelope Tetracerus quadricornis occurs in Parsa, on the southern slopes of the Churia Hills, and the reserve

contains Nepal's only reproducing herd of about 21 elephants (Smith et al., 1983).

A larger number of bird species has been recorded in Chitwan (489 in total) than in any other protected area in Nepal. This is attributed to the park's wide range of habitat types and location within the tropical lowlands of Central Nepal where eastern and western species overlap in their distributions. There are ten breeding species for which Nepal may hold internationally significant populations including Bengal florican Houbaropsis bengalensis (E) and rufous-necked laughing-thrush Garrulax ruficollis. It is the only locality in the country for striped buttonquail Turnix sylvatica, bristled grass warbler Chaetornis striatus and slender-billed babbler Turdoides longirostris. In addition, Chitwan is the only protected area where the following species considered to be at risk in Nepal have been found: yellow bittern Ixobrychus sinensis, black baza Aviceda leuphotes, laggar falcon Falco jugger, blue-breasted quail Coturnix chinensis, thick-billed green pigeon Treron curvirostra, mountain imperial pigeon Ducula badia, vernal hanging parrot Loriculus vernalis, red-winged crested cuckoo Clamator coromandus, banded bay cuckoo Cacomantis sonneratii, tawny fish owl Ketupa flavipes, white-vented needletail Hirundapus cochinchinensis, deep blue kingfisher Alcedo meninting, white-browed piculet Sasia ochracea, long-tailed broadbill Psarisomus dalhousiae, hooded pitta Pitta sordida, white-throated bulbul Criniger flaveolus, lesser necklaced laughing-thrush Garrulax monileger, greater necklaced laughing-thrush G. pectoralis, ruby-cheeked sunbird Anthreptes singalensis and little spiderhunter Arachnothera longirostra. Chitwan is very important for wintering birds (about 160 in total), both winter visitors from outside Nepal and many altitudinal migrants which descend to the lowlands outside the breeding season, as well as a valuable staging point for numerous passage migrant species (Inskipp, 1989). Details of the waterfowl are given by Scott (1989).

Some 19 species of snake occur in the park including king cobra Ophiophagus hannah, green pit viper Trimeresurus albolabris, common krait Bungarus caeruleus and Indian python Python molurus (V). Other notable reptiles are mugger Crocodylus palustris (V) (declining from at least 200 in 1978 to 70 in 1986/1988), gharial Gavialis gangeticus (E), Indian starred tortoise Geochelone elongata and monitor lizards Varanus spp.

Some 113 species of fish have been recorded, including Barilius spp., Tor tor, T. putitora and Puntius spp. (Edds, 1986).

CULTURAL HERITAGE The indigenous Tharus have lived in the Chitwan area for centuries, but they are out-numbered by settlers from the hills who poured into the Inner Terai following the eradication of malaria in the 1950s. There are two Hindu religious sites, Bikram Baba at Kasara and Balmiki Ashram at Tribeni, which are very significant to both the local people living around the park and visitors from India (B.N. Upreti, pers. comm., 1989).

LOCAL HUMAN POPULATION Padampur Panchayat, located immediately to the south of the Rapti River, is a heavily populated area as well as providing

LOCAL HUMAN POPULATION Padampur Panchayat, located immediately to the south of the Rapti River, is a heavily populated area as well as providing some of the last remaining habitat for tiger, rhinoceros, and gharial. In the 1950s, with the fall of the Rana regime and the eradication of malaria from the area, the human population of Chitwan rose dramatically from 36,000 to 100,000 between 1950 and 1960. By 1980 there were 261,300 people in 320 settlements around the park (Milton and Binney, 1980; Mishra, 1982a).

VISITORS AND VISITOR FACILITIES Chitwan is one of the most popular tourist destinations outside Kathmandu and Pokhara. Visitor numbers have risen from less than 1,000 in 1974 to 31,446 in 1989. Tiger Tops operates a Jungle Lodge and Tented Camp in the west of the park, and Tharu Village Resort peripheral to the park. Its Jungle Lodge pre-dates the park, having been set up by John Coapman in the mid-1960s (Willan, 1965). Other concession lodges inside the park are Chitwan Jungle Lodge and Machan Wildlife Resort in the east, and Tiger Temple in the west. Similar luxury lodges on the edge of the park are Gaida Wildlife Camp and Elephant Camp at Sauraha, and Island Resort and Narayani Safari. There are over 30 low-budget lodges and guest houses outside the park. Sauraha has a good visitor information centre (Berkmüller, 1979). There are no provisions for visitors in Parsa Wildlife Reserve, and no visitors were recorded in 1989.

SCIENTIFIC RESEARCH AND FACILITIES Chitwan is one of the best studied protected areas in the subcontinent. A programme of research concerning the ecology of the tiger and its prey species was initiated in 1973 by His Majesty's Government, the Smithsonian Institution and WWF (Sunquist, 1981; Wemmer *et al.*, 1983). This was superseded in 1984 by the Smithsonian-Nepal Terai Ecology Project, the scope of which encompasses broader aspects of ecology, including the relationship between habitats, invertebrate, vertebrate and human populations. Further details of its research activities can be found in the project's newsletter. McDougal (1977) also studied the tiger in the west of the park. The ecology of the Indian rhinoceros has been studied by Laurie (1978, 1982) and more recently by Dinerstein (1989). Other mammals studied include chital (Mishra, 1982b), hog deer (Dhungel, 1985) and muntjac (Oli, 1986). The avifauna is well documented (Gurung, 1983; Inskipp, 1989), with research including surveys of wetland species (Halliday, 1983). A gharial breeding centre, funded by Frankfurt Zoological Society, was established at Kasara Durbar in 1977. More than 200 young have been reared and re-introduced to the wild (Dhungel, 1987). T.M. Maskey has studied the survival and dispersal of gharial released in the Narayani River. Aberdeen University Expedition to Nepal (1980) surveyed fish resources in the Narayani River system with respect to the endangered gharial population. Studies on grassland ecology have been carried out by Lemkuhl *et al.* (1988). A proposal to establish the Nepal Conservation Training and Wildlife Institute has been made by the King Mahendra Trust for Nature Conservation, the Department of National Parks and Wildlife Conservation, Tribhuvan University and the Institute of Forestry (B.N. Upreti, pers. comm., 1989). The Smithsonian-Nepal Terai Ecology Project has its field station at Sauraha, where accommodation and facilities for scientists are available.

CONSERVATION VALUE Chitwan National Park and the adjacent Parsa Wildlife Reserve constitute the largest and least disturbed example of sal forest and associated communities of the Terai, with a long history of protection dating back to the early 1800s in the case of Chitwan. Species diversity is high, notably for mammals and birds which are well documented. Chitwan supports the world's second largest population of Indian rhinoceros and is also an important refuge for tiger and gharial. Its tall grasslands and riverine forest support a very high wild ungulate biomass which greatly exceeds that reported elsewhere in the Indian subcontinent. Large numbers of visitors are attracted to the area because of its exceptional natural beauty, with the distant Himalaya providing a spectacular backdrop to views of forested hills, grasslands, and great rivers. Research on the natural history of the area has been an important contribution to understanding ecological systems in the Terai (IUCN Technical Evaluation of World Heritage Nomination, 1984).

CONSERVATION MANAGEMENT Chitwan was identified as the priority area in the Terai for conservation due to its important faunal elements, particularly Indian rhinoceros which had been extirpated from its former range elsewhere in Nepal (Bolton, 1975). Development of the then proposed national park began in 1971 with a modest budget provided by the Forest Department and supplemented by a grant from WWF. Conservation measures have been an outstanding success, as indicated by the substantial increase in wildlife populations and regeneration of vegetation along the Rapti River over subsequent years (Mishra, 1982). Much of this success can be attributed to several resettlement schemes. Some 22,000 people were resettled from the Rapti area, including 4,000 from the former rhinoceros sanctuary, following the creation of a Land Settlement Commission in 1964. Subsequently, 7,000 people from 10 of the 16 villages in Padampur Panchayat on the eastern side of the park were resettled to more fertile lands devoid of wild herbivores, based on recommendations from a study by the International Centre for Environmental Renewal (Milton and Binney, 1980). The scheme met with local support but further relocation of any of the other 310 villages that surround the park is not politically or economically feasible (Mishra, 1982a).

There is a park management plan for the period 1975-1979 (Bolton, 1975) but it needs to be completely revised. The establishment of Parsa Wildlife Reserve as an eastern extension to the park has increased the area under protection by about 60%. This extension was also intended to prevent possible isolation of the proposed Bara Hunting Reserve from the park (Smith and Mishra, 1981).

The main concession to local people is the annual harvesting of tall grasses, a valuable building material which is not readily available elsewhere (Mishra, 1982). In 1987, an estimated 11,132 tonnes of grass were removed by 60,000 people during the 15-day grass-cutting period, valued at approximately NRS 9.9 million (US\$ 450,000). The net contribution to the local economy, after subtraction of labour and permit costs, is NRS 5.5 million (US\$ 250,000) (Lehmkuhl *et al.*, 1988). The opening of the Bhrikuti Paper Mill at nearby Gaidakot is introducing a new dimension to local requirements for grass. In view of Chitwan's importance

as a tourist attraction, the park authorities, in collaboration with Peace Corps/Nepal, run a two-week training programme annually for tour guides. In future, it is planned to permit only licensed guides who have attended and passed the course to operate in the park (Heinen, 1990).

MANAGEMENT CONSTRAINTS The park was listed as a Threatened Protected Area of the World by the IUCN Commission on National Parks and Protected Areas in 1990 in view of the proposed establishment of a hydroelectric barrage on the Narayani River upstream of the park and the East Rapti Irrigation Project, which would reduce the base flow by 75%. Both projects would result in changes to the riverine ecosystems, and could seriously affect aquatic and terrestrial faunal populations (Sharma, 1990; Anon., 1991). In a recent assessment of the East Rapti Irrigation Project for the Asian Development Bank, Talbot (1991) concludes that environmental risks from the project are unacceptably high and recommends that it be reformulated or replaced by one or more lower-cost projects.

Considerable antagonism has long existed between the park and local people, particularly residents of Padampur Panchayat. The main areas of conflict are loss of life (three to five people are killed each year by rhinoceros and tiger), loss of livestock (domestic cattle may constitute up to 30% of tiger kills in settled areas peripheral to the park), damage to crops (estimated to range from 10% to 100%) and restrictions concerning the use of the park's resources (hunting, fishing, grazing, and collection of timber, fuelwood and other forest products for food and medicine are prohibited within the park) (Milton and Binney, 1980; Mishra, 1982). Sixteen people were killed by tigers in and around the park between October 1980 and early 1989 (McDougal, 1989). Such conflicts will escalate as the local human population continues to increase and remnant forest and grassland areas outside the protected areas complex decline, but they are being addressed by the park authorities and local people are beginning to appreciate the value of the park for managed natural resources (Lehmkuhl *et al.*, 1988). Illegal collection of fuelwood during the grass-cutting season is a hindrance to the proper management of the programme and, in the long-term, will need to be resolved by establishing community fuelwood plantations around the park (Lehmkuhl *et al.*, 1988). Collection of tall grasses is well controlled but has inevitably led to changes in the floral composition of the grassland communities. Annual burning seems to maintain the grasslands but semal Bombax ceiba, the only fire resistant tree, is encroaching this habitat (Troth, 1976). Overgrazing along Padampur Panchayat's riverine boundary is seriously accelerating the already extensive erosion of the river bank: consequently valuable crop lands are being lost. The development of tourist facilities (hotels and teashops) on the eastern side of the park has not been controlled. In general, the rapid increase in the number of foreigners visiting Chitwan has led to locally inflated prices for basic foods and household products. This problem is compounded by the fact that few local people are employed in the park so that the local population is poorer as a result of the park's presence (Mishra, 1982). Poaching has increased recently. At least eight rhinos were killed between August 1990 and March 1991 and three tigers poisoned since November 1990 (M. Rowntree, pers. comm.).

STAFF One chief warden, one warden, two assistant wardens, 11 rangers, 11 senior game scouts, 44 game scouts, and 29 office staff. One battalion of the Royal Nepal Army is stationed in the park for enforcement duties. Elephant staff total 67 at Chitwan and 34 at Birganj.

BUDGET Expenditure was NRs 2,447,353 (US\$ 81,578) and income NRs 13,449,910 (US\$ 448,330) in 1989/1990. Income was derived from entrance and camping fees (65.4%), elephant rides (14.4%), hotel concessions (12.2%), grass-cutting permits (2.3%) and various other sources (5.6%). The budget for 1990/1991 is NRs 2,970,000 (US\$ 99,000).

LOCAL ADDRESSES

Chief Warden, Chitwan National Park Headquarters, Kasra Durbar, Narayani Zone

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DOCUMENT 0826V

PROPOSITION D'INSCRIPTION SUR LA LISTE DU PATRIMOINE MONDIAL

Nom : PARC NATIONAL ROYAL CHITWAN

N° d'ordre : 284

Date de réception par le Secrétariat : 3.8.83

Etat partie ayant présenté la proposition d'inscription du bien conformément à la Convention : NEPAL

Résumé établi par l'UICN (mars 1984) à partir de la proposition d'inscription présentée par le Népal. Le document original et toutes les informations communiquées à l'appui de cette proposition d'inscription pourront être consultés aux réunions du Bureau et du Comité.

1. LOCALISATION : Centre du Népal méridional à la frontière avec l'Inde.

2. DONNEES JURIDIQUES :

Propriété du Gouvernement népalais, ce bien est administré par le Département des parcs nationaux et de la conservation de la faune et de la flore sauvages. La région a été bien protégée aux fins de la chasse de 1846 jusqu'au début des années 1950. La création d'un parc a été proposée dès 1959 et le parc a été établi en 1973 en vertu de la loi sur les parcs nationaux et la conservation de la faune et de la flore sauvages. 22.000 habitants ont dû quitter la région. Le parc a été considérablement agrandi en 1978 et il est prévu de l'étendre encore vers l'est, d'une superficie représentant 40 % de sa surface actuelle.

3. IDENTIFICATION :

Le parc national Royal Chitwan couvre 932 km² de plaines subtropicales, enclavées entre deux vallées fluviales est-ouest au pied de la chaîne des Siwalik, avant-monts de l'Himalaya. Les roches de cette chaîne sont essentiellement composées de grès, de poudingue, de quartzite, de schiste argileux et de grès micacé. L'altitude varie de 150 à 760 m. Les pluies de mousson durant lesquelles près de 2.000 mm d'eau tombent entre juin et septembre, provoquent des inondations dramatiques et d'importants changements dans la nature des rivières dont elles modifient souvent sensiblement le cours. Les variations climatiques saisonnières sont très prononcées et en hiver des vents du nord secs réduisent considérablement la température et l'humidité.

Le parc est essentiellement couvert de peuplements presque monotypes de forêt à sal qui occupent 60 % de la superficie totale et constituent un vestige de la plaine du Terai qui s'étendait au pied de l'Himalaya en Inde et au Népal. Les forêts et les herbages forment une mosaïque le long des cours d'eau alimentés par des crues saisonnières. Des pins et des palmiers poussent sur les collines et des bambous sur les pentes plus humides.

Le parc abrite la dernière population népalaise (estimée à 400 têtes) de grands rhinocéros asiatiques unicolores qui constitue la deuxième grande concentration de cette espèce menacée après celle de Kaziranga en Inde. Royal Chitwan est également l'un des derniers bastions du tigre royal du Bengale. Les autres mammifères menacés vivant dans le parc sont le léopard, le chien sauvage et le gaur qui sont classés par l'UICN comme vulnérables, et le prochile. Les autres mammifères sont le sambar, le chital, le cerf du Gange, le muntjac, le sanglier, les singes, la loutre, le porc-épic, la martre à gorge jaune, la civette, le chat viverrin, le chat sauvage asiatique, le chacal, l'hyène rayée et le renard d'Inde. Les espèces aquatiques sont notamment le sousouc, le crocodile de l'Inde (classé

par l'UICN comme vulnérable) et le garial (espèce menacée). Plus de 350 espèces d'oiseaux ont été recensées, notamment le grand calao, le florican du Bengale, le paon, l'aigle serpenteaire, le pygargue de Pallas et le vautour à dos blanc. Le tadorne casarca et l'oie barrée hivernent sur les rivières. Le parc abrite également le python molure (espèce menacée) et 99 espèces de poissons vivent dans les cours d'eau et leurs bras morts.

4. ETAT DE PRESERVATION OU DE CONSERVATION

La gestion du parc sur place a commencé en 1971 et un plan de gestion a été établi pour la période 1975-1979. Le parc a attiré des chercheurs scientifiques et de nombreuses études y ont été exécutées. Un centre d'informations touristiques accueille un nombre croissant de visiteurs qui se rendent au refuge de "Tiger Tops".

Les principales perturbations sont dues aux incendies et au tourisme. En outre, la population locale utilise l'herbe pour la couverture des toits (le parc est ouvert 15 jours par an pour la fenaison). Le parc suscite une certaine opposition en raison de la perte du droit de pâture et de ramassage du bois, des dégâts causés aux cultures (bien que les cultivateurs reçoivent désormais des indemnités) et des morts dues aux animaux du parc. Actuellement, les objectifs prioritaires de la gestion sont d'intensifier le programme éducatif et d'améliorer la réglementation de l'accès le long de la limite nord. La construction d'usines de pâte à papier qui est proposée dans la région risque de poser un problème en raison des effets des effluents en aval, en particulier sur le garial, et de l'utilisation potentielle de l'herbe du parc comme matière première.

5. JUSTIFICATION DE L'INSCRIPTION SUR LA LISTE DU PATRIMOINE MONDIAL

La proposition présentée par le Gouvernement népalais, visant à l'inscription du Parc national de Royal Chitwan sur la Liste du Patrimoine mondial, invoque les critères suivants :

Bien naturel

- (i) stade de l'évolution de la terre. La vallée du Churia est un bassin versant important pour l'Inde du Nord en raison du caractère exceptionnel de sa situation topographique.
- (ii) processus géologiques en cours. Le parc est un des derniers exemples intacts de ce type d'habitat en Asie du Sud et il abrite une grande diversité d'espèces.
- (iii) beauté naturelle exceptionnelle. Un nombre relativement élevé de visiteurs viennent dans le parc pour voir la faune et la flore sauvages avec l'Himalaya en arrière-plan.
- (iv) habitats d'espèces rares ou menacées. Le parc abrite un certain nombre d'espèces menacées et en danger d'extinction (tigre du Bengale, rhinocéros unicolore asiatique, gaur, chien sauvage asiatique, prochile, garial, python molure). Une fois agrandi selon les prévisions, le parc deviendra la plus grande zone protégée de ce genre en Asie du Sud.

EVALUATION TECHNIQUE PAR L'UICN284 PARC NATIONAL ROYAL CHITWAN (NEPAL)1. DOCUMENTATION

- i) Formulaire de proposition d'inscription et cartes
- ii) Fiches signalétiques de l'UICN
- iii) Consultants : P. Jackson, J. Blower, J. McNeely, A. Laurie
- iv) Documents consultés : Bolton, M. 1975. Royal Chitwan National Park Management Plan 1975-1979. Rapport de la FAO.
Dossiers de projets de projets de l'UICN
Milton, J.P. et G.A. Binney; 1980. Ecological Planning on the Nepalese Terai. Threshold Report to WWF and Sierra Club.
Mishra, H.R. 1982. Balancing Human Needs and Conservation in Nepal's Royal Chitwan Park. Document présenté au Congrès mondial sur les parcs nationaux (Bali, Indonésie).

2. COMPARAISON AVEC D'AUTRES REGIONS

Le Teraï népalais comporte trois autres zones protégées : le Parc animalier Karnali, le Refuge Sulkaphanta et le Refuge Kosi Tappu. Dans aucune de ces zones, on ne trouve de rhinocéros, ni la diversité des espèces de Royal Chitwan. En outre, elles sont beaucoup plus petites et font l'objet de mesures de protection moins rigoureuses.

Les zones comparables en Inde sont le Parc national Kaziranga et le Parc national Corbett. Kaziranga abrite davantage de rhinocéros asiatiques unicornes en danger d'extinction, mais se trouve dans une autre province biogéographique, présente une combinaison différente d'espèces et ne contient pas de garial. Corbett appartient à la même province, mais abrite des espèces moins nombreuses et moins variées.

On signale à Chitwan une densité de la biomasse de 18.590 kg/km², correspondant à l'association composée d'ongulés sauvages/forêt ripicole/hautes herbes, qui est bien supérieure à celle que l'on observe n'importe où ailleurs sur le continent indien et est proche de celle des réserves africaines. Chitwan constitue l'exemple le plus vaste et le plus intact de forêt de montagne à sal naturelle et des communautés associées du Teraï. En outre, Chitwan a bénéficié de la période de protection la plus longue puisqu'elle était utilisée comme réserve de chasse royale dès le début des années 1800. L'intérêt scientifique du parc, surtout pour l'étude du rhinocéros et du tigre en a fait un modèle pour de nombreuses autres zones.

3. INTEGRITE

Le Parc national Royal Chitwan est très bien géré par un personnel comprenant notamment un conservateur professionnel et 450 gardes armés. Le programme de gestion du parc a été un succès ; en effet, la population de rhinocéros a quadruplé et la végétation a repoussé sur les berges du cours d'eau Rapti, ce qui a eu pour effet de les stabiliser et, par voie de conséquence, de contribuer dans une importante mesure à lutter contre l'érosion et les inondations. Le parc a des limites bien définies et fait l'objet d'un plan de gestion, qui a toutefois besoin d'être mis à jour. L'extension du parc est envisagée par le gouvernement.

Le parc est menacé notamment par le ramassage illicite de plantes et de bois de chauffage le long des bordures et par la pêche intensive dans les rivières voisines. Les villageois utilisent l'herbe du parc pour leurs toitures mais cette pratique est bien réglementée et n'est pas jugée préjudiciable. L'existence du parc inspire un vif ressentiment à la population locale, en raison principalement des dommages causés aux récoltes par les animaux sauvages. En l'autorisant à ramasser l'herbe pour les toitures et en appliquant des programmes d'éducation en matière de conservation et d'information du public, l'Office des parcs nationaux essaie de résoudre ces problèmes.

Actuellement, le parc est visité chaque année par quelque 8.000 touristes, qui y passent en moyenne trois nuits. Cette activité constitue une importante justification économique pour le parc et les services d'accueil mis en place sont exemplaires.

L'intégrité du parc est principalement menacée par la construction proposée de deux usines de pâte à papier sur le cours d'eau Narayani en amont du parc. Non seulement le parc pourrait être mis à contribution comme source de matière première, mais en outre, les effluents risqueraient de perturber gravement l'écologie fluviale, surtout l'habitat du garial en danger d'extinction.

4. OBSERVATIONS SUPPLEMENTAIRES

Le Népal s'est sérieusement engagé à assurer la gestion des zones protégées et le prouve en augmentant les moyens qu'il consacre au Parc national de Sagarmatha depuis qu'il a été ajouté à la Liste du Patrimoine mondial en 1979.

L'intérêt porté par l'UICN/WWF à Chitwan est attesté par la somme de plus de 500.000 dollars des Etats-Unis qui a été allouée au parc au titre de l'assistance. La FAO contribue aussi à la protection de Chitwan depuis 1970 dans le cadre du Projet des parcs nationaux et de la conservation de la faune et de la flore sauvages.

5. EVALUATION

Le Parc national Royal Chitwan répond à trois critères applicables aux biens naturel du Patrimoine mondial. Il est éminemment représentatif des processus géologiques en cours et de l'évolution biologique, car il constitue le dernier grand exemple survivant des écosystèmes naturels de la région du Terai (critère ii). La recherche consacrée à l'histoire naturelle de la région a considérablement contribué à la connaissance des systèmes écologiques du Terai.

Le parc contient aussi des traits naturels éminemment remarquables d'une beauté exceptionnelle en raison de l'attrait spectaculaire des collines boisées, formations herbeuses, grandes rivières et vues des monts de l'Himalaya en arrière-plan (critère iii). En outre, il offre un habitat viable et d'une importance décisive pour des populations considérables de plusieurs espèces rares ou en danger d'extinction, surtout le rhinocéros unicolore asiatique et le garial (critère iv). Le parc bénéficie actuellement d'une gestion d'une grande qualité et le Gouvernement népalais a clairement fait la preuve qu'il considère le parc comme un élément important du patrimoine du Népal.

6. RECOMMANDATIONS

Le Parc national Royal Chitwan doit être ajouté à la Liste du Patrimoine mondial. Le Comité doit considérer et soutenir les efforts visant à étendre le parc à l'ouest. Il doit aussi faire savoir qu'il souhaite être tenu au courant de la construction éventuelle d'usines de pâte à papier sur la rivière Narayani et de l'incidence potentiel de ce projet sur les ressources du parc.

