

SCIENTIFIC RESEARCH Studies by Florida and Oklahoma Universities of fish and insect faunas and limnology.

SPECIAL SCIENTIFIC FACILITIES A small limnological research station is planned by the University of San Carlos, Guatemala City.

PRINCIPAL REFERENCE MATERIAL None

STAFF One honorary lake guard. A military patrolboat passes daily.

BUDGET No information (the U.N. List 1971 ed. refers to provision of 'staff salaries').

LOCAL PARK ADMINISTRATION DIRENARE (Direccion de Recursos Naturales Renovables), Ministerio de Agricultura, Guatemala City, Guatemala.

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INDIA

INDIA

AREA 3,268,090 sq. km

POPULATION 606,200,000 (1976 official estimate)

PARKS AND RESERVES LEGISLATION The basis for protection of wildlife in reserves and protected forests lies in the Indian Forest Act (1879, 1927 and 1951), which is variously adapted to the needs of the different States. Within each State further protection categories of wild animal are laid down by State Wild Life Acts. A more recent enactment is the Wild Life (Protection) Act 1972, which was placed in the statutes-book on 9 September 1972.

PARKS AND RESERVES ADMINISTRATION Responsibility of each State.

ADDRESS The Joint Secretary (Forests and Wildlife), Department of Agriculture, Ministry of Agriculture and Irrigation, New Delhi 110001.

TOTAL AREA UNDER PROTECTION The sixteen National Parks and Sanctuaries included in the UN List are indicated below by asterisks. To these have been added a further nine reserves, as a representative sample of other categories of protected area, giving a total of 2,274,096 hectares. It should be noted, however, that the Government of India's latest comprehensive list, although still provisional pending final checking, includes over 180 national parks, wildlife sanctuaries and bird sanctuaries, increasing the grand total to about 5,200,000 ha.

PROTECTED AREAS

1.1	Dandeli Wildlife Sanctuary (Karnataka)	572,907 ha
2.1	Wild Ass Sanctuary, Rann of Kutch (Gujarat)	484,000 ha
2.2	Similipal Tiger Reserve (Orissa)	277,000 ha
2.3	Sundarbans Tiger Reserves (West Bengal)	258,500 ha
*2.4	Gir Forest National Park (Gujarat)	129,500 ha
*3.1	Periyar Wildlife Sanctuary (Kerala)	77,700 ha
3.2	Nagarhole National Park (Karnataka)	57,155 ha
*3.3	Corbett National Park (Uttar Pradesh)	52,547 ha
*3.4	Sariska Wildlife Sanctuary (Rajasthan)	49,182 ha
*3.5	Kaziranga National Park (Assam)	42,994 ha
3.6	Ranthambore Tiger Project (Rajasthan)	39,220 ha
3.7	Palamau Wildlife Sanctuary (Bihar)	34,500 ha
*3.8	Mudumalai Wildlife Sanctuary (Tamil Nadu)	32,100 ha
*3.9	Kanha National Park (Madhya Pradesh)	31,598 ha
*3.10	Manas Wildlife Sanctuary (Assam)	27,195 ha
*4.1	Hazaribagh Wildlife Sanctuary (Bihar)	18,389 ha
4.2	Bandhavgarh National Park (Madhya Pradesh)	16,500 ha
*4.3	Shivpuri National Park (Madhya Pradesh)	15,799 ha
4.4	Dachigam Sanctuary (Kashmir)	14,500 ha
*4.5	Tarora National Park (Maharashtra)	11,654 ha
*4.6	Jaldapara Wildlife Sanctuary (West Bengal)	10,464 ha
*4.7	Borivli National Park (Maharashtra)	6,930 ha
*4.8	Bandipur National Park (Karnataka)	5,695 ha
*4.9	Jaisamand Wildlife Sanctuary (Rajasthan)	5,267 ha
*5.1	Ghana Bird Sanctuary (Rajasthan)	2,800 ha



INDIA

NAME Similipal Tiger Reserve and proposed National Park (Orissa)

TYPE NP BIOTIC PROVINCE 5.6.3/5.6.7

LEGAL PROTECTION Total

DATE ESTABLISHED 1973

GEOGRAPHICAL LOCATION North-eastern Orissa, between Balasore/Baripada and the small town of Joshipur (Mayurbhanj District): N 21° 50'; E 86° 10'

ALTITUDE 600-914 metres

AREA 277,000 ha

LAND TENURE Under joint public and Orissa Forest Department ownership

PHYSICAL FEATURES A plateau area not more than 70 km from the Bay of Bengal and hence, despite its moderate altitude, enjoying a fairly high rainfall ranging from 1250 to 2500 mm, according to locality, and also a wide range of temperature from about a 4°C minimum to a 40°C maximum.

VEGETATION Tropical semi-evergreen forest, moist deciduous forest and dry deciduous forest. Species present include sal *Shorea robusta*, Indian laurel or asna *Terminalia tomentosa*, *Alstonia* spp., *Dillenia*, mango *Mangifera*, *Sterculia*, jackfruit *Artocarpus*, *Xylia* and bamboo species.

NOTEWORTHY FAUNA Mammals include good numbers of rhesus monkey *Macaca mulatta* and common langur *Presbytis entellus*, together with porcupine *Hystrix indica*, wild dog *Cuon alpinus*, sloth bear *Melursus ursinus*, hyaena *Hyaena hyaena*, tiger *Panthera tigris tigris*, elephant *Elephas maximus*, wild boar *Sus scrofa*, barking deer *Muntiacus muntjak*, spotted deer *Axis axis*, sambar *Cervus unicolor*, four-horned deer *Tetracerus quadricornis* and gaur *Bos gaurus*. Of these the tiger is rated by the Red Data Book as 'endangered', the wild dog, elephant and gaur as 'vulnerable', and the bear as of 'indeterminate' status but certainly on the decline.

ZONING None

DISTURBANCES OR DEFICIENCIES None reported

TOURISM The development of facilities for visitors to this fairly new park has apparently not yet made much progress and the area remains a blank on tourist travel maps of the subcontinent.

SCIENTIFIC RESEARCH No information

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF No information

BUDGET No information

LOCAL PARK ADMINISTRATION Field Director, Project Tiger, Similipal Tiger Reserve, Baripada 757001, Orissa.



NAME Sundarbans Tiger Reserves (West Bengal)

TYPE NR BIOTIC PROVINCE 5.7.5

LEGAL PROTECTION Total

DATE ESTABLISHED 1973: one of the reserves established under Project Tiger.

GEOGRAPHICAL LOCATION Ganges delta, east of the Hooghly River and close to the border with Bangladesh, about 70 km SW of Calcutta: N 21°30'-22°15'; E 88°10'-89°10'

ALTITUDE Sea level to a few metres at most.

AREA 258,500 ha

LAND TENURE Public ownership, exercised by the Forest Department of the Government of West Bengal.

PHYSICAL FEATURES Estuarine swamps and islets criss-crossed by a maze of interweaving channels. The water table is very close to the surface of 'dry land' sectors and the water is generally brackish, except in the interior of some larger islands. Most of the rain falls during the south-west monsoon in May to September. Temperatures range from 20°C to 33.9°C.

VEGETATION Composed of characteristic species of tropical South-east Asian estuarine swamp, very largely dominated by mangroves, Avicennia and Rhizophora in particular, but with an admixture of such species as the Sterculiaceae Heritiera fomes.

NOTEWORTHY FAUNA The reserve has been established primarily for the protection of the tiger Panthera tigris tigris which is in the 'endangered' category of the Red Data Book classification. Other mammals include the rhesus monkey Macaca mulatta, wild boar Sus scrofa and spotted deer Axis axis. Reptiles include the estuarine crocodile Crocodylus porosus which is also in the 'endangered' category. The area has a rich avifauna and it provides the winter-quarters of many migrants from the north. With the neighbouring sector of the Sundarbans in Bangladesh it is also the only known regular habitat in the Indian subcontinent of the goliath heron Ardea goliath.

ZONING None

DISTURBANCES OR DEFICIENCIES Poaching in the Reserve has been rife but it is hoped that the recent installation of radio communication equipment for patrols will help combat it.

TOURISM Access to the Reserve is from Port Canning, 40 km south-west of Calcutta, but no facilities for visitors have been developed or are at present practicable.

SCIENTIFIC RESEARCH Studies by the expedition the region led by G.R. Mountfort in 1967 and during the current operations of Project Tiger.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF No information

BUDGET No information

LOCAL PARK ADMINISTRATION Field Director, Project Tiger, Sundarbans Tiger Reserves, P.O. Gosaba, Distr. 24-Parganas, West Bengal.

INDIA

NAME Gir Forest National Park (Gujarat)

TYPE NP BIOTIC PROVINCE 5.6.6

LEGAL PROTECTION Total

DATE ESTABLISHED Hunting was banned in 1948; wildlife sanctuary status was accorded on 18 September 1965.

GEOGRAPHICAL LOCATION About 60 km SSW of Junagadh, Gujarat, Kathiawar peninsular western India: approx. N 21°; E 71°

ALTITUDE 61-122 metres

AREA 129,500 ha (also quoted as 140,400 ha)

LAND TENURE Ownership exercised on behalf of the public by Forest Department, Government of Gujarat.

PHYSICAL FEATURES A hilly area of dry scrubland, interspersed with a few drainage lines, small lakes and waterholes. One fair-sized reservoir, with islets, sandbanks and fairly inaccessible peninsulas.

VEGETATION Dry deciduous forest dominated by teak Tectona grandis, with an admixture of deciduous trees, such as salai Boswellia serrata, dhak Butea monosperma and Ficus glomerata, and thorn forests of Acacia and Zizyphus.

NOTEWORTHY FAUNA The reserve was created to protect the last remaining population of Asiatic lion Panthera leo persica, which is classified by the Red Data Book as an 'endangered species' and of which the estimated 190 individuals remaining in the Park and its vicinity form by far the largest surviving population. Other mammals include leopard P. pardus (rated as a 'vulnerable' species), wild pig Sus scrofa, spotted deer Axis axis, nilgai Boselaphus tragocamelus, four-horned antelope Tetracerus quadricornis and chinkara Gazella bennetti. Large numbers of peafowl Pavo cristatus are present and the avifauna is quite rich, with parakeets particularly conspicuous round the waterholes. A large central water impoundment still contains a few crocodiles Crocodylus palustris palustris, another 'endangered' Red Data Book species.

ZONING None

DISTURBANCES OR DEFICIENCIES Local graziers have, until recently, been a major threat to survival of lion populations. Some 500,000 head of domestic cattle were counted in the Park area in a 1970 census together with 4800 human residents. Plans for resettlement and improving the protection afforded by the Park to lion and other diminishing species, on lines recommended in 1971, are however slowly being implemented.

TOURISM Forest Guest House with accommodation for 20 to 30 visitors and full catering facilities: also transport for visiting the best parts of the Park and special 'shows' of lion and leopard. Access is normally by road from Keshod airport via Veraval on the coast.

SCIENTIFIC RESEARCH A number of studies have been undertaken on the botany and wildlife of the reserve, with special emphasis on the status of the lion.

SPECIAL SCIENTIFIC FACILITIES None, though accommodation and work space for visiting scientists have usually been provided by the Forest Department.

PRINCIPAL REFERENCE MATERIAL

ANON. 1975. Oryx 13: 139.

JOSLIN, P. 1970. Conserving the Asiatic lion. IUCN 11th Technical Meeting Proceedings, Vol. II. IUCN Publ. New Series 17: 24-33.

STAFF In 1971 the reserve was staffed by forest guards under a Superintendent.

BUDGET No information

LOCAL PARK ADMINISTRATION Deputy Conservator of Forests, Sasan, Gir, Gujarat.

INDIA

NAME Periyar Wildlife Sanctuary (Kerala)

TYPE NP BIOTIC PROVINCE 5.7.7

LEGAL PROTECTION Total

DATE ESTABLISHED 1940

GEOGRAPHICAL LOCATION Near Kerala/Tamil Nadu boundary, on the level of Alleppey and about 118 km south-east of Ernakulam: N 9° 30'; E 77° 20'

ALTITUDE 914-1828 metres

AREA 77,700 ha

LAND TENURE Government ownership

PHYSICAL FEATURES Situated on the western side of the Western Ghats, not far below the watershed, the Sanctuary borders a large lake, formed by the impoundment of the Periyar river. The topography, at a ruling level of 1400 m, is undulating so that the shores of the lake are varied by numerous creeks, bays and reentrants, some with the dead branches of drowned trees still projecting from the water and providing safe perching and roosting places for birds. Average annual rainfall is around 3000 mm and temperature ranges from 18°C to 32°C.

VEGETATION About 60 per cent of the area is tropical evergreen and deciduous forest, the tree species including jackfruit *Artocarpus hirsuta*, shisham *Dalbergia* spp., *Terminalia paniculata*, bellirica, chebula and tomentosa, silk-cotton tree *Salmalia malabarica*, teak *Tectona grandis*, *Pterocarpus marsupium* and *Myristica* spp. The remaining area is grassland, of which about 80% has now been planted up with *Eucalyptus*.

NOTEWORTHY FAUNA Mammals include the bonnet monkey *Macaca radiata*, the Nilgiri langur *Presbytis johnii*, black-naped hare *Lepus nigricollis*, Indian giant squirrel *Ratufa indica*, porcupine *Hystrix indica*, Asiatic wild dog *Cuon alpinus*, sloth bear *Melursus ursinus*, otter *Lutra perspicillata*, stripe-necked mongoose *Herpestes vitticollis*, jungle cat *Felis chaus*, tiger *Panthera tigris tigris*, leopard *Panthera pardus*, Asian elephant *Elephas maximus*, wild pig *Sus scrofa*, mouse deer *Tragulus meminna*, barking deer *Muntiacus muntjak*, sambar *Cervus unicolor* and gaur *Bos gaurus*. No less than seven of these are included in the Red Data Book, the tiger being classified as 'endangered', the langur, wild dog, leopard, elephant and gaur as 'vulnerable' and the bear as 'indeterminate'. Birdlife is plentiful, the species present including grey jungle fowl *Gallus sonneratii*, kingfishers and other water birds, the great Indian hornbill *Buceros bicornis* and the southern grackle *Gracula religiosa*.

ZONING None

DISTURBANCES OR DEFICIENCIES None of any extent reported

TOURISM Road access from Cochin, Madurai and Trivandrum. Both eastern and western style accommodation for upwards of a hundred persons in a hotel, guesthouse and bungalow complex centred on one arm of the lake, which is also equipped with boats and jetties. The sanctuary is open to visitors throughout the year, but the best season is December to May; tourist information and guides are always available. Hiking though not prohibited is discouraged because of the risk of

encountering wild elephants. Game observing is largely undertaken from boats or launches which allow this and other shy or dangerous species to be closely approached and photographed without disturbance; but there are also several 'machan' or watchtower hides in the vicinity of landing-places where visitors may be taken under the escort of guides. Latest visitor figures not available but there were 57,515 in 1967.

SCIENTIFIC RESEARCH A short but detailed ecological study of the Sanctuary was carried out by a team sponsored by IUCN's Commission on Ecology and with the cooperation of the Kerala Forest Department from 18 to 22 November 1969.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

BERRY, J., MATHEW, K.T., OVINGTON, J.D. & SWIFT, L.W. 1971. Periyar Wild Life Sanctuary, Kerala, with special reference to the ecological effects of eucalyptus plantations. In Proceedings of IUCN's 11th Technical Meeting, New Delhi, 1969, pp. 114-124 IUCN publ. new series No. 19.

STAFF Three Forest Department Wildlife Preservation Officers, 4 Wildlife Foresters, 30 guards, 9 guides, 11 boat crew: total 57. Hotels are administered by the Tourist Department.

BUDGET Provided by State Government and approximately Rs 500,000 (U.S. \$ 58,000) per annum.

LOCAL PARK ADMINISTRATION Wildlife Preservation Officer, Thekkady, P.O. Kumily, Idikki District, Kerala (tel. Kumily 27).

INDIA

NAME Corbett National Park (Uttar Pradesh)

TYPE NP BIOTIC PROVINCE 5.6.4

LEGAL PROTECTION Total

DATE ESTABLISHED 11 May 1935, as Hailey National Park; name changed in 1954 to Ramganga and finally to Corbett in 1957.

GEOGRAPHICAL LOCATION Foothills of the Himalayas near the junction of Naini Tal, Almora and Garhwal districts, about 50 km north-west of Rammagar: N 29°25'-29°40'; E 78°45'-79°05'.

ALTITUDE 459-914 metres

AREA 52,547 ha

LAND TENURE Public ownership, exercised by the Forest Department of the Government of Uttar Pradesh.

PHYSICAL FEATURES The Ramganga river, a tributary of the Ganges, flows through the area from north-east to south-west carving through the ridges of the Himalayan foothills which run at right-angles to its course. A feature of the Park is the broad flat Patlidoon valley through which the Ramganga flows in a westerly direction before turning south into the plains. In contrast, the upper reaches and tributaries are often enclosed in gorges walled by sandstone cliffs. During the monsoon, from June to October, when rainfall and temperatures are high, the Park is virtually cut off and deserted.

VEGETATION 50% of the area is occupied by moist deciduous forest and 40% by dry deciduous forest. The tree species include sal *Shorea robusta*, shisham *Dalbergia sissoo*, bael *Aegle marmelos*, *Butea monosperma*, *Acacia catechu*, *Anogeissus latifolia*, *Cassia fistula*, *Diospyros tomentosa*, *Terminalia tomentosa* and *euphorbia* *Emblia officinalis*. Of the remaining 10% of the area sub-tropical pine forest dominated by *Pinus roxburghii* occupies about 2% and the rest has been flooded by a dam or otherwise disturbed, though there are some patches of tall seasonal grasses.

NOTEWORTHY FAUNA Larger mammals include the langur *Presbytis entellus*, lomri or Bengal fox *Vulpes bengalensis*, sloth bear *Melursus ursinus*, yellow-throated marten *Martes flavigula*, otter *Lutra lutra*, civet *Viverricula indica*, palm civet *Paradoxurus hermaphroditus*, Indian grey mongoose *Herpestes edwardsii*, leopard cat *Felis bengalensis*, jungle cat *F. chaus*, tiger *Panthera tigris tigris*, elephant *Elephas maximus*, a local race of wild boar *Sus scrofa cristatus*, barking deer *Muntiacus muntjak*, cheetal or spotted deer *Axis axis*, hog deer *A. porcinus*, sambar *Cervus unicolor*, nilgai *Boselaphus tragocamelus* and goral *Naemorhaedus goral*. The tiger is classified as 'endangered' in the Red Data Book, the bear and the elephant as of indeterminate status and vulnerable, respectively. A rich avifauna of over 400 species includes many raptors, such as brahmyn kite *Haliastur indus*, black kite *Milvus migrans*, shikra *Accipiter badius*, tawny eagle *Aquila rapax*, Indian white-backed vulture *Cyps bengalensis*, Egyptian vulture *Neophron percnopterus* and osprey *Pandion haliaetus*; black partridge *Francolinus francolinus*, red jungle fowl *Gallus gallus* and peafowl *Pavo cristatus*. The mugger *Crocodylus palustris*, gharial *Gavialis gangeticus* and Indian python *Python molurus*, the first two rated as 'endangered', the last as a 'vulnerable' species, still survive in and along the river.

ZONING None

DISTURBANCES OR DEFICIENCIES A barrage on the river has put a substantial area in the west of the reserve under water and considerable disturbance to the Park took place during construction. Rights to cut firewood and pasture cattle have persisted in some sectors at least till very recently. Experimental planting of reeds Arundo donax to improve cover for animals is of uncertain value.

TOURISM Season for tourism is November to May, plentiful accommodation being available in Rest Houses and tourist Camps. About 6000 visitors each year are provided with a variety of facilities such as elephant-back excursions, 'machan' observation towers, sport-fishing and films and other information media.

SCIENTIFIC RESEARCH Various scientific studies undertaken in the course of 'Project Tiger'.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed: several brochures have been published for tourists.

STAFF Totals 55 consisting of 7 Wild Life Wardens and Officers, 15 Wild Life Guards, 6 receptionists/guides, clerical staff and 25 others.

BUDGET Rs. 300,000 per annum (equivalent to about U.S. \$ 34,000)

LOCAL PARK ADMINISTRATION Chief Wild Life Warden/Chief Conservator of Forests, 17 Rana Pratap Marg., Lucknow, U.P. Also: Field Director, Project Tiger, Corbett Tiger Reserve, Ramnagar, Dist. Naini Tal, U.P.

INDIA

NAME Kaziranga National Park (Assam)

TYPE NP BIOTIC PROVINCE 5.7.5

LEGAL PROTECTION Total

DATE ESTABLISHED Game Reserve established in 1908; status changed to National Park on 1 January 1974.

GEOGRAPHICAL LOCATION South bank of the Brahmaputra River, 97 km west of Jorhat, on the main road to Nowgong and Gauhati: N 26°40'; E 93°15'

ALTITUDE The mean altitude is approximately 75 metres

AREA 42,994 ha

LAND TENURE Public ownership, exercised by the Forest Department of Assam State.

PHYSICAL FEATURES A low-lying area between the Brahmaputra and the Mikir hills, which are a northern spur of the mountains which run west-east from Shillong to Kohima and link up with the great ranges along the Burmese border. Except along the southern fringe, much of the Park is marshland, liable to periodic flooding.

VEGETATION Typical swamp vegetation, in which water hyacinth *Eichhornia crassipes* has unfortunately become established, interspersed with large pools fringed with reeds especially *Phragmites karka*. There are also patches of tall grassland dominated by 'elephant grasses' such as *Arundo donax*, *Saccharum spontaneum* and *Alpinia* sp; and scattered trees and thicket, mostly of *Albizia procera*, hickory *Carya arborea*, *Lagerstroemia parviflora* and the queen's flower *L. speciosa*.

NOTEWORTHY FAUNA Good populations of mammals include several species classified in the Red Data Book, such as the tiger *Panthera tigris tigris* ('endangered'), leopard *P. pardus* and the elephant *Elephas maximus* (both 'vulnerable'), the great Indian rhinoceros *Rhinoceros unicornis* ('endangered' again), wild pig *Sus scrofa*, hog deer *Axis porcinus*, swamp deer *Cervus duvauceli* (endangered) and wild buffalo *Bubalus bubalis* (vulnerable). Birds include grey pelicans *Pelecanus philippensis*, which nest near Kaziranga village, black-necked stork *Xenorhynchus asiaticus*, lesser adjutant stork *Leptoptilos javanicus* and numerous species of smaller waterfowl. The hill slopes of the buffer zone fringing the Park on the south have many woodland species including the red junglefowl *Gallus gallus*.

ZONING None

DISTURBANCES OR DEFICIENCIES Poaching of the rhinoceros has always been the most serious problem but has been brought fairly well under control. Deliberate grass-burning in February/March is also quite well controlled.

TOURISM Rest camp within Park boundaries at Arimora, on the river bank, and two well equipped guest houses, with about 25 beds, just outside the Park and perched above the main road at Kohora, near the centre of the southern boundary, so that on the rare occasions when the air is clear there is a superb view of the Himalayas. A motorable track for 4-wheel drive vehicles bisects the Park from Kohora to Arimora and another track from Baguri village further to the west allows access to the west central area. Otherwise, the main facility is the provision of elephants for game viewing in the swampland, though there are also one or two low watch-towers.

SCIENTIFIC RESEARCH Some fairly detailed studies have been undertaken, particularly of the rhinoceros, for which Kaziranga is one of the last strongholds.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed, but a tourist brochure gives a fairly detailed account of the rhino and the problems of its protection.

STAFF 26 Game Wardens and 21 Forest Guards reported in 1971.

BUDGET Reported in 1971 as U.S. \$ 7,250, \$ 3,300 being allocated to salaries.

LOCAL PARK ADMINISTRATION Divisional Forest Officer, Sibsagar Forest Division, Jorhat 785001, Assam.

INDIA

NAME Kanha National Park (Madhya Pradesh)

TYPE NP

BIOTIC PROVINCE 5.6.3

LEGAL PROTECTION Total

DATE ESTABLISHED Originally given protection under the name of 'Banjar Valley Sanctuary' in 1935, having previously been a hunting reserve. Established as a National Park on 1 June 1955, under the Madhya Pradesh National Parks Act 1955. Enlarged in 1964.

GEOGRAPHICAL LOCATION In Mandla District, 320 km by road north-east of Nagpur, about 120 km south-east of Jabalpur, and 40 km ESE of Mandla itself: N 22°30'; E 80°45'

ALTITUDE 525-870 metres

AREA 31,598 ha

LAND TENURE Public ownership, exercised by the Forest Department of Madhya Pradesh Government.

PHYSICAL FEATURES At the western end of the eastern half of the Satpura Range, in what are known as the Maikal Hills, the topography of the Park area consists of rolling, sometimes quite rugged hills, enclosing on three sides what is in effect a large amphitheatre of meadow-like grasslands locally known as maidan. The hills tend to be flat-topped and the underlying rock is volcanic and breaks down into black cotton soil in low-lying areas liable to flooding in the rains, along the line of the Banjar river, a tributary of the Narmada which reaches the sea north of Bombay. The wet season begins in late June and ends in October, producing about 1800 mm of rainfall, and is followed by the cool season from November to February and the hot season from then until the monsoon arrives, with a temperature range of -5.5°C to 43°C.

VEGETATION The grassy meadows are of two types, those marking former village sites and dominated by coarse Pennisetum alopecurus and the 'maidan' proper in which Themeda triandra is dominant but many other species occur, growing up to one or two metres tall in the monsoon. The meadows which account for about 15 per cent of the area are largely enclosed by sal forest Shorea robusta with which various Terminalia species are commonly associated. There are occasional patches of bamboo and thickets dominated by the leguminous Maughania stricta. Higher up the slopes and on the hill tops bamboos are much more common, in places there is dense scrubby bush or tall grassland, and there is a very large area, accounting for over half the Park, of dry deciduous woodland of such species as Acacia torta, Anogeissus latifolia, Bauhinia spp. and Cassia fistula.

NOTEWORTHY FAUNA The mammals include langurs Presbytis spp., wild dog Cuon alpinus, tiger Panthera tigris tigris, leopard P. pardus, wild pig Sus scrofa, barking deer Muntiacus muntjak, chital or spotted deer Axis axis, sambar Cervus unicolor, the southern subspecies of barasingha or swamp deer C. duvauceli branderi and gaur Bos gaurus. Of these the tiger, of which the Park is one of the most important strongholds, and the swamp deer are rated as 'endangered' by the Red Data Book, and the wild dog, leopard and gaur as 'vulnerable'. Many species of bird have been recorded, including numerous gamebirds like quail, red and grey jungle fowl Gallus gallus and G. sonneratii, and peafowl Pavo cristatus. Vultures as might be expected are quite common and there is a fine selection of small colourful passerine species especially on the sal forest-edge.

ZONING None

DISTURBANCES OR DEFICIENCIES There are no less than seventeen villages within the enlarged Park boundaries, but they are to be moved out under a phased programme. Forest fires in summer are a fairly frequent feature. Poaching was formerly rife but is now reported to be under control.

TOURISM Two forest rest houses, game-viewing towers or 'machan', and guides are available. Motorable tracks are impassable during rains.

SCIENTIFIC RESEARCH A major study was carried out in the Park under the auspices of the Johns Hopkins Center for Medical Research and the University of Calcutta in 1963-1965. A further brief study of particular problems was carried out in 1969 by an inter-commission group, in connection with the 11th Technical Meeting of IUCN held at New Delhi in November of that year.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- BINNEY, G.A., BOURLIERE, F., CURRY-LINDAHL, K., DUTTA, J.J. and SPILLETT, J.J. 1971. Kanha National Park, Madhya Pradesh, with special reference to the swamp deer *Cervus duvauceli*: a rehabilitation problem. In Proceedings of IUCN's 11th Technical Meeting Vol. III (International Commission on National Parks), pp. 102-108. IUCN Publ. new series No. 19, Morges.
- BURTON, R. (ed.) 1953. The Central Provinces (Madhya Pradesh). In The Preservation of Wild Life in India. Bangalore.
- SCHALLER, G.B. 1967. The deer and the tiger. Univ. Chicago Press.

STAFF Reported as 6 in 1971, including 2 foresters and 2 guards.

BUDGET Reported in 1971 as averaging U.S. \$ 7,500 (for the period 1964-1965).

LOCAL PARK ADMINISTRATION Field Director, Project Tiger, Kanha Tiger Reserve, Mandla, Madhya Pradesh.

<u>NAME</u>	Bandhavgarh National Park (Madhya Pradesh)		
<u>TYPE</u>	NP	<u>BIOTIC PROVINCE</u>	5.6.3
<u>LEGAL PROTECTION</u>	Total		
<u>DATE ESTABLISHED</u>	23 March 1968, under the Madhya Pradesh National Parks Act 1955.		
<u>GEOGRAPHICAL LOCATION</u>	About 130 km north-east of Jabalpur, some 30 km beyond Umaria: N 23° 40'; E 81° 02'		
<u>ALTITUDE</u>	Mean height 810 metres		
<u>AREA</u>	16,500 ha (elsewhere quoted as 26,775 ha)		
<u>LAND TENURE</u>	Public ownership, exercised by the Madhya Pradesh Forest Department		
<u>PHYSICAL FEATURES</u>	North-east corner of the most northerly spur of the Maikal range of hills, in which the Kanha National Park (area 3.9) is also situated, some 160 km to the south. The landscape is a similar mixture of fairly steep and rocky hills, often with flat tops and with fairly level grassland or meadows in the valleys below. On a hill almost in the centre of the Park, Bandhavgarh Fort and its adjacent temple form an additional asset of considerable historical, religious and aesthetic interest.		
<u>VEGETATION</u>	Moist and dry deciduous forest dominated by sal <i>Shorea robusta</i> and clumps of bamboos. Grasslands occur in the lower parts of the valleys and also on the summit plateaus of many hills.		
<u>NOTEWORTHY FAUNA</u>	The larger mammals include sloth bear <i>Melursus ursinus</i> , tiger <i>Panthera tigris tigris</i> , leopard <i>P. pardus</i> , wild pig <i>Sus scrofa</i> , barking deer <i>Muntiacus muntjak</i> , chital <i>Axis axis</i> and sambar <i>Cervus unicolor</i> , four-horned antelope <i>Tetracerus quadricornis</i> , gaur <i>Bos gaurus</i> and chinkara <i>Gazella gazella bennetti</i> . The general area in which the Park is situated is noted for its 'white tigers' and it is hoped that it will give protection to a wild population of this strain of what the Red Data Book rates as an endangered species.		
<u>ZONING</u>	None reported		
<u>DISTURBANCES OR DEFICIENCIES</u>	The area of the Park was originally the shooting preserve of the Maharajas of Rewa, whose capital is situated about 100 km to the north and the exercise of their rights undoubtedly contributed to the survival of wildlife, though when used unwisely it could also do serious harm to the ecosystem. The shooting rights have now been surrendered and it remains to be seen whether balanced and optimal populations of wildlife species, including particularly the carnivores, can be restored and maintained.		
<u>TOURISM</u>	Not yet encouraged: the Park is still very much in the development stage despite having been in existence for ten years.		
<u>SCIENTIFIC RESEARCH</u>	No information		
<u>SPECIAL SCIENTIFIC FACILITIES</u>	None		

PRINCIPAL REFERENCE MATERIAL None listed

STAFF No information

BUDGET No information

LOCAL PARK ADMINISTRATION Divisional Forest Officer, Bandhavgarh National Park
Division, Umaria 484661, Madhya Pradesh.

INDIA

NAME Bandipur National Park (Karnataka)

TYPE NP BIOTIC PROVINCE 5.7.7/5.6.3

LEGAL PROTECTION Total

DATE ESTABLISHED Established as a Wild Life Park of 80,244 hectares by the Maharaja of Mysore in 1941; 5695 hectares were given Sanctuary status by the State Government in or before 1964; and finally on 5 June 1974, the present area, substantially exceeding that of the original Park, was declared a National Park by the Karnataka State Government.

GEOGRAPHICAL LOCATION Near the junction of the Karnataka, Kerala and Tamil Nadu state boundaries, 70 km south of Mysore: N 11° 30'-45'; E 76° 30'

ALTITUDE 1025-1223 metres (highest point also quoted as 1454 metres)

AREA 87,420 ha

LAND TENURE Public ownership, exercised by Karnataka State Government

PHYSICAL FEATURES A hilly region forming part of the Western Ghats and including a northern spur of the main Nilgiri massif. On the south-west and south-east, respectively, the Nugu River and a small but perennial tributary of the Moyar River separate the Park from protected areas of Kerala and Tamil Nadu. Otherwise the water supply for wildlife depends on waterholes, many of which dry up in the dry season, and marshy patches known locally as 'gaddes'. Natural salt-licks are another important feature. The temperature range is 21°C to 35°C, the hottest months being April and May, before the break of the monsoon, which produces the greater part of the 875 mm annual rainfall during the months of June to August.

VEGETATION Much of the Park is occupied by dry deciduous forest of a savanna type, dominated by such trees as Anogeissus latifolia, teak Tectona grandis, sandalwood Santalum album, Terminalia spp., Pterocarpus marsupium, shisham or rosewood Dalbergia latifolia, Grewia tilifolia and the silk cotton tree Bombax malabaricum, and by bamboos such as Bambusa arundinacea, the latter mainly around marshy areas and along the watercourses. Seasonal grasses grow abundantly under about 90% of the tree cover.

NOTEWORTHY FAUNA Larger mammals include the bonnet monkey Macaca radiata, the langur Presbytis entellus, jackal Canis aureus, wild dog Cuon alpinus, sloth bear Melursus ursinus, jungle cat Felis chaus, tiger Panthera tigris tigris, leopard P. pardus, wild pig Sus scrofa, mouse deer Tragulus meminna, barking deer Muntiacus muntjak, spotted deer Axis axis, sambar Cervus unicolor, four-horned antelope Tetracerus quadricornis and gaur Bos gaurus. Four of these, the wild dog, bear, leopard and gaur are classified as 'vulnerable' in the Red Data Book and the tiger as 'endangered'. The gaur herd was much reduced by rinderpest in 1969. Jungle-fowl Gallus spp. and peafowl Pavo cristatus are among the many bird species and most of the best known snakes of India are known to occur.

ZONING None

DISTURBANCES OR DEFICIENCIES The Park is well known as having been kept comparatively free for a long period from human disturbances such as forestry operations, but the outer fringes of the now greatly extended area are subject to encroachment by cattle.

TOURISM With easy road access from such centres as Bangalore (nearest airport), Ootacamund, Cannanore and Calicut, as well as Mysore itself, this Park receives a considerable number of visitors, for whom Forest Lodges, cottages and tented accommodation provide about 50 beds, while youth hostel type accommodation, with a further 30-40 beds, should by now have been completed. There is a network of about 40 km of game-viewing tracks and one or more 'machan' or tower hides. Guides, vehicles and riding elephants may be hired and there is a children's playground.

SCIENTIFIC RESEARCH No information

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF Consisted of 40 units in 1971, including 7 Game Watchers. A Field Director and Deputy Field Director of Project Tiger, with supporting staff, are now based in the Park.

BUDGET Was quoted as U.S. \$ 22,000 in 1971, including salaries.

LOCAL PARK ADMINISTRATION Field Director, Project Tiger, Bandipur Tiger Reserve, 6 Lakshmi Vilas Road, Mysore 1.

INDIA

NAME Ghana Bird Sanctuary (Rajasthan)

TYPE NP

BIOTIC PROVINCE 5.6.3

LEGAL PROTECTION Total: all hunting now said to be prohibited

DATE ESTABLISHED Established in 1956, as the Keoladeo Ghana Wild Life Sanctuary and included under that name or as the Bharatpur Wild Life Sanctuary in the U.N. List.

GEOGRAPHICAL LOCATION South-east of the city of Bharatpur, about 45 km due west of Agra: N 27°13'; E 77°30'

ALTITUDE 366 metres (elsewhere quoted as only 174 metres)

AREA 2,800 ha

LAND TENURE Public ownership, exercised by the Rajasthan Forest Department

PHYSICAL FEATURES Shallow depressions bordered by bunds and artificially improved to act as reservoirs for the Delhi-Agra canal and its various branches. The water level thus tends to be lowered and some sections drained by the end of the dry season and, conversely, filled to capacity (but never more than 1.5 metres in depth) by sluices from the Gambhir and Banganga rivers before the dry season begins. Fortunately, this fits in well with waterfowl breeding season requirements. The hottest month is June, with temperatures up to 46°C; freezing point 0°C has been recorded in January. Rainfall averages 662 mm.

VEGETATION Medium sized trees, such as babul *Acacia arabica* and *A. leucophloea*, are distributed throughout the area and in places form dense thickets or what in the wet season resembles typical groundwater forest. Other dominant species include *Ziziphus jujuba*, *Prosopis spicigera* and shrubs such as *Capparis* spp. Those providing the large water birds with nesting places are, however, well scattered; most of them are standing in water for several months of the year. An abundance of waterlilies and other aquatic vegetation, including extensive reedbeds and composed of *Wolfia*, *Ipomea*, *Nelumbo*, *Neptunia*, *Vallisneria*, *Naja*, *Azolla* spp. and many others, occupies most of the water surfaces. Taller trees such as pipal and other *Ficus* species and exotics like *Cordia dichotoma* and mezquit *Prosopis juliflora* have been planted along the bunds.

NOTEWORTHY FAUNA Breeding water birds from July until October and a vast influx of migrants from September to March, together with attendant raptors and resident species, make up a total of over 250 species. Cormorants, darters, herons, storks and ibises, including the painted stork *Ibis leucocephalus* and open-bill *Anastomus oscitans*, comb-duck or nukta *Sarkidiornis melanotos* and Pallas's fishing eagle *Haliaeetus leucoryphus*, are among the most notable breeding species. At least 15 species of ducks and geese and, above all the Siberian white crane *Grus leucogeranus*, a Red Data Book 'endangered' species, for which the Sanctuary is one of the principal winter refuges, constitute the most outstanding migrant species. The Sanctuary also harbours one mammal species rated as vulnerable in the Red Data Book, the leopard *Panthera pardus*, and a good selection of other mammals, although in small numbers, including the rhesus monkey *Macaca mulatta*, jungle cat and leopard cat *Felis chaus* and *bengalensis*, striped hyaena *H. hyaena*, spotted deer *Axis axis*, nilgai *Boselaphus tragocamelus*, blackbuck *Antelope cervicapra* and many

civets, bats, rodents and other small species. Reptiles are well represented and include at least ten species of snake, the monitor lizard Varanus monitor and turtles; even an occasional example of the endangered gharial Gavialis gangeticus has been recorded. The variety and abundance of fish is described as 'impressive', Labeo spp. being particularly numerous: it has been estimated that the daily consumption of fish by the main stork and ibis breeding colony alone is upwards of 6000 kg.

ZONING None; but vehicular passage along some of the bunds is restricted.

DISTURBANCES OR DEFICIENCIES Heavy sport shooting early in the century was reduced by the Maharajah of Bharatpur to occasional shoots, and now has ceased altogether. The exercise of a traditional right to graze cattle in the reserve has always proved extremely difficult to keep under sufficiently strict control and sometimes becomes seriously disturbing. The spread of water hyacinth Eichhornia crassipes in the more permanently inundated area poses a major problem.

TOURISM In view of the proximity of the Sanctuary to Agra and the thousands of visitors to the Taj Mahal, it is not surprising that the unique spectacle offered by Ghana's swarming waterfowl is attracting increasing numbers (nearly 5000 in 1968/69) of ordinary visitors, as it has long drawn in the dedicated ornithologist. A Rest House in the Sanctuary can accommodate about 10 persons and there is a motel not far outside the main gate. Boats and boatmen are available for touring the bird breeding colony, but cause more disturbance than they should because of lack of adequate control. There are about 40 km of motorable tracks.

SCIENTIFIC RESEARCH The Bombay Natural History Society under the expert guidance of Dr. Salim Ali has studied and ringed birds since 1967, and a considerable number of recoveries have been reported from the U.S.S.R.

SPECIAL SCIENTIFIC FACILITIES Ringing hut and accommodation for bird-ringers and other properly accredited ornithologists.

PRINCIPAL REFERENCE MATERIAL

BORA, G.K. and SAXENA, V.S. 1969. Bharatpur Bird Sanctuary. Indian Forester Vol. 95(11): 753-762.

STAFF A Game Warden; no details as to supporting staff.

BUDGET No information

LOCAL PARK ADMINISTRATION Divisional Forest Officer, Bharatpur, Rajasthan.

INDONESIAAREA 1,904,000 sq. kmPOPULATION 129,000,000 (1976 estimate)

PARKS AND RESERVES LEGISLATION Reserves were originally established on the basis of the Netherlands Indies "Natuurmonumenten en Wildreservaten ordonnantie" (Staatsblad 1932, No. 17) but this was withdrawn in 1941 and the Nature Protection Ordinance (Staatsblad 1941, No. 167) took its place.

PARKS AND RESERVES ADMINISTRATION The Directorate for Nature Conservation and Wildlife Management is responsible for management of reserves and has offices at Djakarta and Bogor. The Directorate (Direktorat Perlindungan dan Pengawetan Alam, PPA) has a number of Sections to which local park management is directly related.

ADDRESS No information other than as quoted in previous sectionTOTAL AREA UNDER PROTECTION 1,269,694 ha (U.N. Listed areas only).PROTECTED AREAS

1.1	Gunung Leuser Reserves (including Kluët Reserve, Sikundur Reserve and South and West Langkat Reserves) (Sumatra)	636,500 ha
2.1	Mt. Lorentz (West Irian)	320,000 ha
2.2	Kotawaringin/Sampat (Kalimantan)	205,000 ha
3.1	Ujung Kulon-Panaitan (Java)	56,620 ha
4.1	Mt. Indrapura (Sumatra)	12,530 ha
4.2	Musa Barung (Java)	6,000 ha
4.3	Laut Pasir Tengger (Java)	5,250 ha
5.1	Padang Luwai (Kalimantan)	5,000 ha
5.2	Mt. Tangkoko Batu Angus (Sulawesi)	4,446 ha
5.3	Rimbopanti (Sumatra)	3,500 ha
5.4	Kawah Idjen (Java)	2,560 ha
5.5	Rantja Danau (Java)	2,500 ha
5.6	Krakatau Mountain (Sumatra)	2,500 ha
5.7	Bengkulu (Sumatra)	2,448 ha
5.8	Mandor (Kalimantan)	2,000 ha
5.9	Panua (Sulawesi)	1,500 ha
5.10	Ranu Kumbolo (Java)	1,340 ha



INDONESIA

NAME Gunung Leuser (Sumatra). Comprises the reserves of Kluët, Sikundur and South and West Langkat

TYPE NP BIOTIC PROVINCE 5.12.1

LEGAL PROTECTION Protected, with a 'nature park' status, under Netherlands Indies Natuurmonumenten en Wildreservaten ordonnantie, 1932, replaced by the Nature Protection Ordinance (Ordonansi Perlindungan Alam) of 1941.

DATE ESTABLISHED Gunung Leuser Reserve proper was established on 3 July 1934; Kluët Reserve on 30 September 1936; the three other Reserves on 30 October 1938.

GEOGRAPHICAL LOCATION North-western Sumatra, Atjeh (Aceh) and Sumatera Utara provinces, due west of Medan: N 2°55'-4°05'; E 96°55'-98°30'.

ALTITUDE A few hundred metres to 3381 m (summit of Gunung Leuser, elsewhere quoted as 3466 m).

AREA 636,500 ha (Gunung Leuser 416,500 ha; Kluët c. 20,000; and Sikundur with South and West Langkat rather more than 200,000 ha).

LAND TENURE State ownership, under the management of the Directorate for Nature Conservation and Wildlife Management (PPA).

PHYSICAL FEATURES The Reserves are situated at the northern end of the great Barisan range which forms the backbone of the island of Sumatra, running along the whole 1750 km of its length. The mountains are very rugged and access is difficult, the two Reserves in Atjeh Province (Gunung Leuser and Kluët) being separated by a considerable distance from the three in Sumatera Utara. The inhabited Alas river valley also bisects the Reserves. The region is essentially volcanic, with occasional outcrops of pre-Carboniferous gneiss, schists and quartzites scattered along the summit ridge.

VEGETATION Lower levels of the Reserves are covered by dense tropical rain forest in which the flowers of Rafflesia, a root parasite, are a notable feature: the flowers of R. arnoldii may be from 45-60 cm or more in diameter, weigh up to 7 kg and are well-known for their putrid smell. Higher levels have stunted moss forest. The peripheries of the Reserves consist of "blangs", a type of savanna characterized by dwarf shrubs, herbs, rushes and moss. The montane flora includes many Eurasian genera such as Rhododendron, Vaccinium, Parnassia and Gentiana.

NOTEWORTHY FAUNA The Reserves and their surroundings provide a refuge for many species, including the following mammals: crab-eating and pig-tailed macaques Macaca irus and M. nemestrina, the silvered leaf monkey Presbytis cristata, the siamang and white-handed gibbons Hylobates syndactylus and H. lar, orang-utan Pongo pygmaeus (classified by the Red Data Book as 'endangered'), for which the area is one of the last remaining strongholds, the sun bear Helarctos malayanus, three more Red Data Book species, the Sumatran tiger Panthera tigris sumatrae ('vulnerable'), the Asian elephant Elephas maximus ('vulnerable') and the Sumatran rhinoceros Didemnoceros sumatrensis ('endangered'), sambar deer Rusa unicolor and the Sumatran serow Capricornis sumatraensis sumatraensis (another 'endangered' species). Birds include the great argus pheasant Argusianus argus, Blyth's hornbill Rhyticeros plicatus, the rhinoceros hornbill Buceros rhinoceros and the helmeted hornbill Rhinoplax vigil.

ZONING None

DISTURBANCES OR DEFICIENCIES The lowland forest areas bordering the Reserves are under threat of clearance for subsistence agriculture and for timber (the latter mainly through concessions to foreign logging companies). Poaching by the inhabitants of the Alas Valley is reported to have been rife at least until very recently and directed chiefly against two highly endangered species, the orang utan and Sumatran rhinoceros.

TOURISM Difficult of access and with no tourist facilities, the Reserves have had very few visitors to date.

SCIENTIFIC RESEARCH The ecology and ethology of primates have been under study by H.D. Rijksen since 1971. Botanical and entomological surveys were undertaken in 1972.

SPECIAL SCIENTIFIC FACILITIES An orang-utan rehabilitation centre for acclimatization of confiscated orang-utans for eventual release into the wild was established in 1972 at Ketambe. They are the subject of special study by H.D. Rijksen.

PRINCIPAL REFERENCE MATERIAL

NETHERLANDS COMMISSION FOR INTERNATIONAL NATURE PROTECTION, 1955.

Mededelingen No. 16 (includes 1:400,000 map dated 1938, for relevant part of Northern Sumatra).

KURT, F. 1972. Project 596 Leuser Reserve, Indonesia, Survey. World Wildlife Fund, Morges.

STAFF The Gunung Leuser Reserve proper and the Kluët Reserve are under the regional management of the Chief of Atjeh Section of the PPA, who has a staff of 9 wardens for the purpose. Sikundur and West and South Langkat Reserves are under the Chief of the Sumatera Utara Section, with 7 wardens.

BUDGET Part of the funds for payment of staff for the Reserves are provided by the Indonesian Government. About another U.S. \$ 20,000 is contributed annually through the World Wildlife Fund, Netherlands Appeal.

LOCAL PARK ADMINISTRATION PPA, Banda Atjeh and Medan.

IRAN

IRAN

AREA 1,626,500 sq. km

POPULATION 28,448,000 (UN estimate, 1970)

PARKS AND RESERVES LEGISLATION In 1967 Parliament enacted the Organic Law creating the Game and Fish Department of Iran and defining its jurisdiction over 'Protected Regions' and 'Wildlife Parks'. The Game and Fish Department has now been incorporated into the Department of the Environment created in 1974.

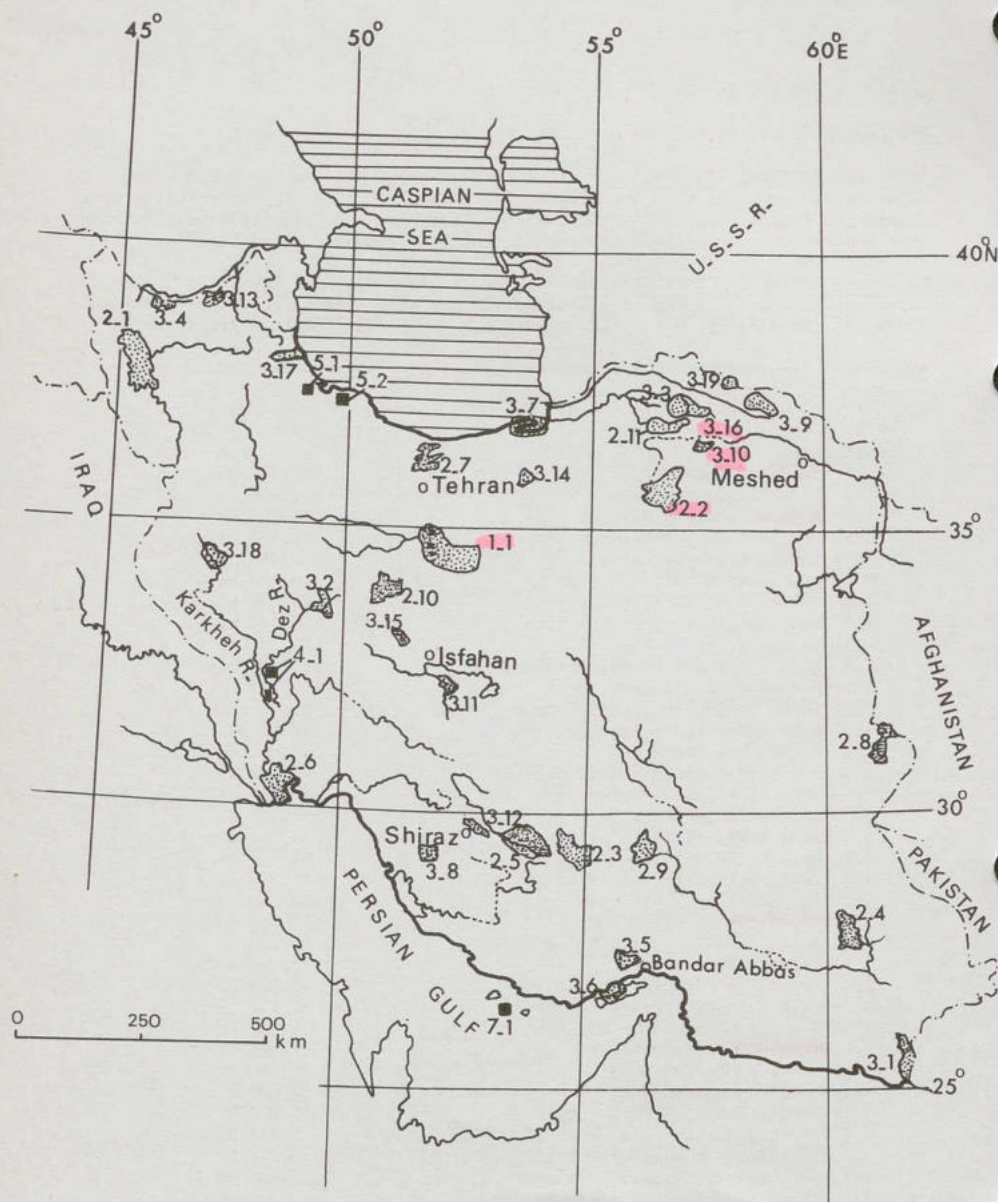
PARKS AND RESERVES ADMINISTRATION Under the Environmental Law of 1974, the Department of the Environment administers four categories of reserves: National Parks, National Nature Monuments, Wildlife Refuges and Protected Areas.

ADDRESS Department of the Environment, P.O. Box 1430, Tehran, Iran

TOTAL AREA UNDER PROTECTION 4,815,846 ha

PROTECTED AREAS

1.1	Kavir National Park	609,438 ha
2.1	Lake Rezaieyeh National Park	483,000 ha
2.2	Touran Wildlife Refuge	431,250 ha
2.3	Bahram-e Gour Protected Area	384,500 ha
2.4	Bazman Protected Area	324,688 ha
2.5	Bakhtegan Wildlife Refuge	310,438 ha
2.6	Shadegan Wildlife Refuge	290,000 ha
2.7	Central Alborz National Park	203,000 ha
2.8	Hamoun Wildlife Refuge	180,000 ha
2.9	Khahr-va-Rouchoun Wildlife Refuge	169,200 ha
2.10	Mooteh Wildlife Refuge	163,250 ha
2.11	Khosh Yeilagh Wildlife Refuge	150,595 ha
3.1	Bahu Kalat Protected Area	94,750 ha
3.2	Oshtrankuh Protected Area	93,950 ha
3.3	Mohammad Reza Shah National Park	91,890 ha
3.4	Kiamaki Wildlife Refuge	84,400 ha
3.5	Geno National Park	82,400 ha
3.6	Hara National Park	82,360 ha
3.7	Mian Kaleh Wildlife Refuge	81,180 ha
3.8	Arjan National Park-International Reserve	65,750 ha
3.9	Tandoureh National Park	53,780 ha
3.10	Miandasht Wildlife Refuge	52,000 ha
3.11	Kolah Ghazi Wildlife Refuge	50,000 ha
3.12	Bamou National Park	47,440 ha
3.13	Arasbaran Wildlife Refuge	38,320 ha
3.14	Parvar Protected Area	37,937 ha
3.15	Ghamishloo Wildlife Refuge	37,000 ha
3.16	Chorkhod National Park	34,000 ha
3.17	Lisar Protected Area	31,250 ha
3.18	Bisotoun Wildlife Refuge	30,000 ha
3.19	Sarani National Park	17,800 ha
4.1	Dez and Karkheh Wildlife Refuge	5,375 ha
5.1	Siah Kesheem and Selke Wildlife Refuge	3,515 ha
5.2	Amir Kelayeh Wildlife Refuge	1,230 ha
7.1	Sheedvar Island Wildlife Refuge	160 ha



NAME Kavir National Park

TYPE NR

BIOTIC PROVINCE 2.11.5

LEGAL PROTECTION Total

DATE ESTABLISHED 20 June 1964

GEOGRAPHICAL LOCATION Western margins of the Dasht i Kavir (Great Salt Desert), 170 km south-east of Tehran. N 34°40'; E 52°10'

ALTITUDE 609-2015 metres

AREA 609,438 ha

LAND TENURE Government land

PHYSICAL FEATURES Nearly all desert formations of the Persian plateau are present here: enormous sand dunes, salt waste and rugged to rolling mountains. Geological characteristics include extrusive igneous rocks comprising higher elevations, Miocene and more recent limestones at intermediate levels and salt pans at lowest elevations. Most soils severely depleted due to past abuse. Average precipitation low, highly variable, 50 mm to over 300 mm, average 100 mm, in light rain from November to May. Temperature range from -15°C to over 40°C.

VEGETATION The vegetation has made a reasonable recovery from past abuse and all sand has been stabilized except for a small area of very high dunes. Plant cover varies with edaphic conditions: Haloxylon and Aristida on lighter soils; Suaeda, the manna plant Alhagi and Tamarix on saline soils; and dwarf scrub with sagebrush Artemisia sp., Astragalus, Zygophyllum and wild almond Amygdalus in areas with more than 100 mm mean annual precipitation.

NOTEWORTHY FAUNA Excellent representation of desert fauna including goitred and mountain gazelles Gazella subgutturosa and G. gazella, Persian wild ass Equus hemionus, cheetah Acinonyx jubatus, caracal Lynx caracal and desert forms of wild sheep Ovis ammon and mountain goat Capra aegagrus. Palearctic birds well represented including desert species such as the houbara bustard Chlamydotis undulata.

ZONING Managed nature reserve throughoutDISTURBANCES OR DEFICIENCIES Two mines in full operationSCIENTIFIC RESEARCH Special studies by the Environmental Research Centre of the Department of the EnvironmentSPECIAL SCIENTIFIC FACILITIES NonePRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. Biological Conservation, 3(1): 37-45
 FIROUZ, E. 1971 Conservation and Wildlife Management in Iran. Game and Fish Department of Iran. Ziba Press, Tehran. 63 pp.

STAFF 19 full-time personnel

BUDGET About US\$ 32,200 for 1972 provided by Government

LOCAL PARK ADMINISTRATION Contact Department of the Environment, P.O. Box 1430,
Tehran, Iran.

NAME Lake Rezaiyeh National Park

TYPE NR

BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 29 August 1967

GEOGRAPHICAL LOCATION North-west Iran, between Tabriz to east and Zagros Mountains 30 km to west, N 38° 17'; E 45° 55'

ALTITUDE 1126-1526 metres

AREA 483,000 ha

LAND TENURE Government land except for portions of shore area

PHYSICAL FEATURES Lake Rezaiyeh is the largest inland body of water in Iran, has an average depth of 5 m and is extremely saline. Barren saltflats several hundred metres wide edge the lake and the shores are surrounded by gently sloping gravel and alluvium. The lake includes 56 small islands, the largest being Kabudan, 3135 ha of hilly terrain with steppe vegetation. To the south of the lake are about 60 sq. km of fresh to brackish marshes. Annual precipitation is 400-600 mm and temperatures range from -30°C to 33°C.

VEGETATION Agricultural land dominates surrounding landscape with scattered grassy areas occupied by species of *Stipa*, *Bromus*, *Cynodon* and *Chenopodiaceae*. The steppe areas of the islands are dominated by associations of sagebrush *Artemisia* with large stands of pistacio trees *Pistacia atlantica*, the remnants of forests formerly surrounding the lake.

NOTEWORTHY FAUNA The marshes form an important wintering area for waterfowl especially mallard *Anas platyrhynchos*, teal *A. crecca*, pintail *A. acuta* and coot *Fulica atra*. Green algae and brine shrimp provide food for breeding populations of shelduck *Tadorna tadorna* and *T. ferruginea*, flamingo *Phoenicopterus ruber* and white pelican *Pelecanus onocrotalus*. Kabudan I. has more than 1000 wild sheep of the Armenian race *Ovis ammon gmelini* and a high density of the partridge *Alectoris chukar*.

ZONING Managed nature reserve throughout

DISTURBANCES OR DEFICIENCIES None

SCIENTIFIC RESEARCH Special studies by Environmental Research Centre of the Department of the Environment

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. *Biological Conservation*, 3(1): 37-45

FIROUZ, E. 1971. *Conservation and Wildlife Management in Iran*. Game and Fish Department of Iran. Ziba Press, Tehran. 63 pp.

GAME AND FISH DEPARTMENT OF IRAN, 1971. The Wetlands and Waterfowl of Iran.
Kayhan Press, Tehran. 47pp.

STAFF 8 full-time personnel

BUDGET About US\$ 20,900 for 1972 provided by the Government

LOCAL PARK ADMINISTRATION Contact Department of the Environment, P.O. Box 1430,
Tehran, Iran.

NAME Touran Wildlife Refuge

TYPE MR BIOTIC PROVINCE 2.11.5

LEGAL PROTECTION Total

DATE ESTABLISHED 21 January 1972

GEOGRAPHICAL LOCATION To the south-east of the Alborz mountains and forming part of the Dasht-e-Kavir arid zone: N 36°20'; E 57°02'

ALTITUDE 600-2281 metres

AREA 431,250 ha

LAND TENURE Government ownership

PHYSICAL FEATURES A large expanse of gently sloping desert country draining into a large salt pan lake on the southern boundary of the Refuge. Geologically composed of limestone outcrops, gypsiferous marls and rocky soils. Temperatures range from 15°C to over 40°C and annual precipitation averages about 100 mm but is very variable.

VEGETATION Greatly affected in the past by livestock grazing, which depleted the grass components of the desert steppe plant associations. However, some good stands of Zygophyllum, together with Artemisia and Astragalus communities, survive and are recovering well under protection. Other species present include Haloxylon, prickly thistle Acantholimon, and wild barley and lettuce Hordeum and Lactuca.

NOTEWORTHY FAUNA This representative sample of a desert ecosystem still supports a number of large mammals: striped hyaena Hyaena hyaena, caracal lynx Felis caracal, leopard Panthera pardus (rated as 'vulnerable' by the Red Data Book), Asiatic cheetah Acinonyx jubatus venaticus (rated as 'endangered', though now increasing in Iran), Asiatic wild ass Equus hemionus (another 'vulnerable' species), Persian and Dorcas gazelles Gazella subgutturosa and G. dorcas, and wild sheep Ovis ammon. It is one of the major strongholds of the wild ass and of particular importance in maintaining viable populations of this vulnerable species.

ZONING Protected natural zone primarily under managed nature reserve status, buffered by a 1,410,750 ha Protected Area.

DISTURBANCES OR DEFICIENCIES The area is occupied by many villages and pastoralists with their herds.

TOURISM No facilities available to the general public: small groups are permitted to use Department facilities.

SCIENTIFIC RESEARCH Important for long term research on impact of local graziers and on competition between domestic and wild herbivores. Land-use and ethnological studies being conducted by Arid Zone and Wildlife Divisions of Department of the Environment, for development of land-use models in arid reserves.

SPECIAL SCIENTIFIC FACILITIES None. Proposed research station awaits funding.

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Department of Iran, Ziba Press, Tehran, 63 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.
- SPOONER, B. 1976. Flexibility and interdependence in traditional pastoral land use systems: a case for the human component in ecological studies for development (Touran). In Ecological Guidelines for the use of Natural Resources in the Middle East and South West Asia. IUCN Publications New Series 34, Morges.

STAFF 12 full time staff (1975)

BUDGET Operational budget of U.S. \$ 19,157 and development budget of U.S. \$ 19,371 in 1975: total U.S. \$ 38,528.

LOCAL PARK ADMINISTRATION Enquiries to Department of the Environment, P.O. Box 1430, Tehran.

NAME Bahram-e Gour Protected Area

TYPE MR

BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Totally protected

DATE ESTABLISHED December 1972

GEOGRAPHICAL LOCATION South-central Iran, ESE of Shiraz and about 70 km beyond the Bakhtegan Wildlife Refuge (2.5) and the town of Neiriz: N 29° 30'; E 55° 00'

ALTITUDE 1,830-2,400 metres

AREA 384,500 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The area consists of the Ghatrouyeh plain (Maidan-e Gel) and the mountains and hills bordering it to the north. There are numerous springs in the area and considerable cultivation takes place in the north-west portion. Water from irrigation schemes provides an abundant source for the wildlife of the area. Temperatures are extreme and range from -30°C to 40°C, with rainfall varying from less than 100 mm to over 200 mm per annum.

VEGETATION Fairly good steppe vegetation covers most of the area, despite considerable abuse in the past. Only the Maidan-e Gel, which is partially flooded in winter, is more or less bare. Shrub associations dominated by such species as *Artemisia* and *Astragalus* are widespread, with dense stands of trees like almond *Prunus amygdalus* and pistachio *Pistacia* in the western portion. There is also quite a good cover of caltrops *Zygophyllum atriplicoides* in some areas and halophytic vegetation borders the Maidan-e Gel.

NOTEWORTHY FAUNA The area supports a viable population of the Asiatic wild ass *Equus hemionus* (a 'vulnerable' species according to the Red Data Book), whose estimated number here is about 100. Other larger mammals include the mountain or jebeer gazelle *Gazella gazella*, Persian ibex *Capra ibex aegagrus* and wild sheep *Ovis ammon*. The basin is a valuable wintering area for the houbara bustard *Chlamydotis undulata*, with an estimated 1000 birds migrating into the area annually. Recent observations (June 1973) indicate that they may also breed. The endemic ground jay also known as the fawn-coloured chough *Podoces pleskei* occurs in *Zygophyllum* stands.

ZONING None

DISTURBANCES OR DEFICIENCIES There is some agricultural activity in the area, but it serves a useful purpose by providing habitats where wildlife, especially birds, can rest and feed.

TOURISM No public facilities, but for small groups Departmental facilities may be made available on application. The main road from Shiraz to Kerman runs through the area.

SCIENTIFIC RESEARCH Special studies by the Department of the Environment Technical Divisions.

SPECIAL SCIENTIFIC FACILITIES None specified.

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The wildlife and protected regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Department of Iran, Ziba Press, Tehran, 63 pp.
- GAME AND FISH DEPARTMENT OF IRAN, 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and the Human Environment, Tehran, 54 pp.

STAFF 15 full time staff (1975)

BUDGET A development budget of U.S. \$ 1,142 in 1975.

LOCAL PARK ADMINISTRATION Enquiries to Department of the Environment, P.O. Box 1430, Tehran.

IRAN

NAME Bazman Protected Area

TYPE NR

BIOTIC PROVINCE 2.11.2/5.11.1

LEGAL PROTECTION Total

DATE ESTABLISHED 28 August 1968

GEOGRAPHICAL LOCATION 200 km SSW of Zahidan and 100 km NW of Iranshar, Iranian Baluchistan: N 28°15'; E 60°17'

ALTITUDE 574-3489 metres (the summit of Zideh Mt. or the Kuh-e-Bazman).

AREA 324,688 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The northern half of the area is dominated by Mount Zideh, an extinct cone-shaped volcano, which is in effect the easternmost tip of the great chain of the Zagros mountains running south-east through the greater part of the country from the vicinity of Kermanshah. The southern half of the area is characterized by rolling rounded hills, also of volcanic origin, with the actual boundary of the protected area marking the beginning of the desert or dasht, which extends about 200 km to the south-west. A feature of the area are the deep gullies formed along drainage lines and up to 70 m wide. Mean daily temperatures in January range from 20°C to 25°C and in July from 35°C to 40°C; the annual precipitation varies from 100-200 mm.

VEGETATION The area is a geobotanical transition zone from Irano-Turanian steppe to Sudan-type steppe dominated by steppe and semi-desert vegetation. A sparse, primarily woody, vegetation on the hills and along watercourses comprises isolated stands of Tamarix spp. and date palms Phoenix dactylifera, but there are some patches of Phragmites reed. The eastern ridge of Zideh mountain has a sprinkling of deciduous trees, mainly Acacia species.

NOTEWORTHY FAUNA Larger mammals include the Persian gazelle Gazella subgutturosa in the desert regions, ibex Capra ibex aegagrus and wild sheep Ovis ammon on the higher hills. The area is at the junction of the Palearctic and Oriental faunal regions and the diverse bird life shows the effects of isolation on the margin of its respective ranges. Among the species of interest are black-bellied sandgrouse Pterocles orientalis, the grey and the black francolins Francolinus pondicerianus and F. francolinus and the houbara bustard Chlamydotis undulata.

ZONING None

DISTURBANCES OR DEFICIENCIES None

TOURISM No public facilities, but small groups may be permitted to use Department facilities on application.

SCIENTIFIC RESEARCH Special studies conducted by the Department of the Environment Technical Divisions.

SPECIAL SCIENTIFIC FACILITIES None specified

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The wildlife parks and protected areas of Iran.
Biological Conservation 3(1): 37-45.

FIROUZ, E. 1971. Conservation and Wildlife Management in Iran.

Game and Fish Department of Iran, Ziba Press, Tehran, 63 pp.

FIROUZ, E. 1974. Environment Iran. The National Society for the
Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 12 full time staff in 1975.

BUDGET Operational budget of U.S. \$ 14,728 in 1975.

LOCAL PARK ADMINISTRATION Enquiries to Department of the Environment, P.O.
Box 1430, Tehran.

NAME Bakhtegan Wildlife Refuge

TYPE MR

BIOTIC PROVINCE 2.11.5

LEGAL PROTECTION Total

DATE ESTABLISHED 3 December 1968

GEOGRAPHICAL LOCATION About 125 km ESE of Shiraz, in the Bakhtegan basin, Fars Province: N 29°30'; E 53°40'

ALTITUDE 1546-2599 metres

AREA 310,438 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The area is an important wetland comprising three separate inland drainage basins formed between folded ridges of the Zagros mountains. Each is occupied by a brackish or saline lake and extensive seasonal freshwater marshes and they include Neiriz, with 2 more or less permanent salt lakes, Tashk to the north and Bakhtegan to the south. In wet years the basins are flooded and join up to form one vast shallow lake some 1,810 sq. km in area. The water supply is supplemented by the Kor river and several springs. The climate is arid, the annual rainfall between 100 and 300 mm.

VEGETATION Salt marsh plant associations occupy the greater part of the lake shore. An extensive Phragmites marsh surrounds the brackish springs at Gumoon on Lake Tashk and smaller marshes the Sahlabad springs and the mouth of the river Kor at Dosok on Lake Bakhtegan. Islands in the central Neiriz sector support a steppe vegetation of Artemisia and Astragalus with scattered almond and pistachio Prunus amygdalus and Pistacia.

NOTEWORTHY FAUNA Larger mammals include brown bear Ursus arctos, striped hyaena Hyaena hyaena, leopard Panthera pardus (a 'vulnerable' species in the Red Data Book classification), ibex Capra ibex and wild sheep Ovis ammon. Many migrant bird species use the area as a stopping place in spring and autumn and it also serves as an important wintering ground for wildfowl and waders, and, since it provides a wide range of habitats, it is also a breeding ground for such diverse water birds as greater flamingo Phoenicopterus ruber, white-tailed plover Vanellus leucurus, Kentish plover Charadrius alexandrinus and black-winged stilt Himantopus himantopus.

ZONING None

DISTURBANCES OR DEFICIENCIES A dam built on the Kor River for irrigation purposes has brought about greater seasonal variation in the wetlands of the Neiriz basin. The area of permanent marsh may decrease in dry years and affect breeding birds although populations of some wintering species appear to be unaffected and even to benefit from a resulting increase in their feeding habitat.

TOURISM No facilities generally available.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES The biological research centre for the Southern Region of Iran is to be located in Shiraz.

PRINCIPAL REFERENCE MATERIAL

- LOFFLER, H. 1968. The hydrobiology of Lake Niriz, Iran. In Proceedings of a Technical Meeting on Wetland Conservation. IUCN publ. new series 12, Morges.
- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- GAME AND FISH DEPT. OF IRAN, 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 25 full time staff in 1975.

BUDGET The 1975 allocation was equivalent to U.S. \$ 40,359, of which \$ 30,959 covered operational costs and \$9,400 development costs.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

NAME Shadegan Wildlife Refuge

TYPE NR

BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 5 April 1973

GEOGRAPHICAL LOCATION Khuzestan Province, east of Abadan and the southern end of the Iraqi border: N 30° 30'; E 48° 30'

ALTITUDE 3-7 metres

AREA 290,000 ha

LAND TENURE Government ownership

PHYSICAL FEATURES An alluvial plain and largest expanse of lowland in Iran. This forms the delta of the Karun and five other rivers which carry the run-off from 115,000 sq. km of the north-western end of the Zagros mountain chain into a 38,000 sq. km basin, creating extensive fresh water and salt water marshes in the process. Temperatures are very high with mean January temperature above 7°C and July means in excess of 45°C. Winter precipitation from November to April accounts for 92% of the annual rainfall of around 146 mm.

VEGETATION Much of the area is occupied by sterile silt flats due to natural salinity and soil deterioration from irrigation malpractices. Moderate plant growth occurs only where there is abundant fresh water and good drainage, for example in the northern part of Shadegan marshes there are extensive stands of *Carex* sedges, but these soon give way further south to saltmarsh associations and then to bare saline expanses.

NOTEWORTHY FAUNA The marshes are an important wintering area for wildfowl, of which over 80,000 have been recorded on mid-winter counts, among them on occasion probably over half the much depleted world population of marbled teal *Anas angustirostris*. Altogether some 125 species of waterfowl have been observed, including several thousand non-breeding Dalmatian pelicans *Pelecanus crispus*. The marshes are an important wintering area and likely breeding area for the sacred ibis *Threskiornis aethiopicus*, a species of very local distribution in the Middle East. Herons, egrets, waders, gulls and terns are also numerous both in species and numbers.

ZONING None

DISTURBANCES OR DEFICIENCIES None

TOURISM No facilities generally available.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- GAME AND FISH DEPT. OF IRAN, 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 12 full time in 1975.

BUDGET An operational budget in 1975 of U.S. \$ 10,214.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

NAME Central Alborz National Park

TYPE NP BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Wildlife locally protected, except by special permission of the Department of the Environment. No grazing permitted above 3000 m.

DATE ESTABLISHED 14 January 1961. Boundaries enlarged 12 February 1962 and 11 April 1964.

GEOGRAPHICAL LOCATION Central section of the Alborz range, north of Tehran and east of the Tehran-Now Shahr road: N 36°15'; E 51°30'

ALTITUDE approximately sea level to 4375 metres (summit of the Bar-e-Sany Kuh)

AREA 203,000 ha

LAND TENURE Largely government ownership but some privately owned land in the valleys.

PHYSICAL FEATURES A massive rugged block of mountains comprising three ridges on an east-west axis, increasing in height from north to south. The terrain is particularly broken in the south of the Park, with numerous ridges and peaks, and precipitous canyons draining into the Jaje and Karadj rivers, which flow south towards the Dasht-e-Kavir.

VEGETATION The northern slopes support typical Caspian deciduous forest of beech Fagus, hornbeam Carpinus, maple Acer, lime Tilia, alder Alnus and oak Quercus. The plateaus above 3000 m have a special vegetation showing affinities with that of high mountains in Central Asia. Further south scattered juniper Juniperus excelsa occurs and the southern slopes have a mixture of steppe forest and a sub-steppe type of flora.

NOTEWORTHY FAUNA A great variety of mountain and forest species occur, ungulates being locally abundant. Larger mammals include the wolf Canis lupus, brown bear Ursus arctos, martin Martes foina, otter Lutra lutra, jungle cat Felis chaus, leopard Panthera pardus (classified as 'vulnerable' in the Red Data Book), wild pig Sus scrofa, red deer Cervus elaphus, roe deer Capreolus capreolus, ibex Capra ibex, aegagrus and wild sheep Ovis ammon. Among the numerous birds the Caspian snowcock Tetraogallus caspius is of special interest.

ZONING The Park has the status of a managed nature reserve and is surrounded by a protected buffer zone of 215,450 ha.

DISTURBANCES OR DEFICIENCIES These are many and include new road and ski resort development, extension of orchards, logging in the Caspian forest zone and grazing. A Management Authority is proposed to place the various types of land use on a co-ordinated basis.

TOURISM Ski resorts are established at Dizin and Shemshak; further tourist accommodation is under consideration.

SCIENTIFIC RESEARCH Studies of wild sheep and chukar partridge populations and well established watershed management programme. This could be an ideal study area for monitoring resource use impacts.

SPECIAL SCIENTIFIC FACILITIES Limited accommodation for visiting scientists in game guard stations.

PRINCIPAL REFERENCE MATERIAL

FAO, 1971. Management Plan for the Central Alborz Protected Region.

FAO Report No. TZ 3046, 43 pp.

FIROUZ, E. 1974. Environment Iran. National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 26 full time staff in 1975

BUDGET An operational budget of U.S. \$ 19,042 in 1975

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

NAME Hamoun Wildlife Refuge

TYPE NR

BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 29 August 1967

GEOGRAPHICAL LOCATION Near the southern end of the border with Afghanistan, north-west of the Seistan town of Zabol: N 31°29'; E 61°23'

ALTITUDE 557-722 metres

AREA 180,000 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The area lies in the Hamoun river basin and includes a portion of the very large Hamoun lake and its surrounding marshes. The extent of the wetlands is subject to great variation. Most of the water is carried to the area by the Hirmand (Helmand) River from Afghanistan and in years of heavy rainfall may increase the total size of the lakes and marshes of Seistan to more than 3000 sq. km. Mean daily temperatures range from 15°C to 20°C in January and 35°C to 40°C in July, with a largely winter precipitation of around 100 mm.

VEGETATION This is typically composed of halophytes such as Halocnemum strobilaceum, sea lavender Limonium carnosum, glasswort Salsola spp. and the orache Atriplex verruciferum. The distribution of this vegetation is closely related to the water table. Extensive reed beds of Phragmites border the Hamoun wetland complex.

NOTEWORTHY FAUNA Mammals include the caracal lynx Felis caracal, abundant wild pig Sus scrofa, small herds of the Persian or goitred gazelle Gazella subgutturosa and bebeer or mountain gazelle G. gazella. The extensive complex of fresh and brackish waters provide an important habitat for breeding and wintering waterfowl including a few white and Dalmatian pelicans Pelecanus onocrotalus and P. crispus, abundant grey lag geese Anser anser, mallard Anas platyrhynchos, teal A. crecca, shoveler Spatula clypeata, red-crested pochard Netta rufina and pochard Aythya ferina. Up to 42 of the scarce white-headed duck Oxyura leucocephala have been recorded and over 300 common crane Grus grus. Coots Fulica atra are very abundant.

ZONING None

DISTURBANCES OR DEFICIENCIES Water levels are made more liable to variation by the fact that the Hirmand River waters are tapped for irrigation in Afghanistan.

TOURISM No generally available facilities

SCIENTIFIC RESEARCH Special studies by the Technical Division of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- GAME AND FISH DEPT. OF IRAN, 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 12 full time staff in 1975

BUDGET U.S. \$ 45,142 were allocated in 1975 (\$ 25,771 for recurrent expenditure and \$19,371 for development).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

NAME Khabr-va-Rouchoun Wildlife Refuge

TYPE MR BIOTIC PROVINCE 2.11.5

LEGAL PROTECTION Total

DATE ESTABLISHED 23 October, 1971

GEOGRAPHICAL LOCATION About 150 km SSW of Kerman, not far beyond the town of Baft, at the south-eastern end of the Zagros mountain range: N 28°58'; E 56°42'

ALTITUDE 1181-3862 metres

AREA 169,200 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The Refuge represents a unique transitional area between alpine habitat over 3800m high to part of the arid steppe of the central plateau, which includes lowland valleys affected by climatic influences from the Gulf. Seasonal temperatures range from -5°C in winter to 36°C in summer and the primarily winter rainfall amounts to 170-200 mm annually.

VEGETATION Patches of Pistacia and Juniperus occur in the alpine zone and there are good stands of almond Prunus amygdalus along the watercourses. The arid steppe areas have a low shrubby vegetation dominated by caltrops Zygophyllum, wormwood Artemisia and milk-vetch Astragalus species, together with such plants as Clematis orientalis and Peganum harmala (the seeds of which yield Turkey red dye).

NOTEWORTHY FAUNA Larger mammals include the Asiatic black bear Selenarctos thibetanus, striped hyaena Hyaena hyaena, jungle cat Felis chaus, caracal lynx Felis caracal, leopard Panthera pardus (a Red Data Book 'vulnerable' species), Persian ibex Capra ibex aegagrus and wild sheep Ovis ammon. The mountain birds include the lammergeyer Gypaetus barbatus, alpine chough Pyrrhocorax graculus and Siberian accentor Prunella montanella. At lower levels typical Zagros forest species to be seen are red-wattled lapwing Vanellus indicus, wood pigeon Columbus palumbus, Syrian woodpecker Dendrocopos syriacus, white-eared bulbul Pycnonotus leucogenys and common babbler Turdoides caudatus.

ZONING None

DISTURBANCES OR DEFICIENCIES Seasonal use by nomadic herdsmen on migration through the area. A limited number of permanent inhabitants.

TOURISM No facilities for the general public but small groups are permitted to use Departmental facilities.

SCIENTIFIC RESEARCH Special studies on the distribution of the Asiatic black bear and annual avifaunal surveys by technical staff of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 35 full time staff in 1975

BUDGET An allocation of U.S. \$ 51,942 in 1975 (\$ 34,228 for recurrent expenditure and \$ 17,714 for development).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

NAME Mooteh Wildlife Refuge

TYPE MR

BIOTIC PROVINCE 2.11.2/2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 20 June 1964

GEOGRAPHICAL LOCATION East of the main Tehran-Isfahan road, about 100 km south of Qom: N 33°58'; E 51°14'

ALTITUDE 1572-3264 metres

AREA 163,250 ha

LAND TENURE Government ownership

PHYSICAL FEATURES A mountain range with many outwash plains and dissected relief. Soils are shallow and a water deficit occurs during the year. The annual precipitation is spread evenly through the winter months and doubtless misquoted at the extraordinarily low figure of 50 mm; it is certainly much higher and better soil conditions occur in some areas, enough to support a fair cover of steppe-type vegetation. Average daily maximum temperatures are 0°-10°C in January and 30°C-35°C in July and August.

VEGETATION Arid montane and steppe vegetation dominated by Artemisia shrub associations, including a mixture of grasses but mainly Stipa sp. In some places there is a thin cover of salt bush species such as Salsola and of manna Alhagi sp.

NOTEWORTHY FAUNA Larger mammals include the wolf Canis lupus, fox Vulpes vulpes, leopard Panthera pardus (a Red Data Book 'vulnerable' species), Persian or goitred gazelle Gazella subgutturosa, Persian ibex Capra ibex aegagrus and wild sheep Ovis ammon. The reserve was principally aimed at protecting the gazelle, the population of which is now estimated at 7,600 and forms an impressive sight. The ibex number about 800 and the wild sheep 700. The avifauna includes chukar and rock partridges Alectoris chukar and graeca, see-see partridge Ammoperdix griseogularis, little bustard Otis tetrax, houbara bustard Chlamydotis undulata and black-bellied sandgrouse Pterocles orientalis.

ZONING The whole of the Refuge has managed nature reserve status but it is surrounded by a 134,910 ha partially protected buffer zone.

DISTURBANCES OR DEFICIENCIES Small villages are located within the reserve and practise controlled grazing. There are also infringements of its protected status through the spread of cultivation into the reserve from agricultural lands beyond its borders.

TOURISM No generally available facilities but small groups are permitted to use Departmental facilities.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. Biological Conservation Vol. 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 13 full time staff in 1975

BUDGET U.S. \$ 140,285 in 1975 (\$ 70,671 for operational and \$ 69,614 for development expenditure).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

NAME Bahu Kalat Protected Area

TYPE MR BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 14 July 1971

GEOGRAPHICAL LOCATION Part of the Sarbaz River valley between Firouzabad (Rask) and the sea at Gwatar Bay, near the southern end of the border with Pakistan: N 26°17'; E 61°49'

ALTITUDE Sea level to 1018 metres

AREA 94,750 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The Sarbaz River originates from the western section of the Makran mountain range, in steep and rugged terrain rising to an elevation of about 2000 m. Its valley gradually broadens into a flood plain of several kilometres in width. The mountains are composed of shales and volcanic rocks, and there is a rapid run-off of the mainly winter rainfall, water in summer being limited to headwaters and a few other areas. Total annual rainfall is less than 100 mm and summer temperatures reach 45°C.

VEGETATION The area is one of geobotanical transition from Irano-Turanian to Sudanian, with the addition of some elements derived from the southern sea coast. The flood plain areas support good stands of fan palms Nannorhops ritchieana, date palm Phoenix dactylifera, Tamarix and Acacia, together with scattered halophytic vegetation. The delta region is dominated by reed Phragmites and the coast has a good stand of mangrove Avicennia.

NOTEWORTHY FAUNA Common mammals include Cape hare Lepus capensis, northern palm squirrel Funambulus pennanti, long-clawed ground squirrel Spermophilopsis leptodactylus, Indian grey mongoose Herpestes edwardsi, and goitred gazelle Gazella subgutturosa. The reserve is of great ornithological interest with 203 recorded species, many representing oriental influences. The delta supports wintering populations of Dalmatian pelican Pelecanus crispus and there is a great concentration of cormorant Phalacrocorax sp. on an offshore island. Other species include herons, egrets, including the African reef heron Egretta gularis, black stork Ciconia nigra, spoonbill Platalea leucorodia, white-backed vulture Pseudogyps bengalensis, shikra Accipiter badius, white-eyed buzzard-eagle Butastur teesa, osprey Pandion haliaetus, grey partridge Francolinus pondicerianus, houbara bustard Chlamydotis undulata, Hemprich's gull Larus hemprichii, bay-backed shrike Lanius vittatus, common mynah Acridotheres tristis and purple sun-bird Nectarinia asiatica. Common reptiles include the desert monitor Varanus griseus caspius and blunt-tailed spider gecko Agamura persica as well as a notable population of marsh crocodile Crocodylus palustris, the crocodile and the monitor being rated as 'endangered' and 'vulnerable', respectively, in the Red Data Book.

ZONING None

DISTURBANCES OR DEFICIENCIES Grazing of flood plain areas by domestic livestock, date plantations, collecting of plant materials.

TOURISM No generally available facilities

SCIENTIFIC RESEARCH Special studies of the marsh crocodile and annual avifaunal censuses by Department of the Environment technical staff.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 10 full time staff in 1975

BUDGET The 1975 allocation was U.S. \$ 27,442, of which \$16,385 covered operational expenditure and \$ 11,057 development.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

NAME Oshtorankuh Protected Area

TYPE MR

BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 8 September 1970

GEOGRAPHICAL LOCATION About 30 km south-east of Dorud, half way between Qom and Ahvaz, in the north-western Zagros mountain chain: N 33°35'; E 49°23'

ALTITUDE 2130-4070 metres (summit of Oshtoran Kuh)

AREA 93,950 ha

LAND TENURE Government ownership

PHYSICAL FEATURES Two massive mountain ridges on a WNE/ESE axis, dominating the Luristan sector of the Zagros Mountains. Between their summits, Oshtoran Kuh (4070 m) and Kuh-e-Garzesun (3200 m), a narrow valley is the starting point of the River Negha, which flows into the River Dez and thence to the Persian Gulf. There are two small lakes, named Gahaal, at about 2400 m, the larger being about 150 ha in extent and 28 m deep and the smaller and higher, separated from the other by 3 km, only 4-5 ha and 4 m deep.

VEGETATION Typical of the high Zagros flora with abundant forbs. The valleys have tree species such as *Pistacia* and almond *Prunus amygdalus*, and there are scattered junipers *Juniperus* sp. on higher slopes. A large grove of willows is found near the lakes and the smaller lake has extensive stands of reed *Phragmites* and a dense growth of pondweed *Potamogeton* together with algae and mosses.

NOTEWORTHY FAUNA Among commoner mammals are brown bear *Ursus arctos*, Persian ibex *Capra ibex aegagrus* and wild sheep *Ovis ammon*. The lakes have nesting mallard *Anas platyrhynchos* and common sandpiper *Tringa hypoleucos*. Noteworthy in the high mountain zone are lammergeyer *Gypaetus barbatus*, Caspian snowcock *Tetraogallus caspius*, dipper *Cinclus cinclus*, rock thrush *Monticola saxatilis* and snow finch *Montifringilla nivalis*. Typical species of the willow grove habitat are wood-pigeon *Columbus palumbus*, nightjar *Caprimulgus europaeus*, three species of woodpecker and the white-throated robin *Irania gutturalis*. The larger lake has a population of brown trout *Salmo trutta fario* and rainbow trout *S. gairdneri*, which was introduced in 1974 and is now well established.

ZONING None

DISTURBANCES OR DEFICIENCIES The Negha valley is the main access route for Luristan herdsmen to summer grazing areas. Limited grazing occurs along the valley, but the Gahaal lakes watershed enjoys almost complete protection. See also under next section.

TOURISM No developed facilities but overnight camping allowed with access by foot or horseback only. Sport fishing permitted.

SCIENTIFIC RESEARCH Intensive fishery studies include monitoring of population dynamics. Studies of sheep and ibex populations have been undertaken by Department of the Environment personnel.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. 1974. Environment Iran. The National Society for the
Conservation of Natural Resources and Human Environment, Tehran, 54 pp.
NEHRING, B. 1975. Chaal Lake, Job Progress Report 1354. Dept. of the
Environment, 10 pp.

STAFF 10 full time personnel in 1975

BUDGET The 1975 allocation was equivalent to U.S. \$ 79,014, of which \$ 54,800
were for operational expenditures and \$ 24,214 for development.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

IRAN

NAME Tandoureh National Park

TYPE NR

BIOTIC PROVINCE 2.11.2.
(2.8.7, 2.11.1)

LEGAL PROTECTION Total

DATE ESTABLISHED 3 December 1968

GEOGRAPHICAL LOCATION North-east Iran, 170 km north of Meshed, N 37°25';
E 58°50'

ALTITUDE 914-1818 metres

AREA 53,780 ha

LAND TENURE Government land

PHYSICAL FEATURES In the Kopet Dagh mountain range formed by low limestone outcrops. Precipitation about 300 mm, climate with cold winters and warm summers, temperatures varying from -35°C to 35°C.

VEGETATION Steppe vegetation with shrubs such as Juniperus, maple Acer and gum-producing low shrubs, such as Artemisia, Astragalus, Acantholimon, Acanthophyllum and Noëa. One of the finest grass communities in the country includes numerous perennials such as fescue Festuca, Agropyron, Bromus and Stipa as well as annual species.

NOTEWORTHY FAUNA Mammals numerous and include wolf Canis lupus, brown bear Ursus arctos, leopard Panthera pardus, wild sheep Ovis ammon and mountain goat Capra aegagrus. A large and interesting avifauna.

ZONING Managed nature reserve throughout

DISTURBANCES OR DEFICIENCIES None

SCIENTIFIC RESEARCH Special studies by the Environmental Research Centre of the Department of the Environment

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. Biological Conservation, 3(1): 37-45

FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Department of Iran. Ziba Press, Tehran. 63 pp.

STAFF 8 full-time personnel

BUDGET About US\$ 13,200 were provided by the Government for 1972

LOCAL PARK ADMINISTRATION Contact Department of the Environment, P.O. Box 1430, Tehran, Iran.



IRAN

NAME Kiamaki Wildlife Refuge

TYPE NR

BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 26 September 1974

GEOGRAPHICAL LOCATION On the border with the U.S.S.R., about 85 km NNW of Tabriz and just to the east of the road and railway: N 39°00'; E 46°00'

ALTITUDE 500-3347 metres

AREA 84,400 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The area lies in the rain shadow area of the mountain range bordering the Aras (Araxes) river valley and as a result constitutes an unusual example of arid low altitude montane steppe. Precipitation is 412 mm annually and temperatures range from -16°C to 30°C.

VEGETATION Typical arid montane steppe flora dominated by wormwood Artemisia and milk vetch Astragalus. The more barren rocky sectors have scattered stands of the plumbaginaceous Acantholimon, sainfoin Onobrychis and joint-pine Ephedra species.

NOTEWORTHY FAUNA Larger mammals include the wolf Canis lupus, jackal C. aureus, red fox Vulpes vulpes, brown bear Ursus arctos, jungle cat Felis chaus, caracal lynx Felis caracal and leopard Panthera pardus (classified as 'vulnerable' in the Red Data Book). The area has an interesting avifauna which includes white stork Ciconia ciconia, long legged buzzard Buteo rufinus, black-bellied sandgrouse Pterocles orientalis, bee-eaters Merops apiaster, Finsch's wheatear Oenanthe finschii and black-headed bunting Emberiza melanocephala.

ZONING None

DISTURBANCES OR DEFICIENCIES None reported

TOURISM No generally available facilities

SCIENTIFIC RESEARCH Special studies by the Department of the Environment

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 10 full time personnel in 1975

BUDGET An operational budget of U.S. \$ 57,871 in 1975

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.



IRAN

NAME Geno National Park

TYPE NP

BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 31 March 1972

GEOGRAPHICAL LOCATION Overlooking the coast of the Strait of Kharm (Hormuz) at the eastern end of the Persian Gulf, 20 km inland from Bandar Abbas: N 27°35'; E 56°20'

ALTITUDE 50-2371 metres (summit of Kuh-e-Geno)

AREA 82,400 ha

LAND TENURE Government ownership

PHYSICAL FEATURES An isolated mountain which, with its associated ridges, rises to 2371 m above the Persian Gulf. It is deeply dissected by canyon-like valleys cutting back into its slopes, and resulting in numerous local microclimates. Several hot springs are located in the valleys. Temperature variation, due to the adiabatic effect of air masses moving over the mountain massif, is very marked, summer temperatures ranging from 35°C-40°C at the foot of the mountain to 17°C on the summit and annual rainfall from 10-120 mm.

VEGETATION Botanically the area is of great interest because of the zonal relationships and the number of species which do not occur elsewhere in southern Iran. These include Juniperus polycarpos, Olea aucteri, the pistachio species Pistacia mutica and khinjuk, the maple Acer cinerascens, Daphne angustifolia, Euphorbia lanica and various species of Prunus, Fraxinus and Acacia.

NOTEWORTHY FAUNA The large mammals include wolf Canis lupus, jackal C. aureus, striped hyaena Hyaena hyaena, jebber or mountain gazelle Gazella subgutturosa, Persian ibex Capra ibex aegagrus and wild sheep Ovis ammon. The avifauna is very diverse, because of the location of the Park in a transitional zone between the Palearctic and Oriental faunal regions and also because of the number of bioclimatic zones.

ZONING None

DISTURBANCES OR DEFICIENCIES A radio communications station has been built at the top of Geno mountain. Charcoal burning still occurs to a limited extent within the confines of the Park.

TOURISM No facilities generally available, but small groups are permitted to use Departmental facilities.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Areas of Iran. Biological Conservation 3(1): 37-45.

FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.

FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 24 full time staff in 1975

BUDGET In 1975 the equivalent of U.S. \$ 70,000 was allocated for this and one other neighbouring reserve (3.6)

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

IRAN

NAME Hara National Park

TYPE NP

BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 31 March 1972

GEOGRAPHICAL LOCATION On the mainland, on the other side of the Khuran strait from Qeshm Island and about half way between Bandar Abbas and Bandar-e-Lengeh: N 26°59'; E 55°50'

ALTITUDE Sea level to 173 metres

AREA 82,360 ha

LAND TENURE Government ownership

PHYSICAL FEATURES Delta of the Mehran river which forms extensive silt flats and a marshy shoreline. Climatically within the zone of sub-tropical to tropical climate, the summers extremely hot, with temperatures up to 45°C. Rainfall is sparse and occurs only between November and April, totalling 100-300 mm.

VEGETATION The Park has the largest area of mangroves *Avicennia* sp. along the whole northern shore of the Persian Gulf. Inland, the salty plain has a thin covering of *Zygophyllum*, *Anastatica hierochuntica* (rose of Jericho) and *Centaurea*, with denser shrub and annuals occurring in sandy places. These consist mainly of species of mezquit *Prosopis*, feather grass *Stipa* and *Acacia* and various Umbelliferae.

NOTEWORTHY FAUNA Sea turtles (probably the green turtle *Chelonia mydas*, which ranks as an 'endangered' species in the Red Data Book) occur in significant numbers offshore in the vicinity of Qeshm Island. Their density has been estimated at about 30 per kilometre. The terrestrial fauna includes wildfowl and crustaceans, for which the intertidal and mangrove zones provide a rich habitat. The marine fauna also includes porpoises.

ZONING None

DISTURBANCES OR DEFICIENCIES Charcoal burning is still practised by the local inhabitants but to a fairly limited extent.

TOURISM No generally available facilities

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES A marine research station has been established on Hormoz Island, at the far end of the Khuran strait and off the eastern tip of Qeshm Island.

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.

FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.

GAME AND FISH DEPT. 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.

FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 25 full time staff in 1975

BUDGET In 1975 about U.S. \$ 70,000, shared with the previously listed Geno National Park (3.5).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

IRAN

NAME Arjan National Park and International Reserve

TYPE NP BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 31 March 1972

GEOGRAPHICAL LOCATION South-western flank of the Zagros mountains, 65 km north-west of Shiraz: N 30°00'; E 52°12'

ALTITUDE 853-3041 metres

AREA 65,750 ha

LAND TENURE Government ownership; the conservation of the area was placed under U.N. patronage at the Ramsar Wetlands Convention meeting in 1971.

PHYSICAL FEATURES Limestone rocks of Oligocene to Miocene age which form basins filled with alluvial deposits. These basins include that of Parishan, a saline lake with a 290 sq. km catchment and a surface area of 40 sq. km and a 200 ha area of associated fresh to brackish marshes. Another lake, Arjan, which is fresh water and varies in size from 1950 to no more than a few hundred hectares in summer, due mainly to swallow-holes in the lake bed, has an associated 400 ha of permanent marshland. In keeping with an altitudinal span of nearly 2200 m, the topography ranges from salt flats to vertical rock escarpments. Mean annual precipitation is between 400-500 mm, coming as winter rain and snow. Temperatures vary with altitude: Arjan lake has mild winters of 10°C-15°C and summers of 15°C-35°C, Parishan lake more extreme temperatures of 5°C-15°C in winter and 22°C-40°C in summer.

VEGETATION Halophytic vegetation around Lake Parishan includes Chenopodaceous species such as *Salsola*, *Kochia*, *Camphorosma* and *Halocnemum*. Below 1400 m the plant cover is steppic and shrubby, except for the fresh water marshes which are dominated by *Phragmites*, *Juncus* and *Typha*. In montane areas remnants of *Quercus persica* oak forest still exist, in what is otherwise a sparse xerophytic woodland of *Quercus* spp., almond *Prunus amygdalus*, hawthorn *Crataegus*, nettle tree *Celtis* and pears *Pyrus* spp., extending up to an altitude of 2400 m.

NOTEWORTHY FAUNA Mammals include wolf *Canis lupus*, jackal *C. aureus*, red fox *Vulpes vulpes*, an important population of Syrian brown bear *Ursus arctos syriacus*, martin *Martes foina*, badger *Meles meles*, mongoose *Herpestes ichneumon*, striped hyaena *Hyaena hyaena*, jungle cat *Felis chaus*, leopard *Panthera pardus* (this and wolf 'vulnerable' Red Data Book species), wild pig *Sus scrofa*, Persian ibex *Capra ibex aegagrus*, and wild sheep *Ovis ammon*. Winter and breeding waterfowl are estimated to exceed 250,000 in number, the breeding species including black-necked grebe *Podiceps nigricollis*, great crested grebe *P. cristatus*, little bittern *Ixobrychus minutus*, purple heron *Ardea purpurea*, glossy ibis *Plegadis falcinellus*, spoonbill *Platalea leucorodia* and marbled teal *Anas angustirostris*. There are also notably large concentrations of flamingo *Phoenicopterus ruber*, mallard *Anas platyrhynchos*, pintail *A. acuta*, teal *A. crecca*, pochard *Aythya ferina* and coot *Fulica atra*.

ZONING None

DISTURBANCES OR DEFICIENCIES Human occupation, grazing and agriculture, which are gradually being phased out.

TOURISM No facilities for the general public. Funds for the development of tourist facilities are expected to be approved before the end of the present Five-year Plan (1973-1978).

SCIENTIFIC RESEARCH Special studies conducted by the technical divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES The scientific research centre for the Southern Region is being established at Shiraz.

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.
GAME AND FISH DEPT. 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.

STAFF 25 full time staff

BUDGET An operational budget of U.S. \$ 32,585 and a development budget of U.S. \$ 2,142,857 in 1975: total U.S. \$ 2,175,442.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

NAME Miandasht Wildlife Refuge

TYPE NR BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 16 September 1974

GEOGRAPHICAL LOCATION Between the Jajarm and Javin rivers, at the eastern end of the Alborz mountain range, about 70 km north-east of Shahrud: N 37°20'; E 55°30'.

ALTITUDE 890-1324 metres

AREA 52,000 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The name of the area means "between the plains", namely the flood plains of the Jajarm and Javin rivers. The topography is undulating to nearly flat, but lightly dissected, nearly four-fifths of it occupied by stable sand dunes, with light soils on the ridges and heavy clay in the declivities. Summers are dry and annual precipitation varies from 250-300 mm. Maximum temperatures are about 20°C in winter and 45°C in summer.

VEGETATION The northern plain has extensive stands of halophytic vegetation such as Tamarix, Halocnemum, Seidlitzia, Suaeda, Anabasis, Salsola and manna Alhagi. The sand dunes have been stabilized by Aristida plumosa and Haloxylon ammodendron. Elsewhere the vegetation is steppic with Artemisia herba-alba and associations of Astragalus, Lactuca, Ephedra, Cousinia and Aegilops.

NOTEWORTHY FAUNA Except for the ibex most of the typical species of the north-eastern steppes of Iran occur, including excellent resident populations of three rated as 'vulnerable' in the Red Data Book, wolf Canis lupus, cheetah Acinonyx jubatus and Asiatic wild ass or onager Equus hemionus, as well as of Persian or goitred gazelle Gazella subgutturosa and wild sheep Ovis ammon. Birds include black-bellied sandgrouse Pterocles orientalis, crane Grus grus and houbara bustard Chlamydotis undulata. With good management, the area should provide increasingly good habitat for waterfowl.

ZONING None

DISTURBANCES OR DEFICIENCIES None reported

TOURISM No facilities for the general public; small groups are permitted to use Departmental facilities.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Department of Iran, Ziba Press, Tehran, 63 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 15 full time staff in 1975

BUDGET The 1975 provision amounted to U.S. \$ 55,899 (\$ 50,185 for operational expenditure and \$ 5,714 for development).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

IRAN

NAME Arasbaran Wildlife Refuge

TYPE MR

BIOTIC PROVINCE 2.8.7/2.5.5

LEGAL PROTECTION Total

DATE ESTABLISHED 5 December 1971

GEOGRAPHICAL LOCATION 120 km north-east of Tabriz and centred on the massif between Ahar and the U.S.S.R. border, which it adjoins: N 39°08'; E 47°02'

ALTITUDE 250-2887 metres

AREA 38,320 ha

LAND TENURE Government ownership

PHYSICAL FEATURES Mountain slope running down to the Aras (Araxes) river valley, which forms part of a major mountain belt of very varied relief, which gives rise to numerous springs and watercourses. The climate ranges from semi-arid to very humid, depending on location and rain-shadow effects. Mean temperatures are -1.8°C in January and 25°C in July.

VEGETATION The flora shows the influence of the Mediterranean to the west, the Black Sea region to the north-west, the Caucasus to the north, the Caspian to the east and the central Iran steppes to the south. Zonation with altitude is also very evident, plant communities ranging from semi-arid through shrub to high alpine meadow. Among the numerous genera are Cornus, Rosa, Paliurus, Rhus, Cotoneaster, Ribes, Taxus, Juglans, Quercus, Ephedra, Juniperus and Tamarix.

NOTEWORTHY FAUNA Larger mammals include the wolf Canis lupus (now rated as 'vulnerable' in the Red Data Book) and brown bear Ursus arctos, both of them in notably high densities. Other common species are the northern lynx Felis lynx, wild pig Sus scrofa, red deer Cervus elaphus, Persian ibex Capra ibex aegagrus and wild sheep Ovis ammon. The area is notable as an avifaunal transition zone: for example, among the Galliformes one finds in shrubland the Caucasian blackcock Lyrurus mlokosiewiczii in its only known locality in Iran, the Caspian snow cock Tetraogallus caspius, the typical race of black francolin Francolinus francolinus, an intergradation of two races of common partridge Perdix perdix, quail Coturnix coturnix and the typical subspecies of the pheasant Phasianus colchicus, which is again not recorded elsewhere in Iran, although the south Caspian form is only slightly differentiated.

ZONING The managed nature reserve is supported by a buffer zone of 34,145 ha, which is also protected.

DISTURBANCES OR DEFICIENCIES Scattered upland wheat farming and wood cutting for local use. The high level shrub zone is, however, very well protected.

TOURISM None

SCIENTIFIC RESEARCH Studies are being undertaken of the Causasian blackcock and other bird species, with special attention to predator-prey relationships.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.
SCOTT, D. 1975. Job Progress Report: Caucasian Black Grouse. Dept. of the Environment, Tehran.

STAFF 10 full time personnel in 1975

BUDGET The 1975 allocation was U.S. \$ 88,584 (\$65,642 covering operations and \$ 22,942 for development).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

NAME Parvar Protected Area

TYPE NR

BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 9 December, 1962

GEOGRAPHICAL LOCATION About 250 km east of Tehran, southern flank of the Alborz mountains: N 35°39'; E 53°39'

ALTITUDE 1639-3221 metres

AREA 37,937 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The area is dominated by Kolurd mountain, from which it descends through a zone of outwash plains to the great salt desert of the Dasht-e Kavir. The higher parts are characterized by narrow valleys, steep rocky slopes, perpendicular escarpments and outcrops of bare rock. Climatically the area is transitional between the northern wetter areas with 400-600 mm annual rainfall and the southern drier slopes with 200-400 mm rainfall. Temperatures range from 5°C-15°C.

VEGETATION The higher rainfall zone includes a sample of Caspian deciduous forest, composed of such species as the oriental hornbeam *Carpinus orientalis*, beech *Fagus hyrcanus*, oak *Quercus acranthera* and alder *Alnus glutinosa*. The mountain meadows, as on Kolurd mountain, have a variety of grasses and occasional patches of juniper *Juniperus excelsa*, which can also be found in solid stands on many of the hillsides. The lower slopes merging into the dry steppes, and also some overgrazed areas, have a cover of dwarf shrubs, about 20 cm high, dominated by *Astragalus* and *Acantholimon*, together with a sprinkling of *Cousinia*.

NOTEWORTHY FAUNA Common large predators include the wolf *Canis lupus*, brown bear *Ursus arctos* and leopard *Panthera pardus*, of which the leopard and wolf are classified as 'vulnerable' in the Red Data Book. Among the other mammals are wild pig *Sus scrofa*, red deer *Cervus elaphus*, roe deer *Capreolus capreolus* and Persian ibex *Capra ibex aegagrus*, the population of the latter estimated at 400 animals. The area is in the transitional zone between two races of the urial group of wild sheep, *Ovis orientalis*, the nominate *orientalis* usually known as the Red Sheep and the north-eastern race *arkal*, one of the true urials.

ZONING None

DISTURBANCES OR DEFICIENCIES None reported

TOURISM No facilities available to the general public, but small groups are permitted to use Department facilities.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 30 full time staff in 1975

BUDGET U.S. \$ 100,899 in 1975 (\$ 58,385 for operational and \$ 42,514 for developmental expenditure).

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

NAME Ghorkhod National Park

TYPE NP BIOTIC PROVINCE 2.11.2/2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 18 July 1971

GEOGRAPHICAL LOCATION Adjoining Mohammad Reza Shah National Park (3.3) on the east, between the eastern end of the Alborz mountains and the Kopet Dagh at north-western end of the chain extending south-east towards Meshed: N 37°30'; E 56°34'

ALTITUDE 1108-3030 metres

AREA 34,000 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The terrain is steppe-like but mountainous, a mixture of gently rolling meadows, rocky slopes, dissected ridges and flat plains. Climatically much drier than neighbouring areas due to the less pronounced influence of the Caspian. Annual rainfall is about 310 mm, this coming mainly between autumn and spring. In summer thick mist is frequent about 1500 m. Temperature extremes range from a minimum of -23°C to a 37°C maximum.

VEGETATION Dense stands of juniper *Juniperus excelsa* are found on rocky slopes, groves of shrubby maple *Acer* sp. in valleys. Most of the higher ground is occupied by grassland, bunch-grass and shrubby steppe composed of such species as *Artemisia*, *Astragalus*, *Acantholimon*, *Agropyron*, *Stipa* and *Bromus*.

NOTEWORTHY FAUNA Mammals quite widespread in the Park area include two of the Red Data Book 'vulnerable' species, the wolf *Canis lupus* and the leopard *Panthera pardus*, and another 'vulnerable' species, the cheetah *Acinonyx jubatus* is occasionally sighted. Others recorded are jackal *Canis aureus*, brown bear *Ursus arctos*, wild pig *Sus scrofa*, an increasing population of goitred gazelle *Gazella subgutturosa* and abundant ibex *Capra ibex aegagrus* and wild sheep *Ovis ammon*.

ZONING None

DISTURBANCES OR DEFICIENCIES Controlled grazing by nomadic tribal populations

TOURISM No facilities available to the general public, but small groups are permitted to use Department facilities.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.

FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.

FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF Shared with Mohammad Reza Shah National Park and totalling 62 full time in 1975.

BUDGET A small allocation of U.S. \$ 1970 was made available for running the Park in 1975.

LOCAL PARK ADMINISTRATION Enquiries to: The Department of the Environment, P.O. Box 1430, Tehran.

NAME Lisar Protected Area

TYPE MR

BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 26 May, 1970

GEOGRAPHICAL LOCATION Inland from the western end of the Iranian coast of the Caspian, about half way between Bandar-e-Pahlavi and Astara on the U.S.S.R. frontier: N 37°59'; E 48°52'

ALTITUDE Sea level to 3438 metres

AREA 31,250 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The area spans the northernmost spur of the Alborz (Elburz) mountains, between the coastal forest on the east and Neur lake on the western side of the ridge. This high mountain lake of 181 ha is bordered by marshlands totalling 140 ha in wet years. The climate is varied, the milder Caspian slopes having mean temperatures ranging between -3°C and 32°C, while to the immediate west of the summit they range from -15°C to 35°C. Annual rainfall is 2310 mm on the Caspian side and 670 mm on the western side of the divide.

VEGETATION The coastal forest is one of the last remnants of the forests which once bordered the Caspian. The main genera represented in the original tree cover were oak *Quercus*, lime *Tilia*, hornbeam *Carpinus*, alder *Alnus*, maple *Acer* and ash *Fraxinus*. Other genera of widespread occurrence include *Albizia*, hawthorn *Crataegus*, elder *Sambucus*, ironwood *Parrotia persica*, pomegranate *Punica granatum* and medlar *Mespilus germanica*. The higher ridges are in the shrub-steppe zone.

NOTEWORTHY FAUNA Mammals include porcupine *Hystrix indica*, wolf *Canis lupus*, jackal *C. aureus*, brown bear *Ursus arctos*, jungle cat *Felis chaus*, northern lynx *Felis lynx*, leopard *Panthera pardus*, wild pig *Sus scrofa*, red deer *Cervus elaphus*, roe deer *Capreolus capreolus*, Persian ibex *Capra ibex aegagrus* and wild sheep *Ovis ammon*, of which wolf and leopard are in the 'vulnerable' Red Data Book category. Many woodland bird species are to be found and they include the common pheasant *Phasianus colchicus* in quite unusual numbers. Rainbow trout *Salmo gairdneri* have been introduced into Lake Neur and due to its high population of crustaceans they have shown a phenomenal growth rate.

ZONING None

DISTURBANCES OR DEFICIENCIES The forest outside the reserve is under intensive exploitation for pulp-wood and plans are being developed for the management of wildlife in areas adjacent to the reserve. Some woodcutting and cultivation also still occur within the reserve itself.

TOURISM High quality sport fishing and overnight camping are permitted. Further touristic developments are budgeted for in the current Five-year Plan (1973-1978).

SCIENTIFIC RESEARCH Intensive fishery management, research and monitoring by the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. 1974. Environment Iran. The National Society for the
Conservation of Natural Resources and Human Environment, Tehran, 54 pp.
NEHRING, B. 1975. Neur Lake: Job Progress Reports, Iran Dept. of the
Environment, Tehran.

STAFF 10 full time staff in 1975

BUDGET U.S. \$ 33,000 shared between this and two other reserves, in 1975

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

IRAN

NAME Bisotoun Wildlife Refuge

TYPE NR

BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 9 February 1965

GEOGRAPHICAL LOCATION About 40 km east of Kermanshah and north of the road to Hamadan, north-western Zagros mountains: N 34°42'; E 47°28'

ALTITUDE 1639-3716 metres

AREA 30,000 ha

LAND TENURE Government ownership

PHYSICAL FEATURES A section of the Zagros mountains characterized by a contorted and overthrust mass of Cretaceous limestones. Further to the east the limestone terminates in an escarpment overlooking the great central plain of Iran and forming a very sharp boundary between the limestone and alluvial regions. The comparatively low latitude combined with high elevation results in marked temperature variations which may range from over 50°C on a summer's day down to below freezing point at night. The July/August maximum averages 37°C. Compared with the exiguous 40 mm rainfall of the central plain, the high mountains of the Refuge get about 80 mm, though it is also confined to the winter months.

VEGETATION A low herbaceous vegetation is characteristic of the area today, but in the past it may have been covered by deciduous oak forests. The shrubland is dominated by Artemisia, Astragalus, Pteropyrum (Polygonaceae) and Peganum. Other genera which occur quite commonly are Calligonum, Haloxylon and Salsola.

NOTEWORTHY FAUNA The wolf Canis lupus, jackal C. aureus and brown bear Ursus arctos are occasional visitors. Other mammals include the red fox Vulpes vulpes, martin Martes foina, and Persian ibex Capra ibex aegagrus, which is numerous on the limestone cliffs. Birds of the high rocky areas include the Caspian snowcock Tetrao gallus caspius and chukar partridge Alectoris chukar.

ZONING The whole Refuge has the status of managed nature reserve but it is adjoined by a 91,937 ha buffer zone which also enjoys some degree of protection.

DISTURBANCES OR DEFICIENCIES None

TOURISM No facilities available to the general public, but small groups are sometimes allowed to use Department facilities on application.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 25 full time staff in 1975

BUDGET An operational budget of U.S. \$ 80,789 in 1975

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

IRAN

NAME Sarani National Park

TYPE NP

BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 16 September 1971

GEOGRAPHICAL LOCATION Near the point where north-west extremity of the Kopet Dag range crosses the U.S.S.R. border, about 35 km south-west of Ashkabad and 180 km north-west of Meshed: N 37°52'; E 58°12'.

ALTITUDE 2062-3210 metres

AREA 17,800 ha

LAND TENURE Government ownership

PHYSICAL FEATURES Rugged limestone formations with rocky slopes and gorge-like river valleys, all at a very considerable altitude. Temperature ranges from -14°C to 38°C seasonally and average annual precipitation is between 100 and 200 mm.

VEGETATION This region is of particular floristic importance, being a centre of local endemism within the Khorasan province. The montane and alpine zones have dense stands of juniper Juniperus excelsa; lower elevations perennial grass and thorn-cushion steppe, in which such xerophytic genera as Acanthophyllum, Astragalus and Acantholimon, as well as the grasses Agropyron, Lolium and Poa, are well represented.

NOTEWORTHY FAUNA Two predators rated as vulnerable in the Red Data Book, the wolf Canis lupus and the leopard Panthera pardus are relatively common, as are red fox Vulpes vulpes and brown bear Ursus arctos. The ibex Capra ibex aegagrus and wild sheep Ovis ammon are abundant. The Caspian snowcock Tetraogallus caspius occurs in the summit areas.

ZONING None

DISTURBANCES OR DEFICIENCIES None

TOURISM No facilities for the general public, but small groups are permitted to use Departmental facilities.

SCIENTIFIC RESEARCH Special studies conducted by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
 FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran. Ziba Press, Tehran, 63 pp.
 FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 15 full time staff in 1975

BUDGET U.S. \$ 68,671 were allocated in 1975 (\$ 45,200 for operational expenditure and \$ 23,371 for development purposes.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment,
P.O. Box 1430, Tehran.

IRAN

NAME Dez and Karkheh Wildlife Refuges

TYPE NR BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED Dez: 31 January 1970
Karkheh: 12 December 1970

GEOGRAPHICAL LOCATION South-west Iran, 50 km north of Ahwaz, N 32°29'; E 48°51'

ALTITUDE 75-115 metres

AREA 5375 ha (Dez: 3837 ha, Karkheh: 1538 ha)

LAND TENURE Government land

PHYSICAL FEATURES Two separate non-contiguous areas along the Dez and Karkheh Rivers. Both rivers are deep and wide and meander considerably. The parks are narrow strips of forest adjacent to the rivers and the surrounding region is characterized by hills, plains and basins. Mean annual precipitation ranges from 200 mm to 300 mm and temperature maxima from 15°C - 20°C in winter to more than 45°C in summer.

VEGETATION Riparian forest of shrubby trees of Tamarix and poplar Populus euphraticus up to 10 m tall. Tamarix dominant along the Kaun and Karkheh rivers and Populus along the Dez river. The forest varies from dense and impenetrable to open, grazed and burnt-over scrub.

NOTEWORTHY FAUNA Last known indigenous populations of the Mesopotamian fallow deer Dama mesopotamica, together totalling only 20-40 individuals. Other mammals include crested porcupine Hystrix indica, wolf Canis lupus (classed as vulnerable in the Red Data Book), jackal C. aureus, red fox Vulpes vulpes, ratel or honey badger Mellivora capensis, jungle cat Felis chaus and wild pig Sus scrofa. The parks are situated on a major migratory bird flyway, 40-50 species a day being commonly recorded in the spring. Breeding birds include marbled teal Anas angustirostris and black partridge Francolinus francolinus, both scarce and depleted species in the greater part of their range.

SPECIAL CONSERVATION AIMS Protection and maintenance of the Mesopotamian fallow deer still surviving in the remnants of their natural habitat represented by these two fenced parks and surrounding areas.

ZONING Managed nature reserve throughout the fenced sectors, with some protection of adjacent zones (quoted in the Red Data Book as Dez 11,138, Karkheh 16,587 ha).

DISTURBANCES OR DEFICIENCIES Absence of secure land tenure in the face of agricultural expansion and water development projects in the region.

SCIENTIFIC RESEARCH Special studies by the Parks and Wildlife Division of the Department of the Environment

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. Biological Conservation, 3(1): 37-45
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Department of Iran. Ziba Press, Tehran. 63 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment. Offset Press Inc., Tehran. 51 pp.

STAFF 12 full-time personnel (Dez Park: 8; Karkheh: 4)

BUDGET US\$ 14,400 allocated by Government annually.
(Dez Park: US\$ 9000; Karkheh Park: US\$ 5400)

LOCAL PARK ADMINISTRATION Contact Department of the Environment, P.O. Box 1430, Tehran, Iran.

NAME Siah Kesheem and Selke Wildlife Refuges

TYPE NR BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 29 August 1967

GEOGRAPHICAL LOCATION South-west coast of Caspian Sea near Pahlavi Mordab,
N 37°25'; E 49°24'

ALTITUDE -27 to -20 metres

AREA 3515 ha

LAND TENURE Government land

PHYSICAL FEATURES Siah Kesheem is a freshwater marsh surrounded by flooded meadows and shallow marshes near the Caspian Sea. Selke consists of three small man-made reservoirs or rice paddies called 'ab-bandans'. These 'ab-bandans' are a major feature of the surrounding wetland area and vary in size from three hectares to one thousand hectares. Precipitation is between 1000 mm to 2000 mm and temperatures range from -11°C to 30°C.

VEGETATION Siah Kesheem marsh has dense reed beds of *Phragmites* with other shallow water aquatic plants. Selke 'ab-bandans' have an excellent variety of submergent vegetation.

NOTEWORTHY FAUNA Internationally important wintering area for wildfowl, including mallard *Anas platyrhynchos*, pintail *A. acuta*, shoveler *A. clypeata*, white-fronted goose *Anser albifrons* and whooper swan *Cygnus cygnus*. Less prevalent are tufted duck *Aythya fuligula*, goldeneye *Bucephala clangula* and Bewick's swans *Cygnus bewickii*. Breeding populations include grebes *Podiceps cristatus* and *P. nigricollis*, purple gallinule *Porphyrio porphyrio* and coot *Fulica atra*. Selke provides a feeding area for duck and geese and a habitat for heron, egrets and many species of waders during migration.

ZONING Managed nature reserve throughout

DISTURBANCES OR DEFICIENCIES None

TOURISM Small groups of visitors have been allowed to use Departmental facilities, but some provision for expanded tourist facilities envisaged in current Five-year Plan.

SCIENTIFIC RESEARCH Special studies by the Environmental Research Centre of the Department of the Environment

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. *Biological Conservation*, 3(1): 37-45

FIROUZ, E. 1971 *Conservation and Wildlife Management in Iran*. Game and Fish Department of Iran. Ziba Press, Tehran. 63 pp.

GAME AND FISH DEPARTMENT OF IRAN, 1971. The Wetlands and Waterfowl of Iran.
Kayhan Press, Tehran. 47 pp.

STAFF 10 full-time personnel

BUDGET About US\$ 11,800 were provided by the Government for 1972

LOCAL PARK ADMINISTRATION Contact Department of the Environment, P.O. Box 1430,
Tehran, Iran.

IRAN

NAME Amir Kelayeh Wildlife Refuge

TYPE NR BIOTIC PROVINCE 2.8.7

LEGAL PROTECTION Total

DATE ESTABLISHED 15 March 1970

GEOGRAPHICAL LOCATION One kilometre from the south-west shore of the Caspian Sea, 55 km east of Rasht near township of Langarud, N 37°24'; E 50°13'

ALTITUDE -26 to -20 metres

AREA 1230 ha

LAND TENURE Government land

PHYSICAL FEATURES Shallow fresh-water lake with 225 ha of open water, part of a complex of large and small lakes, marshes and lagoons covering the coast plain together with man-made reservoirs or flooded rice paddies called 'ab-bandans'. Many streams cross the coastal plain to the Caspian. Heavy precipitation of between 1000 mm and 2000 mm annually and an annual temperature of 15.8°C.

VEGETATION Lake Amir Kelayeh has shoreline fringed by reedbeds of Phragmites. The 'ab-bandans' support a luxuriant growth of submergent vegetation. The alluvial coast plain has remnants of former forest cover of willow poplar and alder, including Salix caprea, S. micans, S. fragilis, Populus canescens, Alnus subcordata, A. glutinosa and Pterocarya fraxinifolia.

NOTEWORTHY FAUNA The lake is an important wintering area for red-crested pochard Netta rufina and pochard Aythya ferina. The area provides resting and feeding facilities for a wide variety of waterfowl. Mammals include jackal Canis aureus, otter Lutra lutra, jungle cat Felis chaus, wild pig Sus scrofa.

ZONING Managed nature reserve throughout

DISTURBANCES OR DEFICIENCIES None

SCIENTIFIC RESEARCH Special studies by the Environmental Research Centre of the Department of the Environment

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

FIROUZ, E. et al. 1970. The wildlife parks and protected regions of Iran. Biological Conservation, 3(1): 37-45

FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Department of Iran. Ziba Press, Tehran. 63 pp.

GAME AND FISH DEPARTMENT OF IRAN. 1971. The Wetlands and Waterfowl of Iran. Kayhan press, Tehran. 47 pp.

STAFF 2 full-time personnel

BUDGET About US\$ 2,300 were provided by the Government for 1972

LOCAL PARK ADMINISTRATION
Tehran, Iran.

Contact Department of the Environment, P.O. Box 1430,

NAME Sheedvar Island Wildlife Refuge

TYPE NR BIOTIC PROVINCE 2.11.2

LEGAL PROTECTION Total

DATE ESTABLISHED 18 July 1971

GEOGRAPHICAL LOCATION 9 km from the Gulf coast, about 145 km WNW of Bandar-e-Lengeh: N 26°48'; E 53°25'

ALTITUDE Sea level to 5 metres

AREA 160 ha

LAND TENURE Government ownership

PHYSICAL FEATURES The islet is composed of coral conglomerate which above the high water mark is almost completely overlaid by sand dunes and some sandy soil. A two-metre-high fragmented low-lying rocky bank fringes the southern, western and north-western shores, the remaining 40% of the shoreline being a narrow sandy beach which widens at the north-east corner to form a sandy spit. There are no springs or other sources of fresh water. Rainfall is less than 150 mm and temperatures are extremely high, exceeding 42°C in summer months.

VEGETATION Two of the main dune areas are sparsely vegetated with typical psammophytic species. The flat central area is covered by dense impenetrable shrub up to 60 cm high.

NOTEWORTHY FAUNA The Socotra cormorant Phalacrocorax nigrogularis nests on the island, this being the first confirmed breeding record of this species on the Iranian side of the Persian Gulf. A population of little green heron Butorides striatus is also the first recorded for Iran and represents an extension of the known range of this species in the Gulf. Large numbers of the white-cheeked tern Sterna repressa visit the island to nest, over 300,000 pairs having been counted in one 60 ha area alone. The island is also an important breeding place for the green turtle Chelonia mydas, a species classified as endangered in the Red Data Book.

ZONING None

DISTURBANCES OR DEFICIENCIES None

TOURISM No facilities are available to the general public, but use of Departmental facilities by small groups may be permitted.

SCIENTIFIC RESEARCH Special studies by the Technical Divisions of the Department of the Environment.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- FIROUZ, E. et al. 1970. The Wildlife Parks and Protected Regions of Iran. Biological Conservation 3(1): 37-45.
- FIROUZ, E. 1971. Conservation and Wildlife Management in Iran. Game and Fish Dept. of Iran, Ziba Press, Tehran, 63 pp.
- GAME AND FISH DEPARTMENT, 1971. The Wetlands and Waterfowl of Iran. Kayhan Press, Tehran, 47 pp.
- FIROUZ, E. 1974. Environment Iran. The National Society for the Conservation of Natural Resources and Human Environment, Tehran, 54 pp.

STAFF 12 full time staff in 1975

BUDGET About U.S. \$ 228,000 for this and three other reserves, in 1975.

LOCAL PARK ADMINISTRATION Enquiries to: Department of the Environment, P.O. Box 1430, Tehran.

IRELAND

IRELAND

AREA 68,894 sq. km

POPULATION 2,978,248 (1971 census)

PARKS AND RESERVES LEGISLATION Land can be acquired by the State under the State Property Act, 1954. In the case of National Parks, its management is entrusted to the Commissioners of Public Works.

PARKS AND RESERVES ADMINISTRATION The Parks and Monuments Branch of the Office of Public Works deals with the management of National Parks.

ADDRESS Parks and Monuments Branch, Office of Public Works, 51 St. Stephen's Green, Dublin 2.

TOTAL AREA UNDER PROTECTION 14,500 ha

PROTECTED AREAS

4.1	Glenveagh National Park	10,000 ha
5.1	Bourn-Vincent Memorial Park	4,500 ha



IRELAND

NAME Glenveagh National Park

TYPE NP (not yet officially established) BIOTIC PROVINCE 2.4.3

LEGAL PROTECTION Total

DATE ESTABLISHED 1975, but official establishment still under way.

GEOGRAPHICAL LOCATION North-west Donegal, at the north-eastern end of the Derryveagh mountains: N 55°; W 8°

ALTITUDE 42-480 metres

AREA c. 10,000 ha

LAND TENURE State owned, acquired from landowner

PHYSICAL FEATURES Glenveagh is a glacial trough cut along a SW-NE fault line of the Caledonian period. The Paleozoic rocks are mostly granite with some pre-cambrian schist and gneiss outcropping in adjacent hills. The valley floor is occupied by a glacial lake Lough Beagh, the valley sides being steepened to form cliffs in its upper portion. The topography in general is one of rounded hills. Climate is moist and oceanic, with mild winters.

VEGETATION Most of the mountain slopes have blanket bog with Sphagnum moss, moor grass Molinia caerulea and heather Calluna vulgaris. Three stands of oakwood Quercus petraea occur close to the lake and are becoming open due to lack of regeneration. They are typically Atlantic oakwoods with associated tree and shrub species and an abundance of ferns, mosses and liverworts, which closely resemble those of the Killarney oak woods. A valley bog at the head of the lake is of interest in view of its rarity.

NOTEWORTHY FAUNA An introduced herd of red deer Cervus elaphus is present, but indigenous species have not yet been listed

ZONING No information

DISTURBANCES OR DEFICIENCIES Overgrazing by the introduced red deer and invasion by Rhododendron ponticum. The woodland is threatened by these developments due to prevention of regeneration.

TOURISM This will be limited to particular areas

SCIENTIFIC RESEARCH A small research programme is under way

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF Not yet established

BUDGET Not yet established

LOCAL PARK ADMINISTRATION Not yet established



IRELAND

NAME Bourn-Vincent Memorial Park

TYPE NP BIOTIC PROVINCE 2.4.3

LEGAL PROTECTION Total (with the exception of activities of State or semi-State bodies).

DATE ESTABLISHED 1932, under the Bourn-Vincent Memorial Park Act

GEOGRAPHICAL LOCATION South-west of Killarney, County Kerry: N 52 0'; W 9 35'

ALTITUDE 20-827 metres metres of Killarney, County Kerry

AREA 4500 ha

LAND TENURE State-owned following donation by the three former owners. Now leased in part by the Office of Public Works to the Forest and Wildlife Service.

PHYSICAL FEATURES A glaciated valley cutting through Devonian red sandstones to the south and Carboniferous limestones to the north, in a landscape of large lakes dominated to east and west by hills rising to between 500 m and 750 m. Features include high cliffs, hanging valleys and widespread glacial cirques. The valley floor is rocky with a minimal drift cover and "roches moutonnées". The lakes are transitional from acid to alkaline with increasing eutrophication downstream. Rainfall is high and temperatures are moderated by oceanic influences.

VEGETATION Present vegetation is predominantly blanket bog which is suffering from erosion on the mountain summits. The former oak woods are now fairly widespread following a period of destruction and would constitute the climax vegetation in the absence of grazing. Oceanic conditions favour an abundance of evergreen species in the shrub layer together with bryophytes and lichens. Noteworthy species include the hair grass Deschampsia alpina, alpine saussurea Saussurea alpina, clubmoss Lycopodium alpina, all alpine and northern species occurring at low levels and merging with a Mediterranean and oceanic ("Lusitanian") flora. This includes the strawberry tree Arbutus unedo, Irish spurge Euphorbia hyberna, butterwort Pinguicula grandiflora and kidney saxifrage Saxifraga hirsuta. Also of note are filmy ferns Hymenophyllum spp. and the rare bristle fern Trichomanes speciosum. A rich bryophyte flora includes a few endemic species.

NOTEWORTHY FAUNA Mammals include indigenous red deer Cervus elaphus and the introduced sika deer Cervus nippon. A local race of the twaite shad Alosa fallax occurs in the lakes together with the charr Salvelinus obtusus. A rich invertebrate fauna includes the hemipterous waterbug Corixa cavifrons and Ceratocombus coleoptratus, lepidoptera such as the lobstermoth Stauropus fagi, peacock moth Semiothisa notata and magpie moth Abraxas sylvata, dragonflies, the ant Formica lugubris and the glass snail Vitrina pyrenaica.

ZONING None apart from informal management to keep the majority of visitors away from the ecologically important areas.

DISTURBANCES OR DEFICIENCIES Non-native species such as Rhododendron ponticum and Cervus nippon are invading native ecosystems. Afforestation is spreading. Eutrophication is a problem, especially in Lough Leane. Recreational developments outside the park affect the area.

TOURISM Small areas are intensively used causing local visitor pressure

SCIENTIFIC RESEARCH Studies of woodland and its regeneration, the native red deer, introduced sika deer, limnology. Entomological collections have been made.

SPECIAL SCIENTIFIC FACILITIES Small laboratory facilities together with some cheap accommodation.

PRINCIPAL REFERENCE MATERIAL

FEHILY ASSOCIATES, 1967. Killarney Valley Survey. An Foras Forbatha, Dublin.

TURNER, J.S. and WATT, A.S. 1939. The oakwoods of Killarney.
J. Ecol. 27: 202

STAFF 59 in total, including those attached to a Folk museum at Muckross House, south of Killarney.

BUDGET No recent information but quoted as U.S. \$ 60,000 in 1971 U.N. List

LOCAL PARK ADMINISTRATION No details

ITALY

ITALY

AREA 324,000 sq. km

POPULATION 56,024,000 (1975 estimate)

PARKS AND RESERVES LEGISLATION Drafts of new basic legislation for National Parks and Strict Nature Reserves, respectively, were reported in the 1971 Edition of the U.N. List to be under active parliamentary study in 1966, but no confirmation of the enactment and implementation of such legislation has been received. Most existing reserves appear to have been set up by decree, in some cases reinforced by a series of Laws enacted in the period 1947-50, for the purpose of establishing 'Autonomous Organisations' for the maintenance and running of parks.

PARKS AND RESERVES ADMINISTRATION In each of the National Parks the immediately responsible body is the Ente Autonomo set up for that purpose, but the final responsibility is vested in the Ministry of Agriculture and Forests. The Azienda di Stato per le Foreste Demaniali (ASFD) normally manages the Nature Reserves of which 15 were listed in 1972, although none of them have been included in the U.N. List (most are too small in size though they are often of great importance and interest, notably the Montecristo island sanctuary established in 1971): unfortunately no details have been supplied which would enable a sample to be included here.

ADDRESS For the Park included in the Directory see under 'Local Park Administration'.

TOTAL AREA UNDER PROTECTION The four National Parks and 51 Natural Reserves existing in 1972 (Benvenuti & Pavan 'Riserve Naturali Italiane', 2nd ed., Meroni, Albese, Como) totalled 206,315 hectares. The three National Parks at present included in the U.N. List and listed below total: 186,521 ha.

PROTECTED AREAS (U.N. Listed only)

3.1 Stelvio National Park	95,361 ha
3.2 Gran Paradiso National Park	62,000 ha
3.3 Abruzzo National Park	29,160 ha



ITALY

NAME Abruzzo National Park

TYPE NP

BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Total but subject to waivers and exceptions. The Park has held the Council of Europe's Diploma for several years.

DATE ESTABLISHED 1922

GEOGRAPHICAL LOCATION About 100 km slightly south of due east of Rome:
N 41°37'-55'; E 1°12'-34'

ALTITUDE 893-2249 metres

AREA 29,160 ha

LAND TENURE The Park, represented by the Ente Autonomo, an agency controlled by the Ministry of Agriculture and Forests, owns 60 ha and leases a further 600 ha from the Commune of Civitella Alfedena. The remainder is under the ownership of the various communes within whose territory the Park lies.

PHYSICAL FEATURES On the border between the Abruzzo and Lazio regions of the central Apennines and south and west of the Sangro river which flows into the Adriatic, the Park has a sharply undulating, typically glacier-formed relief. The Sangro valley in particular has glacial cirques and stretches of ordinary moraine interspersed with great fault blocks and various karstic phenomena.

VEGETATION Extensive forests of beech *Fagus sylvatica*, admixed usually at rather higher elevations with a local subspecies of black pine *Pinus nigra*, which also occurs in pure stands and is replaced towards the tree line by the mountain pine *Pinus mugo pumilis*. Scattered maples *Acer opalus* and *platanoides* are found in limited areas. Yew *Taxus baccata* and silver birch *Betula pendula* occur sporadically. *Viola* spp., which dominate the mountain meadows in spring, bilberry *Vaccinium myrtillus*, *Cyclamen* spp. and *Cypripedium calceolus*, which because of its striking beauty always needs careful protection, are among the notable flowering and fruiting species.

NOTEWORTHY FAUNA Mammals include one or two small packs of wolves *Canis lupus* (rated a vulnerable species in the Red Data Book), a distinctive subspecies of the brown bear *Ursus arctos marsicanus*, of which the number in the Park varies between about 80 and 100, a subspecies of the chamois *Rupicapra rupicapra ornata* (estimated to number 200), otter *Lutra lutra*, pine marten *Martes martes* and wild cat *Felis silvestris*. Roe deer *Capreolus capreolus* and red deer *Cervus elaphus* have been reintroduced, having been exterminated by hunting pressure in fairly recent times. The avifauna still includes a few pairs of golden eagle *Aquila chrysaetos* and peregrine falcon *Falco peregrinus*, and a number of species at the edge of their range such as the white-backed woodpecker *Dendrocopos leucotos* and snow finch *Montifringilla nivalis*.

ZONING Two sections of the Park, of 600 and 900 ha respectively, have been given strict nature reserve status. A more comprehensive zoning plan is under consideration.

DISTURBANCES OR DEFICIENCIES Two towns Pescasseroli and Civitella Alfedena are inside the Park boundaries, the former now developed into a winter sports centre, with ski lifts and other facilities established in the vicinity. Main roads with considerable traffic run along the northern border, through the north-east corner and across the centre of the Park, thus bisecting it. Some lumbering still continues.

TOURISM Free entry and circulation. Plentiful accommodation in Pescasseroli and other local towns and villages.

SCIENTIFIC RESEARCH Under the control of the Park Directorate; over 30 publications have been issued.

SPECIAL SCIENTIFIC FACILITIES The Park Directorate headquarters provides accommodation, a library, laboratory, museum and other research facilities now under development.

PRINCIPAL REFERENCE MATERIAL

BORTOLETTI, L. 1965. Il Parco Nazionale d'Abruzzo. In I Parchi Nazionali in Italia. Inst. di Tecnica e Propaganda Agraria, Roma, 109 pp.

MINISTERIO DELL'AGRICOLTURA E DELLE FORESTE, 1966. Documenti sul Parco Nazionale d'Abruzzo. Dir. Gen. per l'Economia Montana e per le Foreste, Roma.

ITALIA NOSTRA, 1968. Piano di riassetto del Parco Nazionale d'Abruzzo. Italia Nostra, Roma, 259 pp. (mimeo).

STAFF 32 full time including 20 wardens

BUDGET Equivalent to about U.S. \$ 200,000, of which three-quarters is for salaries.

LOCAL PARK ADMINISTRATION Director, Parco Nazionale d'Abruzzo, 67032 (QA) Pescasseroli.

IVORY COAST

IVORY COAST

AREA 328,930 sq. km.

POPULATION 5,400,000 (1972 estimate)

PARKS AND RESERVES LEGISLATION The declaration of areas as National Parks or other Reserves was provided for in Decree No. 66-433 of September 1966. Under this Decree, the Direction des Parcs Nationaux or any other appropriate Administrative Service at prefectural or municipal level presents a study document, containing a detailed description of the proposal, to the Secretary of State for National Parks. If approved by him in principle, it is referred for discussions to the heads of the Préfecture and Sous-préfecture concerned with a view to agreement on the eventual legislative measures required. When agreement has been reached, the area is declared a National Park or Reserve by Presidential Decree.

PARKS AND RESERVES ADMINISTRATION The Secretary of State for National Parks is given special responsibility within the Ministère des Eaux et Forêts for all National Parks, Faunal and Floral Reserves and other Nature Reserves. Protected forests remain under the direct charge of the Ministry.

ADDRESS Ministère des Eaux et Forêts, Secrétariat d'Etat chargé des Parcs Nationaux, Abidjan, Côte d'Ivoire.

TOTAL AREA UNDER PROTECTION 1,829,000 ha of National Parks and Reserves (together with a further 3,600,860 ha of protected forests).

PROTECTED AREAS

1.1	La Comoé National Park	1,150,000 ha
2.1	Taï National Park	330,000 ha
2.2	Haut-Bandama Flora and Fauna Reserve	123,000 ha
3.1	Marahoué National Park	100,000 ha
3.2	N'Zo Partial Fauna Reserve	73,000 ha
3.3	Mont Peko National Park	34,000 ha
4.1	Asagny Fauna Reserve	17,000 ha
5.1	Mont Nimba Strict Nature Reserve (Ivory Coast Sector)	5,000 ha
5.2	Banco National Park	3,000 ha
5.3	Divo Botanical Reserve	3,000 ha



IVORY COAST

NAME Comoe National Park

TYPE NP

BIOTIC PROVINCE 4.6.1

LEGAL PROTECTION Protected against all types of disturbance and exploitation

DATE ESTABLISHED 9 February 1968, by Decree No. 68-81; formerly constituted as the Bouna-Komoé Faunal Reserve under Decree 1605 of 4 March 1953.

GEOGRAPHICAL LOCATION Extending from 35 km south-west of Bouna, in the north-eastern corner of the country, westwards across the Comoe River to the vicinity of Kong: N 8°30'-9°40'; W 3°5'-4°25'.

ALTITUDE 200-595 metres

AREA 1,150,000 ha

LAND TENURE State ownership

PHYSICAL FEATURES A peneplain of schist and granite, with a mean altitude of 300 m and a series of ridges and granite inselbergs rising to 595 m along the Comoe River. The river and its tributaries form the principal drainage and permanent and semi-permanent water is available in many places. The soils are infertile and unsuitable for cultivation. Sudan-type humid tropical transitional climate with 1200 mm mean annual precipitation and a dry season of 6 months in the south and 9 months in the north of the Park.

VEGETATION Open forest and savanna woodland characteristic of the Sudano-Guinean zone occupy around 90% of the area, with gallery forest and dense dry forest occupying 10%. The forest is composed of many leguminous trees such as *Burkea africana*, *Detarium micranthum*, *Azizelia africana*, *Daniellia oliveri*, *Isoberlinia* spp., *Parkia biglobosa* and *Pterocarpus erinaceus*, together with *Combretum*, *Terminalia*, the shea nut *Butyrospermum parkii* and *Uapaca somon*, and there is a grassy ground cover of *Andropogon* spp. The savanna grasslands consist mainly of *Panicum*, *Ctenium*, *Andropogon*, *Elionurus* and *Cymbopogon* species, varied by some *Bauhinia*, *Combretum* and *Gardenia* thicket. The gallery forests are dominated by *Cynometra vogelii*; the patches of dense dry forest by *Anogeissus leiocarpus*, *Cola cordifolia*, *Antiaria africana*, *Chlorophora excelsa* and 'akee', the edible *Blighia sapida*; and the flood plains by *Hyparrhenia rufa*.

NOTEWORTHY FAUNA A large number of species are present, estimated numbers for some being quoted in brackets. They include anubis baboon *Papio doguera* (10,000), green monkey *Cercopithecus aethiops*, black-and-white colobus *Colobus polykomos*, giant pangolin *Manis gigantea*, lion *Panthera leo* (120), leopard *P. pardus*, classified as vulnerable in the Red Data Book, aardvark *Orycteropus afer*, rock hyrax *Procavia capensis*, elephant *Loxodonta africana* (250), bushpig *Potamochoerus porcus*, warthog *Phacochoerus aethiopicus* (1500), hippo *Hippopotamus amphibius* (600), bushbuck *Tragelaphus scriptus*, buffalo *Syncerus caffer aequinoctialis* (500), red-flanked duiker *Cephalophus rufilatus* (4200), yellow-backed duiker *C. silvicultor* (350), grey duiker *Sylvicapra grimmia* (4500), waterbuck *Kobus defassa* (800), kob K. (or *Adenota kob* (6000), roan antelope *Hippotragus equinus* (900) and oribi *Ourebia ourebi* (12,000). Birds are not abundant but include herons, duck, raptors, plovers and francolins. The reptiles include 3 species of crocodile, the slender-snouted *Crocodylus cataphractus*, *C. niloticus* and the dwarf *Osteolaemus tetraspis*, the first and last classified as endangered in the Red Data Book, while the Nile crocodile is 'vulnerable'.

ZONING None

DISTURBANCES OR DEFICIENCIES Local subsistence cultivation also intensive poaching; a small village of subsistence farmers in the west and incursions of domestic livestock from Tehini, to the north of the Park, are other disturbing factors.

TOURISM The Park is open between December and May or June and has 3000-4000 visitors each year. Access is by reasonably good roads from Ferkessédougou, Katiola and Boudoukou, ferries across the Comoé river being provided at Ferké in the north and Gansé in the south. There are airstrips at Bouna and Ouango-Fitini and another at Kakpin on the southern border is under construction. 530 km of variable quality track within the Park; camps at Ouango-Fitini (60 beds), Kakpin (40 beds) and hotels at Ferké and Gansé (under construction).

SCIENTIFIC RESEARCH None

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL No dates quoted, but the following should be obtainable with the assistance of the National Parks Secretariat:

RAHM, U. and BIENEK, B. Etude des Parcs Nationaux de Côte d'Ivoire.
LAUGINIE, F. Inventaire de la faune du P.N. de la Comoé.
PFEFFER, P. Parcs Nationaux et aménagement de la faune sauvage en Côte d'Ivoire.

STAFF Conservation Officer for the National Park, Chief Inspector at Bouna, 7 assistants (heads of 5 zones), 8 "plant and animal products" staff, 26 guards and 34 other watchmen, all full time: total 77.

BUDGET Expenditure on staff amounted to CFA Francs 36 million in 1975, on maintenance and operations CFA Francs 24 million and on equipment and capital investment CFA Francs 60 million. CFA Francs 1 million approximately equivalent to U.S. \$4000.

LOCAL PARK ADMINISTRATION Chef d'Inspection, Conservateur du Parc National de la Comoé, Bouna.

IVORY COAST

NAME Taï National Park

TYPE NP

BIOTIC PROVINCE 4.7.2

LEGAL PROTECTION Protected against all types of disturbance and exploitation

DATE ESTABLISHED 28 August 1972, by Presidential Decree; formerly a Fauna Reserve under decree of 7 August 1956 and a Forest Refuge under a decree of 16 April 1926.

GEOGRAPHICAL LOCATION In the south-west, about 200 km south of Man and 100 km from the coast, between the Cavally River along the Liberian border and the Sassandra River on the east: N 5°16'-6°7'30"; W 6°41'-7°14'.

ALTITUDE 80-396 metres

AREA 330,000 ha

LAND TENURE State ownership

PHYSICAL FEATURES A sloping area of granitic rock, broken by a few isolated hills formed by volcanic intrusions, especially in the south, where the inselberg Mt. Niénokoué rises to 396 m. A large zone of schists runs from south-west to north-east across the park, dissected in places by tributaries of the watercourses which run parallel to it. There are two distinct climatic zones of an equatorial transitional type. Rainfall ranges from a mean of 1700 mm in the north to 2100 mm in the south, reaching a peak in June and with a shorter wet season in September, followed by a marked dry season from December to February. Ferralitic soils of generally low fertility, but rather more fertile in the south.

VEGETATION Dense evergreen ombrophilous forest of a Guinean type, characterised by tall trees of 40-60 m with massive trunks and sometimes large buttresses or stilt roots. Large numbers of epiphytes and lianes form an important element in the lower horizons. Two types of forest can be recognized: the poorer soils of the north and south-east support such species as the palm *Eremospatha africana*, ebony *Diospyros mannii*, *Parinari chrysophylla*, *Chrysophyllum perpulchrum* and *Chidlowia sanguinea*. In the south-west the 'Sassandrian' forest is dominated by ebony *Diospyros* spp. and *Mapania* spp., these being the most water-demanding species of ombrophiles, and there are also numerous endemic species, especially in the lower part of the Cavally valley and the Meno and Hana depressions near Mont Niénokoué.

NOTEWORTHY FAUNA Mammals include mona, white-nosed and diana monkeys *Cercopithecus mona*, *C. nictitans* and *C. diana*, black-and-white, red and green colobus monkeys *Colobus polykomos*, *C. badius* and *C. verus*, the sooty mangabey *Cercocebus torquatus*, chimpanzee *Pan troglodytes*, classed as vulnerable in the Red Data Book, the giant, tree and long-tailed pangolins *Manis gigantea*, *M. tricuspis* and *M. longicaudata*, golden cat *Felis aurata*, leopard *Panthera pardus*, another vulnerable species, elephant *Loxodonta africana*, bushpig *Potamochoerus porcus*, forest hog *Hylochoerus meinertzhageni*, pygmy hippo *Choeropsis liberiensis*, classified as rare and of now very restricted distribution, the water chevrotain *Hyemoschus aquaticus*, bongo *Taurotragus eurycerus*, buffalo *Syncerus caffer*, an extraordinary assemblage of forest duikers which includes the 'endangered' Jentink's *Cephalophus jentinki* as well as the banded duiker or zebra antelope *C. zebra*, Ogilby's duiker *C. ogilbyi*, and the black *C. niger*, bay *C. dorsalis* and yellow-backed *C. sylviculitor* duikers, also the royal antelope *Neotragus pygmaeus*.

ZONING None

DISTURBANCES AND DEFICIENCIES Apart from poaching, which is especially evident on the Park boundaries, mention should be made of exploitation of the forest for timber, especially in the north where many inroads have been made; but strict measures are being taken to bring these under control.

TOURISM The proximity of the Park to the regional centre of Man region offers possibilities of giving tourists a chance to visit an exceptional stand of dense humid forest. Tourist facilities are to be developed around Mont Niénokoué in the south of the Park.

SCIENTIFIC RESEARCH A centre for research, under the UNESCO Man and Biosphere programme, is being developed outside the Park to the north-west, in the Audrinisrou river valley; but the park will serve as a reference area.

SPECIAL SCIENTIFIC FACILITIES These will be developed as required for ecological research.

PRINCIPAL REFERENCE MATERIAL A number of reports have been prepared by the Autorité pour l'Aménagement du Sud-Ouest (A.R.S.O.), including:

ORSTOM. Le milieu naturel de la Côte d'Ivoire. Mémoire No. 50.

RAHM, U. Propositions pour la création du Parc National de Taï et la Côte d'Ivoire; centre de recherches tropicales.

SCHNELL. Notes africaines: La montagne Niénikoué. L'Anthropologie Vol. 52.

B.D.P.A. Propositions d'aménagement touristique de Conservation du milieu naturel du Parc National de Taï.

STAFF Chief Inspector of National Parks, technical assistant, 11 other assistants, 17 guards, 5 watchmen and 15 other employees: total 50

BUDGET In 1975, expenditure on personnel amounted to CFA Francs 20 million, on park maintenance about CFA Francs 6 million, and on equipment and capital investment CFA Francs 25 million.

LOCAL PARK ADMINISTRATION Chef de l'Inspection des Parcs Nationaux, Soubred.

IVORY COAST

NAME Haut-Bandama Flora and Fauna Reserve

TYPE NP BIOTIC PROVINCE 4.6.1

LEGAL PROTECTION All hunting, forestry, fishing, the taking of honey or wax and medicinal plants prohibited. Research and mining exploration permitted.

DATE ESTABLISHED 21 March 1973, under Decree No. 73-133

GEOGRAPHICAL LOCATION In the north-centre of the country, on the Bandama Blanc and Bou rivers, north-west of Katiola and extending to the Dikodougou sous-préfectures: N 8°13'-8°40'; W 5°17'-5°42'.

ALTITUDE Estimated at about 250-500 metres

AREA 123,000 ha

LAND TENURE State ownership

PHYSICAL FEATURES A generally flat area with very little change in elevation. Topographically a table-land with several granitic domes in the north, transected from north to south by the Bandama Blanc river system. The climate is typical of the Soudano-guinean zone, with a very marked dry season from November to April and a mean annual precipitation of around 1100 mm.

VEGETATION Very open savanna woodland with some gallery forest along the tributaries of the Bandama. The trees are similar to those of the Comoé National Park and include many Leguminosae such as *Isobertinia* sp., *Pterocarpus erinaceus*, *Burkea africana*, *Detarium micranthum*, *Daniellia oliveri*, *Parkia biglobosa*, Combretaceae such as *Combretum* and *Terminalia* spp., *Parinari* sp. and *Uapaca somon*. Grasses are mainly species of *Panicum*, *Andropogon*, *Elionurus*, *Ctenium* and *Cymbopogon*.

NOTEWORTHY FAUNA Again similar to that of Comoé National Park, the mammals including anubis baboon *Papio doguera*, patas monkey *Erythrocebus patas*, elephant *Loxodonta africana*, warthog *Phacochoerus aethiopicus*, bushbuck *Tragelaphus scriptus*, buffalo *Syncerus caffer*, yellow-backed and red-flanked duikers *Cephalopus sylvicultor* and *C. rufilatus*, grey duiker *Sylvicapra grimmia*, kob *Kobus* (= *Adenota*) *kob*, defassa waterbuck *K. defassa*, reedbuck *Redunca redunca*, roan antelope *Hippotragus equinus*, bubal hartebeest *Alcelaphus buselaphus* and oribi *Ourebia ourebi*.

ZONING None

DISTURBANCES AND DEFICIENCIES The reserve has only recently been created and the fauna, which had been markedly reduced by hunting, is now beginning to recover. The area is threatened by agro-industrial development, especially sugar-growing, which is encroaching on the south-eastern sector.

TOURISM No road of access or tracks but there is an airstrip at Bouaké, where accommodation is available and from which the main road north through Katiola and Niakaramandougou and a branch road from the latter to Dikodougou are within striking distance of the reserve across country. There are no visitor facilities.

SCIENTIFIC RESEARCH None

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

RAHM, U. and BIENEK, B. Etude des Parcs Nationaux de Côte d'Ivoire.

STAFF A Chief Inspector is stationed at Bouaké, together with an assistant; a Chef de Brigade and an assistant at Katiola, together with 4 guards and 2 other staff: total 10.

BUDGET In 1975, expenditure on staff was about CFA Francs 2½ million and on maintenance and running of the reserve CFA Francs 300,000.

LOCAL PARK ADMINISTRATION Chef d'Inspection des Parcs Nationaux, Bouaké.

IVORY COAST

NAME Marahoué National Park Park National Marahoué

TYPE NP BIOTIC PROVINCE 4.6.1/4.7.2

LEGAL PROTECTION Protected against all types of disturbance and exploitation.

DATE ESTABLISHED 9 February 1968, by Decree No. 68-30

GEOGRAPHICAL LOCATION West-central Ivory Coast, north of the Bouafle-Daloa road and along the Bandama Rouge or Marahoué river: N 7°54'-7°17'; W 5°46'-6°11'.

ALTITUDE 90-320 metres

AREA 100,000 ha

LAND TENURE State ownership

PHYSICAL FEATURES A relatively undulating area drained southwards by the Bandama Rouge or Marahoué river and its tributaries and separated by high ground from the great lake formed by the Bandama Blanc barrage. There are a number of dome-like hills, notably Mont Sininglégo and the hill of Gobazra. The climate is typically Soudano-guinean with a mean annual rainfall of 1100 mm.

VEGETATION In the east and north-east and occupying about one-third of the Park, Guinean savanna woodland, with Combretum, Terminalia and Isobertia species, together with Burkea africana, Daniellia oliveri, Pterocarpus erinaceus and Uapaca somon as the principal tree species. The remaining two thirds, in the south and south-west, consist of dense deciduous forest and some gallery forest, including many good timber trees such as mahogany Khaya grandifoliola, tali or ordeal tree Erythrophloeum ivorensis, iroko Chlorophora excelsa, samba Triplochiton scleroxylon, aiele Canarium schweinfurthii, kapok Ceiba pentandra, Mansonia altissima, Pycnanthus kombo, Terminalia superba, Antiaria welwitschii, the mulberry Morus mesozygia and Celtis zenkeri.

NOTEWORTHY FAUNA Both savanna and forest species are represented, the mammals including anubis baboon Papio doguera, white-collared mangabey Cercocebus torquatus, mona monkey Cercopithecus mona, red colobus Colobus badius, chimpanzee Pan troglodytes, now rated in the Red Data Book as a vulnerable species, the African linsang Poiana richardsoni, about 50 elephant Loxodonta africana, hippo Hippopotamus amphibius, bushbuck Tragelaphus scriptus, bongo Taurotragus eurycerus, buffalo Syncerus caffer, red-flanked Cephalophus rufilatus, bay C. dorsalis and black C. niger duikers, kob Kobus (=Adenota) kob, Defassa waterbuck K. defassa, reedbuck Redunca arundinum and bubal hartebeest Alcelaphus buselaphus.

DISTURBANCES AND DEFICIENCIES The Park has suffered in the past from a period of severe poaching but conditions have now improved. It is still subject to pressure from industrial plantations.

TOURISM The Park is well suited for tourism, being readily accessible from the surfaced highway to the west, branching off the great north road at Yamoussoukro. The main entrance is at Gobazra, between Bouafle and Daloa, and a track for visitors has been constructed. No other facilities exist at present, but there is hotel accommodation at Yamoussoukro (206 rooms) and Daloa (52 rooms).

SCIENTIFIC RESEARCH Confined so far to studies of animal biology and behaviour sponsored by the Secretary of State for National Parks.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

RAHM, U. and BIENEK, B. Etude des Parcs Nationaux de Côte d'Ivoire.

STAFF Chief Inspector of National Parks, technical assistant, 4 other assistants, 20 guards and watchmen and 7 other employees: total 33.

BUDGET Expenditure in 1975 on staff amounted to about CFA Francs 14 million, on maintenance and running CFA Francs 4.7 million and on capital investment and equipment CFA Francs 24.5 million, the latter figure also covering 1974. During the relevant period CFA Francs 1 million was equivalent to about U.S. \$4000.

LOCAL PARK ADMINISTRATION Chef d'Inspection des Parcs Nationaux, Bouaflé.

IVORY COAST

NAME N'Zo Partial Fauna Reserve

TYPE MR BIOTIC PROVINCE 4.7.2

LEGAL PROTECTION All hunting, pursuit and disturbance of game prohibited, as are clearing and burning of scrub after agricultural cropping. But forest exploitation is permitted (Articles 1 and 2 of the Decree).

DATE ESTABLISHED 28 August 1972 under Decree No. 72-546.

GEOGRAPHICAL LOCATION About 150 km south of Man, adjoining the Taï National Park (IVO.2.1) on the north, the N'Zo river being a tributary of the Sassandra: approx. N 6°08'; W 7°15'.

ALTITUDE 100-250 metres

AREA 73,000 ha

LAND TENURE State ownership

PHYSICAL FEATURES Similar to the Taï National Park, with which it is contiguous: generally flat except for a few isolated hills resulting from greenstone intrusions. The equatorial climate comprises two rainy seasons, a longer one at its peak in June, a shorter one in September and the two together accounting for a mean annual rainfall of 1700 mm; the marked dry season lasts from December to February.

VEGETATION Dense ombrophilous evergreen forest of Guinean type similar to that of the Taï National Park; trees 40-60 m high with buttresses and stilt roots and rich in epiphytes and lianes. Dominant species are ebony Diospyros mannii and Eremospatha macrocarpa palms, and Parinari chrysophylla, Chrysophyllum perpulchrum and the monotypic Chidlowia sanguinea are also common.

NOTEWORTHY FAUNA Again broadly similar to that of the Taï forest, the reserve giving protection to such 'rare' or 'endangered' species, in the Red Data Book listings, as the pygmy hippo Choeropsis liberiensis and Jentink's duiker Cephalophus jentinki. Other uncommon forest duikers which are found include Ogilby's duiker C. ogilbyi and the banded duiker or zebra antelope C. zebra.

ZONING None

DISTURBANCES AND DEFICIENCIES Forest exploitation which is permitted within the reserve, makes it very difficult to control other disturbing activities, especially poaching.

TOURISM No tourist facilities

SCIENTIFIC RESEARCH None

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF The staff of the Taï National Park is also responsible for the care of this reserve.