NAME  Nyanga Sud Game Reserve

TYPE  MR  BIOTIC PROVINCE  4.7.1

LEGAL PROTECTION  Controlled hunting by permit hunters, and those authorised by the Service des Chasses et de la Conservation de la Nature

DATE ESTABLISHED  8 February 1958 by Decree No. 535/CH

GEOGRAPHICAL LOCATION  South of the Nyanga river very close to the point where it crosses the Gabon border, in the Nyari Region of SW Congo: S 2°40'-3°10'; E 11°30'-12°

ALTITUDE  200-400 metres approximately

AREA  23,000 ha

LAND TENURE  State ownership

PHYSICAL FEATURES  The Nyanga river separates this Reserve from that of Nyanga Nord and is also the main feature of the area, apart from a small hill in the southwest of the Reserve. Red lateritic soils prevail throughout the Reserve. Climatically identical to Nyanga Nord and Fouari Reserves: a long wet season from October to May, broken by a short dry season in February and March, and the main dry season from June to September. Annual rainfall between 2500 and 3000 mm and mean temperatures of 22°C to 28°C.

VEGETATION  85% of the Reserve consists of fairly well wooded savanna, the remaining 15% of secondary forests noted for their good stands of limba Terminalia superba. The latter have recently been threatened by unauthorised felling.

NOTEWORTHY FAUNA  No faunal survey has been undertaken due to lack of adequate financial support but the mammals certainly include bushpig Potamochoerus porcus, hippo Hippopotamus amphibius, bushbuck Tragelaphus scriptus, sitatunga T. spekei and Defassa waterbuck Kobus defassa.

ZONING  None

DISTURBANCES OR DEFICIENCIES  Poaching and unauthorised forest exploitation, particularly directed to Terminalia stands.

TOURISM  None

SCIENTIFIC RESEARCH  None

SPECIAL SCIENTIFIC FACILITIES  None

PRINCIPAL REFERENCE MATERIAL  None listed

STAFF  1 game guard

BUDGET  Allocation to cover the salary of the guard is made from the relevant item in the national budget.

LOCAL PARK ADMINISTRATION  Chef de la Service des Chasses et de la Conservation de la Nature, B.P. 2153, Brazzaville

WDNP  IUCN © 1977

(1)F  Code: CON.3.5
NAME Mont Fouari Strict Fauna Reserve

TYPE NR

BIOTIC PROVINCE 4.7.1/4.6.3

LEGAL PROTECTION Total

DATE ESTABLISHED 8 February 1958 by Decree No. 535/CH

GEOGRAPHICAL LOCATION Another reserve adjoining the Gabon border, in SW Congo, 230 km from Loubomo (formerly Dolisie) on the main road to Libreville: $2^\circ35'-3^\circ$; $E11^\circ40'$

ALTITUDE 100-400 metres approximately

AREA 18,000 ha

LAND TENURE State ownership, acquired by expropriation

PHYSICAL FEATURES A major part of the area consists of a plain that is sometimes flooded and has a fair number of marshy areas, one of the most important being the Lac Bleu which is supplied by underground water sources. Mont Fouari, which gives its name to the Reserve and an outstanding feature, is partly composed of calcareous rocks and the source of a small river which sometimes dries up in the dry season. The south-western boundary of the Reserve is formed by the N'Gongo river, which also in some places forms the boundary with Gabon. Red lateritic soils are widespread but there are areas of black cotton soil on the plains. Hot, humid equatorial climate with a dry season from June to 15 October and a wet season (broken by a short dry period January/March) from 15 October to May. Mean temperature $23^\circ-28^\circ$C.

VEGETATION The dominant vegetation is tall and short grassland savanna, moderately well wooded and covering about 95% of the total area. As elsewhere in this region Hymenocardia assida and Hannonia sp. are among the commoner tree species; while Cyperaceae of many species are typical of the margins of marshy areas and the banks of watercourses. There is a fairly dense forest of Terminalia superba on Mont Fouari, made more impenetrable by the liberal growth of lianes. This and gallery forests account for the remaining 5% of the total area of the Reserve.

NOTEWORTHY FAUNA Many species of monkey are present and larger mammals include leopard *Panthera pardus* (rated a 'vulnerable' species by the Red Data Book), bushpig *Potamochoerus porcus*, bushbuck *Tragelaphus scriptus*, dwarf forest buffalo *Syncerus caffer nanus*, Defassa waterbuck *Kobus defassa* and reedbuck *Redunca arundinum*. The area is especially noted for the sizeable populations of the antelopes mentioned.

ZONING None

DISTURBANCES OR DEFICIENCIES Intense poaching, together with the existence of villages in the surrounding area, especially along the Loubomo-Gabon road.

TOURISM Viewing of game animals is to be developed.
SCIENTIFIC RESEARCH None
SPECIAL SCIENTIFIC FACILITIES None
PRINCIPAL REFERENCE MATERIAL None listed
STAFF 4 game guards and 2 game auxiliaries and a guard post
BUDGET Staff salaries are covered by an allocation from the relevant head of the national budget (see under Code 3.1)
LOCAL PARK ADMINISTRATION Chef de la Service des Chasses et de la Conservation de la Nature, B.P. 2153, Brazzaville
CONGO

NAME Nyanga Nord Strict Fauna Reserve

TYPE NR

BIOTIC PROVINCE 4.7.1

LEGAL PROTECTION Total

DATE ESTABLISHED 8 February 1958 by Decree No. 535/CH

GEOGRAPHICAL LOCATION Divânié District, south-west Congo, on the border with Gabon at the point where it runs along the main road, and south-east of the Mont Mavoumbou and Mont Fouari Reserves: S 2°40'-3°10'; E 11°30'-12°

ALTITUDE 150-300 metres approximately

AREA 18,000 ha

LAND TENURE State ownership

PHYSICAL FEATURES Separated from Nyanga Sud Reserve (3.5) by the Nyanga River. Somewhat resembling Lac Bleu in the Mont Fouari Reserve (4.1), L. Tsoubou is one of the more remarkable features of Nyanga Nord, both for its great depth in one place and for its blue waters that are in constant circulation. Unfortunately access to its shore is difficult due to jagged limestone rocks dissected by erosion. Another feature is the narrow Mitsoubou gorge consisting of rock formations shaped by natural forces. Soils are lateritic. The climate is of the humid equatorial type, with the main dry season from June to September and rains from October to May with a short break in February and March. Annual precipitation 2500-3000 mm, mean temperature 22°C-28°C.

VEGETATION Tall grass savanna in low lying areas and short grass savanna on slopes account for about 70% of the total area. Another 30% is occupied by gallery forests. The tree species include Hymenocardia assida and Hannonia sp. in the savanna areas and limba Terminalia superba in the forested zones, but the great majority of the species which compose the flora have yet to be identified.

NOTEWORTHY FAUNA Larger mammals present include bushpig Potamochoerus porcus, hippo Hippopotamus amphibius, sitatunga Tragelaphus spekei, dwarf forest buffalo Syncerus caffer nanus and Defassa waterbuck Kobus defassa.

ZONING None

DISTURBANCES OR DEFICIENCIES Poaching, especially from the surrounding villages and from Gabon. Insufficient surveillance is available and the attitude of the public is not yet favourable to fauna conservation. However, a reserve is reported to have been established on the Gabon side of the border, and joint action may eventually ensure the conservation of this valuable wildlife area.

TOURISM A few tourists have visited Lake Tsoubou and the Mitsoubou passage and a new policy for development of the high potential of this Reserve has been under consideration and may by now have been initiated.

SCIENTIFIC RESEARCH None

WDNP IUCN © 1977 (1)F Code: CON.4.2
SPECIAL SCIENTIFIC FACILITIES  None
PRINCIPAL REFERENCE MATERIAL  Not listed
STAFF  1 full time Game Guard
BUDGET  An allocation from central government funds covers the guard's salary.

COSTA RICA

AREA 50,901 sq. km

POPULATION 1,875,000 (1974 estimate)

PARKS AND RESERVES LEGISLATION The 'Ley Forestal', enacted by Congress on 2 December 1969, established a Forest Service and National Parks Department. Under its provisions they are empowered to create national parks and reserves by executive decree; once created these can only be altered by a Congressional Act. The Parks Department has the right to expropriate lands, set up and administer funds derived from entrance fees, enter and inspect rural properties, and seize vehicles, arms or equipment used for any illegal activities, in accordance with the provisions of the Forest Law.

PARKS AND RESERVES ADMINISTRATION Responsibility of the Departamento de Parques Nacionales.

ADDRESS Departamento de Parques Nacionales, Dirección General Forestal, Ministerio de Agricultura y Ganadería, San José.

TOTAL AREA UNDER PROTECTION 34,772 ha

PROTECTED AREAS

4.1 Tortuguero National Park 18,000 ha
4.2 Santa Rosa National Park 9,900 ha
5.1 Volcan Poas National Park 4,000 ha
5.2 Cahuita National Park 1,700 ha
5.3 Cabo Blanco National Reserve 1,172 ha
COSTA RICA

NAME Tortuguero National Park

TYPE NP

BIOTIC PROVINCE 3.7.2

LEGAL PROTECTION Total

DATE ESTABLISHED 7 September 1970, by Executive Decree No. 1235-A

GEOGRAPHICAL LOCATION On Atlantic coast. N 10°22'-32'; W 83°23'-34'

ALTITUDE 0-299 metres

AREA 18,000 ha

LAND TENURE Government expropriated lands by law

PHYSICAL FEATURES On Caribbean coast about 90 km north of Limon in Limon Province. Includes beach, estuary and rain forest (the latter covers 140 sq. km of palm swamps and a long series of hills called 'lomas de Sierpes'). The climate is hot and one of the wettest in all of Central America with about 5000 mm of annual rainfall and no dry season. Mean annual temperature is close to 25°C.

VEGETATION Large areas of relatively undisturbed tropical wet forest of mixed composition. Noteworthy are Carapa slaterii, Virola spp. and Pentaclethra macroloba. Much of the park is covered by a virtually pure stand of swamp palm Raphia taedigera.

NOTEWORTHY FAUNA Mammals include Baird's tapir Tapirus bairdii, jaguar Felis onca, mountain lion Felis concolor, ocelot Felis pardalis, kinkajou Potos flavus, giant anteater Myrmecophaga tridactyla and manatee Trichechus manatus. Among the birds are many varieties of toucans, parrots and macaws. Marine species include green turtle Chelonia mydas, hawksbill Eretmochelys imbricata and leatherback turtle Dermochelys coriacea.

ZONING Not yet established

DISTURBANCES OR DEFICIENCIES None reported

SCIENTIFIC RESEARCH Mostly on sea turtles, but also on lizards and fishes

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL


STAFF

One guard

BUDGET

Personnel only: about US$ 1000 for 1973, provided by the federal government. Organizations like the WWF, the U.S. Peace Corps and others have helped finance the establishment and work of the park.

LOCAL PARK ADMINISTRATION

Nazario Ramirez Davila, Parque Nacional Tortuguero, Departamento de Parques Nacionales, Dirección General Forestal, Ministerio de Agricultura y Ganadería, San José, Costa Rica.
COSTA RICA

NAME  Santa Rosa National Park

TYPE  NP

BIOTIC PROVINCE  3.7.2

LEGAL PROTECTION  Totally protected

DATE ESTABLISHED  20 March 1970, by Executive Decree No. 1562-A

GEOGRAFICAL LOCATION  Pacific coast. N 10°44'-55'; W 85°34'-43'

ALTITUDE  0-319 metres

AREA  9900 ha

LAND TENURE  Government expropriated lands by law

PHYSICAL FEATURES  Park is located in northwest province of Guanacaste, 30 km north of Liberia, the provincial capital. Eastern border is the Panamerican highway; western, the Pacific Ocean. Wet and dry season of approximately 6 months duration each, with about 2000 mm of annual rainfall. Volcanic rock of high calcium carbonate content underlies the western region; sedimentary sandstone occurs on the coastal flank. Salt flats ('salinas') along littoral lowlands. Mean annual temperature is 28.2°C.

The original Hacienda was one of the first and most important cattle ranches of the region and dated back to before 1751. In 1856 it was the site of the 'Battle of Santa Rosa'. The House ('Casona') of Hacienda Santa Rosa has become the historical landmark of the successful 'Campaign of 56-57' in which Costa Rica upheld her independence.

VEGETATION  Dry forest life-zone (sensu Holdridge) including savannas with some forest, gallery forest, estuaries and 6 km beach. Main vegetation types: 1) mixed deciduous forest with Calycophyllum candidissimum, Bombacopsis quinatum, and Luehea candida among the dominants; 2) evergreen forests along streams and behind the occasionally flooded zone (estero); 3) savannas of jaragua grass Hyparchenia rufa with scattered trees of Nyssonima crassifolia and Curatella americana; 4) oak forests and savannas with Quercus oleiodes dominants; and 5) mangroves Rhizophora mangle.

NOTEWORTHY FAUNA  Due to the rapid clearing of the Guanacaste landscape for timber and subsequent use as pasture, Santa Rosa National Park will soon be one of the last large tracts of originally widespread tropical dry forest and lowland gallery forest in the country. Some of the more common mammal species or those gradually regaining their previous status within the sanctuary of the park are: white-lipped peccary Tayassu sibirostris, white-tailed deer Odocoileus virginianus, collared peccary Tayassu tajacu, Baird's tapir Tapirus bairdii, white-faced capuchin Cebus capucinus, spider monkey Ateles geoffroyi, howler monkey Alouatta palliata, collared anteater Tamandua tetradactyla and five species of cats including jaguar Felis onca and ocelot F. pardalis. The dry forest avifauna includes scarlet macaw Ara militaris, rufescent tinamou Crypturellus cinnaeum and several gallinaceous birds such as spot-billed bobwhite Colinus leucopogon, great curassow Crax rubra and crested guan Penelope purpurascens. Permanent water areas support several species of migratory waterfowl, notably blue-winged teal Anas discors. The extensive estuary area on the coast is a prime resting and feeding stop for roseate spoonbill Ajaia ajaja and large mixed flocks of Ardeidae and Scolopacidae. The
estuary shelters some of the few large Crocodylus americanus left in the area. Within the park boundary is one of the prime nesting beaches of the Pacific ridley turtle Lepidochelys olivacea. During the breeding and nesting season (August to December) well over 100,000 individuals arrive at Nancite Beach in the Park. The East Pacific green turtle Chelonia mydas agassizii and leatherback turtle Dermochelys coriacea also use the beaches quite extensively to nest.

OUT OF THE ORDINARY CONSERVATION AIMS Maintenance of man-made structures, particularly the historic Hacienda house of Santa Rosa, and their settings, for anthropological, archaeological or historical interest.

ZONING Proposals are: (i) zone of controlled cattle grazing, to maintain the open landscape, about 50% of the park; (ii) historic zone, small enclave inside zone (i); (iii) recreation zone comprising amenity and camping sites, beaches, stables—these facilities are distributed throughout the park; (iv) biological zone of woodlands covering about three-fifths of the park—access allowed by trail; and (v) small service zone.

DISTURBANCES OR DEFICIENCIES None presently reported, although uncontrolled fires, illegal hunting and poaching have been traditionally practised in the past. Salt was formerly extracted from the coastal "salinas".

TOURISM One colon entry fee for guided tours of historic Hacienda. Facilities include campgrounds, nature trail, restrooms, gravel road access and power plant. Under construction: tourist centre, restaurant, administrative area (guard and supervisor's houses, research centre, bodega). 15,000 visitors a year at present, mostly Costa Rican nationals. The majority visit only the historic site and nearby nature trail, few venturing as far as the beach. Peak of tourism during dry season (December to May).

SCIENTIFIC RESEARCH Mainly on local fauna, savanna succession and effects of fire.

SPECIAL SCIENTIFIC FACILITIES Research centre (building at present in progress) including herbarium cabinets, library, general equipment, projection rooms and dark room.

PRINCIPAL REFERENCE MATERIAL

STAFF 1 superintendent, 7 guards, 4 peones full-time

BUDGET About US$ 19,000 for 1973, provided by the Federal Government and international organizations.

LOCAL PARK ADMINISTRATION Willie Navarro Alvarez (Superintendent), Parque Nacional Santa Rosa, Dirección General Forestal, Ministerio de Agricultura y Ganaderia, San José, Costa Rica.
COSTA RICA

NAME Volcán Poás National Park

TYPE NP

BIOTIC PROVINCE 3.7.2

LEGAL PROTECTION Total

DATE ESTABLISHED 23 December 1970, by Ley de la República No. 4714

GEOGRAPHICAL LOCATION In Central Highlands. N 10°10'-14'; W 84°12'-16'

ALTITUDE 1600-2708 metres (summit of volcano)

AREA 4000 ha

LAND TENURE Government expropriated lands by law

PHYSICAL FEATURES The volcano is in the northwestern corner of the Central Valley and part of the Cordillera Central. Accessible year-round by road, 60 km north-west of the capital San José, but only 20 km in a straight line. Poás, of Pliocene origin, exhibits five craters, four ancient and one still active. The latter is easily reached and from it another ancient, lagoon-filled crater at a higher elevation is within walking distance. Recent activity has been documented since 1828, with especially strong eruptions recorded for the periods 1888-1895, 1903-1912, and 1952-1954. The rock strata consist of andesites and basalt. Average annual rainfall is 1750 mm; mean annual temperature varies between 12°C and 15°C according to elevation. There is much cloud and occasional frost, especially during the drier period of January to April.

VEGETATION Lower montane and montane wet (cloud) forests, characterized by several species of tall native oaks Quercus spp., with the smaller Clusia odorata, Didymopanax pittieri and Weinmannia pinnata reaching the higher fringes. Many species of epiphytic orchids and bromeliads, ferns and mosses are represented, as well as aquatics (e.g. Isoetes storkii). Other notable members of the flora include two species of Podocarpus, standleyii and oleifolius, Magnolia poasana, Quercus insignis, and tree ferns of the genera Cyathea and Alsophila. Areas affected by recent volcanic activity support low, tangled scrub with Clusia odorata, Vaccinium consanguineum and Escallonia poasensis. An interesting plant succession has been taking place near the crater since its last major eruption in 1954.

NOTEWORTHY FAUNA Of the mammals, the endemic Poas mountain squirrel Syntheosciurus poasensis is fairly common. Species formerly more abundant in the area but now rarely observed include brocket deer Mazama americana and peccary Tayassu tajacu, but it is doubtful whether any Baird’s tapir Tapirus bairdii or jaguar Felis onca still occur. In general, the fauna is rather impoverished due to the isolation of the mountain caused by intensive agriculture at lower elevations, but the birds are interesting and the quetzal Pharomachrus mocinno can still be seen in the vicinity.

ZONING Proposals are: (i) strict nature reserve zone covering about two-thirds of the park and denied to public access; (ii) outdoor recreation zone with roads, trails and other recreation facilities for tourist use including the park centre; (iii) service zone; (iv) biological zone, where a biological station of the University of Costa Rica would be established.
DISTURBANCES OR DEFICIENCIES  Past grazing rights are now being eliminated but there is still occasional trespass by herdsmen and their cattle.

TOURISM  Gravel access road, visitors' centre, picnic areas, campground, nature trail from active crater observation point to lagoon-filled inactive crater. Nearly 70,000 persons visit the park each year, the majority Costa Ricans, the peak period being from December to April inclusive and during the vacations. The more primitive nature trails are rarely used.

SCIENTIFIC RESEARCH  A number of studies have been undertaken

SPECIAL SCIENTIFIC FACILITIES  None

PRINCIPAL REFERENCE MATERIAL


STAFF  1 superintendent, 1 intendent, 2 technicians, 10 guards and small labour force, with occasional assistance from Peace Corps volunteers.

BUDGET  About US$ 25,000 in 1972 provided by the Federal Government and interested organizations.

LOCAL PARK ADMINISTRATION  Uriel Barrantes C. (Superintendent), Parque Nacional Volcan Poas, Departamento de Parques Nacionales, Dirección General Forestal, Ministerio de Agricultura y Ganadería, San José, Costa Rica.
NAME  Cahuita National Park

TYPE    NP-M

LEGAL PROTECTION Total

DATE ESTABLISHED 7 September 1970, by Executive Decree No. 1236-A

GEOGRAPHICAL LOCATION On Atlantic coast. N 9°40'-48'; W 82°45'-50'

ALTITUDE (Land area) 0-10 metres

DEPTH (Marine area) No information available

AREA  c. 1700 ha: land - 1100 ha

water - 600 ha

LAND TENURE Government expropriated lands by law

PHYSICAL FEATURES The park is south of the town of Cahuita in southeastern Limon Province and follows the shoreline of the Caribbean for approximately 10 km. The 'Punta Cahuita' is formed on emergent ancient coral; there is a currently-forming fringing reef 6.5 km long offshore. The bedrock of the terrestrial sector is Pleistocene alluvial sandstone. The climate is hot and wet with annual rainfall close to 3500 mm, mean annual temperature about 25°C and hardly any dry season.

LAND VEGETATION Although there has been much recent land clearance for cultivation, an almost undisturbed tropical moist forest association survives on the punta itself. Dominant species are Cordia alliodora (mostly in old secondary growth), Cedrela mexicana, Prioria copaifera, Carapa guianensis, Anacardium excelsum, Calophyllum brasiliense and Hura crepitans. A pure stand of swamp palm Raphia taedigera occupies the southwest corner of the park, and coconut palm Cocos nocifera lines the stretch of beach nearest to the town.

MARINE VEGETATION No information available

NOTEWORTHY LAND FAUNA Common mammals include howler monkey Alouatta palliata, three-toed sloth Bradypus griseus, the squirrel Sciurus granatensis and the margay subspecies Felis wiedi pirrensis. Among the birds the brown pelican Pelecanus occidentalis and various ant-wrens Myrmotherula spp. are of interest. One of the basilisks Basiliscus vittatus is to be seen.

NOTEWORTHY MARINE FAUNA Horny corals associated with sponges and turtle grass, on which the Atlantic hawksbill turtle Eretmochelys imbricata feeds. Closer to the reef edge brain corals predominate with squirrel and surgeon fish, lobsters, stingring and short-spined urchins and polychaete worms. Horny corals and snappers are common on the seaward face of the reef.

ZONING Not yet applied. Current studies are examining possible relocation of park further south where another reef occurs and pressure from people is likely to be less.
DISTURBANCES OR DEFICIENCIES  Little information available. Harvesting of coconut is allowed along portions of the beach and considerable areas have been cleared recently for banana and cocoa planting.

TOURISM  Approximately 2000 people visit the park annually. Boats are available on a daily rental basis and skin-diving is popular. A primitive nature trail leads from the town of Cahuita to the point.

SCIENTIFIC RESEARCH  No research programmes have been undertaken, but the marine ecology is now under investigation and a study of the secondary botanical succession in areas no longer cultivated would be of considerable interest for conservation purposes.

SPECIAL SCIENTIFIC FACILITIES  None

PRINCIPAL REFERENCE MATERIAL


STAFF  One guard-supervisor. Occasional assistance with research from Peace Corps volunteers.

BUDGET  US$ 1000 for 1973, provided by the Federal Government

LOCAL PARK ADMINISTRATION  Glodaldo Williams Hall (Supervisor), Cahuita National Park, Departamento de Parques Nacionales, Dirección General Forestal, Ministerio de Agricultura y Ganadería, San José, Costa Rica.
NAME: Cabo Blanco National Reserve

TYPE: NP

BIOTIC PROVINCE: 3.7.2

LEGAL PROTECTION: Total

DATE ESTABLISHED: 26 October 1963, by Executive Decree No. 10

GEOGRAPHICAL LOCATION: On Pacific Coast. N 9°31'-36"; W 85°3'-12"

ALTITUDE: 0-355 metres

AREA: 1172 ha

LAND TENURE: Government expropriated lands by law

PHYSICAL FEATURES: The Cabo Blanco Reserve is at the southernmost tip of the Nicoya Peninsula in the Province of Puntarenas. The rugged terrain, bounded by the Pacific Ocean, is mainly formed of sedimentary limestone bedrock of Miocene origin. The island of Cabo Blanco which gave its name to the reserve is about 1.6 km south of the peninsula and about c. 1000 ha in area. In the dry season its rocks turn white from the guano of large breeding-colonies of frigate-birds Fregata magnificens and pelicans, probably well over 1000 in number. The climate is tropical humid, but with a distinct dry season between December and March. Rainfall is estimated at c. 2500 mm a year and mean annual temperature at about 26°C-27°C.

VEGETATION: Original vegetation: lowland seasonal forest 80%, drought-deciduous tropical lowland forest 20%, approximately. Of this forest cover only 15% is primary and 20% secondary, the remaining 65% being at various stages of earlier successional growth (1962).

NOTEWORTHY FLORA: Among the dominant tree species are: Calycophyllum candidissimum, the sapodilla plum Achras zapota, logwood Haematoxylon campechianum, Bombacopsis quinatum, Muntingia calabura, Erosimum costaricanum and Tabebuia pentephylla. Many species of epiphytic tree orchids and bromeliads.

NOTEWORTHY FAUNA: Mammals: howler monkey Alouatta villosa, paca Cuniculus paca, spotted agouti Dasyprocta punctata and the variegated squirrel Scirurus variegatoides; depleted or endangered species reported are Baird's tapir Tapirus bairdii and the jaguar Felis onca; there are also records of two monkeys, a local race of spider monkey Ateles geoffroyi frontatus and the white-throated capuchin Cebus capucinus, and four cats, the margay Felis wiedi, jaguarundi F. yaguaroundi, ocelot F. pardalis and puma F. concolor, but all still need scientific confirmation.

ZONING: None yet applied, the whole area being strict nature reserve

DISTURBANCES OR DEFICIENCIES: None reported at present, but evidence of past shifting agriculture widespread.

TOURISM: None, in view of the strict protection status

SCIENTIFIC RESEARCH: No special programme has yet been started

SPECIAL SCIENTIFIC FACILITIES: None
PRINCIPAL REFERENCE MATERIAL


STAFF 1 superintendent, 2 guards

BUDGET Personnel: about US$ 2000 for 1971, provided by the Federal Government

LOCAL PARK ADMINISTRATION Olof Wessberg (volunteer), Moctezuma de Puntarenas, Costa Rica.
CZECHOSLOVAKIA

AREA 127,946 sq. km (Czech S.R. 78,863)

POPULATION 14,686,255 (1974: Czech S.R. approx. 10,000,000)

PARKS AND RESERVES LEGISLATION (information based on a report supplied by the Czech S.R. authorities only; data for the Slovak S.R. not yet available). The basic legislation is the Nature Protection Act No. 40 of 1 August 1956. This provides for the protection, both of landscape and of natural resources, for the educational, recreational, health and cultural welfare of the people, by declaring specified areas protected and determining the methods and conditions of their conservation. Such areas range from national parks, protected landscape areas, nature reserves, habitat reserves, protected parks and gardens, research centres and protected natural phenomena and monuments, to rocks, caves, limestone formations, trees etc.

PARKS AND RESERVES ADMINISTRATION Protected areas having been established in the Czech S.R. under the general direction of the Ministry of Culture, in consultation with the Council of the Regional National Committee, their management is the responsibility of the Scientific Institute for the Protection of Historic Monuments and Nature Conservation and undertaken by Regional Centres in each of the seven regions. Special Directorates have been established for the one National Park and some of the Protected Landscape Areas.

ADDRESS Ministry of Culture, Prague; Institute for the Protection of Historic Monuments and Nature Conservation, Prague.

TOTAL AREA UNDER PROTECTION Not quoted, but altogether over 560 protected areas of various categories have been established, of which the following is a selection of some of the more important and interesting and 100 hectares or more in area. In view of this and of the absence of a list of Slovak S.R. protected areas, the size-categories and code numbers are only very provisional.

PROTECTED AREAS

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Area</th>
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<tr>
<td>2.1</td>
<td>Šumava Protected Landscape</td>
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<tr>
<td>2.2</td>
<td>Beskydy</td>
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<td>3.1</td>
<td>Jeseníky</td>
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<td>Zdárské vrchy Protected Landscape</td>
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<td>Krkonošský národní park/Krkonoše National Park</td>
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<td>Božídarské rašeliniště</td>
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<td>6.2</td>
<td>Broumovské stěný</td>
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<td>6.3</td>
<td>Malý a Velký Tisť</td>
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<td>6.4</td>
<td>Lednické rybníky</td>
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<td>Novozámecký rybník</td>
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<td>Prachovské skály</td>
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<td>Novodomské rašeliniště</td>
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</table>
CZECHOSLOVAKIA

NAME Kentonse National Park/Krkonošský národní park (Czech S.R.)

TYPE NP

LEGAL PROTECTION The landscape, together with geomorphological phenomena, rare plants and animals are specifically protected by an Act.

DATE ESTABLISHED 17 May 1963, by Act No. 41/63

GEOGRAPHICAL LOCATION On border with Poland, 100 km north-east of Prague: N 50°36'-50°49'; E 15°22'-15°55'

ALTITUDE 528-1603 metres

AREA 38,000 ha

LAND TENURE National ownership

PHYSICAL FEATURES Part of the Bohemian Mountains, geologically composed of igneous rocks of Paleozoic age (granites and schists), which have been subjected to folding in Caledonian and Hercynian times and subsequently glaciated, resulting in rounded landforms and, in particular, much evidence of Pleistocene glaciation. Some basalt outcrops also occur. There are numerous peat bogs in upland areas. The climate is cool to cold montane, with 1400-1600 mm annual precipitation.

VEGETATION Most of the area is forested with Norway spruce Picea abies, but there are local remnants of mixed woods of beech Fagus sylvatica, maple Acer spp. and rowan Sorbus aucuparia. Above the upper limits of forest patches of mountain pine Pinus mugo and swards of mat grass Nardus stricta occur. The mountain flora is of great interest with many relict and endemic species, including Sudeten sedge Carex sudetica, Compania concinna, downy willow Salix lanata, alpine hawkweed and orange hawkweed Hieracium alpinum and aurantiacum, Saxifraga nivalis, S. oppositifolia, Cryptogramma crispa, Crocus albidiflorus, Pulsatilla vernalis, Anemone narcissiflora, willow gentian Gentiana aculeptis, least primrose Primula minima, Daphne mezereum, Lilium martagon, orange lily L. bulbiferum, blue sow-thistle Mulgedium (= Cicerbita) alpinum and common monkshood Aconitum napellus.

NOTEWORTHY FAUNA Once again, many relict and endemic species, including alpine shrew Sorex alpinus, bats such as big brown bat Eptesicus nilssonii, mouse-eared bat Myotis dasycneme and parti-coloured bat Vespadelio murinus. Birds of note include the merlin Falco columbarius, dotterel Charadrius morinellus, rock thrush Monticola saxatilis, ring ouzel Turdus torquatus and redpoll Acanthis flammia.

ZONING The Park includes 10 Nature Reserves, under strict protection, and two reserves with lesser protective status.

DISTURBANCES OR DEFICIENCIES Forestry and agriculture are not restricted, except within Nature Reserves. Intensive tourist use occurs throughout the year.

TOURISM Includes winter sports and summer recreation. Many hotels are available as well as hostels run by various organizations.

SCIENTIFIC RESEARCH University Institutes and the Academy of Sciences both undertake work in the area on geomorphology, botany, zoology, forestry and climatology.
SPECIAL SCIENTIFIC FACILITIES  Not available to date.

PRINCIPAL REFERENCE MATERIAL  Not listed but numerous studies of the area have been published in scientific journals.

STAFF  50 officers and 40 guards

BUDGET  About U.S. $ 862,000 (Kcs 5 million)

LOCAL PARK ADMINISTRATION  Správa Krkonošského národního parku, Vrchlabí.
CZECHOSLOVAKIA

NAME Adršpašsko-Teplické skalý Reserve (Czech S.R.)

TYPE NR BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Total

DATE ESTABLISHED 31 December 1933 by Decree No. 143.547/33

GEOGRAPHICAL LOCATION About 60 km north of Pardubice, near Polish border: N 50°36'; E 16°08'

ALTITUDE 500-785 metres

AREA 1772 ha

LAND TENURE National ownership

PHYSICAL FEATURES An area of cretaceous sandstones of lower and middle Turonian age, forming a morphologically complex series of rocky pinnacles and mounds of typical "rock city" form. Drainage is deeply incised. Climatically of a fairly mild continental type with a mean annual temperature of around 8°C and 650 mm precipitation.

VEGETATION Most of the area is covered by secondary monocultures of pine Pinus sylvestris and spruce Picea abies. Remnants of natural Pinus forests survive on small rock plateaus and likewise of natural mixed forest, including stands of beech Fagus sylvatica and sycamore Acer pseudoplatanus, in damp, deeply cleft valleys. The bare rocky areas support only a scatter of lichens and mosses.

NOTEWORTHY FAUNA No information

ZONING None: entirely strict nature reserve.

DISTURBANCES OR DEFICIENCIES There were large quarries in the immediate vicinity of the Reserve for the mining of sands used in the optical industry, but these were scheduled for closure in 1973.

TOURISM A number of marked trails through the area have been established.

SCIENTIFIC RESEARCH No special programmes

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF No information

BUDGET No information

LOCAL PARK ADMINISTRATION Krajské středisko památkové péče a ochrany přírody, Pardubice.

WDNP IUCN C 1977 (L)F Code: CZE.5.1
NAME Stara Reka Reserve (Czech S.R.)

TYPE NR

BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Total

DATE ESTABLISHED 5 March 1956, by Decree No. 1604/56

GEOGRAPHICAL LOCATION Between Třeboň and the Austrian border, 25 km east of České Budějovice, C.S.R.: N 49°00'; E 14°51'

ALTITUDE 435 metres

AREA 1200 ha

LAND TENURE National ownership

PHYSICAL FEATURES Section of a large tributary of the Lužnice River, with many channels and pools. The surrounding area is a tectonic basin with Mesozoic sediments. There are a number of large man-made fishponds, some of considerable antiquity and some of which are linked by the so-called Golden Canal (Zlata stoka). Climatically of a continental type with a mean annual temperature of 6°-7°C and 600-650 mm annual precipitation.

VEGETATION Riverine woodlands with willow Salix spp., alder Alnus glutinosa, beech Fagus sylvatica, maple Acer platanoides, sycamore Acer pseudoplatanus and some very fine oak trees Quercus robur. There are considerable stands of reed Phragmites communis and other emergent macrophytes and, in standing waters, yellow and white water-lilies Nuphar luteum and Nymphaea alba are widespread. The water chestnut Trapa natans occurs locally.

NOTEWORTHY FAUNA A former habitat of the European beaver Castor fiber, but the most notable mammal is now the otter Lutra lutra.

ZONING None: entirely strict nature reserve.

DISTURBANCES OR DEFICIENCIES None reported

TOURISM Camping and fires are prohibited within the Reserve but day visitors are allowed and mostly come for picknicking and bathing.

SCIENTIFIC RESEARCH Réintroduction of the beaver is under consideration. The Botanical Institute at Třeboň has undertaken considerable research on the aquatic environments.

SPECIAL SCIENTIFIC FACILITIES No facilities exist on site but a field station of the Institute of Botany has been established at Lomnice u Lužnice. Full laboratory facilities are available at Třeboň.

PRINCIPAL REFERENCE MATERIAL None listed

STAFF No information

BUDGET No information

LOCAL PARK ADMINISTRATION Krajské štredisko památkové péče a ochrany přírody, České Budějovice.

WDNP IUCN © 1977 (1)F Code: CZE.5.2
NAME Malý a Velký Tisý Reserve (Czech S.R.)

TYPE NR BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Total

DATE ESTABLISHED 17 June 1957, by Decree No. 18.829/56

GEOGRAPHICAL LOCATION In the same region as Stará Štuka Reserve (5.2), but to the north of České Budějovice and Třeboň: N 49°03'; E 14°44'

ALTITUDE 428 metres

AREA 616 ha

LAND TENURE National ownership

PHYSICAL FEATURES A system of several man-made fish ponds, constructed about 500 years ago and so of considerable historical interest: maximum depth of 4 m. The ponds have a number of bays, peninsulas and islands. The surrounding area is a tectonic basin of Mesozoic sediments with many man-made ponds, linked by the Zlatá stoka (Golden canal) and lying in the valley of the River Lužnice. 

Climatically of a mild continental type with a mean annual temperature of around 7°C with 650 mm annual precipitation.

VEGETATION The ponds have a typical wetland flora: some notable species are the bog orchid Orchis palustris, the water-lilies Nymphaea alba and Nuphar luteum, and the introduced bog arum Calla palustris. Emergent macrophytes, such as reed Phragmites communis, are an important feature. Surrounding woodlands are mainly alder Alnus glutinosa and Salix spp. with an admixture of riverine oak forest of Quercus robur and some small-leaved lime Tilia cordata.

NOTEWORTHY FAUNA The Reserve is important for waterfowl and altogether some 95 birds have been recorded as breeding species. They include grebes Podiceps spp., grey heron Ardea cinerea, purple heron A. purpurea, great white egret Egretta alba, night heron Nycticorax nycticorax, bittern Botaurus stellaris, many ducks Anas spp., crakes Porzana spp., plovers Charadrius spp., black-tailed godwit Limosa limosa, redshank Tringa totanus, gulls Larus spp., black tern Chlidonias niger, common tern Sterna hirundo, Savi's warbler Locustella luscinioides, reed warblers Acrocephalus spp. and buntings Emberiza spp. The fish and invertebrate faunas are also of great interest.

ZONING None: entirely strict nature reserve

DISTURBANCES OR DEFICIENCIES None reported, but eutrophication is believed to be a problem.

TOURISM None

SCIENTIFIC RESEARCH The site is recognized as a wetland of international importance both for its limological ("Project AQUA") and ornithological ("Project MAR") values. Some plankton sampling has been carried out but no major limological research; most of the studies so far undertaken under the sponsorship of such bodies as the National Museum, Prague, the Czechoslovak Ornithological Society and various Institutes of the Czechoslovak Academy of Sciences, have been concerned with entomology, ornithology and botany.
SPECIAL SCIENTIFIC FACILITIES Ornithological field station; also a field station of the Institute of Botany nearby at Lomnice u Lužnice; and laboratories of the Institutes of Botany and Hydrobiology at Ústí nad Labem.

PRINCIPAL REFERENCE MATERIAL Scientific papers mainly concerning the plankton fauna, on Coleoptera, Heteroptera and other invertebrates, and on the birdlife, have been published by the Institute of Chemical Technology in Prague and in such journals as Ochrana Prírody, Praha.

STAFF No information

BUDGET No information

LOCAL PARK ADMINISTRATION Krajské středisko památkové péče a ochrany přírody, České Budějovice
NAME Lednické rybníky Reserve (Czech S.R.)

TYPE NR BIOTIC PROVINCE 2.8.3/2.10.1

LEGAL PROTECTION Total

DATE ESTABLISHED 9 January 1953 by Decree No. 49004/53

GEOGRAPHICAL LOCATION Extreme south-eastern corner of Czech S.R., just to the west of Beclav: N 48°47'; E 16°46'

ALTITUDE 165-180 metres

AREA 553 ha

LAND TENURE National ownership

PHYSICAL FEATURES A group of four man-made fishponds averaging 3 m in depth, at Ladnice castle. The ponds are named Mlynsky, Prostredni, Hlohovecky and Nesyt, the last-mentioned the largest (322 ha) and also the oldest having been constructed in 1500; the Reserve also includes adjacent meadows and woods and part of the park surrounding the castle. The ponds lie in what was an old bed of the river Dyje, now a tributary, in an area of upper Tertiary sediments; some chalk outcrops are also present. The park surrounding the castle was laid out in the 18th century and has some rare trees and shrubs and a 'hunting lodge' and other monuments of interest. Mild climate with 8°C-9°C mean temperature, 550 mm annual precipitation.

VEGETATION The ponds are surrounded by impressive stands of reed Phragmites communis, cat’s-tails Typha sp. and yellow flag Iris pseudacorus. Open water has yellow and white water-lilies Nuphar luteum and Nymphaea alba, and water chestnut Trapa natans. The ponds are bordered by periodically flooded forest and woodland of alder Alnus glutinosa, willows Salix spp. and oak Quercus robur. Some surviving areas of salt marsh support Salicornia herbacea, brook weed Samolus valerandii and sea spurrey Spergularia marina and S. media.

NOTEWORTHY FAUNA Numerous wetland birds and altogether 130 breeding bird species, among them grebes Podiceps spp., comorant Phalacrocorax carbo, grey heron Ardea cinerea, purple heron A. purpurea, great white egret Egretta alba, night heron Nycticorax nycticorax, bittern Botaurus stellaris (a heronry is situated on an island in one of the lakes), black stork Ciconia nigra, mute swan Cygnus olor, greylag goose Anser anser, ducks such as shoveler Anas clypeata and red-crested pochard Netta rufina, kites Milvus spp., sandpipers Tringa spp., avocet Recurvirostra avosetta, gulls Larus spp., Savin’s warbler Locustella luscinioides, nightingale Luscinia megarhynchos, bearded tit Parus biarmicus and penduline tit Remiz pendulinus.

ZONING Under strict nature reserve status, except for one pond partly open to the public for swimming.

DISTURBANCES OR DEFICIENCIES None reported

TOURISM Some parts of the Reserve, including the park and some dykes, are open to the public along specified paths.
SCIENTIFIC RESEARCH  In Project MAR ranked as one of the most important ornithological reserves; studies have been mainly sponsored by the Moravian Museum at Brno and the Academy of Sciences. The pond complex was also ranked as of international importance by Project AQUA and a large number of biological studies within the International Biological Programme were carried out on Nesyt Pond, in particular, and directed to primary productivity and hydrobiological problems, amongst others.

SPECIAL SCIENTIFIC FACILITIES  The Institute of Botany, Academy of Sciences, Brno, maintains a field laboratory in the hunting lodge by Nesyt. There is also an ornithological field station.

PRINCIPAL REFERENCE MATERIAL  Thirteen important scientific papers, mainly relating to botany and hydrobiology, were listed in IBP Handbook No. 21 (1971) on Project Aqua. A general account of the reserve is -


An additional reference work of importance is -


STAFF  No information

BUDGET  No information

LOCAL PARK ADMINISTRATION  Krajské středisko památkové péče a ochrany přírody, Brno.
CZECOSLOVAKIA

NAME Novozámecký rybník Reserve (Czech S.R.)

TYPE NR BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Total

DATE ESTABLISHED 31 December 1933, by Decree No. 143.547/33

GEOGRAPHICAL LOCATION Near Česka Lipa about 45 km due north of Prague: N 50°38'; E 14°34'

ALTITUDE 250 metres

AREA 350 ha

LAND TENURE National ownership

PHYSICAL FEATURES One of the earliest man-made fishponds, dating from the 13th century, situated in the valley of a tributary of the R. Ploučnice and having a total length of around 3 km. The vegetation succession is well advanced, resulting in shallow water with a mean depth of 1.5 m, though the maximum is 5 m. Climatically a region of mild winters and a mean annual temperature of around 7°C, with 600-650 mm annual precipitation. Many Cretaceous sediments in the area bordering the pond.

VEGETATION Most of the pond supports a dense growth of reed Phragmites communis and even the more open water areas are covered by water-lilies Nymphaea alba and Nuphar luteum. The littoral zone with its ever progressing growth of macrophytes is of particular importance for waterfowl and, encircling this, there are riverine woodlands of alder Alnus glutinosa and willow Salix sp.

NOTEWORTHY FAUNA The otter Lutra lutra is present but rare. About 100 species of breeding bird have been recorded, including grebes Podiceps spp., grey heron Ardea cinerea, greylag goose Anser anser, ducks Anas spp., red kite Milvus milvus, Montagu’s harrier Circus pygargus, osprey Pandion haliaetus, little crake Porzana parva, kingfisher Alcedo atthis, bearded tit Panurus biarmicus and penduline tit Remiz pendulina.

ZONING None: entirely strict nature reserve

DISTURBANCES OR DEFICIENCIES None reported, but eutrophication and expansion of macrophytes are known to be problems.

TOURISM The public has access to the area on paths along the dyke and the northern margins of the Reserve.

SCIENTIFIC RESEARCH A number of hydrobiological studies have been completed in the area. The site is listed as a wetland of international importance by both Project MAR and Project AQUA.

SPECIAL SCIENTIFIC FACILITIES None reported

STAFF  No information
BUDGET  No information
LOCAL PARK ADMINISTRATION  Krajské středisko památkové péče a ochrany přírody,
Ústí nad Labem
CZECHOSLOVAKIA

NAME Soos Reserve (Czech S.R.)

TYPE

NR

BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Total

DATE ESTABLISHED 7 November 1964 by Decree No. 45.160/64

GEOGRAPHICAL LOCATION In the extreme west of the country, between Plzeň and Mariánské Lázně: N 50°09'; E 12°23'

ALTITUDE 420 metres

AREA 221 ha

LAND TENURE National ownership

PHYSICAL FEATURES The Reserve is a base rich peat bog, or fen, developed in the bed of a former lake which was fed by run-off and by mineral springs. Layers of diatomaceous shales are present, broken in places by sulphur springs and also by carbon dioxide emissions which form small mud craters. Two of the largest hot mineral springs are used for medical treatment. Climatically a region with fairly mild conditions, but of a continental type. Mean annual temperature around 6°C, annual precipitation 600-650 mm.

VEGETATION The peat bog has typical vegetation comprising moss Sphagnum spp. and sedge Carex spp., together with cotton grass Eriophorum spp., cranberry Vaccinium oxycoccos and sundew Drosera rotundifolia. The diatomaceous horizon has a typical salt marsh flora, including mud rush Juncus gerardii, sea milk-wort Glaux marítiima, bulrush Scirpus tabernaemontani, strawberry clover Trifolium fragiferum and dandelion Taraxacum bessarabicum.

NOTEWORTHY FAUNA No information

ZONING None: entirely strict nature reserve

DISTURBANCES OR DEFICIENCIES None reported

TOURISM Day visitors are frequent and a Nature Trail has been provided.

SCIENTIFIC RESEARCH No special programme has yet been undertaken.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL None listed

STAFF One warden

BUDGET No information

LOCAL PARK ADMINISTRATION Krajské středisko památkové péče a ochrany přírody, Plzeň
DENMARK

AREA  44,030 sq. km; Faroes 1,399 sq. km; Greenland 2,175,590 sq. km

POPULATION  5,054,900 (1975 estimate); Faroes 38,000; Greenland 49,000

PARKS AND RESERVES LEGISLATION  The Executive Order of the Danish Ministry for Greenland dated 25 June 1976, under which the Greenland National Park was established, was made under an Act No. 266 of 25 May 1974, entitled The Conservation (Nature and Ancient Relics) Act for Greenland.

PARKS AND RESERVES ADMINISTRATION  The Executive Order referred to in the previous section has provisions covering the aims and objects of the Greenland National Park, regulations governing public access and conduct, regulations for the protection of fresh-water resources and regulations for safeguarding archaeological sites and discoveries. All these provisions are vested in and administered by the Ministry for Greenland in cooperation with a comprehensive Nature Conservation Council for Greenland.


TOTAL AREA UNDER PROTECTION  700,093 sq. km as listed below

<table>
<thead>
<tr>
<th>PROTECTED AREAS</th>
<th>ANSC</th>
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</thead>
<tbody>
<tr>
<td>1.1 Greenland National Park</td>
<td>70,000,000 ha</td>
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<tr>
<td>4.1 Vejlerne Nature Reserve</td>
<td>6,000 ha</td>
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<td>5.1 Hansted Nature Reserve</td>
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<td>7.1 Klaegbanken Nature Reserve (island)</td>
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<td>7.2 Hesselø Nature Reserve (island)</td>
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<td>7.3 Vorsø Nature Reserve (island)</td>
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<td>7.4 Hirsholmene Nature Reserves (islands)</td>
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<td>7.6 Aegholm Nature Reserve (island)</td>
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<td>7.7 Knotterne v/Laesø Nature Reserve (island)</td>
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</table>
NAME  Greenland National Park

TYPE  NP  BIOTIC PROVINCE  1.1.3

LEGAL PROTECTION  Total

DATE ESTABLISHED  22 May 1974, by Decree No. 266

GEOGRAPHICAL LOCATION  North-eastern Greenland, including land and inland ice from Petermann Glacier in the north-west to Kong Oscar Fjord in the south-east: N 71°-83°; W 11°39'-63°

ALTITUDE  Sea level to 2940 metres (Petermann Bjerg)

AREA  70,000,000 ha

LAND TENURE  Government ownership

PHYSICAL FEATURES  High arctic landscape, the interior covered by an icecap. The coasts have islands, peninsulas and deep fjords which are blocked for a major part of the year by sea ice. In summer, grassy hills extend inland from the coast. Higher mountain ridges divide the glaciers originating in the icecap. The sea and land are frozen for 8 months each year. The average temperature of the warmest summer month ranges from 2.8°C in the north to 6°C in the south. Winter temperatures may fall to between -40°C and -50°C. The annual average temperature varies between -9.8°C and -16.7°C and precipitation between 100 mm and 600 mm.

VEGETATION  Parts of the area have relatively luxuriant tundra and high mountain vegetation, which form a low scrub of willow Salix arctica, dwarf birch Betula nana, crowberry Empetrum, bilberry Vaccinium, mountain avens Dryas and Cassiope inter-mixed with high arctic grasses, sedges and other plants. The season of vegetative growth is very short.

NOTEWORTHY FAUNA  Mammals include the arctic hare Lepus arcticus, collared lemming Dicrostonyx groenlandicus, white whale Delphinapterus leucas, narwhal Monodon monoceros, arctic fox Alopex lagopus, a population of around 200-500 polar bear Ursus maritimus (rated as a 'vulnerable' species by the Red Data Book), stoat Mustela erminea, walrus Odobenus rosmarus, ringed seal Pusa hispida (along all coasts), harp seal Pagophilus groenlandicus (in southern fjords), bearded seal Erignathus barbatus (less common), hooded seal Cystophora cristata and one of the last remaining good-sized populations of musk ox Ovibos moschatus, numbering between six and twelve thousand. The polar bear and walrus populations are also of considerable conservation significance. The reindeer Rangifer tarandus has been extinct in the area since around 1900 and wolf Canis lupus since 1934. Of the many bird species, pink-footed goose Anser brachyrhynchus, brent goose Branta bernicla, barnacle goose B. leucopsis, gyrfalcon Falco rusticolus, ptarmigan Lagopus mutus, sanderling Calidris alba, knot C. canutus and snowy owl Nyctea scandiaca are of special interest.

ZONING  None

DISTURBANCES OR DEFICIENCIES  No human settlement apart from an airfield at Mestersvig, coastal weather stations at Mestersvig, Danmarkshavn and Station Nord, and the 'Sirius' police sledge patrol headquarters at Daneborg.
TOURISM  No facilities at present, but in future provision will be made for tourist visits to places of special biological and archaeological interest. The archaeological sites are widespread and span a period of nearly 5000 years, from 3000 B.C. to 1822 A.D.

SCIENTIFIC RESEARCH  Excellent field research opportunities exist, especially for plant and animal productivity studies. In the past the work of the Greenland Geological Survey has been of particular importance, as is the still continuing investigation of polar bear population dynamics.

SPECIAL SCIENTIFIC FACILITIES  None

PRINCIPAL REFERENCE MATERIAL  Numerous articles in journals especially the Meddelelser om Grønland.

STAFF  None at present, although the Sirius dogsledge patrols maintained by the Danish Government and with aviation backing, in effect provides supervision of the area.

BUDGET  None at present.

LOCAL PARK ADMINISTRATION  None at present.
ECUADOR

AREA  593,107 sq. km

POPULATION  7,000,000 (1973 estimate)

PARKS AND RESERVES LEGISLATION  The basis for conservation of fauna is found in "Ley de protección de la fauna silvestre y de las recursos ictiológicos" of 17 November 1970. This contains a chapter outlining sanctions and procedures in cases of violations of the law and other criminal acts. Those reporting illegal activities to the authorities receive 50 per cent of any eventual fine. National park legislation is under revision.

PARKS AND RESERVES ADMINISTRATION  The ultimate authority for management of territory within national parks lies with the Department of National Parks and Wildlife, Dirección General de Desarrollo Forestal.

ADDRESS  Departamento de Parques Nacionales y Vida Silvestre, Dirección General de Desarrollo Forestal, Ministerio de Agricultura y Ganadería, Quito, Ecuador.

TOTAL AREA UNDER PROTECTION  691,200 ha

PROTECTED AREAS

| 1.1 Galapagos National Park | 691,200 ha |
ECUADOR

NAME Galápagos National Park

TYPE NP

LEGAL PROTECTION Total

DATE ESTABLISHED 14 May 1936, by Executive Decree but not ratified until 1959

GEOGRAPHICAL LOCATION Archipelago, about 1000 km off the coast of Ecuador: N 1°50'-S 1°30'; W 89°20'-91°50' (approximately)

ALTITUDE Sea level to 1707 metres

AREA 691,200 ha (out of a total land area of 788,300 ha)

LAND TENURE Both Government owned and privately owned land

PHYSICAL FEATURES The archipelago consists of 13 major islands and 19 smaller islets together with numerous exposed rocks all, except for the northernmost islands of Darwin and Wolf, rising from a submarine platform. The six oldest are formed from uplifted submarine lava with a low, flat or tilted topography and abrupt seacliffs. Some sedimentary limestones and sandstones are interbedded with the lavas. The majority of the islands are younger gently-sloping shield volcanoes culminating in craters or collapse calderas with summits studded with smaller parasitic cones flanked by lava flows. Some shorelines are little eroded but others have steep cliffs and beaches of lava, coral or shell sand. Crater lakes, fumaroles and lava tubes are among the other volcanic features. Temperatures in the dry cooler season (May-December) average 17°C-22°C and in the hot rainy season (January-April) 22°C-37°C. Rainfall varies with altitude from about 360 mm at sea level to about 1090 mm at 200 metres.

VEGETATION Flora comprises about 625 native species and sub-species, of which 36 per cent are endemic as a result of isolation and divergence, and about 250 introduced species. They include a high proportion of ferns, Gramineae and Compositae derived from the American mainland. The littoral zone is dominated by mangroves, including Rhizophora mangle, Avicennia germinana and Laguncularia racemosa, with an admixture of Conocarpus erectus and Sesuvium spp.. The dry zone of the lower slopes features arborescent cacti, including Brachycereus, Jasminocereus thouarsii and Opuntia spp., together with Bursera graveolens and Croton scouleri. Above this the characteristic species of the humid zone are Scalesia spp., Psidium galapagenium and Pisonia floribunda, but also in some areas Hiconia robinsoniana, giving way at still higher altitudes to a fern and grass zone dominated by the fern Cyathea weatherbyana. Introductions include such invasive species as guava Psidium guajava, Citrus spp. and Lantana camara.

NOTEWORTHY FAUNA The unique endemic fauna consists mainly of invertebrates, reptiles and birds with no amphibians and few mammals. Terrestrial mammals are limited to rice rats Oryzomys and Nesoryzomys and hairy-tailed bats Lasiusus sp.; marine mammals include whales and dolphins, fur seal Arctocephalus australis and the sea lion Zalophus californianus. Birds include the Galápagos penguin Spheniscus mendiculus, waved albatross Diomedea irrorata, brown pelican Pelecanus occidentalis, frigate birds Fragrae magna, frigates magnificens and F. minor, blue-footed booby Sula nebouxii, flightless cormorant Nannopterum harisi, Galápagos hawk

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**Buteo galapagoensis**, Galápagos dove *Zenaida galapagoensis*, mockingbirds *Nesomimus* spp., vermillion flycatcher *Pyrocephalus rubinus*, yellow warbler *Dendroica petechia* and Darwin's finches *Geospiza* spp., *Cactospiza* spp. and other members of the sub-family Geospizinae. Reptiles include the giant tortoise *Testudo* (=*Geochelone*) *elephantopus* of which 11 different sub-species occurring on different islands are rated in the Red Data Book as endangered; marine iguana *Amblyrhynchus cristatus* (8 sub-species, placed in the 'rare' category though several are still numerous), land iguana *Conolophus pallidus* and *C. subcristatus* (rated as 'rare' and 'vulnerable' respectively) and lava lizards *Tropidurus* spp.. 289 fish species in 88 families occur, of which 23 per cent of the inshore species are endemic to Galápagos waters.

**ZONING** Recommended zones include: a) visitor zone; b) primitive zone; c) restricted zone (highest order protected area) and d) special zone which reconciles national park land use with other land uses.

**DISTURBANCES OR DEFICIENCIES** Introduced plant and animal species are a serious problem, as is uncontrolled tourism.

**TOURISM** Organized tourism began in 1968 and visitation totalled 6000 in 1972. Access by air, limited hotel accommodation, tourist boats from Guayaquil and from the islands. Entrance fee, currently US$ 6, for foreigners.

**SCIENTIFIC RESEARCH** Over 80 scientific missions undertaken since 1964 when the Charles Darwin Station was established; many individual and government studies on aspects of island ecology.

**SPECIAL SCIENTIFIC FACILITIES** Charles Darwin Research Station established in Bahia Academy, 1964, under the auspices of UNESCO and IUCN. Facilities include laboratories, conference room, workshops, housing and transport facilities.

**PRINCIPAL REFERENCE MATERIAL** Many publications on individual aspects of Galápagos geology, flora and fauna but principal publications include:


**STAFF** Superintendent, 5 professionals, secretary and 15 park guards.

**BUDGET** No information

**LOCAL PARK ADMINISTRATION** Intendente, Parque Nacional Galápagos, c/o Departamento de Parques Nacionales y Vide Silvestre, Dirección General de Desarrollo Forestal, Ministerio de Agricultura y Ganadería, Quito, Ecuador.
ETHIOPIA

AREA  1,144,000 sq. km

POPULATION  28,000,000 (mid 1975 estimate)

PARKS AND RESERVES LEGISLATION  The present laws under which the National Parks are established are the Wildlife Conservation Regulations of 1972. These are currently under review. Both the Awash and Simien National Parks were gazetted before this legislation was passed and a revision of the Awash N.P. boundaries is proposed. A number of other protected areas need to be legally gazetted but are called National Parks. Wildlife and game sanctuaries are proposed in addition. The regulations of 1972 (Legal Notice No. 416 of 1972) prohibit all human activities within National Parks apart from those required for development or management.

PARKS AND RESERVES ADMINISTRATION  The Wildlife Conservation Organization is the government authority responsible for the establishment of National Parks. This organization, formerly the Department of Hunting, is under the Ministry of Agriculture and was established in 1968, being officially proclaimed an autonomous government body in 1970. Imperial Proclamations in 1972 and 1974 strengthened it further.

ADDRESS  The Wildlife Conservation Organization, P.O. Box 386, Addis Ababa, Ethiopia.

TOTAL AREA UNDER PROTECTION  88,500 ha (excluding areas not yet legally gazetted)

PROTECTED AREAS

   3.1  Awash National Park  72,000 ha
   4.1  Simien Mountains National Park  16,500 ha
**NAME**  Awash National Park  
**TYPE**  NP  
**BIOTIC PROVINCE**  4.8.1/4.11.6  

**LEGAL PROTECTION**  Revised boundary notification to be issued  
**DATE ESTABLISHED**  6 January 1969, notified by Order No. 54 of 1969 in the Negarit Gazeta  

**GEOGRAPHICAL LOCATION**  Shoa Province, near eastern margin of the Rift Valley overlooking the Danakil (Alledeghi) plains, 225 km due east of Addis Ababa: N 9°; E 40° approximately  

**ALTITUDE**  1200-1829 metres  
**AREA**  72,000 ha  
**LAND TENURE**  State owned  

**PHYSICAL FEATURES**  The area is at the foot of the Shoa escarpment of the Rift Valley where it opens up to form the Danakil plains. In the south-west corner of the park the volcanic cone of Mount Fantalle forms the highest point in the park and has erupted in recent years; other volcanic features include a hot mineral spring and pool near the northern boundary. The Awash River forms part of the southern boundary and below the Awash falls flows through an impressive gorge. The climate is moderately-hot and dry with low rainfall.  

**VEGETATION**  This varies from open grasslands with occasional small trees of Acacia tortilis, A. nilotica and Balanites aegyptiaca to thornbush dominated by Acacia senegal. A. nubica and Grewia spp. Remnants of gallery forest are present along the river and an extensive palm forest occurs near the hot springs in the north.  

**NOTEWORTHY FAUNA**  The hamadryas baboon Papio hamadryas and the anubis baboon Papio anubis are both found in the park and hybrids between them have been noted. It is possible that the African wild ass Equus asinus (classified as an 'endangered' species in the Red Data Book) occasionally wanders to the park but the only large surviving group is found in the lower Awash valley to the north. There are a few Grevy's zebra Equus grevyi, but greater kudu Tragelaphus strepsiceros and lesser kudu T. imberbis are relatively common and Defassa waterbuck Kobus defassa and beisa oryx Oryx beisa occur in large numbers; other herbivores include Swayne's hartebeest Alcelaphus buselaphus swaynei (classified as 'endangered' sub-species) and Soemmering's gazelle Gazella soemmeringi. The population of Swayne's hartebeest was translocated to this area by the Ethiopian Wildlife Organization in 1974.  

**ZONING**  No information  

**DISTURBANCES OR DEFICIENCIES**  Seasonal grazing by cattle of nomadic tribes. Several watering places constructed in the park attract nomads but plans exist for their resettlement. The main road from Addis Ababa to Dire Dawa passes through the park, also the Addis Ababa-Djibouti railway.  

**TOURISM**  Road, rail and air (the park has an airstrip) give easy access to the park; Awash railway station is near the eastern boundary. Camping sites for visitors include air-conditioned trailers at Karayu Lodge overlooking the Awash Gorge and a site upstream of the falls near the park headquarters. There are plans for hotels near the Gorge and at the hot springs.  

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Code: ETH.3.1
SCIENTIFIC RESEARCH The social organization of the Hamadryas baboon has been studied and avifaunal surveys have been made. A work plan has been prepared with conservation management objectives.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

STAFF Park warden, assistant warden and a number of game guards, linked by radio to the headquarters of the Wildlife Conservation Organization in Addis Ababa

BUDGET Total budget for 1975-1976 Eth. $ 162,052 (Eth. $ 75,000 capital expenditure, Eth. $ 87,052 recurrent). Eth. $ 2.50 = approximately U.S. $ 1.00.

LOCAL PARK ADMINISTRATION No details available
ETHIOPIA

NAME Simien Mountains National Park

TYPE NP

BIOTIC PROVINCE 4.8.1

LEGAL PROTECTION Prohibition of shooting, fires, tree and grass cutting etc.


GEORGRAPHICAL LOCATION Bergender Province, western Simien mountains, 120 km north-east of Gondar: N 13°; E 38° (approx.)

ALTITUDE 2400-4550 metres (Ras Dashan, highest point in Ethiopia)

AREA 16,500 ha

LAND TENURE Both state and private (clan) ownership

PHYSICAL FEATURES Part of the Simien massif, a broad undulating plateau with vast grassy plains. Erosion of the rocks, which are of volcanic origin, has resulted in precipitous cliffs and deep gorges. The deeply incised valley of the Takanzee river and its tributaries surround the massif, except on the west and the Mayshaha river bisects it from north to south. The dry season is from October to May broken by the short rains from February to March; the long rains fall from July to September. Dry winds occur during the day and frosts may occur at night.

VEGETATION Afro-alpine communities include the tree heaths Erica arborea, giant lobelia Rhynochopetalum montanum, St. John's wort Hypericum spp., yellow primrose Primula verticillata, everlasting Helichrysum spp., lady's mantle Alchemilla, thyme Thymus and nettle Urtica. Mosses of the family Grimmiaceae and lichens Usnea spp. are common

NOTEWORTHY FAUNA The hamadryas baboon Papio hamadryas and the endemic Gelada baboon Theropithecus gelada are present together with the colobus monkey Colobus abyssinicus. The Simien fox Canis (= Simenia) simensis (classified as 'endangered' in the Red Data Book) is a rarely seen endemic species; other carnivores include the serval cat Felis serval and leopard Panthera pardus (a 'vulnerable' species). Large herbivores include the bushbuck Tragelaphus scriptus, duiker Sylvicapra grimmia, klopperspringer Oreotragus oreotragus and the notable endemic Wallia ibex Capra ibex wallia, a very distinctive and highly endangered subspecies, whose total population was estimated as around 150 animals in 1968/69 but has since been reported as slightly more numerous. Birds include a large number of birds of prey, notably the lammergeyer Gypaetus barbatus and the augur buzzard Buteo rubofuscus, both of which are unusually common.

ZONING 2 zones have been named: I Zone for scenery and adventure; for climbing; II Zone for wildlife observation.

DISTURBANCES OR DEFICIENCIES The human impacts include cultivation, burning, and grazing by cattle owned by local tribesmen. Cattle numbers are high and cause changes in grass cover, prevention of tree regeneration and soil erosion. These disturbances will be eliminated. Pressure on the forest patches for timber and for fodder is still very persistent.
TOURISM Access from Debarik on the Gondar-Asmara road, via a 60 km bridle path leading up to the plateau. Small local hotels at Debarik have mules available. Geech in the heart of the park, 9 hrs from Debarik, has local accommodation for 8 and an additional lodge is proposed for Sankabar, also in the park, 5-6 hrs from Debarik. Nearest airport is at Gonder.

SCIENTIFIC RESEARCH Studies by visiting scientists of the Walia ibex and the Gelada baboon. Ecological studies relating to soil conservation have also been carried out.

SPECIAL SCIENTIFIC FACILITIES None except some accommodation for research workers.

PRINCIPAL REFERENCE MATERIAL

STAFF Game warden and assistant game guards linked by radio to the headquarters of the Wildlife Conservation Organization in Addis Ababa.

BUDGET Total of Eth. $ 1,746,599 for 1975-76 (Eth. $ 897,300 capital expenditure, Eth. $ 849,299 recurrent). Eth. $ 2.50 = approximately U.S. $ 1.00.

LOCAL PARK ADMINISTRATION Three main centres at Debarik, Geech and Sankabar; proposed headquarters at Michibi, near Sankabar.
FRANCE

AREA  543,996 sq. km (excluding overseas Departments and Dependencies)

POPULATION  52,590,000 (1975 estimate)

PARKS AND RESERVES LEGISLATION  Law No. 60.708 of 22 July 1960, applies to the protection of large areas, as yet unexploited by man, on account of their outstanding natural features; it also makes reserves already created available to the public. This availability is subject to visitors being made aware of natural problems. The law of 2 May 1950, refers to the protection of natural monuments as well as other sites of historic, scientific and aesthetic interest. The designation of nature reserves is included in law No. 57.740 of 1 July 1957, but law No. 67.1174 of 28 December 1967, is also relevant in that it concerns organizational procedures and legal penalties.

PARKS AND RESERVES ADMINISTRATION  The laws governing establishment of parks and reserves also control their administration. National Parks are established under Decree by the Council of State and this lays down Park regulations and administrative methods. Administrative councils appoint Directors and staff and such councils include representatives of local officials and scientists. Similar committees under the Departmental Prefect, an Association or a University or similar public institution govern Nature Reserves. Almost all financial support is provided by the Ministère de la Qualité de la Vie.


TOTAL AREA UNDER PROTECTION  301,486 ha

PROTECTED AREAS

3.1 Ecrins National Park and Nature Reserves  92,980 ha
3.2 Cevennes National Park  84,800 ha
3.3 Vanoise National Park  52,839 ha
3.4 Pyrénées Occidentales National Park  45,394 ha
4.1 Camargue Nature Reserve  13,117 ha
5.1 Aiguilles Rouges Nature Reserve  3,279 ha
5.2 Néouvielle Nature Reserve  2,313 ha
5.3 Grand Sassifere Nature Reserve  2,230 ha
5.4 Val d'Isère-Bonneval Nature Reserve  1,491 ha
6.1 Champagny-Tignes Nature Reserve  999 ha
6.2 Banc d'Arguin Nature Reserve  800 ha
6.3 Port-Cros National Park (land only)  694 ha
6.4 Cerbère-Banyuls Nature Reserve  350 ha
Ecrins National Park and Nature Reserves

**NAME**

**TYPE** NP

**LEGAL PROTECTION** Total, but traditional agricultural, pastoral and forestry activities continue under controls. Fishing permitted.

**DATE ESTABLISHED** 1973, under Decree No. 73-378 of 27 March

**GEOGRAPHICAL LOCATION** Eastern end of the Massif de Loisans, Dauphiné Alps, between Grenoble, Gap and Briançon: N 44°35'-45°03'; E 5°57'-6°35'

**ALTITUDE** 800-4103 metres, with around 9700 ha above 3000 metres

**AREA** Central zone: 91,800 ha, plus six nature reserves totalling 1180 ha which form part of a buffer zone of 178,600 ha.

**LAND TENURE** 24% state land, 73% of land owned by the communes and 3% private land.

**PHYSICAL FEATURES** A massif with a complete range of mountain landscapes including high pastures, lakes, torrents and cascades, deciduous and evergreen forests, areas of rocks, snow and glacial topography. Geologically part of the Pelvoux granite block with crystalline rocks on the north and black schists, flysch and marls on the south. The climate of the north-western sector is subject to oceanic influences, the south-eastern to Mediterranean influences. Some 12,100 ha are occupied by glaciers.

**VEGETATION** Forest types range from white oak Quercus pubescens at low altitudes, through beech woods, beech/fir associations, larch and alder beds. Herbaceous plants range from the xerophytic plants of the lower slopes up to alpine pastures. The massif is relatively poor in endemic species but several species endemic to the western Alps occur, such as the uniqueComposite Berardia subacaulis, blue thistle Eryngium alpinum and the Mt. Cenis bellflower Campanula cenisa. Other plants of interest include Draecocephalum austricum, Eritrichium nanum, the fern Woodsia sp. (Aspidiaceae) and several threatened by collecting such as the orange and martagon lilies Lilium bulbiferum croceum and L. martagon, Aquilegia alpina and loose wormwood Artemisia laxa.

**NOTEWORTHY FAUNA** Mammals include a subspecies of variable hare Lepus timidus varronis, the alpine marmot Marmota marmota and the chamois Rupicapra rupicapra. Around 85-100 breeding bird species occur, nearly all those which are especially characteristic of the alpine biota. They include most European Corvidae and the golden eagle Aquila chrysaetos. Species present tend to have southern affinities. The massif is also very rich in lepidoptera.

**ZONING** The National Park area is strictly protected; in the nature reserves protection is limited to the flora and fauna; and the buffer zone is subject to special management and planning regulations.

**DISTURBANCES OR DEFICIENCIES** Considerable tourist pressure in some parts of the Park.

**TOURISM** Access is free and activities include general outdoor recreation such as fishing, climbing and spring and winter excursions. Marked paths and trails, mountain refuges and reception centres are among the facilities available.
SCIENTIFIC RESEARCH  This is directed by a scientific committee and includes inventory and mapping and other projects.

SPECIAL SCIENTIFIC FACILITIES  None

PRINCIPAL REFERENCE MATERIAL  Various scientific and popular publications are under preparation; current publications include cyclostyled notes produced by the Park service.

STAFF  Administrative staff include the Director, his assistant and 9 others; the field staff consists of 2 inspectors, 6 sector heads and 44 guards: total 63.

BUDGET  In 1975, this comprised NF 3.8 million for recurrent expenses and NF 4.3 million for equipment: total NF 8.1 million (approximately U.S. $1,620,000)

LOCAL PARK ADMINISTRATION  Parc national des Ecrins, 7 rue Colonel-Roux, 05000 Gap (Tel. (92) 51.11.45)
NAME: Cevennes National Park

TYPE: NP

BIOTIC PROVINCE: 2.4.4

LEGAL PROTECTION: Not yet complete: partial protection

DATE ESTABLISHED: 2 September 1970 under Decree No. 70.777

GEOGRAPHICAL LOCATION: South-eastern flank of the Massif Central, north and south of Florac, departments of Lozère and Gard: N 44°0'-29'; E 3°22'-56'

ALTITUDE: 430-1702 metres (summit of Mont Lozère); also includes Montagne de l'Aigoual 1567 metres and the Migne-du Bouges 1424 metres.

AREA: 84,800 ha in the central zone (of which 13,000 ha is classified as nature reserve), with a 237,000 ha buffer zone.

LAND TENURE: 30% State land, 7% Communal land, 62% private land and 1% owned by the Park authority.

PHYSICAL FEATURES: A group of calcareous plateaux, separated by the valleys of the Tarn and its various tributaries; the south-eastern slopes, facing the Mediterranean, are abrupt and on the north-west more gentle. Geologically, the area is composed of a variety of rocks, both igneous and sedimentary, and with equally varied geomorphological features, karstic, peatland, etc. Soils range from rankers, through limestone and peat to brown earths. Climatically the Park is in the transitional zone between the Mediterranean and more temperate regimes to the north.

VEGETATION: Below 500 m forests of evergreen oak Quercus ilex; 500-1000 m, forests of chestnut Castanea sativa, common oak Q. robur and durmast oak Q. petraea; from 1000-1500 m, a zone of beech Fagus sylvatica, Scots pine Pinus sylvestris and birch Betula; and above 1500 m, heaths and subalpine pastures. The flora is fairly rich with around 1700 flowering plants. Among the more widespread species are ling Calluna vulgaris, the broom Cytisus purgans, box Buxus sempervirens, bilberry Vaccinium myrtillus, mat-grass Nardus stricta and wavy hair-grass Deschampsia flexuosa. Rare, threatened or very localized species include Saxifraga prostrata, S. cebennensis, the rock cress Arabis cebennensis, lady's slipper orchid Cypripedium calceolus, Adonis vernalis, the soapwort Saponaria bellidifolia and Lilium martagon.

NOTEWORTHY FAUNA: The ordinary montane fauna is present although poor and residual. The beaver Castor fiber is still fairly abundant in the peripheral zone. The avifauna used to be renowned, especially in terms of raptors, which included the golden eagle Aquila chrysaetos, but has been decimated in the last twenty years, although not beyond hope of recovery if given adequate protection not only in the Park but also in the more highly populated areas bordering it.

ZONING: No information

DISTURBANCES OR DEFICIENCIES: The National Park area is inhabited and exploited for cattle-raising and sylviculture. Its management is further complicated by the roads which traverse and give easy access to all parts of the Park.

TOURISM: Exploited for touring, walking, riding and skiing, etc. Florac is only 115 km by a good road from Nimes, a major centre for tourism, and not much further from Avignon.
SCIENTIFIC RESEARCH  A scientific committee is responsible for the biological inventory of the Park, including vegetation mapping, as well as for the strict nature reserves. Multidisciplinary research on the interdependence of natural and economic systems is also in hand.

SPECIAL SCIENTIFIC FACILITIES  Accommodation is available for scientists.

PRINCIPAL REFERENCE MATERIAL

STAFF  2 inspectors, 7 sector heads and 19 guards: total 28

BUDGET  NF 3.4 million for running costs and NF 3.2 million for capital costs: total NF 6.6 million (U.S. $1,320,000 approx.)

LOCAL PARK ADMINISTRATION  Direction de l'Etablissement Public chargé du Parc national des Cevennes, 48400 Florac
**NAME**  
Vanoise National Park

**TYPE**  
NP

**BIOTIC PROVINCE**  
2.8.2

**LEGAL PROTECTION**  
Total protection of flora and fauna but traditional grazing, forestry and fishing continued under controls.

**DATE ESTABLISHED**  
6 July 1963, under Decree No. 63.651

**GEOGRAPHICAL LOCATION**  
Savoie Alps, north of Modane and adjoining the Gran Paradiso National Park along a 6 km section of the Italian frontier: N 45°12'-33; E 6°35'-7°10'

**ALTITUDE**  
1250-3852 metres (summit of the Pointe de la Grande Casse).

**AREA**  
52,839 ha (which does not include the three special nature reserves, listed as 5.3, 5.4 and 6.1); a further 143,637 ha form a peripheral or buffer zone.

**LAND TENURE**  
47,610 ha are communally owned, 5,218 ha private property and 11 ha state owned.

**PHYSICAL FEATURES**  
The Park comprises the greater part of the massif bounded by the upper parts of the valleys of the Isère and Arc rivers. The mean altitude is around 2000 m and the softer rocks have been eroded by quaternary glaciation. Geomorphological features include glaciers, névés, moraines and lakes. Geologically very complex with sedimentary rocks on the west and partially metamorphosed mica schists and granites on the south and south-east, merging to the north-east into the crystalline limestone of the Gran Paradiso. Relatively little rainfall due to a rain shadow effect.

**VEGETATION**  
Great floristic richness due to the variety of rock types, the altitudinal range and the geographical location. The lower mountain slopes have forests of Scots pine Pinus sylvestris and spruce Picea, with occasional fir Abies and rarely beech Fagus sylvatica. The subalpine zone has successional forest types according to altitude, spruce, larch Larix and arolla pine Pinus cembra, passing into shrubby heaths with Rhododendron, bilberry Vaccinium myrtillus and juniper Juniperus. The alpine zone has various types of grassland and above this a large variety of mosses. Flowering species of particular interest include Linnaea borealis, Dracoccephalum austriacum, alpine bells Cortusa matthioli, Primula pedemontana, together with Lilium bulbiferum croceum, L. martagon, Aquilegia alpina and Artemisia laxa.

**NOTEWORTHY FAUNA**  
Larger mammals include the varying hare Lepus timidus varronis, alpine marmot Marmota marmota and fox Vulpes vulpes, stoat Mustela erminea, chamois Rupicapra rupicapra and ibex Capra ibex (= hircus). Over 100 bird species include the golden eagle Aquila chrysaetos, ptarmigan Lagopus mutus, rock partridge Alectoris graeca and raven Corvus corax, with a good variety of small passerines on the lower slopes.

**ZONING**  
National park zone with strict protection, special reserves with protection limited to the flora and fauna and the buffer zone managed in such a way as to support Park requirements.

**DISTURBANCES OR DEFICIENCIES**  
Atmospheric pollution from industrial activities in nearby valleys; grazing by sheep is decreasing but lack of shepherds and less supervision causes excessive trampling of some areas; animal photography is causing increasing disturbance to wildlife.
TOURISM  Free access; 500 km of marked trails and 29 refuges.

SCIENTIFIC RESEARCH  Undertaken under the direction of a scientific committee.

SPECIAL SCIENTIFIC FACILITIES  These are available at the Chalet du Col de la Madeleine (Maurienne) and special accommodation is available in some of the mountain refuges.

PRINCIPAL REFERENCE MATERIAL
ANON.  Le Parc national de la Vanoise (3rd ed.) 180 pp.
Travaux scientifiques du Parc National (5 vols.)
3-monthly bulletin of the Association des Amis du Parc National de la Vanoise (available from the Director).

STAFF  Administrative staff includes director, assistant, inspector and 5 administrators; field staff includes 2 inspectors, 6 sector heads and 30 guards: total 46.

BUDGET  In 1975, this included NF 3 million for recurrent and 1.2 million for capital expenditure: total 4.2 million (U.S. $ 840,000 approx.)

LOCAL PARK ADMINISTRATION  Direction du Parc national de la Vanoise, 15 rue du Docteur Julliand, B.P. 105, 73003 Chambéry.
FRANCE

NAME  Pyrénées National Park

TYPE  NP

BIOTIC PROVINCE  2.8.4/2.4.4

LEGAL PROTECTION  Total but traditional grazing and sport fishing permitted.

DATE ESTABLISHED  23 March 1967, under Decree No. 67-265

GEOGRAPHICAL LOCATION  Adjoining the Spanish frontier south of Pau and Tarbes: N 42°40′-50′; W 0°12′-E C°-50′

ALTITUDE  1100-3298 metres (summit of Pic de Vignemale)

AREA  45,394 ha, plus the Néouvielle Nature Reserve (see FRA.5.2 below) and a buffer zone of 206,000 ha.

LAND TENURE  The entire Park is communally owned, as is the buffer zone, which belongs to no less than 30 Communes in Pyrénées-Atlantiques and 57 Communes in the Hautes-Pyrénées Departments.

PHYSICAL FEATURES  The Park area includes many famous sites from the Pic du Midi d'Ossau on the west to the Port de Marcadau, the Pic de Vignemale, the Cirque de Gavarnie and the Cirque de Troumouse near its eastern extremity. There are numerous glaciers and more than 100 lakes. Geologically the mountains were formed by the Alpine uplift which raised Tertiary calcareous sediments to heights of over 3000 m, subsequently to be worn down or dissected by glacial and other erosion. Climatically the area is under the influence of the Atlantic, being wet and cool in winter and spring, hot and sunny in summer and autumn.

VEGETATION  is remarkable for its diversity. Different altitudinal zones represented in the Park range from the zone dominated by oaks Quercus spp., occupying the lower slopes, through beech Fagus sylvaticus and fir Abies (sometimes with a mixture of Scots pine Pinus sylvestris), to the sub-alpine zone of birch Betula and mountain pine Pinus mugo. Higher still the summit areas are occupied by alpine pastures and permanent snow-fields. Among the endemic flowering species are a relative of the African violet (Gesneriaceae) Ramonda pyrenaica (= myconi), Aster pyreneum, the yellow turk's cap lily Lilium pyrenaicum and Saxifraga longifolia.

NOTEWORTHY FAUNA  The Park is a sanctuary for the special Pyrenean fauna. This includes the desman Galemys pyrenaicus (classified as 'rare' in the Red Data Book), brown bear Ursus arctos, lynx Felis lynx and Pyrenean chamois or isard Rupicapra rupicapra pyrenaica. The bear population is about 30 and that of the Isard 2,500. Birds of note include the Egyptian vulture Neophron percnopterus, griffon vulture Gyps fulvus, lammergeyer Gypaetus barbatus (rare in Europe) and golden eagle Aquila chrysaetos. Game birds include ptarmigan Lagopus mutus and a local race of the capercaillie Tetrao urogallus aquitanicus.

ZONING  None reported

DISTURBANCES OR DEFICIENCIES  Sport fishing allowed. Grazing by sheep is a traditional use and helps to maintain alpine pastures.
TOURISM Access is free and tourist information centres are located at the Park entrances. 250 km of trails and several mountain huts are available. Small nature museums at Arrens, Cauterets and Arudy. Walking, rock climbing and skiing are the most popular forms of recreation in the Park.

SCIENTIFIC RESEARCH Studies in botany, zoology, geology and hydro-biology controlled by a scientific committee. There is a laboratory at the Lac d'Orédon near the Néouvielle Reserve and a Centre for Mountain Ecology at Gabas.

SPECIAL SCIENTIFIC FACILITIES Studies undertaken by special licence, lodging facilities for scientists in the refuges.

PRINCIPAL REFERENCE MATERIAL
ANON. Le Parc National des Pyrénées, Tarbes: Centre Départemental de Documentation Pédagogique de Tarbes.

STAFF 36 guide-wardens and section chiefs

BUDGET NF 3.75 million for recurrent and about 2 million for capital expenditure such as the provision of mountain huts: total NF 5.75 million (U.S. $ 1,150,000 approx.)

LOCAL PARK ADMINISTRATION Etablissement Public National, Parc National des Pyrénées, 43 rue Larrey, B.P. 300, 65-Tarbes
FRANCE

NAME Camargue Zoological and Botanical Nature Reserve

TYPE NR

BIOTIC PROVINCE 2.5.1

LEGAL PROTECTION Totally protected

DATE ESTABLISHED 1928, confirmed by ministerial decree in 1956 and 1963, taken over by the state in 1975.

GEOGRAPHICAL LOCATION At mouth of the Rhône, on Mediterranean coast: N 43°26'-43°34'; E 4°29'-4°38'

ALTITUDE Sea level to 4 metres

AREA 13,117 ha

LAND TENURE In 1971, the Reserve and adjacent territories were purchased by the French Government, with the help of the World Wildlife Fund, from the former owner, the Compagnie des Salins du Midi. An adjacent 3,000 ha of land was bought several years before by the département (regional authority) and converted into a 'réserve cynégétique'. Altogether, over 16,000 ha are in public ownership, but the precise ownership and reserve status of the last-mentioned area still needs to be confirmed.

PHYSICAL FEATURES The Reserve is situated in the delta of the river Rhône, at the edge of the Mediterranean Sea, and comprises low-lying saltings, and brackish lagoons communicating with one another through shallow channels and dunes. Much of the area is covered with water. The climate is typically Mediterranean, with a warm and dry summer and a relatively warm winter. Snow is rare but freezing of parts of the lagoons over short periods is not unusual. An average rainfall of 500 mm/year, mostly in autumn but also in spring.

The concentration of marine salt in waters and soils increases from north to south and depends on many factors, especially on the permeability of the sediments and the level of the watertable in relation to topography: a diversified patchwork of vegetation is the result.

VEGETATION The vegetation is mostly stunted and composed of more or less halophytic species dominated by Salicornia spp. and Statice limonium (sea lavender); where the soil is less saline but still waterlogged, clumps of Tamarix gallica (tamarisk) grow; the drier, less saline soils are covered by the tall thick "maquis" of the Camargue, made up of a Phillyrea angustifolia association, semi-halophytic associations, tall herbs such as sea-rush and the couch grass Agropyron pycanthum and grassy swards. The most saline flats support Arthrocnemum (= Salicornia) macrorachya and the dunes an Agropyron junceum-Ammophila association while the very old dunes of what was once the sea-bank have particularly good stands of Juniperus phoenicea.

NOTEWORTHY FAUNA The area is a remarkable sanctuary for waterfowl breeding and a resting place for numbers of migratory birds. Some 323 different species have been recorded. It is the only regular breeding place in France for 8 or 9 species including greater flamingo Phoenicopterus ruber (5,000 pairs), squacco heron Ardea ralloides (100 pairs), cattle egret Ardea ibis (100 pairs), gull-billed tern Gelochelidon nilotica (250-300 pairs), pratincole Glareola pratincola (150-200 pairs). The other main species include among the ardeids: little egret
Egretta garzetta, black-crowned night heron Nycticorax nycticorax and purple heron Ardea purpurea. The bee-eater Merops apiaster, roller Coracias garrulus, lesser kestrel Falco naumanni and great spotted cuckoo Clamator glandarius have spread here from warmer regions. Ducks include shelduck Tadorna tadorna, mallard Anas platyrhynchos, gadwall A. strepera, garganey A. querquedula, red-crested pochard Netta rufina, and among the waders are found avocet Recurvirostra avosetta and black-winged stilt Himantopus himantopus.

ZONING The Reserve is a "managed nature reserve", and part of a vast protected area, the "Regional Park of Camargue", which has been under development for several years.

DISTURBANCES OR DEFICIENCIES The draining into the Reserve of some of the irrigation channels of the surrounding rice fields disturbs the ecology of the Camargue (salinity, water level and toxic chemicals used in agriculture). The Rhône also carries industrial pollutants into the Reserve. Increasing hunting pressure outside the Reserve is becoming a problem for some game species. Invasion, by campers and tourists, of the part of the Reserve situated along the littoral between the dyke and the sea.

TOURISM Entry is strictly controlled: only people having special reasons can obtain a permit. 706 visitors were accepted in 1970. The whole Camargue region with its wildfowl, the semi-wild cattle and horses, constitutes a main tourist amenity and attracts thousands of visitors.

SCIENTIFIC RESEARCH Several groups have undertaken research programmes in the Reserve including ORSTOM, Institut Pasteur, Faculty of Science of Marseille, Faculty of Science and Faculty of Medicine of Montpellier, and CNRS. These scientists are based in the "Station Biologique de la Tour du Valat", a privately run research station, and in the newly established "Centre écologique de Camargue", run by the Centre National de la Recherche Scientifique.

SPECIAL SCIENTIFIC FACILITIES Available in the last two centres mentioned above.

PRINCIPAL REFERENCE MATERIAL Biannual reports in "Actes de la Réserve de Camargue"; various scientific articles in "La Terre et la Vie".

STAFF 1 director, 5 permanent guards.

BUDGET NF 200,000 or about U.S. $40,000 per annum in 1973.

LOCAL PARK ADMINISTRATION Le Directeur, Réserve de Camargue, rue Honoré Nicolas, 13200 Arles.
NAME
Aiguilles Rouges Nature Reserve

TYPE

NR

Biotic Province

2.8.3

Legal Protection
Total protection of flora, fauna and landscape but construction of ski tongs (but not ski runs) can be legally permitted.

Date Established
Ministerial Decree of 23 August 1974

Geographical Location
Right bank of the Chamonix valley, French Alps: N 45° 55'; E 6° 50'

Altitude
1200-2966 metres

Area
3,279 ha

Land tenure
About 2122 ha belong to the Chamonix commune, 426 ha to that of Vallorcine, 593 ha to Chaserys and 138 to Remuaz.

Physical Features
A granitic and gneissic massif oriented NE-SW, with glacial topography of moraines, "roches moutonnées", lakes and glaciers. The highest point, the Aiguille du Belvedere, is of considerable geological importance as it has the only remains of the calcareous rocks that once covered all the Mont Blanc massif. It also commands a remarkable view of Mont Blanc. Rainfall from 1400-3000 mm per annum depending on altitude and much of it falling as snow; above 1500 m this lies for c.130 days a year though the mean annual temperature at Chamonix is 12.7°C.

Vegetation
Sub-alpine forests of larch and acid pastures of an alpine type, the plant associations differing greatly according to orientation. Relict plants include a number of clubmosses Lycopodium such as L. clavatum, L. inundatum, L. selago, L. alpinum and L. annotinum, the presence of these 5 species in one area being unique in Europe. Many snow hollows are colonized by willows and acid peatbogs dominated by Sphagnum moss and sundew Drosera have resulted from past glacial activities. Heath associations have Vaccinium, Calluna and Loiseeria. Rare or interesting plant species include the ferns Woodsia ilvensis and Hyperborea and Botrichium lunaria, ternatsum, simplex and matricariæ, the campanulæ Hopunius scorius and the pyramidal saxifrages Saxifraga coryledon. There are many rare lichens such as Haplocarpon melinodes, Pertusaria oculata and Lonzaspor origin.

Noteworthy Fauna
Mammals include the varying hare Lepus timidus, the alpine marmot Marmota marmota and the chamois Rupicapra rupicapra. The bird fauna is typical of high mountain regions and can still boast a few pairs of golden eagle Aquila chrysaetos and eagle owl Bubo bubo. An important migration route from the Col de Bretolet crosses the Reserve to outflank the Mont Blanc massif on the west.

Zoning
None

Disturbances or Deficiencies
The area may be impaired by construction of ski tongs (although ski run construction is not permitted). The Col des Montets (en route from Vallorcine to Chamonix) and the la Flégère to Lac Blanc path suffer from intense tourist pressure, causing damage to flora and fauna, during June to September. This is partly compensated for by educational activities at Col des Montets and future plans for similar activities at Lac Blanc.
TOURISM A trail for viewing Mont Blanc and an ecological trail at Col des Montets are among a few facilities which have been provided for tourists.

SCIENTIFIC RESEARCH Undertaken under the guidance of the Scientific Committee for the Reserve.

SPECIAL SCIENTIFIC FACILITIES Chalet-laboratory at Col des Montets (with information for the public and facilities for scientists).

PRINCIPAL REFERENCE MATERIAL

STAFF A guard is appointed to survey the area from the 1 June to 15 September and student volunteers are also active.

BUDGET Costs are met by the Communes of Chamonix and Vallorcine and by the Ministère de la Qualité de la Vie. The Association of friends of the Reserve contribute through subscriptions and sale of maps etc.

LOCAL PARK ADMINISTRATION Division de la Protection de la Nature, Direction Départementale de l'Agriculture de la Haute-Savoie.
NAME  Néouvielle Nature Reserve

TYPE  NR  BIOTIC PROVINCE  2.8.4

LEGAL PROTECTION  Hunting, dogs, destruction or removal of animals or plants, dumping of rubbish and overflying below 1000 m forbidden. Construction of roads etc. subject to general planning regulations; other exploitation for grazing, hydro-electricity, forestry and fishing subject to special regulations (Order of 8th May, 1968).

DATE ESTABLISHED  1935 (under lease to the Société Nationale d'Acclimatation), extended by a Ministerial Decree of 20 December 1951, which took in the Estibère valley, and properly established as a Natural Reserve in 1967.

GEOGRAPHICAL LOCATION  At the eastern end of Pyrenees National Park buffer zone; headwaters of the Neste d'Aure river, about 70 km by road due west of Bagnères de Luchon: N 42°50'-53'; E 0°06'-14'

ALTITUDE  1800-3092 metres (Pic de Néouvielle summit)

AREA  2,313 ha

LAND TENURE  The Reserve falls within the area of three communes, but only two of them hold proprietary rights.

PHYSICAL FEATURES  A granitic area subjected to quaternary glaciation, with flat-bottomed cirques, narrow ridges and a series of lakes, pools and bogs that are among the highest in the Pyrenees. There are two valleys opening out to the south to embrace several large lakes and some smaller lakes and bogs, respectively. The two valleys eventually join and continue through a narrow defile to the main valley of the Neste d'Aure. The climate of the Reserve is relatively dry and bright, and its biological interest derives from the fact that it is a meeting place of many different influences and from the presence of several relict species.

VEGETATION  1238 species of angiosperms, gymnosperms and pteridophytes have been recorded, together with 94 lichens. Vegetation zones include that dominated by Scots pine Pinus sylvestris and other pine species up to 2600 m and, at higher levels, heathland associations, and grasslands dominated by fescues Festuca spp. and thickets of Rhododendron. Various types of aquatic habitat, rich in species, are to be found along the valleys and, at the other extreme, the summit areas are characterized by rocks, glaciers and permanent snowfields.

NOTEWORTHY FAUNA  Species present include a variety of smaller mammals, the dama Cervus pyrenaicus (classified as 'rare' in the Red Data Books), otter Lutra lutra and about a dozen chamois or ibex Rupicapra rupicapra. Birds include capercaillie, ptarmigan and numerous passerines, among them many passage migrants. The midwife toad Alytes obstetricans occurs and has been found at altitudes up to 2400 m. The invertebrate microfauna is very rich in both wood-eating and aquatic forms.

ZONING  Most of the research has been concentrated along the Estibère, the easternmost of the two southward draining valleys, while the western valley, which contains the two large lakes of Aubert and Aumar, is used for management studies.
DISTURBANCES OR DEFICIENCIES The utilisation of lakes Aubert and Aumar for water supplies has lowered water levels. Construction of the "Route des Lacs" in 1972, has enabled large numbers of tourists to reach the formerly remote lake Aumar. The pine forests, as well as the plant cover on the moraines, are deteriorating.

TOURISM Camping is permitted and construction of sanitary facilities and a winter refuge for campgrounds is projected. The "Route des Lacs" is open for tourism. Permits to visit the Reserve are issued by the Prefect on recommendation of the Director of the National Park.

SCIENTIFIC RESEARCH Much research has been undertaken over the past 50 years, including hydrobiological and MAB Programme studies.

SPECIAL SCIENTIFIC FACILITIES The Orédon laboratory, situated at an altitude of 1850 m, belongs to the University of Toulouse and has been directed since 1959 by M. Angelier, who is based at the Vielle-Aure annexe, located at 800 m.


Articles in the Bulletin de la Société d'Histoire Naturelle de Toulouse, the Bulletin de la Société Botanique de France and Annales de Limnologie (the publication of the Orédon laboratory).

STAFF Since 1968, one sector head and 3 guards, who are also responsible for keeping an eye upon 2650 ha of neighbouring valleys in the National Park.

BUDGET Covered by that of the Pyrenees National Park (see FRA.3.4).

LOCAL PARK ADMINISTRATION No separate administration. Any local administrative services required are undertaken by the Préfet des Hautes Pyrénées or the Director of the National Park, 42 rue Larrey, B.P. 300, 65-Tarbes.
NAME Grande Sassière Nature Reserve

TYPE NR

Biotic Province 2.8.3

Legal Protection Total (i.e. the same as the Vanoise National Park), excluding work necessary for hydro-electric installations located in the Reserve.

Date Established By Ministerial order of 10 August 1973.

Geographical Location The first branching valley on the right bank of the R. Isère, about 12 km below its source: the Sassière valley runs up to the Italian frontier and is situated in the buffer zone of the Vanoise National Park: N 45°30'; E 7°01'.

Altitude 2280-3748 metres (summit of Aiguille de la Grande Sassière)

Area 2,230 ha

Land Tenure 2,145 ha belonging to the Commune of Tignes, 55 ha to Electricité de France, and 34 ha are privately owned.

Physical Features A very open valley in spite of its altitude. It has considerable geological unity, since both banks are composed of mica schists bordered on the south-east by green-veined marbles. Impressive alpine topography, especially the sheer 1300 m high rock-face of the Grand Sassière peak. The natural landscape of the valley remains attractive despite alterations brought about by a hydro-electric dam. The weather is typical of the high Alps, very changeable and with extremely heavy snowfalls in winter.

Vegetation Sub-alpine pastures, base-rich alpine pastures and unusual plant associations in peaty areas and where there are sheets of water, up to 2500 m. Rare species include milk vetches Astragalus sempervirens, A. leontinus and Oxytropis lapponica, the bellflower Campanula alpestris (= allionii), the sedges Carex bicolor, C. juncifolia and C. microlochium, the small alpine orchid Chamorchis alpina, Saxifraga disjunctoides and S. muscoidea, moor-grass Sesleria ovata, Tofieldia pusilla, Artemisia borealis and Androsace helvetica. Two groups of special interest are the flora of old torrent beds, adapted to a mobile substratum and periodic severe flooding, and glacial relics, of which examples are only very scattered in the Alps, such as those belonging to the acid bog Caricion bicoloris astrofuscae association.

Noteworthy Fauna Considerable numbers of ibex Capra hircus and chamois Rupicapra rupicapra are present.

Zoning None

Disturbances or Deficiencies The floristic richness was threatened by the presence of summer grazing by 2000 sheep up to 1971. The valley is officially designated as a military firing range although it has not been used for that purpose for more than 25 years.

Tourism Two paths lead into the Reserve and a refuge is planned.
SCIENTIFIC RESEARCH is undertaken under the direction of the Scientific Committee of the National Park.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

Volume 5 of the Travaux Scientifique du Parc National de la Vanoise, which includes a vegetation map.

STAFF The Reserve is under the surveillance of the National Park authorities of the Tignes-Val d'Isère sector (1 sector head and 4 guards).

BUDGET Included within the budget of the Vanoise National Park (see FRA.3.3)

LOCAL PARK ADMINISTRATION Préfecture de la Savoie, 73018 Chambéry and Parc National de la Vanoise, B.P. 105, 73003 Chambéry.
NAME  Val d'Isère-Bonneval Nature Reserve

TYPE  NR

Biotic Province  2.8.3

LEGAL PROTECTION  Flora and fauna protected, but construction of skiing facilities including tows and runs, is permissible.

DATE ESTABLISHED  by Ministerial order of 24 July 1963

GEOGRAPHICAL LOCATION  The north slope of the Col d'Iseran, more than half its boundary adjoining that of the Vanoise National Park (see FRA 3.3): N 45°23'; E 7°05'

ALTITUDE  2100-3426 metres (Pointe du Montet)

AREA  1,491 ha

LAND TENURE  Property of the communes of Val d'Isère and of Bonneval-sur-Arc.

PHYSICAL FEATURES  The south-east portion of the Reserve is the highest and includes a glacier with a gentle slope. This feeds the small Iseran river, which flows northwards through an extensive zone of mica schists to join the river Isere a few kilometres from its source. Summer rainfall and winter snow are fairly heavy, in contrast to the rest of the Vanoise massif. The difference is due to the influence of the more humid climate of northern Italy.

VEGETATION  includes the classic associations of alpine screes, carbonate moraines and base-rich pasturage. Species of particular local interest include the hawk's beard Crepis jubata and alpine bells Cortusa matthioli.

NOTEWORTHY FAUNA  Large mammals include chamois Rupicapra rupicapra and ibex Capra hircus.

ZONING  None

DISTURBANCES OR DEFICIENCIES  The use of bulldozers to prepare ski runs damages the vegetation cover and accelerates erosion. The Reserve nevertheless affords some protection for the migration route of ibex and chamois between the Vanoise and Gran Paradiso National Parks, despite the many ski-runs and ski-lifts which traverse it.

TOURISM  Very large numbers of tourists in winter. The Reserve is crossed by a marked trail from Val d'Isère to the Vanoise National Park due west of the Col d'Iseran.

SCIENTIFIC RESEARCH  This is undertaken under the guidance of the Scientific Committee of the National Park.

SPECIAL SCIENTIFIC FACILITIES  None

STAFF The Reserve is under the surveillance of the National Park authorities of the Vanoise sector of Tignes-Val d'Isère (1 sector head and 4 guards).

BUDGET Covered by that of the Vanoise National Park (see FRA.3.3).

LOCAL PARK ADMINISTRATION Préfecture de la Savoie, 73018 Chambéry and the Direction du Parc National de la Vanoise, 15 rue du Dr. Julliand, B.P. 105, 73003 Chambéry.
FRANCE

NAME Champagny-Tignes Nature Reserve

TYPE NR

BIOTIC PROVINCE 2.8.3

LEGAL PROTECTION Flora and fauna protected, but the construction of skiing facilities is permissible.

DATE ESTABLISHED Ministerial order of 24 July 1963

GEOGRAPHICAL LOCATION The southern slopes of the Dome de la Sache, Mont-Pourri massif, at the northern end of the Vanoise National Park, which the Reserve adjoins: N 45°20'; E 6°51'

ALTITUDE 2400-3600 metres

AREA 999 ha

LAND TENURE Property of the Tignes and Champagny-en-Vanoise communes.

PHYSICAL FEATURES The whole of the northern part of the Reserve consists of a glacier with its terminal moraines and screes of schists and sandstones. To the south the topography is more gentle and the underlying rock largely calcareous.

VEGETATION The classic plant associations of the Alpine zone succeed one another from north to south, passing from scree vegetation and that of acid moraines and grassland to the base-rich pasturage of the lower levels. Flowering species of particular interest include Androsace alpina, confined to the lime-free moraines and screes.

NOTEWORTHY FAUNA This Reserve fills a gap at the northern end of the area protected by the Vanoise National Park. The mammals include the variable hare Lepus timidus and the chamois Rupicapra rupicapra. Among the birds the numbers of ptarmigan Lagopus mutus are notable.

ZONING None

DISTURBANCES OR DEFICIENCIES Formerly considerable, but this no longer applies since the area, which was subject to heavy recreational use and, in particular, extensive winter sports facilities, has been downgraded and excised from the neighbouring Park. This excision has been offset by allowing another area in the Commune of Tignes, and one of great natural interest and importance, to be reserved, namely the Grande Sassière (FRA.5.3).

TOURISM Difficult access limits numbers of visitors; a path across the Reserve gives access to the Vanoise National Park via Tignes.

SCIENTIFIC RESEARCH Under the direction of the scientific committee of the Vanoise National Park.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL 5 volumes on the Travaux scientifiques du Parc National de la Vanoise, available from the Park authorities.
STAFF  Under the surveillance of the National Park authorities of the Tignes-Val d'Isère sector (Sector chief and 4 guards).

BUDGET  Covered by that of the Vanoise National Park (see FRA.3.3).

LOCAL PARK ADMINISTRATION  Préfecture de la Savoie, 73018 Chambéry and Direction du Parc National de la Vanoise, 15 rue du Dr. Julliand, B.P. 105, 73003 Chambéry.
NAME Banc d'Arguin Nature Reserve

TYPE NR BIOTIC PROVINCE 2.4.4

LEGAL PROTECTION No information

DATE ESTABLISHED 4 August 1972

GEOGRAPHICAL LOCATION Atlantic coast, at the entrance of the Arcachon basin, 60 km WSW of Bordeaux: N 44°45'; W 01°09'

ALTITUDE From sea level to 3 metres

AREA Varying from 800 ha at low tide to 300 ha at high tide

LAND TENURE Seashore area belonging to the commune of La Teste de Buch

PHYSICAL FEATURES A sandy oceanic islet oriented NW-SE from Cap Ferret, a beach exposed to the open ocean below the low dunes on the west and a second sheltered beach on their eastern side. The tide rises and falls about 4.20 m. The climate is relatively mild in winter, hot in summer and characterized by strong winds during the period September to March.

VEGETATION Fixed dune vegetation dominated by grasses such as marram Ammophila arenaria and sand couch Agropyron junceiforme (= A. junceum). Other species present include Convolvulus soldanella, sea spurge Euphorbia paralias, sea holly Eryngium maritimum, Helichrysum stoechas and Linaria thymifolia which is endemic to south-west France.

NOTEWORTHY FAUNA Birds predominate and include nesting species such as oyster catcher Haematopus ostralegus (30 pairs), sandwich tern Sterna sandvicensis (2200 pairs) and a few pairs of crested lark Galerida cristata, tawny pipit Anthus campestris and grey wagtail Motacilla cinerea. Over-wintering species include significant populations of grey plover Pluvialis squatarola (800 individuals), bar-tailed godwit Limosa lapponica (300), dunlin Calidris alpina (over 220,000) and gulls, including greater and lesser black-backs Larus marinus and L. fuscus, herring gull L. argentatus and common gull L. canus. Many other smaller migrants pass down the coast at this point and are recorded in the Reserve. The marine fauna includes the spider crab Maia squinado.

ZONING None

DISTURBANCES OR DEFICIENCIES The area suffers from the difficulty of effectively controlling unauthorised dogs and camping and keeping tourists away from nesting areas. Too much disturbance of migrating birds also occurs in August. Collecting of seashells and spider crabs is widely practised around the shores.

TOURISM Accessible to all, apart from the nesting area which is marked out from 1 April to 1 August. Camping is controlled and the removal of plants or animals prohibited.

SCIENTIFIC RESEARCH On the biology and reproduction of the sandwich tern and on the migrations of shore-birds.

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Code: FRA.6.2
SPECIAL SCIENTIFIC FACILITIES  Shelter which provides lodging facilities for guards and naturalist-guides, also for visiting naturalists working in the area. It is also used for exhibitions during the summer.

PRINCIPAL REFERENCE MATERIAL

Annual reports of SEPANSO (Société pour l'étude, la protection et l'aménagement de la nature dans le Sud-Ouest), published by the Institut de Biologie Animale, Université de Bordeaux I, 33405 Talence; also many articles in regional journals such as "Sud-Ouest Nature" and "Le Courbageot" as well as international journals.

STAFF  Permanent guard, 3 naturalist-guides temporarily available in July and August and voluntary guides during the summer.

BUDGET  Provision for recurrent expenditure is NF 60,000 ($ 12,000), and for capital expenditure and equipment NF 110,000 ($ 22,000) were provided.

LOCAL PARK ADMINISTRATION  SEPANSO, Institut de Biologie Animale, Université de Bordeaux I, 33405 Talence.
NAME  Port-Cros National Park
TYPE NP-M  Biotic Province 2.5.1

Legal Protection  Total protection of flora, fauna and site, but traditional fishing continues under controls.

Date Established  14 December 1963 under Decree No. 63-1235. There is a plan to extend the Park in 1977, by including the larger island of Porquerolles, lying some 12 km to the west; the whole complex would then be renamed the Îles d'Hyères National Park.

Geographical Location  Off the Mediterranean coast between Toulon and St. Tropez: N 43°; E 6°22'-25'

Altitude  60 metres below sea level to 196 metres a.s.l. (inclusive of marine area).

Area  694 ha (plus marine area estimated at 1,500 ha)

Land Tenure  400 ha State owned and 300 ha privately owned (including village plots).

Physical Features  The Reserve includes the island of Port-Cros, and the islets of Bagaud, Rascasse and Gabinière together with a 600 m wide zone around the islands of Port-Cros and Bagaud which constitutes the marine portion of the Reserve. Steep cliffs bound the southern coast of all the islands and, in addition, Port-Cros has five high ridges. These fan out northwards from the hill tops bordering the southern coast from Mt. Vinaigre to the Look-out, the valleys between them ending in a series of bays of varying size along the northern coast. The islands are in fact an extension of the Massif des Maures of the mainland, their subsoil being derived from metamorphic rock and therefore easily penetrated by water and plant roots.

Vegetation  The terrestrial flora is relatively limited but the woody vegetation is of note. Four zones have been identified: a littoral halophytic zone dominated by Senecio cineraria, staticie Limonium sinutatum, rock samphire Crithmum maritimum and Euphorbia pina; a zone just above this with pistachio Pistacia lentiscus, myrtle Myrtus communis and tree spurge Euphorbia dendroides; humid valleys with evergreen oak Quercus ilex; and at higher elevations a maquis of Arbutus unedo and tree heather Erica arborea and other scruffy plants, covering the largest area. Four marine zones have also been identified: a supra-littoral zone with spray-tolerant flora; a medio-littoral zone with the red alga Hissaecilla verruculosa; an infra-littoral zone dominated by great sheets of Posidonia oceanica, in which many pen shells Pinna nobilis are to be found, together with Zostera noltii and the brown seaweed Cystoseira stricta; lastly the circum-littoral zone beneath the rocks supports the calcareous alga Pyssonelia and the red alga Violalia volubilis.

Noteworthy Fauna  The terrestrial fauna is poor in mammals - only rabbit Oryctolagus cuniculus and black rat Rattus rattus. Many bird species pass through, especially during the spring migration; nesting species include shearwaters and gulls. Reptiles are represented by snakes, lizards and geckos and amphibia by tree-frogs. Some remarkable species of insects and spiders are present. The marine fauna includes all the fishes characteristic of rocky Mediterranean coasts as well as the invertebrate fauna of the coastal zones.
ZONING  Strict protection of the terrestrial zone; fishing permitted other than with nets or spear-guns; no buffer zone, the village is within the Reserve.

DISTURBANCES OR DEFICIENCIES  Excessive use by tourists of the area around the village and the southern beach. The roadsteads tend to get damaged by anchors and pollution, and in general protection of the marine area is still inadequate, though under further study.

TOURISM  Few of the summer visitors are affected by the existence of the National Park.

SCIENTIFIC RESEARCH  Under the direction of a scientific committee.

SPECIAL SCIENTIFIC FACILITIES  None

PRINCIPAL REFERENCE MATERIAL
Le Parc National de Port-Cros; special review produced in association with the U.R.V.N.
Guide touristique et botanique de Port-Cros
Carte phytosociologique de Port Cros
Le Parc National de Port-Cros; text and pictures by the C.R.D.P. Nice
Travaux scientifiques du Parc National de Port-Cros (1st vol.), available from the Park authorities.

STAFF  Director, inspector and 3 administrators plus 3 guards, launch captain and sailor, 1 worker: total 11.

BUDGET  In 1976, NF 1,207,000 were allocated to recurrent and NF 1,625,000 to capital expenditure: total NF 2,832,000 (U.S. $ 566,000 approximately).

LOCAL PARK ADMINISTRATION
Direction du Parc National de Port-Cros, 50 Av. Gambetta, 83400 Hyères.
FRANCE

NAME  Cerbère-Banyuls-sur-Mer Marine Nature Reserve

TYPE  NR-M  BIOTIC PROVINCE  2.5.1

LEGAL PROTECTION  Under water area totally protected, with controlled fishing.

DATE ESTABLISHED  5 March 1974

GEOGRAPHICAL LOCATION  From Banyuls to Cape Peyrefitte, Mediterranean coast of France near border with Spain: N 42°27'–42°29'; E 3°08'–3°11'

ALTITUDE  From sea level to c.-60m below sea level

AREA  550 ha

LAND TENURE  Maritime area under the authority of the Secretary of the Merchant Marine.

PHYSICAL FEATURES  Marine bedrock composed of metamorphic schists covered by incrustations of corals, extending from the headlands and the sands and mudflats between the headlands to a depth of 60 m. Relatively turbid water with visibility of 10–20 m (measured using Secchi discs). Salinity of between 37.70 and 38.00 parts per million. Water temperature ranges between 11°C and 25°C; in summer the thermocline is very steep, the temperature dropping by as much as five or six degrees Centigrade as one descends from 20 metres below the water surface to 30 metres below the surface. Strong winds are frequent.

VEGETATION  A covering of Lithothamnion species tends to carpet the rocks, the intervening spaces being filled with many species of Cystoseira seaweeds and a great variety of red algae. Beds of Posidonia are also present.

NOTEWORTHY FAUNA  The marine fauna is one of the richest of the Mediterranean coast due to the presence of a coral substratum. More than 530 species of invertebrate have been recorded, including many types of Sponges, Octocorallia, Echinoids and Ascidians. The fish fauna is equally rich with characteristic species of the rocky coast of the Mediterranean. Many pelagic fish and coastal migratory species, such as porgies Sparidae, herrings Clupeiformes and tunnies Thunnidae, are to be found.

ZONING  None

DISTURBANCES OR DEFICIENCIES  Surveillance is insufficient as is information on the use being made of the marine environment. The sedentary fauna is subject to great depredations during the summer season. Out of season poaching by methods ranging from the use of trawls or dragnets to underwater fishing by aqualung-equipped wet-suited swimmers still takes place.

TOURISM  The Reserve is accessible to anyone having a line-fishing permit; skin diving for viewing the underwater scene is also permitted.

SCIENTIFIC RESEARCH  Up till now the only research has been the numerous and very diverse studies undertaken by the Arago Laboratory of the Pierre and Marie Curie University, Paris, and by the University Centre, Perpignan. The Reserve is a marine pollution monitoring point.

SPECIAL SCIENTIFIC FACILITIES  None

WDNP  IUCN © 1977  (1)F  Code: FRA.6.4
PRINCIPAL REFERENCE MATERIAL  Various articles in the journal *Vie Milieu*, produced by the Laboratoire Arago, Banyuls-sur-Mer, deal with organisms living in the Reserve.

STAFF  Director, assisted by a management committee under the chairmanship of the Prefect of the Pyrénées Orientales Department.

BUDGET  For 1975, NF 100,000-200,000 (or between about 20,000 and 40,000 U.S. dollars) were theoretically made available for the maintenance and development of this Reserve.

LOCAL PARK ADMINISTRATION  Le Directeur, Laboratoire Arago, 66650 Banyuls-s.-Mer.

WDNP IUCN © 1977  (1)B  Code: FRA.6.4
GABON

AREA 262,265 sq. km

POPULATION 500,000 (1972 estimate)

PARKS AND RESERVES LEGISLATION No information

PARKS AND RESERVES ADMINISTRATION Vested in the Ministry of Tourism

ADDRESS Le Ministre du Tourisme Chargé des Parcs Nationaux, Libreville

TOTAL AREA UNDER PROTECTION 358,000 ha. The listed area is stated by the Ministry of Tourism to be the only National Park and it is assumed that the two reserves and one national park in the centre of the country, referred to in the 1971 U.N. List, no longer have protected status.

PROTECTED AREAS

2.1 Wonga-Wongué National Park 358,000 ha
NAME Wonga-Wongud National Park

TYPE NP

BIOTIC PROVINCE 4.7.1

LEGAL PROTECTION Total


GEOGRAPHICAL LOCATION On the Atlantic coast, between Libreville and Port-Gentil, to the west of Lambarene: approx. S. 0°30'-1; E 9°40'-10

ALTITUDE 1000-1575 metres

AREA 358,000 ha

LAND TENURE State ownership acquired by legal expropriation

PHYSICAL FEATURES Bounded on the west by the Atlantic coast between the right bank of the Gongoud river and the mouth of the Aouagne river, on the north by the Aouagne and Pambo-Nyango rivers, which also mark the northern edge of the savanna, on the south-east by the west bank of Lake Azingo, and to the south by the Oranga, Wanga, Bembelié and Mpqoué rivers and Lakes Inyongo and Nguelid, back to the Gongoud. The Park includes the schistose hills of the Sierra del Cristal coastal ranges, the rocky ridges of which alternate with swampland.

VEGETATION Humid tropical forest, mainly of ebony Diospyros spp. and other hardwoods such as purpleheart Copaifera mopane, interspersed with climbing palm Calamus and rubber vine Landolphia. Large areas of stunted woodland savanna also occur on the upland areas. Species of interest include Gabon mahogany Aucoumea klaineana, a resin yielding species, limba Terminalia superba, ilomba Pycnanthus angolensis, iroko Chlorophora excelsa and acajou mahoganies Khaya spp.

NOTEWORTHY FAUNA The most important of the larger mammals are chimpanzee Pan troglodytes troglodytes (classified as 'vulnerable' in the Red Data Book), the western race of the gorilla G. g. gorilla (another 'vulnerable' species), elephant Loxodonta africana, water chevrotain Hyemoschus aquaticus, sitatunga Tragelaphus spekel and buffalo Syncerus caffer. Reptiles include the python and the Gabon viper Bitis gabonica. Many species of Lepidoptera have been recorded. Birds include the white pelican Pelecanus onocrotalus.

ZONING None

DISTURBANCES OR DEFICIENCIES The forest areas were formerly exploited but are now protected.

TOURISM has not yet been developed to any great extent, but existing facilities include a resthouse with a tourist information bureau, restaurant and swimming pool, and comprising one three-roomed bungalow and seventeen single-roomed cabins.

SCIENTIFIC RESEARCH None

SPECIAL SCIENTIFIC FACILITIES None
PRINCIPAL REFERENCE MATERIAL  A description of the area can be found in
KINGSLEY, M. 1897. Travels in West Africa  Frank Cass & Co., London,

STAFF  Superintendent, 3 game guards and 17 other workers engaged in park
maintenance and supervision.

BUDGET  About Frs 24 million CFA were allocated for the initial year 1967/68
(now equivalent to about U.S. $ 96,000).

LOCAL PARK ADMINISTRATION  Direction Générale du Tourism, B.P. 403, Libreville
and B.P. 240, Port-Gentil.

WDNP  IUCN © 1977 (1)B
Code: GAB.2.1
GERMANY, FEDERAL REPUBLIC OF

AREA 248,620 sq. km

POPULATION 61,644,600 (31 December 1975)

PARKS AND RESERVES LEGISLATION No recent information, but according to the Second Edition of the U.N. List (1971) "under the Constitution, the conservation of nature and safeguarding of sites and landscape fall within the competence of each of the eleven Länder. The Federal Government only has limited legislative powers, sufficient however to ensure that conservation efforts in each state are kept in harmony with other public interests and that at least a minimum area is set aside for reserves under general protection".

PARKS AND RESERVES ADMINISTRATION Responsibility of individual Länder, but the central organisation for advising local authorities and organizations and coordinating their work is the Bundesanstalt für Vegetations Kunde, Naturschutz und Landschaftspflege (B.A.V.N.L.), which is directly responsible to the Bundesministerium für Ernährung, Landwirtschaft und Forsten.

ADDRESS The B.A.V.N.L. is based at Bad Godesberg.

TOTAL AREA UNDER PROTECTION Well over 3 million hectares.

PROTECTED AREAS

2.1 Nordfriesisches Wattenmeer N.R. 140,000 ha
3.1 Knechtsand N.R. 30,200 ha
3.2 Ammergauer N.R. 27,600 ha
4.1 Lüneburger Heide N.R. 20,000 ha
4.2 Königsee N.R. 20,000 ha
4.3 Karwendel N.R. 19,000 ha
4.4 Bayerischer Wald N.P. 12,000 ha
4.5 Hochkienberg-Dürnbachhorn-Sonntagshorn-Inzeller-Kienberg-Staufen N.R. 9,500 ha
4.6 Oberharz N.R. 7,053 ha
5.1 Insel Mellum N.R. 3,500 ha
5.2 Nordsee-Insel Memmert N.R. 2,200 ha
5.3 Nord-Sylt N.R. 1,790 ha
5.4 Federeese N.R. 1,410 ha
GERMANY, FEDERAL REPUBLIC OF

NAME  Lüneburger Heide (Naturschutzgebiet)

TYPE  NR/MR

BIOTIC PROVINCE  2.4.4

LEGAL PROTECTION  Total, except for controlled cultivation and grazing as part of a deliberate management policy.

DATE ESTABLISHED  29 December 1921, by Police Ordinance (Regierungsamtsblatt Lüneburg of 12.1.1922).

GEOGRAPHICAL LOCATION  Lower Saxony, between Hanover and Hamburg, north-west German plain: N 53°04'-53°16'; E 9°50'-10°04'

ALTITUDE  70-170 metres

AREA  19,740 ha

LAND TENURE  41% public ownership (State or local government), 32.5% owned by the Verein Naturschutzpark conservation organization, 26.5% private property.

PHYSICAL FEATURES  A low-lying region of morainic deposits in the central region of north-west Germany. Underlying Mesozoic and Tertiary sediments with interposed salt deposits, locally forming dome-like structures. Deep layers of surface sands and gravels are a result of former glaciation, their surface transformed by tree cover to podsolized forest soils. The climate is maritime with some continental influences: mean annual temperature of 8°C and a relatively high precipitation of 738 mm.

CLEARANCE of forests probably dates from bronze age (1500 B.C.).

VEGETATION  Originally broad leaf cold-deciduous forest (1.2.5.1) of oak and birch forming a Querceto-Betuletum. This oak and birch forest still occupies about 1% of the area. With clearance it was replaced by present dwarf shrub heathland (4.1.1) of heather Calluna and furze Genista, which accounts for over 22.4% of the area. Some heaths have subsequently been afforested with pine Pinus sylvestris (1.1.9.2), which also accounts for about 22.4%. Raised bogs occupy about 8% (4.3.1). Associations present in small areas and requiring conservation include Calluno-Genistetum cladonietosum, Vaccinio-Genistetum, Arctostaphylo-Genistetum, Empetro-Genistetum, Corynephoretum canescentis, Ericetum tetralicis, Sphagnetum medii and Caricion canescents fuscac.

NOTEWORTHY FAUNA  This is typical of northern heathlands. 40 species of mammal have been recorded, including otter Lutra lutra. The 360 listed bird species include black grouse Lyrurus tetrix. Among the insects of interest are Mesoeuxa lidia (Lepidoptera), Gampsocleis glabra (Orthoptera) and Lochmaea suturalis (Coleoptera).

ZONING  Approximately 12% of the Reserve is available for agriculture and 60% of the area is open to forestry operations. The central part of the Reserve is only accessible by foot or horse-drawn carts. The whole area is managed for heathland preservation.

DISTURBANCES OR DEFICIENCIES  9.3% of the Reserve is part of a military training area. Other deficiencies result from forest exploitation and hunting. Strong visitor pressure occurs at some times, e.g. when the heather is in bloom, but no far-reaching effects have been noted.

WDNP  IUCN © 1977

Code: GER(2).4.1
TOURISM About 3 million visitors annually, mainly weekend tourism from neighbouring cities. Facilities include trails, museum and accommodation.

SCIENTIFIC RESEARCH Study area for a number of scientific institutions. Projects include geological, pedological, archaeological, vegetational and zoological research.

SPECIAL SCIENTIFIC FACILITIES None noted.

PRINCIPAL REFERENCE MATERIAL


STAFF Scientific consultant, managing director of Verein Naturschutzpark; other Verein Naturschutzpark staff include a senior forestry officer, 15 labourers and 14 shepherds (for heath management). Also 3 local State forestry divisions with 3 senior foresters and 45 labourers.


GERMANY, FEDERAL REPUBLIC OF

NAME Bayerischer Wald National Park

TYPE NP

BIOTIC PROVINCE 2.4.4

LEGAL PROTECTION The whole area is under landscape protection and 600 ha is totally protected.

DATE ESTABLISHED 1970

GEOGRAPHICAL LOCATION East of Regensburg, between the Danube and the Czech border: N 48°50'-49°00'; E 13°20'-13°35'

ALTITUDE 735-1453 metres (Gross Rachel)

AREA 12,000 ha (The boundaries will be finalized after a decision on general plans for the area).

LAND TENURE Owned by the State of Bavaria and administered by the Bundesministerium für Ernährung, Landwirtschaft und Forsten. Small areas of 100 ha and 34 ha etc. are privately owned.

PHYSICAL FEATURES South-eastern and south-western slopes of the central Bayerisches Wald-Bohmer Wald ranges in the region of Lusen (1373 m) and Rachel peaks. The mountains are composed of Algonquin and pre-Algonquin crystalline granite and gneiss rocks. The only natural water body is Rachel Lake, which is situated in a glacial hollow at the foot of Rachel mountain. Undulating plains are more typical of the Bohmer Wald section but occupy only a limited area. The climate is of a continental type, with average annual temperatures of 7°C-4°C according to altitude and 2000 mm annual precipitation, including about 3 m-thick snow cover in winter.

VEGETATION This is part of the largest block of closed forest remaining in Europe. Valleys, depressions and plains support spruce forest of Picea abies, lower slopes of the mountains a mixture of spruce, fir Abies alba and beech Fagus sylvaticus. High altitude forests are again mainly spruce. Moorland areas occur at all altitudes. The interesting flora contains alpine, boreal and eastern European elements, but has been modified by forestry and the high density of ungulates.

NOTEWORTHY FAUNA Larger carnivores have been extinct for more than a century, but high populations of red deer Cervus elaphus and roe deer Capreolus capreolus are maintained by winter feeding. Bird species include buzzard Buteo buteo, honey buzzard Pernis apivorus, goshawk Accipiter gentilis, sparrow hawk A. nisus, grouse Lagopus lagopus, capercaillie Tetrao urogallus, black grouse Lyrurus tetrix, hazel hen Tetrao bonasia, pygmy owl Glauclium passerinum, Tengmalm's owl Aegolius funereus, white-backed woodpecker Dendrocopos leucotos, three-toed woodpecker Picoides tridactylus, red-breasted flycatcher Ficedula parva, ring ouzel Turdus torquatus and redpoll Acanthis flammea.

ZONING Three zones: tourist zone with facilities near border areas (recreational zone), wilderness zone reserved for hiking with a network of 130 km of trails, and a core zone of strict reserve kept free from tourism and forestry.

WDNP IUCN © 1977  (1)F  Code: GER(2).4.4
DISTURBANCES OR DEFICIENCIES
High densities of ungulates which affect vegetation regeneration, heavy pressure from tourism and forestry, water extraction and hydro-electric installations. Some animal species are endangered by hunting in border areas of the Park.

TOURISM
Free access, educational and informational displays; facilities include two mountain huts and a restaurant. Accommodation is concentrated in the 'Waldhause' enclave.

SCIENTIFIC RESEARCH
Research projects on the ecology and natural evolution of the ecosystem.

SPECIAL SCIENTIFIC FACILITIES
A documentation centre is under development.

PRINCIPAL REFERENCE MATERIAL

STAFF
16, plus the staff of five forestry administrations.

BUDGET
1.6 million DM annually (approx. U.S. $ 670,000), of which 90% comes from the Bavarian state and 10% from Federal Government.

LOCAL PARK ADMINISTRATION
Nationalparkamt Bayerischer Wald, 8356 Spiegelau.
GHANA

AREA 276,000 sq. km

POPULATION 8,559,000 (1970)

PARKS AND RESERVES LEGISLATION  Under the Wild Animal Preservation Act, No. 43 of 1961, the President is empowered (section 11) to establish reserves within which it is unlawful to hunt, capture, destroy or collect any wild animals except those specially exempted. The Legislative Instrument L.I. 710 setting up the first three reserves listed below provides that the consent of the Chief Game and Wildlife Officer shall be necessary for entry into the reserve and that conditions for such entry may be determined by him and that any exemption given for capturing, killing or collecting plants or animals shall only be for conservation or management. Further, the Chief Game and Wildlife Officer may seize and confiscate equipment which in his view can be used to kill or capture animals, and only with his consent may any cultivation or clearing be carried out in a reserve. Regulations also control lighting of fires, water pollution and litter.

PARKS AND RESERVES ADMINISTRATION  Department of Game and Wildlife, Ministry of Lands and Mineral Resources.

ADDRESS  Chief Game and Wildlife Officer, Department of Game and Wildlife, P.O. Box M. 239, Accra, Ghana.

TOTAL AREA UNDER PROTECTION  1,016,097 ha, in national parks

PROTECTED AREAS

2.1 Mole National Park  466,200 ha
2.2 Digya National Park  312,436 ha
2.3 Bui National Park  207,233 ha
3.1 Bia National Park  30,208 ha

REFERENCES

NAME: Mole National Park

TYPE: NP

LEGAL PROTECTION: Total

DATE ESTABLISHED: 1961 as Game Reserve; as NP in 1971 (L.I.710)

GEOGRAPHICAL LOCATION: Northern Region west of the White Volta, N 9°0'-10°13', W 1°22'-2°20'

ALTITUDE: 180-360 metres

AREA: 466,200 ha

LAND TENURE: State ownership

PHYSICAL FEATURES: A ridge running north and south on the eastern side of the park, cut near its southern end by the Mole river, is geologically part of the Voltaian system (Palaeozoic) with plateaux and fairly steep scarps, giving way in the central area to the lower Birrimian system and in the west to pre-Cambrian granites in undulating country with gentle slopes. Streams below the eastern scarp show reversed drainage, although in the dry season these and all other water courses cease to flow. Soils are mainly savanna ochrosols, groundwater laterites and lithosols. Average annual rainfall is c. 1000 mm; March and April, before the rains, are the hottest (c. 30°C) months; lowest temperatures (c. 25°C) towards the end of the rains in August.

VEGETATION: Guinean woodland savanna with gallery forest along rivers. Much of the park is of the 'orchard bush' type savanna in which the following communities may be recognized: middle slope Burkea africana-Hyparrhenia spp., upper slope Detarium microcarpum-Loudetia simplex, top slope Isoberlinia doka-Loudetiposis scaetae, scarp Strychnos spinosa-Ischaemum hirsutum. The scarps also support a denser woodland community of Diospyros mespiliformis-Monodora tenuifolia. Significant areas of 'iron-pan' grass-savanna Loudetiposis kerstingii-Polycarpaceae tenuifolia and seasonal swamp tree-savanna Terminalia macroptera-Loudetiposis thoroldii. Daniellia olivieri-Andropogon tectorum woodland and Berlinia grandiflora-Cola laurifolia forest are the chief riparian communities, the latter constituting gallery forest in which Borassus palms and 'sausage trees' Kigelia aesthopicas are noticeable.

NOTEWORTHY FAUNA: Mammals include the primates: Guinea baboon P. papio green monkey Cercopithecus aesthiops, patas monkey Erythrocebus patas and colobus Colobus polykomos; carnivores: side-striped jackal Canis adustus, wild dog Lycaon pictus, spotted hyena C. crocuta, lion and leopard Panthera leo and pardus; elephant Loxodonta africana; and a variety of ungulates: bushbuck Tragelaphus scriptus, buffalo Syncerus caffer, waterbuck Kobus ellipsiprymnus, Buffon's kob Kobus kob, reedbuck Redunca arundinum, roan Hippotragus equinus and oribi Ourebia ourebi. Reptiles include: Nile crocodile Crocodylus niloticus and the slender-snouted crocodile Crocodylus cataphractus, Nile monitor Varanus niloticus, Bosc's monitor V. exanthematicus, and several terrapins and river turtles. Birdlife plentiful.

ZONING: Not yet applied

DISTURBANCES OR DEFICIENCIES: None reported

WDNP IUCN © 1975 6(1)F Code: GHA.2.1
TOURISM Facilities include a motel (80 beds) and a restcamp (25 beds), a repair workshop and filling station for vehicles, and the possibility of game viewing on foot accompanied by armed scouts.

SCIENTIFIC RESEARCH Studies of animal populations, habitats and the ornithology of the park are being undertaken.

SPECIAL SCIENTIFIC FACILITIES A field laboratory at Samoli

PRINCIPAL REFERENCE MATERIAL

STAFF A game warden, 3 senior assistant wardens, 4 assistant wardens, 2 senior game protection officers, 2 game protection officers, 2 senior rangers, 15 rangers, 5 senior game scouts, 65 game scouts, 55 game assistants and 15 guards, making a total of 169, plus labour force of 300.


LOCAL PARK ADMINISTRATION Under supervision of the Game and Wildlife Department (Ministry of Lands and Mineral Resources), see Country Sheet for address.
GHANA

NAME  Digya National Park

TYPE  NP

BIOTIC PROVINCE  4.6.1-4.7.2

LEGAL PROTECTION  Total, but not yet fully implemented

DATE ESTABLISHED  1971, by L.I. 710

GEOGRAPHICAL LOCATION  Peninsula of west central shore of Volta Lake. At 7°05'-7°45'N and 0°10'E to 0°45'W

ALTITUDE  91-182 metres

AREA  312,436 ha

LAND TENURE  State ownership

PHYSICAL FEATURES  A fairly level section of the Voltaian (Palaeozoic) system, with a few hills and rocky outcrops, between the Sene river and arm of the Volta Lake to the north and the Obosum river and arm to the south. In the transition area between single rainy season of the savanna and two wet seasons of the forest zone, February to April hottest (15°-40°C), August coolest (mean of 25°C), although colder minima (c. 9°C) occur during the harmattan of December-January.

VEGETATION  Savanna woodland with transitional and gallery forest along major drainage lines. Dominant species of the savanna are Anogeissus leiocarpus, Ceiba and Albizzia spp., Ricinodendron heudeloti, Antiaria africana, Sterculia spp., and Triplochiton scleroxylon.

NOTEWORTHY FAUNA  Primates: olive baboon Papio anubis, green monkey Cercopithecus aethiops, Mona monkey C. mona, spot-nosed or red-tailed monkey C. nictitans, colobus Colobus polykomos, of the short-haired abyssinicus race, and patas monkey Erythrocebus patas; elephant Loxodonta africana; bush pig, here known as the red river hog Potamochoerus porcus, warthog Phacochoerus aethiopicus, Hippopotamus amphibius, bushbuck Tragelaphus scriptus, buffalo Syncerus caffer, red-flanked duiker Cephalophus rufilatus, grey duiker Sylvicapra grimmia, Defassa waterbuck Kobus defassa, Buffon's kob K. kob, roan Hippotragus equinus, hartebeest Alcelaphus buselaphus and oribi Orebia oreibi. Crocodiles are reported as still occurring.

ZONING  None yet applied

DISTURBANCES OR DEFICIENCIES  Some human settlements which have still to be moved outside the park boundaries.

TOURISM  None

SCIENTIFIC RESEARCH  None

PRINCIPAL REFERENCE MATERIAL


WDNP  IUCN © 1975  6(1)F  Code: GHA.2.2

STAFF An assistant game warden, 2 game rangers, a clerical officer, 5 senior game assistants, 4 senior game scouts, 20 game scouts, 20 game assistants, ancillary staff and labour force.

BUDGET US$ 50,490 in 1971-72, plus US$ 3460 for development

LOCAL PARK ADMINISTRATION Under direction of the Game and Wildlife Department, see Country Sheet for address.
NAME: Bui National Park

TYPE: NP

BIOTIC PROVINCE: 4.6.1

LEGAL PROTECTION: Total, but not yet fully implemented

DATE ESTABLISHED: 1971, by L.I. 710

GEOGRAPHICAL LOCATION: 400 km inland on western border with the Ivory Coast. 8°-8°25'N, 2°15'30''W

ALTITUDE: 122-244 metres

AREA: 207,253 ha (also quoted as 154,368 ha)

LAND TENURE: State ownership

PHYSICAL FEATURES: Undulating catchment of small tributaries of the Black Volta river, which roughly bisects the park. Soils mainly lateritic. Long dry season and rather short wet season from June to September. Temperature range 10°-40°C.

VEGETATION: Guinea savanna woodland with gallery forest along rivers


ZONING: Not yet applied

DISTURBANCES OR DEFICIENCIES: Human settlements which have still to be moved outside the park boundaries.

TOURISM: 25-bed motel planned for completion in 1972, but no confirmation of its having been opened.

SCIENTIFIC RESEARCH: None

PRINCIPAL REFERENCE MATERIAL: None yet published

STAFF: An assistant game warden, 2 game rangers, a clerical officer, 5 senior game assistants, 4 senior game scouts, 20 game assistants, 20 game scouts, ancillary staff and labour force.

BUDGET: Not yet confirmed but US$ 40,000 was expected to be made available in 1972-73.

LOCAL PARK ADMINISTRATION: Under direction of the Game and Wildlife Department, see Country Sheet for address.
GHANA

NAME Bia National Park

TYPE NP BIOTIC PROVINCE 4.7.2

LEGAL PROTECTION Total

DATE ESTABLISHED 14 May 1974, by L.I. 881

GEOGRAPHICAL LOCATION In the Western Region between the Ivory Coast border and the Bia river at 6°20'-40"N and 2°55'-3°15"W

ALTITUDE Highest point c. 550 metres

AREA 30,208 ha

LAND TENURE State ownership, by acquisition

PHYSICAL FEATURES Part of the eastern boundary is formed by the Krokosua Hills Forest Reserve and in general the vegetation of the park is relatively untouched, this being perhaps the only area in Ghana where virgin rain forest still exists. Dry season concentrations of animals which have been observed in the centre of the area are therefore very unusual and give the reserve an added importance. The climate is humid tropical, with a distinct dry season from December to March; temperatures are estimated to vary from a maximum 29°-34°C during July/August to a minimum of 20.5°-22°C during February/March. Rainfall peaks are in June and October and the annual total is thought to be about 1500 mm (no meteorological records have hitherto been kept).

VEGETATION Originally described as belonging to the Celtis-Triplochiton association of humid semi-deciduous rain forest, but later found to be a separable variety and, in fact, dominated by species in families other than the Ulmaceae and Sterculiaceae, viz. Tieghemella heckellii, Entandrophragma angolense, Strombosia glaucocense and the two palms Raphia vinifera and gigantea. Climbers, epiphytic orchids, mosses and liverworts abound.

NOTEWORTHY FAUNA The mammals recorded include all three species of Colobus, polykomos, badius and verus (the last mentioned, the olive colobus, a Red Data Book species), the Diana monkey Cercopithecus diana, chimpanzee Pan troglodytes, leopard Panthera pardus, elephant Loxodonta africana, giant forest hog Hylochoerus meinertzhageni, bush pig or red river hog Potamochoerus porcus, bongo Taurotragus oryxerus, bushbuck Tragelaphus scriptus, buffalo Syncerus caffer (subspecies caffer) and yellow-backed duiker Cephalophus silvicultor.

SPECIAL CONSERVATION AIMS To preserve for posterity an ecosystem formerly widespread but now almost vanished from Ghana, which with care should be able to support species otherwise likely to become extinct in the country and some of them, like the olive colobus, endangered in Africa as a whole.

ZONING Not yet applied, but a 'Game Production Area' has been proposed in the vicinity.

DISTURBANCES OR DEFICIENCIES Hunting, logging and cultivation are still taking place around the borders of the park and could affect its viability unless carefully controlled.
TOURISM
The general area already attracts some domestic and foreign visitors and it is intended that the park should be organized to allow intensive tourist use.

SCIENTIFIC RESEARCH
Some accommodation and basic equipment have already been made available for the purpose of the first research programme (status and rehabilitation of Pan troglodytes).

SPECIAL SCIENTIFIC FACILITIES
None

PRINCIPAL REFERENCE MATERIAL

STAFF
2 assistant game wardens (at present research officers supplied by Peace Corps), a game protection officer, 2 game rangers, a senior game assistant, 4 game assistants, a senior game scout and a game scout. Ancillary staff and labour force of 33.

BUDGET
US$ 17,700 in 1973-74, plus US$ 15,000 for capital expenditure

LOCAL PARK ADMINISTRATION
Under direction of the Game and Wildlife Department, see Country Sheet for address.
GUATEMALA

AREA 108,888 sq. km

POPULATION 5,400,000 (1970 estimate)

PARKS AND RESERVES LEGISLATION Article 108 of the Constitution of the Republic establishes the basis for protection of nature. Proposals exist for establishment of a single administration under the Guatemalan Institute of National Parks and Equivalent Reserves.

PARKS AND RESERVES ADMINISTRATION At present National Parks are administered under various agencies. The National Institute of Archaeology has ultimate authority for Tikal National Park. The Department of National Parks within the Forestry Division has ultimate authority for management of Rio Dulce National Park although in practice it only operates two municipal parks.

ADDRESS Instituto Nacional de Arqueología, Guatemala City, Guatemala CA. Departamento de Parques Nacionales, Division Forestal, DIRENARE, Ministerio de Agricultura, Guatemala City, Guatemala CA.

TOTAL AREA UNDER PROTECTION 81,800 ha

PROTECTED AREAS

3.1 Tikal National Park 57,600 ha
3.2 Rio Dulce National Park 24,200 ha
GUATEMALA

NAME Tikal National Park

TYPE NP

BIOTIC PROVINCE 3.7.1

LEGAL PROTECTION Total

DATE ESTABLISHED 26 May 1955, by Decree

GEOGRAPHICAL LOCATION North-eastern Guatemala, Petén Dept.: N 17°06'45"-17°20'15"; W 89°30'35"-89°44'55" (the ruins are at N 17°13'3"; W 89°37'7"

ALTITUDE 200-250 metres

AREA 57,600 ha

LAND TENURE Government land

PHYSICAL FEATURES An undulating area of Cretaceous and Cenozoic sedimentary rocks. Features include hills, lakes and a chain of swamps. The climate is warm and humid with 1500-2000 mm rainfall from September to February and in June. Annual mean temperature is 23°C. The park's main attraction is the ruined city of the Maya Indians. This has temples, pyramids, houses and sculptures; large areas are still to be excavated.

VEGETATION Dry tropical and sub-tropical forests in the transition area from wet to dry conditions. Abundant palms, epiphytes, orchids and bromeliads are present. Common tree species include cedar Cedrela angustifolia, West Indian mahogany Swietenia macrophylla, Manilkara achrás, Vitex guameri, Aspidosperma megalocarpon, Guarea exelsa, bread-nut tree Brosimum alicastrum, Calophyllum brasiliense, Cryosophila argentea, the palm Sabal mayarum, Busera simaruba, Protium copal and Acacia farnesiana.

NOTEWORTHY FAUNA 54 species of mammal occur, including mantled howler monkey Alouatta palliata nigra, spider monkey Ateles geoffroyi, giant anteater Myrmecophaga tridactyla (a Red Data Book species in the 'vulnerable' category), lesser anteater Tamandua tetradactyla, dwarf anteater Cyclopes didactylus, 3-toed sloth Bradypus tridactyla, 9-banded armadillo Dasypus novemcinctus, squirrel Scirius yucatanensis, pocket gopher Heteroegomys hispidus, raccoon Procyon spp., brown coati Nasua nasua, kinkajou Potos flavus, tayra Eira barbara, long-tailed weasel Mustela frenata, hooded skunk Mephitis maccou, otter Lutra canadensis, puma Felis concolor, margay F. wiedi, ocelot F. pardalis, jaguar Panthera onca (both in the 'vulnerable' category), Baird's tapir Tapirus bairdii (an 'endangered' Red Book species, limited by water availability), collard and white-lipped peccary Tayassu tajacu and T. albirostris, white-tailed deer Odocoileus virginianus and red brocket deer Mazama americana sarterii. Avifauna includes 303 species representing 63 of the 74 families in Guatemala. Reptiles and amphibians include the 'endangered' Red Data Book species, Crocodylus moreletii, and other crocodiles, 9 families of amphibian and 6 genera of turtles. 38 species of non-poisonous snakes occur and poisonous snakes include coral snake Micrurus diastema sapperi, 4 species of fer-de-lance Bothrops and 2 species of rattle-snake Crotalus. A rich invertebrate fauna, especially arthropods and molluscs.

ZONING Not specifically defined

WDNP TUCN © 1975 8(1)F Code: GUA.3.1
DISTURBANCES AND DEFICIENCIES

Some illegal hunting. Theft of archaeological remains.

TOURISM

40,000 visitors in 1973 with numbers increasing rapidly. Hotel, camping places and picnic sites available also marked trails, guide service and archaeological museum. Daily air flights and road access (545 km from Guatemala City).

SCIENTIFIC RESEARCH

Mainly on the evolution of Mayan Indian culture (by the University of Florida).

SPECIAL SCIENTIFIC FACILITIES

Simple laboratory for archaeological research; library

PRINCIPAL REFERENCE MATERIAL


STAFF

Total 52 (Superintendent, 36 technicians, 15 guards)

BUDGET

US$ 90,210

LOCAL PARK ADMINISTRATION

Jefe Proyecto Arqueológico Tikal. Instituto Nacional de Arqueología y Historia (INAH), Guatemala City, Guatemala CA.
GUATEMALA

NAME Rio Dulce National Park

TYPE NP

Biotic Province 3.7.1

Legal Protection Total

DATE ESTABLISHED 26 May 1955 by Presidential Decree

Geographical Location Eastern Guatemala, Izabal Department (Livingston and Los Amantes); N 15°30'–15°55'; W 88°40'–89°00'

Altitude Sea level to 1267 metres

Area 24,200 ha, but no exact boundaries have been fixed

Land Tenure Private land. The rivershore, although Government land, is settled

Physical Features Part of the lower Rio Polochio watershed, 275 km from Guatemala City. It includes the Sierra de Mico, Lake Izabal and the mouth of the Rio Dulce on the Atlantic coast. The Rio Polochio flows through a 300-400 m high canyon and elsewhere forms meanders. Geologically composed of serpentine, sandstones, marine sediments and alluvial deposits. Some of these rocks are rich in molluscan and other fossils. The climate is warm, tropical humid with a mean annual precipitation of 2970 mm. The city of Livingston lies within the park.

Vegetation Humid tropical sub-tropical rainforest and low montane rain wet forest. Most of the ecosystems have been altered but some virgin stands of primary forest still remain. Palms are abundant and the native pine Pinus caribaea is present. Other species include Swieteniamahogani, Credrela mexicana, Vochisia guatemalensis, Virola koschnyi and Calophyllum brasiliense. The area around 'El Golfete' has a unique ecosystem for Guatemala.

Noteworthy Fauna Mammals include spider monkey Ateles geoffroyi and other monkeys, raccoon Procyon lotor, ocelot Felis pardalis and jaguar Panthera onca (both in the 'vulnerable' category), manatee Trichechus manatus (also 'vulnerable'), Baird's tapir Tapirus bairdii (an 'endangered' Red Data Book species) and white-tailed deer Odocoileus virginianus. 303 species of resident bird have been recorded. The reptilian and amphibian fauna is rich, and includes the 'endangered' Crocodylus moreleti and C. acutus, and the terrapins Kinosternon acutum and K. cruentatum, Chelydra rossignomi, Dermatemys dawii and others. Snakes include the coral snake Micrurus sp., tropical moccasin or copperhead Agkistrodon bilineatus, fer-de-lance Bothrops sp. and rattlesnake Crotalus terrificus durissus. A rich fish fauna includes 28 families such as the Lepisosteidae, Cyprinodontidae, Cichlidae, Anguillidae, Syngnathidae, and others.

Zoning None

Disturbances or Deficiencies Several small settlements, deforestation and illegal hunting. There is no functioning protection and no management. Nickel mining is planned. The city of Livingston, although within the park, is not quoted as having much impact.

Tourism Few visitors to the area apart from some sport fishermen. A small hotel is available.