
WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

GUNUNG MULU NATIONAL PARK (SARAWAK, MALAYSIA)

1. DOCUMENTATION

- i) **IUCN/WCMC Data Sheet:** (18 references)
- ii) **Additional Literature Consulted:** Meridith M. and J. Wooldridge. 1992. **Giant Caves of Borneo**. Tropical Press. Kuala Lumpur; IUCN-SSC 1998 Global Action Plan for Microchiroptean Bats. Final Draft; Vermeulen J. and T. Whitten. 1999. **Biodiversity and Cultural Property in the Management of Limestone Resources**. Lessons from East Asia. World Bank/IUCN; 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. **The Conservation Atlas of Tropical Forests – Asia and Pacific**; IUCN McNeely J. 1999. **Mobilising Broader Support for Asia's Biodiversity**. ADB; 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; MacKinnon, K. *et. al*. 1996. **The Ecology of Kalimantan** Periplus; Mandis Roberts Consultants. 2000. **Integrated Development and Management Plan**. Inception Report; Waltham, T. 1997. Mulu. The Ultimate in Cavernous Karst. **Geology Today**. Nov/Dec; Waltham, T. 1995. The Pinnacle Karst of Gunung Api, Mulu, Sarawak. **Cave and Karst Science** 22(3); Brookfield, H. *et. al*. 1996. **In Place of the Forest: Environmental and Socio-Economic Transformation in Borneo**. UNU Press; MacKinnon, J. 1975. **Borneo**. Time-Life Books; Cleary M. and P. Eaton. 1992. **Borneo – Change and Development**, OUP; Hanbury-Tenison, R. 1982. **Mulu - The Rainforest**. Weidenfeld and Nicholson.
- iii) **Consultations:** 17 external reviewers, officials from Sarawak Forest Department, Mandis Roberts Planning Consultants.
- iv) **Field Visit:** J. Thorsell, January 2000

2. SUMMARY OF NATURAL VALUES

Gunung Mulu National Park (GMNP) on the island of Borneo protects a wide range of natural values within its 52,864 hectares (see Map 1). With an altitudinal range from 28m to the 2377m summit of Gunung Mulu, the park has 17 vegetation zones, primarily lowland rainforest (40% of the area) and montane rainforest (20% of the area). Some 3,500 species of vascular plants have been recorded including a high number of endemics found on limestone substrates. GMNP is considered to be one of the richest sites in the world for palms with 109 species of 20 genera identified. Eighty species of mammals and 270 species of birds (including 24 Bornean endemics) have been recorded. The cave fauna, including many trogloditic species, number over 200. The area also has many species of reptiles (55), amphibians (76), fish (48) and invertebrates (20,000+). The park also supports huge bat colonies (3 million wrinkled-lipped freetail bats inhabit Deer Cave alone) and cave swiftlets (several million in one cave).

GMNP is not only important for this high biodiversity but also for its karst features. There are at least 295km of explored caves including some of the largest in the world. A range of cave types at different levels exist due to uplift during the late Pliocene to Pleistocene. The caves, which are concentrated in the Melinau limestone formation and on Gunung Api and are estimated to be at least 2-3 million years old. Sarawak Chamber, which is 600m x 415m and 80m high, is the largest known cave chamber in the world. There are some exceptional decorated speleothems with spectacular examples of argonite and calcite needles. Another outstanding karst feature in GMNP are the "pinnacles", 50m high sharp blades of rock that project through the rainforest canopy.

In sum, GMNP protects a substantial area of Borneo's primary tropical forest containing a high diversity of biota including many Bornean endemics and threatened species. The park also has a high concentration of large cave passages and chambers which in turn provide a major wildlife spectacle in terms of millions of cave swiftlets and bats. The area is roadless and has no permanent residents. Local Penans retain traditional hunting rights within the park.

3. COMPARISONS WITH OTHER AREAS

There are no natural World Heritage sites in the Borneo Biogeographic Province although Kinabalu in the neighbouring state of Sabah has also been nominated for review in 2000. There is some overlap in species between Kinabalu and GMNP, with the former being about 20% more species-rich in both flora and fauna. Kinabalu is very different geologically (i.e. a granite dome) and is much higher in elevation (4100m). Kinabalu does not have the extensive karst landscape of GMNP, however, nor any of the associated values that are found with karst. Both sites are very distinctive in their own right and are judged by most reviewers as the two most important conservation areas on the island of Borneo.

GMNP's karst features have been the focus of much research (notably through the Royal Geographical Society) and are generally accepted to be among the most spectacular in the world. Most other World Heritage karst and cave sites are in the temperate zone (e.g. Carlsbad, Mammoth, Castleguard (Canadian Rockies), Wulingyuan, Agglelek, Plitvice, Skokjan, Nahanni) and are very different from GMNP's rainforest karst setting. A relevant comparison is the Lorentz World Heritage site in Irian Jaya, inscribed in 1999, which includes major high altitude karst with what may be the largest underground river in the world. In terms of scale of its karst features, Lorentz is thus comparable to Mulu but differs in almost all other respects. There are also tropical karst features at Thung Yai Hua Kha Khaeng in Thailand and in the Puerto Princesa World Heritage Site in the Philippines, but these are on a much smaller scale with much less variety than found in GMNP. The Phong Nha/Hin Namno karst in Vietnam/Laos is another significant area but of lesser global significance than Mulu. There are many karst features in China as well but these are not tropical karst.

Perhaps the most similar karst area is to be found in several remote areas of Papua New Guinea's mountains. These areas are little known (Hindenburg Wall, Kanada, and Nakanai mountains) and none have any protective status. The pinnacle karst of Mulu is distinctive as well as being in both a more natural condition and a larger scale than the "Stone Forest" in Lunan, China. It is also different from the pinnacles found in Madagascar's Tsingy de Bemaraha World Heritage site in that Mulu is located on a steep mountain side and is not in the form of dissected plateaus created beneath major controlling bedding planes. Finally, there are clear contrasts between Mulu's caves that evolved on such a gigantic scale by a process of dissolution and those of Mammoth (USA) with its longer networks of smaller passages and Carlsbad (USA) which has evolved largely by hydrothermal processes.

In conclusion, the caves of Mulu are so long, large and complex, that Gunung Api can claim to be the most cavernous mountain in the world. It is also the most studied tropical karst area in the world and is without rival in terms of karst scenery and its setting in a mountainous rainforest.

Finally, the nomination notes the importance of the area for microchiropteran bats. This is certainly the case for the freetailed bat which number 3 million in Deer Cave alone. This is still much smaller than some *Tadaridu brasiliensis* colonies in South America, many of which number between 10 and 20 million. Likewise, there are other caves and parks with more bat species (e.g. Phong Nha). Comparative data for cave swiftlets is not available but the numbers using Mulu are impressive. In sum, GMNP is indeed a significant habitat for bats and swiftlets and is among the world's most important sites for protection of these species.

4. INTEGRITY

4.1 Boundaries

GMNP's limits are not ideal as full catchment protection is lacking (very important for some of the caves) and the very important caves in the adjacent Gunung Buda area are not included in the site. Fortunately, the State Government of Sarawak has recognised these deficiencies and the nomination document provides a map (see Map 2) indicating several extensions awaiting Ministerial approval. An additional 25,000ha. will eventually be added. Certainly the Gunung Buda area has substantial values and should be eventually incorporated into the site

(particularly as it is currently being overharvested by swiftlet nest collectors). These extensions will greatly contribute to the integrity of the Park.

GMNP also adjoins the Labi Forest Reserve in Brunei. This reserve contains extensive undisturbed lowland forest and effectively complements GMNP by adding to its integrity and habitat connectivity. IUCN suggests high-level discussions between the Governments of Sarawak and Brunei on the future co-operative protection of the two adjoining sites.

4.2 Management

GMNP has had two management plans prepared and a third is now in process (due September, 2000). Implementation has been effective with a park headquarters, field stations and a good system of trails and access to four "show caves". One constraint is adequate staffing. Currently there is only an acting park director and the level of staffing (47 people) and range of expertise compares unfavourably with Kinabalu in Sabah. Related to this constraint is the proposal to contract the management of the park out to a private body. Provision for concession management is made in Sarawak's 1998 Parks Act and, if structured properly, could result in a more effective management regime. The new management plan will contain details of the new arrangements.

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 Sarawak, national parks including Gunung Mulu are established and managed at the State level under a new Ordinance passed in 1998. Malaysia's national park act does not apply to Sarawak (or Sabah) and it is thus the individual states that will carry the prime responsibility for the implementing the Convention in Malaysia (as is the case in other federal systems).

4.3 Threats

Local Penan and Berawan peoples were given privileges to hunt pig and deer in the park when it was gazetted. As much of the traditional nomadic hunting area outside the park has been affected by logging, hunting pressure on the park has intensified especially on larger animals such as pigs, primates and hornbills. GMNP has been intensively hunted over the past decade and a wildlife census is needed to determine sustainability levels.

A second serious threat comes from logging which is occurring around the park. Most of the forests have been cut up to the boundary rivers. Growing erosion has increased the silt-load of these rivers significantly altering the aquatic ecology. Further away from the park, the conversion of natural forests to oil palm plantations is inevitably leading to habitat loss for cave swiftlets and bats. These species are known to forage for insects beyond a 25km radius from their nesting sites. IUCN suggests that clear felling to create oil palm estates not be permitted within this distance from the GMNP boundary.

5. ADDITIONAL COMMENTS

With some 300 nomadic Penans using the GMNP for hunting and gathering and with two Penan settlements on the boundary of the park, various social issues need attention. These will be addressed in the management plan now being prepared.

6. APPLICATION OF WORLD HERITAGE CRITERIA

GMNP was nominated under all four natural criteria. In all assessments conducted by IUCN, WWF and other conservation organisations on the biological values of protected areas in Asia/Pacific, GMNP is ranked as one of the top priorities. Other reviews of karst features also mention Mulu as one of the most outstanding in the world. With its combination of many natural values, GMNP is a clear candidate for inscription on the World Heritage List on the basis of all four natural criteria:

Criterion (i): Earth's history and geological features

The concentration of caves in Mulu's Melinau Formation with its geomorphic and structural characteristics are an outstanding resource which allows a greater understanding of earth's history. The caves of Mulu are important for their classic features of underground geomorphology, notably the sediment sequence and the layered sequences of wall notches that demonstrate an evolutionary history of more than 1.5 million years. This

exceptionally long period makes the caves a valuable data source on geo-climatic fluctuations during the Pleistocene. The giant doline of the "Garden of Eden" is a massive expression of karstic collapse whose proximity to the nearby Sarawak Chamber (the world's largest) offers one of the world's finest examples of the collapse process in Karstic terrain. Also of significance are the foot caves found around the base of the limestone mountains which demonstrate the processes of lateral planation in a karst environment. IUCN considers that the nominated site meets this criterion.

Criterion (ii): Ecological Processes

GMNP provides outstanding scientific opportunities to study theories on the origins of cave faunas. The food webs of Mulu's caves and the large-scale transfer of food energy from forest to caves by bats and swiftlets is an exceptionally well-studied process here. Many of Mulu's troglodytes belong to very ancient groups which have largely disappeared from the modern land surface and are now represented by a few widely scattered species. These evolutionary processes in response to tectonic change are on-going. IUCN considers that the nominated site meets this criterion.

Criterion (iii): Superlative natural phenomena or natural beauty and aesthetic importance

With its deeply-incised canyons, wild rivers, rainforest-covered mountains, spectacular limestone pinnacles, cave passages and decorations, Mulu has outstanding scenic values. The natural phenomenon of millions of bats and swiftlets leaving and entering the caves is a superlative wildlife spectacle as is the less-easily appreciated life of the invertebrate world in the caves. IUCN considers that the nominated site meets this criterion.

Criterion (iv): Biodiversity and threatened species

GMNP also provides significant natural habitat for a wide range of plant and animal diversity both above and below ground. Its lowland and montane forests are botanically-rich in species and high in endemism. Mulu is one of the richest sites in the world for palm species and assumes greater importance in perspective of the transformation of much of Borneo's forests. The park also hosts one of the highest number of bat species (28) and populations in the region as well as an exceptionally diverse range of troglobitic species. IUCN considers that the nominated site meets this criterion.

7. RECOMMENDATION

The Bureau noted that GMNP is considered by IUCN to meet natural criteria i, ii, iii and iv. However, it decided that the nomination be referred back to the State Party for clarification of the following issues:

- progress with the gazette process to incorporate the three extensions referred to in the nomination;
- action to strengthen management capacity in the park;
- recognition of the need to minimise impacts of logging activities around the park and the effect of clear-felling on cave swiftlet and bat populations; and
- assurance that the new management plan addresses issues relating to local peoples' use of and benefits from the park as well as the new contractual arrangements for management of the park.

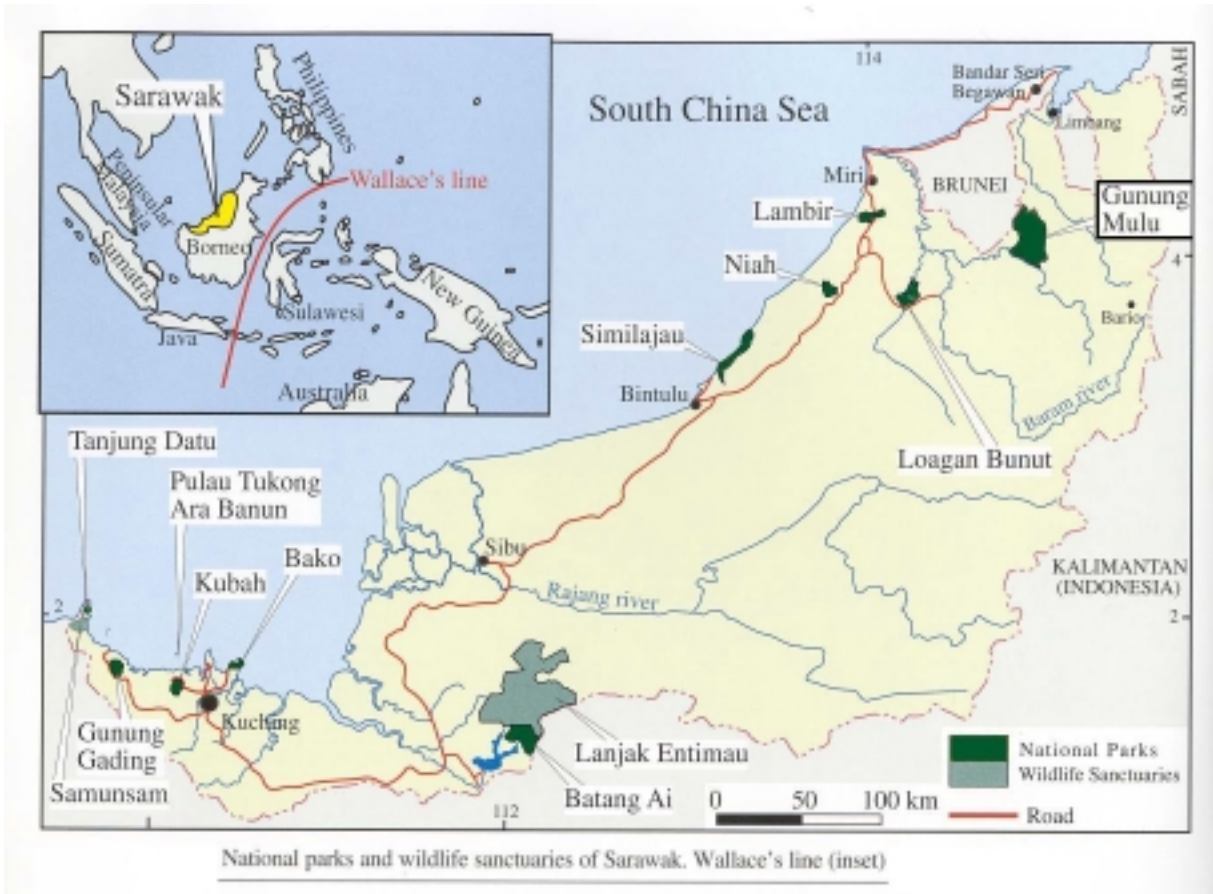
The Bureau furthermore drew the attention of the State Party to the important buffer and corridor function of the adjacent protected forests in the Labi Hills in Brunei and noted that this country had not yet signed the Convention.

Following the twenty-fourth ordinary session of the Bureau, the Centre received a letter from the State Party on 20 September 2000. This letter notes that two extensions (10,787ha) have been approved by the State government and that two other proposed extensions (34,960ha) have been submitted to the state government for approval. IUCN notes that the area of gazetted and proposed extensions (45,747ha) is greater than the area of extensions envisaged in the original nomination (circa 25,000ha) and that these areas are not formally included in the current nomination.

The letter notes that an Integrated Development and Management Plan for GMNP was in process (completed in October 2000). IUCN has reviewed the plan which gives high priority to management capacity issues and addresses benefits to the local community and activities outside the park.

IUCN considers that the response from the Malaysian authorities and the new management plan very satisfactorily address the Bureau's concerns over integrity. GMNP should thus be **inscribed** on the basis of all four natural criteria.

The Committee may wish to commend the State Party for preparation of the Integrated Development and Management Plan and the progress with approving the extensions to the park. The Committee may also wish to invite the State Party's to review the potential of the recently gazetted extensions as future additions to the World Heritage area.



Map 1: Location Map – Gunung Mulu National Park

