
WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

KINABALU PARK (SABAH, MALAYSIA)

1. DOCUMENTATION

- i) **IUCN/WCMC Data Sheet:** (16 references)
- ii) **Additional Literature Consulted:** IUCN-SSC. 1998. Global Action Plan for Microchiroptean Bats. Final Draft; Braatz, S. 1992. Conserving Biological Diversity: A Strategy for Protected Areas in Asia – Pacific Region. World Bank Technical Paper 193; Collins, M. *et al* eds. 1991. **The Conservation Atlas of Tropical Forests – Asia and Pacific;** IUCN McNeely, J. 1999. **Mobilising Broader Support for Asia’s Biodiversity.** ABD; MacKinnon, J. ed. 1997. **Protected Area Systems Review of the Indomalayan Realm.** ABC/WCMC; Hitchcock, P. 1998. Post World Heritage Seminar Report on Mission to Malaysia; CIFOR/UNESCO 1999. **World Heritage Forests – The World Heritage Convention as a Mechanism for Conserving Tropical Forest Biodiversity;** Cubitt, G. 1996. **Wild Malaysia.** New Holland; Meng, W. K. 1991. The State of Nature Conservation in Malaysia. Proceedings; Kitayama, K. 1993. Human Impacts and Implications for Management in Mount Kinabalu. *in* Hamilton, L. *et al* eds. 1993. **Peaks, Parks and People.** East-West Centre; IUCN/WWF. 1995. **Centres of Plant Diversity.** Vol. 2. Asia; MacKinnon, K. *et al* 1996. **The Ecology of Kalimantan.** Periplus; Khoom, Wong. 1998. Kinabalu: Sabah’s Tropical Paradise. **Plant Talk** (15); Cleary M and P. Eaton. 1992. **Borneo – Change and Development.** OUP; MacKinnon, J. 1975. **Borneo.** Time-Life Books; Brooks, R. R. 1987. **Serpentine and its Vegetation.** Croom Helm; Roberts, J. L. 1989. **Geological Structures.** Macmillan Field Guide.
- iii) **Consultations:** 13 external reviewers, officials from Sabah Forest Department,
- iv) **Field Visit:** J. Thorsell, January, 2000

2. SUMMARY OF NATURAL VALUES

As the highest mountain between the Himalayas and New Guinea, Mount Kinabalu (4,095m) holds a distinctive position for the biota of Southeast Asia. Kinabalu is a granite intrusion formed 15 million years ago by the hardening of a mass of molten rock that rose beneath the sedimentary rocks of Borneo’s Crocker Range. One million years ago this pluton was thrust upward by tectonic movements which continues to this day. The sandstone and shale that once covered the granite have been eroded to reveal the underlying rock. During the Pleistocene, glaciers covered Kinabalu’s summit, scouring the granite plateau and sharpening the jagged peaks above the ice. The ice sheet disappeared 10,000 years ago. Since then, wind and water have sculpted the summit peaks further to create pinnacles and deep valleys.

Kinabalu Park presents a wide range of habitats within its altitudinal range of 152m – 4,095m and size of 75,370ha. Natural vegetation covers 93% of the park with rich tropical lowland and hill rainforest (dominated by diptocarps) amounting to 35%. Tropical montane forest covers another 37% of the park with sub-alpine forest and evergreen scrub found at the higher elevations. Of particular conservation significance are vegetation types developed on ultramafic (serpentine) rocks. Ultramafic vegetation covers about 16% of the park and contains many species restricted to this substrate.

Kinabalu has been identified by IUCN/WWF as a Centre of Plant Diversity. Despite its geological youth, it is exceptionally rich in species with elements from the Himalayas, China, Australia, Malesia and Pantropical floras. The park has between 5,000-6,000 vascular plant species, 1,000 of which are orchids. It is particularly rich in *Ficus* (78 taxa), ferns (610sp) and *Nepenthes* (9 species of pitcher plants). *Rafflesia*, a rare parasitic plant is also found. The mountain flora has diverse “living fossils” such as the celery pine and the trig-oak, the evolutionary link between oaks and beeches.

Wildlife is also diverse with 90 species of lowland mammals and 22 others found in the montane zone. Four species of primates occur and 326 bird species have been recorded. Mount Kinabalu is thus both species-rich and an important centre for endemism. Half of all Borneo's birds, mammals and amphibian species including many rare and endangered species occur in the park. Two-thirds of all Bornean reptiles and at least half of its plant species are represented in the park.

3. COMPARISONS WITH OTHER AREAS

The island of Borneo is a Biogeographic Province on its own which includes five other IUCN category II national parks larger than the nominated site. None has the altitudinal gradient (almost 4,000m) and the variety of life zones of Kinabalu. Unfortunately, the protected areas on the Indonesian portion of the island have been seriously degraded and Kinabalu is considered as being one of only two sites on the island (along with Gunung Mulu) with potential as a natural World Heritage site. Even though there are 28 centres of plant diversity and endemism on Borneo, "by far the most important site in Borneo is Mount Kinabalu" (Davis, 1995. p. 258). Moreover, "Mount Kinabalu is, for its area, undoubtedly the richest locality in species in Asia west of New Guinea, and one of the few mountains in the Old World to compare in species diversity with the Andes of Colombia and Ecuador" (Davis, *ibid*, p. 250).

Although there are several other mountains in the region (Crocker Range, Bukit Raya), none has an alpine zone or the variety of species or dramatic scenery found in Kinabalu. The notable exception is the Lorentz World Heritage site on Irian Jaya (inscribed 1999) which is higher (4,884m), 30 times as large, extends out to sea and contains extant glaciers. Indeed, the plant communities of the summit zone on Mount Kinabalu have close affinities with alpine vegetation on New Guinea's higher and more extensive mountains. The geology of the two sites is very distinct, however, because Lorentz has been uplifted at the edge of two colliding continental plates. The biota also varies between the two sites as Lorentz is in a different Biogeographic Realm (Oceania) and falls to the east of the biologically-dividing "Wallace Line". Lorentz is also inhabited by 6,300 indigenous people while Kinabalu has only a few families living in one small enclave in the park.

Granitic dome structures occur elsewhere in the world including the Huangshan and Yakushima World Heritage sites and in the Central Suriname Nature Reserve (nominated in 1999). Kinabalu is the highest of these but its formations are less dramatic than those at Huangshan. Ultramafic substrates (i.e. rocks containing high concentrations of magnesium and iron) occupy less than 1% of the surface of the earth but their unusual and highly-specialised floras have attracted great scientific interest. Other World Heritage sites with ultramafic floras occur in Southwest New Zealand and Puerto Princessa in Palawan as well as other localities (upper Tiber in Italy, northern Honshu in Japan and on Skye in Scotland).

In conclusion, Mount Kinabalu is one of the most outstanding centres of plant diversity in the Indomalayan Biogeographic Realm and indeed, the world. The Kinabalu massif has a remarkably rich flora with elements from the Himalayas, China, Australia and Malesia. Its geology and scenery are supportive natural features that combine to make Kinabalu a park with high scientific and conservation value.

4. INTEGRITY

4.1. Boundaries

The boundaries of Kinabalu Park encompass the main bulk of the mountain including the remaining naturally forested slopes. The site thus incorporates the natural diversity and habitats that constitute Kinabalu's key natural heritage values. Settlement and logging occurs right up to the boundary in many places but the park's limits are clearly marked and regularly patrolled. There is no provision for buffer zones and it would be beneficial for the Sabah State Government to carefully regulate development in key strategic locations outside the park where it still has control.

Two modifications to boundaries have resulted in losses to integrity of Kinabalu Park. In 1970, 2,555ha were excised to allow a copper deposit to be mined. This mine is now worked out but evidence remains. In 1984 a large area of forest was excised to build a golf course, housing development and dairy farm in the Pinosuk area. Several important plant localities were destroyed and much forest was lost. Although compensation for this loss of parkland was made, the losses at Pinosuk were significant. While these past reductions in size were unfortunate, the majority of the key natural values remain.

4.2 Legislation

In terms of legislation and institutional structures, national parks are defined as a concurrent function under the Malaysian constitution. Both state and federal levels of government have powers to pass legislation provided there is consultation. In Sabah, national parks including Kinabalu are established and managed at the State level under the State of Sabah Parks Enactment of 1984 and Amendment of 1996. Malaysia's national park act does not apply to Sabah (or Sarawak) and it is thus the state level of government that will carry the prime responsibility for the implementing the Convention in Malaysia (as is the case in other federal systems).

4.3 Management

A management plan was prepared in 1993 and will soon need updating. The plan is backed by adequate legislation and a state policy document. Kinabalu has been the most productive site in Borneo for scientific research and has an excellent collection of specimens and a laboratory facility. Staffing levels and budget are adequate. Tourism pressures are high but impacts are reasonably controlled. Intensive visitor facility development is kept to the margins of the park. Kinabalu's scenic values are partially marred by the construction of several transmission towers built in the high ridges but these were built before the park was established and it is unlikely that they could be removed.

4.4 Threats

Some encroachment in the form of illegal agriculture and logging has occurred in the past but, with boundaries now marked and patrolled, this threat is minimal. There has been some overcollecting and poaching of orchids and pitcher plants. Park authorities have sought cooperation of local villagers to report on thefts of rare plants and to involve them in an ethnobotany project. There are 12 people practising subsistence agriculture in one 40ha section of the park but they have been there historically and are considering voluntarily re-locating outside the park. Near the mountain huts there is a problem with several invasive plants and attention is needed to ensure that this is kept under control.

In sum, Kinabalu Park sets a high standard for protected area management in south-east Asia. Although much of the lowland forest of the region has been transformed to other uses and the park is becoming an island in a sea of agriculture and forestry development, it is still in a good state of conservation. The only potential threats relate to adjacent land tenure and continued agricultural pressures around the boundary of the park.

5. ADDITIONAL COMMENTS

Prior to the mid-20th Century, Mount Kinabalu was regarded as a sacred mountain by the Dusan people of the surrounding foothills. The mythology associated with the mountain in former times is one reason the upland region was left intact.

6. APPLICATION OF WORLD HERITAGE CRITERIA

Kinabalu Park was nominated under all four natural criteria. All assessments conducted on biological priorities in south-east Asia by FAO, UNEP, ADB, IUCN, WWF and Conservation International rank Mount Kinabalu as one of the top priorities in the Indomalayan region. Kinabalu Park is a clear candidate for inscription on the World Heritage list on the basis of the following two natural criteria:

Criterion (ii): Ecological processes

The high species diversity of Kinabalu results from a number of factors:

- ◆ the great altitudinal and climatic gradient from tropical forest to alpine conditions;
- ◆ precipitous topography causing effective geographical isolation over short distances;
- ◆ the diverse geology with many localised edaphic conditions, particularly the ultramafic substrates;
- ◆ the frequent climate oscillations influenced by El Niño events; and

- ◆ geological history of the Malay archipelago and proximity to the much older Crocker Range.

The above processes provide ideal conditions for a diverse biota, high endemism and rapid evolutionary rates. IUCN considers that the nominated site meets this criterion.

Criterion (iv): Biodiversity and threatened species

Research on the biota of Mount Kinabalu has been extensive and has established that the park is floristically species-rich and a globally important Centre of Plant Endemism. The Park contains an estimated 5,000-6,000 vascular plant species including representatives from more than half the families of all flowering plants. The presence of 1,000 orchid species, 78 species of *Ficus*, and 60 species of ferns are indicative of the botanical richness of the park. The variety of Kinabalu's habitats includes 6 vegetation zones from lowland rainforest through to alpine scrub at 4,095m. Faunal diversity is also high with the majority of Borneo's mammals, birds, amphibians and invertebrates (many threatened and vulnerable) known to occur in the park. It is clear that Kinabalu Park contains "the most important and significant habitats for *in-situ* conservation of biological diversity". IUCN considers that the nominated site meets this criterion.

The case for natural criteria (i) and (iii) was not convincingly made in the nomination document. Although there are high geological values and the park is the dominant landscape feature on the island, these are considered secondary to Kinabalu's primary natural values under criteria ii and iv.

The site meets all related "conditions of integrity" described in Operational Guidelines paragraph 44 (b) but attention needs to be given to minimising external impacts.

7. RECOMMENDATIONS

The Bureau recommended to the Committee that Kinabalu Park be **inscribed** on the World Heritage list under natural criteria (ii) and (iv). The Bureau noted that 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.

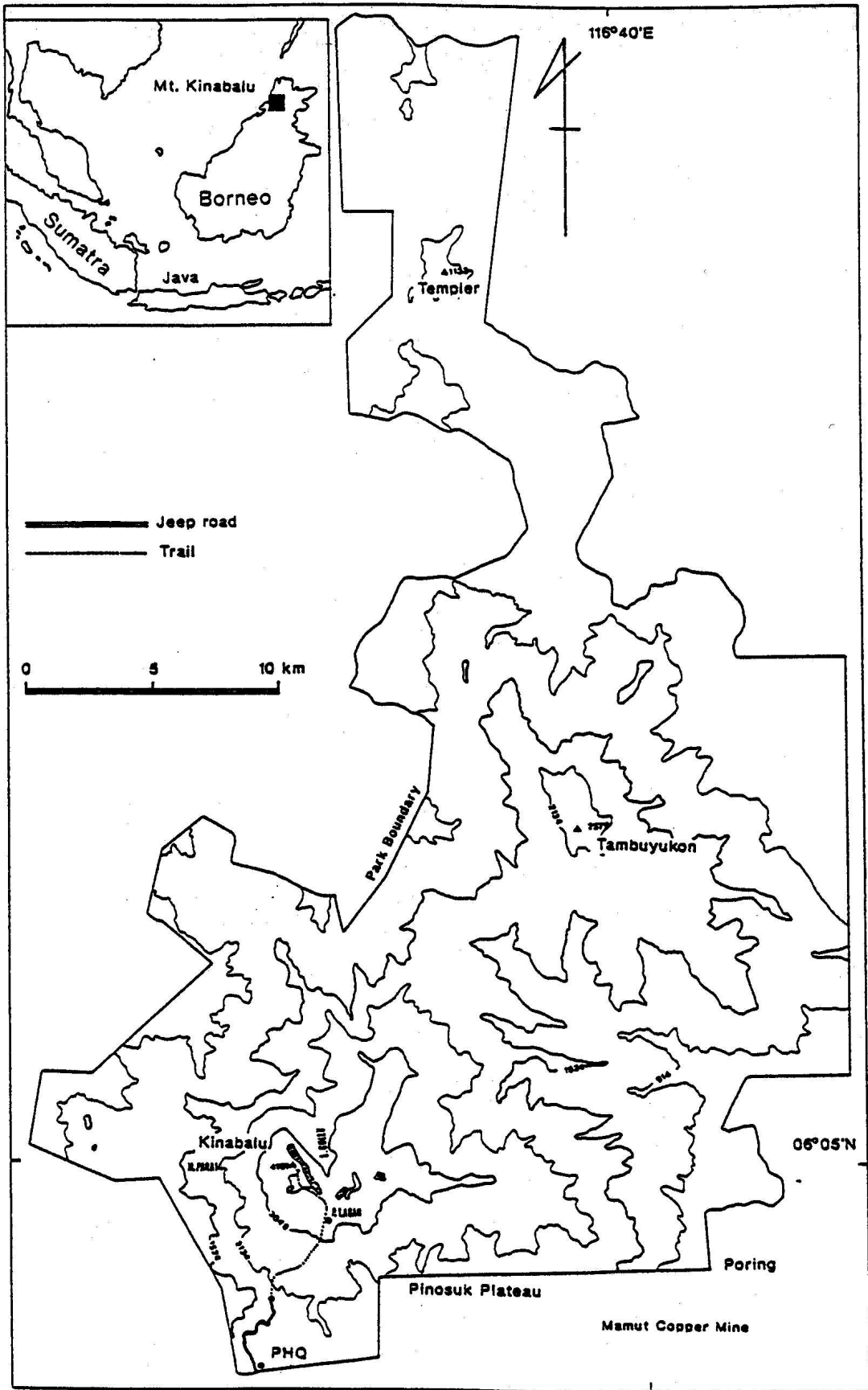
The Committee may also wish to commend the State Party for responding to the Bureau's request to minimise impacts on the Park, by carefully regulating activities in proximity to its borders. A letter was received by the Centre from the State Party on 20 September 2000 outlining measures in place to regulate activities in proximity to the borders of the park.



Map of South East Asia



Map 1: Location Map – Kinabalu Park



Map 2: Site Map – Kinabalu Park