

World Heritage Sites

Protected Areas and World Heritage



MANÚ NATIONAL PARK PERU

In this huge 1.5 million hectare park successive tiers of vegetation rise from tropical forested plains at 350m through mountain cloud forest to high grasslands above 4,000m. Its forests hold some of the greatest biodiversity on the continent with at least 860 species of birds, and rare animals such as the giant otter, giant armadillo and jaguar.

COUNTRY

Peru

NAME

Manú National Park

NATURAL WORLD HERITAGE SITE

1987: Inscribed on the World Heritage List under Natural Criteria ix and x.

2009: Extended slightly under the same criteria to include the National Park.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

INTERNATIONAL DESIGNATION

1977: Designated a Biosphere Reserve under the UNESCO Man & Biosphere Programme (1,881,200 ha).

IUCN MANAGEMENT CATEGORY

II National Park

BIOGEOGRAPHICAL PROVINCE

Amazonia / Yungas / Puna (8.5.1 / 8.35.12 / 8.36.12)

GEOGRAPHICAL LOCATION

The Park lies in the southeastern Peruvian Andes 70 km directly northeast of Cusco, covering most of the Manú River catchment from the crest of the Cordillera de Carabaya to the rainforests of the Amazon basin, between 71°10' to 72°22'W and 11°17' to 13°11'S.

DATES AND HISTORY OF ESTABLISHMENT

1968: The Manú area first declared a Nature Reserve.

1973: The National Park established by Supreme Decree No 644-73-AG;

1977: Designated a UNESCO Biosphere Reserve with surrounding protected areas;

1980: The Manu Reserved Zone established by Supreme Resolution No.151-1980;

2002: The National Park enlarged by the Manu and Amarakaeri Reserves to 215,537.74 ha;

2009: The site boundary in the east slightly amended to include the whole of the National Park.

LAND TENURE

State, in the Departments of Madre de Dios and Cuzco. Administered by the *Instituto de Recursos Nacionales* (INRENA) under the *Corporation de Desarrollo de Madre de Dios* for daily oversight and the *Dirección General Forestal y de Fauna* for long term planning.

AREA

Manú National Park covers 1,716,295 ha, including a detached Cultural Zone of 19,395 ha 40 km to the east. The overlapping Biosphere Reserve also includes the adjacent and intervening *Reserva Manú* of 257,000 ha and the Amarakaeri Communal Reserve of 402,335 ha.

ALTITUDE

365 (Manú river mouth) to ~4,000m (Cerro Huascar).

PHYSICAL FEATURES

The Park, on and below the eastern slopes of the Andes, protects almost the whole watershed of the Rio Manú and many left bank tributaries of the Rio Alto Madre de Dios which drains eventually via the Rio Madiera into the Amazon. It is almost half the size of Belgium or the size of the state of Hawaii. The site falls steeply from over 4,000m on the Paucartambo Mountains of the easternmost Cordillera of Peru, the Cordillera de Carabaya, then extends over low rolling hills between the many tributary river valleys covering half the area, onto the flat alluvial plains of the Amazon basin that cover two-fifths of the site and are seasonally enriched by sediment-bearing floods from the mountains. Tertiary and Quaternary sedimentary rocks from less than 1 to 111 mya underlie the low hills and the plains. The mountains above 1,500m are formed of Precambrian and Palaeozoic sedimentary and metamorphic rocks more than 440 million years old. The adjoining Reserved Zone is mainly the flood plain of the lower Manú river down to its confluence with the Rio Madre de Dios, where for long periods the river has meandered over the plain leaving a number of ox-bow lakes and white sand bars. The soils vary from mountain lithosols to nutrient-poor laterites, rich ancient sediments and the very rich regularly renewed sediments of the plain.

CLIMATE

The area has a wide range of climates from the cold dryness of the Andes through a misty subtropical cloud belt to the hot humid Amazon forests. There are no long term meteorological records for the Park available. At the Biological Station of Cocha Cashu at 400m, the rainfall between September 1976 and August 1977 was 2,100mm. There are virtually no records of rainfall within the Park above Pilcopata at 650m where the mean annual rainfall from 1971 to 1980 was 3,929mm and all months had more than 100mm of rain with July, the driest month, averaging 188mm. Higher up the mountains the rainfall drops with the temperature. There is a rainy season from October to April averaging a monthly rainfall of more than 200mm, falling from early May to late September to less than 100mm a month, though this may be almost doubled by condensation on the leaves of the cloud forest. In the lowlands the annual temperature variation is low. The coldest month is June with an average temperature of 11.1°C, the warmest is October with 25.4°C; the summer maximum can reach 36°C. In the mountains the temperature cools by 0.6 per 100 meters and on the *puna* averages between 3°C and 6°C.

VEGETATION

The Park's range of altitude, climate, soils and vegetation is very wide. Although the number of species is estimated at between 2,000 and 5,000, the flora is still incompletely known, and existing inventories must be considered preliminary (Gentry, 1985a, b). In 2005, for example, long established researchers with the local CREES Foundation claim that there are 15,000 species in the overlapping Biosphere Reserve, and Foster (2001) listed 1,437 species of vascular plants near the Cocha Cashu lowland jungle research station alone. Most of the information has been gathered in the lowlands; on the mountain cloud forests and *puna*, less is available. The 1986 management plan by UNA-LaMolina-CEPID, using the Holdridge system following Tosi (1960), mapped 14 forest types, though given the paucity of rainfall data, the description is speculative. The three main vegetation types are the barren *puna* or alpine grassland above 3,200m, shading through elfin forest into subtropical montane cloud forest or *yunga* to 1,800m and, through humid and very humid subtropical forests and humid tropical forest to the tropical lowland rainforest dominant over much of the site. The latter grows on the alluvial plain which is often seasonally flooded, creating *varzea* forests, and on the interfluvial hills which may

suffer seasonal water loss since the rainfall is variable. The montane forests experience less variation in water supply and are colder.

Between about 1975 and 1985, 1147 plant species were found in the small area of 500 ha. Data from Saavedra in 1989 detailed 1,200 lowland vascular species. 200 trees were found on a single one-hectare plot near the Cocha Cashu research station and a figure of 300 trees in one hectare of the Southwest Amazon moist forest biome was cited by Sears in 2001. In a one-hectare plot of alluvial lowland forest, 17 trees of over 70cm in diameter were found where 4 to 11 trees of that diameter are typical. The biggest tree was a *Ceiba pentandra* (120cm), while others included the locally rare *Poulsenia armata* (110cm), *Calycophyllum* sp.(117cm), locally endangered *Swietenia macrophylla* (105cm) and *Dipteryx odorata* (100cm). The commonest tree in the plot was *Otoba parviflora*. Other highly abundant species included palms of the genera *Astrocaryum*, *Iriartea* and *Scheelea*, two species of *Quararibea* (Bombacaceae), *Guarea* and *Trichilia* (both Meliaceae from the subcanopy), one *Pouteria* (Sapotaceae), *Pseudolmedia laevis* (Moraceae) and *Theobroma cacao* (Sterculiaceae). *Iriartea deltoidea* palm swamps are common. Another striking feature of these forests is the high abundance of *Ficus* species of which there are at least 18, and of lianas. 43 species of which have been recorded within 1,000 square metres. It is claimed that there are 179 species of orchid in the cloud forest (Manu Tours,n.d.). With incomplete knowledge of the flora of the Park it is not possible to give a detailed account of threatened, endemic or potentially economically important species, though it is known that the native Indians use a great many species medicinally (CREES Foundation, 2005). Cocoa *Theobroma cacao* and South American sapote *Quararibea cordata* are both cultivated for their fruits outside the Park and in the humid forest, two species economically important for their wood, large-leaf mahogany *Swietenia macrophylla* (VU) and tropical cedar *Cedrela odorata* grow in almost pure stands.

The cloud forest vegetation above about 1,800m is rich in ferns, tree ferns, bromeliads and orchids; also the large leaved species *Monstera*, *Philodendron*, *Diffenbachia* and *Xanthosma*. The barren *puna* bunch-grasslands are dominated by *ichu* or needle grass *Stipa ichu*, also by species of fescue *Festuca*, bluegrass *Poa* and the reed bent grass *Calamagrostis*.

FAUNA

The southwest Amazon moist forests have the highest number of both mammals and birds recorded for the Amazon basin (Sears, 2001), preserved hitherto by their inaccessibility and the lack of roads. Most data were recorded in the lowlands and there is less information on the fauna of the mountain cloud forests and *puna*. 200 species of mammals are recorded (5% of the world's total and 40% of Peru's). There are 13 species of monkey, and over 100 species of bat. Notable and threatened species include bushy-tailed opossum *Glironia venusta*, emperor tamarin *Saguinus imperator*, Humboldt's woolly monkey *Lagothrix lagotricha* (VU), giant armadillo *Priodontes maximus* (VU), hairy long-nosed armadillo *Dasybus pilosus* (VU), giant anteater *Myrmecophaga tridactyla* (VU), forest rabbit *Sylvilagus brasiliensis*, capybara *Hydrochaeris hydrochaeris*, spotted paca *Cuniculus paca*, pacarana *Dinomys branickii* (VU), brown agouti *Dasyprocta variegata*, green acouchi *Myoprocta pratti*, bush dog *Speothos venaticus*, short-eared dog or zorro *Atelocynus microtis*, culpeo or Andean fox *Pseudolopex culpaeus*, spectacled bear *Tremarctos ornatus* (VU), the weasel-like tayra *Eira barbara*, giant Brazilian otter *Pteronura brasiliensis* (EN: 200 individuals, the world's largest population), jaguar *Panthera onca*, ocelot *Leopardus pardalis*, oncilla *L. tigrinus* (VU), Andean cat *L. jacobita* (EN), jaguarundi *Puma yagouaroundi*, lowland tapir *Tapirus terrestris* (VU), collared peccary *Tayassu tajacu*, whitelipped peccary *T. pecari*, north Andean huemul deer or taruca *Hippocamelus antisensis* (VU) in the *puna*, grey and red brocket deer *Mazama gouazoubira* and *M. americana*.

Within the larger, but overlapping Biosphere Reserve, a recent study from the Field Museum in Chicago lists 222 species of mammals recorded along an elevational transect in the Manu Biosphere Reserve. Twelve species found were new to science; four others might be new and are being evaluated. Their tally of mammals comprises 20 species of opossums, one shrew opossum, two armadillos, 5 sloths and anteaters, 92 bats, 14 primates, 21 carnivores, one tapir, 7 even-toed ungulates, 58 rodents, and one rabbit (Patterson, Stotz & Solari, 2006). These may not all be found within the National Park site, but the potential for increased discoveries in the area is clear.

More than 800 bird species (Saavedra, 1989) have been identified, 500 from the lowland forests around Cocha Cashu Biological Station alone, Avian records in the 2006 Field Museum study made

along the same transect list 1,005 species of birds (25% of known South American birds and 10% of world species) The checklists of Terborgh, Janson & Brecht (1984) give habitats, foraging position, activity, sociability and abundance for all birds and mammals found up to 1982. According to Renton (1990), six species of macaw occur in the lowland forest: blue-and yellow *Ara ararauna*, red-and-green *A. chloropterus*, scarlet *A. macao*, chestnut-fronted *A. severus*, *Orthopsittica manilata* and blueheaded macaw *Primolius couloni* (VU). Rare species also include yellow-rumped antwren *Terenura sharpei* (EN), marvellous spatuletail *Loddigesia mirabilis* (EN), golden plumed parakeet *Leptosittaca branickii*, (VU), black tinamou *Tinamus osgoodi* (VU), Buckley's forest falcon *Micrastur buckleyi*, and rufus-fronted antthrush *Formicarius rufifrons*. The king vulture *Sarcoramphus papa*, and harpy eagle *Harpia harpyja* also occur. The 2006 Field Museum study included 682 species seen and another 108 documented by recognizable photographs or voice recordings. It noted a largely resident avifauna, including 911 year-round residents, 42 migrants from the north, 24 migrants from the south or other tropical areas, and 28 vagrants (Patterson, Stotz & Solari, 2006). In 1992 the International Council for Bird Preservation described three Endemic Bird Areas represented within the Park: the South-East Peruvian lowlands, with 15 restricted range species, the Eastern Andean Foothills of Peru, with 11 restricted range species, and the High Peruvian Andes with 30 restricted range species, totalling 56.

There are 68 species of reptiles, among them black caiman *Melanosuchus niger*, common spectacled caiman *Caiman crocodilus*, and yellow-spotted river turtle *Podocnemis unifilis* (VU) (Sears, 2001), and 77 species of amphibian from five families known from near the Cocha Cashu Biological Station (Rodriguez & Cadle, 1990). There is no complete checklist available for invertebrates, but the Park may contain around 500,000 species of arthropod. Fish species eaten by the local population identified by Groenendijk & Hajek (1995) include gamitana *Colossoma macroponum*, paco *Piaratus brachypomus* red-tailed sabalo *Brycon erythropterus*, boquichico *Prochilodus nigricans*, lisa *Leporinus trifasciatus* and lisa *Schizodon fasciatus*. 1,307 species of butterflies are also recorded, 15% of the world's total (CREES Foundation, 2005). Another unreferenced record cites 99 species of reptiles, 140 amphibians, 210 fish, 650 beetles, 300 ants and 136 dragonflies (Mundandino, n.d.).

CONSERVATION VALUE

Manú National Park is possibly the most biologically diverse protected area in the world, containing nearly all the ecosystems, flora and fauna of eastern Peru, 10% of the world's bird species, 5% of its mammals, a vast number of fish, reptiles, amphibians and invertebrates, including over 500,000 species of arthropods (IUCN, 1989). At least 13 species are globally threatened and it may have more plant species than any other protected area. The Park lies within a Conservation International-designated Conservation Hotspot, a WWF Global 200 Freshwater Eco-region, a WWF/IUCN Centre of Plant Diversity, a BirdLife-designated Endemic Bird Area and is contained within a UNESCO Biosphere Reserve.

CULTURAL HERITAGE

The Park is inhabited by at least four different Amerindian groups who follow long unchanged customs: the Machiguenga, the Mascho-Piro, the Yaminahua (or Yora) and the Amahuaca. The first is the best known and largest ethnic group, found throughout the area with the exception of the highlands and upper Manú river. Several tribes are organized in communities, others live in voluntary isolation, rejecting contact with modern society. The forest Indians are nomadic, mostly subsisting on a root crop such as manioc grown on the alluvial soils of river banks and lakes, on hunting along water courses and in the forest, on fishing and collecting turtle eggs (Jungius, 1976). Shifting cultivation is their basic agriculture where a patch of primary forest or old field is cleared, burned and cultivated for up to three years then abandoned for at least five years and a new field opened up. As secondary growth on old fields is easier to clear than the primary forest, they prefer to re-use them. These peoples are considered part of the area's natural system, and are left to use the Park as they please while their lifestyle does not threaten its objectives.

LOCAL HUMAN POPULATION

The Madre de Dios region has a low population density, with human activity mainly along the rivers which provide the best travel routes. The Biosphere Reserve is home to eight tribes as well as highland Quechua-speaking communities and immigrant mestizo colonists, in all totaling 18,000 (CREES, 2005). The Machiguenga were reported by Ferrero in 1967 to have a total population of 5,000 people, and by Varese in 1972, 12,000. Very little is known about the distribution of the Amahuaca and

Yaminahua and their numbers are relatively small: Varese recorded some 4,000 Amahuaca along the Curanga, Inuya and Sepanua rivers, and 2,000 Yaminahua along the Carija and Piedra Rivers. However, the management plan by UNA-La Molina (1986) suggested that only 300-500 tribesmen live in the Park. There are some 70,000 Quechua-speaking inhabitants grouped in 30 rural communities in the high Andes next to the Park in the Paucartambo district. In 1980, 50% of the people living just outside the Park's lowland borders were gold miners, 25% or more of the remainder being mainly peasant farmers or fishermen.

VISITORS AND VISITOR FACILITIES

The Park is quite near to both Cusco and Machu Picchu. In the 1980s the Park and Biosphere Reserve received 250-300 visitors annually, rising to 1,655 in 1999, usually in organised groups during the May to October dry season because in the rains the road becomes impassible. Recently 6,000 people, mainly foreigners, visited the Cultural Zone and Wildlife Centre in the Manú Reserve every year (CREES, 2005). The main activities are wildlife watching - especially birds - on guided walks or by boat; also rafting. There are several tourist lodges: one at Boca de Manú where the Manú meets the Madre de Dios River others and one at the lowland forest Wildlife Centre near to macaw and tapir salt licks. The main wilderness lodge is the Casa Matsigenka some 50 km upriver from the confluence. More accessible lodges in the buffer zone have been developed with native people, at Pantiacolla, with a 3,000m mountain forest bird-watching trail and at Cock-of-the-Rocks Lodge. Riverside campsites and some hostels are available. Six tourism companies operate 20-bed lodges in Manú, run on sustainable principles (Janson, 1994). There are two recreational areas, one at Ajanaco-Tres Cruces on the main entrance road at the southern end of the Park, and in the Manu Reserve along the lower Manu river. There are two main routes in: a gravel road from Cuzco to the Administration Centre at Salvacion, followed by travel along the river which takes up to 1.5 days; or by air from Cuzco to Boca de Manú, although again river travel is necessary to get well into the area. Regular air and highway access is possible to Puerto Maldonado over 1,000 km east, but the journey by road and river from there to the Park is long and tiring.

SCIENTIFIC RESEARCH AND FACILITIES

The first collections in Manú were made in the late 1950s by C.Kalinowski, who sold birds, mammals and reptiles to several museums around the world and first engaged the interest of conservationists and the Field Museum in Chicago which has continued to sponsor expeditions to the area ever since by a wide range of scientists, mainly from the U.S.A. The first research was done on the black cayman by K.Otte with J.Cardenas. In 1974 a group of scientists from Princeton University and Chicago University began a series of long-term ecological studies on primates, and in 1975 botanical and ornithological studies were added. Although the main programs focus on primates, birds and floristic inventories, there have been other programs on giant otters, cats, ants, the black caiman and the yellow-spotted turtle. The few plant collections are those of Foster, and Gentry (both 1985) made in the alluvial plains near the Cocha Cashu Biological Station, and in the Tres Cruces region of the uplands. Other collections were made by Terborgh, and Janson (also both 1985) on trees where birds and primates obtain food around the station. A study on the impact of tourism on the Park's animals was made by Dunstone in 1989. In 1994, the Imperial College London Manu Expedition studied orchid and fish diversity (Groenendijk & Hajek, 1995).

Cocha Cashu Biological Station was established in 1969 by the National Agrarian University La Molina and enlarged by a WWF-funded research facility in 1981. It is located 45 km northwest from the mouth of Rio Manú (80 km upstream) about 8 km inside the National Park. The station consists of two thatch-roofed houses accommodating some 20 - 30 researchers each year in very simple conditions, and there is a network of trails totalling roughly 20 km laid out around it. A local NGO, the Rainforest Education & Resources Center (the CREES Foundation), working from their research centre near Pilcopata in the Alto Madre de Dios valley buffer zone, has more recently sponsored and channelled research into ethnobotany, ecology, soils, and the monitoring of mammals, birds and forests within the Biosphere Reserve.

MANAGEMENT

Manú National Park has full legal protection by National Decree but has been well protected by its remoteness and its native inhabitants. It is administered by INRENA under the supervision of the Development Corporation of Madre de Dios for daily oversight and the Directorate General of Forestry and Fauna for long-term operations. Its main objectives are to preserve the environment and its

biodiversity, and to provide areas for recreation and education of the public. Most of the tourist and research pressure is directed to the adjacent Manu Reserve and the Wildlife Centre. A management plan, which was being updated in 2010, is implemented through three programs: Environmental Management, Public Use and Operations. The Park has been divided into four zones, the largest by far being the Restricted Zone mostly of undisturbed forest and native peoples accessible only to authorised researchers, official visitors and scientific tourist groups. There are two recreational Zones, 200 ha in Ajanaco-Tres Cruces, and in the 257,000 ha Reserved Zone adjoining the Park along the lowest 70 km of the Manu river which contains a Cultural Zone where fishing, hunting and logging are permitted. In the high *puna* there is a Recuperation Zone where grassland burning and cattle raising are brought under control. Service zones comprise small areas around control posts and the Biological Station, in some cases outside the boundary.

There is an administrative headquarters, five operational control posts, two in the upper watershed on the Sipituali and Takoyome rivers and one outside the Park on the lower Manu to discourage potential loggers and poachers. Efforts have been made to integrate local people into the management of the Park and a sustained program of personnel training, health care, education and resource management contribute to Manu's protection (Saavedra, 1989). Recognition of the area's importance has led to the development of long-term sustainable management and conservation strategies for the area and its native inhabitants, especially for the growing spread of native subsistence agriculture in the Special Use zone, but also in other lands bordering more accessible parts of the park. Local NGOs are helping to set up nature lodges with local forest families within the Biosphere Reserve but also to create title to Indian community lands, communal subsistence hunting reserves and larger reserves for uncontacted tribes (CREES Foundation, 2005). The Peruvian and Bolivian governments hope to eventually establish the Vilcabamba-Amboro Corridor, which will include Manu National Park (UNESCO, 2010).

MANAGEMENT CONSTRAINTS

Overgrazing of the *puna* has been an issue. There is about 4,000 head of cattle there where cattle ranchers regularly burn the grasslands to provide new grass and overgrazing is beginning to degrade the highlands (UNESCO, 2010). There is also a cattle raising project on Meseta Pantiacolla in the southwest. Since it is very difficult to remove the cattle, the grazing must be controlled by zonation of the park. Colonization is threatening on the eastern boundary of the Park, along the Palatoa and Pinipini tributaries to the Alto Madre de Dios and resettlement of these families has been needed in order to protect the Park (Peru, 1986). A North American company has gold mining rights along the Palatoa River. If gold were found, large numbers of people might be attracted to the area and mercury pollution of the rivers could ensue. Poachers enter the northwest side of the Park along the Sipituali River and between the Camisea and Manu rivers. Guard posts on these two rivers are necessary to protect the upper part of the Manu River (Peru, 1986). On the eastern boundary across the Pinipini, Pitama and Tono rivers and on its southern boundary in the uplands both licensed and illegal loggers fell the *Polylepis* forests and cut the Andean alder *Alnus jorullensis* for fire wood. The Peruvian Government has also appropriated two sections in the upper basin for oil prospecting, now in progress, violating the *Ley Forestal* (Forestry law) This remains a potential threat, especially from an oil pipeline which could be built across the property (UNESCO, 2010). In common with all Peruvian protected areas widespread political turmoil has weakened the Park in the past (Saavedra, 1989).

La Carretera Marginal de la Selva (Jungle Margin Highway) was planned along the Manú River but a group of a Peruvian conservation organisations, the Technical Committee for the Defence of Manu, prevented its construction. It could have introduced thousands of settlers and become endangered, but an alternative route, La Carretera Interoceanica, financed from Brazil to connect the Pacific and Atlantic with the Amazon basin, has since been nearly completed via Puerto Maldonado 100 km east: a more distant threat. The Southwest Amazon Moist Forests Global 200 Transboundary Ecoregion covers parts of Peru (Madre de Dios province), Brazil (Acre province) and Bolivia (Pando province). It contains some of the richest and most intact tropical rainforest and the highest biodiversity in the Amazon basin, with dozens of indigenous groups, some still uncontacted by the outside world (Sears, 2001). But this region is threatened by the Interoceanic Highway and the inevitable opening and paving of roads for small farmers, exploration for oil and gas, illegal mahogany logging, large-scale cattle ranching and agribusiness. The World Wildlife Fund is responsible for implementing the transboundary project, but its design and operation is shared with a consortium of Conservation International, the Nature Conservancy the Dutch Service Development Corporation and Dutch Tropenbos International (Sears, 2001; WWF, 2006).

STAFF

In 1989 Manú National Park had three professional staff and 29 technicians and rangers (Saavedra, 1989), based at the headquarters in Salvacion, and at the ranger stations.

BUDGET

Before 1977, WWF provided a total of US\$73,675 for the Park. Initially the Peruvian Government paid about US\$200,000 annually for the salaries and running expenses of the Park though the budget subsequently decreased (Saavedra, 1989). The UNF provided US\$28,750 rapid response funding and by 2009, the state budget was US\$205,719, growing in 2010 to US\$260,271 (UNESCO, 2010).

LOCAL ADDRESS

El Director, Parque Nacional y Zona Reserva del Manú, Micaela Bastidas 310, Wanchaq, C.P.591, Cusco.

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