

World Heritage Sites

Protected Areas and World Heritage



KINABULU PARK MALAYSIA

Mount Kinabalu, the highest mountain between the Himalayas and New Guinea, dominates this park in the state of Sabah on the northern tip of Borneo. The Park's altitudinal and climatic gradient from tropical lowland and hill rainforest through tropical montane forest to sub-alpine forest and scrub combined with steep slopes, varied geology and frequent climatic oscillations provide ideal conditions for speciation. The Park has a diverse biota and high endemism and is a Centre of Plant Diversity containing species from the Himalayas, China, Australia and Malaysia as well as pan-tropical flora. Most of Borneo's mammals, birds, amphibians and invertebrates many of which are threatened and vulnerable, occur in the Park.

COUNTRY

Malaysia

NAME

Kinabalu Park

NATURAL WORLD HERITAGE SITE

2000: Inscribed on the World Heritage List under Natural Criteria ix and x.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

The UNESCO World Heritage Committee issued the following statement at the time of inscription:

Justification for Inscription

Criteria (ix) and (x): The site has a diverse biota and high endemism. The altitudinal and climatic gradient from tropical forest to alpine conditions combine with precipitous topography, diverse geology and frequent climate oscillations to provide conditions ideal for the development of new species. The Park contains high biodiversity with representatives from more than half the families of all flowering plants. The majority of Borneo's mammals, birds, amphibians and invertebrates (many threatened and vulnerable) occur in the Park.

IUCN MANAGEMENT CATEGORY

II National Park

BIOGEOGRAPHICAL PROVINCE

Borneo (4.25.13)

GEOGRAPHICAL LOCATION

The site is in the Malaysian State of Sabah in northern Borneo 83 km west of Kota Kinabalu, the state capital, between 6°00'25" to 6°29'48"N and 116°21'30" to 116°45'00"E.

DATES AND HISTORY OF ESTABLISHMENT

- 1961: A Park was first proposed as a memorial to butchered prisoners of war by the Kinabalu Memorial Committee founded by an Australian military investigator. Following an expedition for the Royal Society of London, a report, *The Proposed National Park of Kinabalu*, by Professor E. Corner, a leading tropical botanist, was submitted to the Governor of the colony;
- 1962: The Sabah National Parks Ordinance of 1962 was passed by the colonial Legislature;
- 1964: Kinabalu Park (71,100 ha) was established under the ordinance following independence;
- 1984: Designated an ASEAN Heritage Park.

LAND TENURE

The State government. The Park is managed and administered by the Board of Trustees of Sabah Parks under the Ministry of Tourism, Culture and Environment.

AREA

75,370 ha

ALTITUDE

152m - 4,095m (Gunung Kinabalu).

PHYSICAL FEATURES

The Park comprises two main mountains, Kinabalu (4,095m), a massive inselberg which is the highest and only alpine peak of the Crocker Range and Tambuyukon (2,579m) 12 km north, with a narrow ridge-top extension further north to include three lower peaks. Kinabalu's topography is unusual: the summit has seven main jagged peaks which rise out of a sloping plateau of polished and exfoliated slabs of granite, and another seven peaks above 3,800m. The north side of the summit is split between east and west peaks by the vast smooth-sided cleft of Low's Gully, which has almost vertical 1,000-1,800m sides and extends 16 km flanked for 3.2 km by a northeast-running spur to a narrow ridge 3,500m high. The gullied sides of the mountain are the source of some ten to twelve rivers, and waterfalls, the Cascade Waterfalls and Liwagu Falls being two of the largest. There are caves, the Paka and Tumbling Bats caves, and near its foot at 550m are hot springs at Poring.

The state geologist in 1964 described the mountain: "Kinabalu is a granodiorite body, approximately circular in outcrop, of early Pliocene age; the granodiorite is intrusive into strongly folded strata, probably of Eocene to Miocene age, and associated ultrabasic and basic igneous rocks. The present landform is considered to be a mid-Pliocene peneplain, arched and deeply dissected, through which the Kinabalu granodiorite body has risen in isostatic adjustment" (Collenette, 1964). This plutonic batholith rose about 15 million years ago, and is still rising. It is ringed by metamorphosed rocks including serpentine, limestone and the mudstones and sandstones laid down underseas in the Oligocene 30 million years ago which form most of Borneo, including the Crocker Range, uplifted about 25 million years ago. The ultrabasic (ultramafic) rocks such as serpentine contain high concentrations of magnesium and iron and are globally uncommon. During the Ice Age, glaciers carved the massif into its present form. Above 3,200m the summit shows the effects of glaciation in its jagged peaks and sculpted nunatak rock pillars, striations, scoured, grooved and polished rock surfaces, cirques, u-shaped gullies, roches moutonnées and moraines. The sedimentary and volcanic rocks and the orange-brown ultrabasic clays, low in calcium and high in metals, are the parent material of eight soil associations. The soils grow poorer and more acidic with altitude.

CLIMATE

The site has a wet tropical climate with temperature, humidity and rainfall becoming temperate at height. February to May are generally the driest months, October to January the wettest. At Park Headquarters at 1,560m, the mean monthly temperature is approximately 20 °C, with a daily fluctuations of 7-9°C. The mean annual rainfall at this location is 2,380mm (Kitayama *et al.*, 1999). The local climate on the mountain is very variable. Early mornings are bright, followed by clouds which obscure the mountains by mid-day; showers usually occur on the upper slopes in the afternoon. In some years there are periods of prolonged dryness related to the El Niño Southern Oscillation which have severe effects on the Park's vegetation (Lowry *et al.*, 1973).

VEGETATION

Professor E. Corner, Assistant Director of Singapore Botanic Garden 1929 to 1946, in an essay in *Kinabalu: Summit of Borneo* said that Kinabalu had "the richest and most remarkable assemblage of plants in the world" (Luping *et al.*, 1978). A recent study by Beaman & Beaman (1998) states that the Kinabalu flora contains as many as 5,000 - 6,000 species, in over 1,000 genera and over 200 families, or more than half of all flowering plant families. This includes a very high number of endemics and endangered species. The IUCN 2008 Red List gives 60 species critically endangered, 34 endangered and 107 vulnerable species for Sabah, primarily of the flora and commercially valuable trees. The diversity is greatest in the lowland forests, but most of Kinabalu's endemics are found in the mountain forests, particularly on the low-nutrient serpentine soils. The massif, which is an island

in a sea of Dipterocarps, is one of the few mountain regions to possess a floristic richness to rival that of New Guinea, the eastern Himalayas or the Andes.

Natural vegetation covers 92% of the Park. It contains five tropical forest zones graded by altitude: Lowland Dipterocarp Forest (400-1,200m), Lower Mountain Forest (1,200-1,900m), Upper Mountain Forest (1,900-2,700m), Ultrabasic Rock Forest (2,700-3,000m), Granite Boulder Forest (3,000-3,300m). The Subalpine zone (3,300-3,700m) is treeless. Vegetation within the Park has been classified by Kitayama (1991), who lists 18 types of natural vegetation, and 3 types of induced vegetation. The most extensive communities are: tropical lowland rainforest (34.8% of the park), tropical montane rainforest (37.3%), evergreen microphyllous closed forest (15%) and secondary forest selectively logged before National Park designation (5.9%). There are smaller areas of tropical subalpine coniferous forest, secondary closed forest, ecotone communities, leptophyllous (narrow-leaf) closed forest, leptophyllous thicket, tropical alpine ericaceous thicket, evergreen suffruticose thicket, leptophyllous shrubland, lepto-nanophyllous thicket, matted dwarf-shrub thicket, tropical alpine dwarf-shrub heath, graminoids, cliff communities, rock desert communities and natural bare land. Induced types are the secondary forest, which is quite extensive around the lower peaks in the north, weeds and cleared land. Vegetation growing on ultrabasic soils covers some 16% of the Park and contains many species restricted to this substrate (IUCN, 2000).

The lowland forest occurs mainly to the north and east between Mount Kinabalu and Mount Tambuyukon, and is dominated by the Dipterocarpaceae such as *Shorea* (25 species CR, 7 EN), *Hopea* (7 spp. CR, 4 EN), *Vatica* (4 spp. CR, 3 EN) and *Dipterocarpus* (4 spp. CR), though not all of these endangered species are found in the Park. The canopy can reach 50 meters and *Koompassia excelsa* can grow to 90 metres. The forest is dark beneath with little ground cover but it supports the highest concentrations of animals because the huge trees provide a great variety of habitats and food. Dipterocarps fruit rarely but this forest is rich in fruit trees such as durian, rambutan and figs which are one of the most important food sources for monkeys, civets and larger birds. The lower montane oak-chestnut *Quercus-Castanopsis* forest grows above about 1,200 metres in the southern half of the Park. Borneo has over 100 species in the Fagaceae of which 12 chestnuts and almost 50 oaks grow on Kinabalu, including a rare species, trig oak *Trigobalanus verticillata*. In this zone the floristic diversity is even greater though trees are smaller, with a canopy of 25-30 metres. In the cooler climate, peat begins to develop and mosses become common. With more light there is a thicker ground cover and thicker epiphyte growth, especially of orchids. Common trees are of the eucalyptus and tea families as well as conifers such as *Dacrydium gibbsiae*, *Podocarpus imbricata*, *Dacrycarpus*, *Agathis* and the celery pine *Phyllocladus hypophyllus* where the foliage is composed of phylloclads (flattened stems) not leaves.

Evergreen microphyllous forest dominated by *Tristania elliptica* grows widely northwest of both great peaks on ultrabasic soils. The upper montane cloud forest grows above about 2,200m where mists blanket the forest much of the day. The trees are thickly cloaked with mosses and liverworts, orchids are abundant on the ground and as epiphytes, and rhododendrons with conifers become common. In the subalpine meadow zone by about 3,300m the trees are gnarled and stunted shrubs with conifers and rhododendrons dominating and in open wet ground, grassy meadow-like associations. Many of the alpine species are similar to plants in the alpine zones of New Guinea. Above 3,700m only a few dwarfed twisted shrubs and sparse tough grasses grow in sheltered nooks and crevices.

There are some 1,200 orchid species in 121 genera, including at least five species of the now rare slipper orchid such as *Papiopedillium dayanum* and *P. rothschildianum*. Other vegetation includes 610 ferns - more than in all of mainland tropical Africa, 10 *Nepenthes* pitcher-plants (out of Borneo's 38 species), with 4 species endemic to Kinabalu's ultrabasic soils: *Nepenthes burbidgeae* (EN), *N. rajah* (EN), *N. edwardsiana* (VU) and *N. villosa* (VU), 27 *Rhododendron* species (5 endemic to Kinabalu), 78 *Ficus* species - over half of all those found in Borneo, 52 palms, 6 bamboos and 30 gingers (Beaman, 1996). *Rafflesia*, a parasite on the wild grape-vines *Tetrastigma* spp., is found in very few locations in Borneo and of the five species, two, *Rafflesia keithii* and *R. pricei*, occur on the mountain. By 2001 five exhaustive volumes inventorying the plants of Mount Kinabalu had been published in Sabah and by Kew Gardens covering ferns and fern allies, orchids, gymnosperms, non-orchid monocotyledons and dicotyledons (Parris *et al.*, 1992; Wood *et al.*, 1993); Beaman *et al.*, 1998; Beaman, 2001).

FAUNA

Kinabalu's rich fauna has been studied extensively; 90 mammals are lowland species and 22 montane. Notable are moonrat *Echinosorex gymnura*, Sunda pangolin *Manis javanica* (EN), Bornean orangutan *Pongo pygmaeus morio* (EN: ±50 individuals, Ancrenaz, 2005), Borneo gibbon *Hylobates moloch* (EN), grey leaf monkey *Presbytis hosei everetti* and maroon leaf monkey *P. rubicunda*, western tarsier *Tarsius bancanus borneanus* (VU) Bornean slow loris *Nycticebus menagensis* (VU) Malayan sun bear *Helarctis malayanus euryspilos* (VU), the endemic Bornean ferret-badger *Melogale everetti*, Sunda clouded leopard *Neofelis diardi borneensis* (VU), Borneo bay cat *Pardofelis badia* (EN), marbled cat *P. marmorata* (VU), masked palm civet *Paradoxurus hermaphroditus*, bearded pig *Sus barbatus*, sambar deer *Cervus unicolor* (VU), southern red muntjac *Muntiacus muntjak*. and mouse deer *Tragulus* spp. (WWF & IUCN 1995; IUCN 1996). There are high numbers of bat and rodent species, and 28 species of tree shrew of which the black shrew *Suncus ater* and the Kinabalu shrew *Crocidura baluensis* (VU) are endemic to the mountain. Kinabalu giant red leech *Mimobdella buettikoferi* and Kinabalu giant earthworm *Pheretima darnleiensis* are well known invertebrates.

Two-thirds of all Bornean reptiles are said to be found in the Park (IUCN, 2000). Frog and toad species number approximately 61 (Inger *et al.*, 1996), mainly living below 1,000m. There are 17 species of lizard including slender skink *Sphenomorphus kinabaluensis* and Kinabalu bent-toed gecko *Cyrtodactylus baluensis*, and 23 snakes. Approximately 200 species of butterfly have been seen, most occurring in the lowlands below 2,000m; and about 112 macro moth species have been identified, mostly above 2,000m (Holloway, 1996) although a local source quotes 600 butterfly and 1,000 moth species (Sabah Tshung Tsin School, 2007). 40 species of fish, from nine families have been recorded. The most common are the Gastromyzontidae, frequently found grazing on the surface of rocks and gravels in the clear mountain streams (Chin, 1996).

There are 326 species of birds out of Borneo's total of 518, graded as the habitats change with altitude from the lowland forest below 1,000m through non-endemic and endemic species of the montane zone to the subalpine forests above 2,000m. Some 22 species of montane birds include mountain serpent eagle *Spilornis kinabaluensis* (VU), rhinoceros hornbill *Buceros rhinoceros*, red-breasted partridge *Arborophila hyperythra*, crimson-headed partridge *Haematortyx sanguiniceps*, black oriole *Oriolus hosii*, Dulit frogmouth *Batrachostomus harterti*, Hose's broadbill *Calyptomena hosii* and Everett's thrush *Zoothera everetti*. Above the tree line there are white-browed shortwing *Bradypteryx montana* and the Kinabalu friendly warbler *Bradypterus accentor*.

CONSERVATION VALUE

The site contains one of the richest and most diverse floras in the world, with high levels of endemism. It is a Centre of Plant Diversity containing species from the Himalayas, China, Australia and Malaysia as well as pan-tropical flora and where most of Borneo's mammals, birds, amphibians and invertebrates, many threatened and vulnerable, are found. The high diversity is due to its great altitudinal and climatic ranges, the varied and steep topography which creates geographic isolation over short distances, the diverse geology and exceptional natural beauty. The Park lies within a Conservation International-designated Conservation Hotspot, a WWF Global 200 Freshwater Eco-region, a WWF/IUCN Centre of Plant Diversity and a BirdLife-designated Endemic Bird Area.

CULTURAL HERITAGE

Mount Kinabalu is still regarded as a sacred mountain, *Aki Nabalu*, revered place of the dead, by the native Kadazan Dusun people of the foothills which is one reason its uplands remained untouched (IUCN, 2000). North Borneo became a British protectorate in 1882 and a colony between 1946 and 1963. Kinabalu was first climbed in 1851 by Hugh Low, though the true summit was reached only in 1888 by a botanist team.

The Park was proposed in 1961 to commemorate 1,787 Australian and 641 British prisoners of war who were murdered on a 240 km Japanese death march from Sandakan to Ranau near the mountain in 1944, and the natives who risked their lives to help them. An investigator in Australian military intelligence, Major G. Carter, profoundly affected by the atrocities committed, formed the Kinabalu Memorial Committee. Following a report on the mountain's flora by Professor E. Corner his report, *The Proposed National Park of Kinabalu* was submitted to the Governor. The Park was created the next year.

LOCAL HUMAN POPULATION

The Dusun people of the region practised shifting cultivation until the mid 20th century when they started market farming of vegetables and flowers instead. In 2000 a family of 12 which had lived in the area for five generations occupied 40 ha inside the Park. They practised low level subsistence farming, growing fruit trees and rice and collecting forest products such as bamboo, rattan and pandanus for handicrafts.

VISITORS AND VISITOR FACILITIES

Including visitors to Poring Hot Springs at the base, the mountain is well visited, being within a two hour drive from Kota Kinabalu. In 1982, after completion of a road from the coast, visitors numbered 45,948. But between 1994 and 1998 the average number of visitors was 370,000 and they are well provided for. Kinabalu is a fairly easy climb up the main 8.5 km path from the main entrance to the top though guides must be hired. A 2-km longer trek via the Mesilau path is harder. Visitor facilities are sited at three locations: at the Headquarters on the southern boundary, at Poring Hot Springs on the southeast boundary and at the Mesilau Nature Resort between them on the southern boundary. A variety of overnight accommodation in lodges, chalets and hostels grouped mainly around the main entrance will take 491 people and around Poring, 90 people. On Kinabalu itself there are seven mountain shelters on the summit path, the highest at Labu Rata, at 3,270m. At 3,800m the mountain has the world's highest *via ferrata* or mountain torq, a rock climb equipped with fixed cables, rungs, ladders and bridges. Amenities at the three centres include visitor centres, a conservation centre, an amphitheatre, short interpretative trails, restaurants and gift shops. Networks of trails, a butterfly conservation centre, a tropical garden and a canopy walkway at Poring have been built. There are also two ranger stations at Sayap and Sorinsim on the western and eastern boundaries, for law enforcement.

SCIENTIFIC RESEARCH AND FACILITIES

As the first biological reserve established in Sabah, Kinabalu Park has been studied extensively by many scientists from around the world for its extraordinary range of flora and fauna. It is now one of the best known of any tropical area of its size. The 1851 visit brought back specimens, the 1988 team collected mammals; there was a scientific expedition in 1894 by Staph, and Lilian Gibbs in 1910, brought to the British Museum over 1,000 botanical specimens and with Gibbs in 1914 compiled the first major account of the flora. Professor E. Corner's expeditions of 1961 and 1964 for the Royal Society of London to record the flora, were vital in the creation of the Park. Today, over 300 research projects have been conducted in the Park and there are a laboratory and herbarium at the main entrance and the Butterfly Centre at Poring. After 1986 there was been an increased emphasis on research in the park, such as projects on *Nepenthes villosa*, the *Rafflesias* and the orchid *Paphiopedilum rothschildianum*. From 1992 the Kinabalu Ethnobotanical Project on medicinal plants examined 9000 specimens: 31% of all the mountain's species were found to have medicinal uses. Since May 1995 four fully automated weather stations have been established at Poring hot springs (550m), Park headquarters (1,560m), Carson Camp helipad (2,650m) and Laban Rata hostel (3,270m).

Educational developments increased in the Park after 1980, following the creation of an Ecology section by Park authorities. The section initiated the excellent collection of insect and plant specimens, and prepared a plan for the Exhibition Centre. In 1982 a mountain garden was established at Mesilau bringing together a collection of plants from all over the Park. A Memorandum of Understanding between the Royal Botanic Gardens, Kew and Sabah Parks was signed in June 1998 to establish co-operative relations and mutual assistance in the areas of research and training. Its immediate aim was to enlarge the representation in herbaria of reference specimens of plants and fungus species found in Sabah's parks.

MANAGEMENT

The State of Sabah Parks Enactment 1984, with the Amendment of 1996 govern the control of Parks. The management strategy was based largely on Canadian National Parks policy. A Management and Development Plan for Sabah Parks, with particular emphasis on Kinabalu was commissioned in 1990 by the Board of Trustees. This is the basic working document, identifying its purpose, natural values, management objectives, management strategy and future development. The five main focus areas include: conserving biological and physical resources, spearheading scientific research and enhancing educational values, increasing recreational and tourist activities, preserving cultural and historical values and instituting management procedures to support other strategic thrusts. Activities that contravene the outlined provisions may result in imprisonment for

one to three years and a fine of between RM 25,000 and RM100,000. Updating the plan remains necessary in 2009.

MANAGEMENT CONSTRAINTS

Potential threats to the integrity of the site currently arise from the exercise of native rights, cultivation, commercial over-collection of animals and plants, and climate change. Several areas in the Park have been claimed by adjacent villagers under Section 15 of the Land Ordinance where they claim to possess customary rights to fruit tree cultivation and burial grounds. Five areas are claimed totalling approximately 2,000 ha. With a growing population and a lack of available land elsewhere this may become a future pressure point. Villagers' informal agricultural activities inside the Park may also become of future concern to management. The region is subjected to periods of climatic extremes intensified by El Niño events. Droughts often result, frequently affecting the vegetation as in 1997-1998 when forest fires broke out in nine places over an area of 2,500 hectares. Visitor activities, centred mainly in three locations produce erosion, noise and litter over 5% of the site but are largely under control. Copper mining at Mamut, to the east of Kinabalu which threatened the Mamut River, has ceased although a scar and a huge sludge pond remain.

STAFF

195 staff were employed in 2000, 95 in the Management and Operation Section, and 37 in the Research and Education Section. The Park Warden is responsible for the overall management and administration of the park. The day to day administration of the park is undertaken by 1 assistant warden, 2 senior park rangers, 18 park rangers and 88 maintenance staff. Advanced training is subsidised for selected staff.

BUDGET

Financial support for the management and operations expenses of the Park is received via a government grant to Sabah Parks. In 1998 this totalled US\$631,662. Other income is generated from entrance, climbing and accommodation fees, as well as fines. Total revenue generated in 1998 amounted to US\$526,385. Total expenditure by the Management and Operations Section that year was US\$486,906, and the Research and Education Section spent US\$247,728.

LOCAL ADDRESSES

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Sabah Wildlife Department, 5th Floor, Block B. Wisma MUIS, Jalan Masjid Negeri, 88100 Kota Kinabalu, Sabah, Malaysia.

The Sabah Society, P.O. Box 10547, 88806 Kota Kinabalu, Sabah, Malaysia.

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