

NOMINATION TO THE WORLD HERITAGE LIST

Convention concerning the Protection of the World Cultural and Natural Heritage

Name: MANAS WILDLIFE SANCTUARY

Identification No: 338

Date received by WH Secretariat: 18.4.84

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

Summary prepared by IUCN (March 1985) based on the original nomination submitted by India. 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: State of Assam in the north-east of India along the Manas River on the border with Bhutan. Bengalian rainforest Biogeographical Province.

2. JURIDICAL DATA:

The site consists of a wildlife sanctuary of 39,100 ha. The area was originally declared a reserve forest as early as 1907 and received sanctuary status in 1928. In 1973 it was given added protection when it was designated also as a Tiger Reserve in 1973 under Project Tiger. The overall legislative authority is contained in the Wildlife Protection Act of 1972 which is administered by the Assam Forest Department. The Manas Sanctuary is considered as the core zone of the Manas Tiger Reserve which also includes a buffer zone of 283,700 ha surrounding the Sanctuary. It is contiguous with the Manas Wildlife Sanctuary in Bhutan (44,300 ha).

3. IDENTIFICATION:

An area of low-lying (100-250m altitude) flat land in the foothills of the eastern Himalayas. The land slopes gently to the south with a number of rivers draining the terrain from north to south. The main rivers are the Manas, Mora-manas, Jongrong, Gyati, Chorhuli, Garuchara and Rabang. They carry an enormous amount of silt and rock debris from the Himalayan-Siwalik foothills, resulting from the heavy rainfall, the fragile nature of the rock and the steep gradients of the catchments. This leads to the formation of alluvial terraces, deep layers of deposited rock and detritus overlain with sand and soil of varying depth, shifting river channels and swamps. The Manas area can be divided into four principal geological and geomorphological habitats:

- a) Bhabar savannah with porous soils derived from sandstone, limestone and shale,
- b) the Terai tract, derived from deep alluvium washed down from the Himalayas,
- c) marshlands, and
- d) riverine tracts.

The climate is warm and humid with a mean annual rainfall of 400cm, falling mainly during the rainy season (June-October). The mean summer temperature is 37°C and the mean winter temperature is 11°C.

Vegetation can be broadly divided into three types: (a) Tropical semi-evergreen forests in the northern part of reserve; (b) Tropical moist and dry deciduous forests (the most common type); (c) extensive patches of alluvial grasslands in western part of the sanctuary. There is also a considerable aquatic flora. The Botanical Survey of India has so far identified 285 species of Dicotyledons and 98 species of Monocotyledons. These fall into the following lifeforms, 89 tree species, 49 shrubs, 37 undershrubs, 172 herbs and 36 climbers. Fifteen species of orchids are known so far, 3 terrestrial and 12 epiphytic; 43 species of grasses belonging to 29 genera and 18 species of fern (including one aquatic) belonging to 14 genera have also been collected.

The Manas Sanctuary also provides habitat for 21 of India's most threatened species of mammals. In total there are 55 mammal species present, 36 reptile species, 3 amphibians and 350 species of birds. Noteworthy among these include the elephant, tiger, greater one-horned rhino, clouded leopard, sloth bear, wild buffalo, pigmy hog, hispid hare, golden langur, Bengal florican and gharial. The wild buffalo population is the only pure strain of this species still found within India.

4. STATE OF PRESERVATION/CONSERVATION:

The Sanctuary is strictly managed to keep unwanted and unnatural intrusions to a minimum. Under Project Tiger, the management infrastructure of the Manas was improved with provision of ranger stations, administration roads, and a radio system. Frequent patrols, particularly along the south boundary have reduced the incidence of poaching to a low level. A tourist accommodation facility is available at Mothanguri but travel by foreigners to Assam is currently discouraged. The management plan prepared for the period 1973-78 has now been revised and updated. There is an informal understanding with the Bhutanese authorities to cooperate in the management of the adjoining reserves. Local people benefit from the Sanctuary through provision of inoculation of livestock against diseases transmitted by wildlife, but this is offset by crop damage caused largely by elephant, pigs, and deer. 2000 ha were excised from the Sanctuary in 1971 for a seed farm which has subtracted forest and grassland habitat.

The surrounding buffer zone is managed on a multiple use basis, allowing selective forestry, plantations, grazing, and firewood collection. Some 55,000 people live in 144 forest villages in this zone. Unfortunately, most of the wildlife values in the buffer area have been lost due to dry season burning and over-hunting and over-cutting of the forests in a non-sustainable fashion, and the multiple-use philosophy has proved to have almost exclusive emphasis on resource extraction.

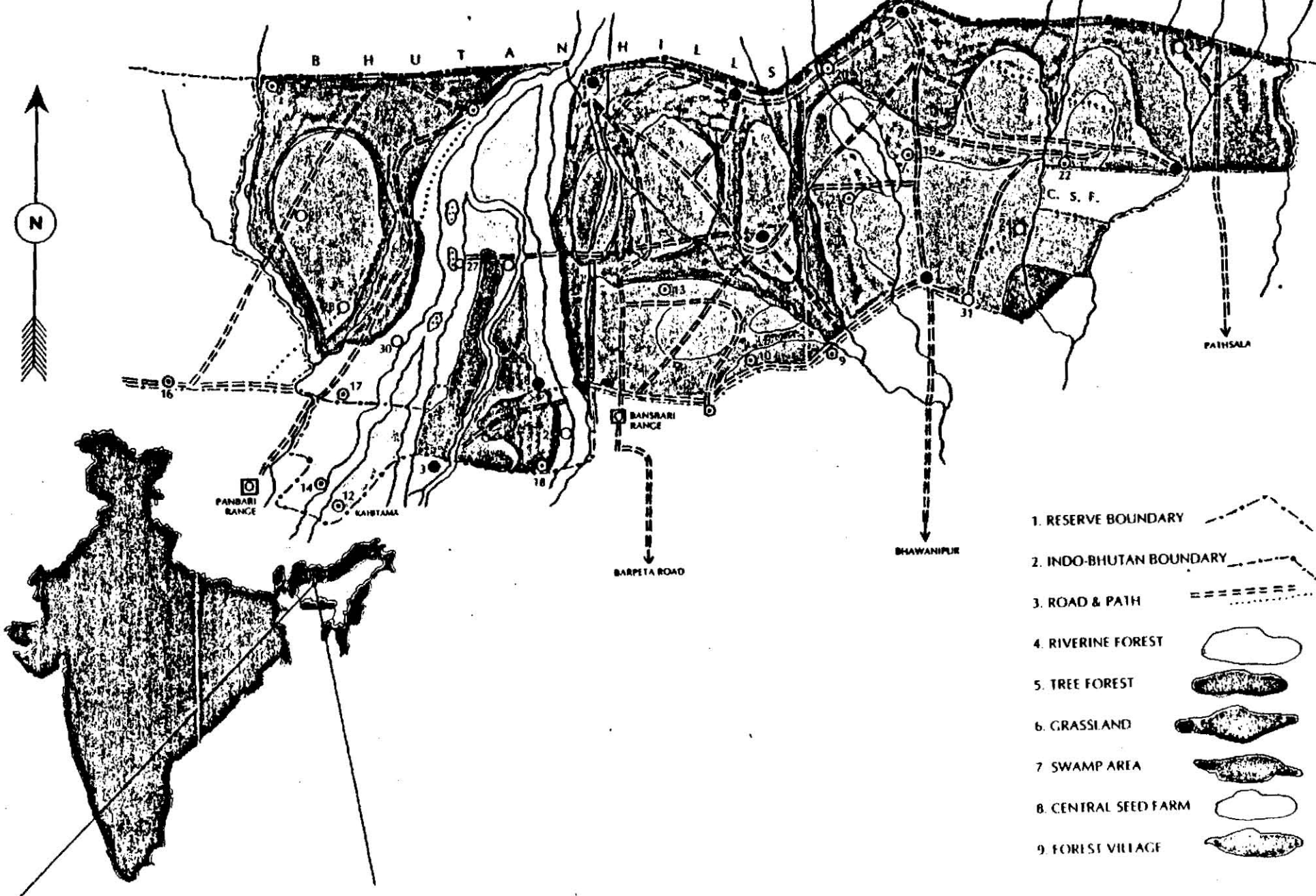
5. JUSTIFICATION FOR INCLUSION ON THE WORLD HERITAGE LIST:

The Manas Wildlife Sanctuary as presented by the Government of India, provides the following justification for designation as a World Heritage property:

- a) Cultural property -- not applicable
- b) Natural property
 - (iv) Habitats of rare and endangered species. The Sanctuary provides the last viable wild habitat for two endangered species (pigmy hog, and hispid hare) as well as another 19 of India's threatened species.

MANAS TIGER RESERVE (Core Area)

Scale 1" = 4 miles



338 MANAS WILDLIFE SANCTUARY (INDIA)

1. DOCUMENTATION:

- (i) Nomination form
- (ii) IUCN Data Sheets
- (iii) Consultations: John MacKinnon, Ian Grimwood, William Oliver, Peter Jackson, Claude Martin, India Government Officials
- (iv) Field visit, 14-16 February 1985
- (v) Literature Consulted: Chief Conservator of Forests, 1973 Management Plan for Manas Tiger Reserve, Assam.
H.S. Panwar, 1982. What to do when you've succeeded - Project Tiger 10 years later. World Parks Congress, IUCN.
Peter Jackson, 1981. Conservation in Bhutan, IUCN.
W.L.R. Oliver, 1980. The biology and conservation of the pigmy hog and the hispid hare. Jersey Wildlife Preservation Trust.

2. COMPARISON WITH OTHER AREAS

Within the Bengalian Rainforest Biogeographical Province, there are 16 other protected areas. The largest one is the Manas Tiger Reserve which surrounds the Manas Sanctuary and as mentioned in the nomination summary, the Tiger Reserve no longer functions as an effective natural system and is not therefore included in the Manas nomination. Many of the other reserves in this province are very small and serve as regionally important natural areas. The Sundarbans are also included in this province but are very different in terms of vegetation (mangrove) and faunal species. The most comparable site is the Buxa Tiger Reserve which is located adjacent to the Manas Tiger Reserve in the State of West Bengal. This reserve has been much more affected by man, has a lower number of species, and does not have a functional linkage with Manas.

Outside of the immediate biogeographical province the Manas can be compared to the Royal Chitwan National Park of Nepal (inscribed on the World Heritage List, 1984). Chitwan is dominated by stands of sal forest of the Terai zone and has a lower habitat and species diversity than Manas. Notable mammals occurring in Manas, but not in Chitwan, include clouded leopard, golden cat, golden langur, Assam macaque, swamp deer, Asiatic buffalo, pigmy hog and hispid hare. Manas still contains species that have recently become extinct in Chitwan including swamp deer, buffalo, and (to all intents and purposes) wild elephant. Manas is located more at the interface of the Indian and Indo-China faunal associations and reflects the distinctive natural importance of the Assam/East Himalaya foothills region.

3. INTEGRITY

Manas is managed to a high standard with a staff that includes a professional park manager and trained field staff. Boundaries are well-marked and patrols are undertaken regularly. Increased resources since Project Tiger was launched in 1973, have resulted in a significant improvement in the status of wildlife populations and the state of the habitat. A revised management plan has just been completed by the warden in charge. Manas Sanctuary is effectively buffered on the north by the rest of the Manas Wildlife Reserve of Bhutan and on the east and west less effectively by the Manas Tiger Reserve. Along the southern boundary agriculture and settlement abut the reserve and some conflicts with local residents exist. Poaching, however, has largely been brought under control through a very rigorous patrolling schedule.

One major threat to the Manas exists and has been described in IUCN's project on "Threatened Protected Areas of the World". The threat is in the form of construction of two dams in the adjoining Manas Wildlife Sanctuary in Bhutan. In addition to flooding a large area, road and canal construction, along with changes in downstream hydrology, would radically alter the intrinsic natural values of Manas. The dams are only one element of proposed water development schemes in the foothills of the Himalayas, now under study by the India Ministry of Irrigation.

4. ADDITIONAL COMMENTS

There are three initiatives that taken together would considerably improve the viability of the Manas nomination.

- a) The adjacent Manas Wildlife Sanctuary of Bhutan (44,300 ha) would provide an additional dimension to the site by adding habitat variety and encouraging more cooperation in management of wildlife that migrates between both reserves. When Bhutan becomes a State Party to the Convention the addition of the area on their side of the border is highly recommended;
- b) Legislation for protected areas in India provides that national parks have a higher level of protection than wildlife sanctuary. In view of the importance of the Manas Sanctuary, the upgrading to national park status would also be highly recommended;
- c) An extension of the reserve along the northwest boundary to the Sankosh River has previously been considered by the State Government of Assam. This additional area would complement the boundaries of the adjacent Bhutan reserve and is also to be encouraged.

5. EVALUATION

Manas Wildlife Sanctuary meets three criteria for World Heritage Natural Properties. The Manas River is an outstanding example of geological processes and biological evolution with its huge depositional load and shifting river channels (criteria ii). The reserve also contains superlative natural features of exceptional natural beauty in terms of its scenic attractions of forested hills, alluvial grasslands and tropical semi-evergreen forests (criteria iii). In addition, the Manas provides critical and viable habitat for more rare and endangered species than any of the Indian sub-continent's protected areas (criteria iv). It is the only or best remaining natural area where sizeable populations of several species can continue to survive (e.g. pigmy hog, hispid hare).

The current management of the park is of a high standard and the Government of India has clearly demonstrated their commitment to conservation through support of Project Tiger.

6. RECOMMENDATIONS

Manas Wildlife Sanctuary should be added to the World Heritage List. The Committee should note and support efforts to extend the Sanctuary's northwest boundary and to upgrade the area to national park status. The Committee should also express its concern on the possible construction of a hydro-electric dam in the adjacent Bhutan Manas Wildlife Reserve and express its interest in the possibility of a trans-frontier World Heritage Site with Bhutan.

INDIA-Manas Sanctuary

INDIA - Assam

NAME Manas Sanctuary

IUCN MANAGEMENT CATEGORY IV (Managed Nature Reserve)
X (World Heritage Site; Criteria ii, iii, iv)

BIOGEOGRAPHICAL PROVINCE 4.09.01 (Burma Monsoon Forest)

GEOGRAPHICAL LOCATION The sanctuary lies in the districts of Barpeta and Kokrajhar, 41km north of Barpeta Road township. It spans the Manas River and is bounded to the north by the international border with Bhutan, to the south by the populated regions of North Kamrup and to the east and west by forest reserves. The sanctuary, which includes part of Manas Reserve Forest and all of North Kamrup Reserve Forest, constitutes the core of Manas Tiger Reserve which lies in the forest divisions of Kachugaon, Haltugaon, Western Assam Wildlife and North Kamrup. 26°37'-26°50'N, 90°45'-91°15'E

DATE AND HISTORY OF ESTABLISHMENT Manas (previously also known as North Kamrup) was declared a sanctuary on 1 October 1928, parts of it having been notified as reserved forests in 1907 and 1927. It was established as the core of the Manas Tiger Reserve with effect from April 1973. Designated a World Heritage site in December 1985. Upgrading of the sanctuary to national park status is being considered (Deb Roy, n.d.).

AREA The sanctuary comprises 39,100ha of the 283,712ha Manas Tiger Reserve. In 1971, 809ha from the sanctuary was allocated for a seed farm. Manas Sanctuary is contiguous with Royal Manas National Park (65,800ha) in Bhutan.

LAND TENURE State

ALTITUDE Ranges from 40m to 150m (Deb Roy, n.d.).

PHYSICAL FEATURES Lying in the foothills of the Outer Himalaya, the area is low-lying and flat. The Manas River flows through the western portion of the sanctuary, where it splits into three separate rivers, and joins the Brahmaputra some 64km further south. These and other rivers running through the tiger reserve carry an enormous amount of silt and rock debris from the foothills, resulting from the heavy rainfall, fragile nature of the rock and steep gradients of the catchments. This leads to the formation of alluvial terraces, comprising deep layers of deposited rock and detritus overlain with sand and soil of varying depth, shifting river channels and swamps. The northern portion is represented by the 'Bhabar' formation, which is very porous due to the deep deposits of coarse detritus overlain by sandy loam and then a thin layer of humus. The 'Terai' tract in the south consists of fine alluvial deposits with underlying pans. Here, the water table lies very near to the surface. The area of the Boki

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basin, in the west of the sanctuary, is sometimes inundated during the monsoon but never for very long due to the sloping relief. Mortality to wildlife is negligible as animals are able to stake refuge on islands of high ground (Anon., 1974; Deb Roy, n.d.).

CLIMATE The climate is warm and humid (up to 76% relative humidity) with most rain falling during the monsoon season (May-September). The mean maximum summer temperature is 37°C and the mean minimum winter temperature is 11°C. Mean annual rainfall ranges from 3332mm at Batabari to 4489mm at Kachugaon, based on 11 and 17 years of records, respectively (Anon., 1974; Deb Roy, n.d.).

VEGETATION The three main types of vegetation are:- (a) Tropical semi-evergreen forests in the northern part of sanctuary, with common trees including Aphanamixis polystachya, Anthocephalus chinensis, Syzygium cumini, S. formosum, S. oblatum, Bauhinia purpurea, Mallotus philippensis, Cinnamomum tamala, Actinodaphne obvata; (b) tropical moist and dry deciduous forests (the most common type), characterised by trees such as Bombax ceiba, Sterculia villosa, Dillenia indica, D. pentagyna, Careya arborea, Lagerstroemia parviflora, L. speciosa, Terminalia bellirica, T. chebula, Trewia polycarpa, Gmelina arborea, Oroxylum indicum, Bridelia spp.; and (c) extensive alluvial grasslands in the western part of the sanctuary, comprising many different grass species together with a variety of tree and shrub species (e.g. Dillenia pentagyna, Phyllanthus emblica, Bombax ceiba, and species of Clerodendrum, Leea, Grewia, Premna and Mussaenda). The grasslands can be subdivided into wet alluvial and highland savanna types. There is also a considerable variety of aquatic flora along river banks and in the numerous pools (Jain and Sastry, 1983). Dry deciduous forests represent early stages in succession and are replaced by moist deciduous forests away from water courses, which, in turn, are succeeded by tropical semi-evergreen climax forest. Grasslands cover about 50% of the sanctuary. Some 393 species of dicotyledons, including 197 trees, and 98 species of monocotyledons have been identified (Jain and Hajra, 1975; S. Deb. Roy, pers. comm.).

FAUNA A total of 55 mammals, 36 reptiles and 3 amphibians has been recorded (Project Tiger, n.d.). Manas harbours by far the greatest number (21) of India's Schedule I mammals of any protected area in the country. Many are typical of South-east Asian rain forest and have their westernmost distribution here. Mammals include golden langur Presbytis geei (R), a recently discovered endemic restricted to Manas and adjoining areas in Bhutan and numbering approximately 305 in 1980, capped langur P. pileata, Hoolock gibbon Hylobates hoolock, clouded leopard Neofelis nebulosa (V), tiger Panthera tigris (E), second largest population in India with 123 recorded in 1984, leopard P. pardus (V), golden cat Felis temmincki (I), fishing cat F. viverrinus, leopard cat F. bengalensis, marbled cat F. marmorata (I), binturong Arctictis binturong, sloth bear Melursus ursinus (I), wild dog Cuon alpinus (V), Ganges dolphin Platanista gangetica, Indian elephant Elephas maximus (E), with up to 2,000 in the tiger reserve and more than 1,000 moving freely between Indian and Bhutan Manas reserves, Indian rhinoceros Rhinoceros unicornis (E), with about 75 individuals in 1980, pygmy hog Sus salvanius (E), swamp deer C. duvauceli (V), sambar

Cervus unicolor, hog deer C. porcinus, Indian muntjac Muntiacus muntjak, water buffalo Bubalus arnee (V), probably representing the only pure strain of this species in India, gaur Bos gaurus (V), giant squirrel Ratufa indica, hispid hare Caprolagus hispidus (E) and Indian pangolin Manis crassicaudata.

Over 300 species of birds have been recorded including the threatened Bengal florican Houbaropsis bengalensis (E), great pied hornbill Buceros bicornis, wreathed hornbill Rhyticeros undulatus and other hornbills. The Bengal florican population was estimated at 34 for the whole tiger reserve in 1984 (Ali et al., 1985) and 24 male territories were identified within the wildlife sanctuary during 1988 (Narayan et al., 1989). Pied harrier Circus melanoleucos nested during 1988 and 1989, the first confirmed record for India (Narayan et al., 1989). Uncommon waterfowl species include spot-billed pelican Pelecanus philippinensis, lesser adjutant stork Leptoptilos javanicus and greater adjutant stork L. dubius (Scott, 1989).

Reptiles include a variety of snakes (e.g. vine snake Ahaetulla nasutas, flying snake Chrysopelea ornata, Assam trinket snake Elaphe frenata and banded krait Bangarus fasciatus), gharial Gavialis gangeticus (E) (possibly introduced from neighbouring Bhutan or as a result of a captive breeding programme), and monitor lizard Varanus sp. Assam roofed turtle Kachuga sylhetensis (K) has recently been recorded (Sarma, 1988).

CULTURAL HERITAGE Manas takes its name after the Goddess Manasa. The surrounding area is inhabited predominantly by tribal people (Deb Roy, n.d.).

LOCAL HUMAN POPULATION There is one forest village in the south-east of the sanctuary, which it is proposed to dereserve and enlist as a revenue village along with other contiguous revenue villages (Deb Roy, n.d.). Some 54,000 people are distributed among 144 villages in the buffer zone of the tiger reserve (Anon., 1974); no relocation of these villages is contemplated (Deb Roy, n.d.).

VISITORS AND VISITOR FACILITIES A forest bungalow at Mothaguri, within the sanctuary, provides dormitory style accommodation for 48 persons. A number of rest houses and camp sites are also available. The Tourist Department of Assam conducts tours, including boat trips down the river and elephant rides. Angling is permitted. Foreign visitors need a special permit to enter the sanctuary. Some 32,860 people visited the area in 1983-1984.

SCIENTIFIC RESEARCH AND FACILITIES The vegetation has been surveyed by the Botanical Survey of India (Jain and Hajra, 1975). Censuses of tiger and elephant populations are regularly undertaken by Project Tiger. The status of Bengal florican was investigated in May 1984 (Ali et al., 1985). Students have received lectures on the behaviour and ecology of wildlife.

CONSERVATION VALUE Manas is noted for its spectacular scenery, with a variety of habitat types that support a diverse fauna, making it the richest of all Indian wildlife areas. The sanctuary represents the core of

an extensive tiger reserve that protects an important migratory wildlife resource along the West Bengal to Arunachal Pradesh and Bhutan borders (Rodgers and Panwar, 1988). Its wetlands are of international importance (Scott, 1989). It is also the single most important site for the future survival of pygmy hog and hispid hare (Oliver, 1980).

CONSERVATION MANAGEMENT The sanctuary is essentially a wilderness zone and forms the core of the tiger reserve. The rest of the tiger reserve is classified as reserve forest. Normal forestry operations were carried out in the core area prior to its designation as a sanctuary, but these were confined mostly to the southern belt. Traditional hunting practices persisted but without any noticeable adverse effects on wildlife populations. Hunting ceased with the establishment of the area as a sanctuary and very little logging has been permitted since 1950. The last timber operation took place in 1964. Much stone was extracted from the area during the construction of the National Highway in 1963-1964. Plantations were established along the southern border to provide a buffer against agricultural encroachment but this work ceased in 1977. Grazing by livestock was phased out from 1963 to 1965. No exploitation is allowed in the sanctuary but tourists may visit the Mothanguri-Bansbari area. Such restrictions do not apply to the surrounding buffer zone of the tiger reserve, which is managed on a multiple-use basis. Here residents are allowed to selectively remove timber, collect firewood, cultivate land and graze their domestic livestock. They benefit from inoculation of their cattle, to prevent diseases being transmitted to the wildlife, but this is offset by damage to their crops by elephants, wild boar and deer (Anon., 1974; Deb Roy, n.d.).

There is a management plan for the tiger reserve (Anon., 1973) but this is being revised. International cooperative efforts have been made by the governments of India and Bhutan to manage the Manas ecosystem as a whole. Work carried out by Project Tiger in 1982 included: provision of 12 barracks to accommodate staff; development of roads and a wireless network to improve the efficiency of administration and anti-poaching operations; and intensified and reorganised patrolling, with three new ranges defined to facilitate administration and the protection of both the core and buffer zones. Boundaries have been clearly marked and the staff are more vigilant than previously, leading to several successful prosecutions being brought against poachers. Following recent successful breeding in captivity of gharial, there are plans to restock all the water channels in the area.

The extent and status of the present sanctuary are considered inadequate to meet long-term conservation requirements. It has been recommended that it be extended to 109,700ha and upgraded to a national park (Rodgers and Panwar, 1988). This is under consideration (Deb Roy, n.d.).

MANAGEMENT CONSTRAINTS The wildlife sanctuary remains intact, although the buffer zone has suffered an unspecified number of encroachments, especially between Sankosh and Manas rivers. This has led to haphazard fragmentation of the forest. Of particular concern is Amtika Village in the midst of the buffer zone and in the area occupied by golden langur. As there is no

buffer zone to the south there has been increasing pressure from cultivation, settlement, collection of forest products and some poaching, as well as increasing contact between local people and wildlife. Crop-raids by elephant and hog-deer are increasingly common, leading to ill-feeling amongst local residents (Rahmani *et al.*, 1989). In 1984 the government attempted to close Kokla Bari Seed Farm, but this was vigorously opposed by Plains tribes, such as Borokacharis, who have been employed there (Choudhury, 1986). The main problems of rhinoceros poaching and encroachment have largely been controlled under 'Operation Tiger'. However, burning in the dry season, hunting and extraction of timber and firewood are practised at non-sustainable levels in the buffer zone. There was public concern over proposals to build two dams in the upper reaches of the Manas and Sankosh rivers in neighbouring Bhutan. The plans, which would have had a severe impact on the integrity of the whole Manas ecosystem, have since been cancelled by the Indian and Bhutanese governments.

In February 1989 the sanctuary was occupied by members of the local Bodo Students Union, which is campaigning for autonomy for its people, who form about one-third of Assam's population (Jackson, 1989). Armed attacks, in which more than a dozen wildlife guards were killed, have led to most of the sanctuary being abandoned by official staff. In addition to the Bodo, poachers and timber smugglers have opportunistically entered the sanctuary and a number of animals including rhinoceros, elephant and valuable prey species such as deer have been killed (Hussain, 1989; Rahmani *et al.*, 1989). A popular account of the incursion (Gavron, 1989) reports that staff have been attacked, resulting in one fatality, and that 30 of the 44 range posts have had to be abandoned. At least six, but almost certainly more, Indian rhinoceros, and at least four tigers, have been killed. In addition, the corpses of two large male elephants have been found. A large number of trees have been felled and the habitat of species, such as golden langur, hispid hare and pygmy hog, has been put at risk. Intervention to protect the sanctuary by either the Assam State Government or Central Government has been delayed by a lack of available manpower and by political difficulties.

STAFF Four forest rangers, two deputy rangers, 29 foresters, 12 head game watchers, 49 forest guards, 46 game watchers and 104 other staff administer the sanctuary (1986). Overall administration of the tiger reserve is the responsibility of the field director.

BUDGET Rs 2,545,000 was allocated in 1989-1990 by the Government of India under its rhino conservation scheme.

LOCAL ADDRESSES The Assam Forest Department is responsible for the administration of the sanctuary.
Field Director, Project Tiger, PO Barpetta Road, District Barpetta, Assam
778 315

REFERENCES

Ali, S., Daniel, J.C. and Rahmani, A.R. (1985). Study of ecology of certain

endangered species of wildlife and their habitats. The floricans. Annual Report 1, 1984-1985. Bombay Natural History Society, Bombay. Pp. 79-83.

Anon. (1974). A management plan for Manas Tiger Reserve 1973-74 to 1978-79.

Government of Assam, Gauhati. 37 pp.

Burnett, J.H. (1958). The Manas - Assam's unknown wildlife sanctuary. Oryx 4: 322-325.

Choudhury, A. (1988). Conservation in Manas Tiger Reserve. Tigerpaper 15(2):23-27.

Deb Roy, S. (n.d.). Manas Tiger Reserve. Unpublished report. 29 pp.

Deb Roy, S. (1982). Elephant census, as carried out in Manas Tiger Reserve,

methodology and figures. Unpublished report. 23 pp.

Gavron, J. (1989). Marauders slaughter Assam tigers. The Sunday Telegraph.

10 September. P. 16.

Hussain, W. (1989). Bodo militants on shooting spree inside Manas Tiger Reserve. The Telegraph, Calcutta. 5 April.

Jackson, P. (1981). Conservation in Bhutan. Unpublished report. Appendix 8.

Jackson, P. (1989). Manas tiger reserve threatened. October WWF Features. 2 pp.

Jain, S.K. and Sastry, A.R.K. (1983). Botany of some tiger habitats in India. Botanical Survey of India, Howrah. 71 pp.

Jain, S.K. and Hajra, P.K. (1975). On the botany of Manas Wildlife Sanctuary

in Assam. Bulletin of the Botanical Survey of India 17: 75-86.

Narayan, G., Sankaran, R., Rosalind, L and Rahmani, A.R. (1989). The Floricans Houbaropsis bengalensis and Sypheotides indica. Annual Report 1988-89. Bombay Natural History Society. 39pp.

Oliver, W.L.R. (1980). The pigmy hog - the biology and conservation of the pigmy hog Sus salvanius and the hispid hare Capriolagus hispidus. Jersey Wildlife Preservation Trust Special Scientific Report No. 1. 80 pp.

Project Tiger (n.d.). Tentative check list of fauna of Manas Tiger Reserve.

Unpublished report. 4 pp.

Rahmani, A. R., Narayan, G. and Rosalind, L. (1989). Threat to India's Manas

Tiger Reserve. Unpublished manuscript. 11 pp.

Rogers, W.A. and Panwar, H.S. (1988). Planning a wildlife protected area network in India. 2 volumes. FAO, Dehra Dun.

Scott, D.A. (Ed.) (1989). A directory of Asian wetlands. IUCN, Gland, Switzerland and Cambridge, UK. 1,181 pp.

WWF/IUCN Project 1002. Operation Tiger - Manas Tiger Reserve, Assam.

DATE October 1985, reviewed July 1988, updated March 1990

DOCUMENT 0900V

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DESIGNATION POUR LA LISTE DU PATRIMOINE MONDIAL

Convention concernant la protection du patrimoine mondial, naturel et culturel

Nom: SANCTUAIRE DE FAUNE DE MANAS

No d'identification: 338 Date de réception par le secrétariat: 18.4.84

Etat Partie contractante ayant présenté la désignation du bien, conformément à la Convention: INDE

Résumé préparé par l'UICN (mars 1985) d'après la désignation d'origine soumise par l'Inde. L'original et tous les documents présentés à l'appui de cette désignation seront disponibles pour consultation aux réunions du bureau et du comité.

1. SITUATION: Etat de l'Assam, au nord-est de l'Inde, le long du fleuve Manas, sur la frontière du Bouthan. Province biogéographique de forêt humide bengalaise.

2. DONNEES JURIDIQUES:

Le site comprend un sanctuaire de faune de 39 100 ha. L'aire a d'abord été déclarée réserve forestière en 1907 et a reçu son statut de sanctuaire en 1928. En 1973, sa protection a été renforcée lorsqu'elle est devenue Réserve de tigres, dans le cadre du Projet tigre. L'organe réglementaire global est la Loi de 1972, sur la protection de la faune qui est appliquée par le Département des forêts de l'Assam. Le Sanctuaire de Manas est considéré comme la zone centrale de la Réserve de tigres de Manas qui comprend aussi une zone tampon de 283 700 ha, entourant le sanctuaire. Il est contigu à la Réserve de faune de Manas, Bouthan (44 300 ha).

3. IDENTIFICATION:

Région de terrains plats, de basse altitude (100 à 250m) sur les contreforts de l'Himalaya orientale. Le terrain descend en pente douce vers le sud et un certain nombre de cours d'eau le drainent du nord au sud. Les principaux cours d'eau sont les suivants: Manas, Mora-manas, Jongrong, Gyati, Chorphuli, Garuchara et Rabang. Ils transportent une énorme quantité de sédiments et de débris rocheux arrachés aux contreforts de l'Himalaya et des Siwalik en raison des pluies violentes, des roches de nature fragile et des versants abrupts du bassin d'alimentation. Cela entraîne la formation de terrasses alluviales, de couches épaisses de roches et de détritiques déposés, recouvertes de terre et de sable d'épaisseur variable et la modification du cours des rivières et des marais. La région de Manas peut être divisée en quatre habitats géologiques et géomorphologiques principaux:

- a) savane à "bhabar" aux sols poreux composés de grès, calcaires et schistes;
- b) passage du Terai, formé des alluvions profondes lessivées de l'Himalaya;
- c) marais; et
- d) terrains riverains.

Le climat est chaud et humide avec une pluviosité annuelle moyenne de 400 mm, tombant surtout pendant la saison des pluies (juin-octobre). La température moyenne estivale est de 37°C et la température hivernale moyenne est de 11°C.

On peut, en gros, diviser la végétation en trois types: a) forêts tropicales semi-sempervirentes dans la partie nord de la réserve; b) forêts tropicales humides et décidues sèches (type le plus commun); c) vastes étendues de prairies alluviales dans la partie ouest du sanctuaire. Il y a aussi une flore aquatique importante. L'étude botanique de l'Inde a, à ce jour, identifié 285 espèces de Dicotylédones et 98 espèces de Monocotylédones. Il s'agit des formes suivantes: 89 espèces d'arbres, 49 arbustes, 37 espèces sous-arbustives, 172 herbes et 36 plantes grimpantes. On a répertorié, à ce jour, 15 espèces d'orchidées; 3 terrestres et 3 épiphytes; 43 espèces de graminées appartenant à 29 genres et 18 espèces de fougères (y compris une aquatique) appartenant à 14 genres ont été dénombrées.

Le Sanctuaire de Manas abrite également 21 des espèces de Mammifères les plus menacées de l'Inde. Au total, il y a 55 espèces de Mammifères, 36 espèces de reptiles, 3 amphibiens et 350 espèces d'oiseaux. Les espèces les plus remarquables sont l'éléphant, le tigre, le grand rhinocéros unicolore, la panthère longibande, l'ours lippu, le buffle sauvage, le sanglier nain, le lièvre hispide, l'entelle doré, l'outarde du Bengale et le garial. Cette population de buffles sauvages est la seule lignée pure de l'espèce que l'on puisse trouver en Inde.

4. ETAT DE PRESERVATION/CONSERVATION:

Le sanctuaire est administré de manière stricte pour réduire au minimum toute intrusion indésirable ou contre nature. Dans le cadre du Projet tigre, l'infrastructure a été améliorée grâce à la construction de bases pour les gardiens, de routes et la mise en place d'un réseau radio. Des patrouilles fréquentes, notamment le long de la limite sud, ont réduit fortement l'incidence du braconnage. Il existe à Mothanguri des logements pour les touristes mais ceux-ci ne sont pas actuellement encouragés à se rendre en Assam. Le plan de gestion préparé pour la période 1973-1978 a été révisé et mis à jour. Il existe un accord officieux avec les autorités du Bouthan pour une coopération dans la gestion des réserves contiguës. Les populations locales bénéficient de la présence du parc en cela que le bétail domestique est vacciné contre les maladies transmises par la faune mais cet avantage est contrebalancé par les dommages causés aux cultures par les éléphants, les sangliers et les cerfs. En 1971, 2000 ha du sanctuaire ont été consacrés à la culture de semences, entraînant la perte d'une partie de l'habitat forestier et de prairies.

La zone tampon est gérée selon le principe de l'utilisation multiple: sylviculture sélective, plantations, pâturages et collecte de bois de feu. Environ 55 000 personnes vivent dans 144 villages de forêt, dans cette zone. Malheureusement, la zone a perdu sa valeur pour la faune en raison des brûlis et de la chasse excessive pendant la saison sèche, de la surexploitation des forêts, la philosophie de l'utilisation multiple s'est révélée mettre presque exclusivement l'accent sur l'extraction des ressources.

5. RAISONS JUSTIFIANT LA DESIGNATION POUR LA LISTE DU PATRIMOINE MONDIAL.

Pour justifier la désignation du Sanctuaire de faune de Manas en tant que bien du patrimoine mondial, le gouvernement de l'Inde a donné les raisons suivantes:

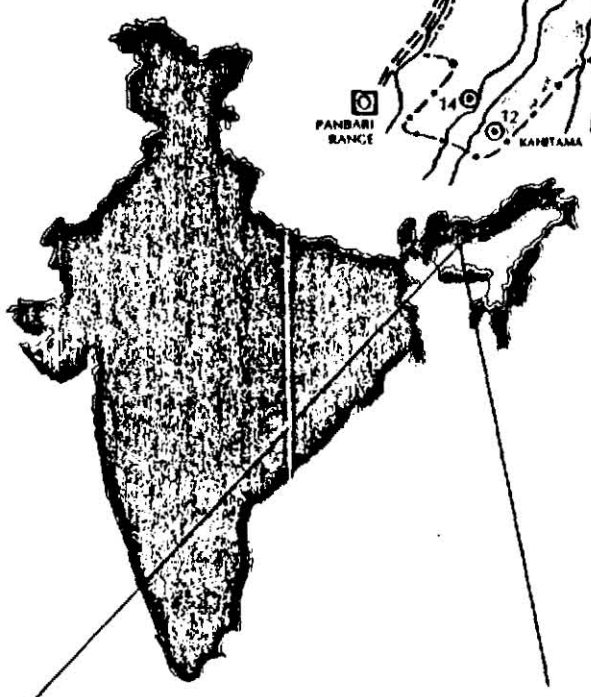
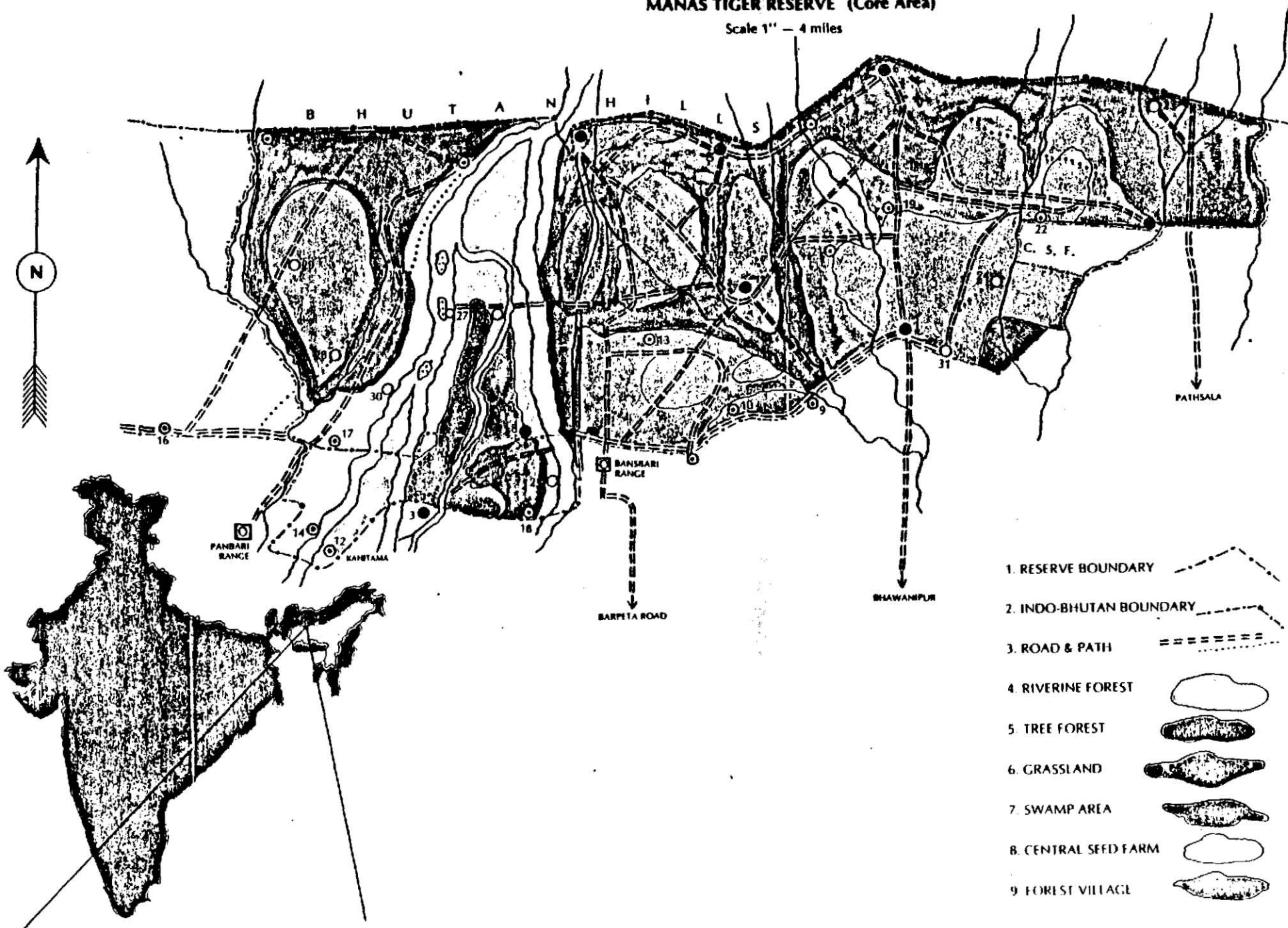
a) Bien culturel -- non applicable

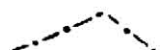
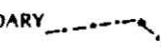
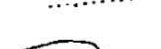





b) Bien naturel

(iv) Habitats d'espèces végétales ou animales rares ou menacées. Le sanctuaire est le dernier habitat sauvage viable de deux espèces en danger (sanglier nain et lièvre hispide) de même que celui de 19 espèces indiennes menacées.

MANAS TIGER RESERVE (Core Area)

Scale 1" = 4 miles



- 1. RESERVE BOUNDARY 
- 2. INDO-BHUTAN BOUNDARY 
- 3. ROAD & PATH 
- 4. RIVERINE FOREST 
- 5. TREE FOREST 
- 6. GRASSLAND 
- 7. SWAMP AREA 
- 8. CENTRAL SEED FARM 
- 9. FOREST VILLAGE

338 SANCTUAIRE DE FAUNE DE MANAS (INDE)

1. DOCUMENTATION:

- a) Formulaire de désignation
- b) Fiches de données de l'UICN
- c) Consultants: John MacKinnon; Ian Grimwood; William Oliver; P. Jackson; C. Martin, représentants du gouvernement de l'Inde
- d) Visite sur le terrain, 14-16 février 1985
- e) Littérature consultée: Conservateur en chef des forêts, Plan de gestion de 1973 pour la Réserve de tigres de Manas, Assam.
H.S. Panwar, 1982. What to do when you've succeeded - Project Tiger ten years later. Congrès mondial des parcs nationaux, UICN.
Peter Jackson, 1981. Conservation in Bhutan, UICN
W.L.R. Oliver, 1980. The biology and conservation of the pygmy hog and the hispid hare. Jersey Wildlife Preservation Trust.

2. COMPARAISON AVEC D'AUTRES AIRES:

Dans la province biogéographique de la forêt humide bengalaise, il y a 16 autres aires protégées. La plus grande est la Réserve de tigres de Manas qui entoure le Sanctuaire de Manas et, comme il est mentionné dans le résumé, la Réserve de tigres ne fonctionne plus comme un système naturel efficace et n'est donc pas comprise dans la désignation. Bien des autres réserves de la province sont très petites et sont des aires naturelles importantes sur le plan régional. Les Sundarbans sont également inclus dans la province mais sont très différents en ce qui concerne la végétation (mangrove) et les espèces de la faune. Le site le plus comparable est la Réserve de tigres de Buxa, adjacente à la Réserve de tigres de Manas, dans l'Etat du Bengal occidental. Cette réserve a été bien plus perturbée par l'homme, possède moins d'espèces et n'a aucun lien fonctionnel avec Manas.

En dehors de la province biogéographique immédiate, on peut comparer Manas au Parc national royal de Chitwan, Népal (inscrit sur la Liste du patrimoine mondial en 1984). Chitwan est dominé par la forêt de sals (Shorea robusta) de la bande du Terai; ses habitats et ses espèces ne sont pas aussi divers que ceux de Manas. Parmi les Mammifères remarquables qui vivent à Manas et non à Chitwan, on peut citer la panthère longibande, le chat doré, l'entelle doré, le macaque de l'Assam, le cerf des marais, le buffle d'Asie, le sanglier nain et le lièvre hispide. Manas compte encore des espèces récemment disparues à Chitwan, dont le cerf des marais, le buffle et (pour autant qu'on sache) l'éléphant sauvage. Manas se trouve plus près de l'interface entre les associations de faune indienne et indo-chinoise et reflète l'importance naturelle distinctive de la région des contreforts de l'Himalaya de l'Assam et de l'Est.

3. INTEGRITE

Le niveau de gestion de Manas est excellent; le personnel comprend un administrateur de parcs professionnel et du personnel formé. Les limites sont marquées avec précision et il y a des patrouilles régulières. Depuis le lancement du Projet tigre, en 1973, les ressources ont augmenté, ce qui a contribué à améliorer considérablement l'état des populations sauvages et de l'habitat. Le gardien chef vient juste de terminer un plan de gestion révisé. Le Sanctuaire de Manas est bien protégé au nord par le reste de la Réserve de faune de Manas, au Bouthan et un peu moins bien à l'est et à l'ouest par la Réserve de tigres de Manas. Sur les limites méridionales, l'agriculture et les villages sont directement adossés à la réserve, ce qui crée des conflits avec les résidents. En revanche, on est pratiquement venu à bout du braconnage, grâce aux patrouilles extrêmement régulières.

Une menace grave pèse sur Manas, menace décrite dans le projet de l'UICN relatif aux "Aires protégées menacées". Il est prévu de construire deux barrages dans la Réserve de faune de Manas, au Bouthan. Outre l'inondation d'une grande partie de la région, la construction de routes, d'un canal et les changements hydrologiques en aval modifieraient radicalement les valeurs naturelles intrinsèques de Manas. Les barrages ne constituent qu'un des éléments du plan de mise en valeur hydrologique des contreforts de l'Himalaya que le ministère de l'Irrigation étudie actuellement.

4. COMMENTAIRES ADDITIONNELS

Les trois initiatives suivantes, prises ensemble, amélioreraient considérablement la viabilité de la désignation de Manas:

- a) la Réserve de faune de Manas adjacente (44 300 ha), située au Bouthan apporterait une nouvelle dimension au site en ajoutant à la diversité des habitats et en encourageant une meilleure coopération dans la gestion de la faune qui migre entre les deux réserves. Lorsque le Bouthan deviendra Etat Partie à la Convention, il est fortement recommandé que ce pays ajoute à la liste le site situé de son côté de la frontière;
- b) en Inde, la législation portant sur les aires protégées prévoit que les parcs nationaux bénéficient d'une protection plus stricte que les sanctuaires. Considérant l'importance de Manas, il est fortement recommandé d'élever le sanctuaire au rang de parc national;
- c) par le passé, le gouvernement de l'Assam avait envisagé d'étendre la réserve le long de la limite nord-ouest, en direction du fleuve Sankosh. L'adjonction de cette région compléterait les limites de la réserve adjacente qui se trouve au Bouthan et doit être encouragée.

5. EVALUATION

Le Sanctuaire de faune de Manas satisfait à trois critères régissant les biens naturels du patrimoine mondial. Le fleuve Manas est un exemple exceptionnel de processus géologiques et biologiques en évolution avec sa forte charge de sédiments et ses modifications de cours (critère ii). La réserve contient également des formations remarquables d'une beauté naturelle exceptionnelle: collines boisées, prairies alluviales et forêts tropicales semi-sempervirentes (critère iii). En outre, Manas est un habitat viable d'importance critique pour plus d'espèces rares ou menacées que toute autre aire protégée du sous-continent Indien (critère iv). C'est la seule et la meilleure aire naturelle où des populations importantes de diverses espèces peuvent continuer à survivre (sanglier nain, lièvre hispide).

L'administration actuelle du parc est de très haut niveau et le gouvernement de l'Inde a clairement démontré son attachement à la conservation en soutenant le Projet tigre.

6. RECOMMANDATIONS

Le Sanctuaire de faune de Manas devrait être inscrit à la Liste du patrimoine mondial. Le comité devrait prendre note des efforts visant à étendre le sanctuaire vers le nord-est ou à élever l'aire au rang de Parc national et les encourager. Le comité devrait également exprimer son inquiétude devant la construction possible d'un barrage hydro-électrique dans la Réserve de faune de Manas, au Bouthan, et son intérêt devant la possibilité de créer un bien transfrontière du patrimoine mondial conjointement avec le Bouthan.