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UNESCO Region: ASIA AND THE PACIFIC

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**SITE NAME:** Kinabalu Park

**DATE OF INSCRIPTION:** 2<sup>nd</sup> December 2000

**STATE PARTY:** MALAYSIA

**CRITERIA:** N (ii)(iv)

**DECISION OF THE WORLD HERITAGE COMMITTEE:**

Excerpt from the Report of the 24<sup>th</sup> Session of the World Heritage Committee

Criteria (ii) and (iv): 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 noted that on request from the Bureau, the State Party has provided the information requested concerning land-use impacts near the boundaries of the Park.

In supporting the nomination, a number of delegates pointed out that the authorities have successfully tackled the Bureau's request and that the site is clearly of outstanding universal value for its high biodiversity.

The Observer of Malaysia informed the Committee about the importance of the cultural and natural heritage in her country.

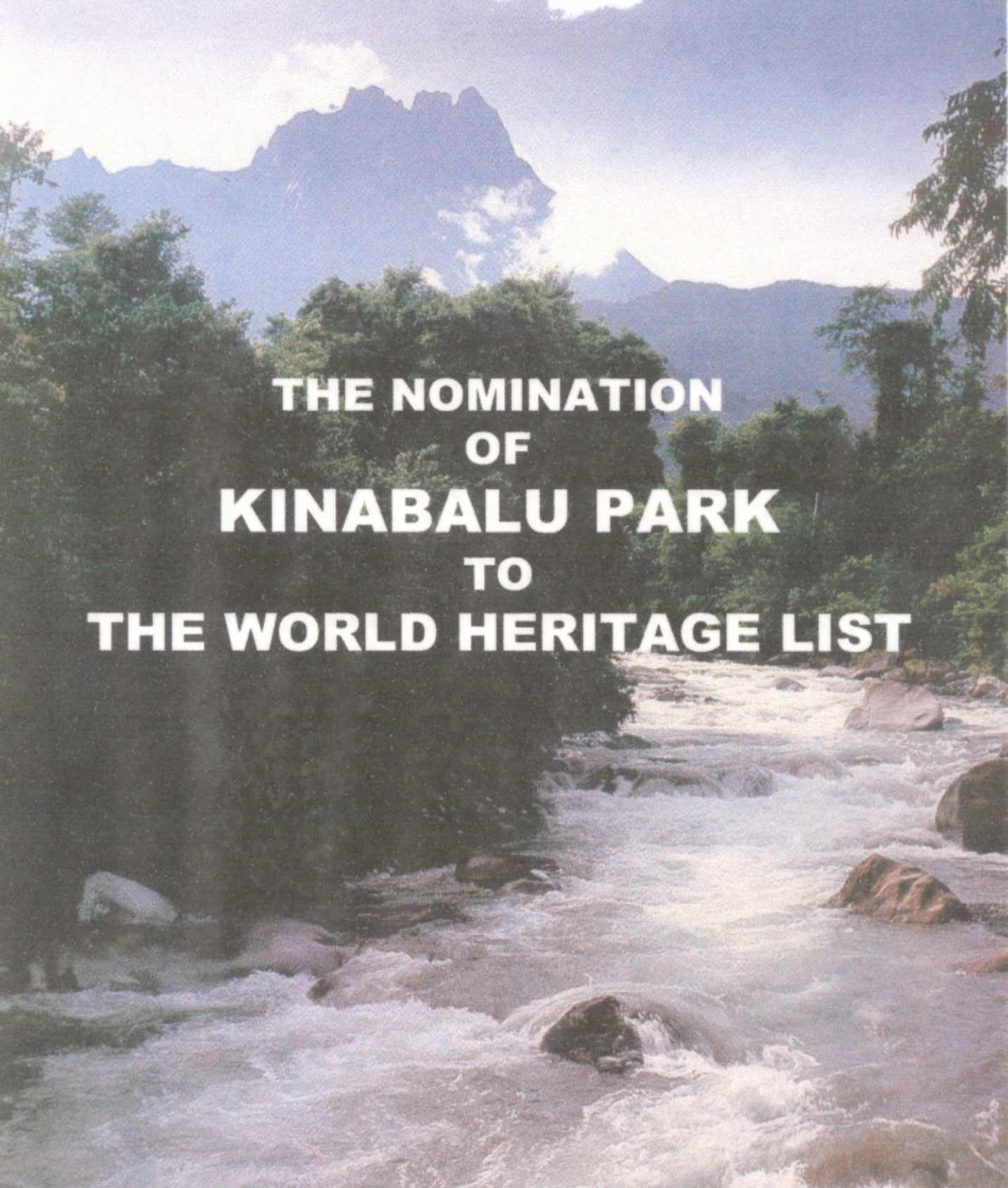
**BRIEF DESCRIPTIONS**

Kinabalu Park, on the northern end of the island of Borneo in the State of Sabah, is dominated by Mount Kinabalu (4,095m), the highest mountain between the Himalayas and New Guinea. Within its altitudinal range it presents a wide array of habitats : from rich tropical lowland and hill rainforest to tropical montane forest, sub-alpine forest and scrub of the higher elevations. It has been identified as a Centre of Plant Diversity for Southeast Asia, and is exceptionally rich in species with elements from the Himalayas, China, Australia, Malaysia and pantropical floras.

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**1.b State, Province or Region:** State of Sabah

**1.d Exact location:** 6° 0' N, 116° 21' E



**THE NOMINATION  
OF  
KINABALU PARK  
TO  
THE WORLD HERITAGE LIST**

## **Acknowledgements**

This full nomination submission paper of Kinabalu Park was principally prepared by Paul Basintal, Assistant Director (Management & Operations) with the advice and guidance from Datuk Lamri Ali, Director of Sabah Parks.

Mr. Francis Liew, the Deputy Director of Sabah Parks provided helpful suggestions, and greatly assisted in vetting the draft. Dr. Jamili Nais and Mr. Maklarin Lakim assisted in sourcing additional reference materials especially on monitoring.

Mr Alim Biun and Mr. Mohd. Zaini and others provided photos for this document. Mr. Thomas Yussop, Mr. Justinus Guntabid and Mr. Patrick Gebok assisted in compiling this nomination paper. Lastly, Miss Sylvia Jamil provided able typing assistance particularly the species list.

# Kinabalu Park

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Sabah, MALAYSIA

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**Inscribed:**

**Criteria:**

**Brief description:**

Excellent example of floral diversity; believed to contain “the richest and most remarkable assemblage of plants in the world.” Outstanding scenic beauty, notably the wonderful Mount Kinabalu (4,095 m) rising straight out of the tropical forest.

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- APPENDIX II Copy of the draft boundary survey plan of Kinabalu Park
- APPENDIX III Vegetation Map of Kinabalu Park
- APPENDIX IV A National Park Policy for Sabah Draft Kinabalu Park Regulations, 1999
- APPENDIX V(A) Extract of Sabah Conservation Strategy, 1992
- APPENDIX V(B) Extract of Sabah Tourism Masterplan, 1996
- APPENDIX V(C) The Kinabalu Park Development Masterplan Towards Sustained Development
- APPENDIX VI Draft Kinabalu Park Regulations, 1999
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**WORLD HERITAGE LIST NOMINATION:  
KINABALU PARK  
No. ....**

**1. Identification of the Property**

**A. Country**

MALAYSIA

**B. State, Province or Region**

Sabah

**C. Name of Property**

Kinabalu Park

**D. Exact location on map and indication of geographical coordinates to the nearest second**

Latitude N 6° 00' 25" and N 6° 29' 48", and  
Longitude E 116° 21' 30" and E 116° 45' 00."

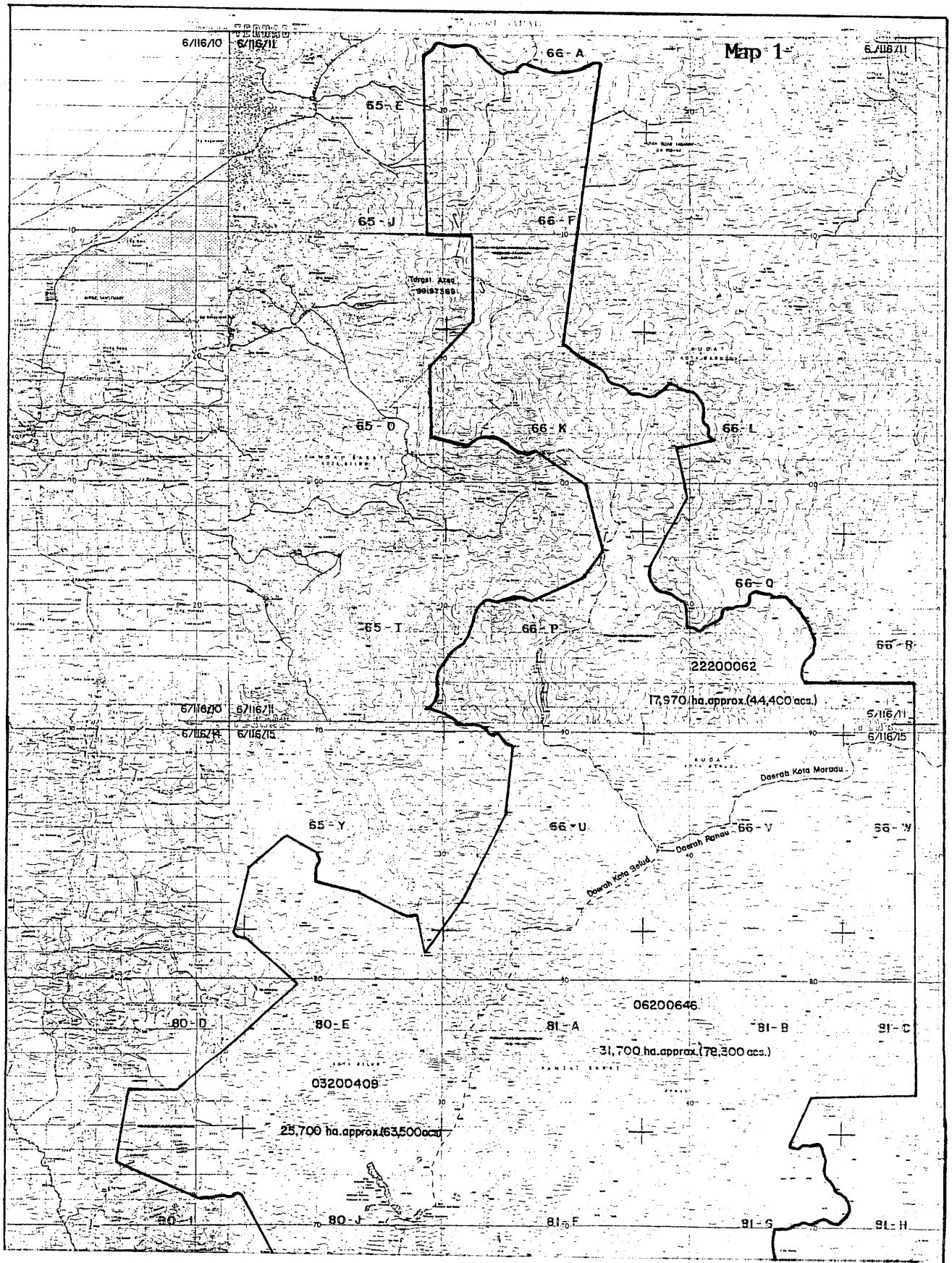
**E. Maps and/or plans showing boundary of area proposed for inscription and of any buffer zone**

Please refer to **Map 1** on page 2

**F. Area of site proposed for inscription (ha.) and proposed buffer zone (ha.)**

75,370 ha.





**Translation**

**Kinabalu Park Reserve  
Districts of Kota Belud, Kota Marudu & Ranau**

Ranau District  
Kota Belud District  
Kota Marudu District

Approved by

Plan reference:

Director of Lands & Surveys

Prepared by:

## 2. Justification for Inscription

### A. Statement of significance

Kinabalu Park possesses several criteria which merit the area to be listed as a World Heritage Site. The criterion which Kinabalu Park certainly qualifies is that it serves as an important “natural habitats for *in situ* conservation of biological diversity” (described in detail on 2.d). Kinabalu has evidences of past glacial action, has example of significant on-going ecological and biological processes in the evolution and development of terrestrial habitat, and possesses exceptional natural beauty.

The mountain has the evidences of past glacial action which are still preserved. Koopmans and Stauffer (1967), who carried out a detailed study of the summit area, first documented the evidence of Pleistocene glaciation on Mount Kinabalu ( Jacobson, 1970). The researchers described that the summit area supported an ice-cap of 5 sq. km in extent. This ice-cap fed a steep valley glacier which flowed to the north down Low’s Gully. The features of this glacial action are preserved. For instance, they maintained the existence of two terminal moraines, a vegetated hummocky area 2890 m in Low’s Gully, based on inference from photo-interpretation although they have not been confirmed by field evidence. They also found valleys with U-shaped cross sections between Alexandra Peak and Victoria Peak, five cirques - one between North Peak and King George Peak, and four between Low’s Peak and King George, and surface markings such as striations and grooves best exposed on the slopes above Sayat-Sayat. Other researchers such as Komoo (1997) described the Kinabalu plateau as representing “a unique morphology that is different from other elevated plateaus in the wet tropics.” The features found on the mountain such as U-shaped gullies and valleys, hanging valleys, cirques, polished surfaces, crescentic gouges and fractures, plucking, grooves and striations, and *roch moutonnees* are “evidences of an ancient (35,000 to 3,000 years) ice sheets that once covered the peak of Mount Kinabalu.” The aforesaid features of Kinabalu Park might fulfill the criterion of “be outstanding examples representing major stages of earth’s history on significant geomorphic or physiographic features.”

The extent of Kinabalu Park covers elevation from 152 meters around the upper eastern boundary at Marak Parak to 4,095 meters at Low’s Peak. Aside from this range of elevation, the presence of several types of rocks such as ultrabasic intrusive rocks, granite rocks and sedimentary rocks (Jacobson, 1967) formed as parent materials for eight types of soil associations, such as Brantian (key 12), Dalit (key 31), Lokan (key 39) Bidu-Bidu (key 41), Malubok (key 44), Crocker (key 47), Trusmadi (key 50), and Kinabalu (key 51) found within Kinabalu Park (Soil of Sabah - Soil sheet NB50-6 of 1974) {Map 2}. Four categories of soils



Key	Association	Landform	Parent materials	Main soil units
12	Brantian	Terraces	Alluvium	Orthic, Ferric and Gleyic Acrisols; Gleyic Podzol
31	Dalit	Moderate hills and minor valley floors: slopes 0-20°	Sandstone, mudstone and alluvium	Orthic, Ferric and Gleyic Acrisols
39	Lokan	Very high hills: slopes >25°	Sandstone and mudstone	Orthic Acrisol; Dystric Cambisol
41	Bidu-Bidu	Mountains and hills	Ultrabasic igneous rocks	Rhodic and Orthic Ferralsols; Eutric Cambisol; Chromic and Orthic Luvisols; Lithosol
44	Malubok	Mountains	Igneous rocks, sandstone, mudstone and chert	As for Associations 41, 42 and 47 with Chromic Cambisols and Lithosols on chert
47	Crocker	Mountains	Sandstone and mudstone	Orthic Acrisol; Chromic and Dystric Cambisols; Lithosol
50	Trusmadi	Mountains above 1200 m a.s.l.	Sandstone	Gleyic and Orthic Acrisols; Gleyic Podzol; Humic Gleysol; Dystric Histosol; Lithosol
51	Kinabalu	Mountains above 2400 m a.s.l.	Acid igneous rocks	Humic Cambisol; Dystric Histosol; Lithosol

Source: The Soils of Sabah (Soil Sheet: TUARAN NB 50-6, 1974)

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classifications based on vegetation zones are found in Kinabalu Park namely, mull humus, mor humus, anaerobic soils, and mull-like soils (Anon, 1992). Thus, Kinabalu Park has outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial habitat.

Kinabalu Park also possesses the criterion of exceptional natural beauty. Anon (1992) listed at least four zones of outstanding natural and scenic values namely, the granitic outcrop, the waterfalls, the hot springs, and the summit trail. The granitic outcrops of Mt. Kinabalu comprise of natural values of outstanding natural scenery (montane, submontane and peaks), montane vegetation and geological forms, while the waterfalls exhibit principal natural values such as outstanding natural scenery and tropical rain forest. The hot springs possess natural value in the form of unique underground geothermal springs, and the summit trail has principal natural values comprising of outstanding natural sceneries, altitudinal changes of vegetation types and geological formations.

#### **B. Possible comparative analysis (including state of conservation of similar site)**

In terms of floral diversity, Kinabalu Park contains “one of the most diverse if not the most diverse flora in the world” (Beaman & Beaman, 1998). This latest finding discloses that “the Kinabalu flora may include as many as 5,000 – 6,000 species” (Beaman & Beaman, 1998) as opposed to nearly 4,000 species stated previously (Beaman, 1996). This figure surpasses the 3,000 species of plants found in Sangay National Park, a world heritage site inscribed in 1983 (<http://www.unesco.org/whc/sites/260.htm>).

On avifauna, there are now 326 species of birds recorded within Kinabalu Park (Biun, 1998). This figure is higher than the 270 species recorded in the Central Eastern Rainforest Reserve of Australia, also a world heritage ([http://www.wcmc.org.uk:80/protected\\_areas/data/wh/cerr.html](http://www.wcmc.org.uk:80/protected_areas/data/wh/cerr.html)), but lower than the figure (more than 450 species) recorded in Los Katios National Park.

On altitudinal vegetation zones, Kinabalu Park exceeded Lorentz National Park of Indonesia by having six vegetation zones compared to five found within the latter.

### **C. Authenticity/Integrity**

The vegetation of Kinabalu Park comprises primarily natural forest. Kitayama (1991) reveals that “natural vegetation covers 93.5 percent of the park, while substituted vegetation (anthropogenic disturbance) accounts for 6.5 percent.” The tropical lowland forest and the tropical (lower and upper) montane forest dominate the natural vegetation, and are found between Mount Kinabalu and Mount Tambuyukon. The substituted vegetation occurs largely around Mount Templer, and mostly in “old, secondary forest selectively logged before designated as a park.”

Exotic floral species occur at Kinabalu Park with concentration at the Kinabalu Park Headquarters (PHQ) either along the river or in the Mountain Garden. Out of some 30 species, two thirds of them fall into the horticultural category while the rest are trees. Some of the common exotic trees are *Pinus caribaea*, *Acacia manguim* and *Araucaria spp.*

Kinabalu Park, established under the National Parks Ordinance, 1962, is a State property managed and administered by The Board of Trustees of the Sabah Parks, a statutory body under the Ministry of Tourism Development, Environment, Science and Technology. As the Park falls under the concurrent list, both the State Government and the Federal Government have jurisdiction over the area. The gazetted plan of Kinabalu Park is 99197385 {Sec.17(1) Parks Enactment, 1984}.

Under the Parks Enactment, 1984 (**Appendix 1**), Kinabalu Park is vested in the Board of Trustees of the Sabah Parks for an estate in leasehold for a period of 999 years free from all liabilities and encumbrances.

### **D. Criteria under which inscription is proposed (and justification for inscription under these criteria)**

The criterion that Kinabalu Park certainly qualifies is “containing the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.” This proposal intends to inscribe Kinabalu Park under this criterion especially on floral aspect.

Mount Kinabalu is considered as a convergent point where the Himalayan and Chinese genera meet with those of Australian, New Zealand and even American affinity (Corner, as revised by Beaman, 1996; Ghazally Ismail & Lamri Ali, 1996). In terms of plant diversity, Mt. Kinabalu is reputed to be one of the richest areas in

the world (Ghazally Ismail & Lamri Ali, 1996). Corner (as revised by Beaman, 1996) believed that the mountain contains “the richest and most remarkable assemblage of plants in the world.” In an area of approximately 700 sq. km some 4,000 species of vascular plants occur at different altitudinal zones (Beaman, 1996). In their latest finding, Beaman & Beaman (1998) reveal that the area may contain as many as 5,000 – 6,000 floral species. Some 608 species of ferns have been recorded in the Park, more than the whole mainland of tropical Africa (Holttum, as cited by Ghazally Ismail and Lamri Ali, 1996).

The flora of Kinabalu indicates a high degree of endemism. For instance, more than half (78 species) of the 135 species of *Ficus* occurring in Borneo can be found in the Park. Of this figure, 14 species are endemic and 5 endemic varieties of other fig species. This makes Kinabalu Park one of the richest areas for figs in the world (Corner as revised by Beaman, 1996). Some 9 species of the insectivorous plants *Nepenthes* occur in the Park of which 4 species are endemic to Kinabalu Park. There are about 1000 species of orchids in 121 genera or 30 percent of all orchids species in Borneo (Lamb, 1996). The famous Slipper Orchids of the genus *Paphiopedilum* are represented by at least 5 species in the Park including *P. rothschildianum* which is endemic.

### 3. Description

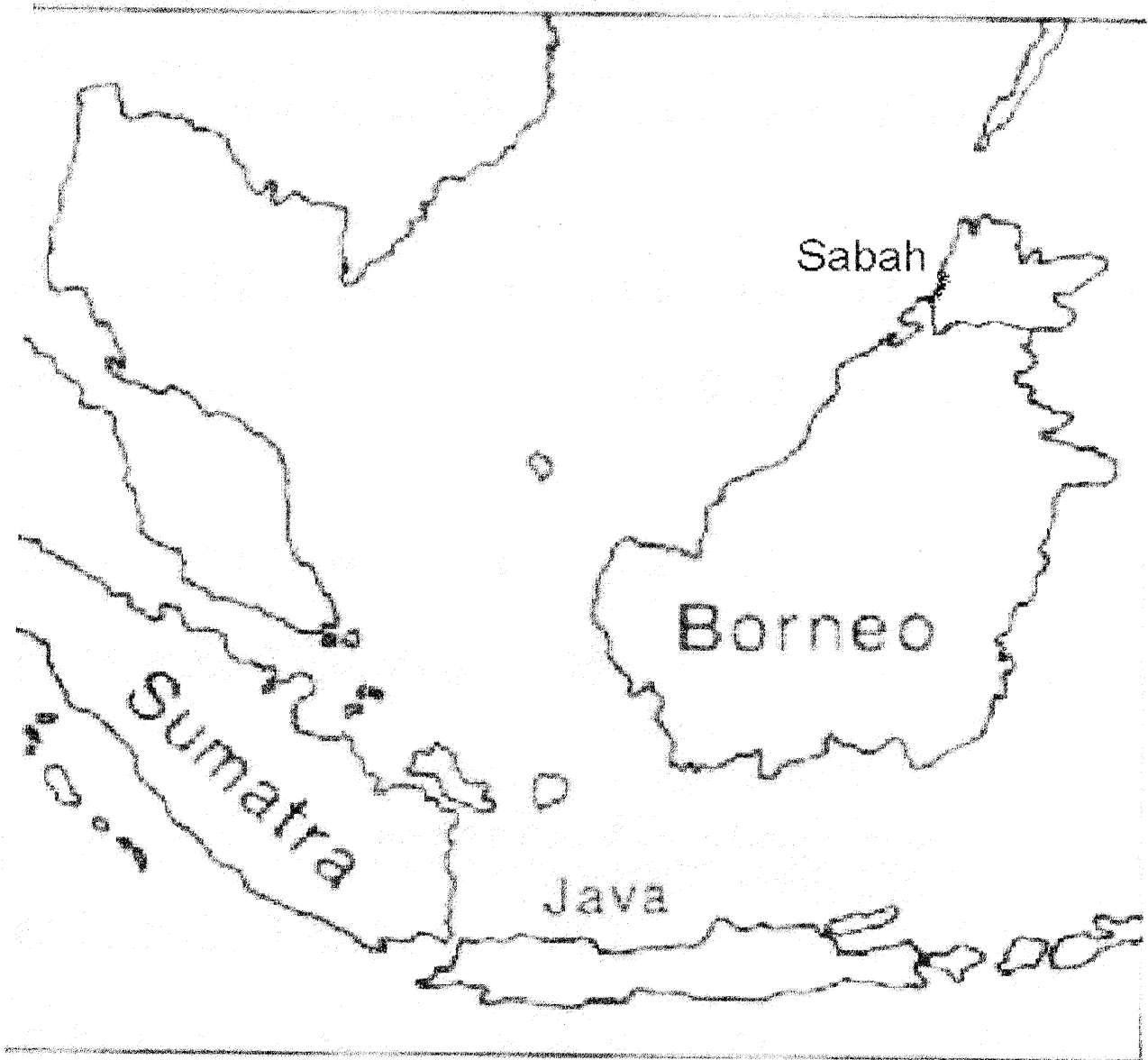
#### A. Description of the Property

##### 1. Physical Area

Kinabalu Park is located within the State of Sabah (**Map 3a**), Malaysia, on the northern part of Borneo (**Map 3**). The Park comprises of three main mountains, from the south to northward, Kinabalu (4,095 m), Tambuyukon (2,579 m), Templer (1133 m). A long-ranging sharp ridge called the “north ridge” connects these non-volcanic mountains. The park is about 83 km by road or about 2-hour drive from Kota Kinabalu, the capital of Sabah. Currently, the park has three main destinations, namely PHQ (1,560 m asl) on the southern boundary, Poring Hot Springs (PHS) (550 m asl) on the eastern boundary, and the newly established Mesilau Nature Resort (~2,000 m asl) also on the southern boundary. Two ranger’s stations had been established at Sayap and Sorinsim on the western and eastern boundary respectively.

The boundary of Kinabalu Park had been properly surveyed. Survey work was completed in April, 1998. The boundaries are well marked with boundary stones and pegs. Trees along the boundary had been painted red, and park logo fixed at certain intervals. Draft plan of the surveyed park boundaries appears on **Appendix 2**.

**Map 3: Map of South East Asia**



Map: 3a

# MAP OF SABAH



ROAD

RAILWAY



## 2. Climate

Kinabalu Park, especially the mountain, has a humid tropical climate. Kitayama (1992) described the climate as follow: The mean monthly air temperature at PHQ is *c.* 20 °C with a daily fluctuation of 7 – 9 °C. The annual TMAX and TMIN (1975 – 83) at 1,860 m are 22.2 °C and 14.4 °C respectively. The year to year rainfall fluctuates greatly at PHQ ranging from 2,000 to 3,800 mm (1975- 83). Kitayama et al. (1999) further monitored the climatic conditions from 1996 to 1997 at four stations within Kinabalu Park and recorded as follows: The mean air temperature is 18.3 °C at PHQ, 24.3 °C at PHS, 11.9 °C at Carson Camp helipad (2,650 m asl), and 9.5 °C at Laban Rata (3,270 m asl). The mean yearly rainfall is 2,380 mm at PHQ, 2,392 mm at PHS, 2,256 mm at Carson Camp helipad, and 2,839 mm at Laban Rata.

## 3. Biological Resources

The documentation of the flora of Kinabalu Park began in 1894 when O. Stapf made an account entitled “On the Flora of Mount Kinabalu in North Borneo.” Since then many studies had been conducted notably by Corner (1962a, 1962b, 1963, 1964, 1966, 1969, 1970, 1976), Corner and Watanabe (1969), Beaman & Beaman (1990, 1998), Parris et al.(1992), and Wood et al. (1993). Professor John Corner, an eminent Cambridge scientist, describes Kinabalu Park as a convergent point for the Himalayan, Chinese, Australian, New Zealand and even American affinity. The flora mingle at all altitude with most of the Malaysian upsurgents begin to disappear above 1200 m., and many new genera unfamiliar to the lowland begin to enter. Examples include the buttercups (*Ranunculus*) of Australian affinity, the climbing madder (*Rubiaceae*) of European affinity, the Rosaceous trees and shrubs of Sino-Himalayan affinity and *Gunnera* of the Southern Hemisphere together with the pitcher plants (*Nepenthes*) of the Borneon affinity continue to thrive. Corner believed that the mountain contains “the richest and most remarkable assemblage of plants in the world.” A new enumeration of the flora by Beaman (1996) reveals that nearly 4,000 species of vascular plants have been collected within the approximately 700 sq. km of Mt. Kinabalu.” He added that “over 180 plants families and 950 genera occur in the flora.” However, in their latest finding, Beaman & Beaman (1998) disclose that Kinabalu flora may contain “as many as 5,000 – 6,000 species,” and “over 200 families and 1,000 genera occur on the flora.” Studies on the flora show that there are about 1,000 orchid species in 121 genera including the famous slipper orchid *Paphiopedilum rothschildianum* (Lamb, 1996), 608 ferns species (Holtum, 1996), 9 *Nepenthes* species of which 3 species, namely *N. burbidgeae*, *N. rajah* and *N. villosa* are endemic to Kinabalu (Corner, 1978 as revised by Beaman, 1996), 24 *Rhododendron* species of which 5 species namely *R. ericoides*, *R. buxifolium*, *R. fallacinum*, *R. stenophyllum* and *R. abietifolium* are endemic to Kinabalu (Argent, 1996), 78 *Ficus* species of which 13 are endemic species and 5 endemic varieties

of other species (Corner, 1962 as revised by Beaman, 1996) 30 ginger species (Smith, 1996), 6 bamboo species (Wong & Dransfield, 1996), 52 palm species (Dransfield, 1996), and two *Rafflesia* sp. namely *R. pricei* and *R. keithii* (Mat Salleh, 1996).

The boundaries of Kinabalu Park range from an elevation of 152 m around the upper eastern boundary at Marak Parak to 4,095 m at Low's Peak. The Park supports six main vegetation zones readily identified based on forest structure and species composition. The zones classified according to latitude are Lower Mountain Forest (1200 - 1900 m), Upper Mountain Forest (1900 - 2700 m), Ultrabasic Rock Forest (2700 - 3000 m), Lower Granite Boulder Forest (3000 - 3300 m), Upper Granite Boulder Forest (3000 - 3800 m) and Summit or Subalpine (3200 - 4095 m). The classification of vegetation by Kitayama (1991), based on communities provides a list of 18 types of natural vegetation and 3 types of substituted vegetation (refer **Appendix 3**). The natural vegetation communities are: tropical lowland rain forest, tropical montane rain forest, tropical subalpine coniferous forest, ecotone communities, tropical alpine ericaceous thicket, tropical alpine dwarf-shrub heath, plant communities in rocky desert, leptophyllous closed forest, leptophyllous shrubland, matted dwarf-shrub thicket, microphyllous closed forest, lepto-nanophyllous thicket, leptophyllous thicket, graminoids, plants communities on cliff, secondary closed forest, evergreen suffruticose thicket, and natural bareland or moss flush. The substituted vegetation are secondary forest, weed, and artificial bareland. Kitayama (1991) concluded that natural vegetation accounts for 93.5 percent, while substituted vegetation consists of 6.5 percent.

The faunal diversity within Kinabalu Park had also been studied. Payne (1996) revealed that at least 90 species of lowland mammals, including 21 species are bats, and 22 species of montane mammals have been recorded. About 306 species of birds are found within Kinabalu Park (Jenkins & de Silva, revised by Wells & Phillips, 1996) and can be categorized into four groups: (i) subalpine zone species; (ii) endemic montane species; (iii) non-endemic montane species; and (iv) lowland species. Four species of birds are found on the subalpine zone, while 46 species occur in the montane zone, of which 14 species are endemic to Borneo (Smythies, 1996). A study by Biun (1999) disclosed that a total of 326 bird species in 180 genera and 47 families have now been recorded within Kinabalu Park. Nine families of fishes have been recorded in the Park (Chin, 1996). The most common fishes found on the clear mountain stream are the *Gastromyzontidae*. The species list of frogs and toads are now about 61 species (Inger et al., 1996). About 200 butterflies species have been recorded and are found mostly below 2000 m on Kinabalu, and about 112 'macro' moth species commonest at 2000 m and above (Holloway, 1996). The beetle fauna of Kinabalu is numerous and diverse with 8 families, and 2 subfamilies. The family Scarabaeidae has the highest number of species (over 100) found within the Park. Species lists appear on **Appendix 4**.

#### 4. Physical Resources

Six major topographical features can be found within Kinabalu Park. They are (a) **Peaks and plateau**: the summit plateau and peak of lower mountains which include South Peak, St John's Peak, Ugly Sister Peaks, and No name Peak; (b) **Gullies**: the presence of a spur which runs in a northeasterly direction from the eastern end of the Kinabalu summit, which is less than 3.2 km long culminating in a long, narrow and jagged ridge at approximately 3,500 m. This spur encloses a deep cleft known as Low's Gully; (c) **Rivers, streams and waterfalls**: Mt. Kinabalu is the source of many important rivers in Sabah flowing eastward and southward direction. The better known waterfalls are Cascade waterfall and Liwagu Fall; (d) **Hot springs**: located at Poring and it contains sulphur which has health and curative properties; (e) **Caves**: the Paka Cave at 3,192 m and the tumbled bats cave at Poring; and (f) **Granitic slabs**: a characteristic of the slopes of the summit zone.

The geological and ecological patterns of Mount Kinabalu seen today were the result of geological processes (volcanic, tectonic and ecstatic). Some 1.5 million years ago, granodiorite from deep below the earth's surfaced forced its way upwards through the overlying rock-crust, sandstone and shales to form the mountain. The summit zone of Kinabalu is the consequence of a rapid uplift of granodiorite pluton, and during the Ice Age the glacier sculptured the smooth mountain to what can be witnessed today. Evidences of these past events are preserved in the form of polished surfaces and moraines, cirques, grooves striations and scratches of the rocks.

Four main categories of soils, based on the main vegetation zones, are found in the Park. At the Lowland Forest Zone (below 1000 m), the organic matter is well mixed into the soil profile resulting in a mull humus. It is reddish brown (10 YR5/8 when dry-Munsell) at 60 cm with some evidence of mottling. The pH of the soil at both profiles range from 3.5 - 5.4; there is a decrease in concentration of metal cations such as Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>++</sup> and especially Ca<sup>++</sup> with depth. At the Lower Montane Forest Zone (1000-1800 m), the general feature of soils is the accumulation of organic soil, and characterised with thick mor humus at 1600 m. Beneath this humus layer, a pale A horizon and a thin (1 cm) dark brown B horizon are found. At around 1600 m the soil is podzolic and more acidic than at 1000 m. At the Upper Montane Zone (1800 - 3200 m), anaerobic soils and a built-up of peat are present due to the extreme wetness of this zone. The soils change from peat to mull humus, and the pH ranges from 3.5 to 4.5. On the Summit or Subalpine zone (3200 - 4095 m), the soil between 3150 - 3300 m becomes very thin, and on the sheltered part of the summit, mull-like soils are found on the granodiorite.

## **B. History and Development**

### **1. Events Leading to the Establishment of Kinabalu Park**

How Mount Kinabalu and its surrounding area became a park was a consequence of the “infamous Sandakan-Ranau Death March.” Tom Harrison related the event as follows: It was in September, 1944 when the Japanese moved some 2,400 Australian and British prisoners of war from Sandakan to Ranau some 240 km away where only six survivors arrived. Major Carter who was profoundly affected by this experience dedicated himself to memorialising the Death March disaster and subsequently formed the Kinabalu Memorial Committee. “This memorial was the nucleus of the whole concept for preserving Kinabalu itself as an entity, a monument for the decency of man and a facility for the enjoyment of all in Sabah.” Professor John Corner reinforced the idea when he organised and led two expeditions for the Royal Society of London to explore the mountain and in particular its flora. In 1961 he made a report entitled “The Proposed National Park of Kinabalu” to His Excellency the Governor of the Crown Colony. As a result, the Sabah National Parks Ordinance was passed in 1962, which in turn led to the establishment of Kinabalu Park in 1964 with an initial area of 711 sq. km (Map 4).

When Kinabalu Park was gazetted, there was no clear policy or guidance regarding the purpose of the Park. This situation had resulted in the interpretation of the use of the Park in different ways which consequently caused conflicts in administration, planning and development, and the park’s role in conservation and education had often been overlooked (Liew, 1996). Realising this danger, a paper entitled *National Park Policy For Sabah* (refer **Appendix 5**) was prepared in 1974 by D.V. Jenkins, Francis Liew and Peter Hetch. The paper was accepted and approved by the Sabah National Parks Board of Trustees, and subsequently by the State Cabinet. The policy, based largely on the Canadian National Parks Policy forms as a basis for the control and management of parks in Sabah.

### **2. Changes in Boundary and Size**

There have been changes made to the park boundary which resulted in expansion in size. On 29th April, 1971 an area of 25 sq. km on the south-eastern portion was de-reserved and turned into Mamut Copper Mine. In compensating for the loss, the State Government in 1974 decided to incorporate the Mt. Templer Forest Reserve, about 93 sq. km in extent, as an extension of Kinabalu Park along the northern boundary, subsequently expanding the area to 779 sq. km. Under the new Enactment, however, the boundaries had been redefined, straightened and streamlined resulting in the reduction in size to approximately 753 sq. km (Liew, 1996).

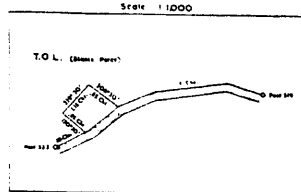
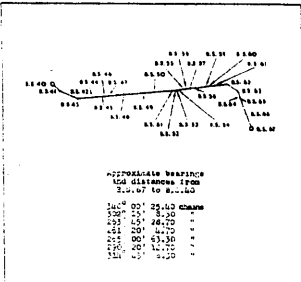
MAP 4

Approximate bearings and distances of sections from Post 100 to Post 201

100-101	00°	1.30
101-102	00°	1.30
102-103	00°	1.30
103-104	00°	1.30
104-105	00°	1.30
105-106	00°	1.30
106-107	00°	1.30
107-108	00°	1.30
108-109	00°	1.30
109-110	00°	1.30
110-111	00°	1.30
111-112	00°	1.30
112-113	00°	1.30
113-114	00°	1.30
114-115	00°	1.30
115-116	00°	1.30
116-117	00°	1.30
117-118	00°	1.30
118-119	00°	1.30
119-120	00°	1.30
120-121	00°	1.30
121-122	00°	1.30
122-123	00°	1.30
123-124	00°	1.30
124-125	00°	1.30
125-126	00°	1.30
126-127	00°	1.30
127-128	00°	1.30
128-129	00°	1.30
129-130	00°	1.30

Approximate bearings and distances of sections from Post 100 to Post 201

100-101	00°	1.30
101-102	00°	1.30
102-103	00°	1.30
103-104	00°	1.30
104-105	00°	1.30
105-106	00°	1.30
106-107	00°	1.30
107-108	00°	1.30
108-109	00°	1.30
109-110	00°	1.30
110-111	00°	1.30
111-112	00°	1.30
112-113	00°	1.30
113-114	00°	1.30
114-115	00°	1.30
115-116	00°	1.30
116-117	00°	1.30
117-118	00°	1.30
118-119	00°	1.30
119-120	00°	1.30
120-121	00°	1.30
121-122	00°	1.30
122-123	00°	1.30
123-124	00°	1.30
124-125	00°	1.30
125-126	00°	1.30
126-127	00°	1.30
127-128	00°	1.30
128-129	00°	1.30
129-130	00°	1.30



VE

275 Sq. Miles (Approx.)  
 Decree No. G. N. No. 98-64 of 1st Feb. 1964

PROPOSED KINABALU NATIONAL PARK  
 LOCALITY RANAU  
 SCALE 1:50,000



### **3. Administration and Research**

In the early days, the administration of Kinabalu Park was based from Kota Kinabalu. In 1965, a Senior Forest Officer was appointed as a part-time Park Warden of Kinabalu Park, and supported by five park rangers. A new post of Park Warden, at Kinabalu Park Headquarters, was established in 1967, and Mr. C.L. Carson assumed the post on full-time basis upon his retirement as the Conservator of Forest. When Carson retired as a Park Warden in 1969, Mr. D.V. Jenkins, on assignment from the Forest Department, replaced him. In 1972, he took up the appointment as Park Warden in the Chief Minister's Department and assigned to Sabah Parks to administer Kinabalu Park. Towards the end of 1972, Mr. Francis Liew was seconded to Kinabalu Park from the Forest Department as Assistant Park Warden and was based at Kinabalu Park Headquarters. He joined the Sabah Parks as a full-time officer in March, 1973 and was promoted to Park Warden in May 1974. Mr. Liew served as Park Warden until April, 1978 when he was appointed as Acting Assistant Director of Parks following the expiry of Jenkins' contract. Subsequently, Mr. Eric Wong was appointed as Assistant Park Warden of Kinabalu Park, but was temporarily replaced by Dr. Janardhanan s/o Swami in 1980 when the former went to pursue further studies. Upon his return 1982, Eric Wong was appointed as Acting Park Warden for Kinabalu, a post he still holds.

Apart from administration, research and education were also developed in the Park. Towards the end of 1980, a Park Ecology section was established and a Park Ecologist was recruited and based at Kinabalu Park. This section initiated the collection of insect and plants specimen, and prepared a plan for the Exhibit Centre in the new Administrative Building. In January, 1982, a volunteer from the Canadian Executive Services Overseas assisted the development of an Education Programme, including training in audio-visual and interpretation technique. A Mountain Garden was also established in 1982 where collection of living plants, including orchids from all over the Park area were transplanted. There was an increased emphasis on research beginning 1986. Among others, research project on *Nepenthes villosa* to study its growth, life span, and associated insects, reintroduction of seedlings of *Paphiopedilum rothschildianum* to certain area within the Park, and monitoring of the blooming of *Rafflesia* were carried out. More than 300 research projects had been completed and these provided insight for the better management of Kinabalu Park.

### **4. Infrastructure Development:**

In the early days, visitor numbers to Kinabalu Park was low, merely 879 in 1965. As the park continues to attract visitors because of its climatic, scenic, floral and faunal splendours, the number rose to 13,020 in 1980. When the sealed highway

from Kota Kinabalu to Ranau was completed in 1982, visitor arrivals increased to 45,948. Since then visitor numbers had been increasing.

From the time of the initial establishment of the park, two destinations had been open for visitors. The PHQ represents the access point to climb the mountain while PHS has a natural hot water spring as a key attraction. Initially, both destinations have limited visitor facilities. At the PHQ, facilities such as fellowship hostel, VIP chalets, twin-bed linked cabins, duplex cabins, and an administrative building were constructed between 1970 to 1980. Accommodation facilities increased from 10 beds to 126 beds following the construction of these buildings. From 1980 to 1990, one unit of hostel, eight units of chalets, and one lodge were built resulting in an increase to 222 beds. Similarly at the mountain, improvement and additional accommodation facilities were made. From 34 beds previously, there are now 138 beds available for climbers following the construction of Gunting Lagadan hut and Laban Rata rest house.

Poring Hot Springs initially started with 2 cabins which can accommodate 6 persons. New facilities such as hostels, a restaurant, and 2 units of chalets were constructed which resulted in an increase to 62 persons per night.

In 1992, the Mesilau area, on the southern boundary, was developed as another destination after Sabah Parks identified the need for a range of leisure and recreational facilities to be established at Kinabalu Park. Chalets, a restaurant, and an exhibit centre had been constructed, and operation began in May 1998.

### **C. Form and date of most recent records of site**

Inventory of The Plants of Mount Kinabalu is an on-going project. A total of five volumes shall be published. Three volumes had been published namely, Volume I: *Ferns and Ferns Allies* by Beaman et al. (1992); Volume II: *Orchids* by Beaman et al. (1993); Volume III: *Gymnosperms and Non-orchid Monocotyledon* by Beaman & Beaman (1998); Volume IV and V: *Dicotyledons* (to be completed in three to four year.)

### **D. Present state of conservation**

Kinabalu Park is listed in the UN list under IUCN category II (protected area managed mainly for ecosystem protection and recreation). Based on this status, the management of Sabah Parks ensures that its Parks are maintained unimpaired in perpetuity. As the areas are extensive, such as Kinabalu Park, the approach to conservation is to preserve the total habitat, and let natural processes take place

without outside interference (Lamri et al., 1991 as cited by Lamri & Nais, 1996). This approach applied to Kinabalu Park is working well. With the boundary of Kinabalu park completely surveyed and demarcated, it is now easier to prosecute offenders for violating the Parks Enactment. In addition, the amendment of the Parks Enactment on powers of park officers, addition of certain prohibited acts, and heavier penalties complemented this approach. Lastly, the present state of conservation of Kinabalu Park is better than previously.

#### **E. Policies and programmes related to the presentation and promotion of the property**

The interpretative and nature education programmes form an integral part of the parks system because the majority of park's visitors are the ecotourist. The foreign tourist acquires a new experience in a tropical rainforest setting, while the local visitors perceive differently the conservation approach advocated by Sabah Parks on the natural environment. As such, the interpretative and nature education programmes becomes an essential tool, not only to enhance the enjoyment of nature, but more importantly, to instill conservation awareness among the visitors. Sabah Parks, through the Interpretative and Education Unit, carries out interpretative and nature education programmes for both foreign tourists and local visitors. The activities carried out are: daily Guided Walk (11:00A.M.), Evening Slide Show (7:30 P.M. on weekend and public holidays), daily Video Show (2:00P.M.), Special Request, School Programme, and daily Mountain Garden Tour (9:00 A.M., 12:00 Noon, and 3:00P.M.)

### **4. Management**

#### **A. Ownership**

The Board of Trustees of the Sabah Parks

#### **B. Legal Status**

The Board of Trustees of the Sabah Parks, established and constituted under section 24 of the Parks Enactment, 1984, is responsible for the management and control of the Parks. The Board comes under the jurisdiction of the State Ministry of Tourism Development, Environment, Science and Technology. Under section 45 (2) of the Parks Enactment, 1984, the Board shall have power among others: (a) to provide and maintain adequate and efficient services and facilities at all parks; (b) to promote the use, improvement and development of the parks; (c) to ensure the security and well being of the animal and vegetation in a park and the



preservation of such park the natural features and the animal and vegetation in their natural state; and (d) to reserve or set side any portions of a park as breeding places for animals and as nurseries for vegetation.

Parks in Sabah were previously established under the National Parks Ordinance, 1962, and National Parks Enactment, 1977. These two legislations, however, had been repealed and replaced with the Parks Enactment, 1984. The objective of the Parks Enactment, 1984 is *to repeal and re-enact the laws relating to the provision and control of National Parks and National Reserves in Sabah and to provide for matters incidental thereto and connected therewith so as to make better provisions respecting the constitution, administration, procedure, functions and finance of Parks.*

### **C. Protective measures and means of implementing them**

#### **1. Survey of the Park Boundary**

Since 1986, Sabah Parks appointed private and qualified surveyors, registered with the Sabah Surveyors Board, to carry out survey of the park boundaries. A total of five survey firms were engaged in the project. The survey had to be carried out in stages due to limited budget allocated for each year. It was completed in 1998 with a total amount exceeding RM650,000.00 (US Dollar170,000.00). With the boundary completely surveyed and clearly demarcated on ground, it is now easier to detect any encroachment and prosecute offenders for violating the Parks Enactment.

#### **2. Enforcement of the Parks Enactment, 1984 and Parks (Amendment) 1996.**

Part VIII of the Enactment deals with the Control of Parks. For instance, Section 48 lists out the prohibited acts as follow: (a) convey into a park or within the confines thereof, or in possession of any weapons, explosive, traps, poison or noxious substance; (b) hunt, kill or capture any animal; (c) cut, damage, injure or destroy or set fire to any vegetation; (d) introduce any animal or vegetation; (e) remove any animal or vegetation; (f) remove any mineral or object of prehistoric, archaeological, historical or scientific interest; (g) destroy or deface any object; (h) erect any building; and (i) clear or break up any land. This section was amended to incorporate the following acts: (j) "cut, fell, damage, remove, injure, destroy or set fire to any tree or protected plant in a park;" and (k) "cut, damage, remove, injure, destroy or bomb any living or dead coral in a park." The Parks (Amendment) Enactment, 1996, provides a heavier penalty for contravening the provisions of this section. A person is liable for 3 years imprisonment and a fine of RM100,000 for

contravening (j) and (k), and one year imprisonment and a fine of RM25,000 for (a), (b), (c), (d), (e), (f), (g), (h) and (i). Section 49 provides the power of the Director to kill or capture any animals for the interest of public safety, protection of property or scientific studies. Section 51 spells out the power of the Director, Trustee or a Park Officer to inspect, enter, search, seize and detain. Section 52 the provides power to arrest without warrant, and section 56 empowers the Director or a Park Officer to compound offences.

The park rangers carry our regular patrols to the park areas and the boundaries. The management had also established two permanent sub stations at Sayap and Sorinsim, located on the western side and eastern sides of the park respectively for enforcement purposes. The park also enjoy good relationship with the villagers residing outside the park who provide information on any illegal activity being carried out within the park.

#### **D. Agents/agencies with management authority**

Kinabalu Park is owned by the Board of Trustees of the Sabah Parks, a statutory body under the State Ministry of Tourism Development, Environment, Science and Technology. The Board of Trustees consists of ten members. Management policies are implemented by a senior management team comprising of the Director of Sabah Parks and assisted by one deputy director and two assistant directors.

#### **E. Level at which management is exercised**

The Park Warden is the officer in charge of Kinabalu Park. His responsibilities include: administration, implementing the functionally related enactment, policies, regulations and procedures in relation to the enforcement, public and facilities security; the operations, maintenance, security, recreational and development programmes; management of visitors, and assisting research work in the park.

Two senior park rangers, 18 park rangers and a number of general workers assist the Park Warden in the day to day administration of the park.

##### **1. Name and Address of Responsible Person:**

Mr. Eric Wong Hon Fui  
Park Warden, Kinabalu Park, Ranau  
c/o Post Office Box 10626  
88806 Kota Kinabalu  
Sabah, MALAYSIA

**F. Agreed plans related to property (e.g., regional, local plan, conservation plan, tourism development plan)**

*Sabah Conservation Strategy, 1992 (Appendix 6A) and Sabah Tourism Masterplan, 1996 (Appendix 6B) have plans related to Kinabalu Park. Under the Sabah Conservation Strategy Volume 2: Action Plan, the promotion of eco-tourism in any Park, Forest Reserve or Nature Reserve be governed by the following methods or activities:*

- (1) Any tourism facility proposed for construction will be subject to an Environmental Impact Assessment;*
- (2) Large buildings and "projects" (e.g. large hotels and extensive sporting facilities) should not be built in or near to any protected area;*
- (3) Payment for entry to parks;*
- (4) Amendments to the Parks legislation.*

Under the marketing plan of the Sabah Tourism Masterplan (1996), Kinabalu Park was listed as one of the area for product development. The recommendations are as follows:

*(I). The tourism roles of the facilities areas within Kinabalu Park be clarified as: Kinabalu for mountain climbing, family weekend bungalows, tourist day use and tourist accommodation lodges; Mesilau Plateau for family weekends, nature studies, outdoor education, training courses, seminars and retreats, and hostel style accommodation for local and international visitors; and Poring Hot Springs for water fun, recreation, family days out and nature walks.*

*(II). Visitors accommodation facilities at Park Headquarters be renovated and designed to cater for specific markets but limited to the present number of beds.*

*(III) The management of accommodation, souvenir shop and restaurants at Kinabalu be licenced to competing and independent commercial operators to promote quality. Ownership of facilities be retained by Sabah Parks.*

*(IV) The road alignment outside the Kinabalu facilities area be altered to allow the construction of car and bus parks for day visitors, a shuttle bus service be initiated around the loop road inside, a new visitor entrance building be constructed with shops and ticketing facilities, and the park's existing public office at the entrance be converted into an information centre.*

(V) Better interpretation of Kinabalu Park be provided by upgrading the information centre at the Park Headquarters Entrance, and rearranging and improving the displays and visitor facilities at the Visitor Centre and Cafeteria.

(VI) A circuit road around the mountain be developed for tourism and named "Around the Mountain Road," including a new road linkage be constructed from Pindawan via Marak Parak to Kota Marudu. Village stay accommodation be encouraged along the Around the Mountain Road.

(VII) Product and marketing linkages be developed between Mount Kinabalu and the coast by promoting scenic drive from Kota Kinabalu to Park Headquarters, initiating a programme of product development assistance key stopping points and developing a self gilded brochures for this and other scenic trips.

(VIII) The proposed Layang Layang to Mesilau Ridge trail be completed, opened, managed and marketed as a one and two day "Mount Kinabalu Trail" trek. A circuit be completed linking Mesilau Plateau with Kundasang.

(IX) Mount Kinabalu summit climb continue to be promoted as an accessible all year round two-day adventure, suitable for moderately fit visitors. Improve the experience by reorganising booking systems, upgrading and expanding Laban Rata to 200 persons and Gunting Lagadan to 100 persons managed by one commercial licensee.

(X) The Mount Kinabalu guiding standards be improved by training and having better mountain safety standards, language skills and plant interpretation.

(XI) Further rock climbing routes be investigated on the summit plateau for the specialist market.

## **G. Sources and levels of finance**

Sabah Parks receives grant from The State Government of Sabah mostly for management and operation expenses for all the six gazetted parks, including Kinabalu. A grant of Malaysian Ringgit (RM) 5.5 million was allocated in 1996, RM2.5 million in 1997, and RM2.4 million in 1998. (Currently, RM1.00 is equivalent to US Dollar 0.2614, or equivalent to Pound Sterling 0.1629)

Kinabalu Park also generates income from many sources such as entrance fees, canopy walkway fee, camera and video fee of canopy walkway, butterfly farm fee,

Mountain Garden fee, mountain climbing fee, sale of park accommodation, rental fee of bath tubs, fines, and compound fees. The total revenue generated in 1998 was RM2,055,329.44. PHQ collected 71.8 percent of the total revenue, while PHS contributed the rest (Sabah Parks Revenue Return for 1998).

In 1998, the Management and Operations Section of Kinabalu Park spent a total of RM1,857,566.70 on management and operational expenses. This figure represents about 18.9 percent of the total budget of Sabah Parks for the said year. During the same year, the Research and Education Section at Kinabalu Park spent RM941,242.98 (or 9.6 percent of the total budget of Sabah Parks for 1998) on staff salaries and others expenses.

#### **H. Sources of expertise and training in conservation and management technique**

**1. Field Museum of Natural History, Chicago, USA:**

Training Program in Conservation of Biological Diversity:

A technical staff (park ranger) attended a three-month training program in 1994 at the above institution.

**2. Smithsonian Institution, Washington D.C, USA:**

Wildlife Conservation and Management Training Program, International Training Course in Conservation Biology and Wildlife Management:

A six-week training course based at Bukit Rengit Training Centre, Krau Wildlife Reserve, Malaysia and at Tong-Ngar-Chang Wildlife Sanctuary, Thailand in 1994. A research officer (zoologist) attended the course.

**3. Protection Program, Ministry of Forests, British Columbia, Canada:**  
Fire Fighting Training:

Two park officers are currently undergoing a three-month fire fighting training program. The training ends late August, 1999.

**4. Kagoshima Prefectural Government, Japan:**

Kagoshima Asia-Pacific International Countryside Center, and Kagoshima Prefectural Museum:

A technical staff, who was a counterpart of a Japanese Overseas Cooperation Volunteer (JOCV), went for training on Zoology and Museum Management from May, 1994 to February, 1995 at the above institution.

**5. Chiba Prefectural Government, Japan:**

Natural History Museum and Institute, Chiba, Japan:

Another technical staff, also a JOCV counterpart, went for training on insectarium management from June, 1995 to March, 1996.

**6. Royal Botanic Gardens, Kew, England:**

A Memorandum of Understanding (MoU) between The Board of Trustees of the Royal Botanic Gardens, Kew and The Sabah Parks was signed in June, 1998. The aim of the MoU is to “establish co-operative relations through mutual assistance in the areas of research and training.” In addition, its immediate aim is “to enlarge the representation in herbaria of reference specimens of plants and fungus species found in Sabah’s parks.” Kew shall assist Sabah Parks to determine un-named specimens (including new plant and fungal species) in order that the reference facilities at Sabah Parks can be augmented for conservation work and related research.

**I. Visitor facilities and statistics**

**1. Visitor Facilities**

Kinabalu Park Headquarters is linked to Kota Kinabalu by an 83-km highway or about 2-hour drive. Poring Hot Springs, the other tourist destination within the park, is also accessible through a sealed road from PHQ taking just 45 minutes by a vehicle.

The Sabah Parks had provided visitors facilities at three different destinations, namely at PHQ, PHS and at Mesliau. Following are lists of visitor’s facilities at each destination:

<b>Gift Shop</b>		
<b>Kinabalu Park Headquarters (PHQ)</b>	<b>Poring Hot Springs (PHS)</b>	<b>Mesilau Nature Resort</b>
Gift shop	Gift Shop	None presently

<b>Cafeteria/ Restaurant</b>		
<b>Kinabalu Park Headquarters</b>	<b>Poring Hot Springs</b>	<b>Mesilau Nature Resort</b>
Balsam Cafeteria	Restaurant	Malaxi Café
Mt. Kinabalu Restaurant		Kedamaian Restaurant
Laban Rata Restaurant		Renanthera Lounge

<b>Other Facilities</b>		
<b>Kinabalu Park Headquarters (PHQ)</b>	<b>Poring Hot Springs (PHS)</b>	<b>Mesilau Nature Resort</b>
A network of trail around the PHQ (18.0 km), and the summit trail (8.72 km)	A network of trail	Trail network (5.7 km.) linking the summit trail at Layang-Layang (2,702.3 m asl)
Multi-purpose hall and exhibit centre	Canopy walkway	Amphitheater
Fitness centre	Orchid Garden	Exhibit centre
Guided walk & slide shows	Butterfly farm	
Mountain Garden	Hot water bathtub (open and enclosed)	

<b>Accommodation</b>		
<b>Kinabalu Park Headquarters Complex (PHQ)</b>	<b>Poring Hot Spring (PHS)</b>	<b>Mesilau Nature Resort</b>
Rajah Lodge (1 unit x 5 bedrooms)	Rajawali Chalet (2 units x 3 bedrooms)	Chalet Type 1 (2 unit x 3 bedrooms)
Kinabalu Lodge (1 unit x 4 bedrooms)	Old Chalets (1 unit x 3 bedrooms) (1 unit x 2 bedroom)	Chalet Type 2 (4 units x 2 bedrooms)
Nepenthes Villa Chalet (8 units x 2 bedrooms)	Hostel (40 persons dormitory)	Witti Range Lodge (4 units x 3 bedrooms)
Double storey chalet (1 unit x 3 bedrooms)		Crocker Range 1 Lodge (4 units x 3 bedrooms)
Single storey chalet (1 unit x 2 bedrooms)		Crocker Range 2 Lodge (4 units x 3 bedrooms)
Twin-bed cabins (10 units x 1 bedroom)		Crocker Range 3 Lodge (4 units x 3 bedrooms)
Duplex chalets (4 units x 2 bedrooms)		Resthouse (96 persons dormitory)
New Hostel (54 persons dormitory)		
Fellowship hostel (48 persons dormitory)		
<b>Accommodation at the mountain</b>		
Waras Hut (12 persons dormitory)		
Panar Laban Hut (12 persons dormitory)		
Gunting Lagadan Hut (44 persons dormitory)		
Laban Rata Resthouse (54 persons dormitory) (1 room for 2 persons with attached bath) (1 room for 4 persons with attached bath)		
Sayat-Sayat Hut (10 persons dormitory)		



## 2. Visitor Numbers to Kinabalu Park:

The table below shows the visitor numbers to Kinabalu Park from 1994 to 1998:

Year	Kinabalu Park Headquarters	Poring Hot Springs	Mount Kinabalu Climbers
1994	200,907	117,994	48,321
1995	214,369	146,170	34,274
1996	210,890	132,566	32,059
1997	218,733	155,896	33,211
1998	180,707	128,038	22,937

Foreign tourists constitute an average of 11.4 percent and 20.3 percent of the visitor numbers to Kinabalu Park and Poring Hot Springs respectively. In 1998, foreign tourists accounted for 30 percent of the visitor numbers to Poring Hot Springs. Foreign tourists represent an average of 41.4 percent of the mountain climbers.

## J. Site management plan and statement of objectives

The Board of Trustees of the Sabah Parks in 1990 commissioned Sun Chong & Wong (Sabah) and Coopers & Lybrand, Malaysia to prepare a Management and Development Masterplan for the Sabah Parks, especially on Kinabalu Park. The plan is basically a set of guidelines which identifies the approach to manage Kinabalu Park. It is the basic working document for the park managers because it identifies the purpose of the park and its natural values, it provides the objectives of management of the park and determines the development and management strategy to be followed to meet the basic management objectives, and it details the work that needs to be carried out to attain the basic management objectives. The management implements the five strategic development thrusts recommended in the plan as follow:

### (1) Strategic Thrust One:

#### Conserving the Biological and Physical Resources

Under thrust one, the management shall preserve habitats harbouring rare plant and animal species, develop a comprehensive zone map for specific conservation effort, designate zones possessing outstanding natural and scenic values and adopt the proposed management objectives and practices, designate zones possessing wilderness and conservation values and adopt the proposed management objectives and practices, to carry out in-vitro conservation and multiplication of endangered plant species, and to establish a biological information data system.

**(2) Strategic Thrust Two:**

**Spearheading Scientific Research and Enhancing Educational Values**

Under thrust two, the management shall identify priority areas of research, compile and analyse all research materials on Kinabalu, train park research personnel, solicit funding and sponsorship of research, initiate research collaboration with other institution, form a committee for Kinabalu Park research, implement guidelines for research collaborations and specimen collection, establish field study centres in areas of scientific values, develop the Kinabalu Park Heritage inventory, establish the Kinabalu Park Herbarium and Museum of Natural History, establish a park interpretative unit, establish an aromatic plant garden, establish thematic interpretative and nature trail, establish a nature and outdoor education centre, conduct regular scientific expeditions, develop educational and interpretative programmes, and designate zones possessing special scientific values and adopt the proposed management objectives and practices.

**(3) Strategic Thrust Three:**

**Increasing Recreational and Touristic Activities**

Under thrust three, the management shall designate zones possessing potential for recreation and tourism, actively involve the public in the planning and management of the park, develop an effective interpretation and information services for Kinabalu Park, improve public access into and within Kinabalu Park, and identify and develop suitable activities which are in consonance with resource carrying capacity for recreation and tourism.

**(4) Strategic Thrust Four:**

**Preserving Cultural and Historical Values**

Under thrust four, the management shall identify and preserve sites possessing cultural and historical features.

**(5) Strategic Thrust Five:**

**Instituting Management Procedures to Support Other Strategic Thrusts.**

Under thrust five, the management shall adopt a procedure for carrying out development projects, plan and provide for safety measures for park users, enhance park's hygiene through measures including rubbish disposal, and institute linkages with other organisations.

A copy of the management plan appears on **Appendix 6C**.

## K. Staffing levels (professional, technical, maintenance)

Kinabalu Park has a total of 132 staff of which 95 are involved in the Management and Operation Section, while 37 are attached to the Research and Education Section. The Research and Education Section presently concentrates mostly on Kinabalu Park although its jurisdiction covers the whole park system. The table below shows the staffing levels:

<b>Kinabalu Park Staffing Level</b>	
<b>Professional</b>	<b>No. of staff</b>
Park Warden	1
Research Officers	3
<b>Technical</b>	
Assistant Research Officers	3
Technical Assistants	9
<b>Clerical</b>	
Clerical Assistants	7
<b>Enforcement</b>	
Asst. Park Warden	1
Senior Park Rangers	2
Park Rangers	18
<b>Maintenance</b>	
Skilled & semi-skilled workers	85
Vehicle drivers	3
<b>Total number of staff</b>	<b>132</b>

## 5. Factors Affecting the Site

### A. Development Pressures:

#### 1. Native Customary Rights:

Several areas within the park had been claimed by adjacent villagers as “native customary rights” based on the Land Ordinance (Sabah Cap. 68). Under section 15 of the Land Ordinance (Sabah Cap. 68), *native customary rights shall be held to be – (a) land possessed by customary tenure; (b) land planted with fruit trees, when the number of fruit trees amounts to twenty and upwards to each acre; (c) isolated fruit trees, and sago, rotan, or other plants of economic value, that the claimant can prove to the satisfaction of the Collector were planted or upkept and regularly enjoyed by him as his personal property; (d) grazing land that the*

*claimant agrees to keep stocked with sufficient number of cattle or horses to keep the undergrowth; (e) land that has been cultivated or built on within three years; (f) burial grounds or shrines, and (g) usual rights of way for men or animal from rivers, roads, or houses to any or all of the above.* The areas claimed (Map 5) are at Podi, Takulong, Piak, Kg. Lahanas, and Kg. Melangkap totalling some 2,000 hectares. Fruit trees cultivation and burial ground form the basis of the villagers' claim. Although they had made their claim since 1988, the management of Sabah Parks had not entertained any. However, it is anticipated to become a "pressure" in future because of the growing population and lacking of available land elsewhere.

## **2. Agriculture:**

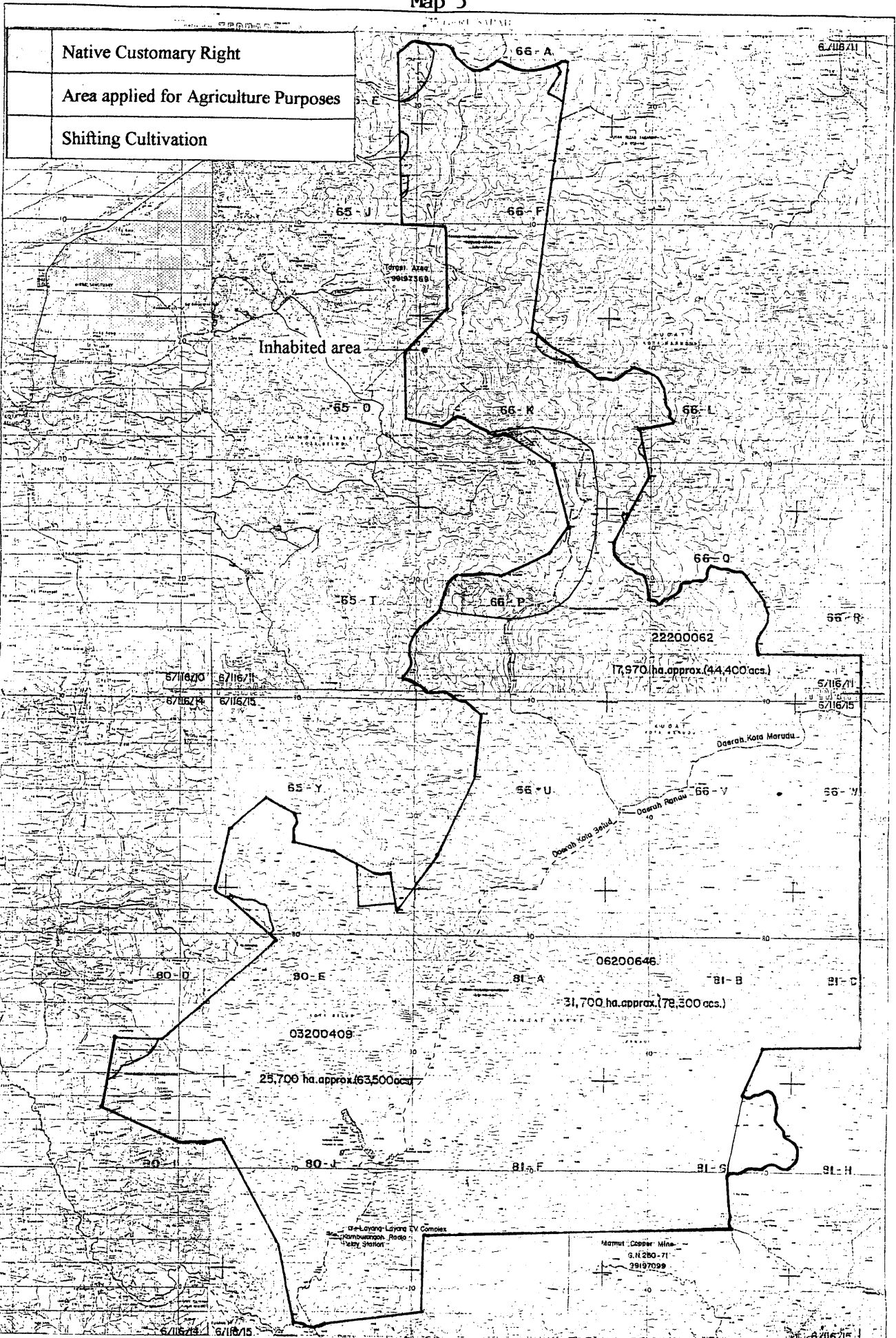
In 1988, the park area near Kg. Nalumad, Takutan (Map 5) had been applied for agricultural purpose. Villagers proposed the area, about 1,800 hectares in extent, for growing temperate vegetables. As in the previous case, Sabah Parks did not entertain their application, but it is foreseen as a threat in future due to lacking of uncommitted land outside the park.

Prior to the establishment of the area as a park, it was a forest reserve with boundary markings on the ground. Adjacent villagers adopted these markings and occupied the area right to the "boundary" for shifting cultivation. However, upon proper survey and demarcation of the park boundaries by qualified surveyors, it was found that shifting cultivation had actually taken place within the park involving 1,225.94 hectares. Shifting cultivation had been controlled and the management believes that it doesn't pose a major threat to the park.

## **B. Environmental Pressures**

### **Climate Change:**

In the humid tropics of South East Asia, El Nino events are usually connected with droughts (Walsh, 1996). Severe droughts had occurred in Kinabalu Park, especially on the summit region of the mountain in 1972-73 (Lowry et al., 1973), in 1982-83 (Kitayama, unpublished data), in 1992 (Kitayama, 1996), and in 1997-98 (Kudo & Kitayama, 1999), and all of them coincided with El Nino events. Kudo & Kitayama (1999) revealed that the 1997-98 drought resulted in extremely serious influence on vegetation when compared to previous droughts. They noted that about 50 percent of the summit plants were killed, but the extent of damage differed between the habitat types. In another related study, Kitayama et al. (1999) observe extensive areas of brown dead canopies, especially in the subalpine *Leptospermum* scrub above 3,100 m. and in the summit scrub/herb vegetation. According to Webster & Palmer (1998), the 1997-98 El Nino was the strongest of this century. This prevailing tendency of drought suggests possible climate change.



Daerah Ranau ——— 31,700 ha. (78,300 acs.)  
 Daerah Kota Belud — 25,700 ha. (63,500 acs.)  
 Daerah Kota Marudu — 17,970 ha. (44,400 acs.)  
 Jumlah ————— 75,370 ha. (186,200 acs. 291 sq.mts.)

Rujukan plan -  
 F 214  
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 99197258  
 99197271  
 99197117  
 99197369

Tanah Simpanan Taman Kinabalu  
 Daerah Kota Belud, Kota Marudu & Ranau

Skal 1:100,000 (125-25 rantai seinci)  
 L.S. 604-2-2-240  
 Tarikh: 5-12-1983

Diluluskan  
 5/12/1983  
 (Mohamad bin Jafry)  
 b.p.Pengarah Tanah & Ukur

### **C. Natural disasters and preparedness**

Other than fires, no other natural disaster had ever occurred within Kinabalu Park. The El Nino event affected Sabah between December, 1997 to April, 1998 causing severe drought throughout the State. This extreme dry season resulted in forest fires affecting the park at nine locations between March and mid-April, 1998. An estimate of about of 2,500 hectares of the park (Map 6), comprising a major portion of substituted vegetation, and located mostly along the boundaries were burnt. The rangers and general workers, with the assistance of surrounding villagers, managed to contain the fires from spreading further.

The forest fires provided an experience to the management Sabah Parks. The management believes that fire issues shall be included as an integral part of the park management. Currently, two park officers are in British Columbia, Canada undergoing fire-fighting training under the Ministry of Forests for three months since May 1999. Upon their return, these officers, with the assistance of a fire fighting expert from the Ministry of Forests, will provide training for the rangers and other staff.

### **D. Visitor/tourism pressures**





Three destinations had been open to visitors. These destinations form only a small fraction {estimated to be less than 5 percent (Nais, 1996)} from the total area of Kinabalu Park. Currently, it is difficult to ascertain whether the level of visitation had negative impacts on the whole natural environment of the park considering the small area involved. However, if the PHQ area is taken into account because of the availability of limited overnight facilities, then the visitation pattern was quite high especially during the boom of 1984-1990 period. There were apparent overcrowding, even trampling and overuse of various facilities (Nais, 1996). This situation prompted Sabah Parks to improve and develop other destinations such as PHS and Mesilau. Consequently, visitor numbers to PHQ decreased while it increased at PHS.

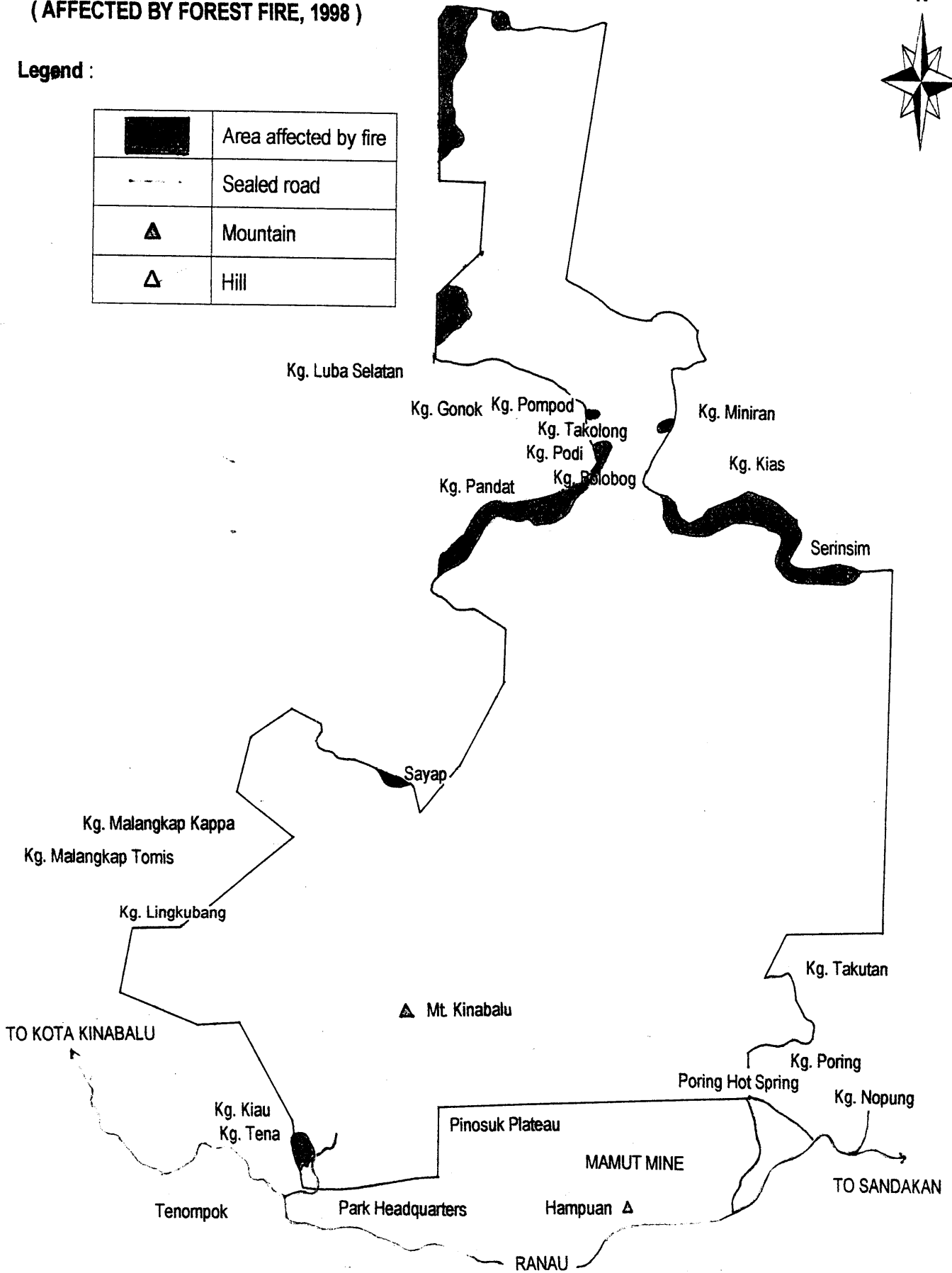
On the other hand, site such as the summit trail, provides a different perception. Moey (1998) carried out an evaluation of the tourism carrying capacity for the summit trail of Mt. Kinabalu. He revealed that "climbers accepted the 'current' level of use for the mountain." However, he pointed out that with many people during "high tourist" seasons on a single trail could have serious effect on the environment such as trail erosion, littering, and disturbance to wildlife. About 10 percent of the mammals species lives exclusively on the mountain, and birds like the Kinabalu Friendly Warbler are Bornean endemic found only at Mt. Kinabalu and Mt. Trus Madi (Jacobson, 1986; MacKinnon & Phillips, 1994). Moey cited Jacobson's (1986) observations on the absence of the Kinabalu Friendly Warbler,

**KINABALU PARK AREA  
( AFFECTED BY FOREST FIRE, 1998 )**



**Legend :**

	Area affected by fire
	Sealed road
	Mountain
	Hill



**( NOT TO SCALE )**

since “the Park became so popular” as an indication of adverse tourism impact on the environment. Nonetheless, Dr. Junaidi Payne of the World Wide fund for Nature, Malaysia, Sabah Branch when interviewed by Moey (1998) commented that “soil erosion along the trail was negligible given the size of the trail” and added that associated negative tourism impacts upon the mountain environment were considered lower in magnitude when compared to large scale land clearance for plantations elsewhere in the State. Mr. Maklarin Lakin, the zoologist of Sabah Parks commented that the absence of the Kinabalu Friendly Warbler could not be used as a tourism impact indicator until specific research on the birds’ behaviour had been done. Moey (1998) concluded that the overall impact from mountain climbing was not apparent. However, with Kinabalu being continuously used as a marketing icon by the State Tourism Promotion Corporation, the Sabah Parks expects an increase in visitation to Kinabalu Park in future.

### **1. Steps taken to manage visitors and tourists:**

The management of Sabah Parks had taken the following steps in managing visitors and tourists.

- 1.1 Developing the Mesilau area as a nature resort. This development aims to reduce the pressures at PHQ and at PHS, to offer alternative recreation activities to park visitors, to project the eco-development thrusts of Sabah Parks, and to meet the different forms of visitors’ demands. The resort started operation in May, 1998.
- 1.2 Increasing the mountain climbing fees effective January, 1998 from RM2.00 to RM10.00 for locals 18 years and below; from RM10.00 to RM25.00 for local adult; from RM2.00 to RM20.00 for foreigners 18 years and below; and from RM10.00 to RM50.00 for adult foreigners.
- 1.2 Cutting up new summit trail (5.7 km) from Mesilau to Layang-Layang at 3,702.3 m above sea level. This new route had been opened since October, 1998.
- 1.4 Formulating new regulations to replace *the Kinabalu National Park Regulations, 1971*. Draft Regulations appears on **Appendix 7**.

### **E. Number of inhabitants within the park**

A 12-member family occupies an area of about 40 ha. inside the park (Map 5). The family comprises of two elderly women who are siblings, age between 56 to 75 years old. They were married previously and had children. One daughter, age 40 years old, continued staying with her mother. She has 9 children from a marriage



with a man residing outside the park. The children were born between 1989 and 1997. Actually, seven members stay full time in the area as the schooling children remain with relatives outside the park.

According to the information received from one of the family member, the area had been inhabited for at least five generations. This claim can be proven by the presence of their ancestors' graves in the area, and the occurrence of large-sized fruit trees.

The activities carried out by this family are planting of hill padi through shifting cultivation, planting of fruit trees such as mango trees, coconut trees, banana trees, and papaya trees. The family also rears a small number of chickens for their own consumption. In addition, they gather forest produce such as bamboo, rattan, and pandanus for making handicraft such as baskets and hats.

Plans are under way to resettle this family outside the park with the assistance of other government departments and agencies.

#### **F. Others**

1. Absence of long-term land use plan for forest land immediately outside the park.
2. Absence of clear land tenure of land outside Park boundary.
3. Degradation of area outside Kinabalu Park Headquarters by spreading of privately owned chalet, poor waste disposal and sewage.

## **6. Monitoring**

### **A. Key indicators for measuring state of conservation**

Presently, Sabah Parks does not employ any key indicator for measuring the state of conservation. However, there are several monitoring activities being undertaken as follows:

#### **1. Monitoring Climatic Conditions:**

A joint organised project, called EcoKinabalu Project, between Sabah Parks and the Japanese Ecological Research Team from the Japanese Forestry and Forest Products Research Institute. Kitayama et al (1999) outlined the purposes of monitoring as follows: 1. to climatically characterize its mountain slope; 2. to understand the climatic patterns and biological influences of abnormal catastrophic

climatic events such as the El Nino phenomenon; 3. To investigate the seasonality of climate and its functional relationship with phenology.

Four fully automated climate stations located at different elevations and forest zones had been established since May, 1995. The stations are at Poring Hot Springs (550 m; Hill dipterocarp forest), Kinabalu Park Headquarters (1,560 m; Lower montane forest), Carson Camp helipad (2,650 m; Upper montane forest), and at Laban Rata (3,270 m; Lower subalpine forest). Each station consists of climate sensors connected to a CR10 data logger (Campbell Scientific, Logan, Utah, U.S.A). The sensors used are Vaisala HMP35C probes for air temperature and relative humidity, 107B probes for soil temperature, 257 Watermark Soil Moisture Blocks for soil moisture, LI-COR 190SB quantum sensors for photosynthetically active radiation (PAR) (wavelength 400-700nm), TE525MM tipping bucket rain gauges for rainfall, and RM Young Wind Sentry Anemometers for wind speed.

**2. Monitoring populations of amphibians:**

This study was carried out from July 1995 to July, 1997 at three sites at differing elevations, namely at Poring (550 m asl), Sayap (950 m asl), and Mesilau (1850-1950 m asl). The study aimed to evaluate the amphibian population within Kinabalu Park and adjacent unprotected areas.

**3. Altitudinal Survey of birds:**

On avifauna, a study on comparison of species richness along an elevational gradient starting from lowland to upper montane was carried out from June 1996 to October, 1997. The study aimed to document the altitudinal distribution of the bird fauna within the park.

**B. Administrative arrangement for monitoring property**

**1. Monitoring climatic conditions:**

A long term ecological research with recordings done daily.

**2. Monitoring populations of amphibians:**

Once every three months over a period of two years.

**3. Altitudinal Survey of birds:**

On monthly basis with an interval of three to four months over a period of 16 months.

## **C. Result of previous reporting exercises**

### **1. Monitoring of climatic conditions:**

Kitayama et al (1999) reported the result of monitoring as follows: For the past three years, some climatic variables changed greatly from year to year. Severe drought occurred from late 1997 to early 1998 which seriously affected social and ecological system.

### **2. Monitoring populations of amphibians:**

Inger et al. (1997) reported the discovery of a new species *Leptolalax maurus* at Mesilau. This new species is distinguished for its small size and the large size of its ova.

Lakim et al. (1999) reported that species richness of amphibians was significantly greater in primary forests than in secondary forests. Species that inhabited only primary forests were rare, but the bulk of species that dwelled in both primary forests and secondary forests were common.

### **3. Altitudinal Survey of birds:**

Biun (1999) reported the increase of bird fauna by 6 percents out of 306 species previously recorded by Wells & Phillipps (1996). The number of birds decreased sharply from lowland to montane and sub-alpine regions of the mountain.

## **Conclusion:**

From the management of Sabah Parks point of view, the nomination of Kinabalu Park as a World Heritage Site does not impose, at least directly, any new management requirement. The current management practice, subscribing to the concept of national park ideal developed by the United States, could be continued. The designation of Kinabalu Park as a World Heritage Site, however, does carry with it significant international prestige. Thus, the management is obliged to protect the quality of Kinabalu Park in accordance with the status of a World Heritage Site. The management believes that the values of the park could be protected using current management practices.

Kinabalu Park has several criteria which qualify for inclusion as a World Heritage Site. The evidences of glacial action on the summit plateau of Mt. Kinabalu, the natural scenic beauty, the topographical features such as the waterfalls, peaks and plateaus, and more importantly, the diversity of plants are some of the unique features of Kinabalu Park. The listing of Kinabalu Park as a World Heritage Site is appreciated as it will benefit Sabah Parks, as well as the State of Sabah, and Malaysia.

## **7. Documentation**

### **A. Photographs and slides**

Illustrations appear at the end of this nomination marked as **Appendix 8**. A set of color photos and slides on the flora, fauna, geological features, and also buildings are included.

### **B. Copies of site management plans and extracts of other plans relevant to site**

The following items appear at the end of this nomination marked as **Appendix 6**.

**Appendix 6A:** Extract of the Sabah Conservation Strategy Volume 2: Action Plan

**Appendix 6B:** Extract of the Sabah Tourism Masterplan

**Appendix 6C:** “The Kinabalu Park Development Masterplan Towards Sustained Development” and A Development Plan for Kinabalu Park Nature and Golf Resort” Volume II & III of The Management and Development Masterplan for he Board of Trustees of Sabah Parks

### **C. Other documents**

**Appendix 1:** Parks Enactment, 1984 and Parks (Amendment) Enactment, 1996

**Appendix 2:** Copy of the draft boundary survey plan of Kinabalu Park

**Appendix 3:** Map showing Actual Vegetation of Mount Kinabalu Park, Sabah Malaysia

**Appendix 4:** Species lists

**Appendix 5:** A National Park Policy for Sabah

**Appendix 7:** Draft Kinabalu Park Regulations, 1999

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Parks (Amendment) Enactment, 1996

Land Ordinance (Sabah Cap. 68)

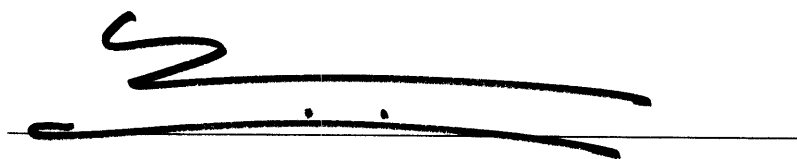
WWF, Malaysia. 1992. "Sabah Conservation Strategy Volume 2: Action Plan"

**E. Address where inventory, records and archives are held**

1. The Board of Trustees of the Sabah Parks  
P.O. Box 10626  
88806 Kota Kinabalu  
Sabah, MALAYSIA  
Tel. 088-211524; Fax: 088-221001
2. The Royal Botanic Gardens, Kew  
Richmond, Surrey TW9 3AB  
UNITED KINGDOM  
Tel. 44-181-332-5000; Fax: 44-181-3325197
3. State Museum Department  
Museum Road  
Mail Bag 2015  
88566 Kota Kinabalu,  
Sabah, MALAYSIA  
Tel. 088-253199/253305/225033; Fax: 088-240230
4. Forestry Department  
Locked Bag 68  
90009 Sandakan  
Sabah, MALAYSIA  
Tel. 089-660811/660824; Fax: 089-669170



**8. Signature on behalf of the State Party**

A handwritten signature in black ink, consisting of a stylized 'S' shape followed by a long horizontal stroke with a small loop at the end.

Full Name: **Yang Berhormat Datuk Chong Kah Kiat**

Title: **Minister of Tourism Development, Environment, Science and  
Technology, State of Sabah, MALAYSIA**

Date: **12 JUN 1998**

## AUTHORIZATION

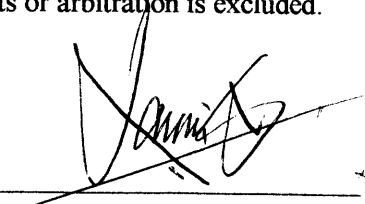
1. I, Datuk Lamri Ali the undersigned, hereby grant free of charge to Unesco the non-exclusive right for the legal term of copy right to reproduce and use in accordance with the terms of paragraph 2 of the present authorization throughout the world the photograph(s) and/or slide(s) described in paragraph 4.
2. I understand that the photograph(s) and/or slide(s) described in paragraph 4 of the present authorization will be used by Unesco to disseminate information on the sites protected under the World Heritage Convention in the following ways:
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  - Co-editions with private publishing houses for World Heritage publications; a percentage of the profits will be given to the World Heritage Fund;
  - Postcards – to be sold at the sites protected under the World Heritage Convention through national park services or antiquities (profit, if any, will be divided between the services in question and the World Heritage Fund);
  - Slide series – to be sold to schools, libraries, other institutions and eventually at the sites (profits, if any, will go to the World Heritage Fund);
  - exhibitions, etc.
3. I also understand that I shall be free to grant the same rights to any other eventual user but without any prejudice to the rights granted to Unesco.
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5. All photographs and/or slides will be duly credited. The photographer's moral rights will be respected. Please indicate the exact wording to be used for the photographic credit.
6. I hereby declare and certify that I am duly authorized to grant the rights mentioned in paragraph 1 of the present authorization.
7. I hereby undertake to indemnify Unesco, and to hold it harmless of any responsibility, for any damages resulting from any violation of the certification mentioned under paragraph 6 of the present authorization.
8. Any differences or disputes which may arise from the exercise of the rights granted to Unesco will be settled in a friendly way. Reference to courts or arbitration is excluded.

Kota Kinabatu

22 June 99

Place

Date

  
Signature, title or function of the  
person duly authorized

**DATUK LAMRI ALI**

Director

Sabah Parks

**APPENDIX 1**

**Parks Enactment, 1984 &  
Parks (Amendment) Enactment, 1996**



**STATE OF SABAH**

I assent,



**TUN DATUK HAJI MOHAMMAD ADNAN ROBERT,**  
*Yang di-Pertua Negeri.*

14TH MARCH, 1984.

**No. 6 of 1984**

An Enactment to repeal and re-enact the law relating to the provision and control of National Parks and National Reserves in Sabah and to provide for matters incidental thereto and connected therewith so as to make better provisions respecting the constitution, administration, procedure, functions and finance of Parks.

ENACTED by the Legislature of the State of Sabah as follows:—

## PART I

## PRELIMINARY

- Short title. 1. This Enactment may be cited as the Parks Enactment, 1984.
- Interpretation. 2. In this Enactment unless the context otherwise requires:—
- “animal” means any mammal, reptile, insect, bird, fish, crustacean, living coral and any product thereof or any invertebrate animal or any other living organism;
- “Board” means the Board of Trustee constituted under the provisions of section 24;
- Cap. 68. “Collector” shall have the same meaning as in the Land Ordinance;
- “declaration” means a declaration of land as a Park under section 13;
- “Director” means the Director of Parks appointed under the said section 41;
- “Fund” means the Park Fund established under section 46;
- “hunt” and “hunting” means the doing of any act immediately directed at the killing, wounding, injuring, disturbing, collecting, taking or capture of any wild animal including eggs and young ones, and the following of any animal of its lair;
- Cap. 68. “land” means the State land as defined in the Land Ordinance and any other land granted or leased to the Board for the purpose of a Park and includes the territorial waters of the State and the sea bed beneath;
- “mineral” means all rock, stone gravel, sand, soil and coral other than mineral oil, minerals or mineral substances which are subject to the provisions of the Mining Ordinance, 1960;
- No 20 of 1960. “Minister” means the minister for the time being responsible for matters relating to Parks;
- “notification of intention” means a notification published under sections 3 and 18;
- “Parks” means any area of land constituted as a Park under the provisions of Part II;

“Park Officer” means any person appointed under section 41 (1) (b);

“trophy” means any animal alive or dead, and any bone, claw, shell, carapace, plastron, feather, hair, hoof, horn, ivory, beak, skin, tooth, tusk, egg, or other durable portion whatsoever of any animal, whether processed or not which is readily recognised as a durable portion of any animal;

“Trustee” means a person appointed as a Trustee under section 25;

“vegetation” means any vegetable matter living or dead to include stems, roots, wood, leaves, flowers sap, latex, fruits, nuts and any product of such vegetation.

## PART II

### ESTABLISHMENT OF PARKS

3. The Yang di-Pertua Negeri may, with the advice of the Minister, by notification in the Gazette, declare his intention to constitute any State land as a Park and such notification shall:—

Power to constitute Parks.

- (a) specify as nearly as possible the situation and extent of such land; and
- (b) declare that it is proposed to constitute such land a Park.

4. A notification of intention shall lapse at the end of such period as shall in each case be specified therein:

Lapse of notification of intention.

Provided that the Yang di-Pertua Negeri may by notice in the Gazette extend the operation of any notification of intention from time to time for such further period or periods as he may think fit.

5. During the interval between the publication of a notification of intention (such notification not having lapsed as provided in section 4) and the date fixed by the notification declaring a Park as in section 13, no land shall be alienated under the provisions of the Land Ordinance, no new house shall be built or plantation formed and no fresh clearing for a cultivation or for any other purpose shall be made and no hunting shall take place on or in any land mentioned in such notice:

Alienation of land, new buildings and cultivation prohibited after publication of notice.

Cap. 68

Provided that the Minister may, with the recommendation of the Director, in his discretion authorise in writing the doing of any act which would otherwise be prohibited under this section.

Publication  
of notice.

6. At any time after the publication of a notification of intention the District Officer or Collector of the district in which the land concerned is situated, shall publish in convenient places on such land, and elsewhere as he may deem expedient, a notice in Bahasa Malaysia and English language and in such other languages as the Yang di-Pertua Negeri may in any particular case direct:—

- (a) specifying as nearly as possible the situation and extent of the land proposed as a Park;
- (b) setting forth the provisions in substance of section 7;
- (c) explaining the consequences which, as hereinafter provided, will ensue on the declaration of such Park;
- (d) fixing the period of not less than three months from the date of publication of such notice, and requiring every person, who has any objection to the proposal or who claims to exercise any right or privilege which is being or has been exercised in or over any part of such land, either to present to such District Officer or Collector within such period a written notice specifying or to appear before him within such period stating, the nature of such objection, right or privilege.

Inquiry by  
District Officer  
or Collector.

7. (1) The District Officer or Collector shall:—

- (a) take down in writing all statements made in response to his requirement under paragraph (d) of section 6;
- (b) inquire into all objections raised and claims made in response to such requirement;
- (c) inquire into the propriety of maintaining any right or conceding any privilege in and over the land which is being or has been exercised but in respect of which no claim is made.

(2) For the purpose of any inquiry under this section the District Officer or Collector may exercise the same

powers as are vested in a Magistrate's Court for compelling the attendance of witnesses and the production of documents.

8. After complying with the provisions of section 7 the District Officer or Collector shall with all convenient speed forward to the Yang di-Pertua Negeri a statement of particulars of all right, privilege, objections and opinion; and the Yang di-Pertua Negeri, after considering the views of the District Officer or Collector and after such further inquiry as the Yang di-Pertua Negeri may think necessary, shall make an order conceding, modifying or disallowing the exercise of such right, and privilege and admitting or rejecting such objections either wholly or in part, as shall seem right to him.

Admission of fact of inquiry to Yang di-Pertua Negeri.

9. (1) Every order made under section 8 conceding any right or privilege within a proposed Park shall prescribe, as far as possible, the quantity and nature of such right or privilege, and the exercise of such right or privilege shall be subject to the control of the Board and to such directions as the Board may give to regulate the mode in which such right or privilege may be exercised.

Board to regulate mode of exercising right and privilege.

(2) In the event of any dispute either party may appeal to the Minister whose decision shall be final.

10. If the Yang di-Pertua Negeri considers it expedient to include in a Park any land leased or granted to, or otherwise lawfully occupied by any person, he may cause such land to be acquired as for a public purpose under the provisions of the Land Acquisition Ordinance, and may thereafter include such land within the limits of the Park.

Acquisition of alienated land for inclusion in Park.

Cap. 69.

11. (1) The Yang di-Pertua Negeri may at any time before the publication of a declaration under section 13, withdraw a proposal to constitute any land a Park.

Abandonment of proposal to reserve.

(2) When a withdrawal is made under subsection (1) a notice shall be published by the District Officer or Collector concerned in the same places and in the same manner in which the notice under section 6 or section 10 was published, announcing that the proposed declaration has been withdrawn.

(3) On the publication of a notice under subsection (2) the provisions of section 5 shall cease to apply to such land.



Conversion of  
forest reserve,  
game sanctuary  
and bird  
sanctuary.

No. 11 of 1963.

Declaration  
of Park.

**12.** The Yang di-Pertua Negeri may, with the advice of the Cabinet by notice in the Gazette, declare his intention to convert any forest reserve declared under the Forest Enactment, 1968 or any game sanctuary or bird sanctuary declared under the Fauna Conservation Ordinance, 1963, in whole or in part, to be a Park and such notice shall specify as nearly as possible the situation and extent of area, and he may at any time before the publication of declaration under section 13 withdraw such notice.

**13.** (1) When any of the following events has occurred namely:—

- (a) the period fixed under paragraph (d) of section 6 has lapsed and all objections and claims, if any, made within such period have been disposed of by the Yang di-Pertua Negeri;
- (b) all land, if any, to be included in the area proposed for declaration which the Yang di-Pertua Negeri has under the provisions of section 10 elected to acquire under the Land Acquisition Ordinance has been vested in the State;
- (c) the notice under section 12 has been published and has not been withdrawn,

the Yang di-Pertua Negeri may, by declaration in the Gazette specifying the land which it is intended to constitute a Park mentioning the rights and privileges conceded in respect of such land and stating the special conditions, if any, governing the declaration thereof, declare such land to be a Park from a date fixed by such declaration.

(2) From the date fixed by such declaration such land as is mentioned therein, together with all the produce thereof, and things found therein, shall be a Park subject only to the rights and privileges mentioned and any special conditions stated in such declaration.

(3) When any land which is within any local authority area is declared to be a Park it shall thereupon cease to be part of the local authority area and section 107 of the Local Government Ordinance, 1961 shall have no application thereto.

(4) When any land which is a forest reserve, game sanctuary or bird sanctuary is declared to be a Park it shall

thereupon cease to be a forest reserve, game sanctuary or bird sanctuary as the case may be.

(5) All land which is specified in a declaration shall, with effect from the date fixed by such declaration and by virtue thereof, vest in the Board for an estate in leasehold for a period of nine hundred and ninety-nine years free of all liabilities and encumbrances not mentioned in the declaration and without payment of any transfer duty, stamp duty, fee of office or other duty, tax or charge otherwise payable under written law in respect of any property or right and for the purposes of the law relating to the registration of title to the land such estate shall be deemed to have been granted under the provisions of such Land Ordinance.

(6) Any public officer or other person having a duty or power to make any entry in any register, or to issue any certificate, in respect of the transfer of any property or right shall, at the request in writing of the Board, make any such entry or issue any such certificate in favour of the Board as is necessary to give full force and effect to the provisions of subsection (5).

14. The Yang di-Pertua Negeri may, by notification in the Gazette after such inquiry as he may deem necessary, rescind, modify or add to any right or privilege conceded or any condition governing the declaration of a Park and mentioned or stated in any such declaration.

Concession, rescission and modification of rights, privileges and conditions.

15. Notwithstanding anything hereinbefore contained, no right or privilege conceded in a declaration shall be transferred by way of grant, sale, lease, charge or by way of inheritance, except with the authority of the Director of Lands and Surveys.

Prohibition of transfer of rights and privileges.

16. Subject to the provisions of this Enactment no right of any description in respect of a Park or any part thereof or any produce therein shall be acquired except such as the Board, in the exercise of its powers under the provisions of this Enactment, may grant.

Acquisition of rights in a Park.

17. (1) There shall be constituted the following Parks:—

	<i>Plan No.</i>
(a) Taman Kinabalu (75,370 ha.)	99197385
(b) Taman Tunku Abdul Rahman (4,929 ha.)	99197164 99197302

	<i>Plan No.</i>
(c) Taman Pulau Penyu (1,740 ha.)	99197210
(d) Taman Pulau Tiga (15,864 ha.)	99197215
(e) Taman Bukit Tawau (27,972 ha.)	99197280
(f) Taman Negara (139,919 ha.)	99194663

(2) The situation and extent of each Park are shown and delineated on Plan No. 99197388 deposited in the office of the Speaker of the Legislative Assembly, the Secretary of Natural Resources and the Director of Parks.

(3) The rights and privileges and conditions governing any of the Parks and existing at the time this Enactment comes into operation shall continue and shall be deemed to be conceded or stated as the case may be under section 8 and 13.

(4) The provisions of this Enactment shall apply to the Parks hereby constituted in the manner and to the same extent as Parks constituted under section 13.

Power to  
declare cessa-  
tion of a Park

**18.** The Yang di-Pertua Negeri may, with the advice of the Minister, by notification in the Gazette, declare his intention to rescind the Constitution of a Park or part thereof and such notification shall:—

- (a) specify as nearly as possible the situation and extent of such land; and
- (b) declare that it is proposed that such land shall cease to be a Park.

Lapse of  
notification  
of intention.

**19.** A notification of intention shall lapse at the end of such period as shall in each case be specified therein:

Provided that the Yang di-Pertua Negeri may by notice in the Gazette extend the operation of any notification of intention from time to time for such further period or periods as he may think fit.

Publication  
of notice.

**20.** At any time after the publication of a notification of intention the District Officer or Collector of the district in which the land concerned is situated, shall publish in convenient places on such land, and elsewhere as he may deem expedient, a notice in Bahasa Malaysia and English language and in such other languages as the Yang di-Pertua Negeri may in any particular case direct:—

- (a) specifying as nearly as possible the situation and extent of the land proposed to cease to be a Park;

- (b) setting forth the provisions in substance of section 21;
- (c) explaining the consequences which, as hereinafter provided, will ensue on the declaration that such land shall cease to be a Park;
- (d) fixing the period of not less than three months from the date of publication of such notice, and requiring every person who has any objection to the proposal either to present to such District Officer or Collector within such period a written notice specifying or to appear before him within such period stating the nature of such objection;

21. (1) The District Officer or Collector shall:

Inquiry by District Officer or Collector.

- (a) take down in writing all statements made in response to his requirement under paragraph (d) of section 20;
- (b) inquire into all objections raised in response to such requirement.

(2) For the purpose of any inquiry under this section the District Officer or Collector may exercise the same powers as are vested in a Magistrate's Court for compelling the attendance of witnesses and the production of documents.

22. After complying with the provisions of section 21 the District Officer or Collector shall with all convenient speed forward to the Yang di-Pertua Negeri a statement of particulars of all objections and opinion; and the Yang di-Pertua Negeri, after considering the views of the District Officer or Collector and after such further inquiry as the Yang di-Pertua Negeri may think necessary, shall make an order as shall seem right to him.

Submission of fact of inquiry to Yang di-Pertua Negeri.

23. (1) The Yang di-Pertua Negeri, after consultation with the Board may, by notice in the Gazette, order that from a date to be fixed by such notice any Park or any portion thereof shall cease to be a Park.

Power to declare cessation of a Park.

(2) The Yang di-Pertua Negeri may give orders dealing with or in regard to the affairs or property of the Board as may be affected by or consequential on any order under subsection (1).

## PART III

## ESTABLISHMENT AND CONSTITUTION OF A BOARD OF TRUSTEES

Establishment  
of a Board  
of Trustees.

24. (1) As from the commencement of this Enactment there shall be constituted a Board to be called the Board of Trustees of the Sabah Parks which shall be a body corporate with perpetual succession, capable of suing and being sued in its Corporate name and with power to purchase or otherwise acquire, hold, and exchange or alienate or otherwise deal with in any lawful manner whatsoever, any property movable and immovable, and to enter into contracts and generally to do such acts and things as a body corporate may do by law and as are necessary for, or incidental to, the carrying out of its objects and the exercise of its powers as set out in this Enactment.

(2) The Board shall have a common seal which shall bear such device as the Board may approve and such seal may from time to time be broken, changed, altered and make anew by the Board as the Board may think fit.

Composition  
of Board

25. (1) The Board shall consist of the following members:—

(a) a Chairman;

(b) a Deputy Chairman;

(c) three ex-officio members, who shall be persons for the time being holding the offices of the Permanent Secretary to the Ministry responsible for Parks, the Secretary of Natural Resources and the Permanent Secretary of the Ministry of Financial Planning and Development;

(d) four other members;

(e) the person who for the time being holding the office of the Director:

Provided that the Director shall not be entitled to vote at the meeting of the Board.

(2) The members as specified in paragraphs (a), (b) and (d) of subsection (1) shall be appointed by the Yang di-Pertua Negeri.

(3) An ex-officio member may by instrument in writing addressed to the Chairman appoint another officer in the public service of the State as an alternate member who

may attend on his behalf any meeting of the Board which such member is for any reason unable to attend and such alternate member when attending such meeting shall for all purposes be deemed to be a member of the Board.

(4) Subject to the provisions of section 28 of this Enactment, a member other than an ex-officio member and the Director, shall hold office for a period of three years from the date of his appointment, and shall be eligible for reappointment.

**26.** (1) A member, other than an ex-officio member and the Director, may at any time resign his office by giving notice in writing to the Chairman. Resignation  
and removal.

(2) The appointment of a member may at any time be revoked by the Yang di-Pertua Negeri if he thinks it expedient to do so.

**27.** The following persons shall be disqualified from being appointed as, or if appointed, remaining a member: — Disqualification  
from membership.

- (a) a person who is of unsound mind or otherwise incapable of performing his duties or managing his affairs;
- (b) a person who is prohibited from being a director of a company under the provisions of any written law relating to companies;
- (c) a person who has been convicted of any offence involving fraud, dishonesty or moral turpitude; and
- (d) a bankrupt.

**28.** The office of a member, other than an ex-officio member and the Director, shall become vacant— Vacation  
of office.

- (a) on his death;
- (b) if he is absent from three consecutive meetings of the Board without the special leave of the Chairman or leave of absence granted under this Enactment and the Board passes a resolution declaring his office vacant;
- (c) if he resigns his office;
- (d) if he becomes disqualified for membership under section 27 of this Enactment;
- (e) if his appointment is revoked by the Yang di-Pertua Negeri.

Leave of  
absence.

29. The Minister may grant to any member such leave of absence as the Minister may deem fit.

Casual vacan-  
cies and  
temporary  
membership.

30. (1) If the office of a member, other than an ex-officio member and the Director, becomes vacant, the Yang di-Pertua Negeri may appoint another suitably qualified person to fill such vacancy for so long only as the member in whose place he is appointed would have held office.

(2) Where any member, other than an ex-officio member and the Director, is prevented by illness, absence from the State or other like cause from performing his duties as a member the Yang di-Pertua Negeri may appoint any suitably qualified person to act as deputy for such member during such period as he is so prevented from performing his duties.

Remuneration  
of members  
of Board.

31. There may be paid to the members, or to such of them as the Minister may determine, such salaries, fees and allowance out of the Fund as the Minister may from time to time approve.

## PART IV

### PROCEDURE OF BOARD

Meetings.

32. (1) The Board shall meet as often as may be necessary or expedient for the transaction of its business and such meetings shall be held at such places and times as the Chairman may determine:

Provided that the Chairman shall not allow more than three months to elapse between such meetings.

(2) Where not less than three members, by notice in writing signed by them and addressed to the Chairman, request that a meeting of the Board be held for any purpose specified in such notice the Chairman shall, within seven days of the receipt by him of such notice, convene a meeting accordingly.

Procedure of  
meetings.

33. (1) The quorum necessary for the transaction of the business of the board shall be five.

(2) In the absence of the Chairman from any meeting of the Board, the Deputy Chairman shall preside thereat and, in the absence of both the Chairman and the Deputy Chair-

man, the members present shall elect one of their number to preside thereat.

(3) Questions arising at any meeting of the Board, shall be decided by the votes of the majority of those present and voting thereon and in the case of an equality of votes the Chairman or other person presiding at such meeting shall have a second or casting vote.

(4) Subject to the provisions of this Part, the Board shall have powers to make standing orders to regulate its own proceedings.

34. (1) Any member who has or acquires, directly or indirectly by himself, his partner or agent—

Members  
interested  
not to act.

(a) any share or interest in any contract made with or work done for the Board or in any company or with any person or in respect of any undertaking with which the Board proposes to contract; or

(b) any beneficial interest in land proposed to be acquired, purchased, leased or otherwise dealt with by the Board or which he knows to be affected or to be likely to be affected by any project, scheme or enterprise approved or proposed to be approved by the Board,

shall, before taking part in any proceedings at a meeting of the Board, relating to or affecting directly or indirectly any such contract or land, inform the person presiding at such meeting of the nature and extent of such share or interest, and such information shall be recorded in the minutes of such meeting, and such member shall not vote upon any resolution or question relating thereto, or to matters incidental thereto and if the person presiding at the meeting so requests, such member shall withdraw from the meeting during such deliberation or decision:

Provided that no member shall be deemed to have or acquire any share or interest in a contract with the Board by reason only that he has or acquires a share in any loan issued by the Board or in any security for the same:

Provided further that for the purpose of determining whether there is a quorum a member who attends the meeting shall be treated as being present notwithstanding that, under the provisions of this section, he may not vote or has withdrawn.



(2) Any person who contravenes or fails to comply with the provisions of subsection (1) of this section shall be guilty of an offence and shall be liable on conviction to a fine of one thousand ringgits and imprisonment for six months.

Power to  
appoint  
committee.

35. (1) Subject to the provisions of this Enactment, the Board may, for any general or special purpose, appoint such committees as it thinks desirable.

(2) A committee may do all such things as may be necessary for the effective carrying out of its functions but shall be subject to the general directions of the Board.

(3) A committee shall consist of a Chairman and not more than five other persons.

(4) A committee may consist of persons who are not members of the Board.

(5) Members of a committee may be paid such remuneration or allowance as the Board may, with the approval of the Minister, determine.

Meetings of  
a committee.

36. (1) In the absence of the Chairman of a committee from any meeting of the committee such other member of the committee as may be elected by the members present shall preside over the meeting.

(2) The quorum for the meeting of a committee shall be three.

(3) Any question to be determined at any meeting of a committee shall be decided by the votes of the majority of those present and voting thereon, and in case of an equality of votes the person presiding shall have a second or casting vote.

(4) A committee may invite to any of its meeting any person who can in its opinion contribute to its deliberations but such a person shall have no right to vote at the meeting.

(5) Subject to this section and the directions of the Board, a committee shall regulate its own procedure.

Delegation  
of powers.

37. (1) The Board may delegate to any committee officer or servant of the Board, such of its functions as it may deem necessary or desirable.

(2) Any functions delegated under this section—

(a) may be so delegated subject to such conditions

or restrictions as the Board may either generally or specially impose;

(b) shall be exercised by the committee, member, officer or servant concerned in the name and on behalf of the Board.

(3) No delegation made under this section shall preclude the Board itself from exercising or performing at any time any of the functions so delegated.

38. (1) Subject to the provisions of this Enactment and of any regulations made thereunder, the Chairman may delegate in writing to any member, officer or servant of the Board the power and authority to carry out on his behalf such duties, powers or functions as he may determine.

Power of  
Chairman to  
delegate.

(2) The Chairman may at the time of delegating any power or authority under subsection (1) to any member, officer or servant, or at any time thereafter give directions as to the manner in which such delegated power or authority is to be exercised and may at any time revoke, modify or increase such delegation.

39. (1) The common seal of the Board shall be in the custody of the Chairman and shall not be used except in the presence of the Chairman or Deputy Chairman and one member and such use shall be authenticated by the signatures of such persons and such authentication shall be sufficient evidence that such seal was duly and properly fixed and that it is the lawful seal of the Board.

Execution of  
documents, etc.

(2) All documents, other than those required by law to be under seal, to which the Board is a party may be signed on behalf of the Board by the Chairman or any member or by any officer or servant generally or specially authorised in that behalf by the Board.

40. (1) No act or proceeding of the Board or any committee thereof shall be questioned on account of any vacancy among the members or on account of the appointment of any member having been defective.

Vacancy not  
to invalidate  
acts, etc.

(2) Until the contrary is proved every meeting of the Board of any committee thereof shall be deemed to have

been duly convened and held and all members present thereat shall be deemed to have been duly qualified.

(3) A statement in any document to the effect that any function has been delegated under this Part shall, unless the contrary is proved, be evidence that such delegation has been lawfully made.

## PART V

### ADMINISTRATION

Appointment of Director, officers and servants.

- 41.** (1) Subject to section 42, the Board shall appoint—
- (a) a Director of Parks; and
  - (b) any number of Park Officers as may be considered necessary for the purposes of this Enactment.

(2) Whenever the Director is prevented by illness, absence from the State, or other like cause from performing his duties as such, or when the office of Director is vacant, the Board may appoint one of its officers to perform the duties of Director during such period as the Director is so prevented from performing his duties or the said office is vacant.

(3) Subject to the approval of the Government, the Director and other officers and servants of the Board shall be engaged on such terms and conditions as the Board may think fit.

Restriction on alterations in establishment.

- 42.** The Board shall not, without the approval of the Government, make any addition to its established posts.

Director as chief executive.

- 43.** (1) The Director shall be the chief executive officer responsible to the Board and shall perform such duties and exercise such powers as may be determined or delegated by the Board.

(2) Subject to the directions and control of the Board, all officers and servants of the Board shall be under the administrative control of the Director who may delegate such of his duties and powers as he may determine.

Officer or servant not to be interested in contracts.

- 44.** (1) No person shall be eligible for employment as an officer or servant of the Board who has, directly or indirectly, by himself or his partner, any share or interest in any contract with, for or on behalf of the Board.

(2) Any officer or servant of the Board who has or acquires any such share or interest shall be liable in the discretion of the Board to summary dismissal without notice.

(3) No officer or servant shall be deemed to have or acquired any such share or interest by reason only that—

(a) he is or becomes a member of an incorporated company which owns land situated in Sabah or has a contract with or executes work for the Board; or

(b) he has or acquires a share in any loan, issued by the Board or in any security for the same.

## PART VI

### FUNCTIONS OF THE BOARD

45. (1) The functions of the Board shall be—

Functions of  
the Board.

(a) to initiate, co-ordinate and control the activities in respect of all Parks in Sabah;

(b) to make recommendations to the Government as to the methods, measures and policies to be adopted to facilitate the development of the Parks and, where approved by Government, to implement and assist in the implementation of the same; and

(c) to control, manage and administer the Fund.

(2) The Board shall have power to do all things expedient or reasonably necessary or incidental to the discharge of its function and in particular but without prejudice to the generality of the foregoing—

(a) to provide and maintain adequate and efficient services and facilities at all Parks constituted under the provisions of this Enactment;

(b) to promote the use, improvement and development of the Parks;

(c) to take such steps as will ensure the security and well being of the animal and vegetable life in a Park and the preservation of such Park the natural features and the animal and vegetable life therein in their natural state;

- (d) reserve or set aside any portions of a Park as breeding places for animals and as nurseries for vegetation;
- (e) provide such accommodation, amenities, facilities and services as are likely to attract visitors to the Parks and are not prejudicial to the proper care, control and management thereof;
- (f) to levy fees or to collect dues from persons utilizing the accommodations, amenities, facilities or services provided under this Enactment.

## PART VII

### FINANCIAL PROVISION

Parks Fund.

46. (1) There shall be established a Fund to be known as the "Parks Fund" which shall consist of such contributions or gifts of requests of moneys as may be made thereto of any money raised or received by the Board in the exercise of its powers hereunder (including moneys paid for the compounding of offences and fees) and of such money as may be provided for by the Legislative Assembly, together with—

- (a) such additions or accumulations as may be made or accrue thereto;
- (b) any investment from time to time representing the same or any of them; and
- (c) the interest and income derived from any such investment.

(2) Notwithstanding the provisions of subsection (1), it shall be lawful for the Board to accept gifts or bequests which do not consist of money but, unless such course is lawfully precluded by the terms of any such gifts or bequests, it shall be the duty of the Board to convert the same into money and to pay the same into the Fund.

(3) It shall be the duty of the Board in the absence of any lawful condition or direction to the contrary to pay into the fund all income derived from any property vested in it, whether forming part of the Fund or not, and any moneys derived from the sale of any property vested in the Board.

(4) Any moneys forming part of the Fund may, from time to time and as occasion requires, be invested by the Board in any form of investment authorised by law for the investment of trust funds in Sabah or Malaysia including the deposit of the same in the Government Treasury or in any bank or as the Minister for Financial Planning and Development may in his discretion from time to time approve, and the Board may from time to time, with the like approval, realize any investment and reinvest such proceeds or any part thereof.

(5) The Board may apply the income of the Fund for any of the purposes of this Enactment and, with the approval of the Minister for Financial Planning and Development, may apply for the like purpose any moneys forming part thereof or realized by the sale of any investment forming part thereof:

Provided that, in the case of any moneys provided for any specified purpose, such moneys shall be applied only in such manner as may be authorised by any trust condition, resolution or other method by which such provision is made.

(6) It is hereby declared that the expression "the purposes of this Enactment" shall include the discharge of any debt incurred by the Board in the discharge of its duties and the satisfaction of any claim made against the Board, whether in legal proceedings or otherwise.

(7) The duty to convert into money imposed by subsection (2) shall not apply to any animal or vegetable life or to any property which the Minister for Financial Planning and Development, for any reason which he may deem sufficient, may authorise the Board to retain its original form.

47. (1) The Board shall, before the first day of January in each year, cause to be prepared and submitted to the Minister for Financial Planning and Development for his approval detailed estimates of revenue and expenditure of the Fund for the ensuing year, and when approved such estimates shall be laid by the Minister for Financial Planning and Development before the Legislative Assembly.

Board to  
keep  
accounts, etc.

(2) When additional financial provision is required during the course of any year, supplementary estimates thereof

shall be submitted in the same manner for approval by the Minister for Financial Planning and Development and shall be laid before the Legislative Assembly.

(3) A statement in any document to the effect that any of all money received into and disbursed from the Fund.

(4) The accounts of the Fund shall be examined and reported upon annually by the Auditor-General or such other auditor as the Minister for Financial Planning and Development may appoint, and the expenses of, and incidental to, the audit shall be paid by the Fund.

(5) The Board shall, when required by the auditor, produce and lay before him all books and accounts of the Fund with all vouchers in support thereof, and all books and writings in its possession or control relating thereto, and the auditors shall be entitled to require such information and explanation as he may deem necessary for the performance of his duties as auditor.

(6) As soon as may be after the close of each financial year, the Board shall cause to be prepared in such manner and containing such particulars as the Minister for Financial Planning and Development may from time to time require, a statement of the accounts of the Fund for such year and such statement shall be approved by the Board, signed by the Chairman, and submitted to the auditor of the Board who shall furnish a report thereon to the Board.

(7) Upon the receipt of the report of the auditor under subsection (6) the Board shall transmit it, together with the statement of accounts to which it relates and the report of the operations of the Board for that financial year concerned, to the Minister for Financial Planning and Development who shall publish the same in such manner as he may think fit and shall lay all such documents before the Legislative Assembly.

## PART VIII

### CONTROL OF PARKS

Prohibitions of certain acts except with the permission of the Board.

48. No person, other than a person acting and in accordance with the written permission of the Board, or the Director or any Park Officer authorised by the Director in that behalf, shall—

- (a) convey into a Park or being within the confines thereof or be in possession of any weapon, explosive, trap, poison or noxious substance;
- (b) within a Park hunt, kill, injure, capture or disturb any animal or take or destroy any egg or nest;
- (c) cut, damage, injure or destroy or set fire to any vegetable or any object of geological, prehistoric, archaeological, historical or other scientific interest in a State Park;
- (d) introduce any animal, or permit any domestic animal to enter or stray into a Park or introduce any vegetation into a Park;
- (e) remove from a Park any animal or vegetation whether alive or dead;
- (f) remove from a Park any mineral or object of geological, prehistoric, archaeological, historical or other scientific interest;
- (g) destroy or deface or object, whether animate or inanimate, in a Park;
- (h) erect any building in a Park;
- (i) clear or break up any land in a Park.

without prejudice to any rights lawfully acquired before the commencement of the Enactment and to the provisions of any written law relating to mining, prospect for metals or minerals in any Park.

49. Notwithstanding any other provisions of this Enactment, the Director or any Park Officer authorised by the Director may kill, capture or authorise the killing or capture of any animal in any part of any Park in any manner if he considers such killing or capture necessary in the interest of public safety, the protection of property, for scientific research, for the better preservation of the environment or other fauna, except that rhinoceros and orang utan may only be killed in the defence of human life.

Power of  
Director.

50. (1) All trophies found or taken within a Park shall be Park trophies and the property of the Board.

Trophies deemed  
property of  
the Board.

(2) Any person who by any means, obtain possession of a Park trophy shall forthwith make a report thereof to the nearest available Park Officer and shall if so required hand the trophy over to such officer.



(3) Any person who:—

- (a) fails to make a report required by subsection (2) of this section; or
- (b) is unlawfully in possession of or who unlawfully deals in any Park trophy shall be guilty of an offence.

Power of  
inspection of  
Director  
Trustee or  
Park Officer.

**51.** (1) If the Director or any Trustee or any Park Officer authorised by the Director in that behalf has reasonable grounds for believing that any person has committed an offence against this Enactment he may—

- (a) require such person to produce for inspection any animal, trophy, mineral or vegetation in such person's possession, or any firearms or other weapon, trap, net, or other instrument, material or thing whatsoever in relation to or in connection with which an offence appears to the Director, such Trustee or Park Officer to have been committed or any permit required to be kept by such person under the provision of this Enactment;
- (b) enter and search, with or without assistance, any land, building, tent, vehicle or boat in the occupation or possession of such person and open and search any baggage or any other thing in the possession of such person:

Provided that no dwelling house shall be entered without a warrant.

- (c) seize and detain any animal trophy, mineral or vegetable matter which appears to the Director, such Trustee or such Park Officer to be the subject of an offence against this Enactment, or any vehicle, boat, firearms or other weapon, trap, net or instrument, material or thing whatsoever in relation to or in connection with which such offence appears to the Director such Trustee or Park Officer to have been committed whether or not it is in the immediate possession of any person and if any apparent means of hunting cannot be removed from its locations, it may be rendered inoperative by the Director such Trustee or Park Officer.

(2) Where any property is seized or detained under subsection (1) of this section the person making the seizure or

detention not being the Director shall forthwith report such seizure to the Director.

52. The Director or any Park Officer authorised by the Director in that behalf may arrest without warrant any person reasonably suspected of committing any offence against this Enactment or regulation made hereunder and may detain such person until he can be delivered into the custody of a police officer to be dealt with according to law:

Power of arrest, search and seizure.

Provided that no person shall be arrested or detained without warrant unless reasonable grounds exist for believing that, except by the arrest of such person, he could not be found or made answerable to justice without undue delay, trouble or expense.

53. (1) Any person who—

- (a) hunts, or is found in circumstances showing that it is his intention to hunt, any animal or bird or disturbs or removes the nest or eggs of any animal or bird in a Park; or
- (b) collects any vegetation or any mineral or is found in circumstances showing that it is his intention to collect vegetation or minerals in a Park; or
- (c) without reasonable excuse, fails to produce anything which he may be required to produce under the powers conferred by section 51; or
- (d) resists, threatens or obstructs the Director any Trustee or Park Officer in the performance of their duties shall be guilty of an offence.

Offence.

(2) The Director or any Park Officer authorised by the Director in that behalf may stop and detain any person whom he sees doing an act for which a permit is required under the Provisions of this Enactment for the purpose or requiring such person to produce such permit, and if such person fails to produce such permit he shall be guilty of an offence.

54. The Director or any other person authorised by the State Attorney may conduct any prosecution for any offence under this Enactment.

Prosecution Officer.

55. (1) Where any person is convicted of an offence against this Enactment, or, in default of a conviction, where

Forfeiture and disqualification.

no person has within three months of a seizure of anything mentioned in paragraph (c) of section 51 of this Enactment appeared to answer a charge preferred against him in relation thereto, a court may order that any animal, meat trophy, firearm or other weapon, trap, net or other instrument, material or thing whatsoever in relation to or in connection with which the offence has been committed shall be forfeited to and become the property of the Board.

(2) Any conviction of the holder of any licence or permit issued under this Enactment for any offence against the provisions of this Enactment shall, unless the court otherwise directs, have the effect of cancelling any such licence or permit with effect from the date of such conviction.

(3) Where any person is convicted of a second or subsequent offence against this Enactment the Court may direct that such person be disqualified from holding any licence or permit for a period not exceeding three years from the date of such conviction, and any person who whilst so disqualified obtains or attempts to obtain any licence or permit shall be guilty of an offence.

(4) Where any person is convicted of an offence against this Enactment in respect of any pitfall, game pit or similar excavation or any device fixed to the ground which such person has made for the purpose of hunting, the court may, in addition to or in lieu of any other punishment, order that such pitfall, game pit, excavation or device shall be destroyed or obliterated in such manner as the court may specify, and any expenditure incurred on account of such order shall be recoverable from such person as a civil debt.

Power of  
Director to  
compound  
offences.

56. (1) The Director may in his discretion compound any offence against this Enactment or against any regulation made thereunder, by collecting from the person reasonably suspected of having committed the same a sum not exceeding five hundred ringgits as the Director may determine.

(2) The Director or any Park Warden making an offer of composition of any offence may require the payment of the sum so determined to be made forthwith or specify a period within which the payment is to be made as he may deem reasonable and on such payment being made shall give a receipt to the person making such payment and shall pay such sum into the Fund.

(3) The payment forthwith, or within such period as the Director may specify, of the sum so determined shall operate as a bar to any or any further penal proceeding in respect of such offence, in respect of which such composition was offered against the person making such payment.

(4) No offence against this Enactment or against any regulation made thereunder in respect of which a prosecution is actually pending shall be compounded under this section otherwise than with the consent of the Court before which such prosecution is pending.

(5) Any abetment of any offence against this Enactment or against any regulation made thereunder or any attempt to commit such offence (when such attempt is itself an offence) may be compounded in accordance with subsections (1), (2), (3) and (4) of this section.

## PART IX

### GENERAL

57. (1) No action, suit prosecution or other proceedings shall be brought or instituted personally against any Trustee or against any officer or servant appointed by the Board in respect of any act done or statement made *bona fide* in pursuance or execution or intended execution of this Enactment.

Protection  
against legal  
proceedings.

(2) Where a person is exempted from liability by reason only of the provision of this section the Board is liable to the extent that it would be if such person were a servant or agent of the Board.

58. (1) Any person who contravenes any of the provisions of this Enactment shall be guilty of an offence and in the case of a first offence, shall be liable to imprisonment for three months and a fine of one thousand ringgits and in the case of a second or subsequent offence, to imprisonment for twelve months and a fine of five thousand ringgits and in the case of killing of a rhinoceros or orang utan to imprisonment for five years and a fine of ten thousand ringgits.

Penalties.

(2) Any domestic animal found within a Park, except a domestic animal in the lawful possession or custody of an officer or servant of the Board or introduced into a Park

in accordance with the provisions of this Enactment may be destroyed.

(3) Any vegetation introduced into a Park in contravention of the provisions of this Enactment may, by order of the Board, or the Director, be destroyed.

Power of the Board to make regulations.

59. (1) The Board may, with the approval of the Minister make regulations generally for carrying out the provisions of this Enactment and, in particular but without prejudice of the generality of the foregoing such regulations may provide for—

- (a) the powers and duties of the Director, the Park servants and agents appointed by the Board in regard to—
  - (i) the exclusion of members of the public from a Park, or any part thereof;
  - (ii) the killing, capturing or impounding of any animal within a State Park;
  - (iii) the burning and cutting of vegetation within a Park; and
  - (iv) the disposal of animal, vegetable, mineral or other products of the Park.
- (b) the conditions subject to which permission to enter a Park may be granted, and the periods or times during which a Park or any part thereof shall be open to the public;
- (c) the conditions under which the services or attendance of officers or servants of the Board or the services or attendance of any person licensed by the Board, may be obtained by any person entering, passing through or sojourning within a Park and the fees to be paid in respect of such services or attendance;
- (d) the fees to be paid for permission to enter or resides in a Park for the admission of vehicles or boats and for photography and cinematography within a Park, or for any other purpose connecting with the use and enjoyment of a Park;
- (e) the protection and preservation of a Park and the animal and vegetable life and property therein;
- (f) the regulation of traffic in and over a Park, the carriage of passengers, goods and weapons in a

Park and the points by which the persons may enter, and the route by which they may pass through or over, a Park.

(2) Any regulations made under subsection (1) may provide that any breach thereof shall be an offence and may prescribe for any such breach a fine not exceeding one thousand ringgits.

60. (1) The Minister may give to the Board such directions not inconsistent with the provisions of the Enactment as he may deem fit as to the exercise and performance by the Board of its powers, duties and functions under the Enactment and the Board shall give effect to all such directions.

Direction of  
the Minister.

(2) The Board shall furnish the Minister with such informations with respect to its property and the activities as he may from time to time require.

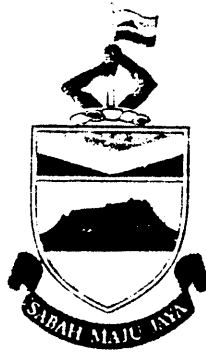
61. The National Parks Enactment, 1977 is hereby repealed:

Enactment  
13 of 1977.

Provided that the National Parks Fund established shall be deemed to be the Parks Fund and any appointment made under the Enactment hereby repealed shall be deemed to be an appointment under this Enactment and shall continue to have effect unless and until revoked, cancelled or otherwise annulled in accordance with the provisions of this Enactment and that anything done or omitted to be done under any power or duty vested or placed upon any person under the Enactment hereby repealed and not having been completed shall be deemed to have been done or omitted under this Enactment and may be continued thereunder unless such thing shall be prohibited or disallowed by or contrary to the provisions of this Enactment.

CERTIFIED by me to be a true copy of the Bill passed by the Assembly on Thursday, 8th March, 1984.

DATUK HAJI MOHD. SUNOH MARSO,  
*Speaker.*



STATE OF SABAH

I assent,

LS

TUN DATUK SERI PANGLIMA HAJI SAKARAN BIN DANDAI,  
*Yang di-Pertua Negeri.*

24TH JULY, 1996.

No. 7 of 1996

An Enactment to amend the Parks Enactment 1984.

ENACTED by the Legislature of the State of Sabah as follows:

1. This Enactment may be cited as the Parks (Amendment) Enactment 1996 and shall come into force on the date of its publication in the *Gazette*.

Short title  
and  
commence-  
ment.

Amendment  
of section 2.  
Enactment  
No. 6 of  
1984.

2. Section 2 of the Parks Enactment 1984, which in this Enactment is referred to as "the principal Enactment", is amended—

(a) by substituting for the definition of "animal" the following:

""animal" means any mammal, reptile, insect, bird, fish, crustacean, coral (whether living or dead), any vertebrate or invertebrate animal, any living organism or any product of the above;"

(b) by inserting, immediately after the definition of "Park Officer", the following new definition:

""protected plant" means any plant specified in the Schedule;" and

(c) by substituting for the definition of "vegetation" the following:

""vegetation" means any vegetable matter living or dead including, but not restricted to, trees, creepers, logs, rattans, bamboos, stems, roots, wood, leaves, flowers, saps, latex, fruits, seeds, mushrooms, nuts or any product of the above."

Amendment  
of section 3.

3. Section 3 of the principal Enactment is amended by deleting the word "State" in line 3.

Amendment  
of section  
13(5).

4. Section 13(5) of the Bahasa Malaysia text of the principal Enactment is amended by inserting, immediately before the words "sembilan puluh sembilan tahun", the words "sembilan ratus".

Amendment  
of section  
17(1).

5. Section 17(1) of the principal Enactment is amended by substituting for the words "Taman Negara" in item (f) the words "Taman Banjaran Crocker".

Amendment  
of section  
25(1).

6. Section 25(1) of the principal Enactment is amended in paragraph (c) by substituting for the words "Ministry of Financial Planning and Development" in lines 5 and 6 the words "Ministry of Finance".

Amendment  
of section  
41(1).

7. Section 41(1) of the principal Enactment is amended in paragraph (b) by substituting for the words "Park Officers" in line 1 the words "officers and servants".



8. Section 45(2) of the English text of the principal Enactment is amended in paragraph (c) by substituting for the words "vegetable life" in lines 2 and 4 respectively the word "vegetation".

Amendment  
of section  
45(2)(c).

9. Section 46 of the principal Enactment is amended—

Amendment  
of section  
46.

- (a) in subsection (1) of the English text, by substituting for the words "of requests" in line 3 the words "or bequests" and for the word "of" in line 4 the word "or";
- (b) in subsections (4) and (5), by substituting for the words "Minister for Financial Planning and Development" appearing therein the words "Minister of Finance"; and
- (c) in subsection (7), by substituting for the words "vegetable life" in line 2 of the English text, the word "vegetation" and for the words "Minister for Financial Planning and Development" in lines 3 and 4 the words "Minister of Finance".

10. Section 47 of the principal Enactment is amended—

Amendment  
of section  
47.

- (a) in subsections (1), (2), (4), (6) and (7), by substituting for the words "Minister for Financial Planning and Development" wherever appearing therein the words "Minister of Finance"; and
- (b) in the English text, by substituting for subsection (3) the following:

"(3) The Board shall cause to be kept accurate accounts of all monies received into and disbursed from the Fund."

11. The principal Enactment is amended by substituting for section 48 the following:

Substitution  
of section  
48.

"Prohibition  
of certain  
acts except  
with  
permission  
of Board  
etc.

48. (1) Without prejudice to any right or privilege lawfully acquired before the commencement of this Enactment and to the provisions of any law relating to mining or prospecting for minerals in any Park, no person, other than a person acting for or in accordance with the written permission of the Board, or the

Director, or any Park Officer authorised by the Director in that behalf, shall—

- (a) cut, fell, damage, remove, injure, destroy or set fire to any tree or protected plant in a Park; or
- (b) cut, damage, remove, injure, destroy or bomb any coral (whether living or dead) in a Park; or
- (c) convey into a Park or, being within the confines thereof, be in possession of any weapon, explosive, trap, poison or noxious substance; or
- (d) within a Park, hunt, kill, injure, capture or disturb any animal other than coral (whether living or dead) or take or destroy any egg or nest; or
- (e) cut, damage, injure or destroy or set fire to any vegetation (other than trees and protected plants) or any object of geological, prehistorical, archaeological, historical or other scientific interest in a Park; or
- (f) introduce any animal, or permit any domestic animal to enter or stray into a Park or introduce any vegetation into a Park; or
- (g) remove from a Park any animal or vegetation whether alive or dead; or
- (h) remove from a Park any mineral or object of geological, prehistorical, archaeological, historical or other scientific interest; or
- (i) destroy or deface any object, whether animate or inanimate, in a Park; or
- (j) erect any building in a Park; or
- (k) clear or break up any land in a Park.

(2) Any person who contravenes any provision of subsection (1) shall be guilty of an offence and shall be liable, on conviction, in the case of an offence under paragraph (a) or (b) of subsection (1), to imprisonment for three years and to a fine of one hundred thousand ringgit, and in the case of an offence under paragraph (c), (d), (e), (f), (g), (h), (i), (j) or (k) of subsection (1), to imprisonment for one year and to a fine of twenty-five thousand ringgit."

12. Section 51(1) of the principal Enactment is amended—

Amendment  
of section  
51(1)(c).

- (a) in the English text of paragraph (c), by substituting for the words "vegetable matter" in line 2 the word "vegetation"; and
- (b) in the Bahasa Malaysia text of paragraph (c), by deleting the word "bahan" in line 2.

13. The principal Enactment is amended by substituting for section 54 the following:

Substitution  
of section  
54.

<sup>"Power to prosecute.</sup> 54. Prosecution in respect of any offence committed under this Enactment may be conducted—

- (a) by the State Attorney-General or a legally qualified member of the State Legal Service; or
- (b) by the Director or a Park Officer duly authorised by the Director in that behalf."

14. Section 56 of the principal Enactment is amended—

Amendment  
of section  
56.

(a) in subsection (1)—

- (i) by inserting, immediately after the word "Director" in line 1, the words "or any Park Officer duly authorised by him in writing in that behalf";
- (ii) by inserting, immediately after the words "this Enactment" in line 2, the words "except an of-

fence for contravening section 48(1)(a) or 48(1)(b);  
and

- (iii) by inserting, immediately after the word "Director" in the last line, the words "or the Park Officer";
- (d) in the English text of subsection (2), by substituting for the words "Park Warden" the words "Park Officer duly authorised by the Director in writing"; and
- (c) in the Bahasa Malaysia text of subsection (2), by inserting, immediately after the word "Pengarah" in line 1, the words "atau mana-mana Pegawai Taman yang diberi kuasa secara bertulis oleh Pengarah".

Amendment  
of section  
58.

15. Section 58 of the principal Enactment is amended by substituting for subsection (1) the following:

"(1) Any person guilty of an offence under this Enactment for which no other penalty is provided shall be liable, on conviction, in the case of a first offence, to imprisonment for six months and to a fine of five thousand ringgit, and, in the case of a second or subsequent offence, to imprisonment for twelve months and to a fine of ten thousand ringgit."

Amendment  
of section  
59.

16. Section 59(1) of the principal Enactment is amended—

- (a) in the English text of subparagraph (ii) of paragraph (a), by deleting the word "State" in line 2;
- (b) in the English text of subparagraph (iv) of paragraph (a), by substituting for the word "vegetable" in line 1 the word "vegetation"; and
- (c) in the English text of paragraph (e), by substituting for the words "vegetable life" in line 2 the word "vegetation".

New section  
60A.

17. The principal Enactment is amended by inserting, immediately after section 60, the following new section 60A:

Amend-  
ment of  
Schedule.

60A. The Minister may, by order published in the *Gazette*, amend, add to or revoke the Schedule."

18. The principal Enactment is amended by inserting, immediately after section 61, the following new Schedule: New  
Schedule.

" Schedule  
(Section 2)

1. All species of *Rafflesia* spp.
2. *Nepenthes rajah*.
3. *Nepenthes villosa*.
4. *Nepenthes burbidgeae*.
5. *Nepenthes edwardsiana*.
6. *Nepenthes lowii*.
7. All species of *Paphiopedilum* spp."

CERTIFIED by me to be a true copy of the Bill passed by the  
Legislative Assembly on Tuesday, the 18th June, 1996.

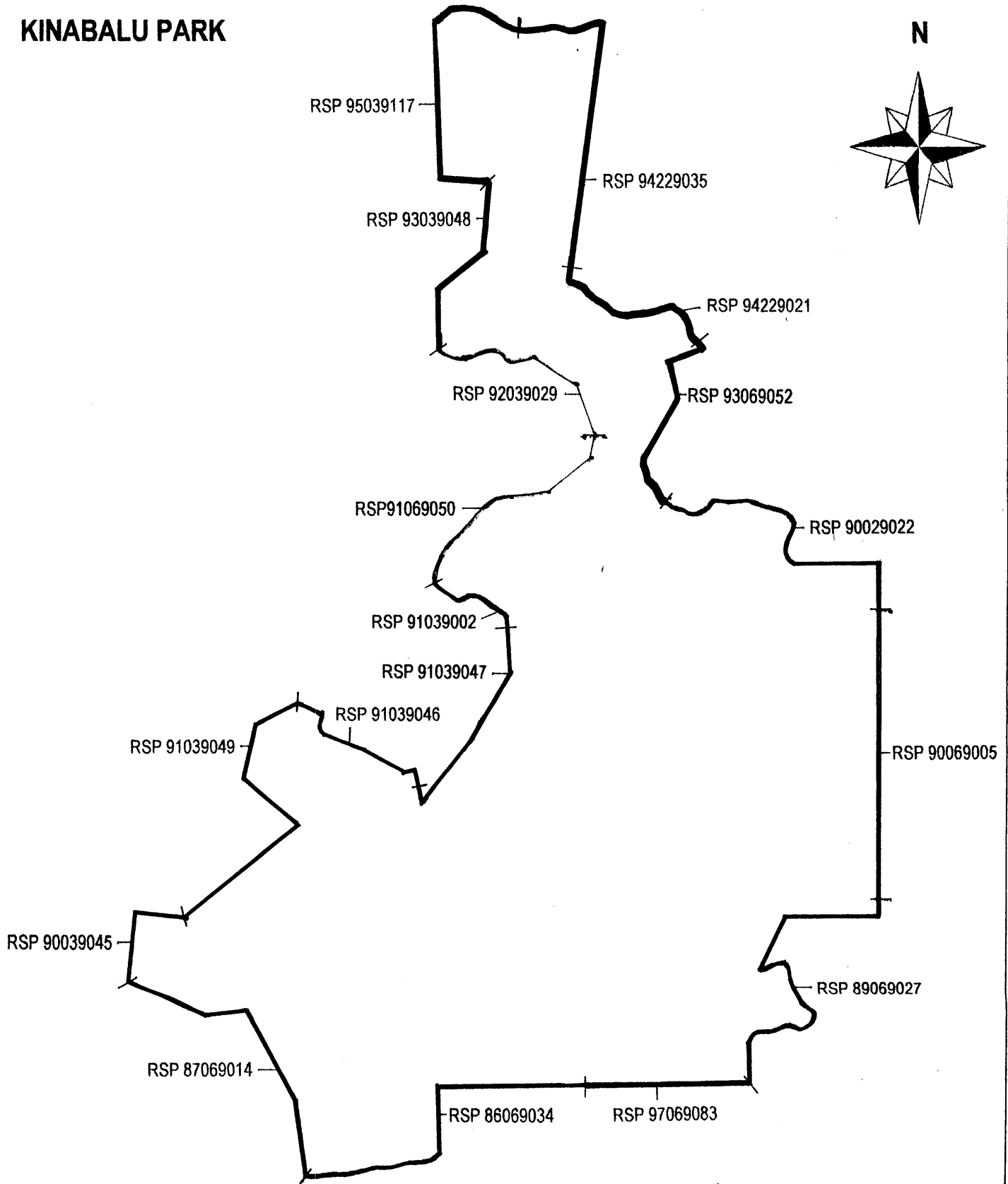
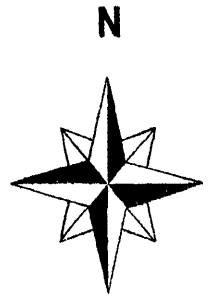
DATUK FRANCIS T.N. YAP,  
*Deputy Speaker,*  
*State Legislative Assembly.*

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**APPENDIX 2**

**Boundary Survey Plan  
of Kinabalu Park**

# KINABALU PARK

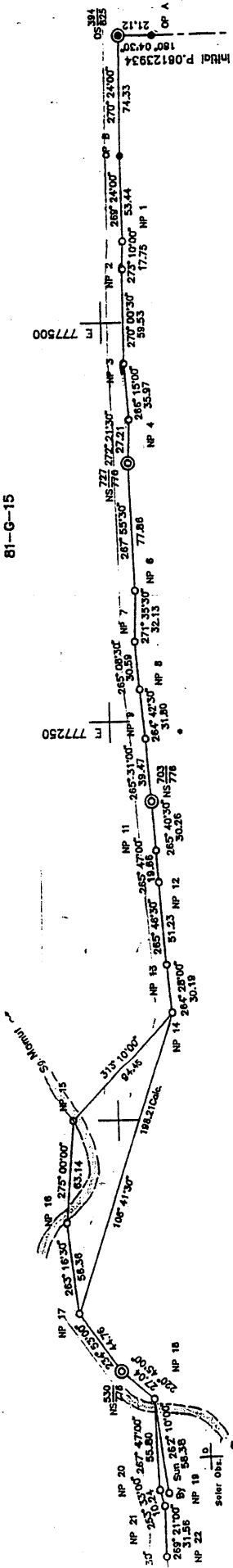


Legend :

	Boundary surveyed by : Syarikat Juruukur Kinabalu Sdn. Bhd.
	Boundary surveyed by : Juruukur Kandiah & Associates
	Boundary surveyed by : Juruukur Swasta Sdn. Bhd.
	Boundary surveyed by : Wah King Tze

( NOT TO SCALE )

81-G-15



77750 E  
669 N

77750 E  
99 N

77750 E

77750 E

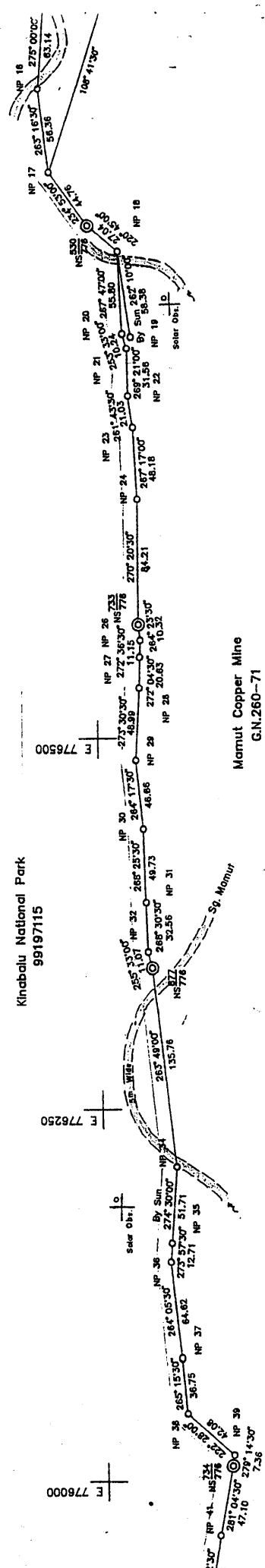
77250 E

77250 E

77000 E

776750 E





E 776000

E 776250

E 776500

E 776750

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E 776250

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E 776750

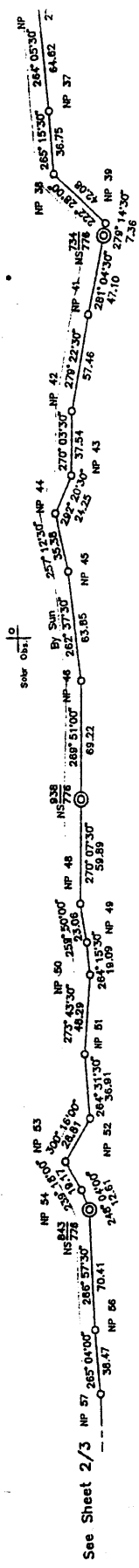
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81-C-14

E 775500

E 775750

E 776000



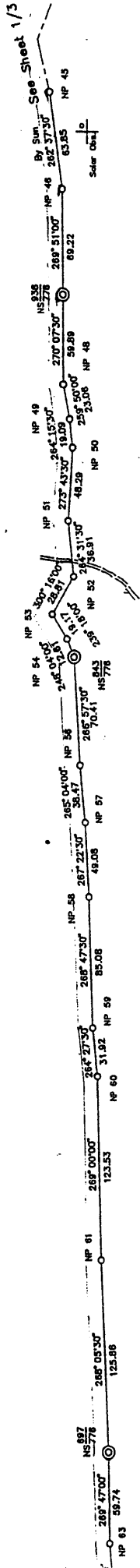
See Sheet 2/3

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E 775500

E 775750

E 776000



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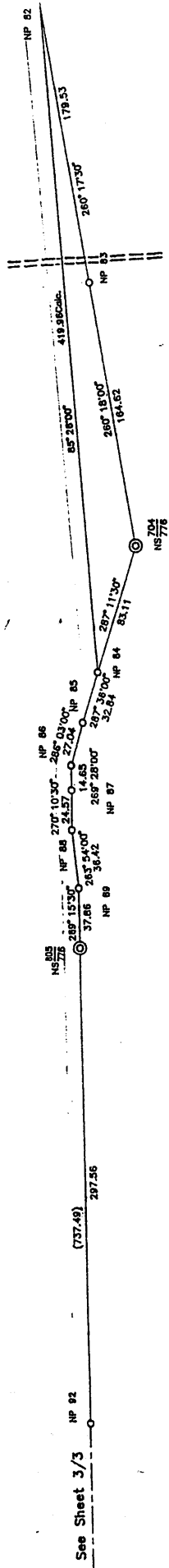
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E 773500

E 773750

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81-G-13



N 669500  
E 773250

E 773500

E 773750

E 774000

N 669750  
E 773500

E 773250

E 773000

E 772750

81-C-13

See Sheet 2/3  
N505 289° 13' 30"  
776 37.86  
NP 89

(737.48)  
297.86

NP 92

30'

193.55

25'

NP 93

268'

246.38

N558 266° 13' 00"  
776 47.40  
NP 84

208.74

N 669500  
E 773500

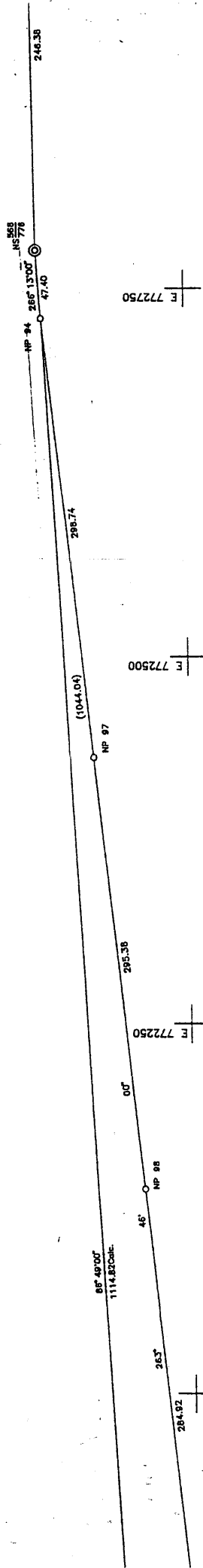
E 773250

E 773000

E 772750

Kinabalu National Park  
99197115

Mamut Copper Mine  
G.N.260-71  
99197099



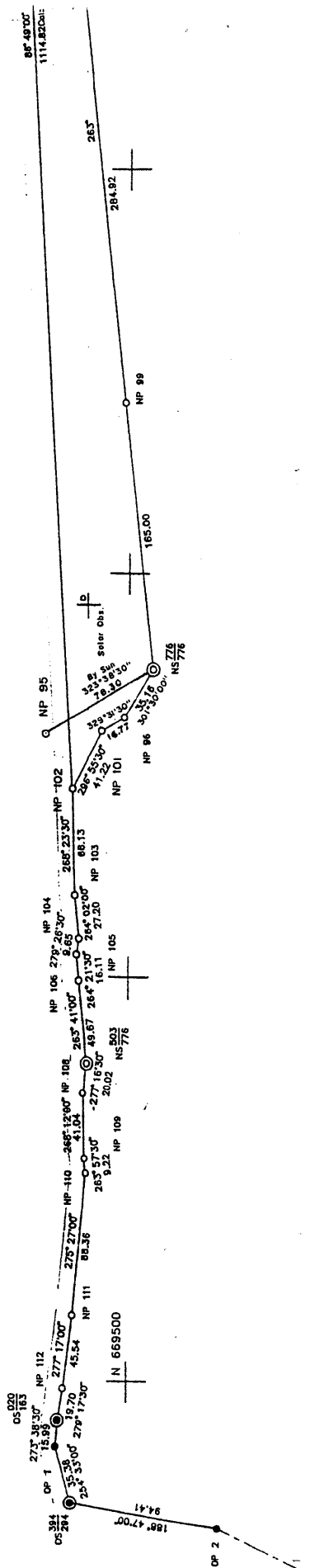
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E 771750

E 771500

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E 771250

81-F-16

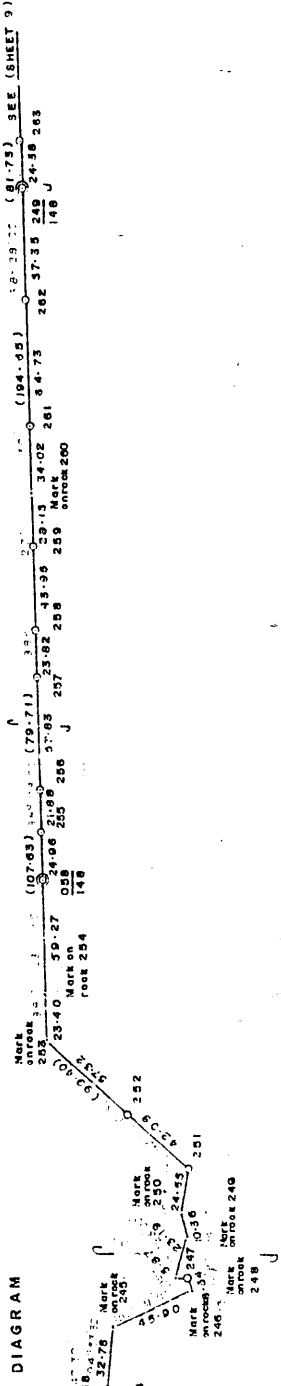


2209022









DIAGRAM

STATE LAND  
 81 - F - 14 & 15  
 67 - LL - 11 & 12

the southern part boundary  
 Kinabalu at Mile 3 1/2,  
 - Ranau Road

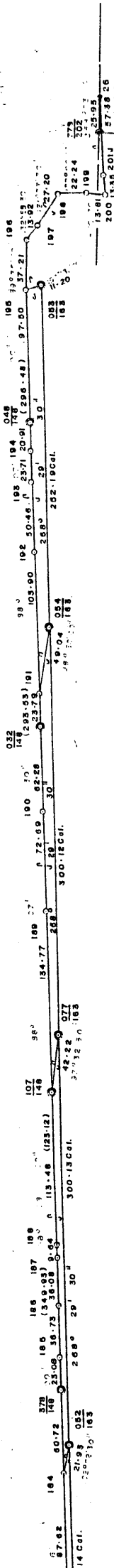


NATIONAL PARK AREA  
 P.99197385  
 67 - KK

STATE RESERVE  
 67 - KK

SABAH TEA PLANTATION  
 99193187/8  
 80-0-6

06629018  
 0612495  
 30 T O - 5



70 18250-00M

71 55 3190.00m. LI









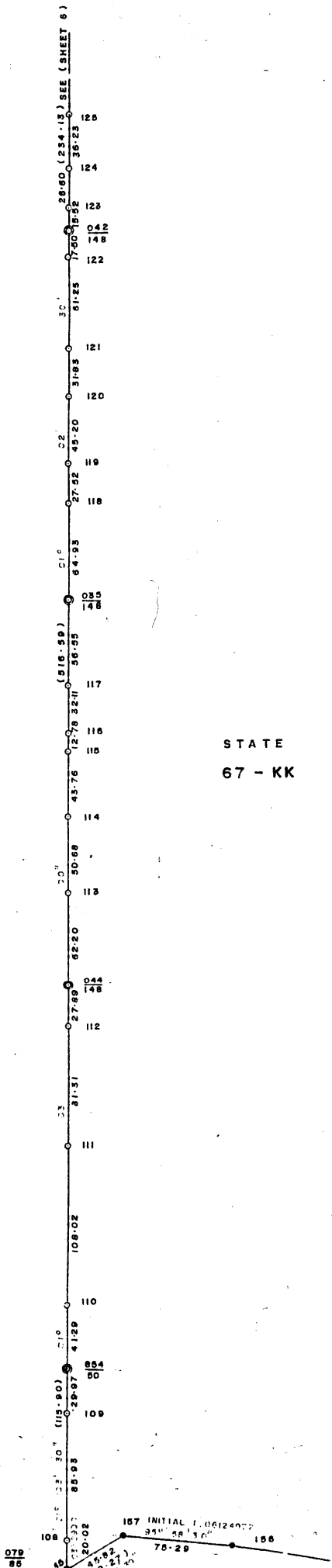
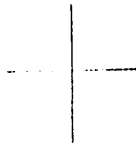
11 66 9120.00m

CO  
OR  
E  
C  
C  
O  
N  
T  
A  
I  
N  
S

NATIONAL PARK AREA

P. 99197385

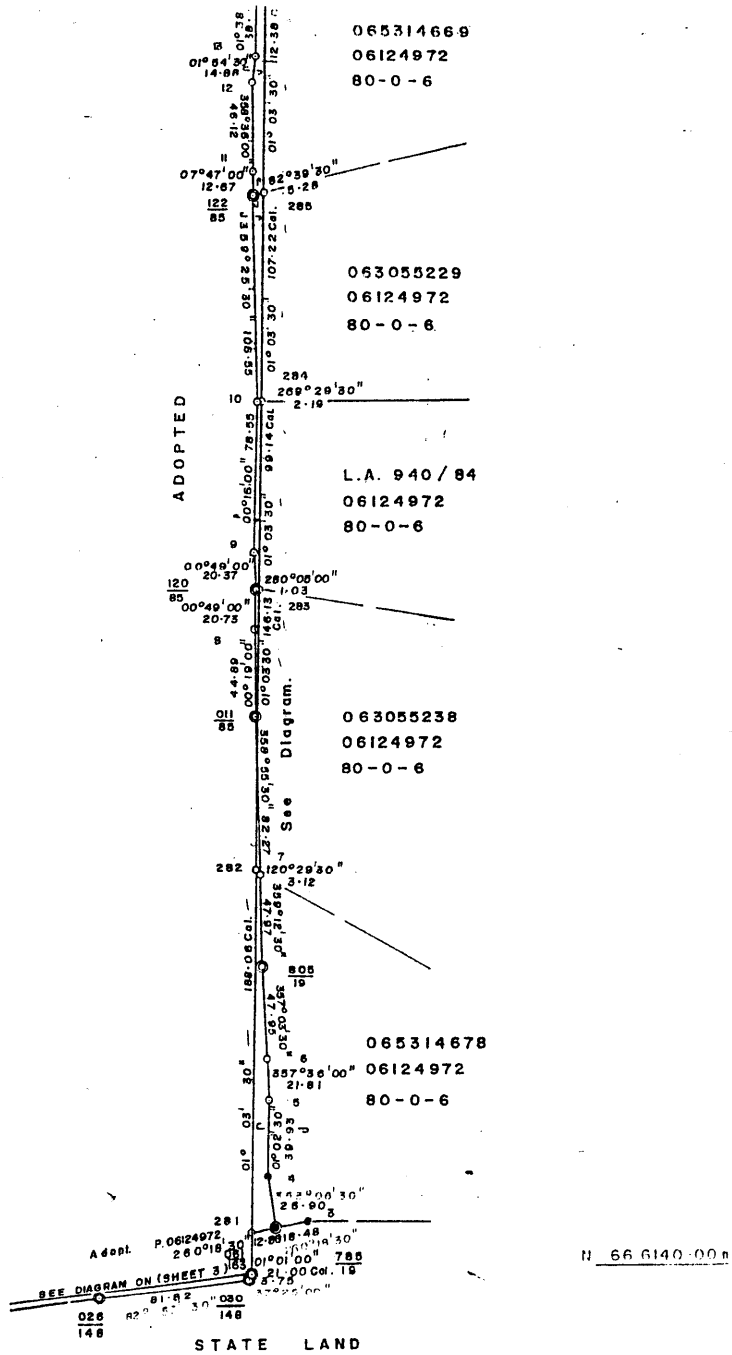
67 - KK



STATE  
67 - KK







Survey of the southern part boundary  
of Taman Kinabalu at Mile  $3\frac{1}{2}$ ,  
Tamparuli - Ranau Road  
District of RANAU  
Scale: 1 : 2500  
(Sheet 4)

065314678  
06124972  
80-0-6

ADOPTED  
P. 06124972  
SEE SHEET 4

266.00 32.00 267.00  
90° 12' 21" 150.19 37  
107.00 16.44 8  
107.00 12.00 106.16 12.30  
124.78 12.30  
120.10  
148

LAND

STATE LAND  
67-KJ

DIAGRAM

(412.74)  
97.36 96.98  
105.08

128  
148

124.30

(506.39)  
100 67.29

112 101  
118 101  
27.8 30.48 102 43.23 113 104

155.04

(209.53)  
105 82.98  
148

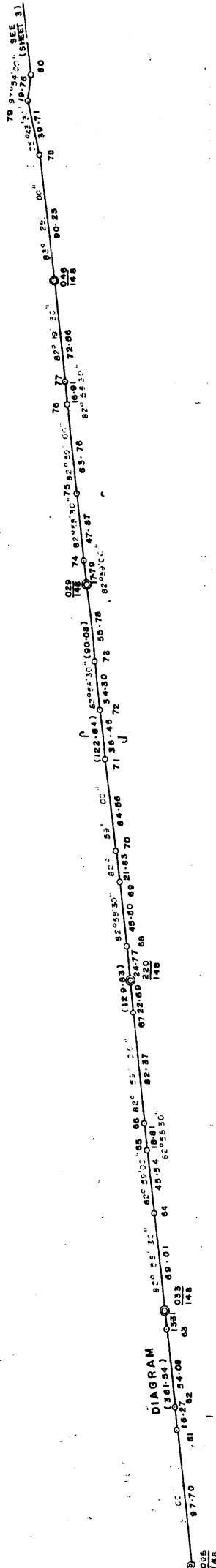
128  
148

N. 66 37.70 C.C. m.



000

K AREA



LAND

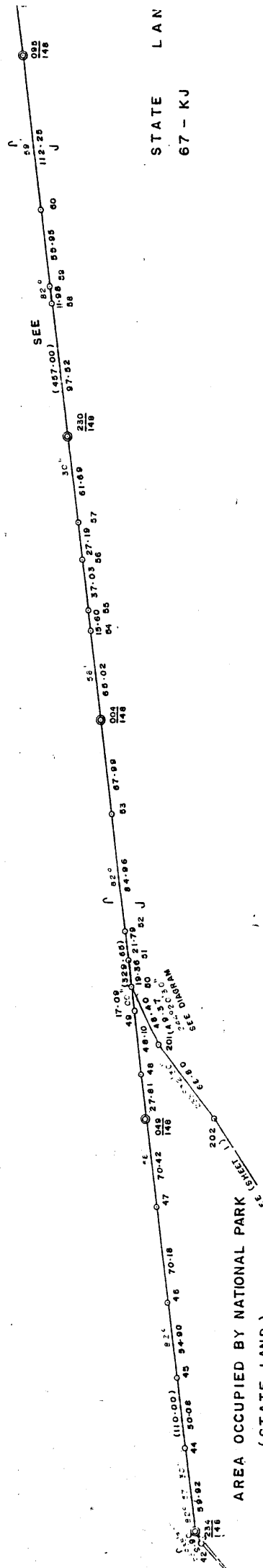
N. 66° 55' 10" 00 m.  
 E. 76 2880.00 m.

ern part boundary  
at Mile 31½,

NATIONAL PARK

P. 99197385

67 - KJ



STATE LAND

67 - KJ

AREA OCCUPIED BY NATIONAL PARK  
(STATE LAND)



"I, P. Y. Ngyaf, a surveyor licensed under the Surveyors Ordinance 1960, certify that the survey from which this plan has been prepared was carried out and marked on the ground by me or under my immediate personal direction and supervision in the field in strict accordance with the Surveyors (Conduct of Title Surveys) Regulations, 1962, and that this plan correctly represents the survey completed on the 10th day of December, 1986.  
Dated this 11th day of Dec. 1986.

*P. Y. Ngyaf*  
Licensed Surveyor

"I, P. Y. Ngyaf, certify that the linear measurements made in the field and those for the purpose of this survey are all done and shown in pencil on this survey plan."

*P. Y. Ngyaf*  
Licensed Surveyor

11-12-1986

Survey of the southern  
of Taman Kinabalu at  
Tamparuli - Ranau Road  
District of RANAU

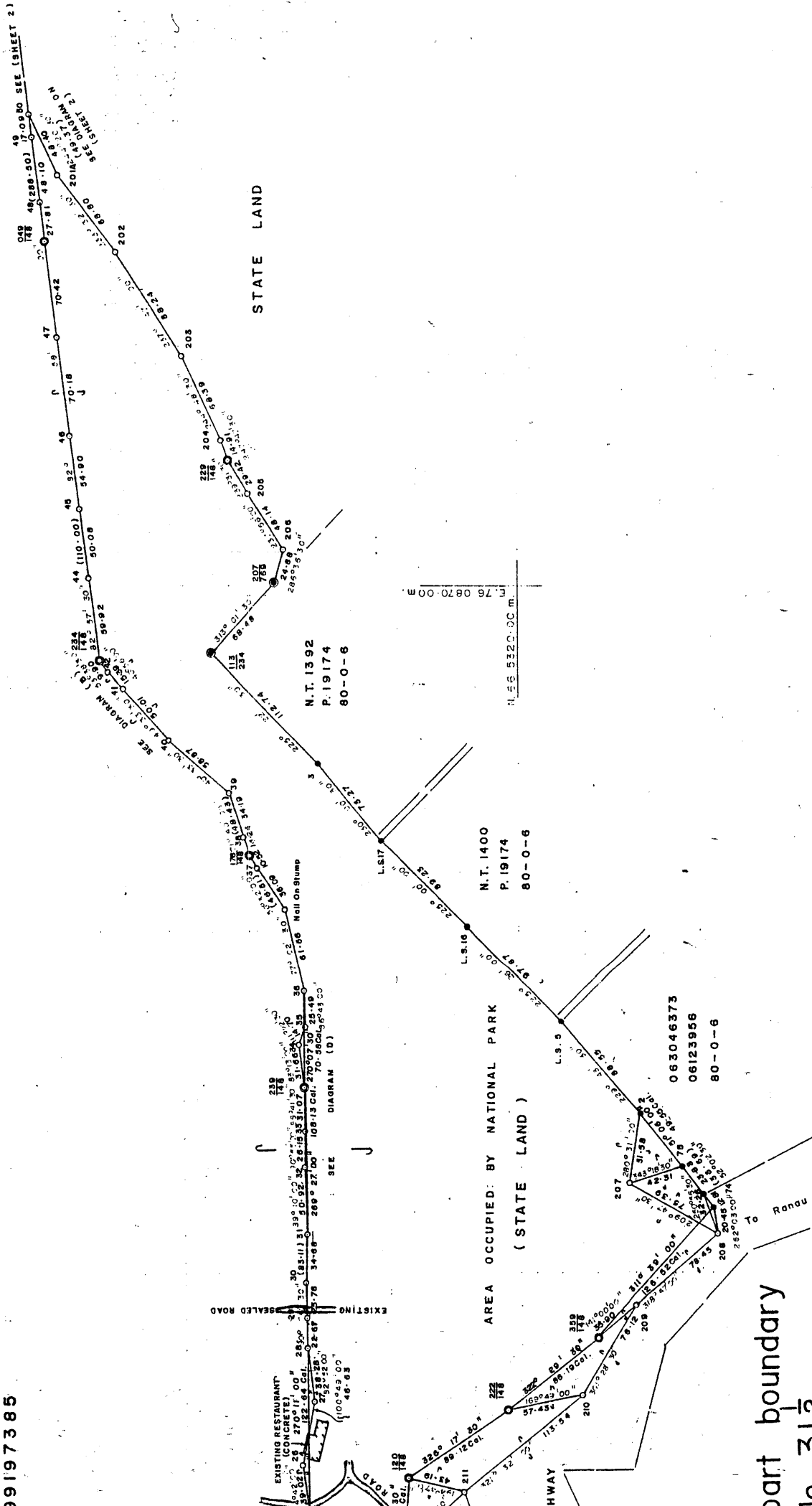
Scale : 1 : 2500

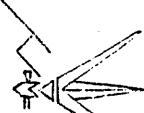
(Sheet 2)



AL PARK AREA

99197385



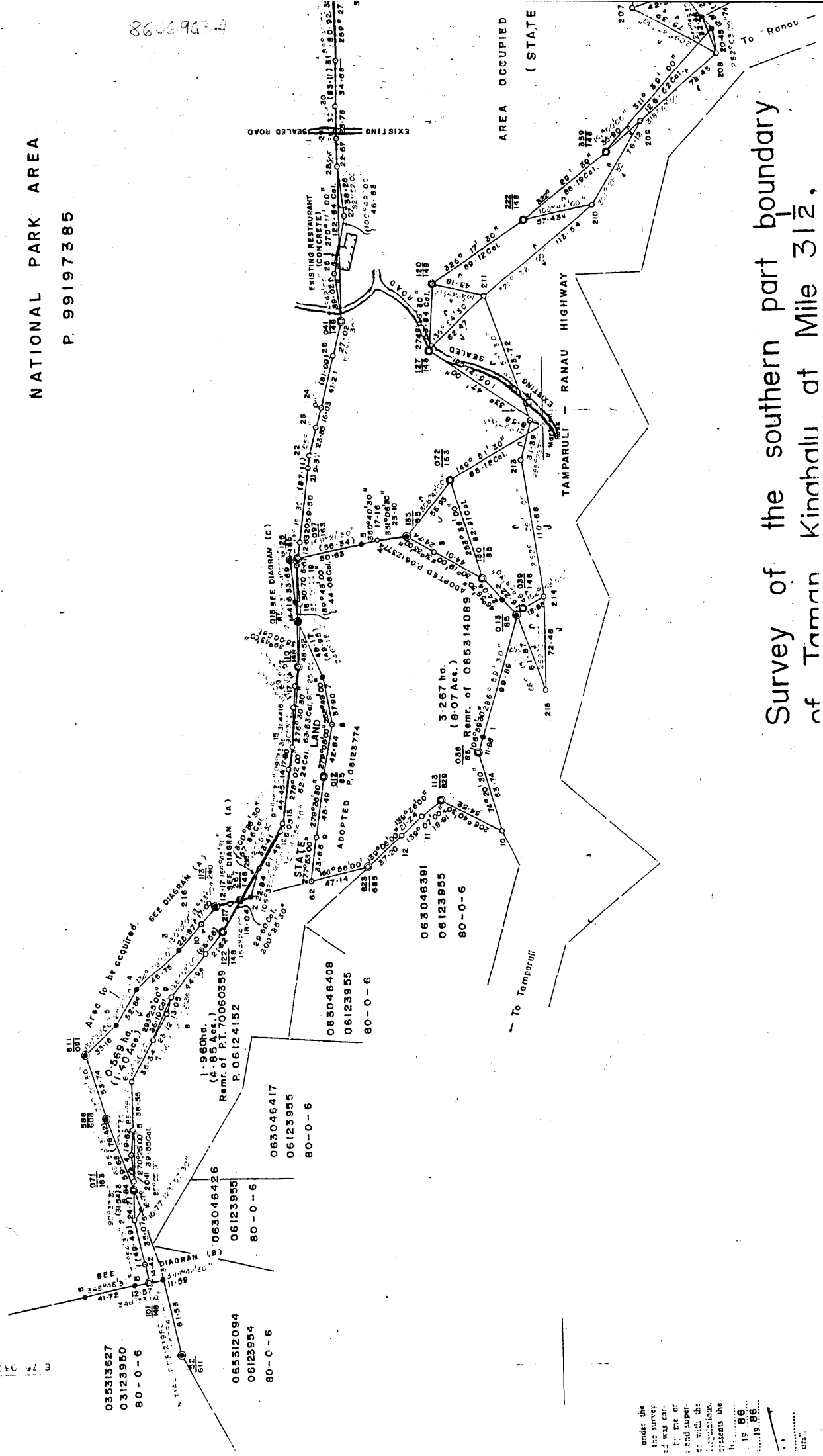
	SYARIKAT JURUKUR KINABALU
	(LICENSED LAND SURVEYOR)
	P. O. BOX 10143.
	88801 KOTA KINABALU, SARAWAK

TEL: 21130, 221398

part boundary  
ile 31 1/2,

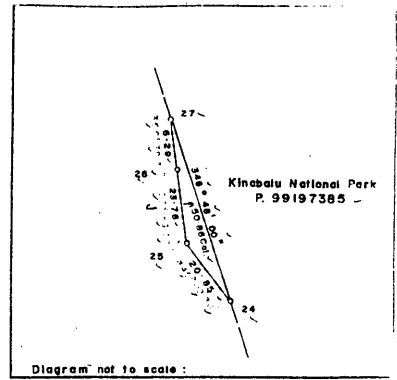
86069434

NATIONAL PARK AREA  
P. 99197385



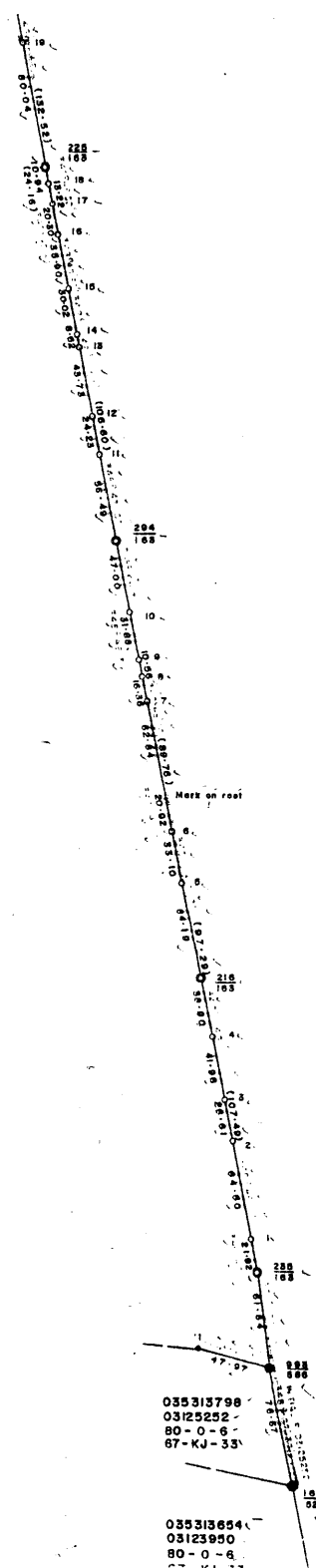
Survey of the southern part boundary  
of Taman Kinohalu at Mile 31 1/2.

under the  
the survey  
was car-  
by the or  
land sur-  
with the  
present the  
15 86  
19 86  
017



KINABALU NATIONAL PARK  
P. 99197385

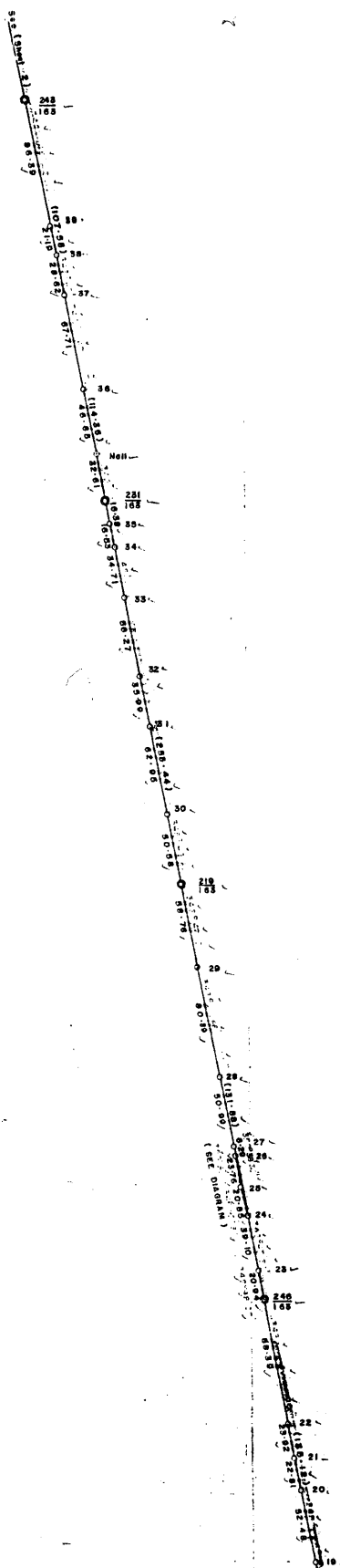
of Western Part Boundary of -  
Kinabalu at Mile 31 1/2,  
Tuli - Ranau Road  
of RANAU  
1:2500  
1)



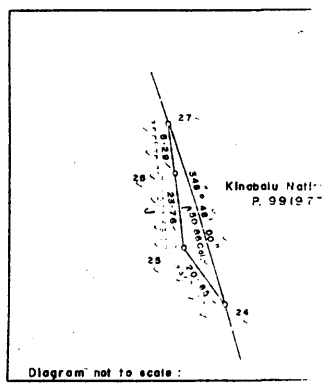
District Surveyor

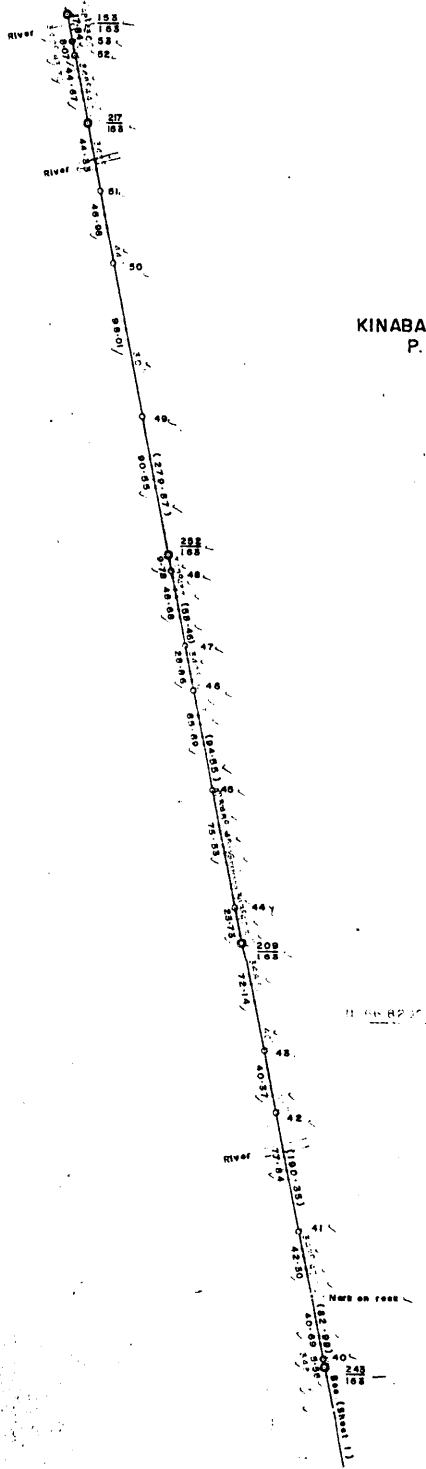
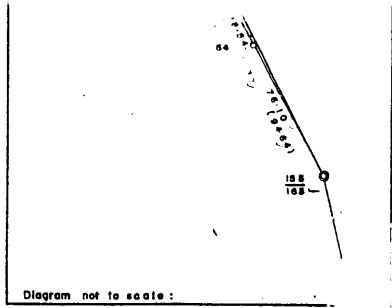
Dir

3



KINABALU NATIONAL PARK  
P. 99197385





KINABALU NATIONAL PARK  
P. 99197385

Boundary of  
31 1/2,

Approved

Director of Lands & Surveys

District Surveyor

SYMBOLS USED IN THIS PLAN









KINABALU NATIONAL PARK -  
P. 99197385 ✓




Boundary of  
1/2 , -

Approved

.....  
Director of Lands & Surveys

.....  
District Surveyor

	<b>SYARIKAT JURUKUR KINABALU SENDIRIAN BERHAD</b>
	(LICENSED LAND SURVEYOR)
	P O BOX 10143, 8801 KOTA KINABALU SAHAB
	TFL 211430

KINABALU NATIONAL PARK  
P. 99197385

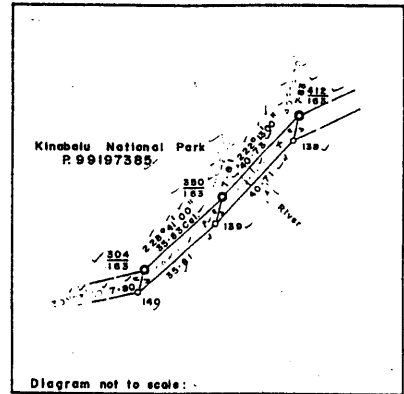
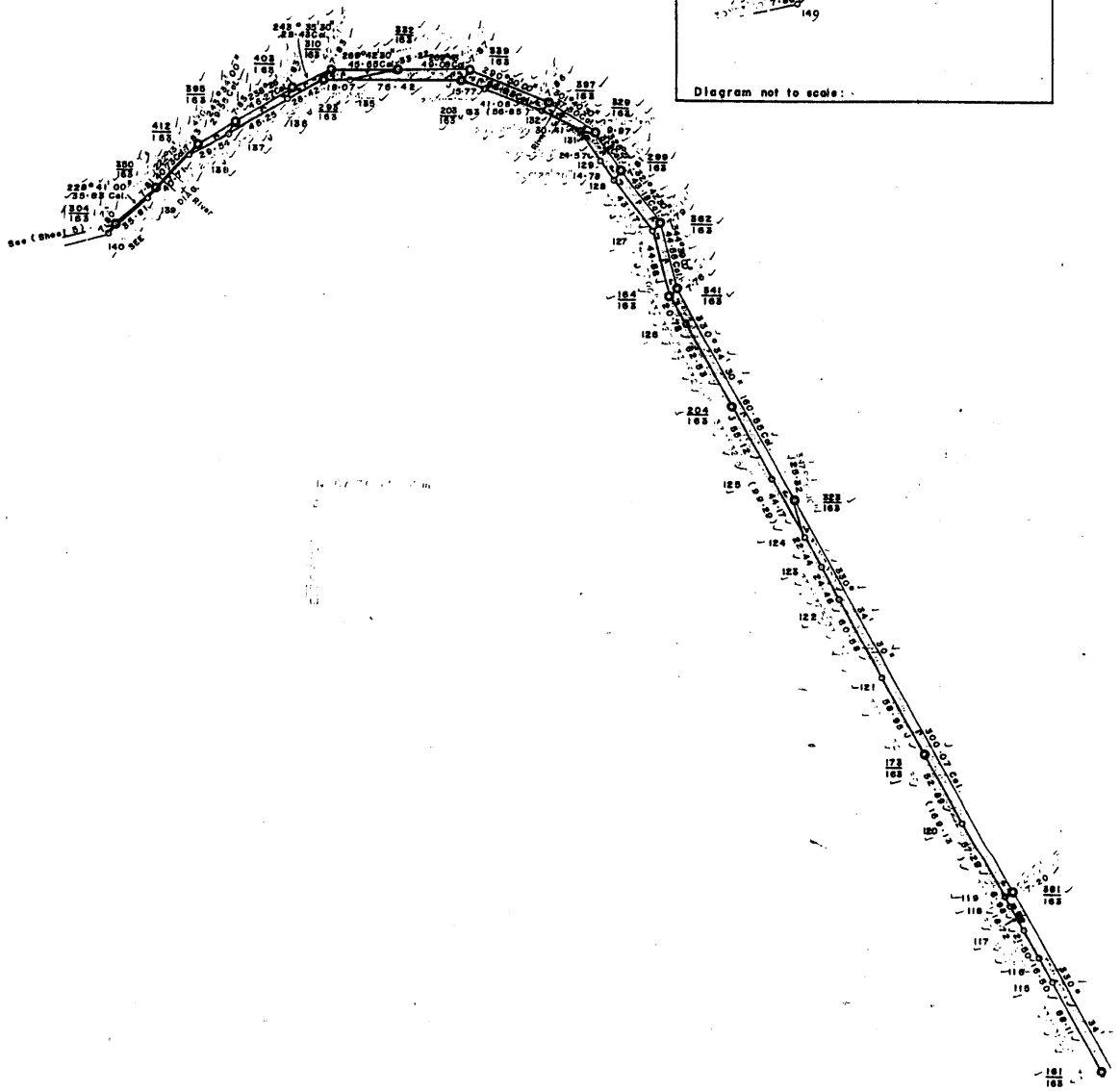
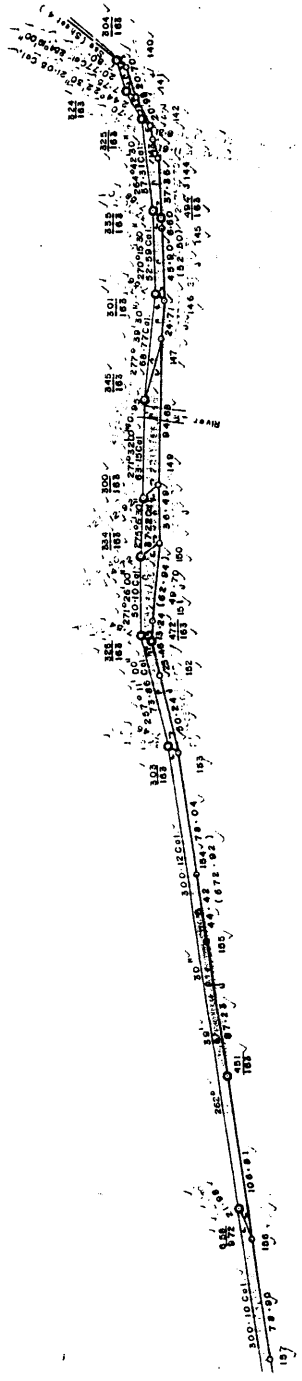


Diagram not to scale.



ALU NATIONAL PARK  
99197385



100-0929-02  
100-0929-02

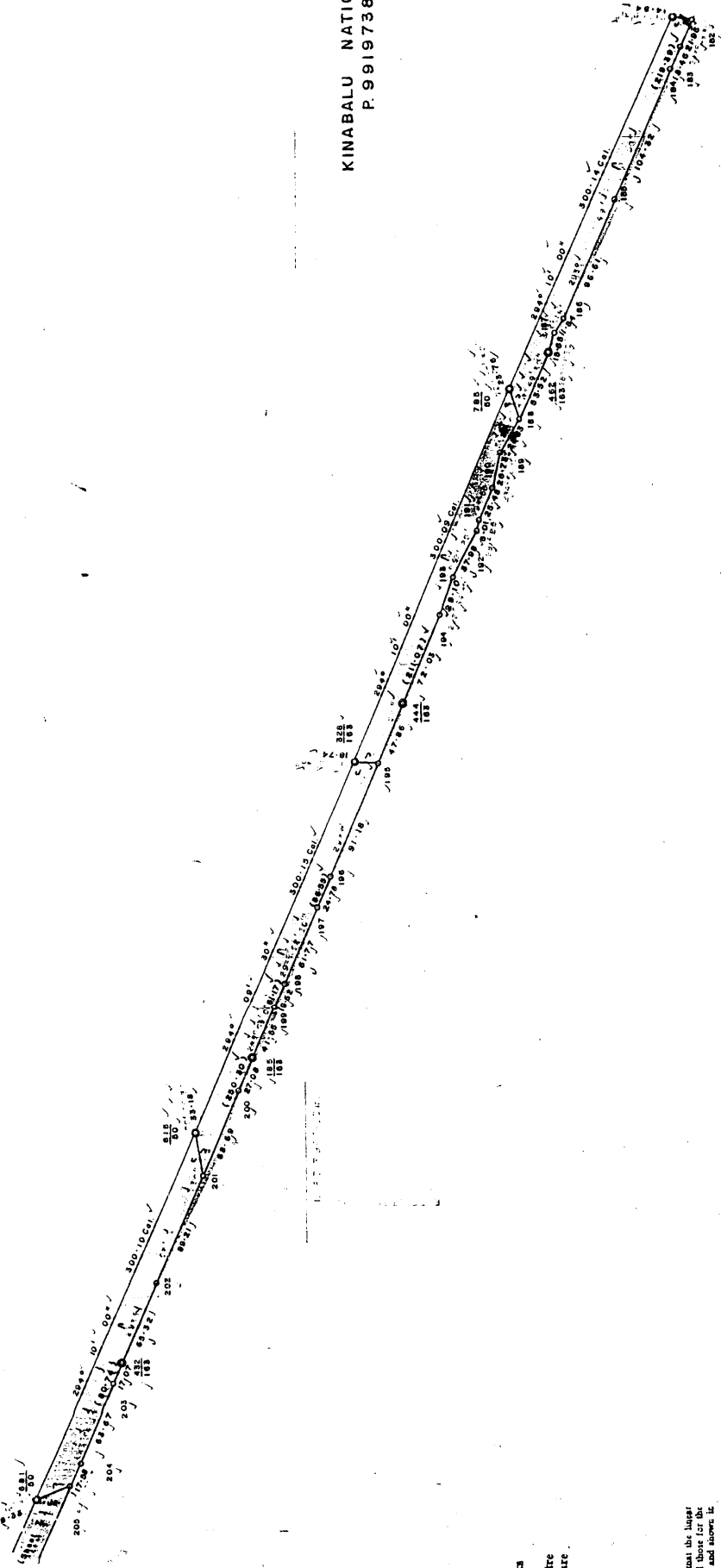
Boundary of

Approved





KINABALU NATIONAL  
P.99197385



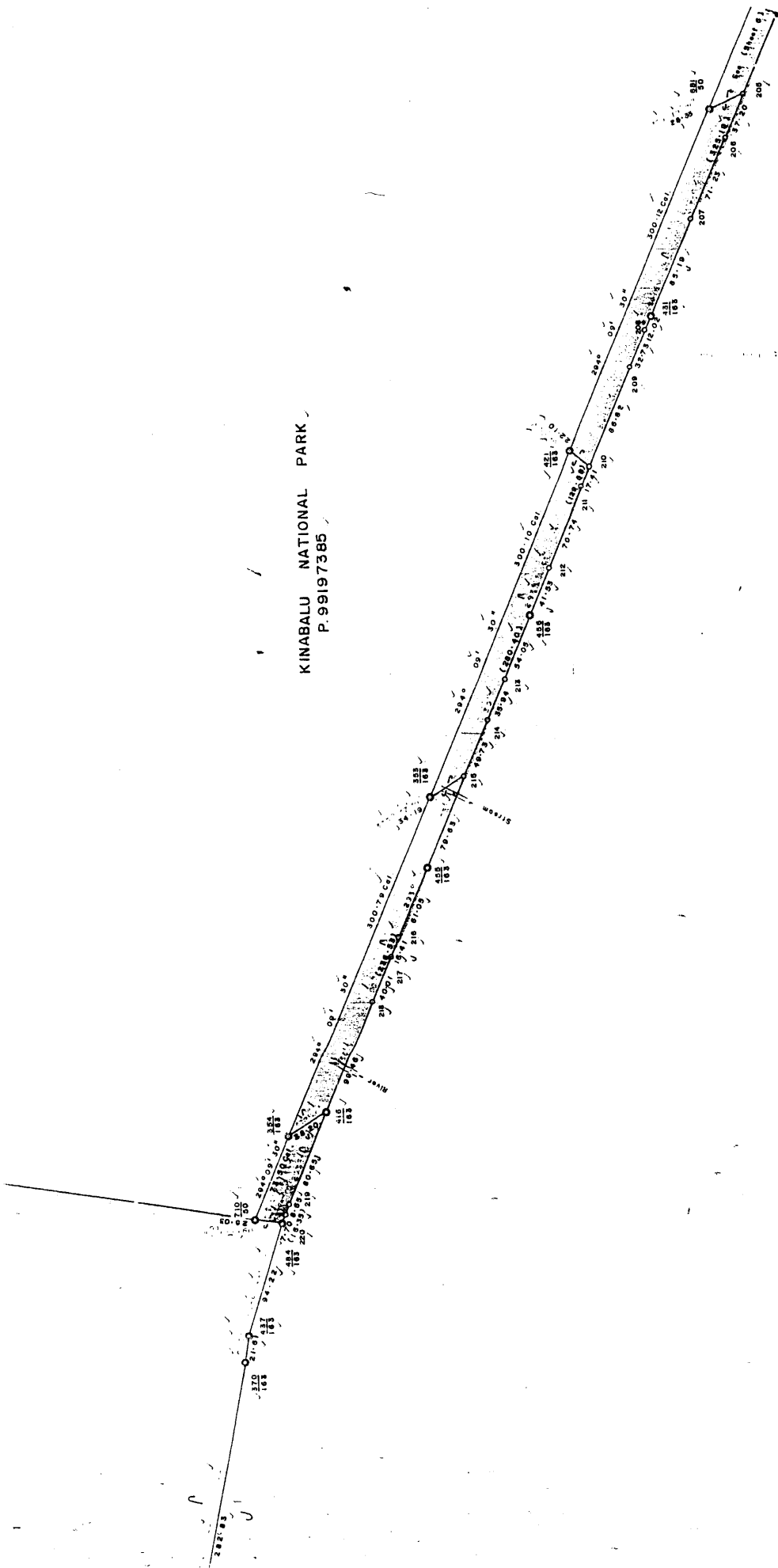
on Factors:  
- 4.67087815 links  
- 2.571022 acres  
- 0.20116765 hectare  
- 0.4946832 hectare

1974... merely that the lines  
made in the field and those for the  
survey are all done and shown in  
a survey plan.

197  
L. J. J.  
L. J. J.  
L. J. J.

1974... a surveyor named under the  
Ordinance 1952, certify that the survey  
made in the field has been prepared and  
checked and marked on the plan by me or  
under my supervision and that the plan  
is correct and true with the  
(Conduct of Title Survey) Regulations,  
that this plan correctly represents the  
surveyed area as shown on the plan  
1974... day of... 1974

KINABALU NATIONAL PARK  
P. 99197385

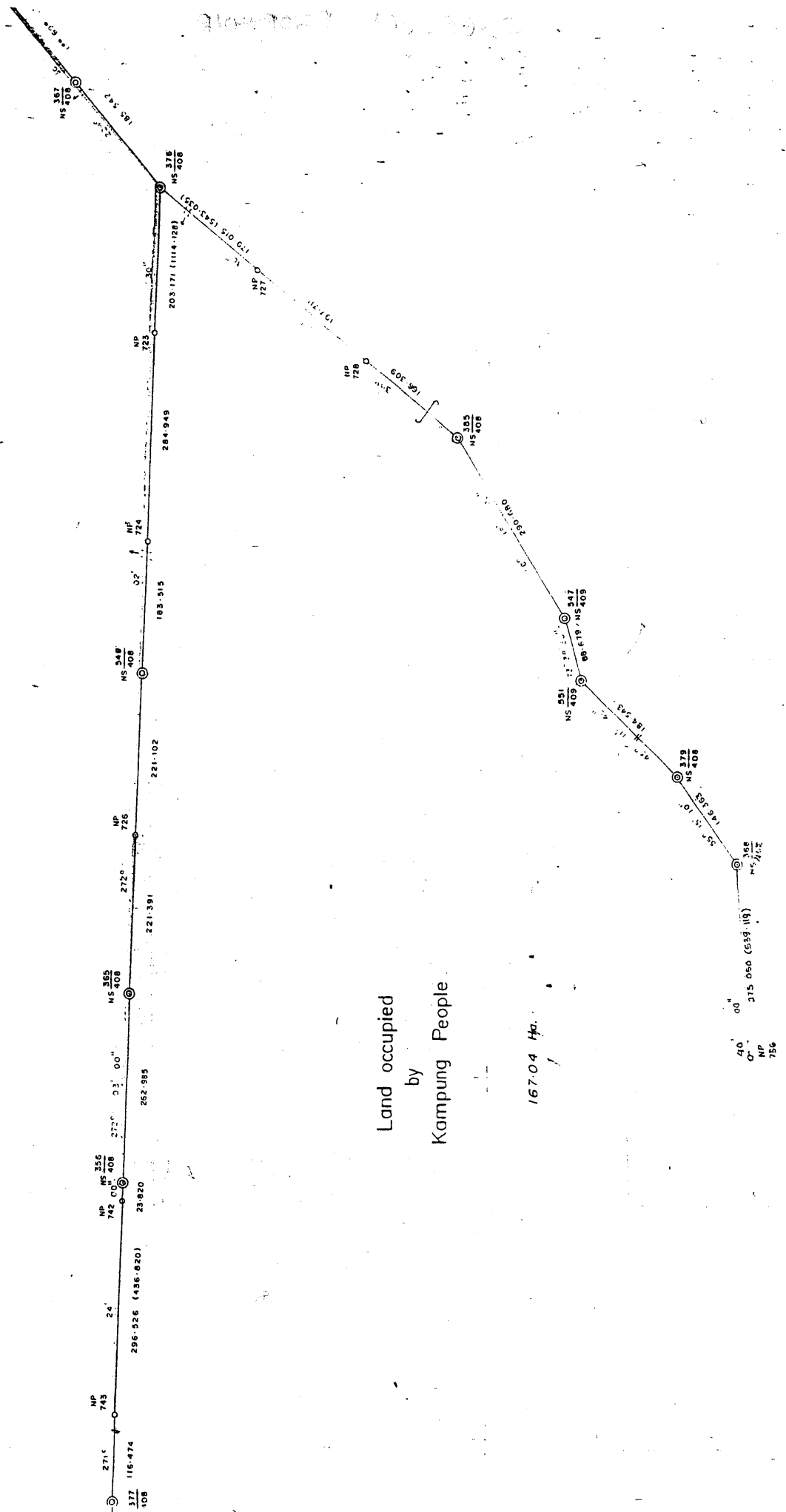


Part Boundary of  
Mile 31 1/2,  
Pogad





167-04

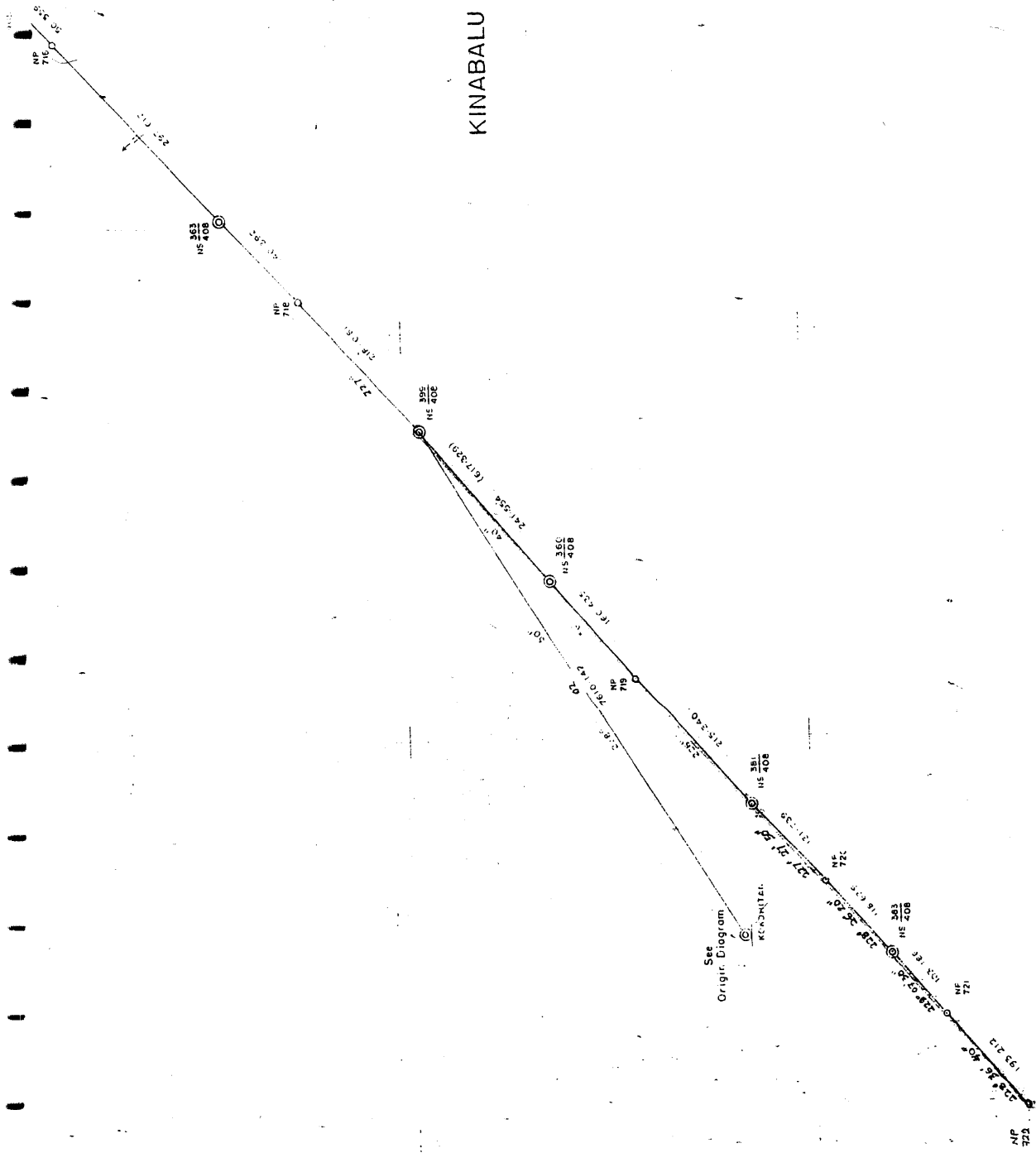


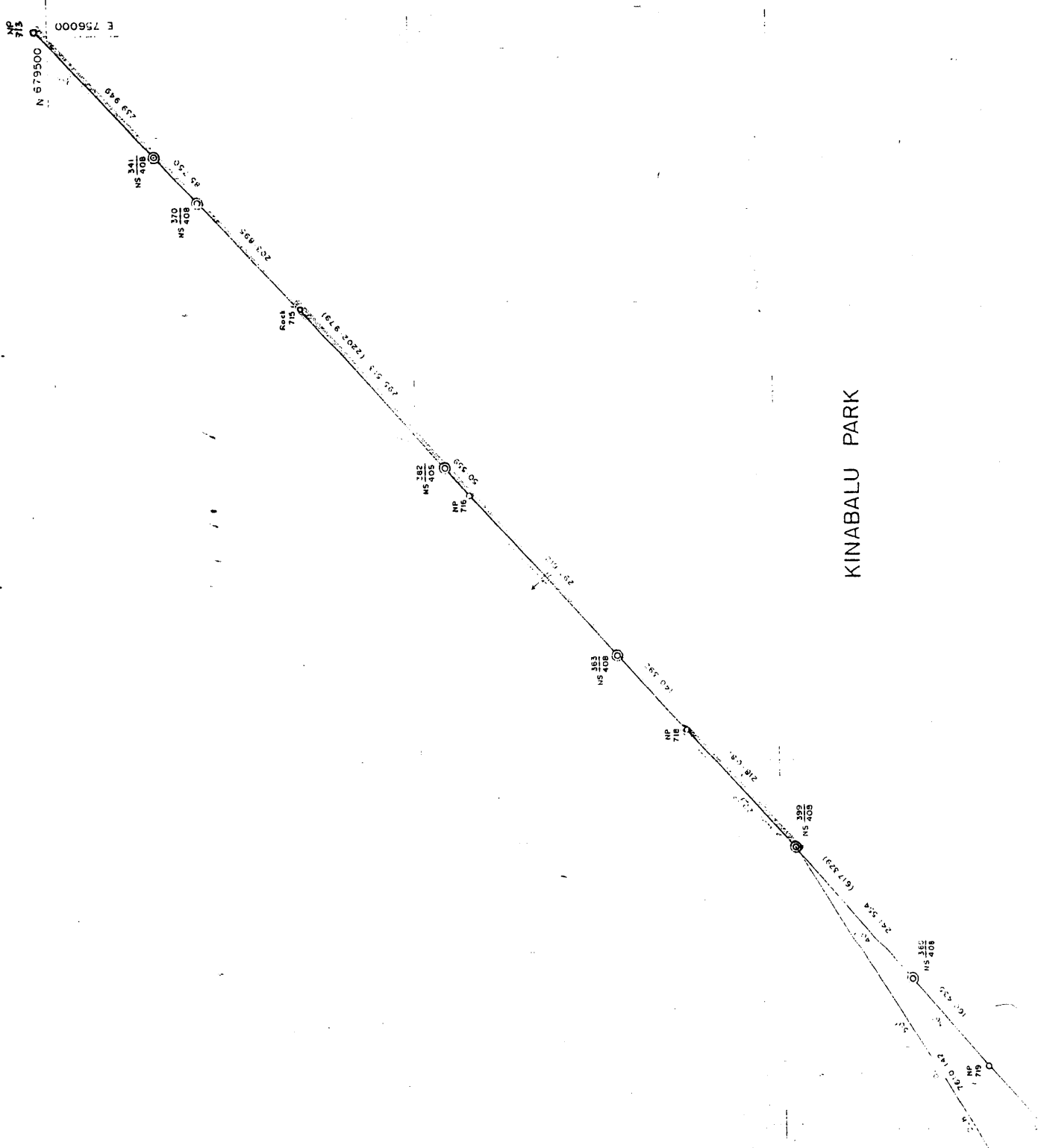
Land occupied  
by  
Kampung People.

167-04 Ha.

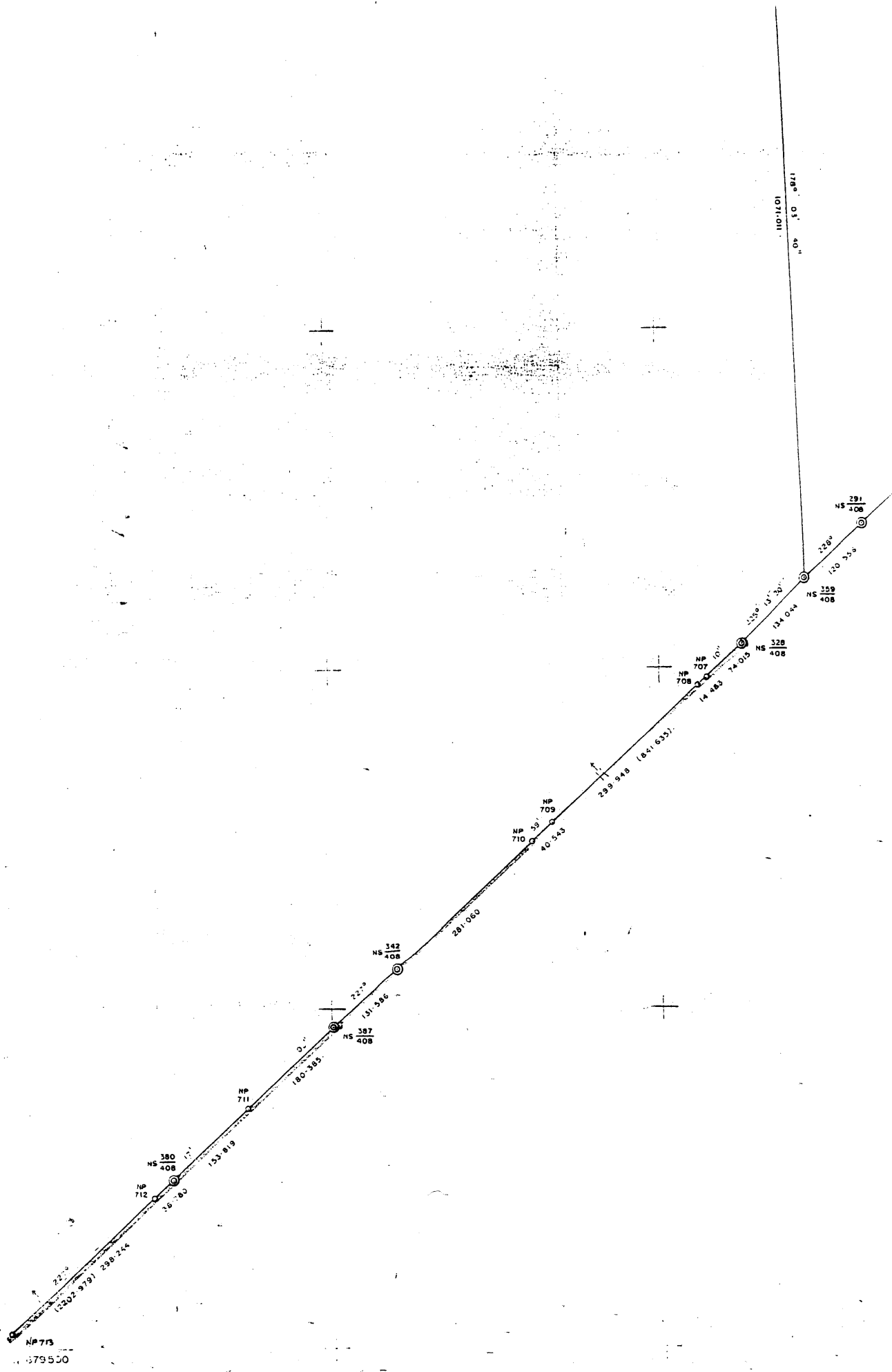
40' 00"  
01"  
NP  
756

KINABALU PARK



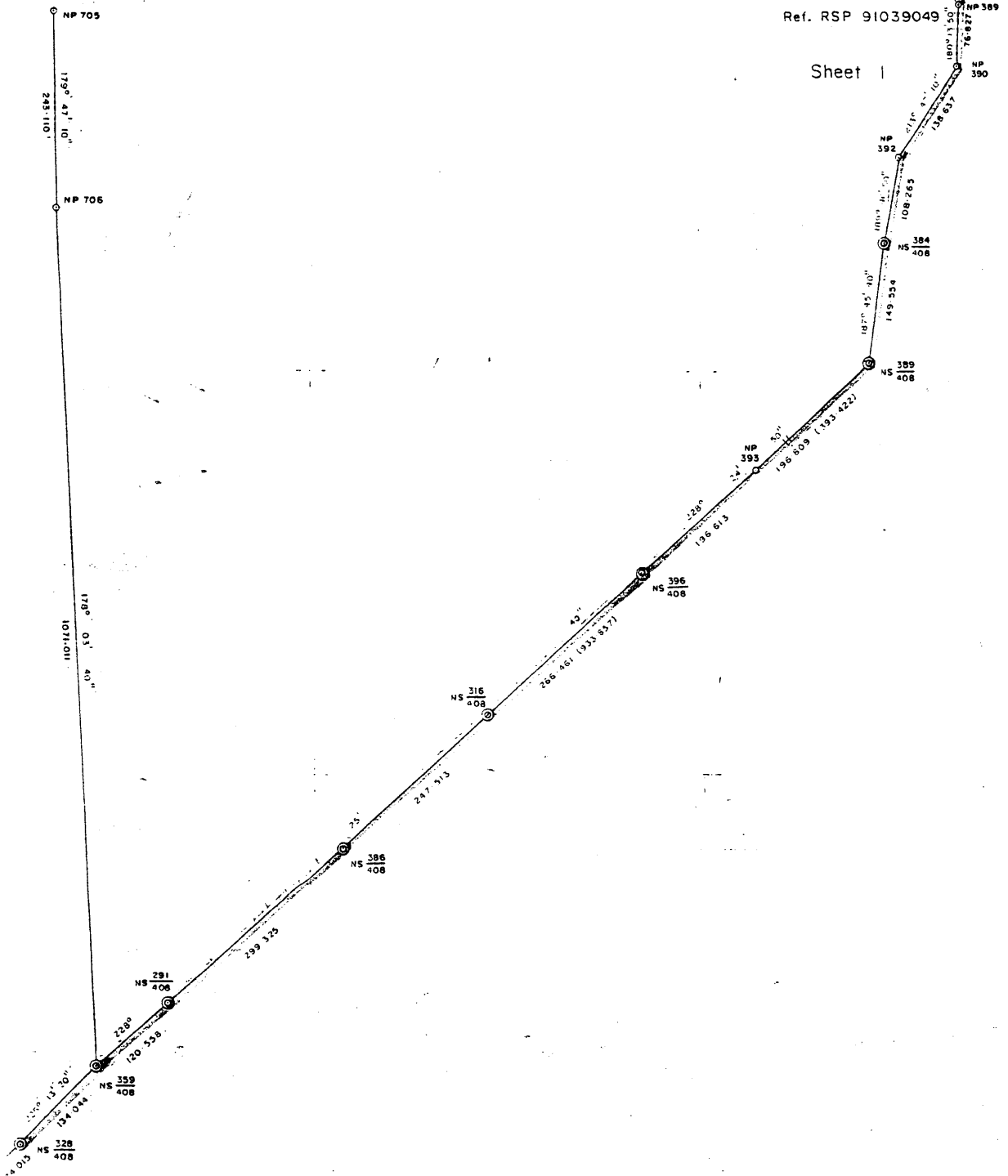


KINABALU PARK



Ref. RSP 91039049

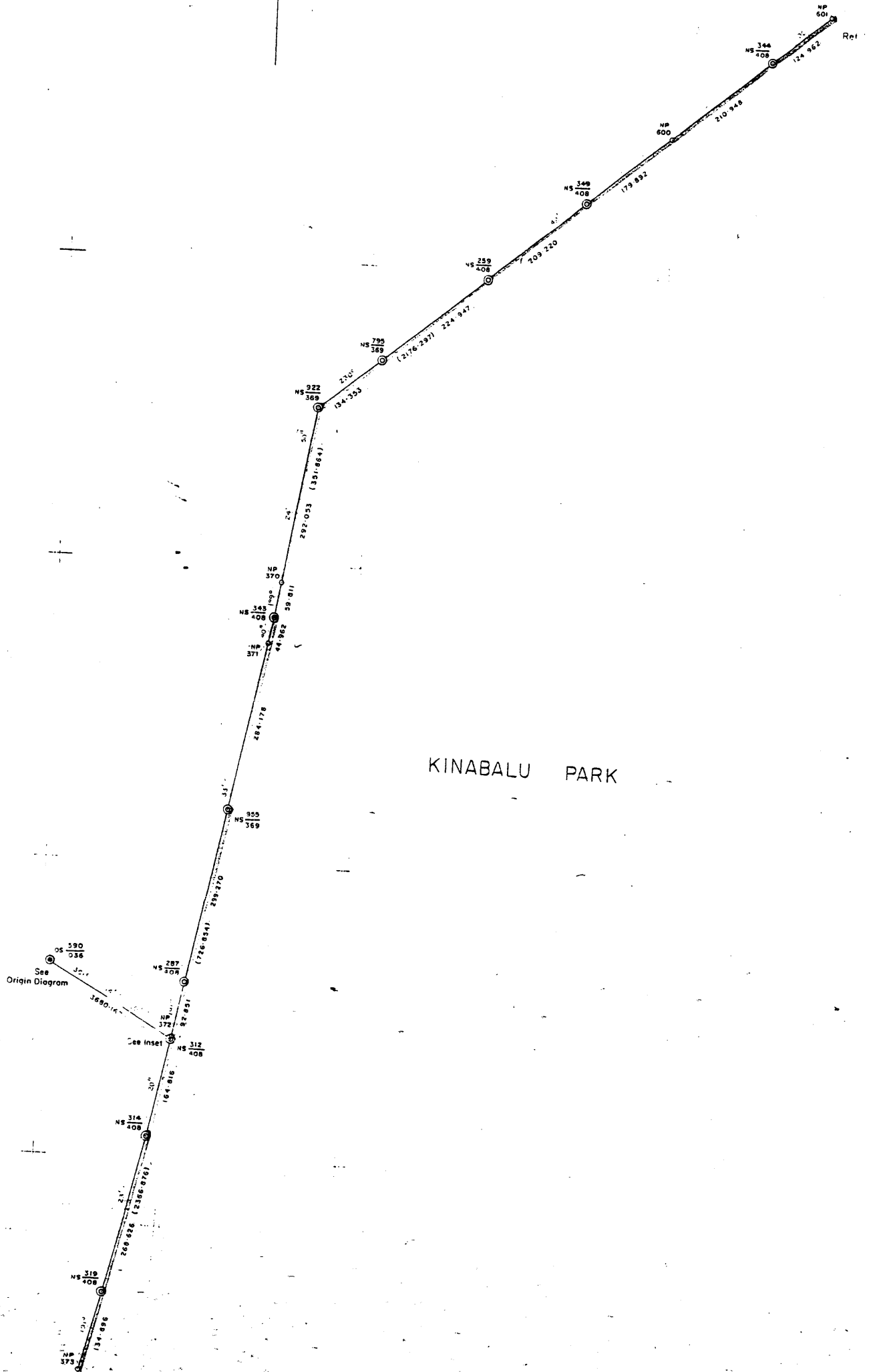
Sheet 1



KINABALU PARK







KINABALU PARK

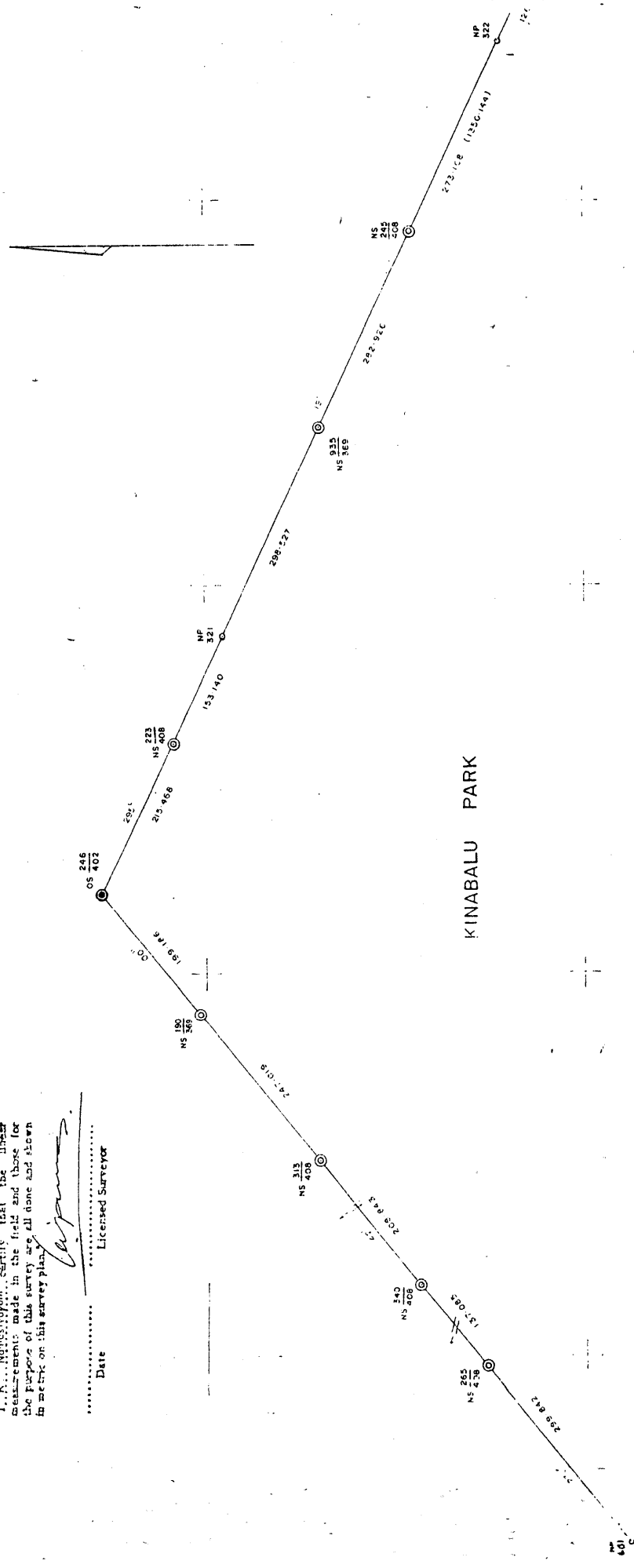


900270 - 9

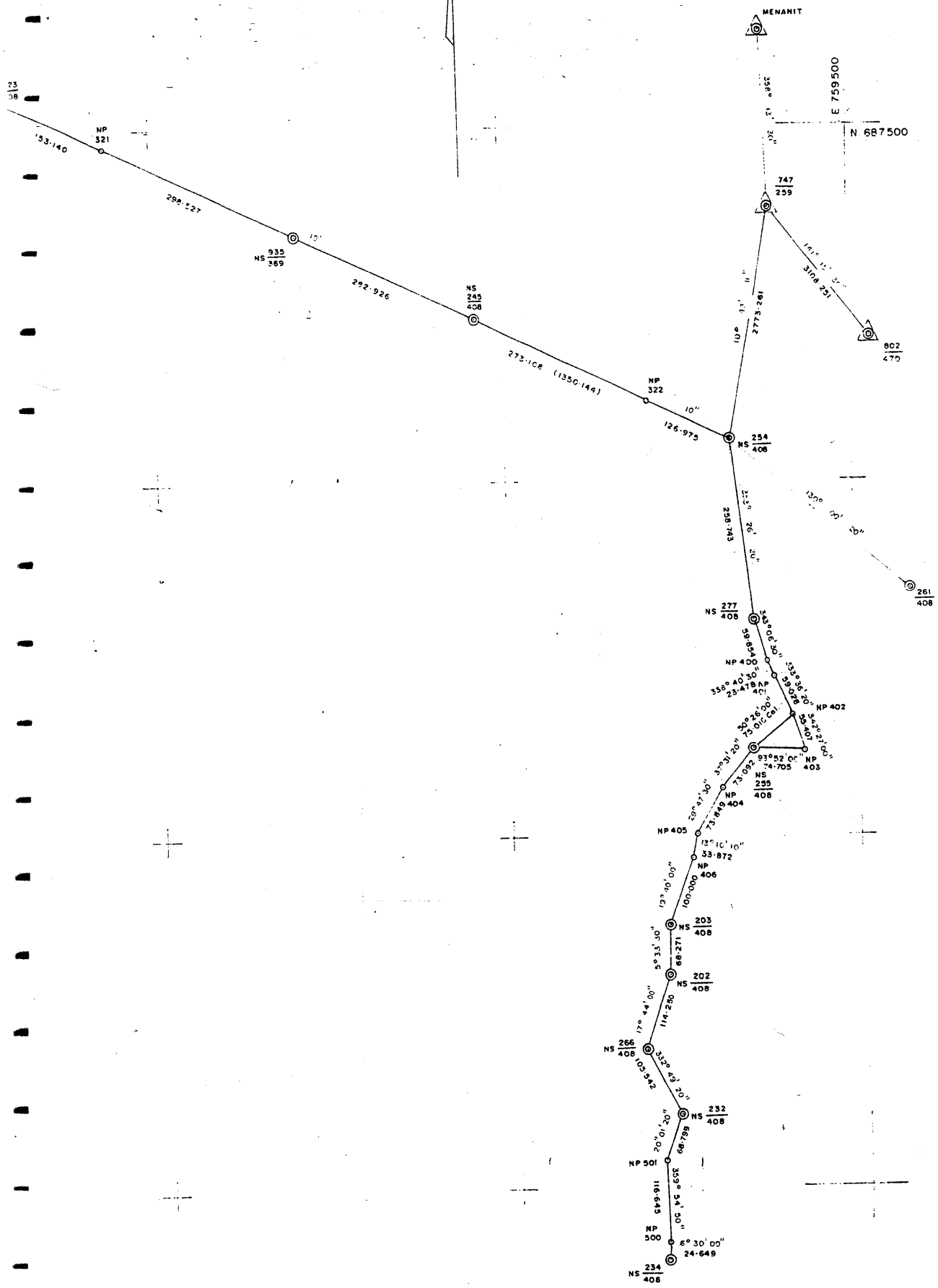
I, K. N. Narayanan, certify that the linear measurements made in the field and those for the purpose of this survey are all done and shown in metric on this survey plan.

*[Signature]*  
Licensed Surveyor

Date .....



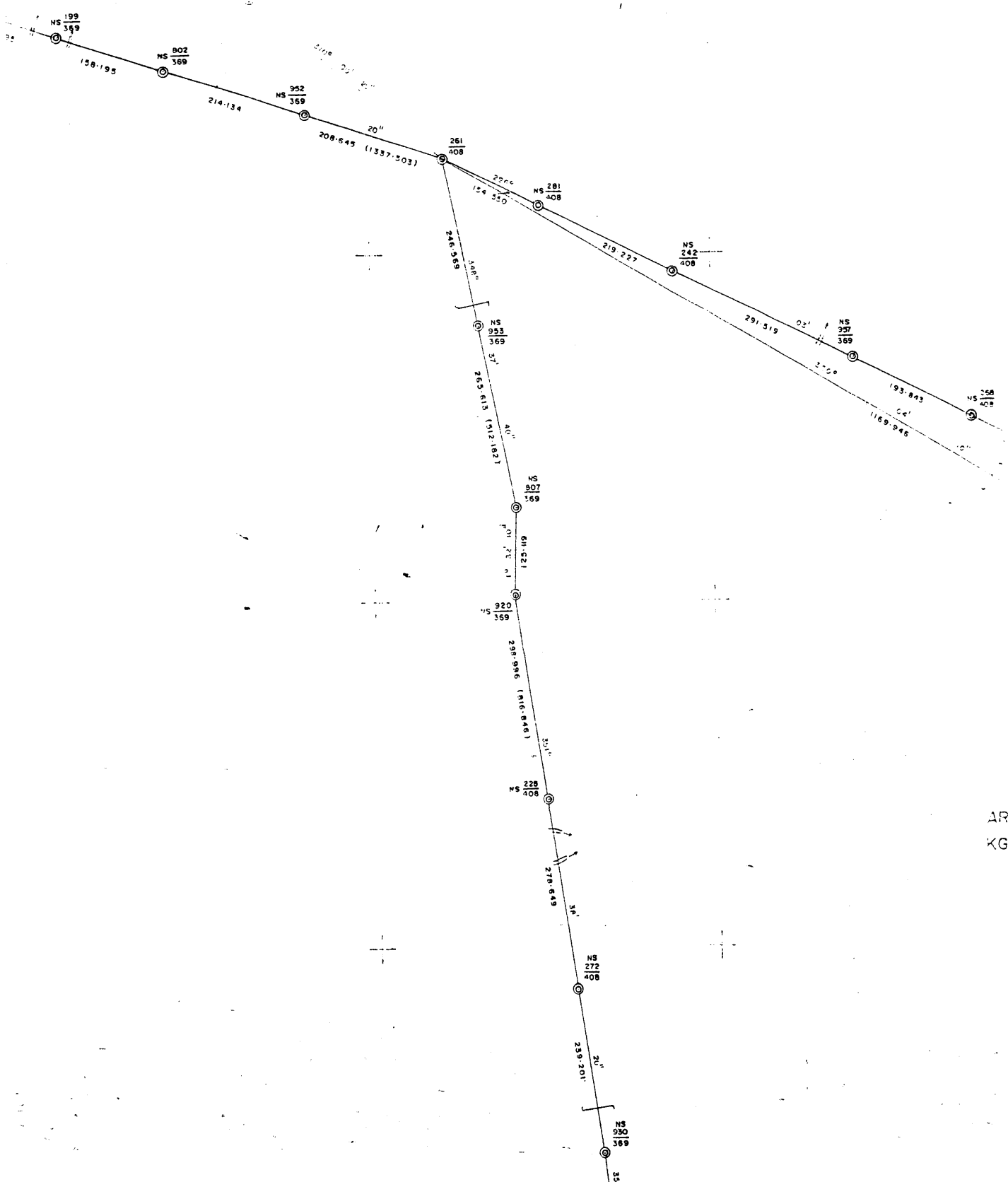
9973108



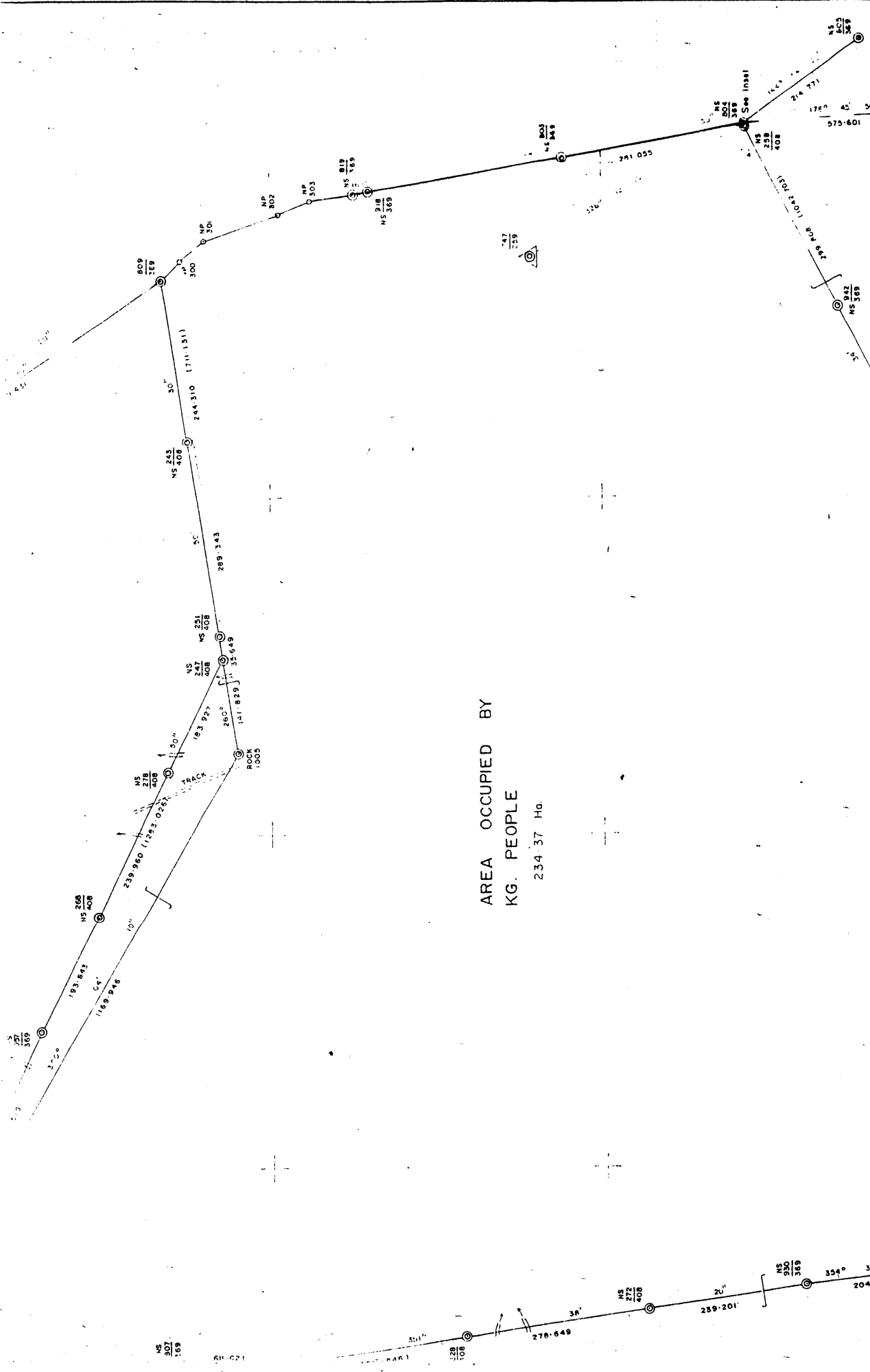
Western Boundary of Kinabalu National Park  
 KOTA BELUD DISTRICT

Approved,





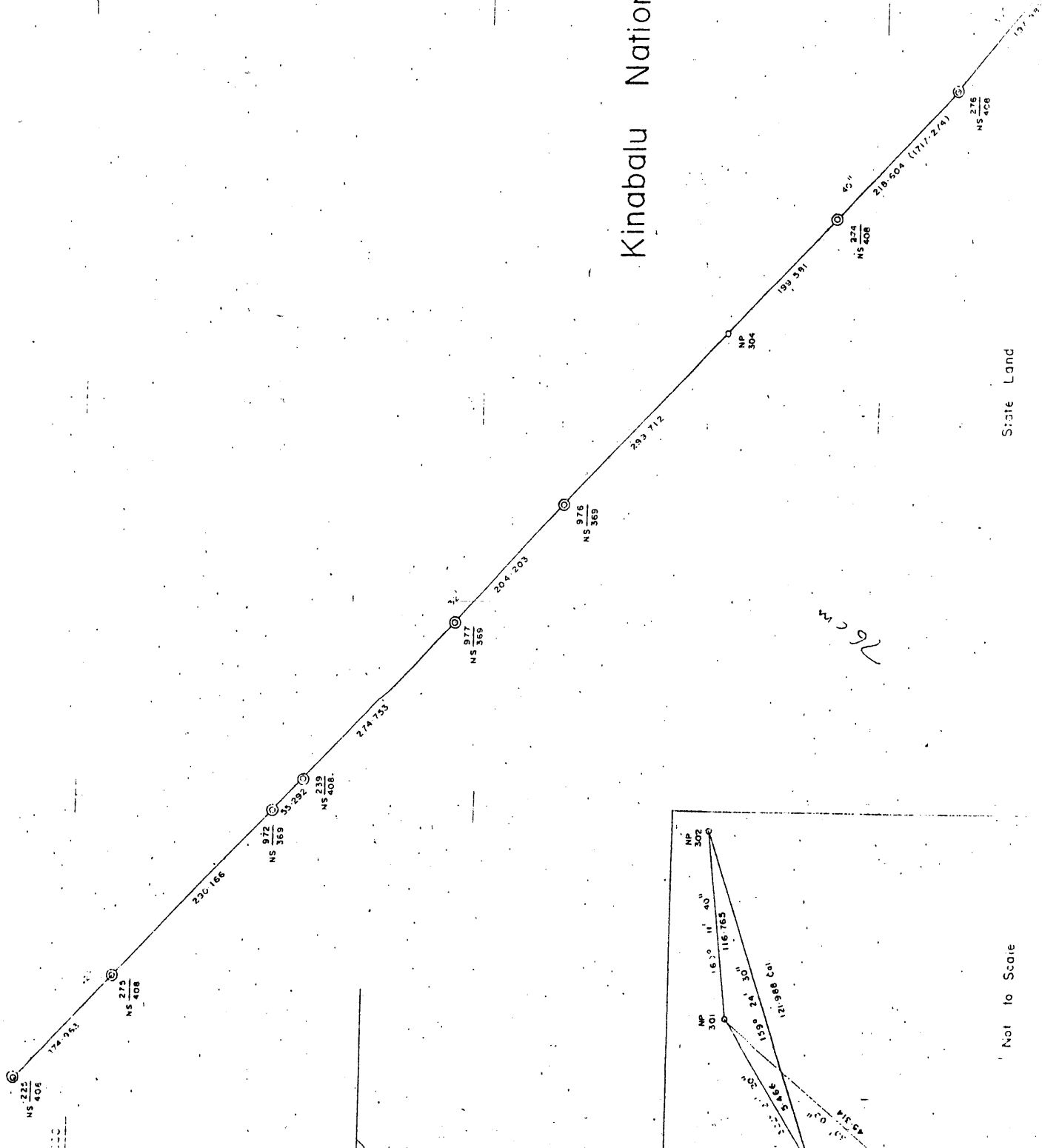
ARI  
KG



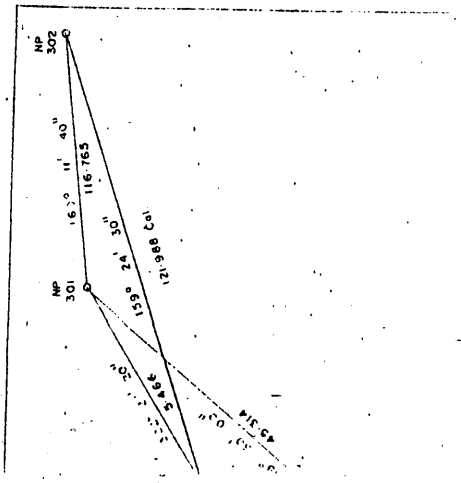
AREA OCCUPIED BY  
 KG. PEOPLE  
 234.37 Ha.



# Kinabalu National Park

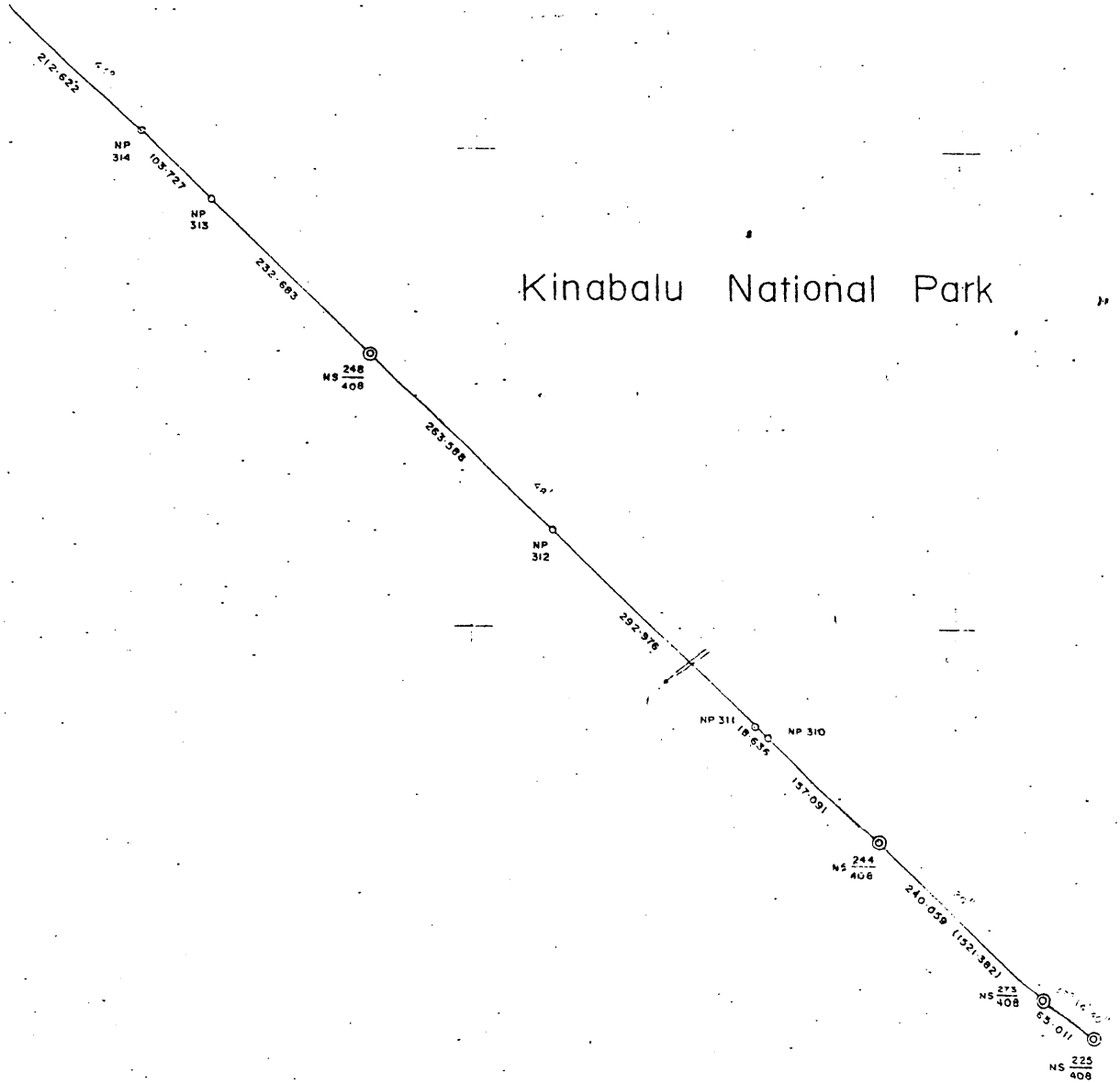


State Land



Not to Scale

# Kinabalu National Park



of Western Boundary of Kinabalu National Park

KOTA BELUD DISTRICT

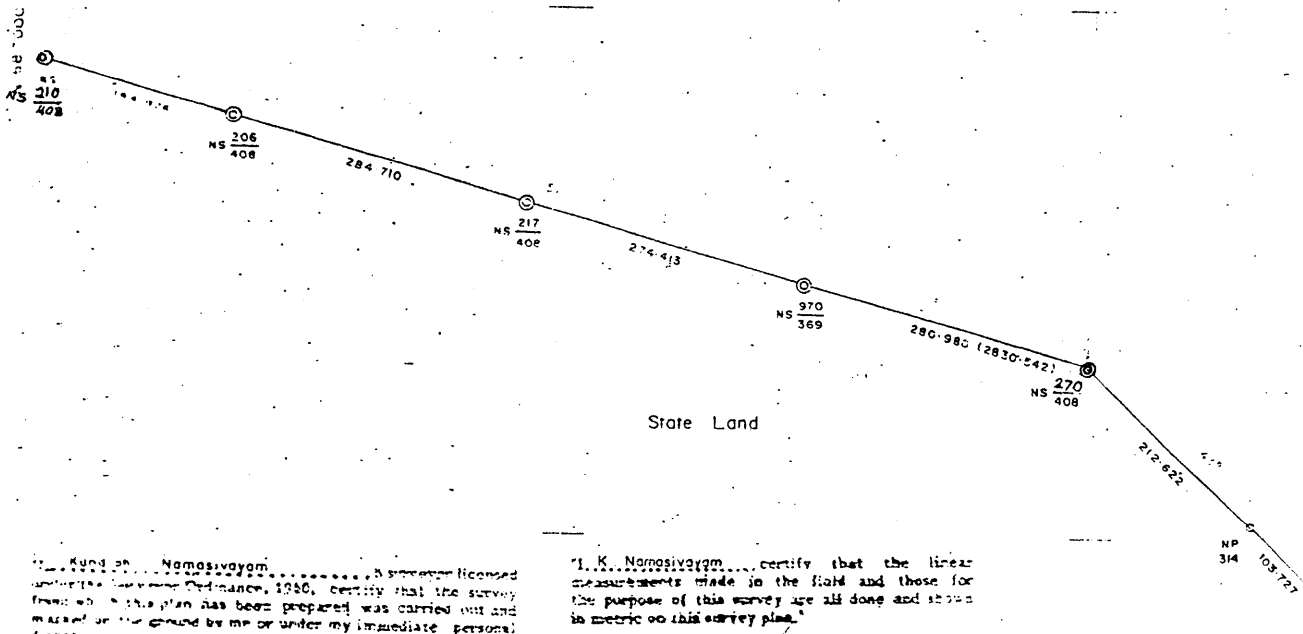
SCALE 1 : 5000

Approved,

Director of L.

By \_\_\_\_\_





I, Kund on Nomosivayom a surveyor licensed under the Surveyors Ordinance, 1980, certify that the survey from which this plan has been prepared was carried out and marked on the ground by me or under my immediate personal direction and supervision in the field in strict accordance with the provisions of the Surveyors (Conduct of Title Surveys) Regulations, 1982, and that this plan correctly represents the survey completed on the 15th day of October 1991.

"I, K. Nomosivayom certify that the linear measurements made in the field and those for the purpose of this survey are all done and shown in metric on this survey plan."

I undertake to accept full responsibility for the correctness of the survey.  
 Dated this 30th day of November 1991.  
K. Nomosivayom  
 Licensed Surveyor.

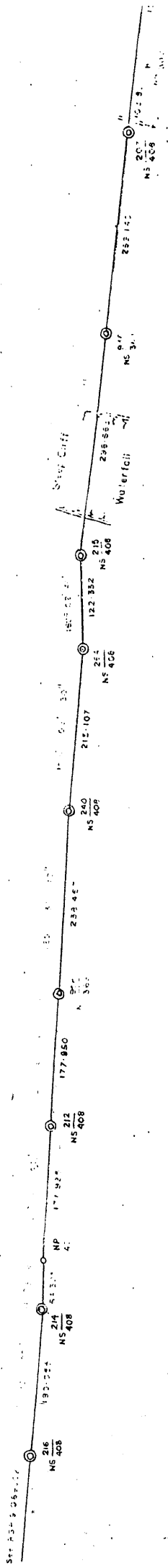
30 / 11 / 1991  
 Date  
K. Nomosivayom  
 Licensed Surveyor

The conversion Factors from metres to links

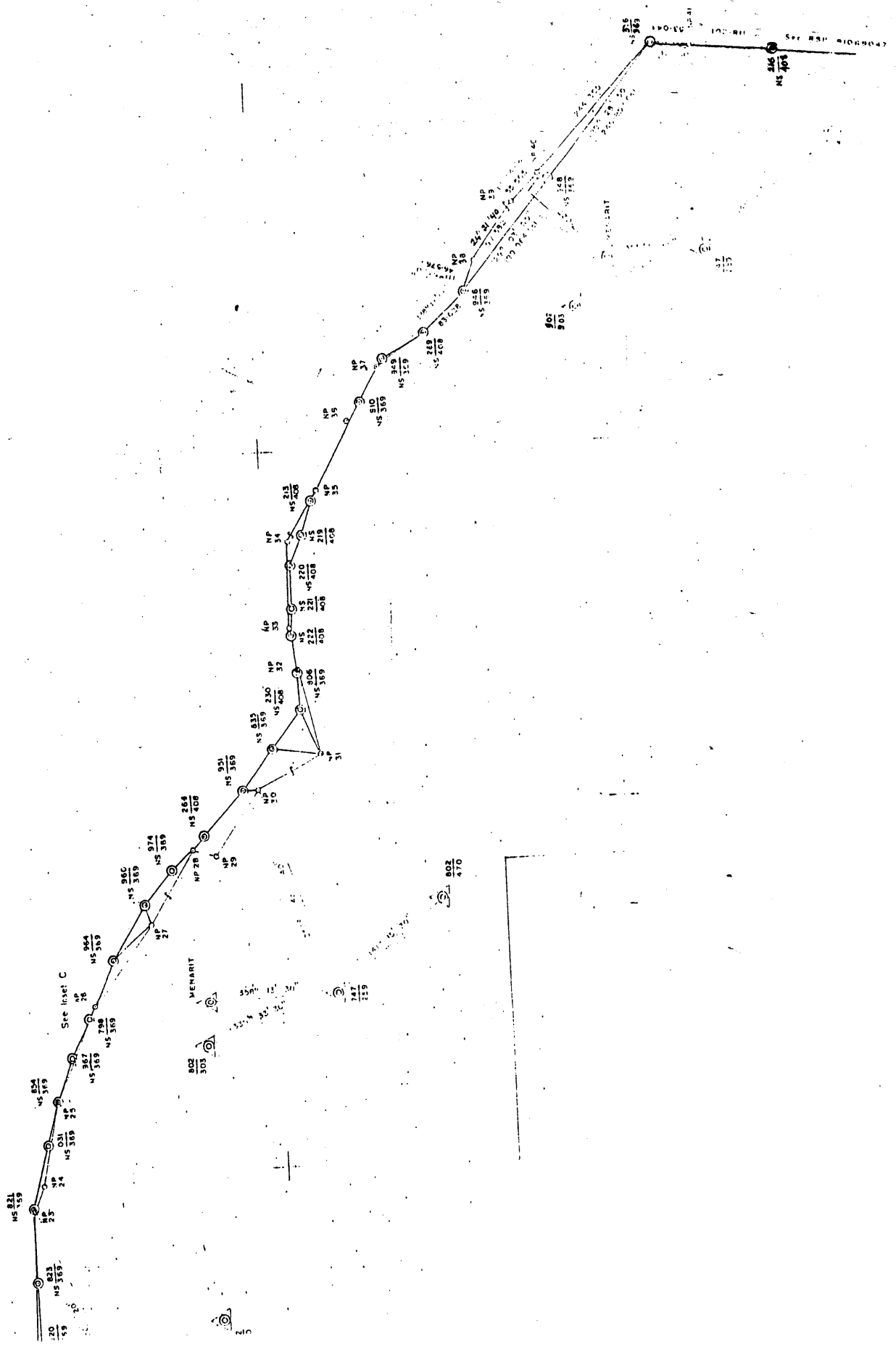
1 metre	==	4.97097015 links
1 hectare	==	2.471052 acres
1 link	==	0.20116765 metres
1 acre	==	4046852 hectare



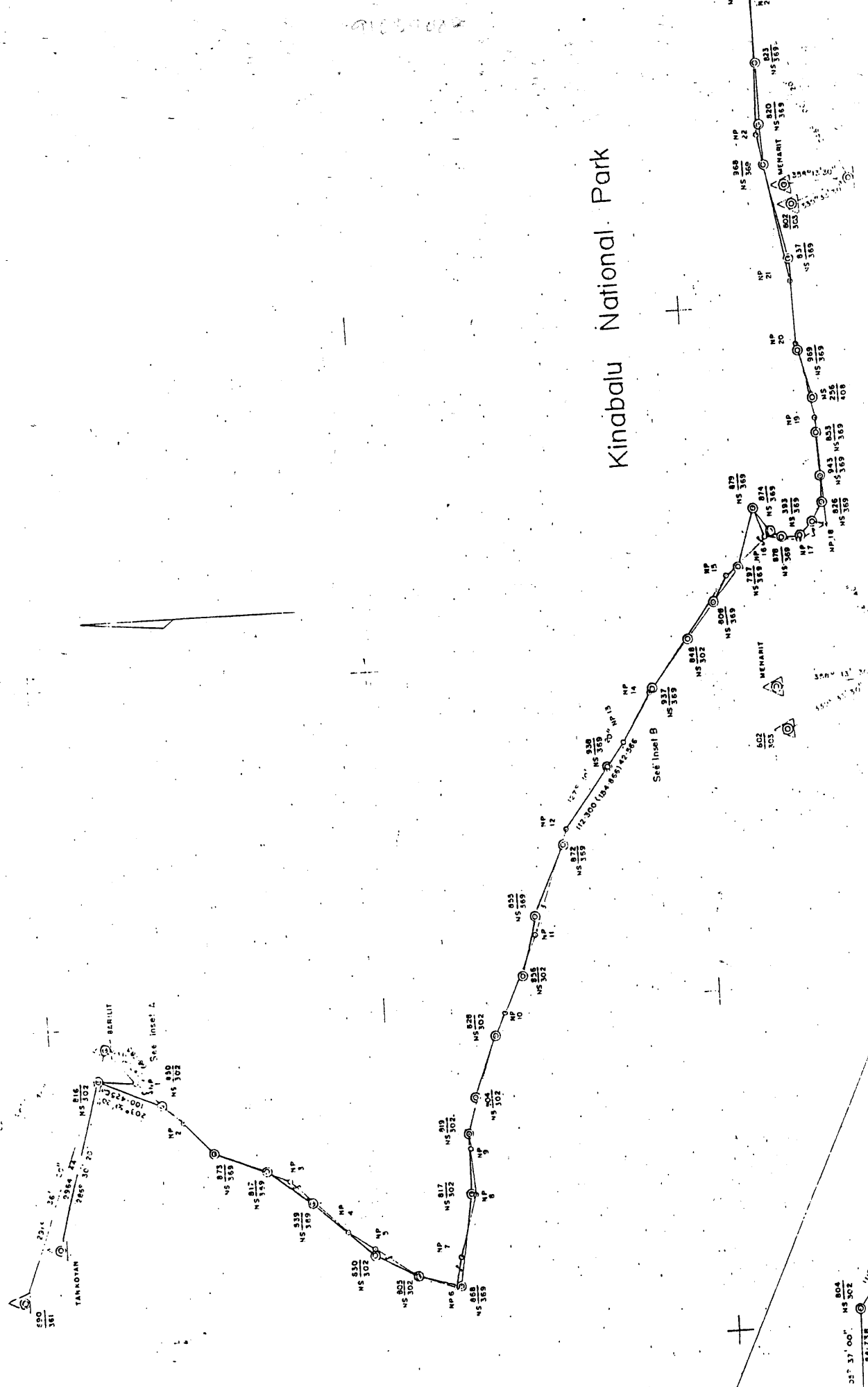




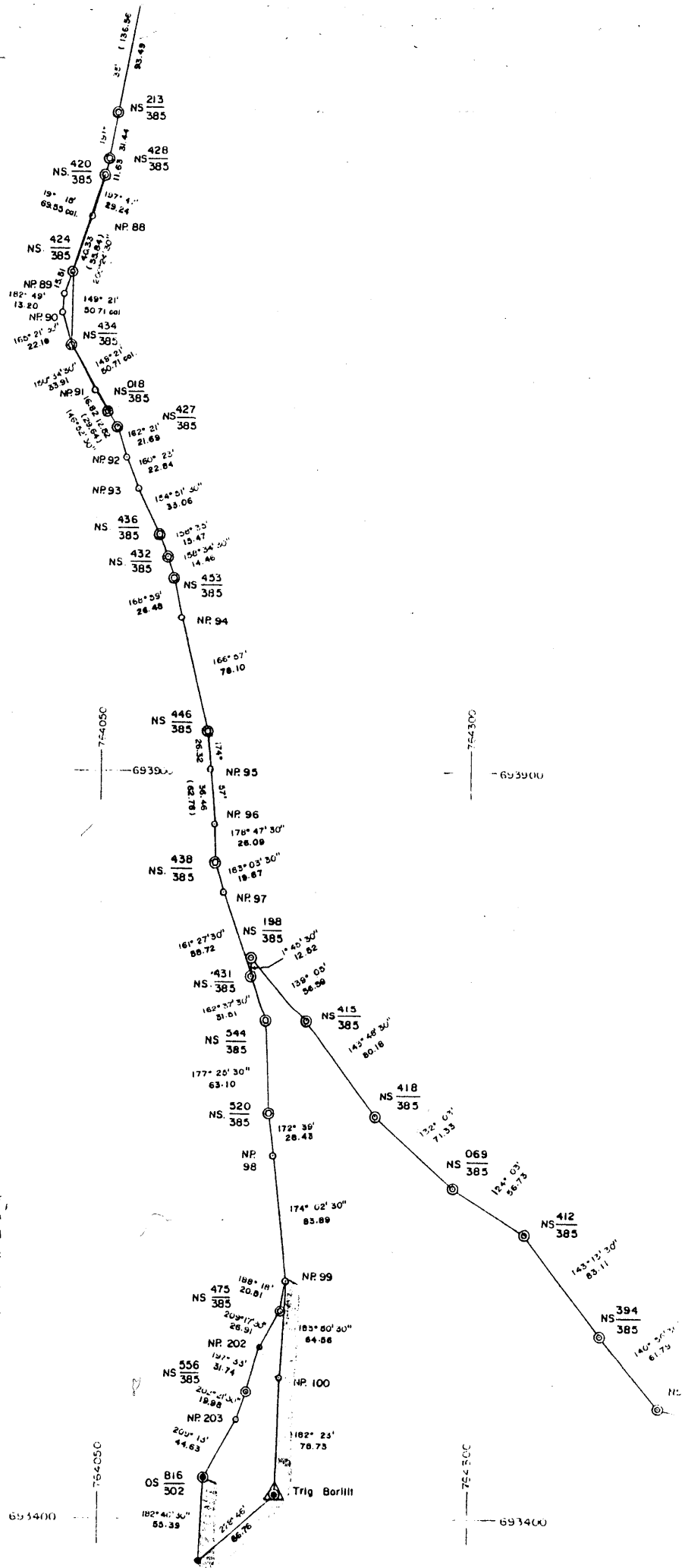
State Land.



# Kinabalu National Park

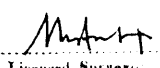


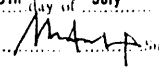
NS 304  
NS 302  
500  
1/100,000



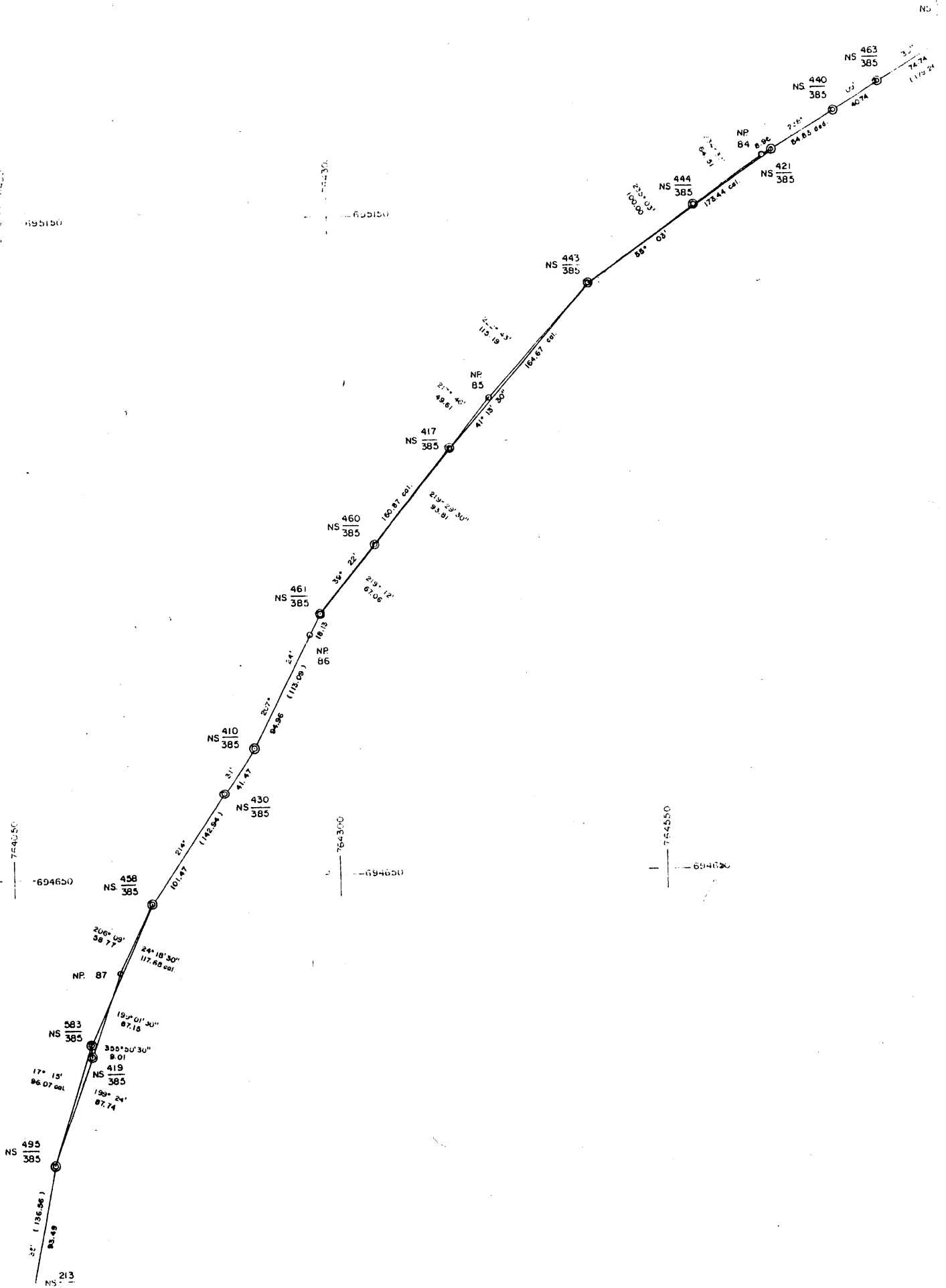
General Notes:  
 1. The bearings and distances are as shown on this plan.  
 2. The bearings are true bearings.  
 3. The distances are in feet and inches.  
 4. The area is in square feet.

I, **CHUNG HON CHEONG**, certify that the linear measurements made in the field and shown on this plan are true and correct as shown in the plan on that survey plan.

15/7/92  
 Date  
  
 Licensed Surveyor

I, **CHUNG HON CHEONG**, a surveyor licensed under the Surveyors' Ordinance, 1960, certify that the survey from which this plan has been prepared was carried out and marked on the ground by me or under my immediate personal direction and supervision in the field and in accordance with the Surveyors' Ordinance, 1960 (and its amendments) and that this plan contains the results of the survey completed on the 20th day of Feb. 1992.  
 Dated this 15th day of July 1992.  
  
 Surveyor

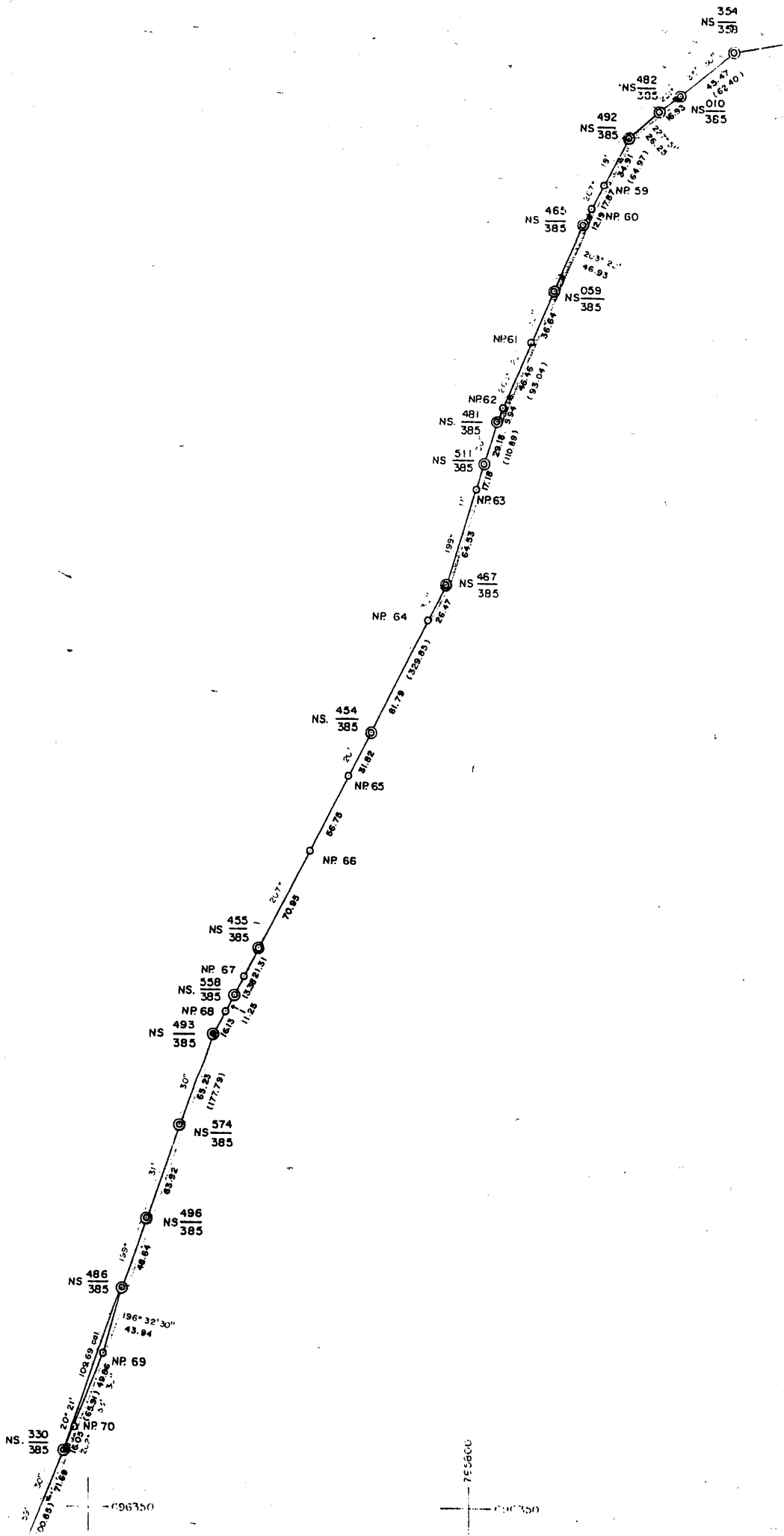
# STATE OF SABAH





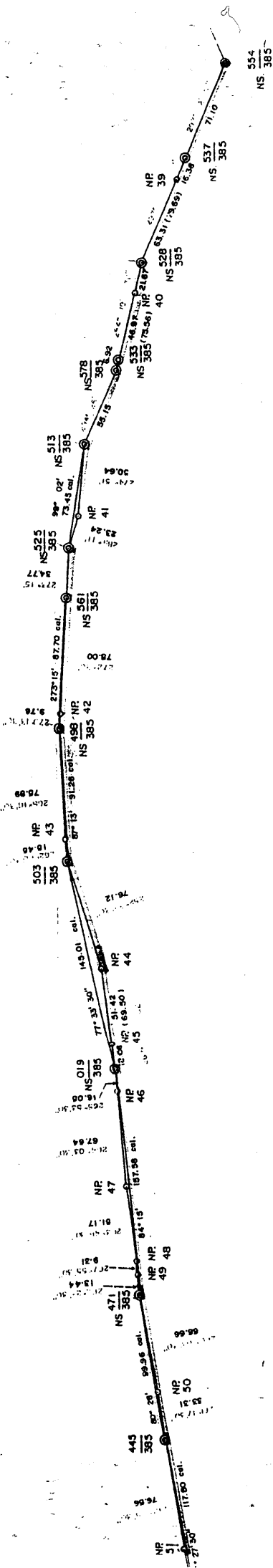






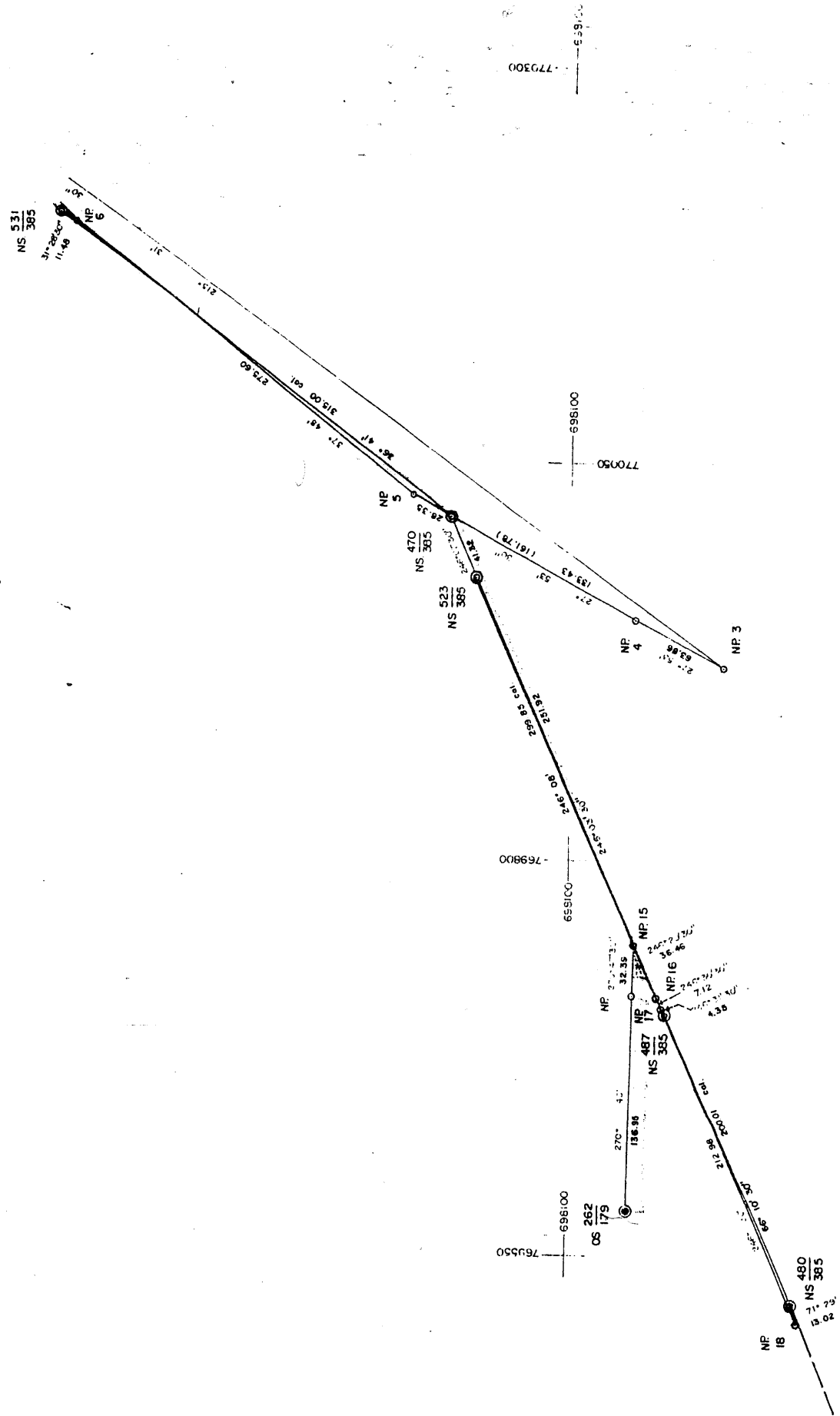
755600  
 096350



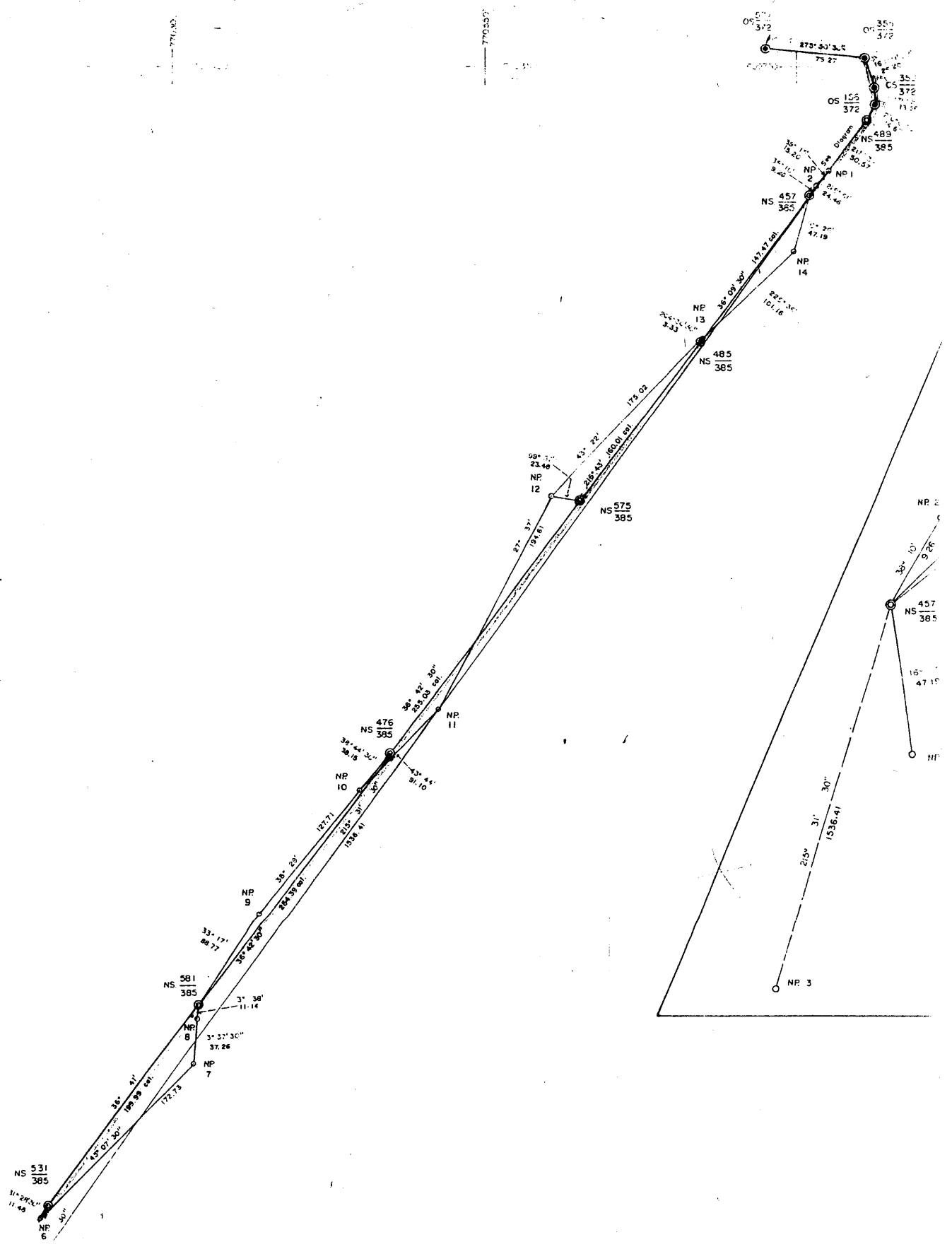


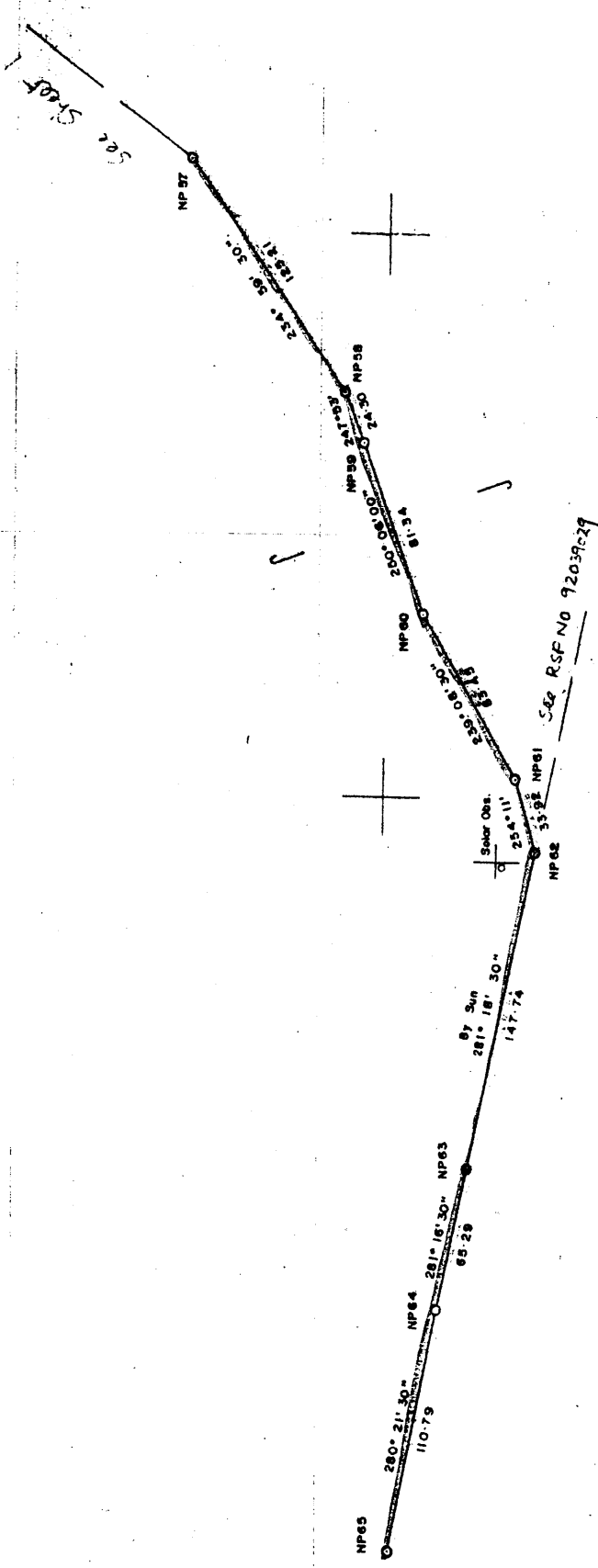




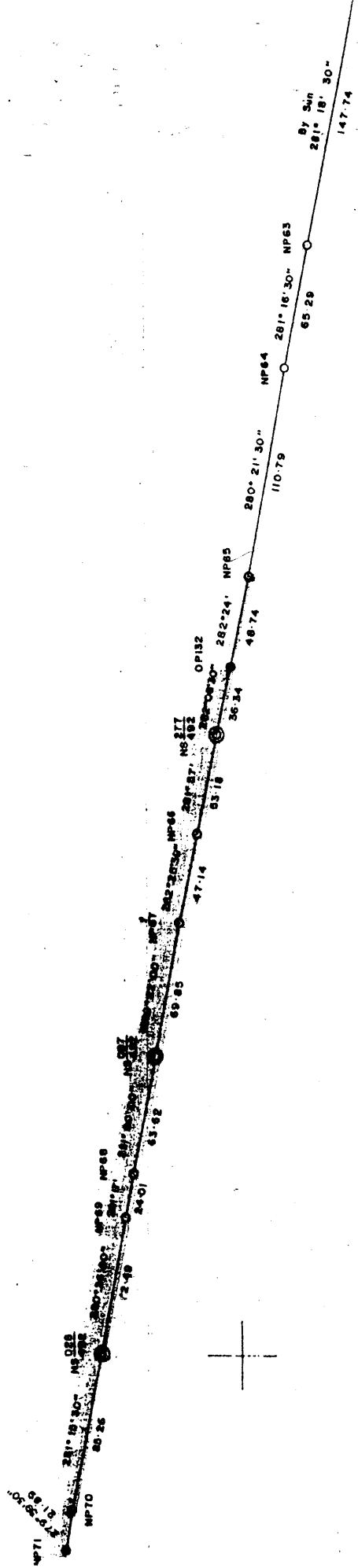








Sabah Parks





E.763600  
N.705100

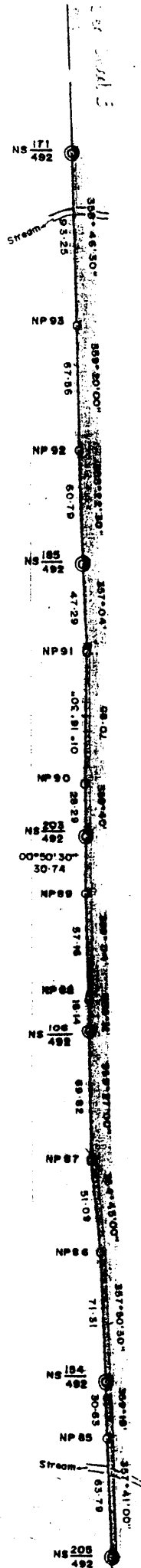
E.763850

E.764100

N.704850

N.704600

N.704350



Sabah Parks

State Land

1 metres to links  
links  
cres  
metre  
hectare

certify that the linear

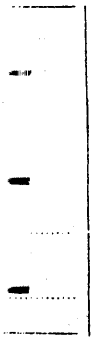
km

Linear  
for the  
shown in

Surveyor

I, the Surveyor,  
do hereby certify that the plan  
of the ground by  
and supervision in  
conduct of  
the plan correctly  
day of  
I undertake  
the survey  
1993....."

*[Signature]*  
Surveyor

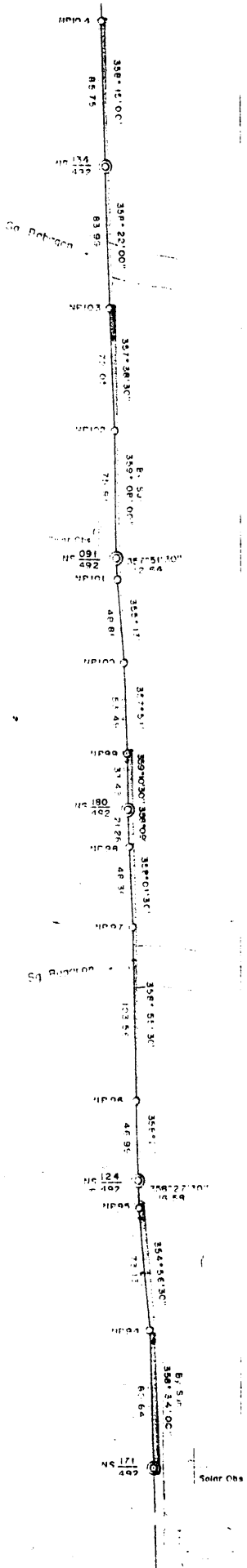


N 705 850

N 705 600

N 705 300

N 705 100



Survey

N 706600

N 706350

N 706100

State Land

N 705850

NS 216  
492

NP113

NP112

NS 230  
492

NP111

NP110

NS 293  
492

NP109

NP108

NS 179  
492

NP107

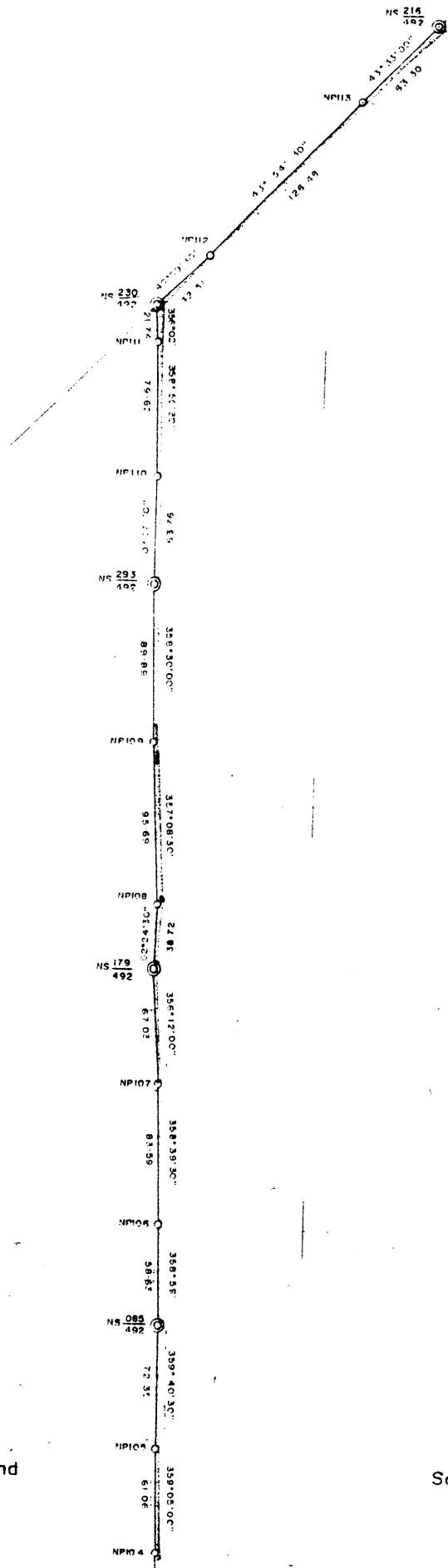
NP106

NS 085  
492

NP105

NP104

Sabah Parks



# STATE OF SABAH

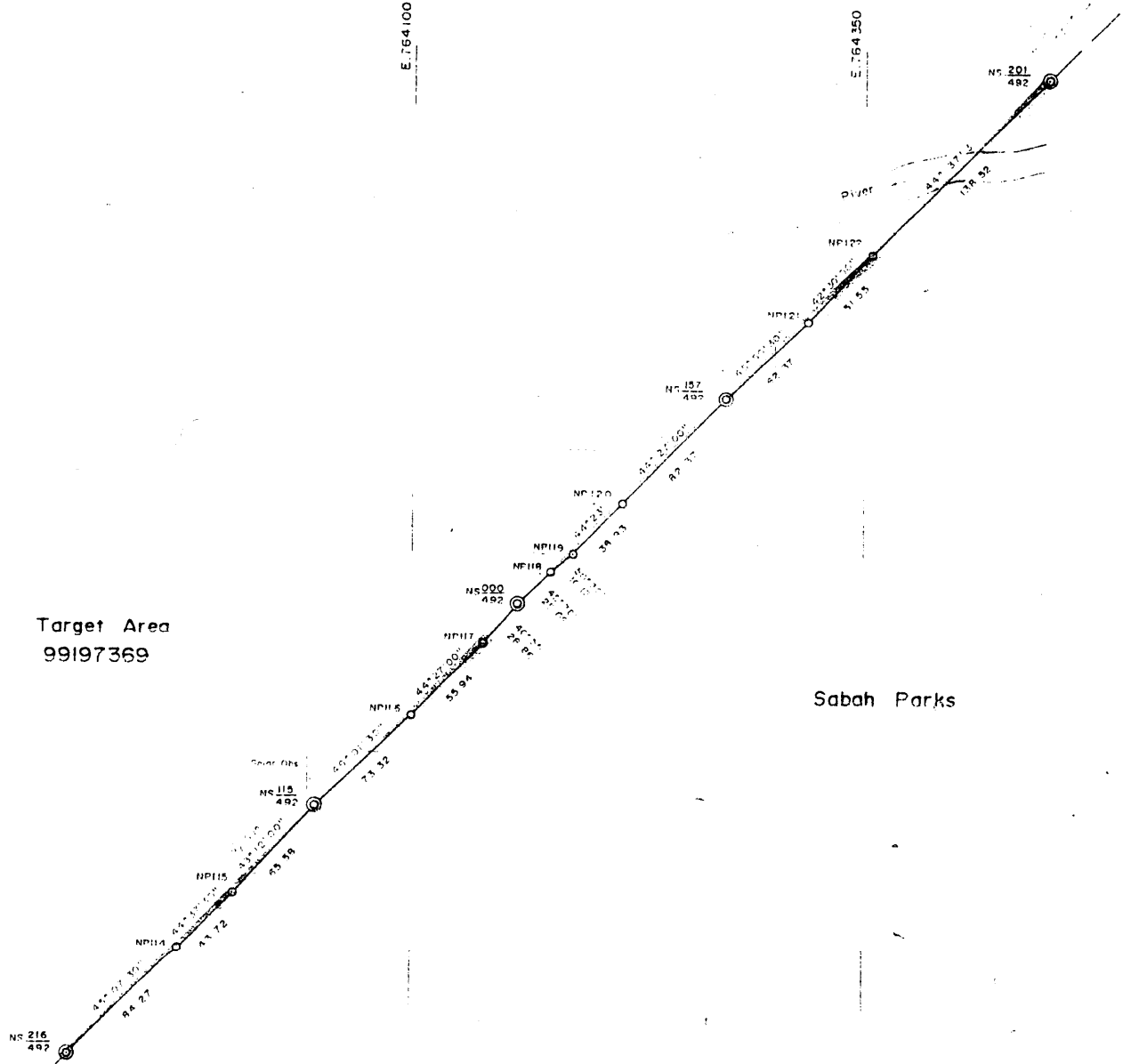
E. 761850

E. 764100

E. 764350

Target Area  
99197369

Sabah Parks





the linear  
for the  
and shown in

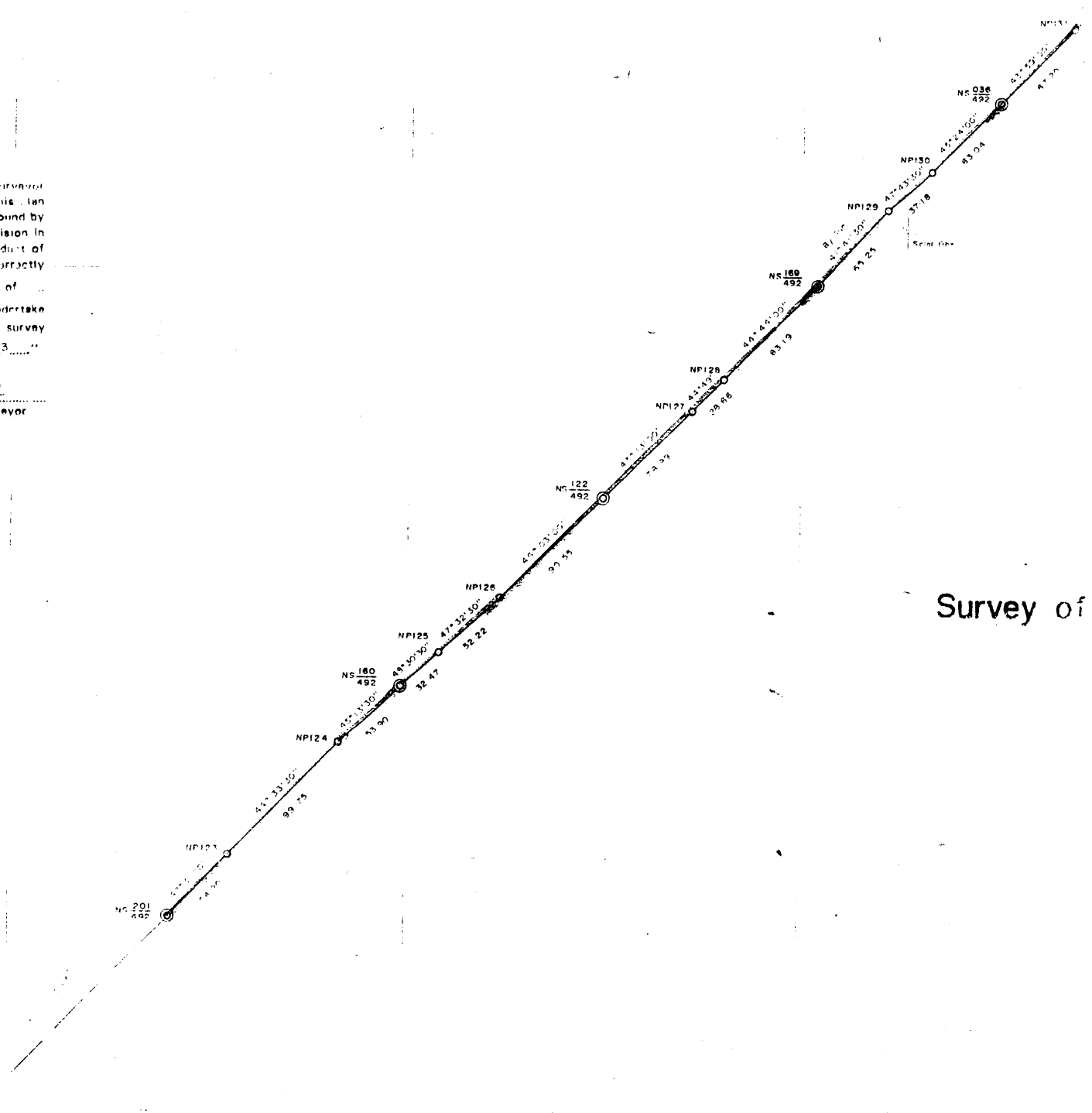
Target Area  
99197369

*[Signature]*  
Surveyor

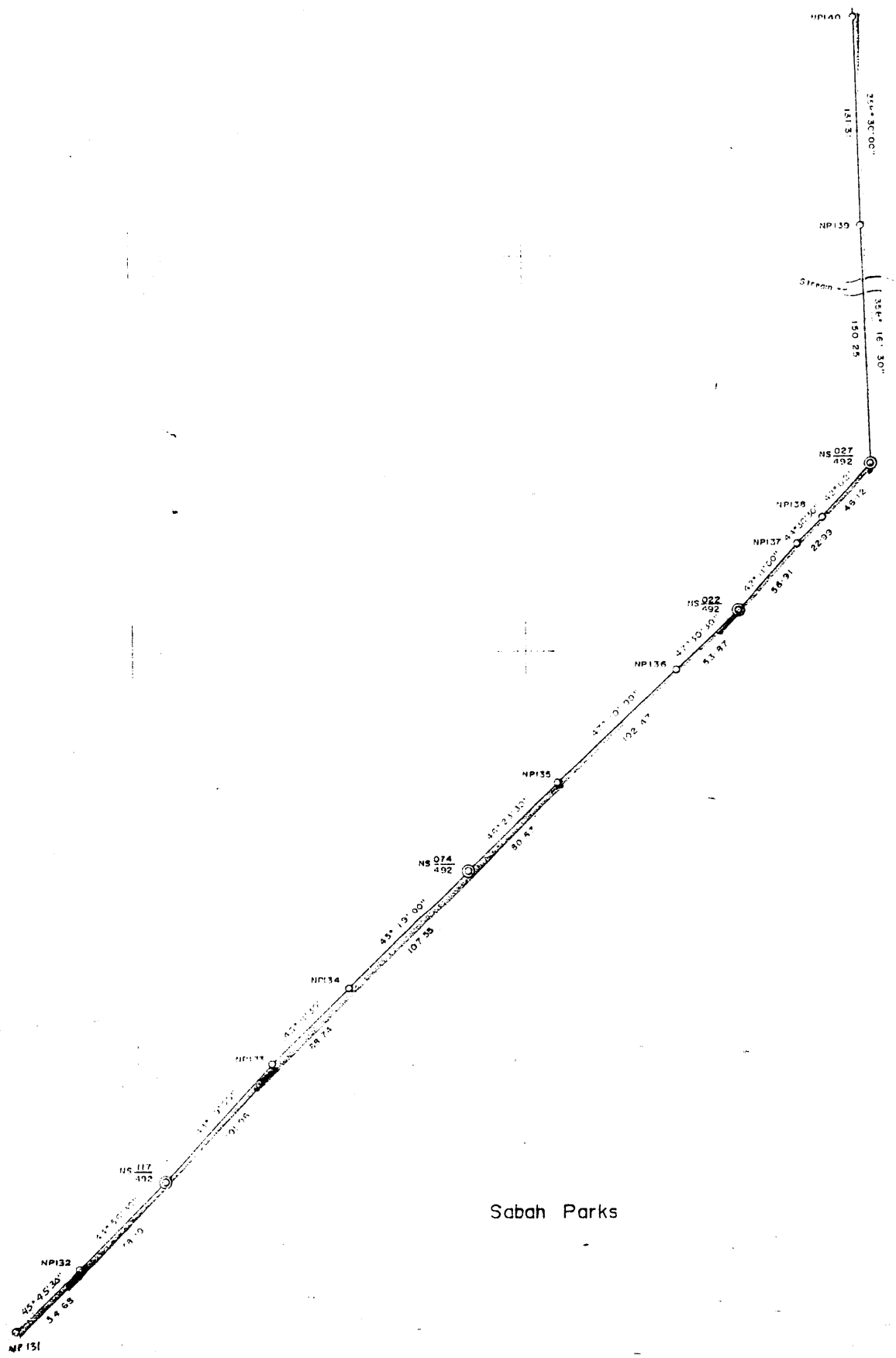
The Surveyor  
has checked this plan  
and on the ground by  
his supervision in  
the presence of the  
owner and has found  
it to be correct  
this 15th day of

I undertake  
to complete the survey  
on or before the 15th day of  
1993

*[Signature]*  
Surveyor



Survey of



N.708600

N.708350

N.708100

N.707850

Sabah Parks

E. 765 350

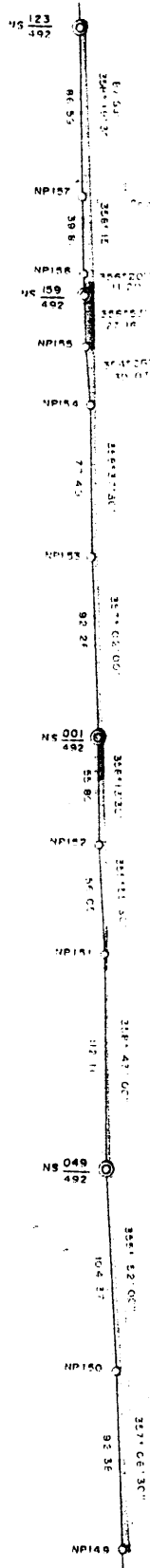
E. 765 600

N. 700 600

Target Area  
99197369

Sabah Parks





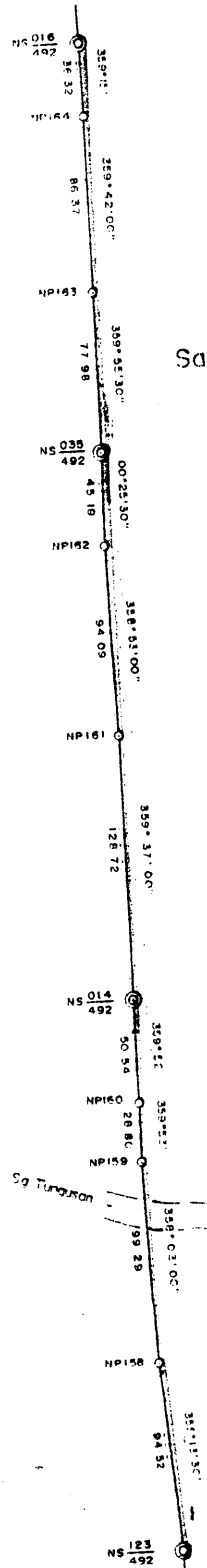
Survey of Se

038581 E

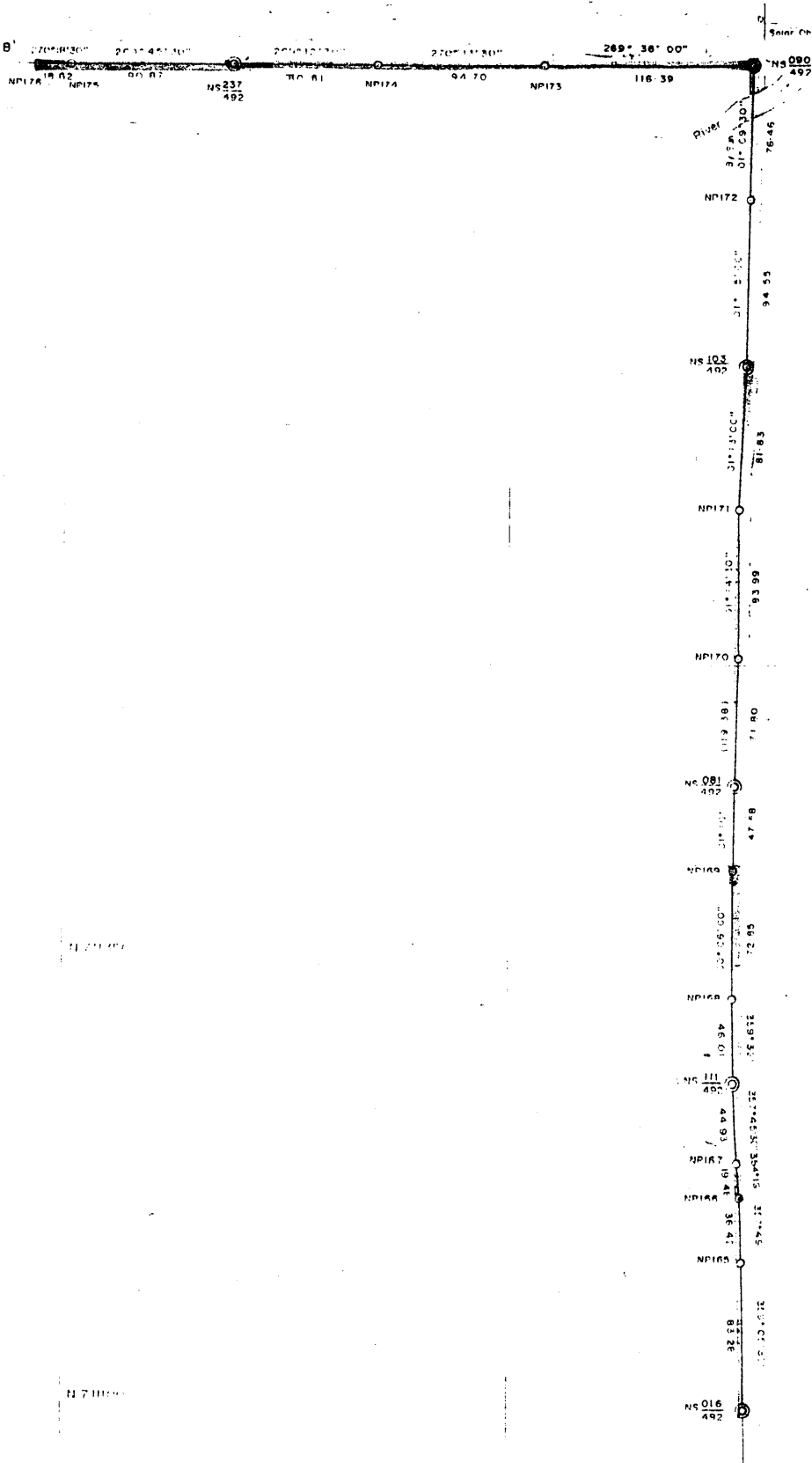
038581 E

Target Area  
99197369

Sabah Parks



SEE DIAGRAM 'B'



Target Area  
99197369

Sabah Dar



E 763000

E 764000

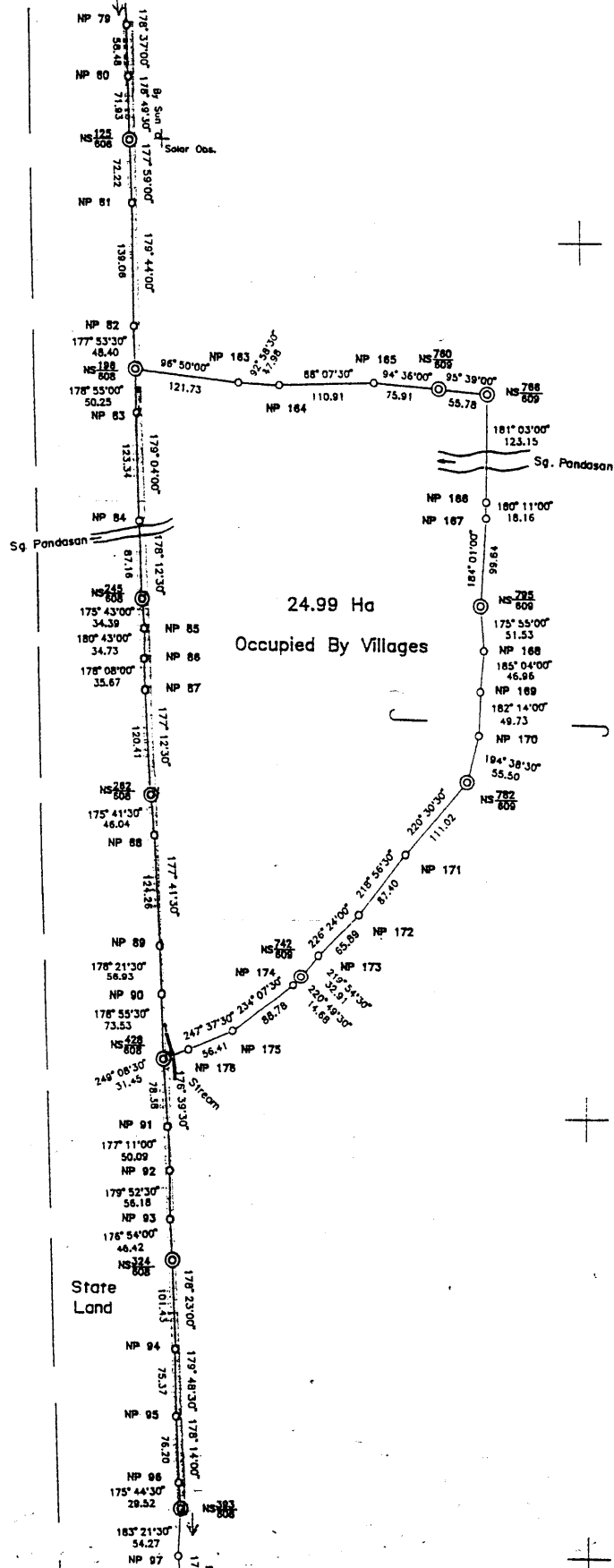
E 763500

1500

14000

13500

1000



87030660  
92039056



Kinabalu Park Reserve  
99197385

Surveyor  
in this plan  
ground by  
vision in  
conduct of  
correctly  
lay of.....  
undertake  
the survey  
1996  
Surveyor

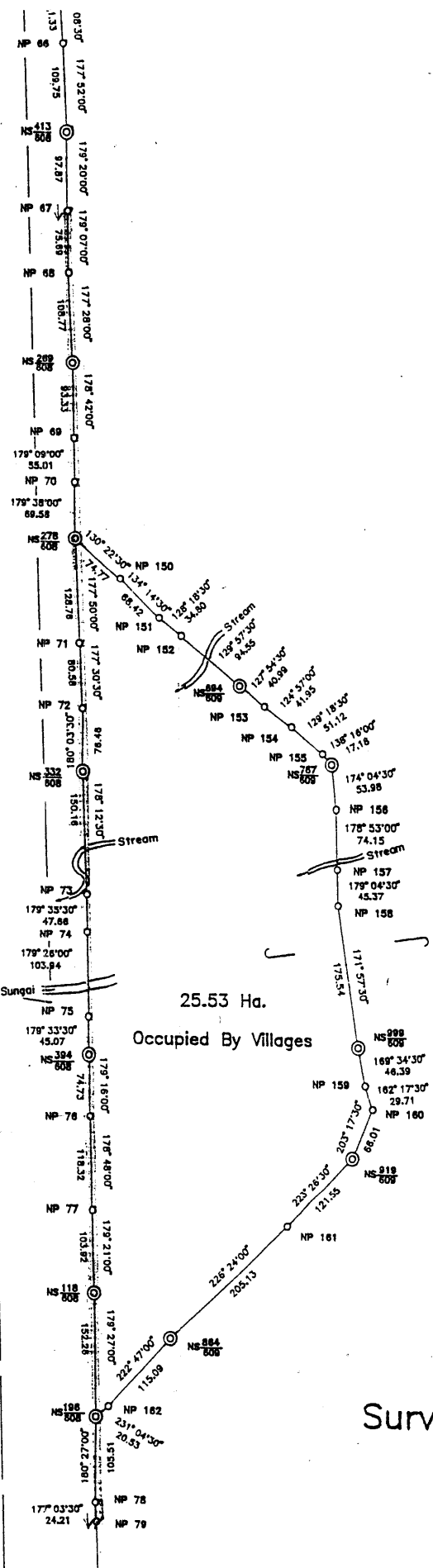
State Land

25.53 Ha.  
Occupied By Villages

87030660  
92039056

Survey Of Kinabalu Park B  
From Point X - I  
Kota Belud District

Scale 1 : 5,000



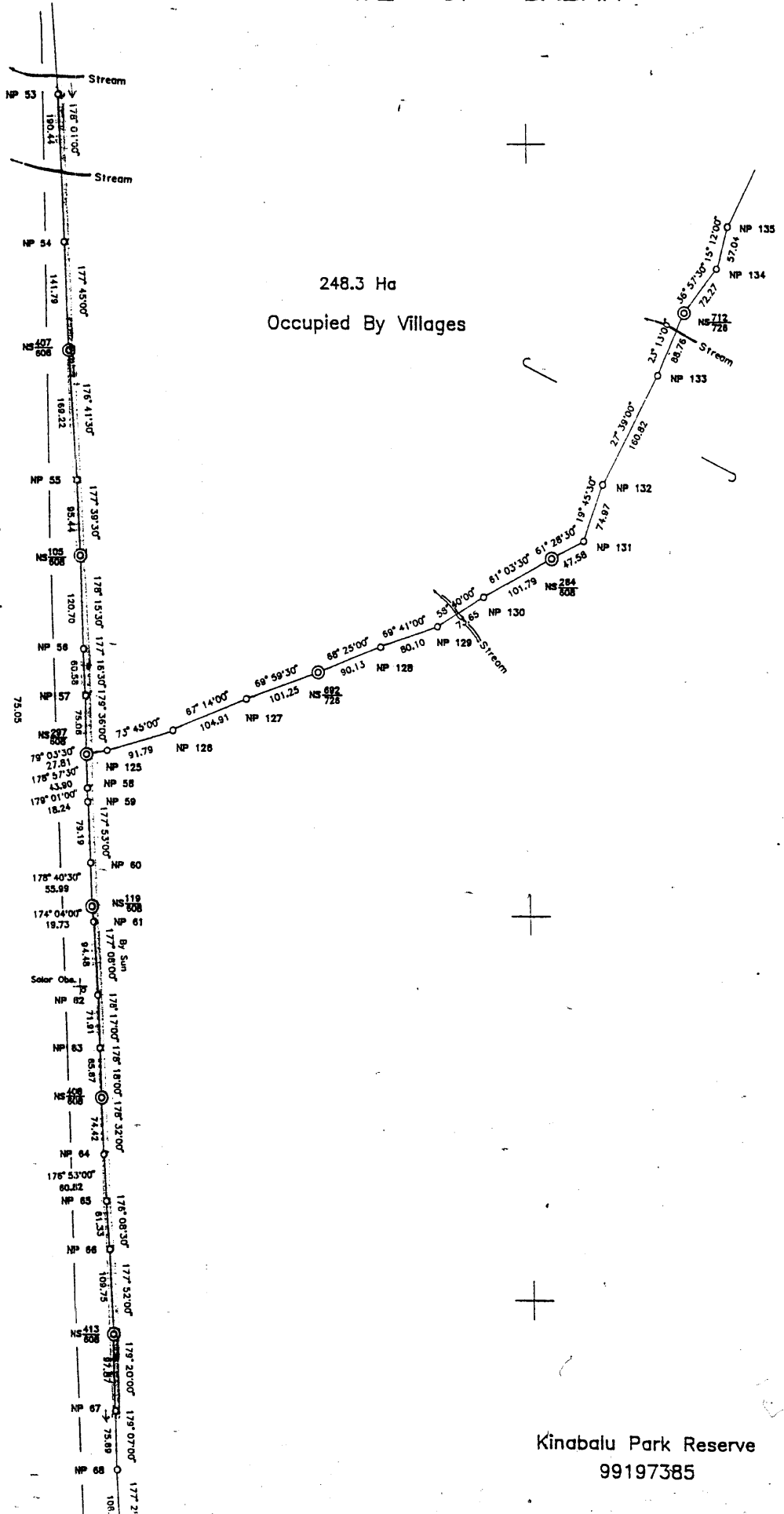
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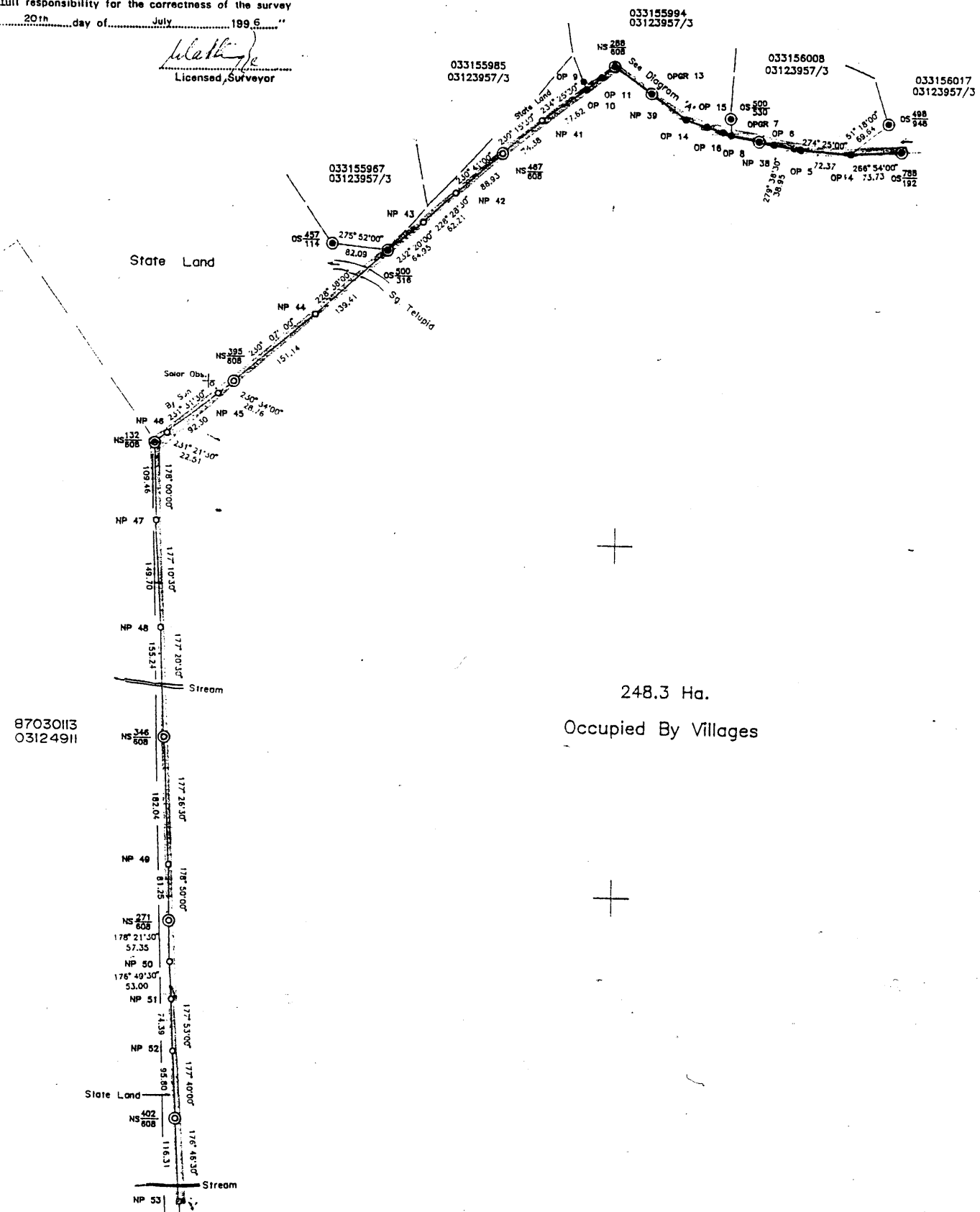


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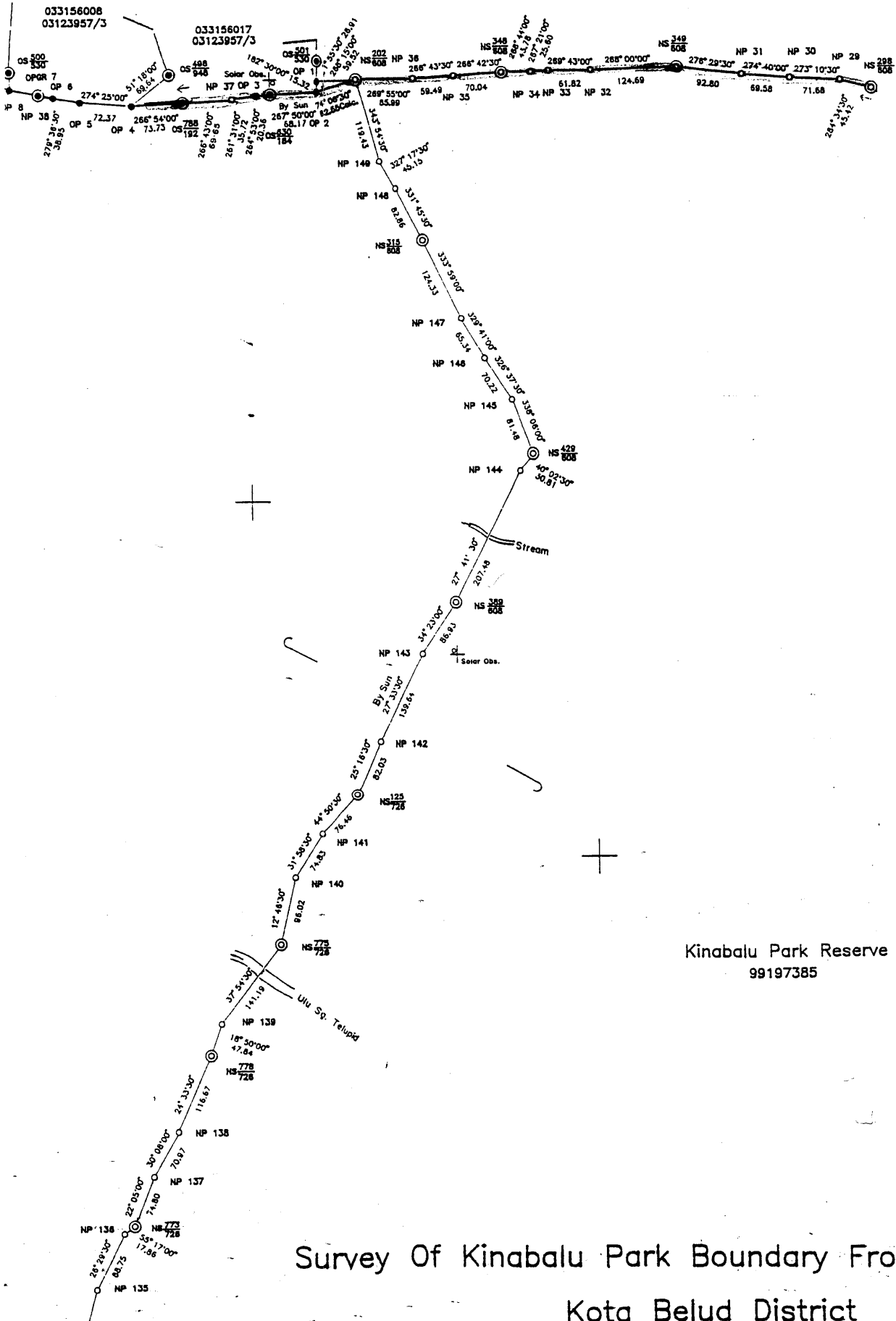
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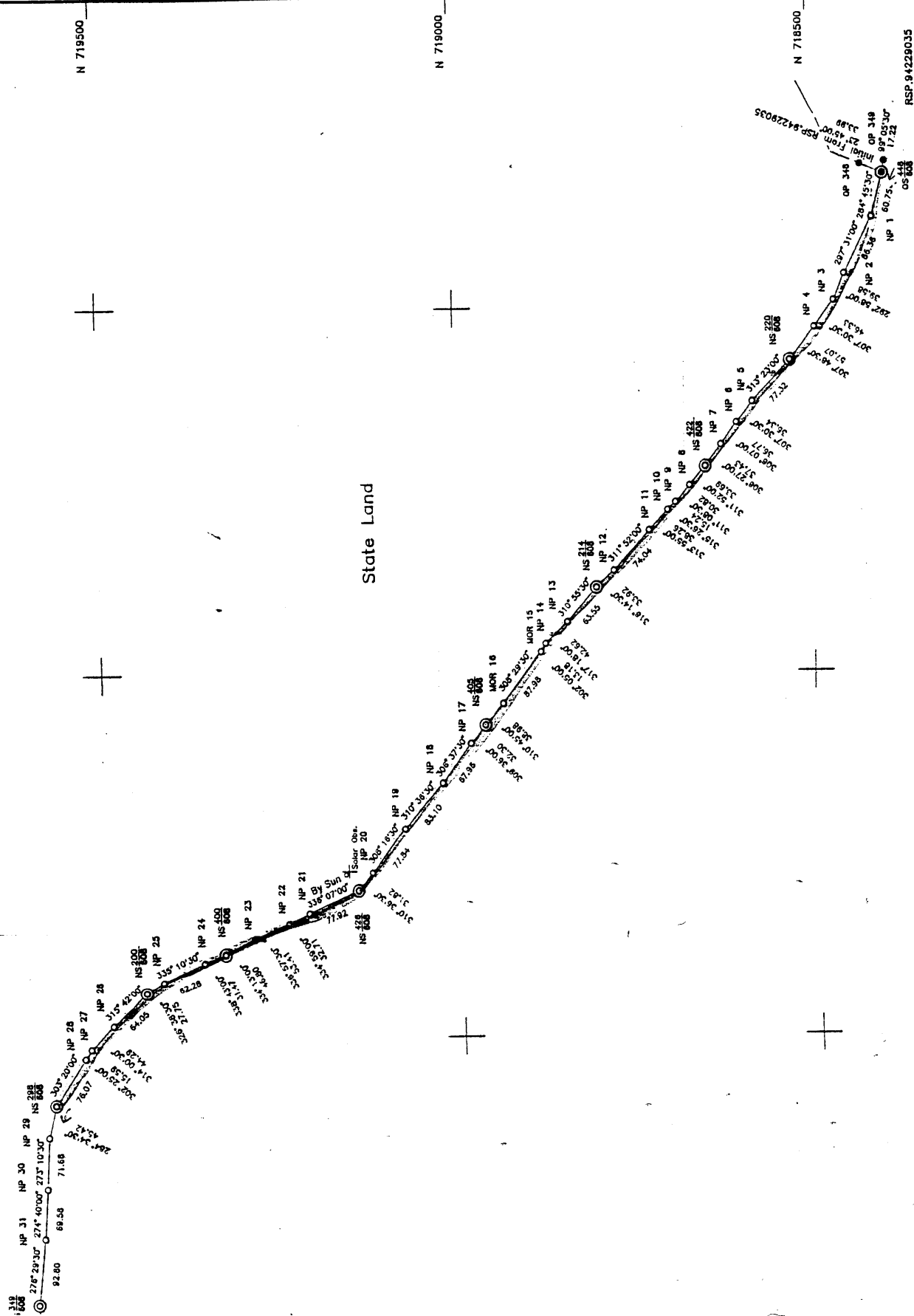
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*King Tze*  
 Licensed Surveyor



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 Bearings & Co-ordinates  
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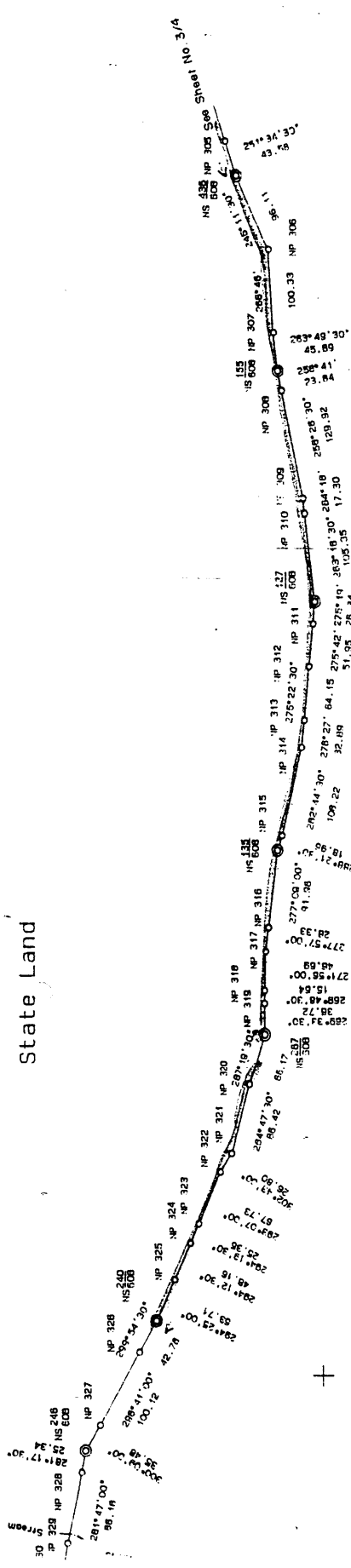




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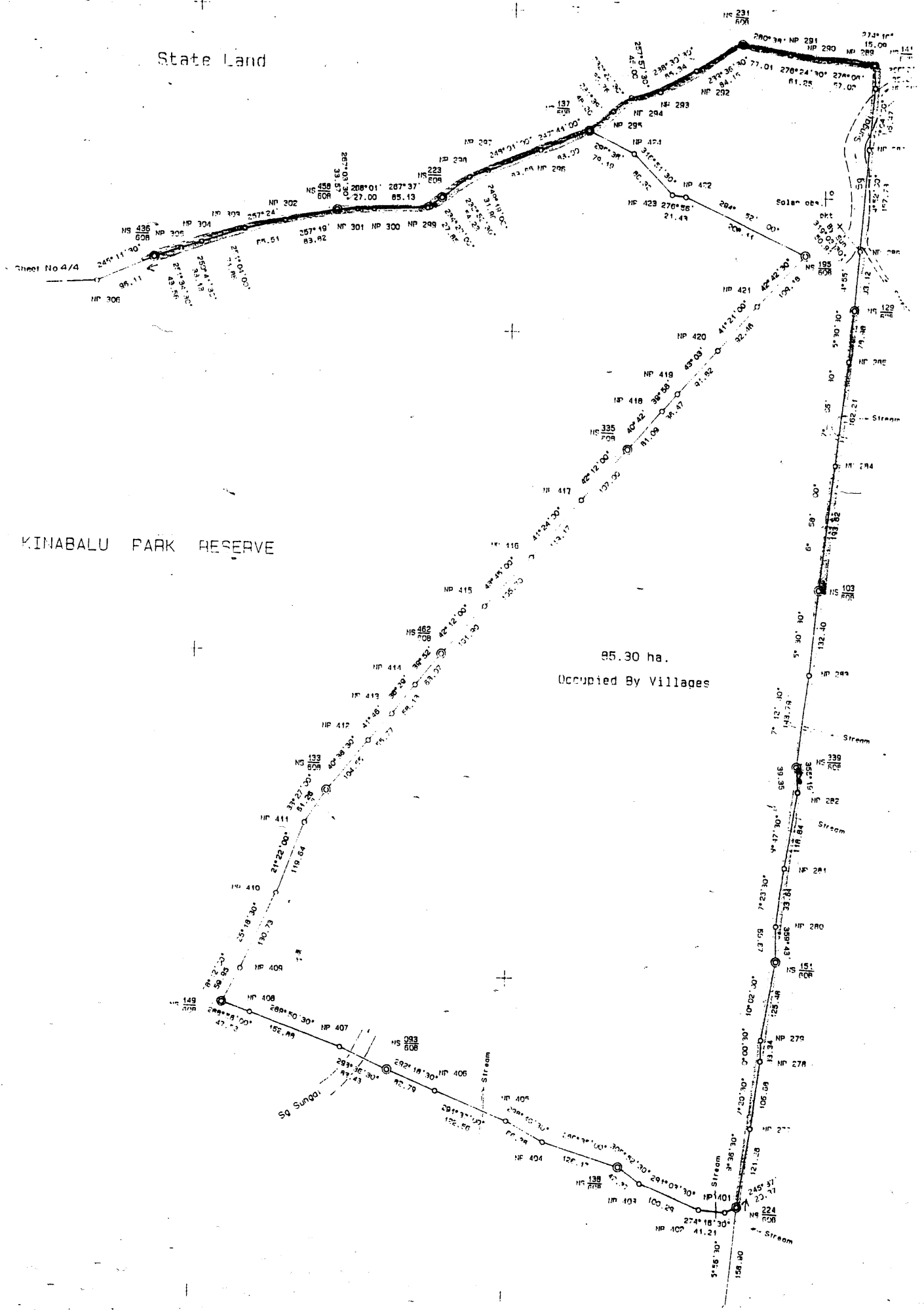
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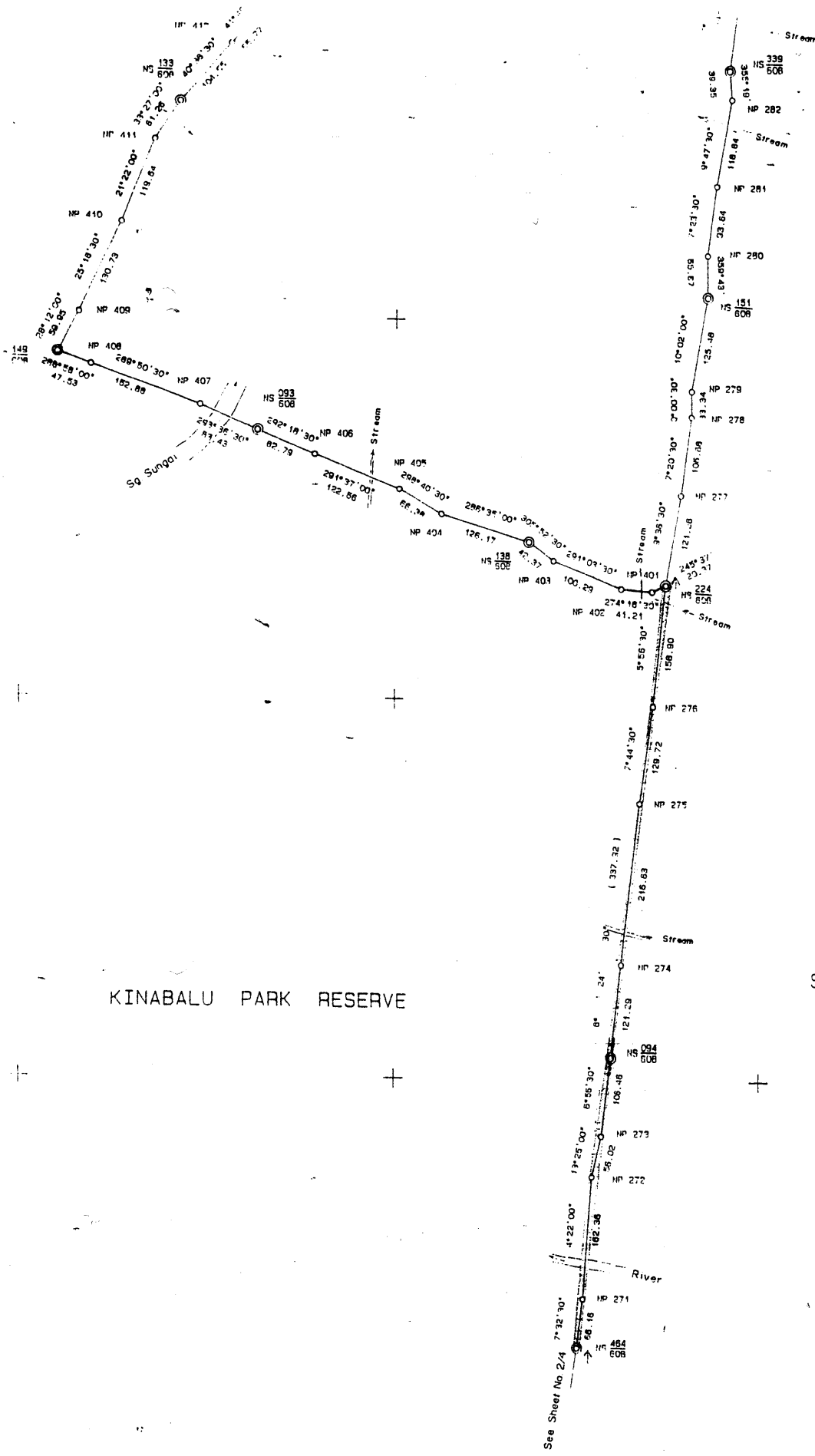
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KINABALU PARK RESERVE

95.30 ha.  
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KINABALU PARK RESERVE

State Land

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See Sheet No 2/4

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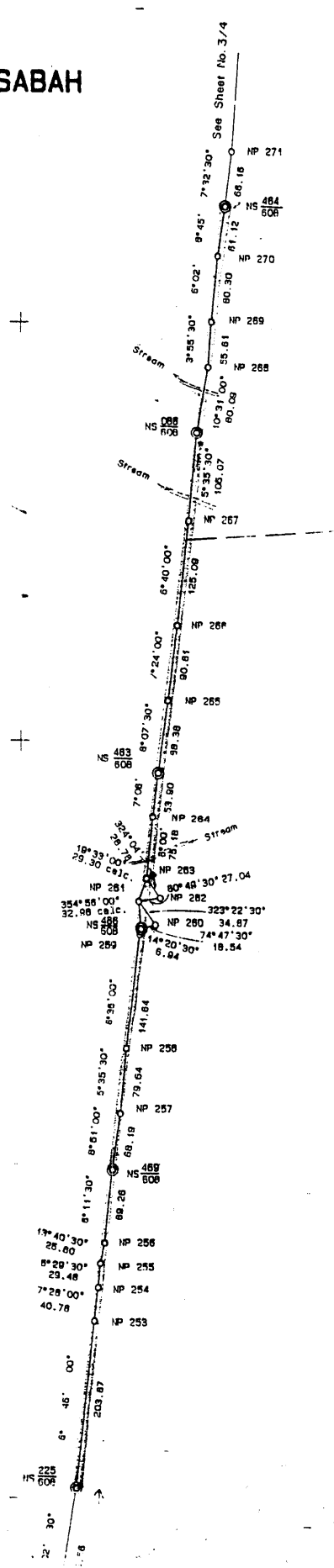
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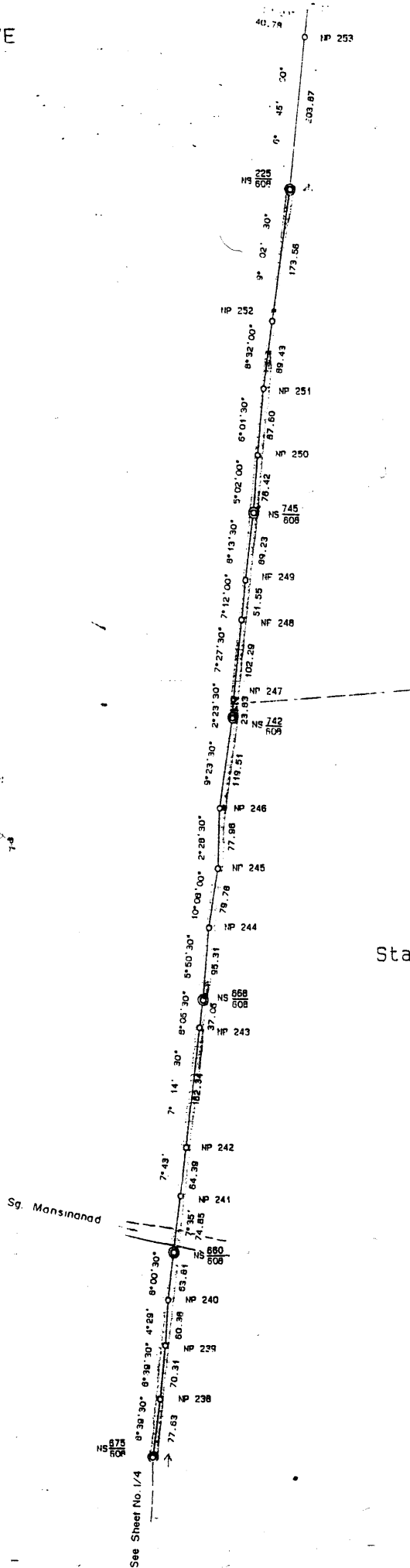
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PARK RESERVE

Hutan Rizab Lagaroh  
G. N. 701.63



State Land

Survey of Kinabalu Park  
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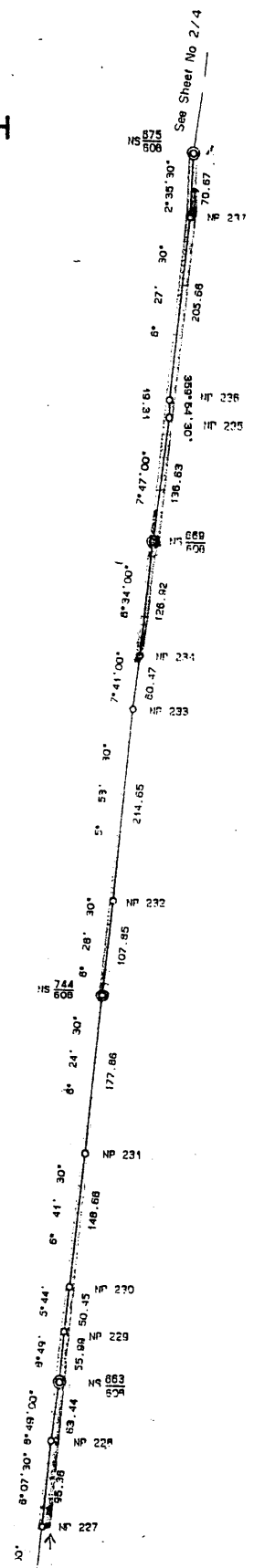
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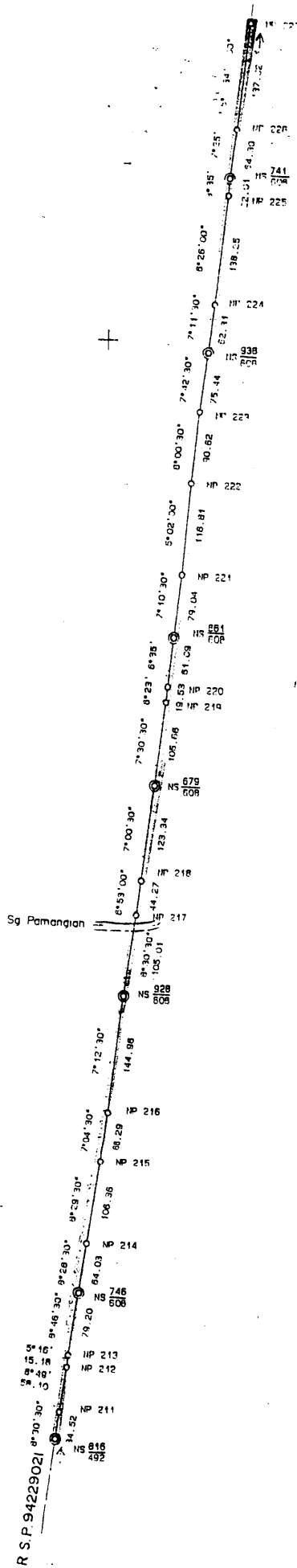
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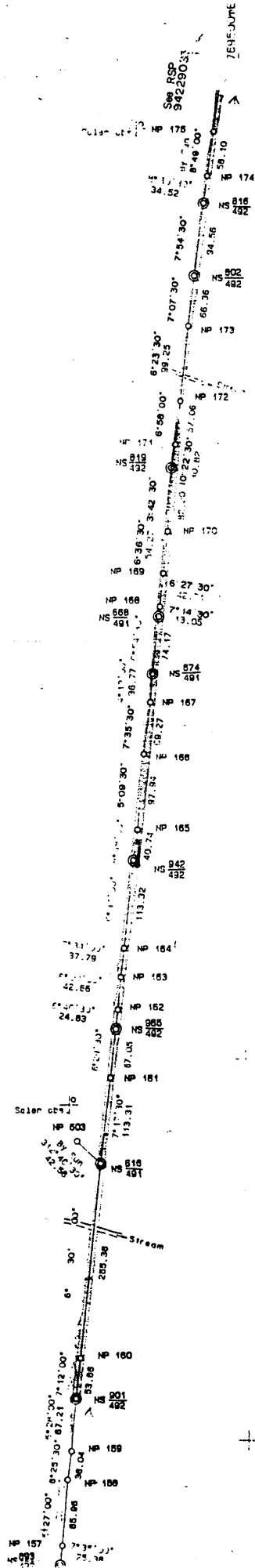
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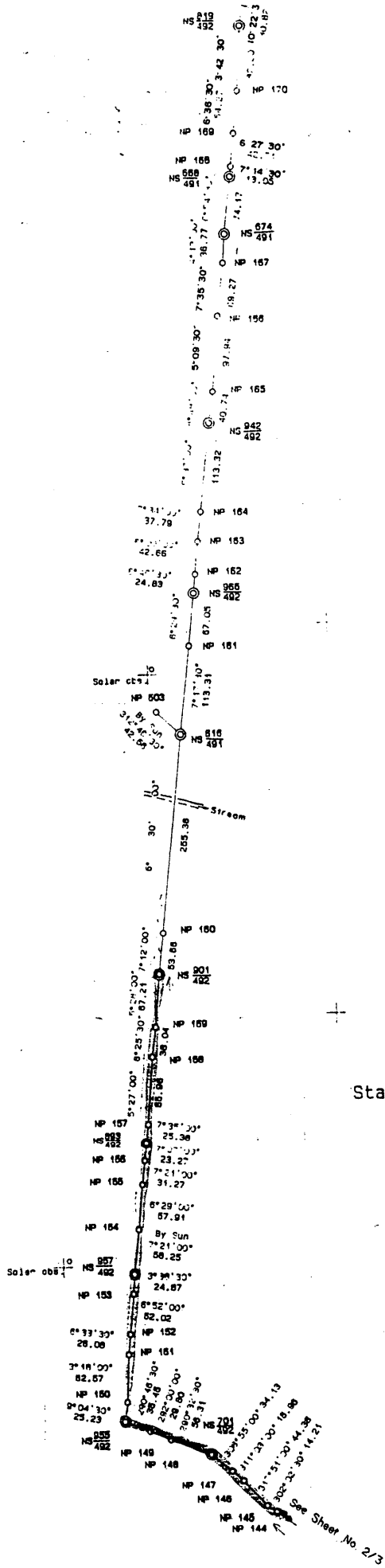
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KINABALU PARK RESERVE  
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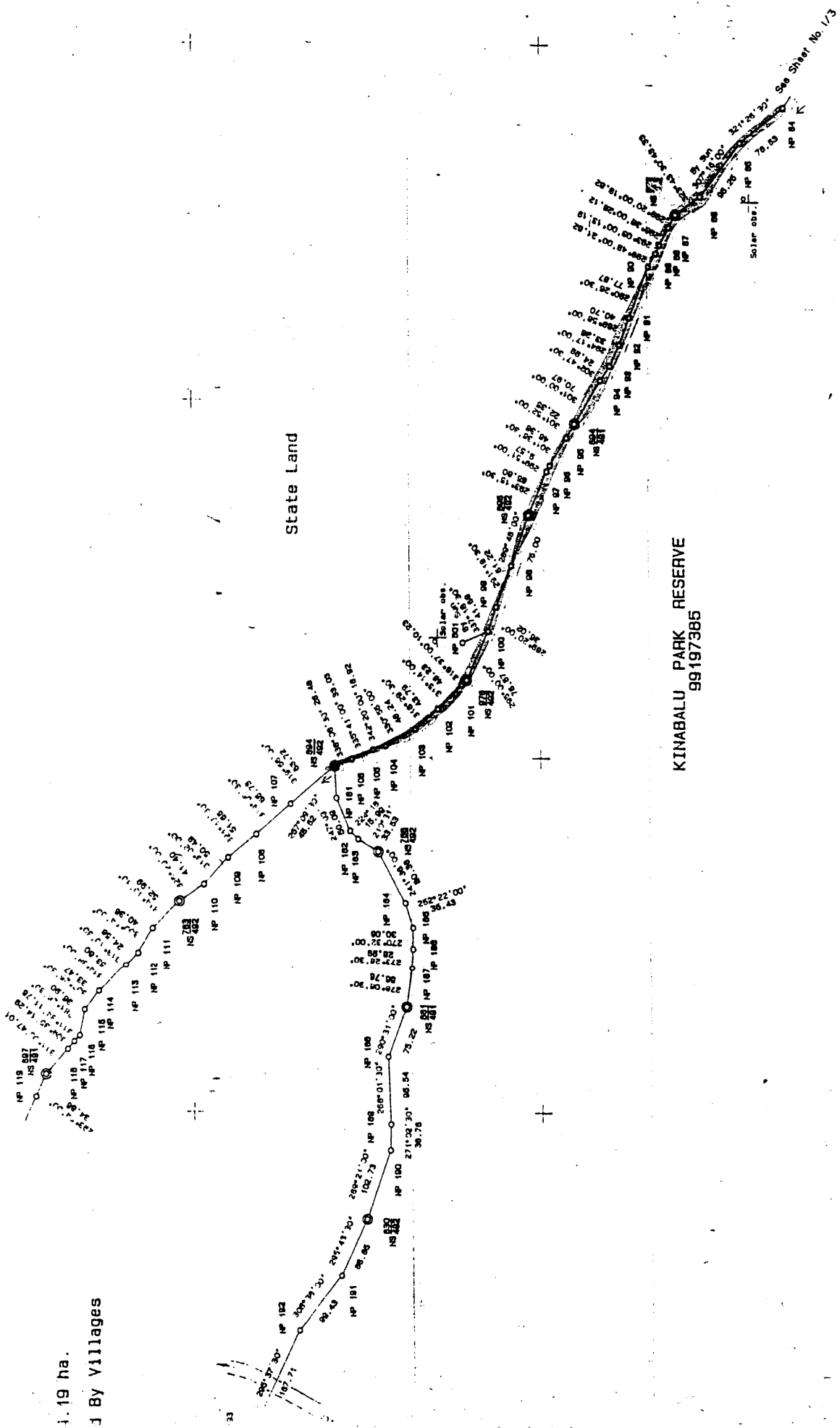
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1.19 ha.

By Villages



KINABALU PARK RESERVE  
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Approved

Director of Lands

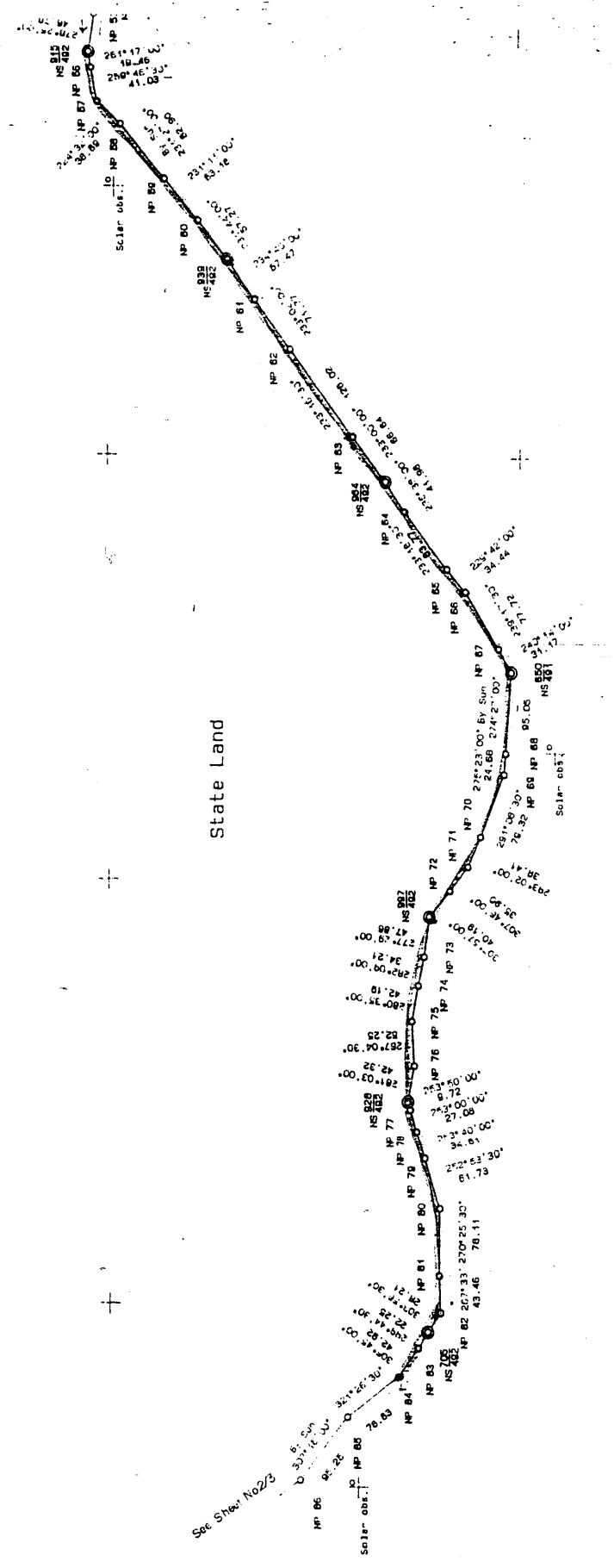
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KINABALU PARK RESERVE  
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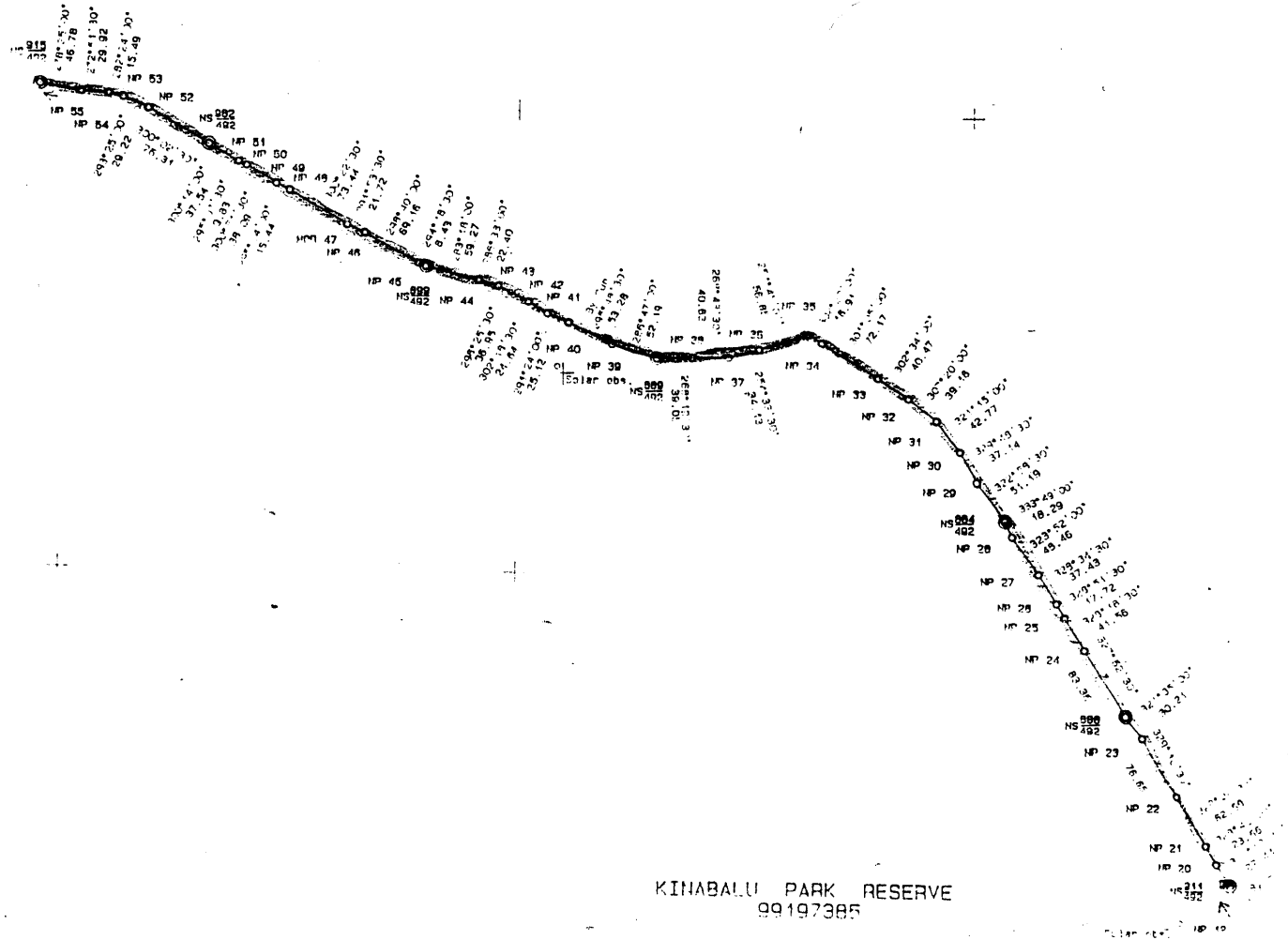
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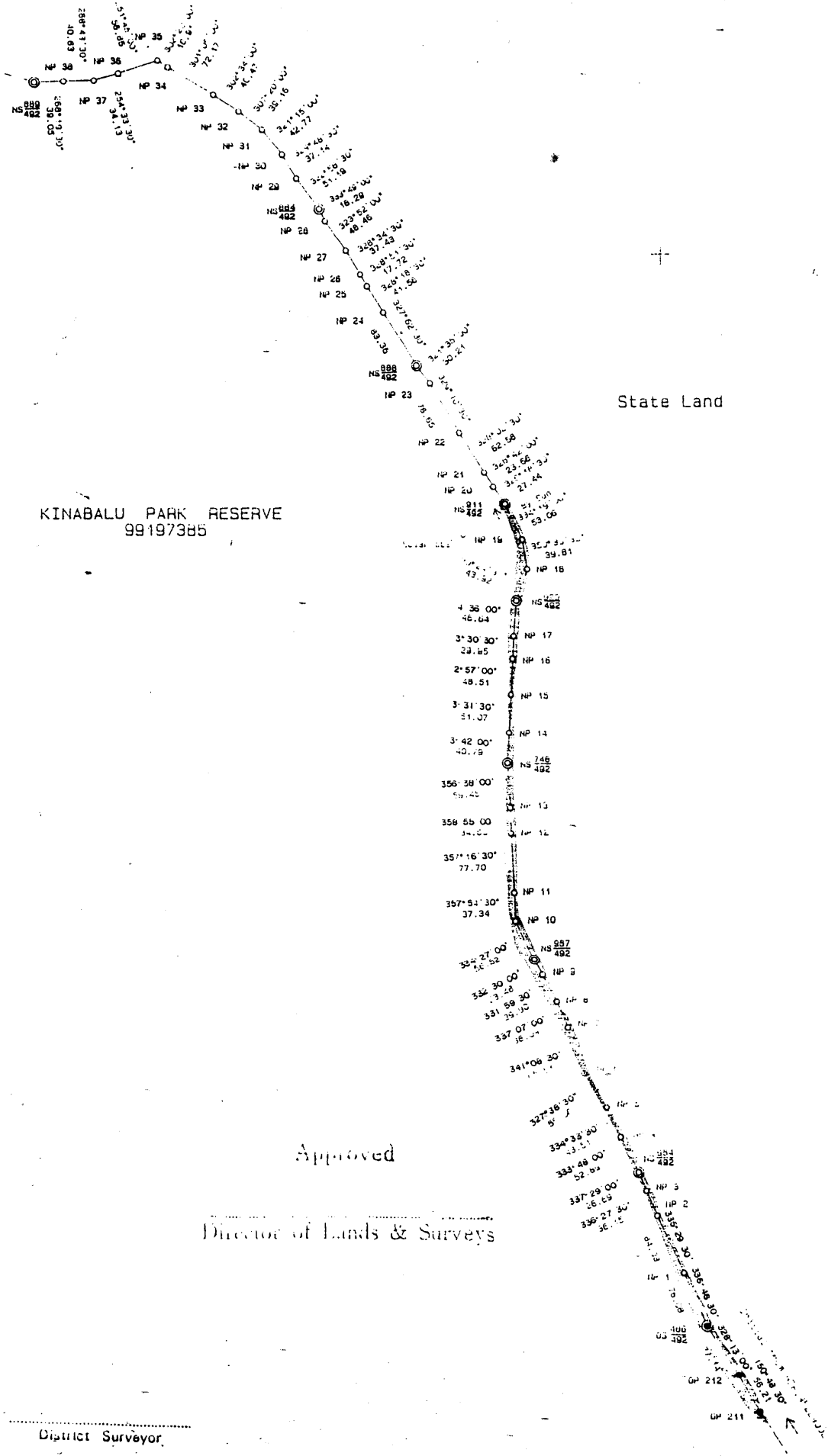
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KINABALU PARK RESERVE  
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KINABALU PARK RESERVE  
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Approved

Director of Lands & Surveys

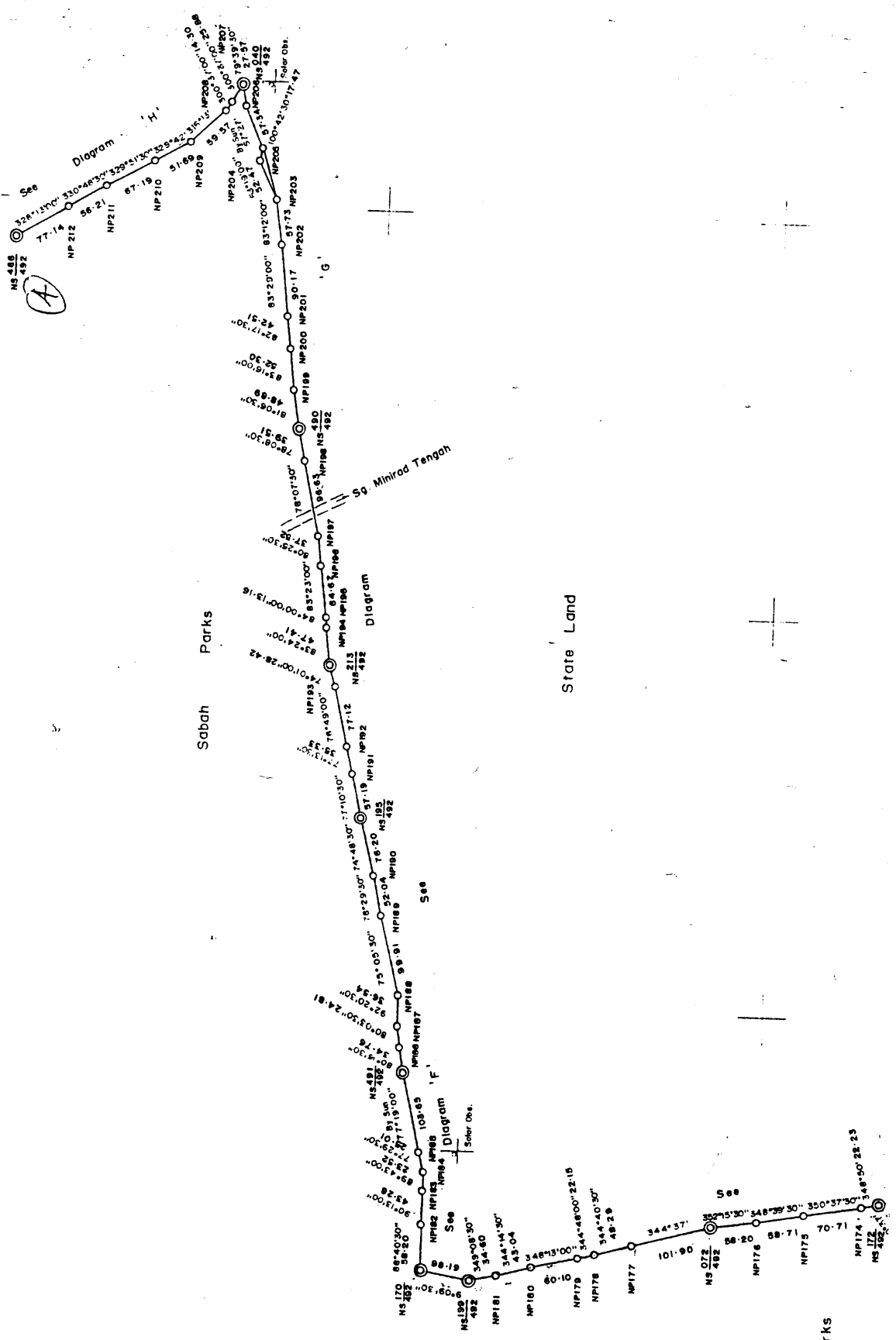
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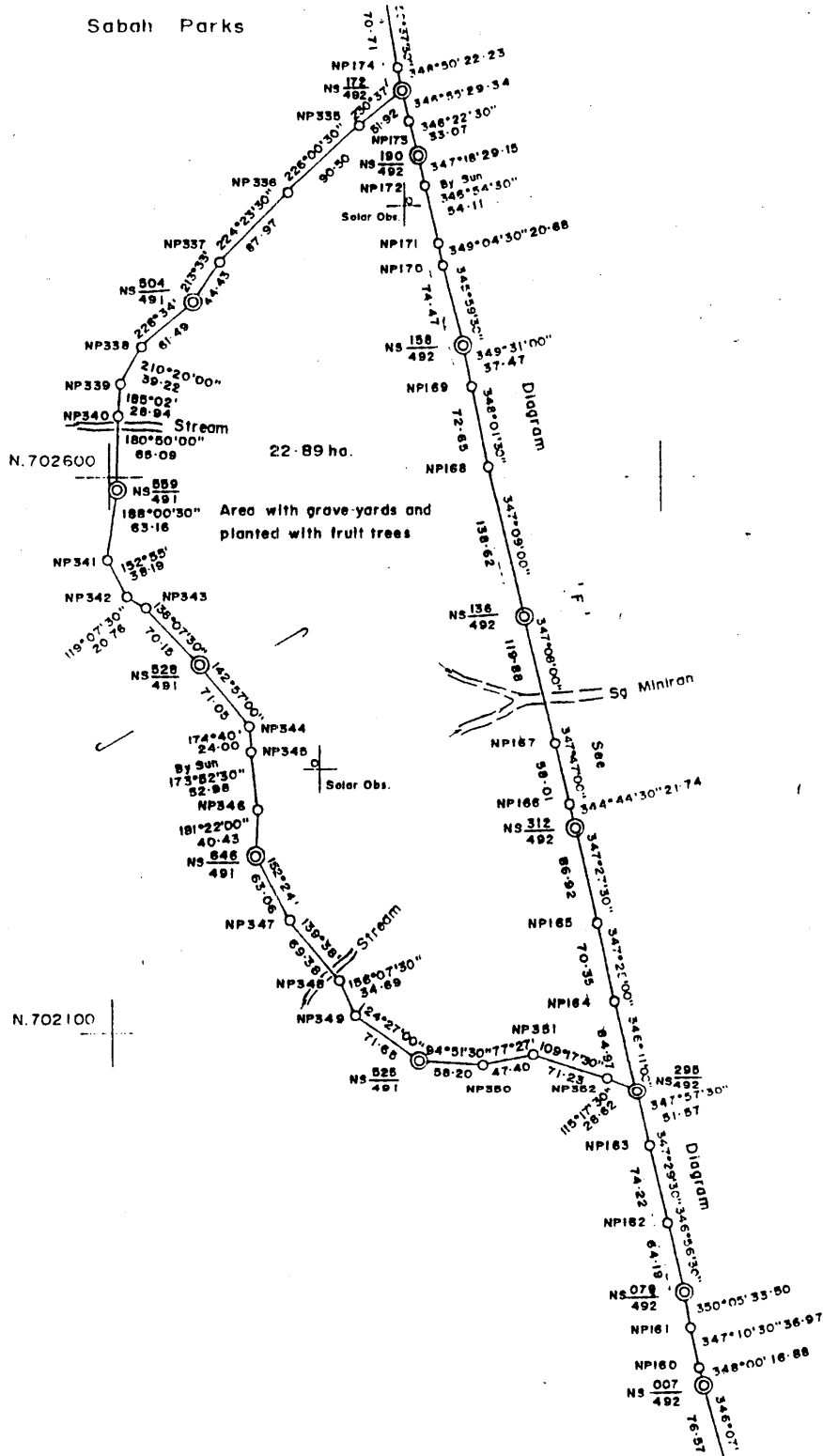
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Sabah Parks

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Sabah Parks



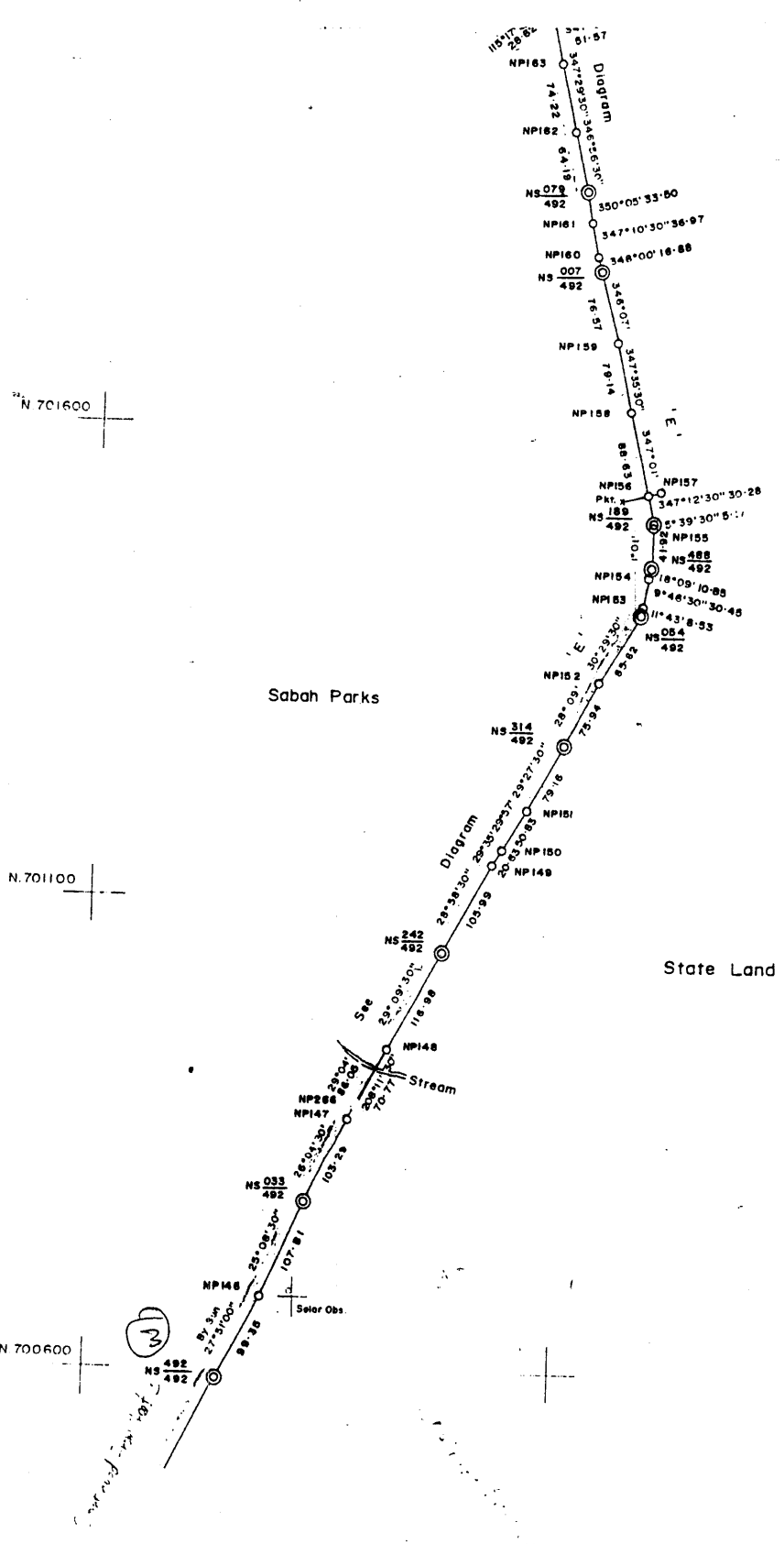
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*W. Lebling*  
Licensed Surveyor

Surveyor Licensed under the Surveyors  
Act 1962, I certify that this plan  
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original and marked on the ground by  
me in my personal direction and supervision in  
conformance with the Surveyors (Conduct of  
Business) Act 1962, and that this plan correctly  
represents the survey conducted on the 29th day of

April 1985.

*W. Lebling*  
Licensed Surveyor



Coordinates

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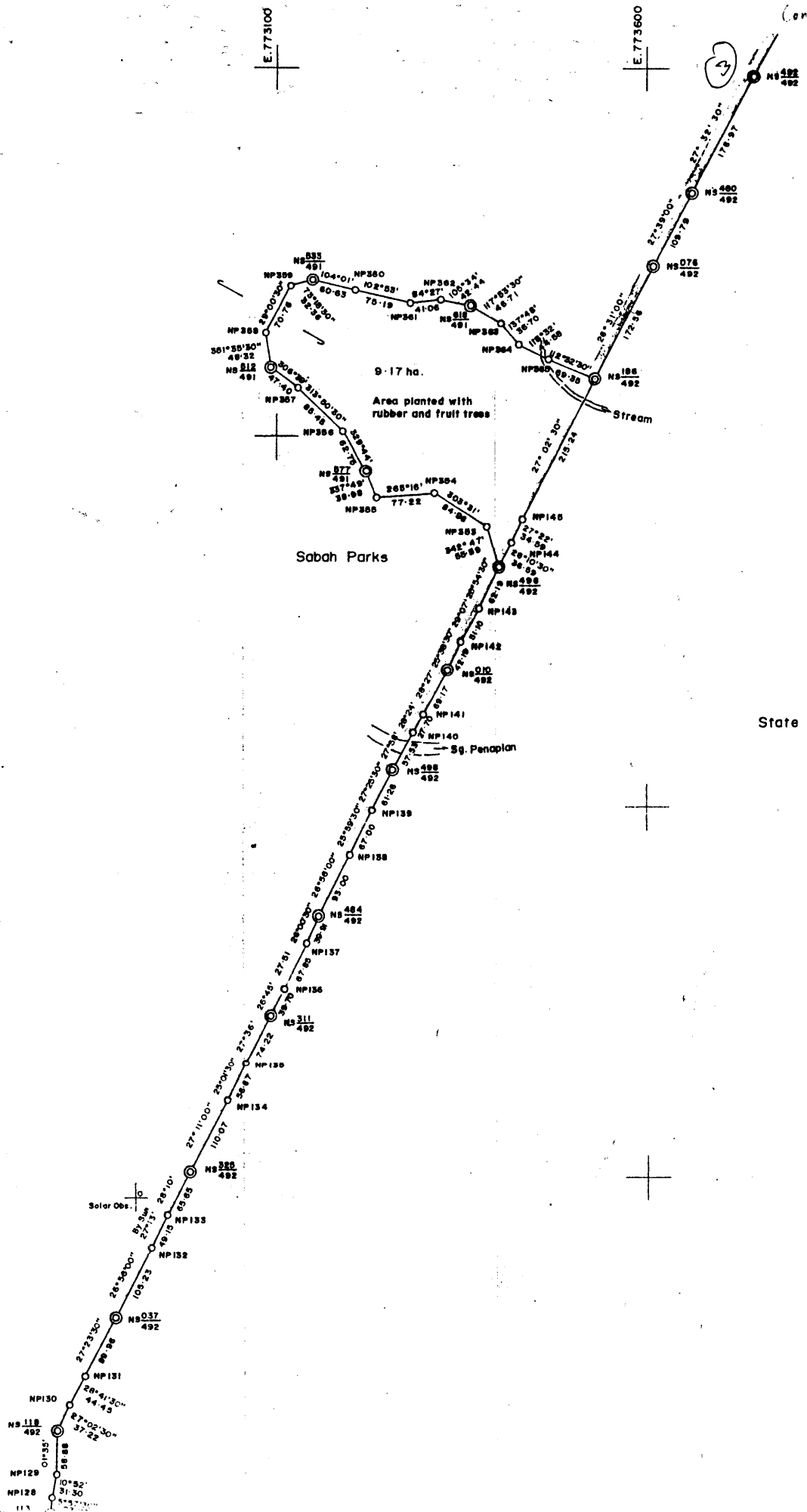
Survey of Sabah Part  
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I certify that the linear field and those for the all done and shown in

*W. K. J. J.*  
Licensed Surveyor

I am licensed under the Surveyor Act 1947 and the survey from which this plan was made and marked on the ground by me and other Surveyors (Conduct of the Survey) and that this plan correctly shows the boundaries of the land on the 29th day of April 1994 and I undertake to maintain the correctness of the survey

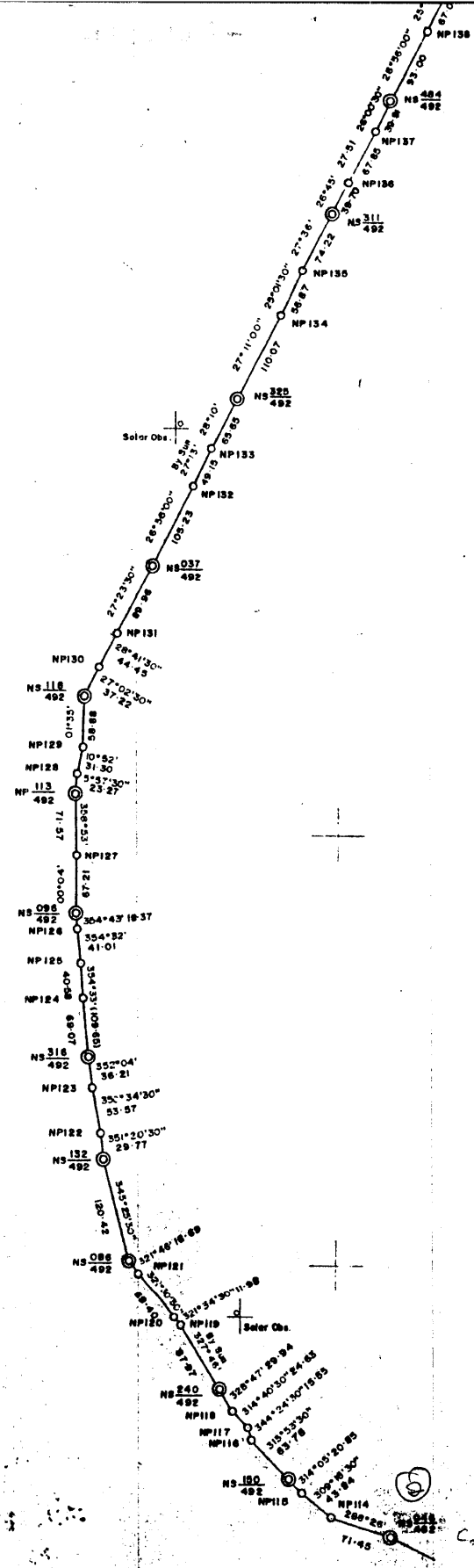
*W. K. J. J.*  
Licensed Surveyor

State Land



... KING TZE, a surveyor licensed under the Surveyor  
 Act, 1960, certify that the survey from which this plan  
 was prepared was carried out and marked on the ground by  
 me under my immediate personal direction and supervision in  
 strict accordance with the Surveyors (Conduct of  
 Surveys) Regulations 1962, and that this plan correctly  
 represents the survey completed on the 29th day of  
 November, 1993. I undertake  
 to accept full responsibility for the correctness of the survey  
 on this 18th day of April, 1994.

*W. King Tze*  
 Licensed Surveyor



Sabah Parks

State Land

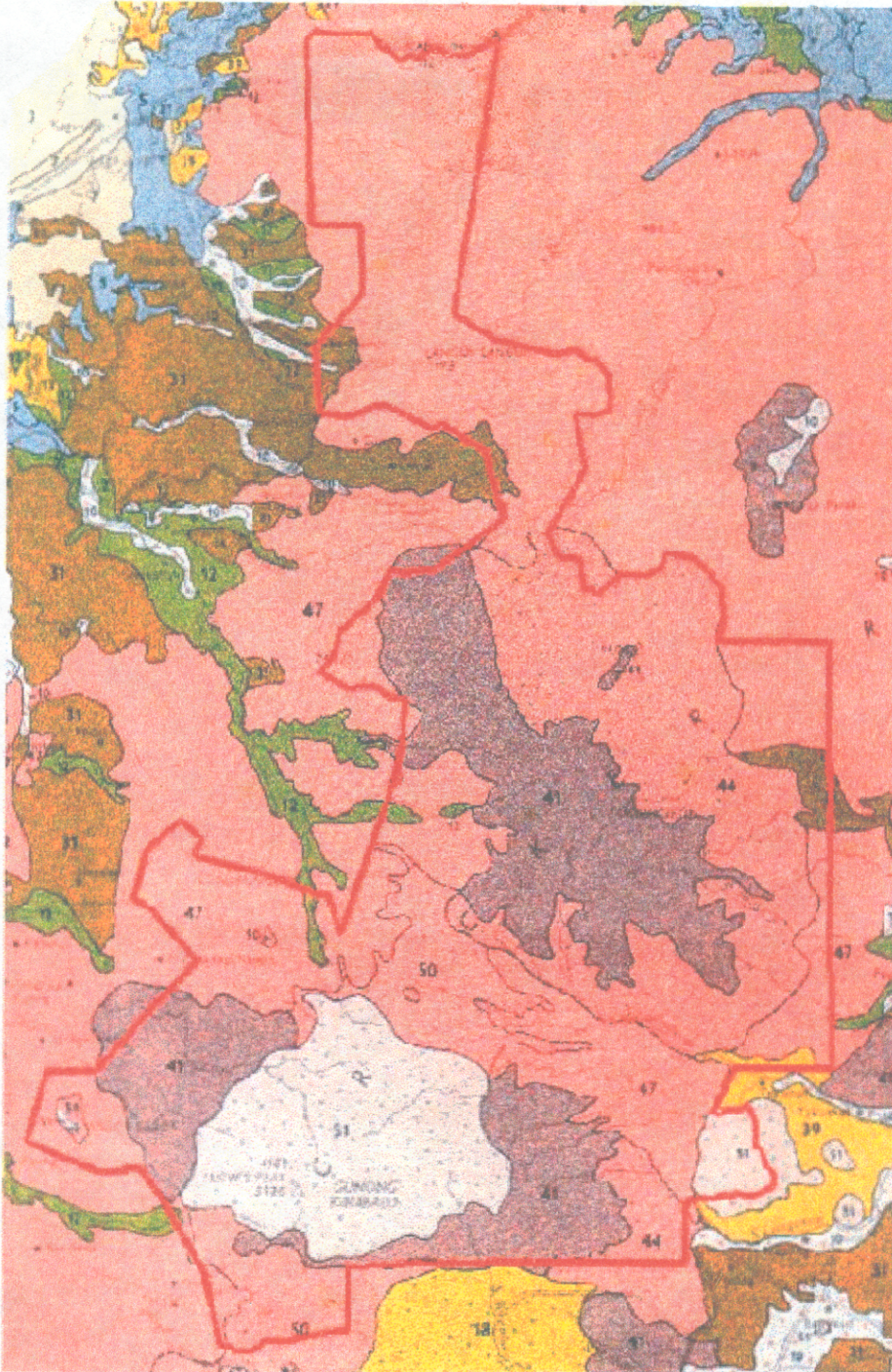
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Sr. D. O. Supervisor	

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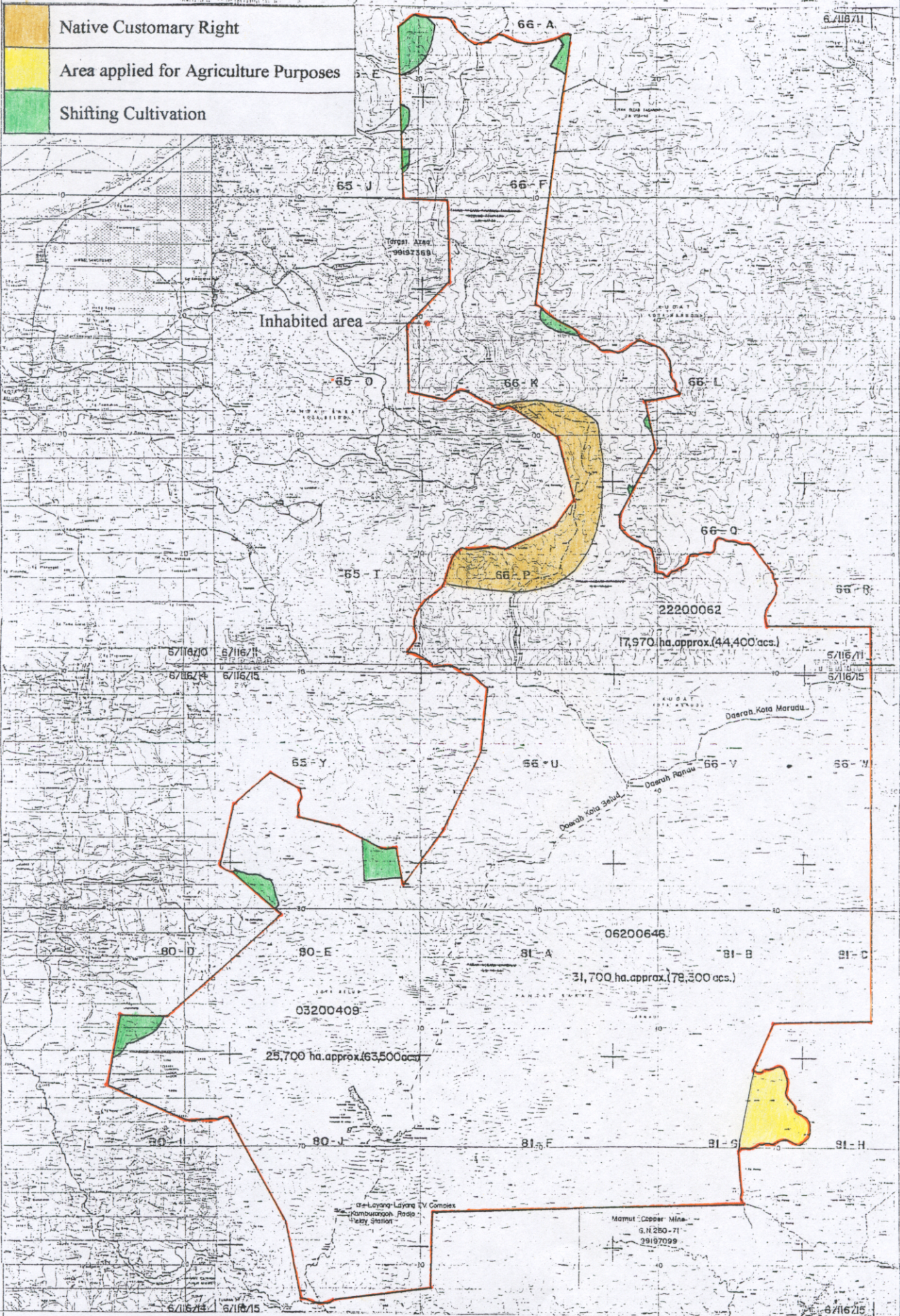




Key	Association	Landform	Parent materials	Main soil units
12	Brantian	Terraces	Alluvium	Orthic, Ferric and Gleyic Acrisols; Gleyic Podzol
31	Dalit	Moderate hills and minor valley floors: slopes 0-20°	Sandstone, mudstone and alluvium	Orthic, Ferric and Gleyic Acrisols
39	Lokan	Very high hills: slopes >25°	Sandstone and mudstone	Orthic Acrisol; Dystric Cambisol
41	Bidu-Bidu	Mountains and hills	Ultrabasic igneous rocks	Rhodic and Orthic Ferralsols; Eutric Cambisol; Chromic and Orthic Luvisols; Lithosol
44	Malubok	Mountains	Igneous rocks, sandstone, mudstone and chert	As for Associations 41, 42 and 47 with Chromic Cambisols and Lithosols on chert
47	Crocker	Mountains	Sandstone and mudstone	Orthic Acrisol; Chromic and Dystric Cambisols; Lithosol
50	Trusmadi	Mountains above 1200 m a.s.l.	Sandstone	Gleyic and Orthic Acrisols; Gleyic Podzol; Humic Gleysol; Dystric Histosol; Lithosol
51	Kinabalu	Mountains above 2400 m a.s.l.	Acid igneous rocks	Humic Cambisol; Dystric Histosol; Lithosol

Source: The Soils of Sabah (Soil Sheet: TUARAN NB 50-6, 1974)

# Map 5



## Tanah Simpanan Taman Kinabalu Daerah Kota Belud, Kota Marudu & Ranau

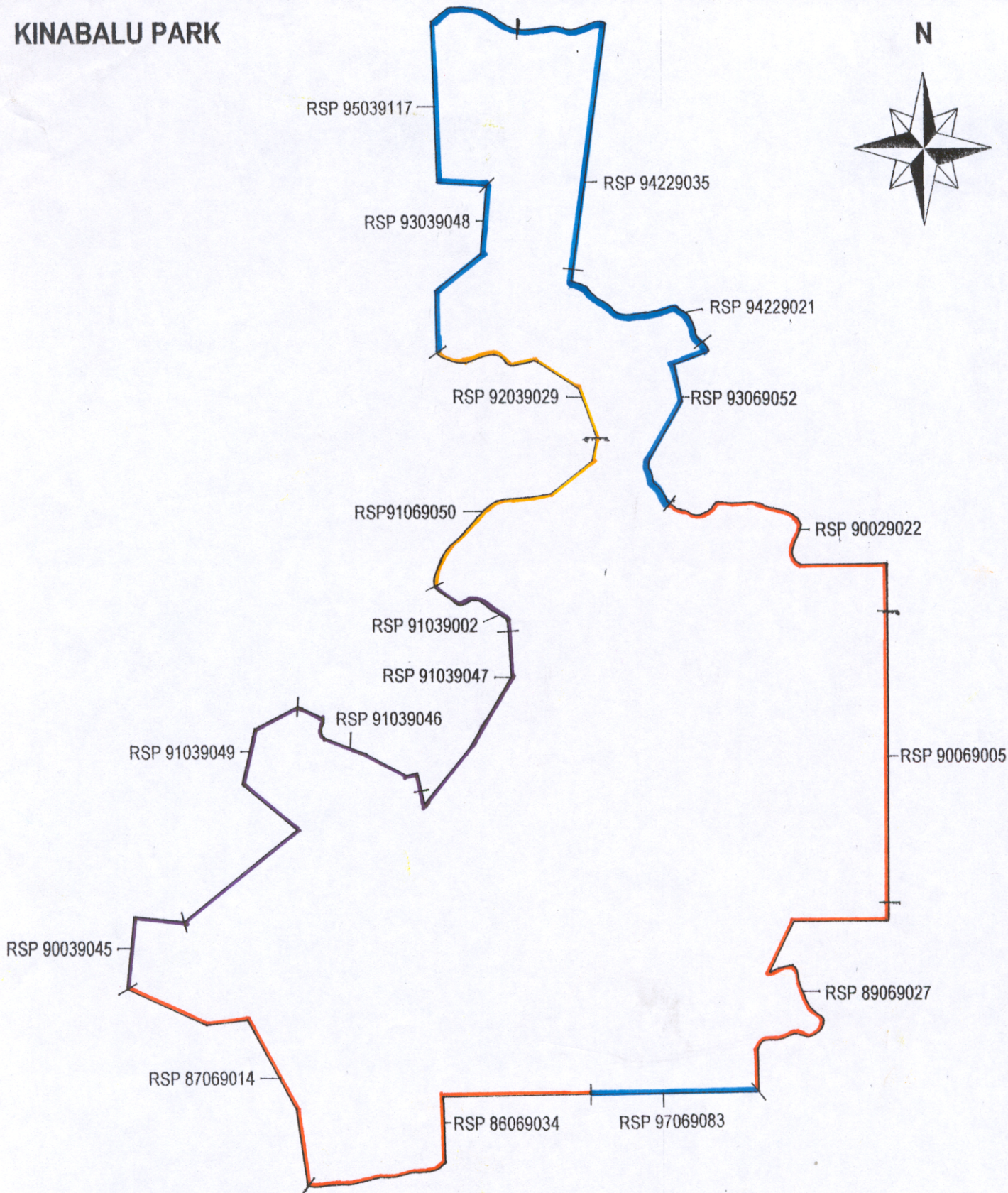
Skel 1:100,000 (126-26 rantai sainci)

Dituluskan

Daerah Ranau	31,700 ha. (78,300 acs.)
Daerah Kota Belud	25,700 ha. (63,500 acs.)
Daerah Kota Marudu	17,970 ha. (44,400 acs.)
<b>Jumlah</b>	<b>75,370 ha. (186,200 acs. 291 sq.mis.)</b>

Rujukan peta:-

# KINABALU PARK



Legend :

	Boundary surveyed by : Syarikat Juruukur Kinabalu Sdn. Bhd.
	Boundary surveyed by : Juruukur Kandiah & Associates
	Boundary surveyed by : Juruukur Swasta Sdn. Bhd.
	Boundary surveyed by : Wah King Tze

( NOT TO SCALE )



Plate 1 : *Paphiopedilum rothschildianum*  
Photo courtesy : Dr. Jamili Nais, 1991

Plate 2 : *Nepenthes burbidgeae*  
Photo courtesy : Ansow Gunsalam





Plate 3 : *Nepenthes villosa*  
Photo courtesy : Charles Phillipps

Plate 4 : *Nepenthes kinabaluensis*  
Photo courtesy : Sabah Parks







Plate 13 : *Renanthera bella*

Photo courtesy : Alim Biun, September 1998



Plate 14 : *Paphiopedilum lowii*

Photo courtesy : Alim Biun, September 1998

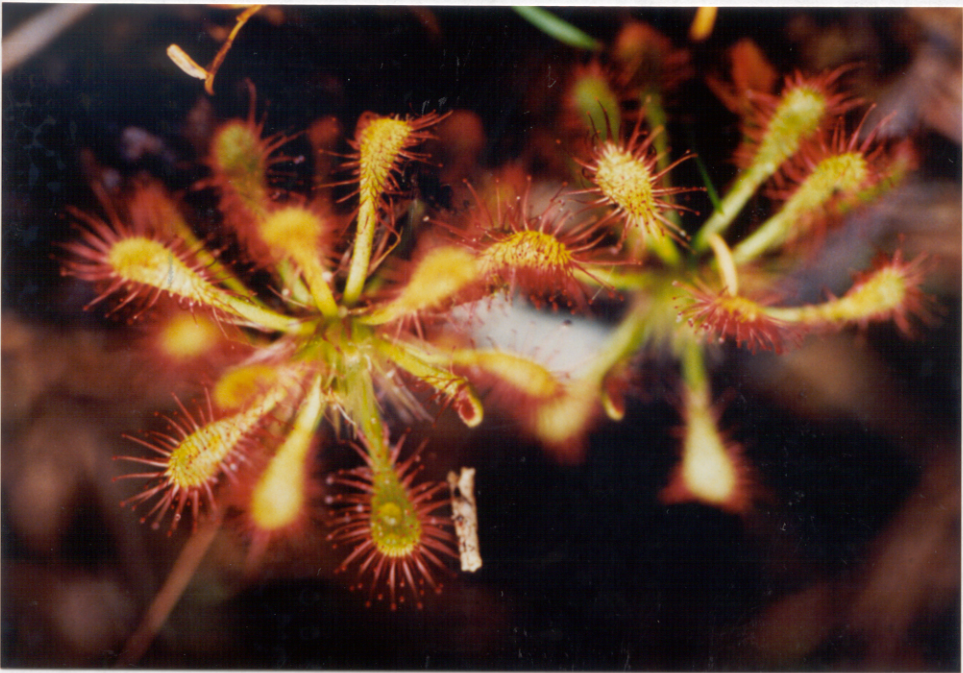


Plate 25 : *Drosera* sp.

Photo courtesy : Sabah Parks



Plate 26 : *Rafflesia priceii*

Photo courtesy : Sabah Parks



Plate 29 : *Cervus unicolor*

Photo courtesy : Sabah Parks



Plate 30 : *Nycticebus coucang*

Photo courtesy : Sabah Parks

# **APPENDIX 6C**

## **The Kinabalu Park Development Masterplan Towards Sustained Development & A Development Plan for Kinabalu Park Nature and Golf Resort**

**A MANAGEMENT AND DEVELOPMENT MASTERPLAN  
FOR THE BOARD OF TRUSTEES OF  
SABAH PARKS**

***VOLUME II***  
**THE KINABALU PARK DEVELOPMENT  
MASTERPLAN TOWARDS SUSTAINED  
DEVELOPMENT**

by

***Coopers & Lybrand Management Consultants Sdn Bhd***  
**and**  
***Sun Chong & Wong***

***DECEMBER 1992***

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## 1. INTRODUCTION

### 1.1 General Description of the Park

Covering an area of 753 sq. km., Kinabalu Park was the first to be gazetted. Besides having Mt. Kinabalu as one of its main attractions, the Park is also renowned for its granite massif of 4,101 m. and rich plant and animal life. The Park is located about 92 km. from Kota Kinabalu and is easily accessible by road.

It receives some 175,000 visitors annually. The visitors are mainly Sabahans who visit the Park to enjoy the cool mountain air. There has been an increasing inflow of visitors to Mt. Kinabalu seeking leisure, enjoying sightseeing, conducting nature-study and pursuing scientific research. Most of the visitors' use is concentrated at the Park Headquarters Complex at 1,620 m. There is also an increasing demand for facilities at the Poring Hot Springs Complex, the lowland section of Kinabalu Park.

In Kinabalu Park, the lowland forests which are dominated by the *Dipterocarpaceae* spp. is much richer while on higher altitude with the relative humidity decreasing, vegetation is reduced to lianas and epiphytes. The lowland dipterocarp forests such as that found at Poring are rich in fruit trees, spiny rattans and other larger palms. The giant parasitic flower, *Rafflesia* spp. also thrives here but is seldom seen. The abundant wild fruit trees and warm climate provide a natural habitat for wildlife such as squirrels, flying foxes, clouded leopards and even forest hill tortoises. Bird life with about 300 species is equally rich and diverse with some exotic species found in the Poring Hot Springs area.

Against the backdrop of the Park's rich natural endowment of flora and fauna lurks the fear of its gradual destruction as development proceeds. As such, it is imperative that a Kinabalu Park Development Masterplan be structured to formulate strategies targetted at the conservation of the Park.

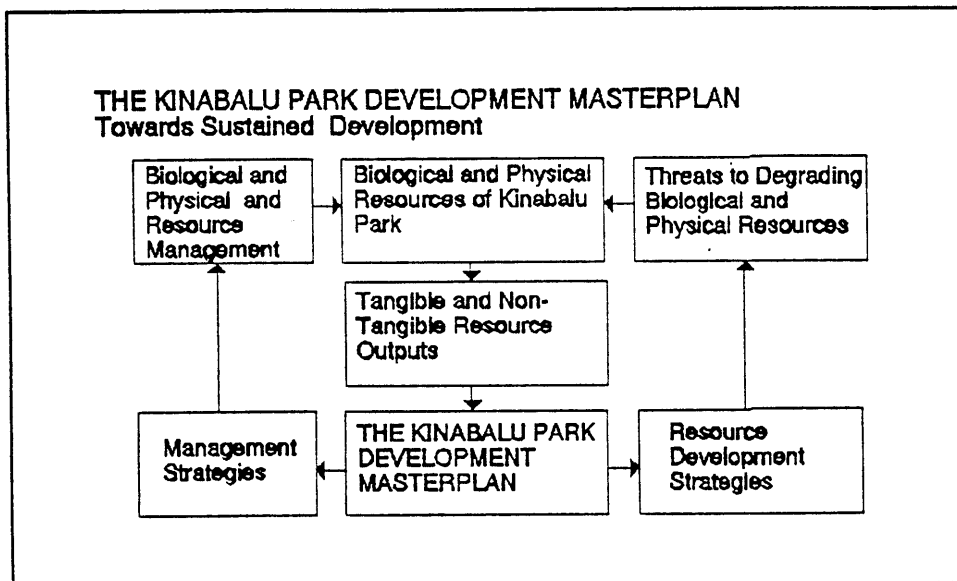
The Development Masterplan comprises a set of management guidelines and recommendations for Kinabalu Park. The document identifies the long term development needs and priorities with focus on the following:

- a description of the biological and physical characteristics of the Park and its implications for the Masterplan;
- a review of the biological and physical resources utilisation;
- recommendations to balance resource conservation and development; and
- pragmatic action plans leading towards sustained quality of biological and physical resources output.

## 1.2 Study Approach

Figure II-I shows the schematic approach of the study which is structured to meet the eco-development objective which balances resource development and conservation. At the outset, a detailed description highlighting the uniqueness of the biological and physical resources in Kinabalu Park and utilisation will be given.

Figure II-I Study Approach



Following that, the strategic development thrusts and resource conservation strategies to achieve optimum resource-utilisation in line with the study's underlying eco-development theme are developed. The strategic development thrusts are as follows:

- **Strategic Thrust One** : **Conserving the Biological & Physical Resources**
- **Strategic Thrust Two** : **Spearheading Scientific Research and Enhancing Educational Values**
- **Strategic Thrust Three** : **Increasing Recreational and Touristic Activities**
- **Strategic Thrust Four** : **Preserving Cultural and Historical Values**
- **Strategic Thrust Five** : **Instituting Management Procedures to Support Other Strategic Thrusts**

### 1.3 Eco-Development Parameters

The Director of Sabah Parks has a statutory responsibility under the Sabah Parks Enactment (1962) for the management of Kinabalu Park. Currently, the Park has no comprehensive development and management plan to guide its administration and overall planning.

In this regard, the management is guided solely by policies governing Sabah Parks. Additionally, it also recognises the constraints imposed by past and present use patterns and facilities provided which may not be compatible with sustained development. Priorities and changing values attached by the community towards the Park is one dynamic element which will also affect development priorities and needs.

Park Managers as a principle should thus be conservative in approach, for it is much easier to provide for new developments at a later date than to revert the degraded, perhaps permanent loss of biological and physical resources.

#### 1.3.1 The State, National Parks and People

Parks exist because people see the value in ensuring the protection of the outstanding scenery or natural features in such areas. As new and different values relating to natural resources emerged, different expectations for use of national or state parks arise.

In contrast to management and development for most other land uses such as cities, towns, agricultural land, mining areas, timber production areas, wildlife reserves, recreation areas and so on, the Development Masterplan of Kinabalu Park is aimed at minimising the negative *total* impact of natural resource use within the area. Natural parks cannot be expected to fulfill the same functions as other distinct land uses in Sabah.

State and National Park Managers will encounter the difficult task of balancing conflicting expectations between natural resource use and preservation. Such a balance can be prescribed in a Masterplan but above all, it requires an awareness of the changing expectations of the people. This implies that park management will essentially involve providing the widest possible range of appropriate opportunities for visitors to appreciate the natural and cultural features of the Park, wherever this is compatible with the protection of the biological and physical resources.

The primary objective of this Development Masterplan is to firmly commit the Management of Sabah Parks to provide people with opportunities to use and appreciate Kinabalu Park. Many of the proposals in the Masterplan involve substantial increase in the range and types of opportunities for people to share the experiences in and provided by Kinabalu Park.

This Masterplan is formulated with the following considerations as basic guidelines:

- that the present range of opportunities will be *maintained*, and new ones *developed* to allow use by as many people as possible; and
- the Board of Trustees of Sabah Parks accepts that there is a wide range of abilities (physical, social, economic, etc.) among the people and that any facility it provides for park users should minimise or avoid any discrimination against any section of the population.

### 1.3.2 Values

Perceptions are expressed in terms of values relating to both natural and man-made features, *viz*:

- *Natural Scenic Values*: for example, the forested mountain ranges, the area above the tree line, the rugged gorges and valleys, the geological features of the summit area, waterfalls and cliffs;
- *Scientific and Educational Values*: for example, geological features and land forms, lowland and sub-alpine tropical vegetation, rare and restricted species or communities and endemic species; tropical and sub-alpine climates, altitudinal changes and dynamics of animal communities;
- *Economic Values*: for example, rivers that run in the Park which include the headwaters of the Sungai Mesilau and Sungai Liwagu and other river systems which together constitute one of the most important protected water catchment areas in Sabah. Water supplies for many towns are substantially dependent on the protection of the water catchments within Kinabalu Park;
- *Historic Values*: for example, a place for worship and sacrifices, early pioneer trails and many other interesting relics; and
- *Recreational Values*: for example, sightseeing, picnicking, camping, trail walking, mountain climbing, photography, and hot water spring bathing.

It must be stressed at this juncture that the endemic values must be preserved at all costs regardless of any development plans so that the natural landscape and habitat are not destroyed in the process.

## 1.4 Structure of the Masterplan

The first section of the study will describe in detail the biological and physical resources of Kinabalu Park and its implications on the Development Masterplan of the Park. This will include description of the Park's flora, fauna, topography, geology, climate, soil, and hydrology. This section will also discuss the patterns of resource use, its impact on the environment, and management of Park resources.

The final part of the study will discuss the five strategic development thrusts and the recommendations for the management to adopt:

- **Strategic Thrust One: Conserving the Biological and Physical Resources**

This thrust of the Masterplan will address issues pertaining to the preservation and protection of the outstanding scenery and natural features of Kinabalu Parks. Pragmatic recommendations to balance development with conservation of wildlife and protection of the ecological systems are the key themes of this thrust.

- **Strategic Thrust Two: Spearheading Scientific Research and Enhancing Educational Values**

Another major development thrust of the Masterplan is the fostering of scientific and educational enquiry into the natural features and processes in Kinabalu Park. This development thrust recommends efforts to generate interest among the general public to visit and study the Park. Scientific research on the Park should also be intensified.

- **Strategic Thrust Three: Increasing Recreational and Touristic Activities**

One of the main attractions of the Park is its recreational values and facilities. A key issue of concern is the threat posed by the influx of an increasing number of tourists that might cause disturbance to the ecological balance of the Park.

- **Strategic Thrust Four: Preserving Cultural and Historical Values**

The Management of the Park is also responsible for preserving and protecting the cultural and historical features of the Park by ensuring that the proposed development is not at the expense of eroding any of its cultural and historical values.

- **Strategic Thrust Five : Instituting Management Procedures to Support Other Strategic Thrusts**

Systematic management procedures are imperative in support of the four strategic thrusts as mentioned above. As such, the proposed management procedures are geared towards the achievement of all recommendations made under the respective strategic thrusts.

## 2. PARK RESOURCES

### 2.1 Biological Resources of Kinabalu Park

The Kinabalu Park is a natural heritage of the Malaesian flora and fauna. More than half of the world's varieties of flowering plants originates from the Park, including 1,000 species of orchids and 26 of rhododendrons. The world's largest flower, the *Rafflesia*, with a diameter of 45 cm. is endemic to this region. The Park is also home to about 300 species of birds and a rich assortment of butterflies. Squirrels, flying foxes, clouded leopards and even forest hill tortoises are found in the lowlands around Poring Hot Springs.

#### 2.1.1 Flora

- **Native Flora of Kinabalu Park**

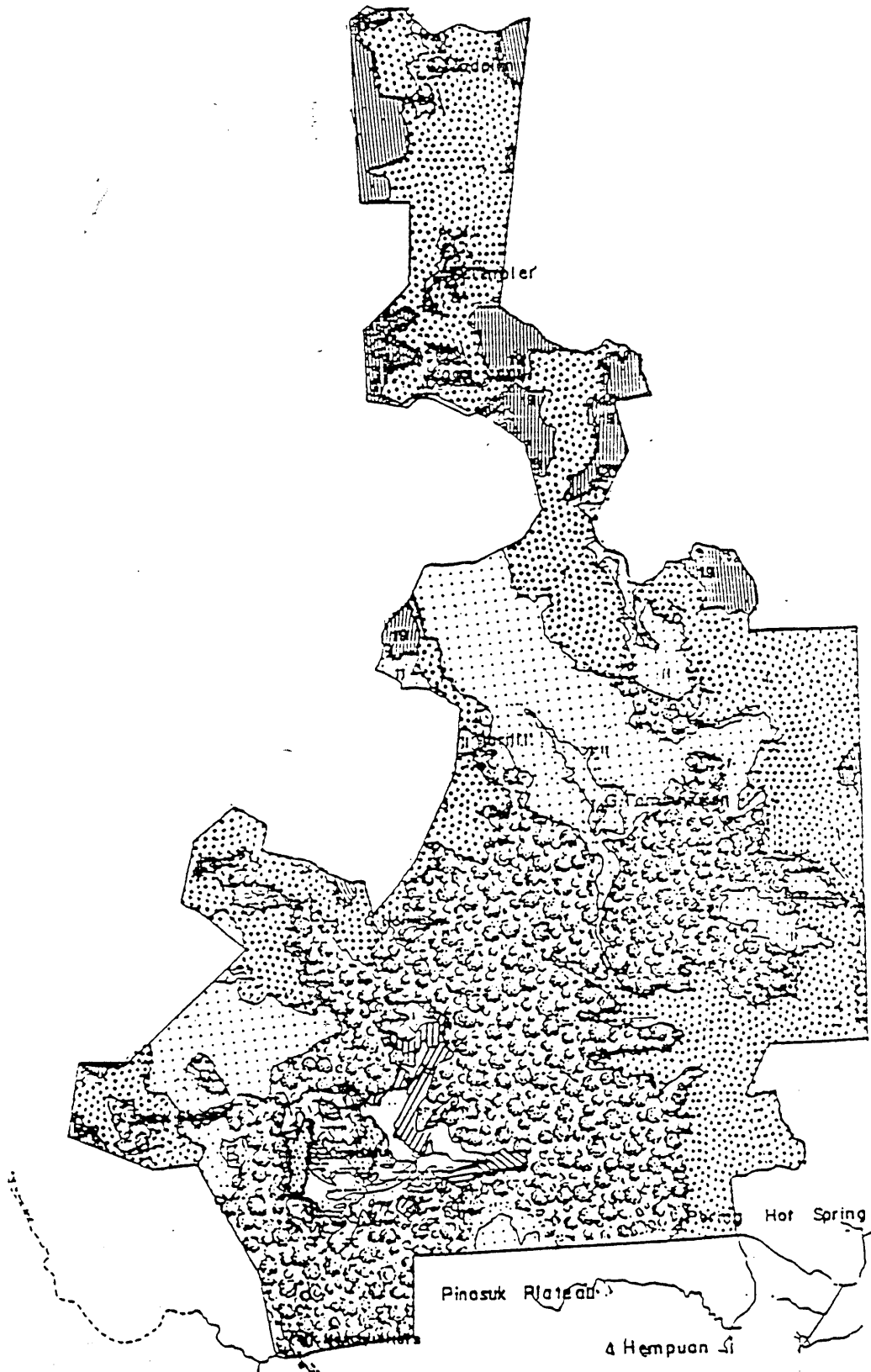
The Kinabalu Park is a meeting place for the Himalayan, Chinese, Australian, New Zealand and even American genera of plants. They mingle at all altitudes with Malaysian upsurgers. Above 1,219 m., most of the Malaysian genera begin to disappear and many new genera, unfamiliar in the lowlands, begin to enter. Examples include the buttercups (*Ranunculus*) of Australian affinity, the climbing madder (*Rubiaceae*) of European affinity, the Rosaceous trees and scrubs of Sino-Himalayan affinity and *Gunnera* of the Southern Hemisphere alongside the pitcher plants (*Nepenthes*) affiliated to Borneo.

Within the 753 sq. km. of Kinabalu Park which includes the massive granitic outcrop of Mt. Kinabalu itself, lies one of the richest flora composition in the world. The latitudinal range from 457 m. to the summit alone provides habitats for no less than 140 families of flowering plants and a large number of ferns, mosses, liverworts and fungi. There are more than 4,000 species of flowering plants in the Park ranging in size from 60 m. trees in the lowlands near Poring to the tiny *Pilea johniana*, a plant only five cm. tall at 3,201 m. The floral diversity in Kinabalu Park is determined by the interaction of various factors such as soil and climate. Many of the known species are endemic to the Park.

The vegetation of Kinabalu Park can be classified according to latitudinal zones of which six can be readily identified based on the forest structure and species component. The different vegetation corresponds to variations in latitude and temperature. The complex ecological and historical factors right from the foot of the mountain to the summit may well explain the phenomenon. Figures II-2 and II-2a show each of the vegetation zones present in the Park.



















The diversity of architectural forms are as great as the species diversity. Species diversity diminish with the higher altitude. Table II-I gives a summary of the more common species present in each vegetation zone.

FIGURE II-2: VEGETATION MAP OF KINABALU PARK



## LEGEND

### Natural Vegetation

-  Plant communities of tropical lowland rain forest
-  Plant communities of tropical montane rain forest
-  Tropical subalpine coniferous forest community (partially mixed forest with evergreen broad-leaved trees)
-  Ecotone community between 3 and 5
-  Tropical alpine ericaceous thicket community
-  Tropical alpine dwarf - shrub heath community
-  Plant communities in rocky desert
-  Leptospermum recurvum dominance forest community on shallow soils (Leptophyllous closed forest)
-  L. recurvum dominance shrubland community on steep slopes (Leptophyllous shrubland)
-  Extremely dwarfed L. recurvum dominance thicket community (Matted dwarf - shrub thicket)
-  Tristania dominance forest community on soils derived from ultrabasic rocks (Microphyllous closed forest)
-  Leptospermum - Tristania dominance thicket community on soils derived from ultrabasic rocks (Lepto - Nanophyllous thicket)
-  L. recurvum - Dacrydium gibbsiae dominance thicket community on soils derived from ultrabasic rocks (Leptophyllous thicket)
-  Graminoids communities on soils derived from ultrabasic rocks (partially with scattered shrubs)
-  Plant communities on cliffs
-  Adinandra dominance forest community on accumulated rocks (Secondary closed forest)
-  Rubus lineatus dominance thicket community (Evergreen suffruticose thicket)
-  Natural bareland or moss flush

### Substituted Vegetation




-  Substituted secondary forest communities
-  Weed communities on cultivated land
-  Artificial bareland



FIGURE II-2a: VEGETATION ZONES IN KINABALU PARK

Subalpine Shrub & Herb  
3200 - 4100 m alt.

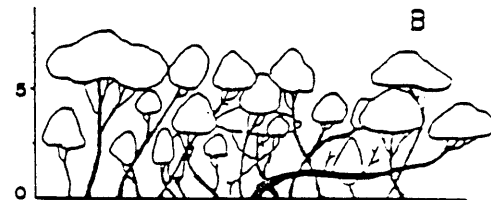


Granite Boulder Forest  
3000 - 3800 m alt.

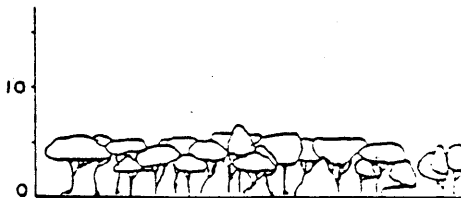
A : Upper part  
3500 - 3800 m alt.



B : Lower part  
3000 - 3300 m alt.



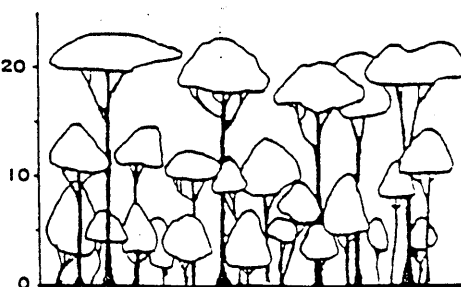
Ultrabasic Rock Forest  
2700 - 3000 m alt.



Upper Mountain Forest  
1900 - 2700 m alt.



Lower Mountain Forest  
1200 - 1900 m alt.



**Table II-I Some Common Plants in the Different Vegetation Zones in Kinabalu Park.**

Zone	Dominant Vegetation Type	Examples of some Common Plants
Lowland	Dipterocarps	<i>Shorea spp.</i> , <i>Sapindaceae spp.</i> , <i>Quercus spp.</i>
Lower mountain	Trees and undergrowth; rattan and orchids	<i>Fragaceae spp. (27 species)</i> <i>Conifers (6 species including Agathis borneensis)</i> , <i>Garcinia spp.</i> , <i>Gleicheniaceae spp.</i>
Upper mountain	Trees and undergrowth	<i>Myrtaceae spp.</i> , <i>Ericaceae spp.</i> , <i>Begonia spp.</i> , <i>Nepenthes spp.</i>
Ultrabasic rock	Small trees	<i>Leptospermum recurvum</i> <i>Dacrydium gibbesii</i> <i>Lithocarpus havilandii</i>
Granite boulder	Small trees and undergrowth	<i>Phyllocladus hypophyllus</i> <i>Rhododendron spp.</i>
Subalpine scrub and herb	Shrubs, herbs and grasses	<i>Rhodocendron spp.</i> <i>Ranunculus potentilla</i> <i>Oreobolus ambiguus</i>

Appendix II-I describes in greater detail the different types of native flora of Kinabalu Park.

- **Exotic Flora of Kinabalu Park**

Of some 30 exotic species introduced into the Park, two thirds of them fall into the horticultural category while the rest are trees. These exotics are concentrated around the Park Headquarters at 1,500 m. either along rivers or in the Mountain Garden. Some of the common exotics present here are *Pinus caribaea*, *Acacia mangium* and *Araucaria spp.*

## 2.1.2 Fauna

- **Mammals of Kinabalu Park**

Two broad categories of mammals species are found in Kinabalu Park. First, the lowland species, comprising at least 79 species, of which 16 are bats (see Appendix II-2).

Second, the montane species which are confined to mountain ranges of which at least 22 species are known. There are however some species in these two categories of mammals which can be found over great latitudinal range. A montane species, the Kinabalu squirrel *Callosciurus kinabaluensis*, for instance, has been sighted in the dipterocarp forest at elevation as low as 305 m., while two lowland species, the barking deer *Muntiacus muntjak pleiharicus* and sambar deer *Cervus unicolor brookei* have been recorded in the upper montane forest up to as high as 3,353 m. Of all the lowland mammal species recorded within Kinabalu Park, 32 (about 40 per cent) occur at the upper limit of the dipterocarp forest zone. The remaining 60 per cent are evidently not limited by the extent of the dipterocarp zone.

In some of the taxonomic groups of lowland mammals (see appendix II- 2) found in Kinabalu Park, species with the largest body size extends to the highest altitudes. This is evident in all tree squirrels, rats, tree-mice, deer and carnivores generally and is in accordance with the general trend on a world wide basis for the taxa of large body sized mammals. For some groups such as fruit bats, insectivorous bats, primates, flying squirrels and cats, this observation does not hold true.

All montane mammal species known to occur in Borneo are found in Kinabalu Park. However, only two members of this montane mammal, the group black shrew and Kinabalu shrew, are known to occur only in Mt. Kinabalu. Thirteen of the montane species occur only in Borneo and Sumatra, and two more (grey fruit bat and long-tailed mountain rat) are found only in the mountains of Borneo, Sumatra and Peninsular Malaysia.

Some montane species cover a large altitudinal range on Mt. Kinabalu, spanning several habitat types. The mountain treeshrew, smooth-squirrel, mountain giant rat, long-tailed mountain rat, mountain spiny rat and ferret-badger occur from the upper dipterocarp forest into the upper montane mossy forest zones.

- **Insectivorous**

The mammals classified as insectivorous feed only on invertebrates. Superficially, unlike rodents, which have chisel-like front teeth for gnawing hard plant material they are characterised by rounded or conical teeth with sharp points. The lesser gymnure is restricted on Mount Kinabalu to forest above the dipterocarp zone. Four species of shrews are known from Mount Kinabalu. The black shrew, known only from one specimen, is the only mammal found on Mount Kinabalu which is unique to the area and which has no close affinities with any other known member of its taxonomic group.

- **Treeshrews**

Treeshrews have been classified as both primates and insectivorous, but are now regarded as a distinct group of their own, *Scandentia*. They feed primarily on insects and fruits. Borneo has ten species of treeshrews, the greatest number in any region where the order occurs, but only four have been recorded in Kinabalu Park. The mountain treeshrew is usually the most commonly-seen mammal in the lower montane forest.

- **Dermoptera**

There are only two species within this order of mammals, both colugos. They travel through the forest mainly by gliding. The Bornean species, believed to feed mainly on leaf shoots and possibly bark and sap, occur at Poring, but has never been recorded above 914 m. elsewhere.

- **Bats**

All bats are classified under the order Chiroptera. Of the 17 species of fruit bats and 75 species of insectivorous bats known from Borneo, all except one, the grey fruit bat, are primarily lowland animals. The large flying fox, which has been observed at Poring, is probably the most mobile mammal in Borneo.

- **Primates**

One of the most intriguing aspects of the seven species of primates known to occur in Kinabalu Park are the grey and red leaf monkeys which are the two most closely-related and ecologically similar species. They are found in markedly different altitudinal levels. The red leaf monkey can be found to 3,048 m. high, much higher than any other primate, and it is the most widespread monkey on the island of Borneo. The grey leaf monkey is confined to north and north-east Borneo, and has not been recorded above 1,524 m. All records except one are below 1,219 m. The single higher record is from the Silau-silau Trail, where an adult male was seen feeding on the eggs of a babbler, the only reported case of any leaf monkey taking animal prey.

Orang-Utan occur only in the eastern and northern parts of the Park, mainly in the upper dipterocarp and the lowest part of the lower montane forest zones. It has been suggested that there are only some 25 to 120 Orang-Utan within Kinabalu Park. This population is ecologically different from those in the lowlands of eastern Sabah which are associated with swamps and riverine forests.

- **Pholidota**

The pangolin is the only member of this order in Borneo. The species is generally recorded in lowland habitats, but has been recorded twice between Kinabalu Park headquarters and Poring Ranger Station.

- **Rodents**

Rodents in Borneo include tree squirrels, ground squirrels, flying squirrels (which actually glide), rats, mice and porcupines. The giant squirrel is the largest tree squirrel in Borneo. It extends from the lowland dipterocarp forest to the lower montane forest zone.

Of the rat and mouse species in the forests of the Sunda shelf, only two occur in the mountains of Borneo and Sumatra, and six are confined to Borneo. The long-tailed giant rat exhibits the greatest latitudinal range of any small mammal in Borneo.

- **Carnivores**

The carnivores are diversely represented in Borneo and the two smallest (Malay weasel and ferret-badger) and the largest (sun bear) occur in Kinabalu Park. The only record of a clouded leopard, Borneo's largest wild cat, in the Mt. Kinabalu area is of footprints on Mt. Madalon, near the northern boundary.

Of great interest among carnivores confirmed to occur on Mt. Kinabalu is the Hose's civet. It is unusual among carnivores in having a restricted distribution at high altitude. It occurs only in the mountains of western Sabah and northern Sarawak at altitudes of between 607 to 1,219 m. The ferret-badger, known in Borneo only from Mt. Kinabalu, also occurs in Nepal, Assam, Burma, Thailand, Indo-China and Java.

- **Large Terrestrial Herbivores**

The occurrence of the Sumatran rhinoceros in the Upper Makadauo Valley on the eastern side of Mount Kinabalu have been reported by local residents but the last definite sightings (and hunting) seemed to have been during the 1950s and during the 1961 Royal Society expedition. Since then, there have been no definite reports of the presence of rhinos in the region. Regrettably, even if a very few do exist in the remote central area north of Mt. Kinabalu, the number would be too small to represent a viable breeding population.

Bearded pigs move great distances in search of food in the form of fallen fruits of *dipterocarp* trees in the lower montane zone. *Fagaceous* trees in Kinabalu Park serve as a massive source of pig food.

Two species of barking deer are now recognised in Borneo. Only the larger and darker form in which the male possesses rough, forked antlers, has been observed in Kinabalu Park.

- **Birds of Kinabalu Park**

The birds at Kinabalu Park can be categorised into four groups:

**Species at the Subalpine Zone**

The most common and conspicuous bird found in the upper slopes of Mt. Kinabalu is the Mountain Blackbird (*Trudus poliocephalus*). This large and friendly blackbird with chestnut belly, yellow eyelids and deep yellow bill and feet, is found on only one other mountain in Borneo, i.e. Mt. Trus Madi, 54 km. away.

Another fairly common montane species is the Mountain Bush Warbler (*Cettia montana*) which is a dark brown bird, paler belly, and a narrow buff eyebrow. This species has a considerable range outside Borneo.

One of the most exclusive attractions the Kinabalu Park has to offer with respect to its bird species is the Kinabalu Friendly Warbler (*Bradypterus accentor*). This reddish brown bird with a moderately long tail and a boldly spotted throat owes its name to its habit of hopping around near human feet, flicking its wing and showing no signs of fear. This species can only be seen on Mt. Kinabalu and Mt. Trus Madi; it has not been found anywhere else in the world.

Towards the summit of Mt. Kinabalu, another conspicuous montane bird species and probably the most abundant, is the Mountain Blackeye (*Chlorocharis emiliae*). It is a small, dark olive-green bird with yellow eyebrows and ear coverts, black lores, a black ring around the eyes with orange-brown bill and yellow feet.

The above four species are found only on the higher elevations of Mt. Kinabalu, i.e. from about 2,134 m. upwards. There are 46 species occurring between 914-2,134 m. Of these 46 species, 14 are endemic to Borneo.

**Endemic Montane Bird Species**

There exists a group of montane species, 14 in all, that is endemic to Borneo. Amongst them are two species of Partridge - Red Breasted Tree Partridge (*Arborophila hyperythra*), Crimson-headed Wood Partridge (*Heamaortyx sanguiniceps*), one species of Trogon-Whitehead's Trogon (*Harpactes whiteheadi*), Whitehead's Broadbill (*Calyptomena whiteheadi*), Black-breasted Thriller (*Chlamydochaera jeffreyi*), Everett's Ground Thrush (*Zoothera everetti*), Mountain Wren-Warbler (*Napothera crassa*), Short-tailed Bush Warbler (*Cettia whiteheadi*), Bornean Mountain Whistler (*Pachcephala hypexantha*), Whitehead's Spiderhunter (*Archnothera juliae*), Pygmy White-eye (*Oculocincta squamifrons*) and three species of barbets--Golderaped Barbet (*Megalaima pucherrima*), Mountain Barbet (*Megalaima monticola*) and Black-throated Barbet (*Megalaima eximia*).

### Non-endemic Montane Species

There are about 31 species of montane birds of Kinabalu Park that are not endemic to Borneo. The more interesting or conspicuous among them is a large dark brown Crested Serpent Eagle (*Spilornis cheela*) often seen soaring high over the Park Headquarters. It feeds mainly on reptiles such as snakes and lizards. Another interesting non-endemic montane species is the Mountain Owl (*Otus Spilocephalus*), a little owl with reddish-brown speckles all over. It is found in the mossy forest at 2,743 m.

### Lowland Species

The more conspicuous birds found in the lowland forests of Kinabalu Park includes many species of woodpeckers, pittas, bulbuls and babblers.

### ● Frogs and Toads of Kinabalu Park

The faunal count for frogs and toads of Kinabalu Park now stands at 61. Three new species have been described since 1978: *Kalophrynus baluensis*, *Amolops amoropalamus* and *A. orphnocnemis*. As the study of amphibians in Kinabalu Park continues, we can expect the discovery of more resident species. The amphibian fauna of Kinabalu is a kind of microcosm of the fauna of Borneo as a whole. There are species of frogs that never leave the banks of streams; some that appear at streams only by accident and spend their lives widely distributed in the forest; and some that breed at stream-side but spend most of their lives in the forest; while some species spend their entire lives at ground level, on or under dead leaves, logs, moss and rock; and still others perch on low vegetation, herbs, and shrubs or live fairly high on trees.

About half of the species of frogs and toads are widely dispersed throughout the forests and at various altitudes (see appendix II - 2). For example, *Rana chalconota* lives at lower elevations in the Park, and is found in the tall lowland dipterocarp forest and adjacent secondary growth. The small bush frog, *Philautus mjobergi*, lives mainly in the mossy oak-chestnut forest. In the forests at Poring, for example, the ground level is occupied by species such as *Leptobrachium montanum* and *Microhyla boerneensis*; and the horned frog *Megophrys baluensis* in the layers of herbs and low shrubs by the small toad, *Ansonia spinulifer*; and the tree layer by the true tree frogs such as *Polypedates otilophus* and several species of *Rhacophorus* (*R. acutirostris* and *R. everetti* and *R. Pardalis*).

At lower elevations, the rocks and gravel of the banks are occupied by the giant toad, *Bufo juxtasper* and a rock skipping frog, *Staurois patopalmatus*, while shrubs and small trees are inhabited by several species of torrent frogs (*Amolops orphnocnemis* and *A. kinabaluensis*) and the poisonous frog, *Rana hosei*.

Many of the forest species breed in streams. The toad *B. divergens*, for example, breeds where little shallow pools have been cut off from the current of a small streams. The forest floor frogs *Megaphrys nasuta* and *L. montanum* lay their eggs in the large open pools of moderate-sized streams where the current is not strong. Still there are others, such as *Leptotalax gracilis* which breed where the current is swift in the ripples and rapids. Some forest species are independent of flowing water throughout their life cycles.

The floor-dwelling *M. borneensis* and the tree frog *P. otilophus* may lay eggs in the same rain pool on the forest floor. Another tree frog *Nyctixalus pictus* lays its eggs in water-filled tree holes, and at least one species of *Philautus* puts its eggs in water-filled pitcher plants.

In terms of altitudinal stratification, the frogs and toads of Kinabalu Park is shaped like the mountain itself, where a broad base of species are found in the lowlands and progressively narrowing towards the top (see Appendix II-2). The distribution of this fauna shows an overlap between montane and lowland species mostly in the lower montane zone, between 1,220 m. and 1,830 m. Some groups are clearly lowland in nature, for example, the so-called "true frogs" of the genus *Rana*. On the other hand, the slender toads species *Ansonia* and bush frog species *Philautus* are found all the way up the mountain.

The little frog *Leptobranchella baluensis* is known only from a single locality on Kinabalu, Kamborangoh (2,500 m.). It has also been found recently on Mt. Mulu, Sarawak at 900 m. It is postulated that it will also be seen at lower elevations. The toads *Pedososotibes everetti* and *P. maculatus* have only been recorded from the general location "Kinabalu."

- **Fish of Kinabalu Park**

Nine families of fishes have been recorded in the Park viz : *Mastacembelidae*, *Anguillidae*, *Cyprinidae*, *Gastromyzontidae*, *Cobitidae*, *Bagridae*, *Sisoridae*, *Anabantidae* and *Cichlidae*. Although there are more species of *Cyprinids*, the *Gastromyzontids* are by far the most common fishes found in the clear mountain streams of the Park. The *Gastromyzon* and *Protomyzon* can usually be seen grazing on the surface of rocks and gravels. The *Glanioptis* are found in clips and holes among rocks and gravels.

The *Gastromyzon* are only found in Borneo. With the pectoral and pelvic fins attached to the lower surface of the body, the *Gastromyzon* possesses the most efficient clinging device for to stick and graze on rocks in very swift waters or onto surface of huge boulders below waterfalls. This clinging device is considered a highly specialised mechanism among fishes living in swift currents.



The *Glaniopsis*, which are only known from Sabah, are not as spectacular as the *Gastromyzon*, but these little fishes are unique in their appearance by having the head of a catfish and the body of a leech. Among the *Cyprspds*, *Hampala macrolepidota bimaculata* (Ikan Barap) is perhaps the only game fish in Kinabalu Park. This species may reach two feet in size and is known to take baited hook readily. *Tor duoronesis* (Ikan Belian) and *Lobocheilus bo* (Ikan Sarauyi) are highly esteemed as a delicacy by the locals. The former usually exceeds 38 cm. and the latter about 25 cm. in length.

Other common species of fish found in the streams of Kinabalu Park include *Puntius binotalus* and *P. Sealei* (Ikan Turungan), *Rasbora sumatrana* (Ikan Londo) and *P. gonionotus* (Lampam Jawa). The catfishes of the families *Bagridae* and *Sisoridae* are fairly common in the Park but are never found in abundance.

- **Butterflies of Kinabalu Park**

Generally, the butterfly fauna of Borneo is very similar to that of Peninsular Malaysia, Sumatra and Java. Despite the close proximity of Sulawesi and Borneo, the butterfly fauna of these land masses are rather different. Bornean butterfly species can be divided roughly into three groups on the basis of distribution. The first group contains species found widespread in the Oriental and Australasian tropics. They are usually mobile, opportunist species, often migratory or exhibiting characteristics of secondary growth. The other two groups are more restricted in distribution. One group extends throughout Sundaland and South-east Asia while the other is largely restricted to Sundaland.

The total number of butterfly species reported from Kinabalu Park stands at 302 of which 171 species are found in the foothills and lowland areas of the Park; 115 from the lower montane zone and 16 from the upper montane zone. Among the families present here, *Lycaenidae* appears to be the best represented with 105 species mostly collected from the lowland areas (62 species), lower montane zone (33) and upper montane zone (10).

Very few butterflies are recorded above 1,829 m. on Mt. Kinabalu and there is little in their distribution that can be said to be unique to the mountain. The majority of species found here are also found in similar lowland and mountainous localities throughout the Sunda shelf. Moths, on the other hand, are far more abundant at higher altitudes and many species are recorded only in Kinabalu Park.

Some 37 species were recorded from above 1,829m. but only 16 were characteristically upper montane, 10 of these being from the family *Lycaenidae*. The family *Pieridae*, especially the genus *Delias*, is also strongly represented at higher altitudes, vividly contrasting with the primarily lowland *Hesperiidae*.

Butterflies exhibit a variety of behaviour patterns. Many, especially *Lycaenids* and females of *Trogonoptera brookiana*, fly in the forest canopy, rarely coming down to ground level. Others, such as *Eurema*, *Mycalesis*, *Ypthima* and *Neptis* spp., are more commonly found at ground level, settling on low herbage in clearings and at forest margins.

## 2.2 Physical Resources of Kinabalu Park

This section will describe the following physical resources and aspects of Kinabalu Park;

- Location and Access
- Topography
- Geology
- Climate
- Soil
- Hydrology

### 2.2.1 Location and Access

Mt. Kinabalu, at 4,101 m. being the highest mountain in Southeast Asia is the outstanding landmark of Kinabalu Park. The Park which is approximately two-hours drive from Kota Kinabalu has two main activity centres;

- the Park Headquarters Complex on the southern boundary at 1,500 m. above sea level.
- Poring Hot Springs Complex on the eastern boundary at 480 m. above sea level; and

In the offing, are plans to assess and include the following as part and parcel of the Park:-

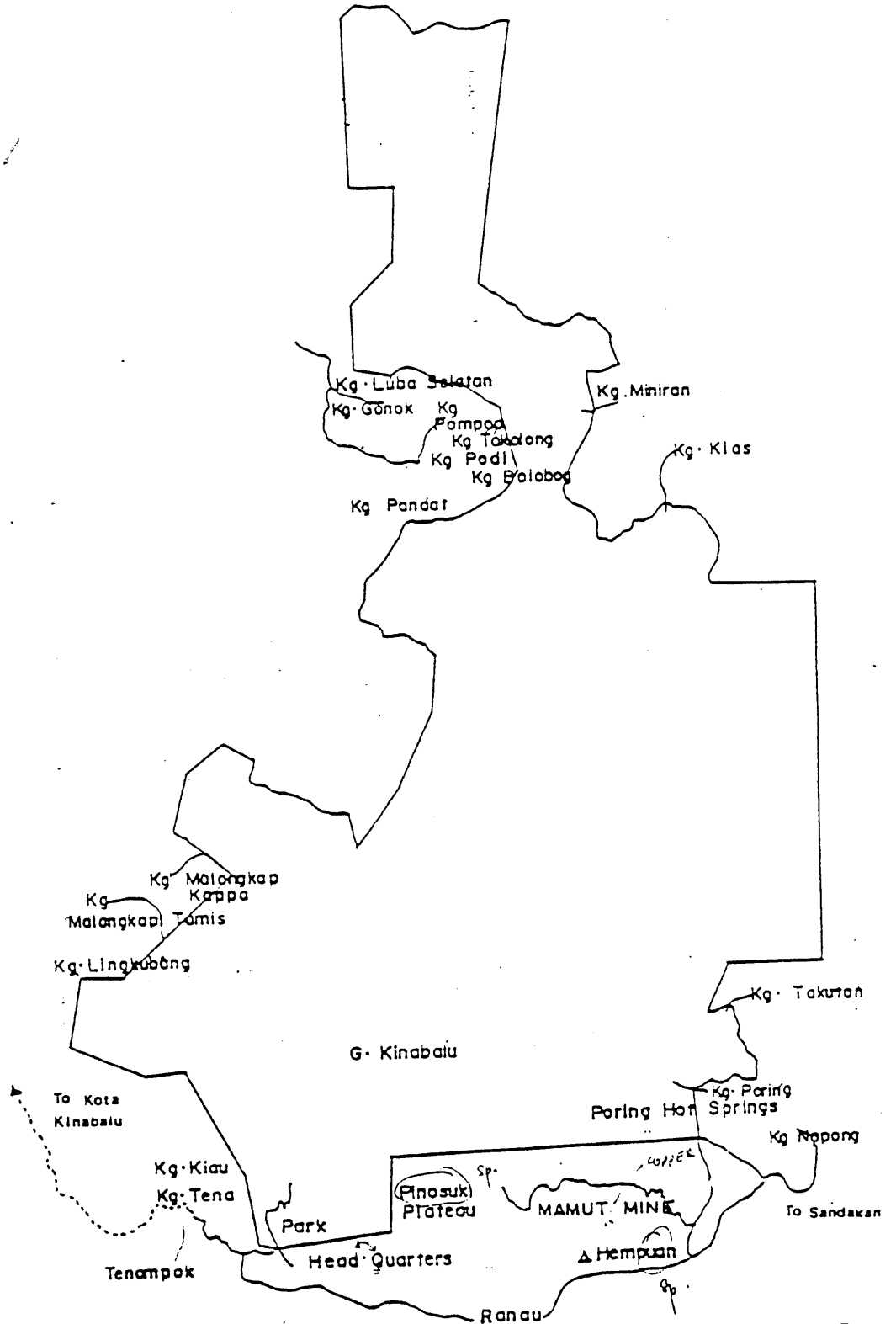
- recreational opportunities in Kota Belud
- setting up of a management station at Serinsim; and
- inclusion of Bukit Hempuen as part of the Park.

Access to the Park is by all sealed or all weather roads and air. However, access by air is limited to helicopters due to the limited landing space at the Park Headquarters.

Road access to the Park (see Figure II - 3) is *via* the following routes:

- the 83 km. sealed road from Kota Kinabalu
- the 60 km. sealed road from Tuaran
- the 7 km. sealed road from Kundasang

FIGURE II-3: ACCESS ROADS TO KINABALU PARK



- the 22 km. needed road from Ranau to Park Headquarters and the 19 km sealed road from Ranau to Poring Hot Springs; and
- the 35 km. all weather road from Kota Belud which joins the 33rd km. sealed road to the Park

Within the Park, there are networks of roads, walking paths and trails. It includes the following :

- the Kambarangoh Road-Summit trail;
- graded paths passing through rich lowland forest to mountain rivers, waterfalls and the tumbled bat caves at Poring Hot Springs;
- walking paths and botanical trails usually located around places of interest with panoramic views in the Park (see Figure II - 4); and
- trails like the Kinabalu mountain trail networks which are well defined due to constant use and the outstanding attraction of Mt. Kinabalu(see Figure II-5).

### 2.2.2 Topography

The elaborate geological processes, climatic patterns and changing sea levels are responsible for shaping the micro relief and major features of the landscape. Six major topographical features can be found:

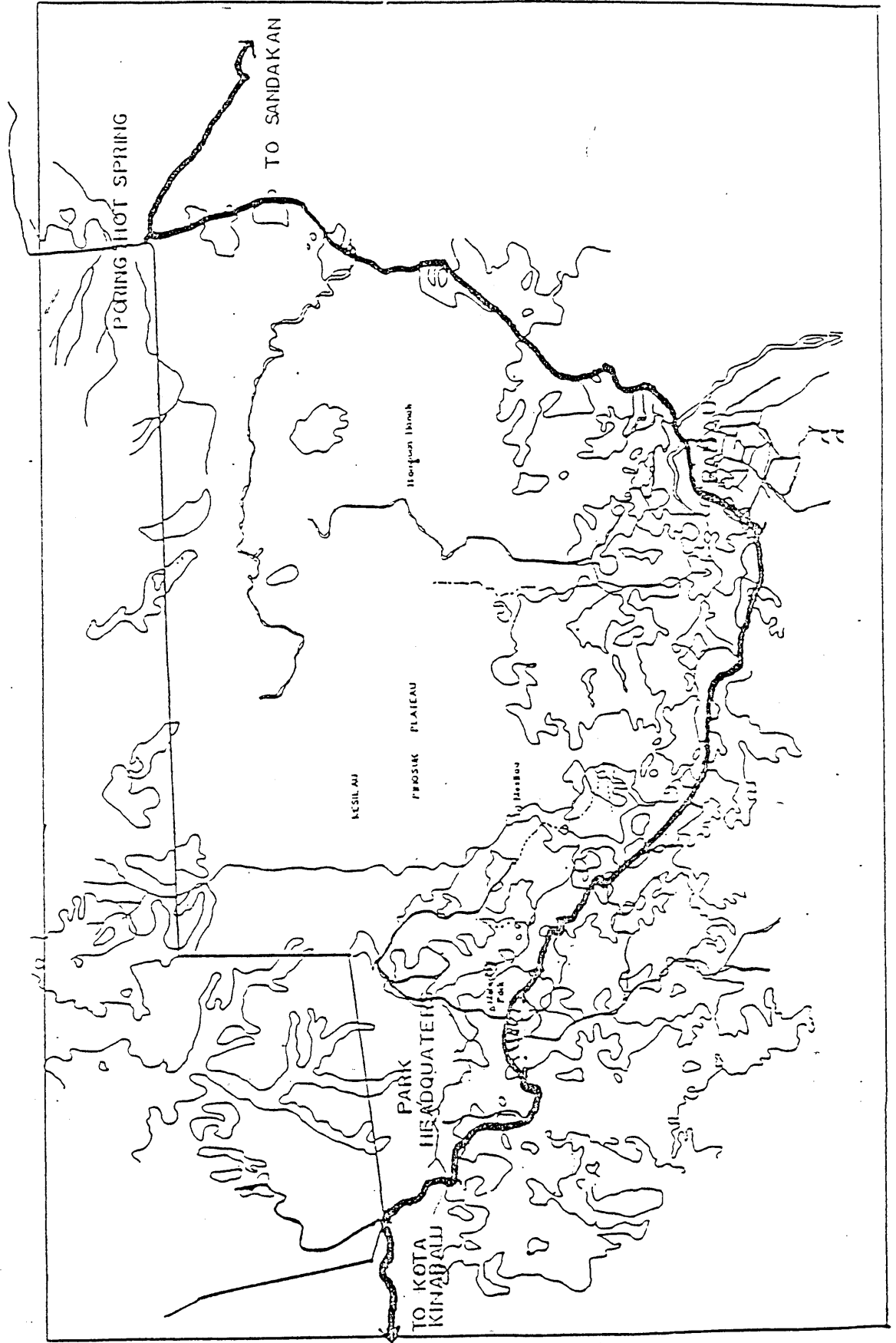
- **Peaks and Plateau**

Much of the present boundary of the Park is located above the shifting cultivation area. The granodiorite intrusion rises above the forest zone at 3,300 metres and is precipitous and accessible. Many of the pinnacles which are staggering in their grandeur mark at the extent of the original summit region before being eroded by ice during the Pleistocene period. Plateau summits and peaks of lower mountains include South Peak (3,933 m.), St John's Peak (4,097 m.), Ugly Sister Peaks (4,029 m.) and No Name Peak (3,937 m.). See Figure 11-5.

- **Gullies**

There is a spur that runs in a north northeasterly direction from the eastern end of the Kinabalu summit, which is less than 3.2 km. long, culminating in a long, narrow and jagged ridge at approximately 3,500 m. This spur encloses a deep cleft known as Low's Gully. The Gully has nearly vertical walls between 1,000 - 1,500 m.

FIGURE II-4: KEY TOPOGRAPHICAL AREAS WITHIN THE PARK





- **Rivers, Streams and Waterfalls**

Mt. Kinabalu is the source of many important rivers in Sabah. The Liwagu River flows eastward from the southern slope to join the Labuk River which drains into the Labuk Bay. The Mamut, Lohan and Langanan Rivers, all flow from the eastern side to join the Sugut River which drains into the Sulu Sea.

The Kindingan and Kinaran Rivers flow from the north side to join the Bongon River before draining into the Marudu Bay. The Kedamian River, including its lower course which is also known as Tempasuk River, flows from the north-western slope into the South China Sea. The Pegalan River flows southward of Liwagu River and along the Tambunan valley to join the Padas River before draining into the Brunei Bay (see Figure II-6).

The Main drainage in the Park Headquarters area is formed by the headwaters of the Liwagu River and its tributary, the Silau-Silau stream. Other rivers in the Park include the Ulu Sg. Penetaran, Ulu Sg. Mesilau, Sg. Kolopis and Sg. Kiibutan. Some of the better known waterfalls include the Cascade Waterfalls and Liwagu Falls.

- **Hot Springs**

The Hot Springs in the Park is at Poring. The water is now piped into several open air Japanese-styled baths. It contains sulphur which has health properties as well as curative properties for skin diseases.

- **Caves**

A few can be found in the Park. These include the Paka Caves at 3,192 m. and the tumbled bats cave at Poring.

- **Granitic Slabs**

The present vast granitic slabs are still in the process of being faked and moulded on the exposed areas by alternating heat and cold, and wind and rain thus giving rise to new sculptures. The slopes of the summit zone are characterised by larger smooth slabs.

### 2.2.3 Geology

Mt. Kinabalu, like any other major peak in South East Asia underwent all three major geological processes (volcanic, tectonic and ecstatic) to produce the elaborate geological and ecological patterns seen today (see Figure II-7 and II-7a).

The rocks which now form the Crocker Range were laid down as sandstone and other sediments in the North-West Borneo Geosyncline during the early Miocene times. With the folding and uplifting of the Geosyncline sediments 1.5 million years ago, granodiorite deep below the earth's surface forced its way upwards through the overlying rock crust, sandstone and shales to form the mountains.

FIGURE II-6: HYDROLOGY MAP OF THE MT. KINABALU AREA

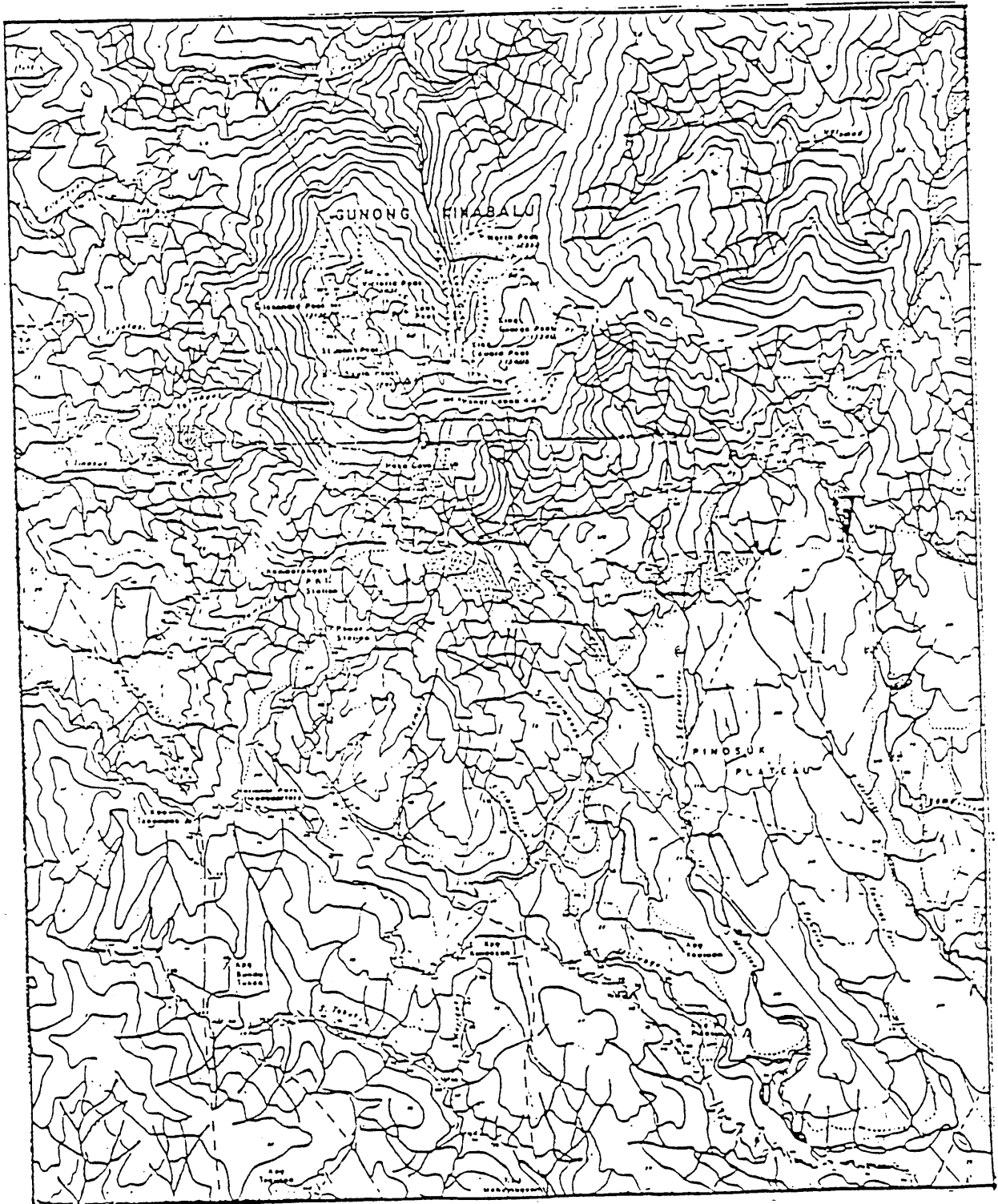
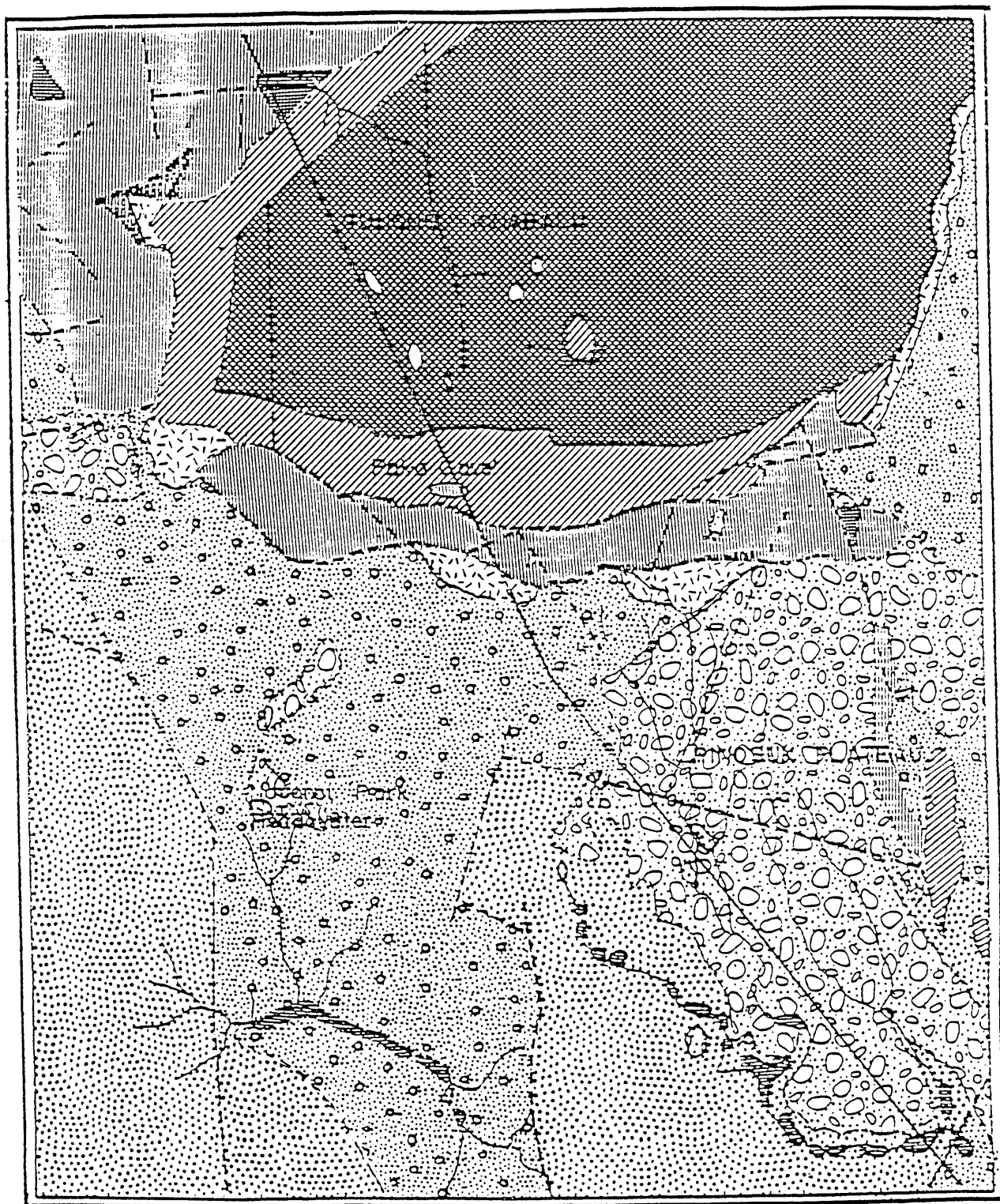




FIGURE II-7: GEOLOGY MAP OF THE MT. KINABALU AREA



## LEGEND

### SEDIMENTARY ROCKS

QUATERNARY



ALLUVIUM (Holocene): Unconsolidated boulder gravel



PINOSUK GRAVELS (Upper Pleistocene): Poorly consolidated unsorted gravel up to boulder size in a sandy to clayey matrix

TERTIARY



CROCKER FORMATION (T<sub>1</sub>a - T<sub>2</sub>d): Strongly folded and faulted sandstone, siltstone, red and grey shale, mudstone and argillite



TRUSWADI FORMATION (T<sub>3</sub>b): Strongly folded and faulted grey and dark grey argillite, slate, siltstone and sandstone with volcanics (v)

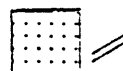
### INTRUSIVE ROCKS



Hornblende adamellite and (a) biotite granodiorite



Adamellite porphyry and porphyritic adamellite



Aplite



Pyroxene granodiorite porphyry

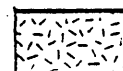


Serpentinite and serpentinitized peridotite, contact metamorphosed in part

### METAMORPHIC ROCKS



CRYSTALLINE BASEMENT: Schist and gneiss of probable Mesozoic age or older



Contact metamorphic rocks: hornfels, spotted schist, quartzite

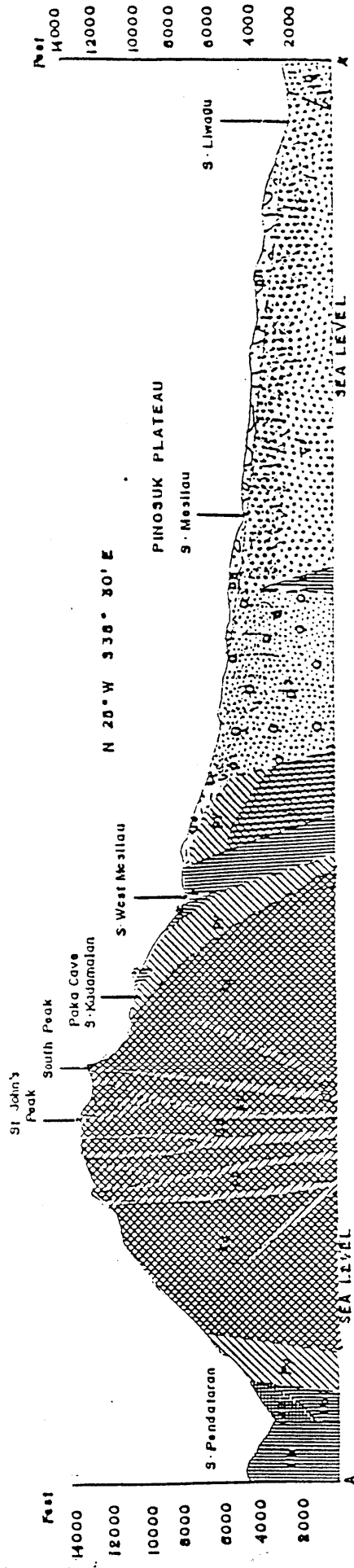
FIGURE II-7a: DIAGRAMMATIC GEOLOGICAL SECTION OF MT. KINABALU

Structural trends (inferred or conjectural)  
in intrusive adamellite and granulite  
in sedimentary and metamorphic rocks and eclogitite

S 25° E

GUNONG KINABALU

N 30° W



SECTION A - A

The summit zone of Mt. Kinabalu is the result of a rapid uplift of granodiorite pluton. The less rapid intrusion of granodiorite simultaneously resulted in the formation of the Crocker Range. Heavy rain and gales initially eroded the softer rocks. Ice and glaciers during the Ice-Age sculptured the smooth mountains to what can be witnessed today.

Evidence of these past events can be seen in the polished surfaces and moraines, cirques, grooves striations and scratches of the rocks. Constant weathering by alternative heat and cold; and wind and rain further moulds and flakes the mountain. Mt. Kinabalu is still rising at a rate of 5 mm annually.

#### 2.2.4 Climate

The climate in the Park follows regional patterns although there are some local peculiarities. Wet or dry periods may occur at any time of the year but it can be generalised that the period from February to May are the driest while October to January, the wettest. The dry months are characterised by the South-west monsoons while the wet months by the North-east. One common climatic feature is the bright early mornings followed quickly by clouding at mid-morning which obscures the mountains by mid-day, and usually brings showers to the upper slopes in the afternoon. Mornings and nights are generally clear.

The average annual rainfall is around 400 cm (see Figure II-8) with an average daily temperature of around 20 C (see Figure II-9) at the Park Headquarters (1,558 m.). At 600 m. rainfall rises to around 450 cm. while at Panar Laban (3,344 m.) the average temperature ranges from 2 - 10 C and may drop to below freezing at night. Ice too, occasionally forms on the summit zone. Poring Hot Springs at 480 metres receives around 250 cm. of rain annually with its lowland climate sufficient to give cool nights (see Figures II-9 and II-10).

#### 2.2.5 Soil

Four main categories of soils based on the main vegetation zones are found in the Park. They are as follows :

- *Lowland Forest Zone* (below 1,000 m.)

The organic matter here is well mixed into the soil profile resulting in mull humus. The soil colour is reddish brown (10 YR 5/8 when dry-Munsell) at 60 cm. depth with some evidence of mottling. This could be due to the red-coloured shales of the parent rock. The more general colour of soils on higher slopes is pale yellow. The soil in both profiles is acidic (pH 3.5 - 5.4) and with depth, there is a decrease in the concentration of metal cations such as Na, K, Mg and especially Ca, reflecting a strong leaching environment. Such leaching effects may also explain the location of the dense network of plant roots just below the litter layer where the concentration of ions is greatest.

FIGURE II-8: MONTHLY RAINFALL AT KINABALU PARK HEADQUARTERS  
COMPLEX 1987

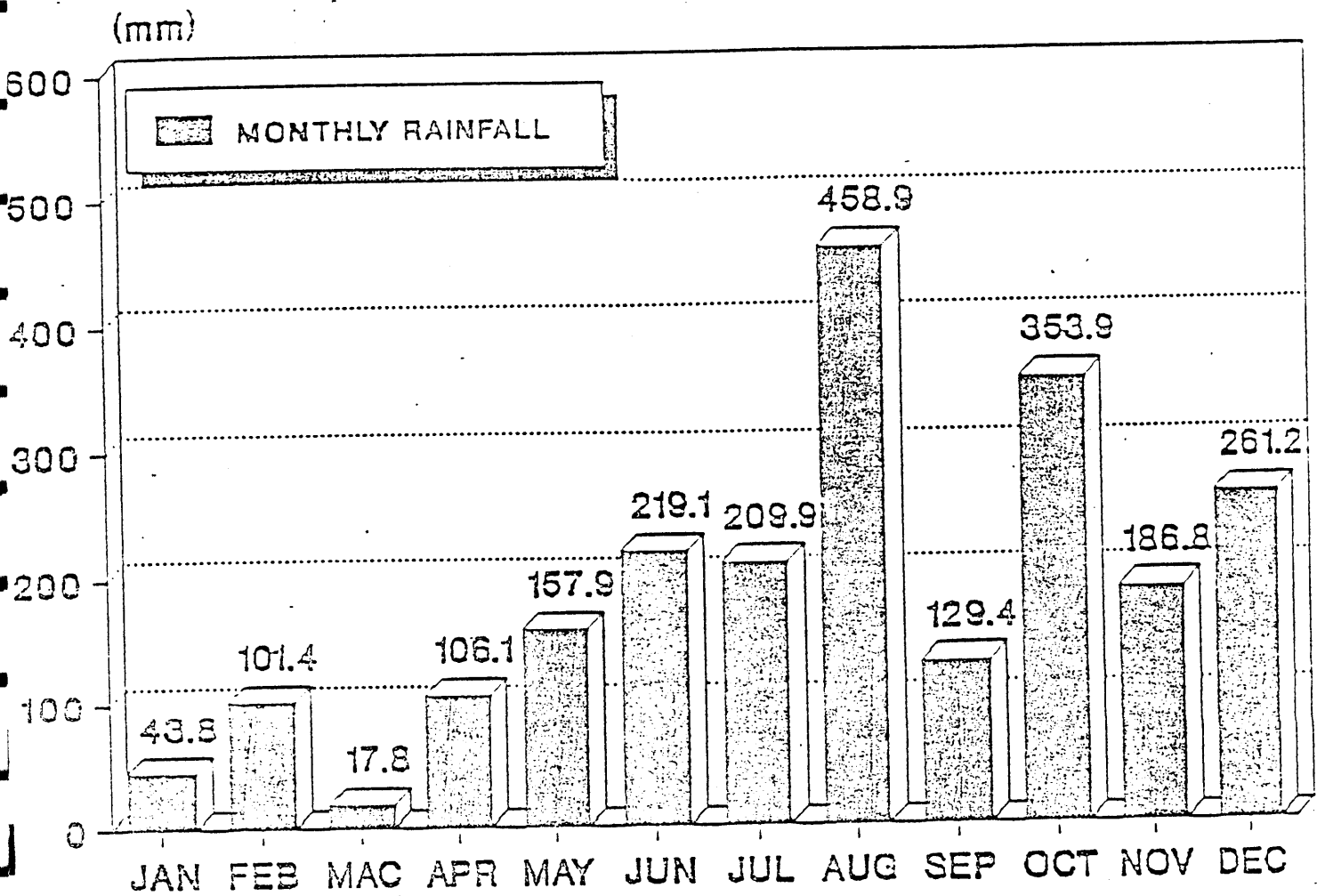


FIGURE II-9: TEMPERATURE AT KINABALU PARK HEADQUARTERS COMPLEX 1987

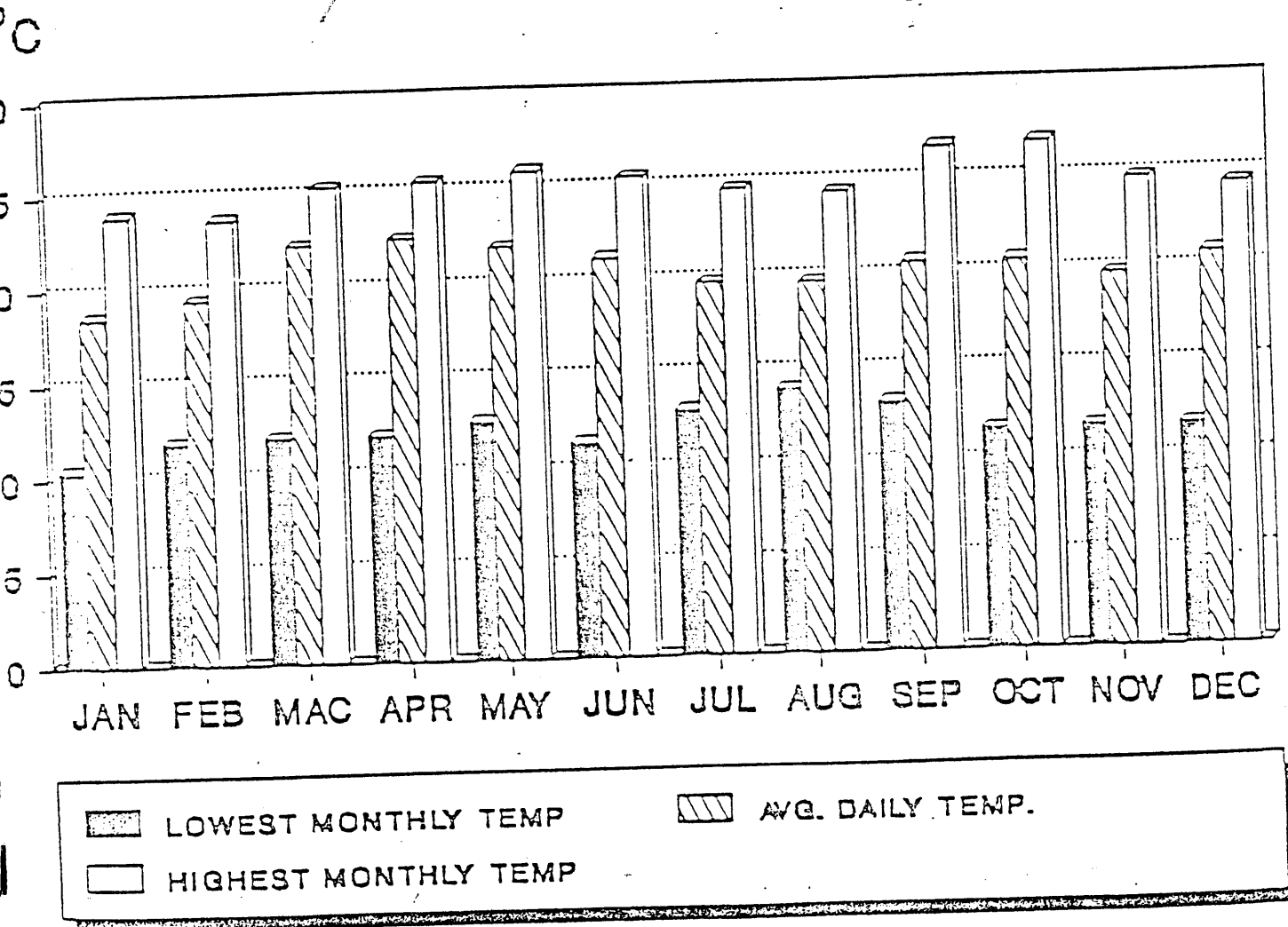
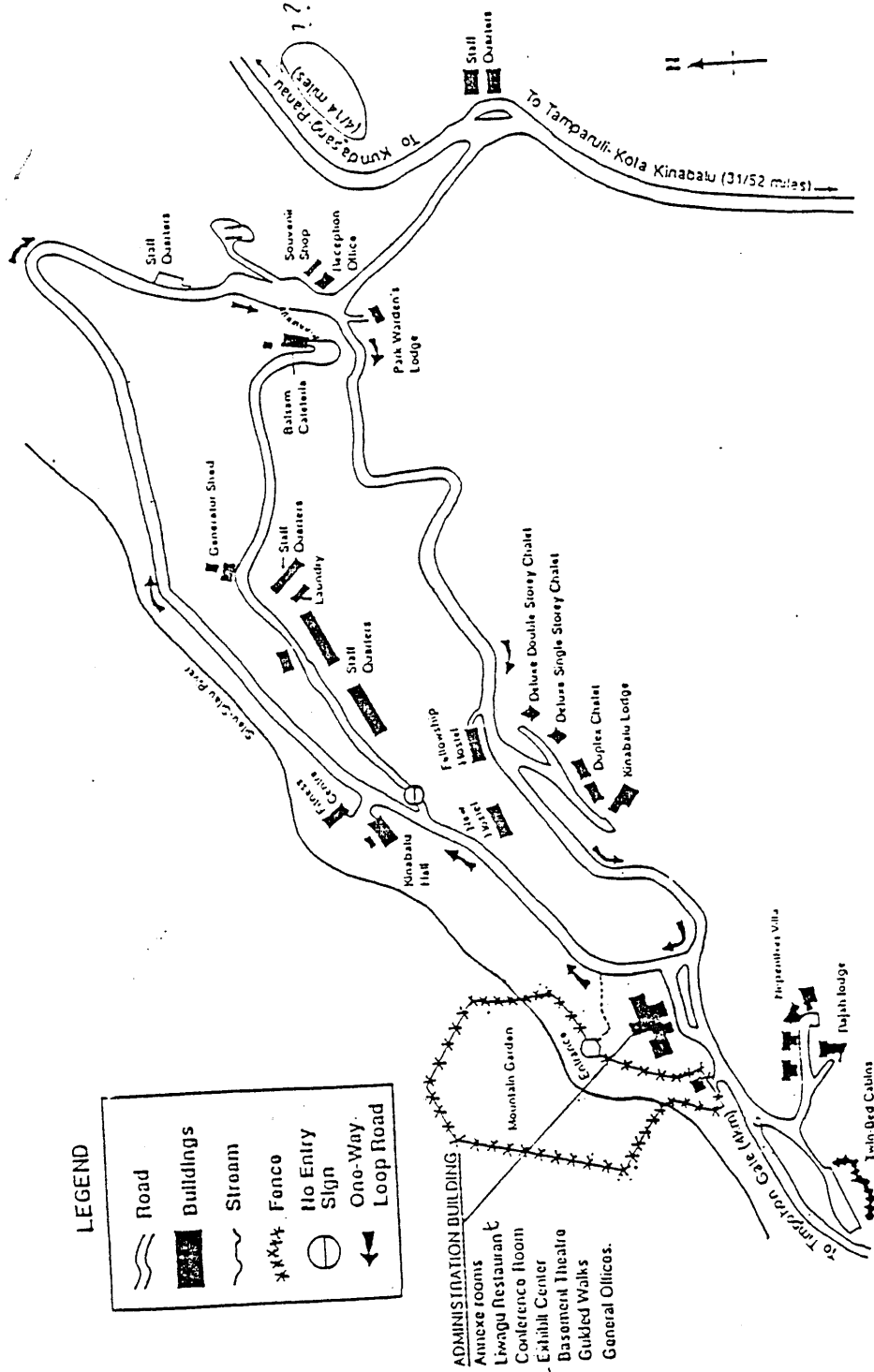


FIGURE II-10: KINABALU PARK HEADQUARTERS COMPLEX



LEGEND

	Road
	Buildings
	Stream
	Fence
	No Entry Sign
	One-Way Road
	Loop Road

- ADMINISTRATION BUILDING  
 Annex rooms  
 Luvu Restaurant  
 Conference Room  
 Exhibit Center  
 Basement Theatre  
 Guided Walks  
 General Offices.

- *Lower Montane Forest Zone (1,000 - 1,800 m.)*

A general feature of soils in this zone at around 1000 m. elevation is the accumulation of organic matter. The soil profile however, is characterised by thick mor humus at around 1,600 m. The humus layer here is sharply bonded and not mixed into the mineral soil below. Beneath this is a very pale A horizon, the colour being due to the downward leaching of iron oxides. Below this is a thin (1 centimetres) dark brown B horizon where the deposition of iron-oxides has occurred to form an iron pan. The soil at around 1,600 m. is podzolic and more acidic than at 1,000 m. Both soils in this zone developed from the same parent material.

- *Upper Montane Forest Zone (1,800 - 3200 m.)*

The extreme wetness of this zone gives rise to anaerobic soils and a build-up of peat. Peat tends to complex phosphorus and nitrogen and render them unavailable to plants. However, there is also a change in soils within this region from peat to mull humus above the cloud zone. This is evident when the mossy forest gives way to a forest of taller stature. The reason for this change could be due to the ultra basic serpentine or some consequence of the climate. The soil acidity is high (pH 3.5 - 4.5).

- *Summit or Sub-alpine Zone (3,200 - 4,101 m.)*

Between 3,150 to 3,300 m. the soil becomes very thin. Nevertheless, on sheltered parts of the summit, mull-like soils are found on the granodiorite. Just below the summit at 4,101 m. a highly granular soil composed largely of earthworm castings can be found in rock crevices. Soil is totally absent on the summit.



### 3. PATTERNS OF RESOURCE USE

The main patterns of resource use in the Park are oriented towards meeting recreational and to some extent, research purpose. Currently, recreational development in the Park are focussed at the Kinabalu Headquarters and Poring Complexes. Visitors who are avid mountain climbers converge at the Kinabalu Headquarters Complex (see Figure II-10); whereas for those who prefer other recreational activities visit the Poring Hot Springs Complex (see Figure II-11). Each of the different patterns of resource use has implications for future management of Kinabalu Park. The following sections will highlight the basic recreational activities and facilities available at both the afore-mentioned tourist centres, before proceeding to detailing the activities and facilities offered at each of the complexes.

#### 3.1 Recreational and Touristic Activities

Among the six parks managed by Sabah Parks, Kinabalu Park offers the most in terms of number of recreational and touristic facilities. The infrastructure catering for the needs of the recreationists and tourists are quite adequate and complete at present demand levels.

The facilities range from access routes, various types of accommodation, food and beverage outlets (especially at the Kinabalu Park Headquarters Complex), general supplies, souvenirs and photography services.

Scaling Mt. Kinabalu is the most popular activity in the Park. The facilities provided for the climbers are sufficient although it might be worthwhile to consider including the number of beds at overnight stops along the trail.

The need for activities and facilities varies among visitors. Kinabalu Park, at the present level of development, has been able to meet these needs but more will have to be provided as visitors' demands increase.

Recreation activities may be categorised into passive and active, and the development and promotion of such activities must be related to the needs and expectations of the client. The outcome should be satisfying and produce benefit to them and society as a whole.

##### ● Passive Recreational Activities

As for the passive activity development, the programmes that may be developed must comprise activities that are leisure-oriented and occur within the context of a relaxed and unrestricted environment. The desire of participants to escape from the hassles and drudgery of daily life must be taken into consideration and accommodated in these activities. Many sites that are situated away from the hub of other activities or remote areas may be developed into 'getaway' destinations which provide solitude and a calm environment in natural surroundings. The number of people accommodated at any one time at these sites should be controlled to ensure the quality of their stay there.



The types of passive recreational activities are as follows:

- board games (Chess, Monopoly, Checkers, etc.)
- picnics (Barbeque)
- birdwatching
- walking
- photography
- painting
- nature walk
- reading
- butterfly watching

The activities mentioned above are popular especially among the locals. Nature walks is one of the popular activities in Kinabalu Park Headquarters area due to the existing trails (see Figure II-12). Although the Park's setting is ideal for one to pursue passive recreational activities, the potential to expand these recreational opportunities is great.

- **Active Recreational Activities**

Active activity development are physical activities that are vigorous, challenging, dynamic and involve certain levels of fitness and competency. These outdoor activities involve certain elements of challenge and risk. Active activities that are to be promoted must not deviate from the Park's values and must ensure quality and satisfying outcomes. In this context the attitudes, fitness, safety code and conduct and skill development have to be emphasized and disseminated.

The types of active recreational activities are as follows:

- mountain climbing
- jogging
- hiking
- indoor sports (badminton and squash)
- rock Climbing
- repelling

The existence of Mt. Kinabalu has turned the Park into a single tourist destination. Mountain climbing and all active recreational activities related to the destination enable the visitors to explore even more.

- **Special Activities**

Types of special activities designed to cater for the listed groups are as follows:

- nature study
- interpretating activities
- wilderness explorations
- special activities (for example, those organised for the disabled). Therapeutic recreational activities require the supervision of able and qualified personnel to enable the disabled to gain more benefits. This would increase the appeal of the Park for this group of visitors.



The present land-use of areas around the Park's boundary are agriculture, settlements and mining.

Settlements can affect the status of the Park's resources and management. Illegal clearing, encroachment, or illegal removal of produce from Kinabalu Park by the villagers are common. The local communities living outside the Park's boundary has developed a close affiliation with the Park. Besides being their "backyard", they are culturally, religiously and historically attached to it.

The area that is now Kinabalu Park was once a continuous forest area linked to the Crocker Range National Park. Due to land settlements and farming, these two entities are now clearly separated. Kinabalu Park now stands like an 'island' with its own boundary surrounded by statelands. The Kinabalu Park's boundary needs proper demarcation on the ground to allow better control and management. This task requires manpower and financial planning.

Mining activities threatens the water systems and this is evident in the case of the Mamut River which flows through the Poring Hot Springs.

The status of statelands surrounding the Park at present complements the existence of the Park as a natural area. Future land-use practices should ensure that this status is maintained. Of particular concern is the stretch of stateland which lies between the Park and the Golf area in the Mesilau section.

## 4. MANAGEMENT OF PARK RESOURCES

The expansiveness of the Kinabalu Parkland area calls for skillful management of its natural resources as there is a host of activities to be planned and organised for the smooth-functioning of the Park. For instance, besides the day-to-day operational matters, the Management needs to look into Park planning and development, personnel administration, communication and public relations and commercial enterprises of the Park. In short, park management has to balance the Park's commercial pursuits whilst preserving the biological heritage so as to achieve sustained eco-development objectives.

### 4.1 Planning and Development

At present, planning exercises for the Park are conducted on an *ad-hoc* basis. However, planning and development functions, ranging from day-to-day operations and up-dating of policy statements are undertaken by an informal in-house committee. This is rather unusual for such a large park like Kinabalu which possesses a variety of natural characteristics and the potential to serve as a nature conservation as well as recreation area.

#### ● **Manpower**

The Kinabalu Park which comprises Kinabalu Park Headquarters Complex and Poring Hot-Springs Complex is managed by the Park Warden. Currently, Kinabalu Park is manned by 100 staff of which 72 are at Kinabalu Park Headquarters, and 28 at Poring; and 14 research staff at Kinabalu Park Headquarters (see Volume I, Table I - 3). The Park Warden reports to the Assistant Director of Enforcement based at Headquarters on matters relating to enforcement, projects and policy. The responsibilities of the Park Warden include :

- administration;
- implementing the functionally related enactment, policies, regulations and procedures in relation to the enforcement, public and the facilities security;
- the operation, maintenance, security, recreational and development programmes;
- management of visitors, facilities and services; and
- assisting research work in the Park.

The above responsibilities are considered to be too heavy for one Park Warden to handle. There is also insufficient manpower to assist him. In addition, the following factors must be taken into account:

- the immense size of the park which totals 753 sq km.;
- increasing number of current and future activities which include enforcement, research, recreation and services;

- external factors which pose as threats, i.e. number of tasks involved in patrolling the border against encroachment including illegal logging as well as policing inside the Park, and public relations with the locals;
- the number of existing and planned facilities and services; and
- the maintenance of facilities.

Based on the above facts, a new structure and manpower requirement for Kinabalu Park has been proposed.

- **Communications and Public Relations**

Internal communication is vital to enable the Park to effectively carry out its functions.

Currently several communication modes are employed and these include telephones, mobile phones and walkie-talkies. Communication between Kinabalu Park and the Parks' Headquarters in Kota Kinabalu is *via* telephone and mobile phone.

For climbing activities, communication is *via* walkie-talkies. Problems in communications arise after the Panar Laban Station. In a number of instances, guides have to run down to the Panar Laban station when emergencies occur.

Externally, public relations strategies including maintaining good relationship with locals surrounding the Park needs to be developed. This exercise will help to cultivate the feeling of being part of the Park and minimise illegal encroachment.

Currently, a mobile unit to educate and foster relationship with the community is staffed by the Parks personnel. An alternative strategy would be to allow trained Public Relations Personnel to undertake the exercise.

The public relations strategy and programmes under the supervision of the Park's Public Relations Unit is to assess the present status, identify the target group, and devise new programmes such as audio visual documentary and Park Open Day. It is also timely for the Park to intensify its publicity and educational programmes through the mass media at national and regional levels.

## 4.2 Management of Recreational Activities

In tandem with the objective of stepping up recreational activities in the Park, a number of activities such as management of visitors, accommodation, guides and restaurants are carried out. Kinabalu Park is adopting a progressive developmental approach towards the provision of recreational-facilities and services. In line with this, the involvement of the private sector in the development of Kinabalu Park is inevitable. Some of these services are currently privatised. The privatised operations include:

- the restaurants managed by the Park's staff cooperative (KOKTAS); and
- the guides which are mandatory for climbers.

Projects that can be planned or developed by private enterprises are contracted out. These are mainly for the construction of major infrastructures.

The total involvement of the private sector in the development of Kinabalu Park should be placed in a proper perspective. Commercialisation should be kept to a minimum and facilities at the Park should be dispersed to create a more open concept of management. Presently, participation in many of the activities in the Park is free. It is envisaged that in the future, especially in the Poring Hot Springs area, charges for selected recreational activities will have to be imposed. Careful study is required before charges are set. The policy guidelines on the subject are currently vague.

More services can be privatised through contracting-out in order to improve the services and at the same time alleviating manpower and budgetary constraints. Care should be exercised to ensure that privatisation does not run contrary to the Park's objectives and policies.

## 4.3 Management of Research, Education and Scientific Activities

Conservation of flora and fauna is a necessary part of preserving the biological future of the Park. The Park is a repository of pristine flora and fauna whereby many animal and plant species face the threat of extinction as development and deforestation continue at an alarming rate. Among the vulnerable species of Kinabalu Park that have been adequately preserved are species of the slipper orchids *Paphiopedillum*, the *Rafflesia* flower, the carnivorous plant *Nepenthes* and the temperate *Rhododendron*. Effective measures need to be taken to protect these rare and endangered species.

In addition to its importance in the conservation of biological diversity, the Kinabalu Park is also the origin of several clean, unpolluted river systems including Sg. Langanan, Sg. Kedamaian, Sg. Kidingan and Sg. Kinanran. Ecological changes or pollution affecting these rivers would have adverse effects on the recreation and research potentials of Kinabalu Park.



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Education is widely regarded as the most effective way of making a positive contribution to conservation and preservation of species or habitats within the Park. Although much of Sabah's population is concentrated in towns, they appear to have a great love for the natural history of the state. This is reflected in the increasing number of visitors to the Park and Poring Hot Springs in recent years. To some extent, the daily guided nature-walks and video shows and other nature education programmes contributed to this success.

Attempts have been made by the Park to further develop conservation education amongst people in all spheres of life. In Kinabalu Park, the initiative for the development of nature education programmes primarily rests with the Park ecologist or rangers in the form of video shows and nature walks. There is also a conservation education programme to facilitate the involvement of the locals has been set up. Currently, there is a mobile unit that regularly goes out to educate villagers on the values of environmental conservation. The right approach to conservation education in Sabah must fall within the aims of providing understanding of and love for nature. As rightly stated by a noted conservationist from Senegal, Baba Dioum : "*In the end, we will conserve what we love and we will love what we understand and we will understand what we are taught*".

It is difficult for the public to gain a real understanding of the meaning of *species extinction* or *habitat destruction*. It is much harder to expect them to understand the implications for mankind.

While the existing nature education programmes have been effective to some extent in enhancing the appreciation of Sabah's natural heritage among visitors to the Park, a dedicated conservation education for the Park goes a long way in the overall effort.

A conservation education programme for facilitating the involvement of the locals in the Park has been set up. Currently, there is a mobile unit that regularly goes out to attend an assembly of villagers for conservation education.

## 5. IMPACT OF RESOURCE USE ON THE ENVIRONMENT

The biological and physical resources of Kinabalu Park are utilised for a myriad of activities.

The more significant patterns of resource use as discussed in the preceding sections of the study lie in recreational and research activities. This will delineate the impact on the biological and physical resources from these patterns of resource use in the Park, and the Management of these resources.

### 5.1 Impact of Recreational and Research Activities on the Park's Biological Resources

#### Flora

The flora of Kinabalu Park serve multifarious patterns of resource use, the more important ones of which are for the following purposes:

- i) recreation and scenic values;
- ii) research and scientific values; and
- iii) food and medicinal values.

Patterns of use emanating from recreational activities and scientific research are likely to trigger negative impacts that will undermine the biological resources. The likely impacts stemming from main patterns of resources used as mentioned above are as follows:

- displacement effects on the plant cover caused by recreational and touristic development;
- threatened gradual loss of certain plant species endemic to the Park due to its illegal removal for research purposes; and
- displacement of indigenous plant species due to the introduction of exotic plant species for specific purposes.

#### Fauna

Activities arising from construction works, hunting for food and development of recreational and accommodation facilities will cause negative impacts on the Park's fauna. The more significant of these likely adverse impacts are:

- increased infestation by pests such as rats and mice which will pose a threat to human health as these small mammals can be reservoirs for many kinds of parasites and pathogens;
- threatened extinction of certain species of fish and mammals highly sought after as food by the locals, for example, the bearded pigs;

- endangerment of attractive species of birds caused by their illegal capture and commercial exportation and exploitation by unscrupulous wildlife traders;
- threatened loss of conspicuous species of birds caused by loud noises from construction works or music blaring from car and personal stereos;
- disturbance to the habitat of all species of amphibians, such as streams and ponds due to silting caused by the development of recreational and accommodation facilities which will pollute the river systems within the Park; and
- disruption of the natural habitat of fish due to increased suspended solid in stream waters caused by pollution and development in the peripheral areas.

## 5.2 Impact of Recreational Activities on the Park's Physical Resources

The main activities associated with recreational development are:

- forest clearance;
- recreational development involving road-building construction of tourist accommodation facilities, building of sewerage systems; and
- other infrastructure development.

These activities will possibly trigger the following impacts:

- accelerated rate of deforestation due to excessive forest clearance;
- disturbance to the habitat for flora and fauna as a result of development and construction activities;
- pollution and contamination of the Park's water systems due to silting and construction of sewerage disposal facilities; and
- increased soil erosion leading to the destruction of plant cover and disturbance of habitat.

## 6. RESOURCE DEVELOPMENT STRATEGIES

Resource exploitation by way of developing the Park's facilities and services must take into account variables including the following :

- its consistency with the Parks objectives, legislation and administration; and
- public interest, limitations of resources and economic conditions.

Thus, the Development Masterplan should be comprehensive and encompasses all aspects that represent protection and conservation of natural resources, opportunities for research and scientific purposes, enhancement of knowledge and environmental education, recreation and tourism. Additionally, appropriate management procedures must be installed.

In developing a Masterplan that will enable the Park's management to provide the various facilities and services and balances that with the perpetuation of the Parks resources and output, a course of actions related to the development activities in the Park will be recommended. With respect to this, the Masterplan aims to assist Management in spearheading the future stewardship of Kinabalu Park by forwarding five strategic development thrusts, namely :-

- Strategic Thrust One : Conserving the Biological and Physical Resources
- Strategic Thrust Two : Spearheading Scientific Research and Enhancing Educational Values
- Strategic Thrust Three : Increasing Recreational and Touristic Activities
- Strategic Thrust Four : Preserving Cultural and Historical Values
- Strategic Thrust Five : Instituting Management Procedures to Support Other Strategic Thrusts

Details of the Strategic Thrusts and associated recommendations and implementation plans are discussed in the following sections .

### 6.1 Strategic Thrust One: Conserving the Biological and Physical Resources

Natural parks serve as a sanctuary for rare and endangered flora and fauna. Parks play an important role in ensuring perpetuity of the natural heritage and maintaining their natural state. Conservation efforts are thus necessary for the survival of the flora and fauna, both at the specific and habitat levels. In line with this, Kinabalu Park can be established as a reference center for research on tropical flora, fauna and biological diversity.

Conservation strategies for plants and animals can be based on the following three percepts:

- definition and scientific understanding of plant and animal species;
- identification of factors threatening the continued survival of the species and their habitat; and

- organisation of resources to address both the protection and stewardship of rare and endangered species from further disturbance.

The conservation strategy adopted must be based on a sound understanding of the protected plant or animal species. Among the reasons why the Kinabalu Park management must focus their efforts on the conservation of rare and endangered species are:

- many of the rare and endangered plants of Kinabalu Park are narrowly endemic or reduced in range and so face serious threats to their survival;
- due to small populations and number of individuals remaining in the Park areas, conservation and management of rare and endangered species must be undertaken with utmost caution. This situation allows little margin for error;
- there is a general paucity of published literature on the biology of rare species. For example, the *Rafflesia spp.* of the Poring Hot Springs area is poorly understood in terms of its life-history, characteristics, generic variation and reproductive biology.

It must be recognized that rarity is not synonymous with endangerment. A rare species may not necessarily be endangered as well. For example, many plant or animal taxa that are restricted in range or habitat type on the montane zone of Kinabalu may be numerically rare but they are reasonably well protected because they occur in areas that are managed for conservation. Thus, some plant species such as *Rhododendron*, *Lithocarpus*, *Weinmannia*, *Rhamnus*, *Symplocos*, *Magnolia* and numerous orchids that occur in the montane zone (3,000-8,500 m.) may be relatively rare to this region, but they are not in any way threatened or endangered. Conversely, some species that are to date known only to occur in at least 33 different sites within and around Kinabalu Park, must be high on the list of priority species of concern because they occur in many isolated lowlands not within the conservation area of the Park and are thus highly vulnerable to forest clearance and other human activities.

The recommendations under strategic Thrust One are as follows:-

#### **RECOMMENDATION 1: To Preserve Habitats Harboursing Rare Plant and Animal Species**

Although threats are themselves complex and difficult to characterise, the decline of species is generally caused by a combination of several basic threats;

- destruction or conversion of habitat (for example, degazettement and partial destruction of Bukit Hempuen);
- competitive exclusion by invasive species or succession (for example, introduction of exotic plant species to the areas around Poring Hot Springs and Kinabalu Headquarters).
- clearance of primary forest for development which may deplete the host plant (for example; *Rafflesia spp.* host, *Tetrastigma vines*).

- destruction of individual plants or populations by disease, foraging or collecting (for example illegal collection of slipper orchids by poachers in Kinabalu Park).

In the conservation of habitats, identification and evaluation of the conditions and status of the habitats has to be urgently carried out.

Habitats can be classified according to whether they are viable, fragile, disturbed, degraded, damaged or doomed. Improvement, modification, conversion or retention of certain types of habitats should be carefully planned and preservation or development can be carried out accordingly.

The ecological system of specific areas in which the functions are performed naturally needs to be maintained at all times. Measures such as pollution control, maintenance of ecological processes, waste management, control of user behaviour and other related activities which may influence the natural resources and surroundings must be taken.

Once the threats to the species being protected has been clearly determined, there is a need to assess all the resources available for conservation. It is of little use from a conservation standpoint to prioritise the species of concern and threats if there are insufficient resources to carry out a conservation plan.

#### **Implementation Plans for Managing Threats**

- Visitor flow into and within the Park will be managed and determination of carrying capacities used in the classification of visitor intensity-use zonal units.
- There will be restricted public vehicle access and access routes will be identified for overnight residents in the park.

Protective legislation, rules and regulation, enforcement procedures and guidelines must be designed for the effective protection of natural resources and other park properties. Stations or posts for enforcement are proposed at strategic locations at Kota Belud and Serinsim.

These stations will be manned by park officials or rangers at all times. Patrols and inspections of park boundaries should be carried out regularly and reports sent to the Headquarters. Offenders must be apprehended, brought to justice and penalised. Any illegal activities must be stopped at the initial stage. Enforcement officers and rangers must be trained in law enforcement and court procedures to carry out their duties more effectively.

Conservation guidelines must be formulated to monitor the status and extent of the threats to the Park's resources. Potential sources of impacts that are bound to occur within and adjacent areas have to be identified. Cooperative actions and agreement between agencies/institutions that are associated with the problems have to be sorted out and implemented.

Meetings, workshops and seminars can be conducted and those involved must be invited so that their input and views can be taken up. Opportunities of involvement should be extended to the agencies and public to review any decisions of any management or development plan.

Studies will have to be carried out to determine the availability of food, water and adequate habitat to support the populations. Rules and regulations regarding the use of pesticides and herbicides must be drawn up while recognising that populations of native insects and weeds should be left alone except where outbreaks become serious and control is imminent. The assistance of the Wildlife and Forestry departments should be sought before this *in-situ* conservation work is started.

Any proximate contact between man and nature can cause changes to the species or its habitat. Different species or habitat have different tolerance levels to disturbance. Traditional approaches to the conservation of rare species or habitat in parks have generally relied on the zoning of specific areas.

*Proposed Objectives of and Practices in Preserving the Habitat Harboursing Rare Plant and Animal Species*

The objectives of management for preserving the habitat harbouring rare plant and animal species include:

- to protect the habitat of the Park's flora and fauna by maintaining a policy on forest clearance such as:
  - determining the extent and size of clearings for development;
  - maintaining an appropriate buffer vegetation between high density development areas and the natural forest area;
- to identify species unique to the Park by zoning the sites and also to reduce the need to introduce exotic species;
- to curb smuggling or illegal removal of certain plant species;
- to control the introduction of exotic species by providing an approval list of exotic plant species;
- to enforce regulations banning all forms of hunting in the peripheral areas of Kinabalu Park;
- to impose strict regulations forbidding any form of fishing in the streams or rivers within the Kinabalu Park's boundaries; and
- to impose strict rules and regulations ensuring that noise from construction works or music blaring from car and personal stereos be kept to a minimum in the Park, especially in the early mornings when the birds go to the forest fringes to feed.

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**RECOMMENDATION 2: To Develop a Comprehensive Zone Map for Specific Conservation Efforts.**

For the purpose of conservation of rare or endangered species through zoning, the biological importance of land areas is the prime consideration. This consideration overrides any other qualities of the area, if the plants and animals found there are high on the list of priority species of concern.

Through zoning and comprehensive mapping, areas are evaluated and classified. The areas will range from intensive visitor-use to fully protected natural areas. For each of the zones specific management practices, prohibitions and permission to use are to be adopted. For easy location and identification, zones should also have ecological boundaries.

Where possible, a buffer zone surrounding the Park should be established to serve as a physical barrier to filter out adverse external influences. This may extend beyond the Park's boundary.

Tentative "zonal units" within the Park have been identified for the purpose of this Masterplan. They have been drawn according to the diverse resource values and potential use to meet different expectations. The zones are not mutually exclusive. Within a zone may lie other opportunities as well. For instance, opportunities for wilderness experiences are made possible in areas designated as "wilderness areas" where there also exists zones of scientific values. The zonal units are a description, rather than a determinant, of the objectives and management procedures proposed for the area. They are a means of providing clearly separated objectives in different parts of the Park, which would otherwise be in conflict if they were adopted for the same area. The zonal unit approach is no more than a systematic framework for managers to make decisions about operations in the area and how it should be used.

There are special values associated with some rivers and streams within many different zonal units of the Park. The few rivers that have not been affected by water supply development are valuable for their nature conservation values, aquatic life and recreational opportunities. The following major rivers and their tributaries within the Park fall into this category :

- Langanan River
- Lohan River
- Kindingan River
- Kedamian River
- Pegalan River

In addition, the untouched headwaters of the streams are particularly valuable. Other rivers and streams within the Park, although modified, have important recreation opportunities downstream.

Management objectives and practices in the various units involved will reflect the special values of the rivers and streams within the Park. The protection of the wild and scenic character of the rivers and streams, and protection of native species of aquatic flora and fauna will be emphasised in the development programmes.



Two categories of zonal units are recommended; first, units with outstanding natural scenic values; and second, wilderness areas. For both units, proposed management objectives and practices are outlined.

**RECOMMENDATION 3: To Designate Zones Possessing Outstanding Natural and Scenic Values and Adopt the Proposed Management Objectives and Practices.**

The protection of areas of outstanding scenery that remains in a relatively undeveloped state is a primary responsibility of Sabah Parks. The natural qualities of these areas are a significant attraction for visitors and as such, require special management if their outstanding character are preserved (see Figure II-13).

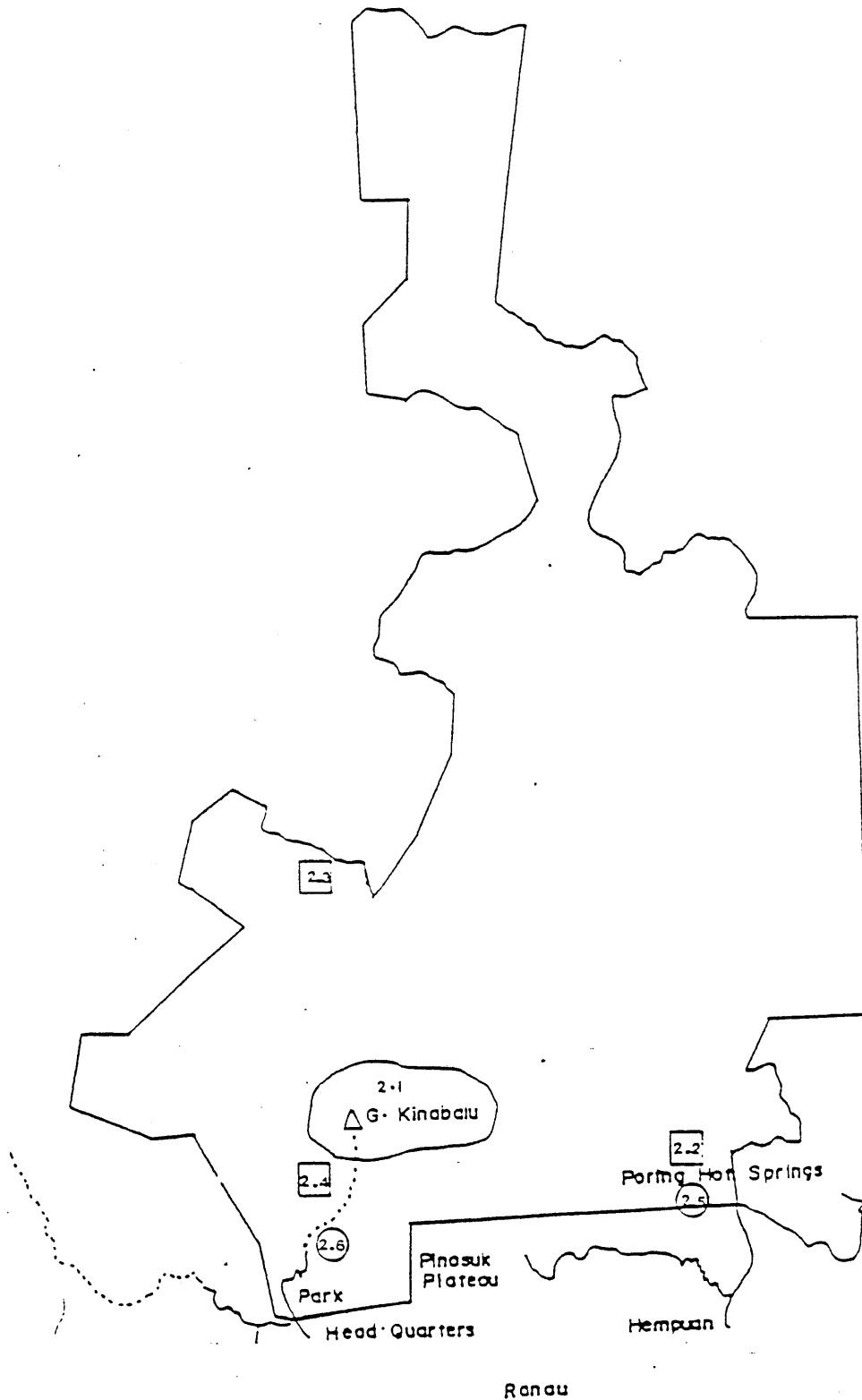
Kinabalu Park possesses several unique features. Mt. Kinabalu with its granitic outcrops is considered a young mountain but its geological features is unique to the park and the ASEAN region. It is also well known that the mountain area is a meeting place of the Australian and Himalayan flora. It possesses all the five altitudinal zonation instead of the common four found in other parts of the world.

This Masterplan identifies four zonal units and the principal natural values as shown in Table II-2.

**Table II-2: Zones of Outstanding Natural and Scenic Values**

Reference on Zone Map	Zonal Unit	Principal Natural Values
2.1	Granitic Outcrops	Outstanding natural scenery (montane, submontane and peaks) montane vegetation and geological forms.
2.2 2.3 2.4	Waterfalls	Outstanding natural scenery, tropical rain forest vegetation.
2.5	Poring Hot-Springs	Unique underground geothermal spring.
2.6	Summit trail	Outstanding natural scenery, altitudinal changes of vegetation types and geological formations

FIGURE II-13: ZONES POSSESSING OUTSTANDING NATURAL AND SCENIC VALUES



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*Proposed Objectives of and Practices in Zones of Outstanding and Scenic Values*

The objectives of management for the zones of outstanding natural and scenic values include :

- to preserve and protect the unique or outstanding scenery or natural phenomena of the Park;
- to allow natural processes to continue with as little disturbance as possible;
- to protect the communities and/or habitat of rare or endemic plants and animals from disturbance;
- to protect sites of geological and geomorphological significance, and other scientific sites from disturbance;
- to protect features of outstanding cultural and historical interest from man-made intrusions;
- to maintain the cool and green environment of the area;
- to harmonise the necessary man-made structures, design, materials and construction method with the natural surrounding;
- to encourage research into the unique or outstanding natural features and processes of the areas;
- to provide visitors with opportunities to enjoy and understand the outstanding scenery and natural features; and
- to provide for forms of recreation activities which are compatible with the above objectives.

The proposed management practices will include:

- protection of scenery, natural features and processes from disturbance;
- identification and protection of specific areas of special or prehistoric importance;
- encouragement of research which is consistent with the Park's research guidelines;
- monitoring the natural conditions and processes in the area, the level and effects of use;
- rehabilitation of disturbed environments to a stable state as close to natural conditions and in which natural processes continue without disturbance;
- control the introduction of exotic plants and animals;

- 
- stimulate visitor awareness of the natural and cultural values of the area through effective interpretation programmes;
  - conduct public education programmes and forge their co-operation with the objective of mitigating the impact of recreational activities in the area;
  - ensure that all developments both within and beyond the zones will not result in adverse impact on the quality of the resources by instituting control procedures and ensuring its consistency with specific zonal objectives;
  - rubbish will be disposed off only in properly serviced bins. Interior park users will be encouraged to carry out their rubbish;
  - provide an alternative climbing trail for Mt.Kinabalu on the eastern side of the mountain;
  - identify and declare areas having outstanding scenic and natural values as World Heritage Areas;
  - safeguard and protect the environment from abuses by stepping up border patrols and enforcement;
  - identify alternative routes to the Park to redirect traffic from existing roads by large vehicles; and
  - curb pollution of water systems by redirecting water discharges and disposals.

**RECOMMENDATION 4: To Designate Zones Possessing Wilderness and Conservation Values and Adopt the Proposed Management Objectives and Practices**

Wilderness is a cultural concept, not a place, and thus extremely difficult to define with any precision. The more common themes and ideas of wilderness include:

- solitude in natural setting;
- perception of isolation from habitation;
- perception of spaciousness;
- perception of a landscape and ecosystem that are relatively undisturbed by man-made intrusions;
- recreation in a relatively large expanse of undeveloped area;
- preservation of plant and animal communities, land form and other features; and
- scientific research into natural features and environmental processes.

Kinabalu Park has the potential to provide some if not all of the above concepts of wilderness. For the purpose of this plan the "wilderness" areas are very large areas having the main elements of wilderness value.

Table II-3 and Figure II-14 shows the wilderness areas in Kinabalu Park.

**Table II-3: Zones of Wilderness**

Reference on Zone Map	Zonal Unit
4.1	Templer Extension
4.2	Eastern Tip of Kinabalu Park
4.3	Eastern Plateau of Kinabalu Park
4.4	Low's Gully
4.5	Mount Tembuyukon
4.6	Western Tip of Kinabalu Park
4.7	South-Western Tip of Kinabalu Park

*Proposed Objectives and Management Practices*

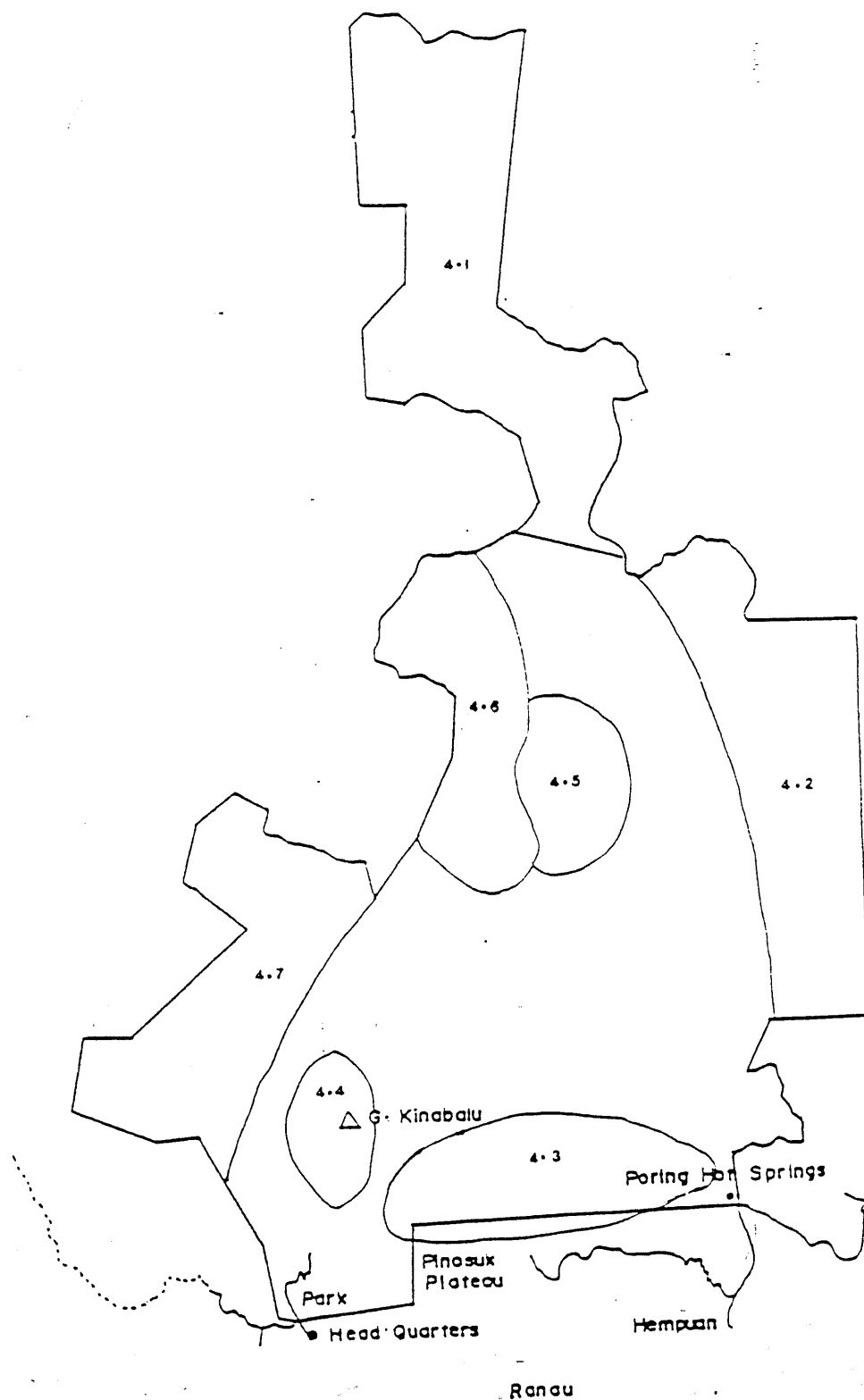
The designation of a zone as a wilderness area are as follows:

- to maintain the opportunities for wilderness experiences in a relatively large area;
- to ensure low use of the wilderness areas especially in unknown areas; and
- to set in perpetuity a certain percentage of the Park as wilderness areas.

The following are the proposed management practices for the wilderness areas:

- conduct of periodic well-planned expeditions especially into areas still unknown, in order to collect selected natural resources data. In the long run, a comprehensive data bank will be built up to cover all the designated areas;
- restrict entry of visitors;
- identify specific sites for overnight camping;
- identify trails of several different distances and walking time suitably dispersed within the area;
- implement guidelines for visitors entering the wilderness to ensure appropriate dispersal of users;

FIGURE II-14: ZONES POSSESSING WILDERNESS AND CONSERVATION VALUES



- 
- produce good topographical maps of the designated wilderness area for management operation purposes and convenience of the users;
  - implement habitat management and wildlife conservation programmes;
  - zoning of the Park areas will be used as a tool to create management entities;
  - banning of activities that conflict with opportunities for wilderness experience;
  - freeing wilderness areas from signs, trail makers and other implements;
  - managing operations by foot unless under exceptional circumstances;
  - rehabilitation of essential management trails and other disturbed sites to as near a natural condition as possible, consistent with the need to utilise them periodically for essential management operations; and
  - banning motorised transport (including aircraft) except for essential management or rescue operations.

**RECOMMENDATION 5: To Carry Out *In-Vitro* Conservation and Multiplication of Endangered Plant Species**

There is an urgent need for Sabah Parks to become seriously involved with conservation through the cultivation of rare and endangered species. The management must attempt to organise the stewardship efforts along the same lines as conservation where energies are concentrated on those species and ecosystems that are more endangered.

Especially critical at this moment are the Kinabalu slipper orchids. In recent years, there have been several exciting discoveries of new *Paphiopedillum spp.*. If seeds are collected instead of plants, it will not take long to raise many thousands of seedlings yet, unscrupulous collectors have been known to enter Kinabalu Park and destroy wild populations of *Prothschildianum* from their only known locality within the Park. The Park management must convince these illegal collectors that their financial rewards would be even greater if they protect the wild resources and use it to develop strong young seedlings for exports.

Positive efforts must be made by Sabah Parks at the international level for cooperation and contribution to orchid conservation. For example, technology transfer of tissue culture techniques for slipper orchids must be initiated. Outside laboratories can share their expertise with Sabah Parks to develop the facilities locally. Once it is possible to propagate large quantities of rare species of orchids in the laboratory, wild populations will remain untouched. It should also provide the possibility of reintroducing rare orchids successfully propagated in the laboratory into its original habitats.

To implement this recommendation, it is proposed that:

- a set of procedures be enforced for the collection of plant specimens within the Park;
- special attention to be paid to poaching problems;
- wherever possible, the local population should be engaged in park management activities; and
- there will be protection against the introduction of exotic species of plants and animals and if this is necessary, it will be restricted to certain identified areas only.

#### **RECOMMENDATION 6: To Establish a Biological Data Information System**

Biological resources that are identified and enumerated can be filed and stored in the Data Information System which is a centralised data bank, set up for fast and effective data processing and retrieval. Data collected must be readily available for utilisation at all times. The list of flora and fauna, for example could be categorised under the headings of extinct, endangered threatened, rare or common species. The CITES list of flora and fauna is recommended for adoption.

### **6.2 Strategic Thrust Two: Spearheading Scientific Research and Enhancing Education Values**

The potential for furthering research and educational activities in Kinabalu Park is immense and as it is, a great deal more indepth research needs to be encouraged. The thrust for spearheading research and educational activities are premised on the following objectives; viz :

- to determine a clear direction for research by formulating comprehensive guidelines;
- to encourage and train Park personnel to conduct research;
- to identify priority areas and explore new research areas;
- to zone selected areas for intensive research;
- to determine the effects of research activities on the flora and fauna diversity;
- to establish more research stations;
- to further enhance research in taxonomic and botanical research and use; and



- to improve conservation education by developing the following aspects:
  - park interpretation;
  - park relations;
  - park interpretative strategies and programmes; and
  - outdoor recreation education.

#### **RECOMMENDATION 7: To Identify Priority Areas of Research**

Several research needs and data gaps became evident during a survey of research aspects done in Kinabalu Park to date. The research needs includes:

- the relative ecological consequences of different vegetation types dominating the western and eastern slopes of Mt. Kinabalu. The studies include evaluating effects on rate and composition of plant re-colonization, animal population, and watershed management;
- the implications of biological diversity on the humid lowland ecosystems at Poring, the oak-forest around the Kinabalu Park Headquarters and the mossy forests of the montane zone as a result of intensive management, development and recreational activities;
- evaluation of the population dynamics of potential predators, pests and competitive species, including those which might respond to changes in forest age, structure and composition. Ecological effects resulting from the introduction of exotic plant species which may suppress the indigenous species is another area of concern;
- total-system nutrient budgets, including estimates on rates of weathering, leaching, runoff and removal of biomass;
- evaluation of the effects of Park management practices on physical, chemical and biological properties of the soil; including impact on soil micro-organisms involved in nitrogen cycling, soil structure and plant nutrition;
- the relationship between management practices on water quality (water chemistry, turbidity, suspended solids, temperature, etc) and water yield, including impact on the total amount, seasonal distribution, and rate of return to the initial condition;
- identification and evaluation of management problems in relation to its three major functions; viz research, education and recreation. Of particular interest is the development of management strategies of natural resources and its scientific values; and
- the implications of the Park's conservation objectives in relation to the promotion of recreational and educational activities. Identification of Park's unique biological components for interpretative programmes and educational purposes.
- reproductive biology of birds, fish and the invertebrate fauna (such as butterflies);

- behavioural studies and distribution (both altitudinal and local microhabitat) of frogs;
- reproductive biology of 16 species of bats and their role as pollinators;
- educational research in the biological attributes of the fish species, *Gastromyzom*;
- documentation of geological and geothermal characteristics of Poring Hot Springs such as its formation structures, rock types, self-guided trail pamphlets on geological features and the interpretation of hot springs formation; and
- identification of location of mineral deposits and areas that are prone to degazetment for mining purposes; and location suitable for interpretative geological study programmes.

**RECOMMENDATION 8: To Compile and Analyse All Research Materials on Kinabalu Park.**

Although much field research has been conducted in Kinabalu Park, the results are widely scattered in museums, private collections, publications or filed away in Sabah Parks. This prevents Sabah Parks from effectively utilising existing information, key answers pertaining to conservation needs, or data gaps in baseline knowledge of the Park's resources. The potential ecological impact of visitors, infrastructural development and recreational activities either do not exist or are not easily accessible. This information gap has become increasingly evident in recent years as more accommodation and recreational facilities continue to increase at an unprecedented rate around the Kinabalu Park Headquarters, the Panar Laban Resthouse sites and Poring Hot Springs. The management has little prior experience to guide them in predicting the impact of the changes currently taking place. Some of the data gaps may be filled by on-going research projects carried out by individual scientists and students who have worked on many aspects of the Park's fauna and flora in the past. These studies might not provide the final answers but could give some guidance in handling potential problems.

**RECOMMENDATION 9: To Train Park Research Personnel**

Presently, the Sabah Parks Authority does not have the resources to conduct research. Over-dependence of the Park on external researchers and inputs can be disadvantageous in its effort to obtain relevant scientific information useful for management. Further, with outside involvement, there is no absolute way of ensuring that all biological specimens collected from the Park will eventually be deposited in the Park's Herbarium or Museum. Sabah Parks management is encouraged to introduce a separate scheme for the training of technical staff (park ecologists, rangers etc.) and to effectively strengthen the Research Division.

**RECOMMENDATION 10: To Solicit Funding and Sponsorship of Research**

Research work is expensive. However, many international agencies and foundations have expressed concern and shown interest in financing research on many aspects of tropical forest biology in Borneo. Sabah Parks' management is

encouraged to seek research funds from such organisations and establish a research "chair" to be conferred upon distinguished researchers interested in carrying out studies in the Park.

**RECOMMENDATION 11: To Initiate Research Collaboration with Other Institutions**

Due to the acute shortage of research personnel at the Park, collaborative research programmes with other interested agencies (Universities, Museums, Herbarium and research institutes ) must be initiated , particularly in the priority areas identified in Recommendation 7. Joint scientific expeditions to different areas of the Park must be regularly organised to encourage broader participation and generate interest in doing research within the Park.

**RECOMMENDATION 12: To Form a Committee for Kinabalu Park Research**

To ensure research in the priority areas and at the same time, accelerate the growth of the Park's Herbarium and Museum to attain international standards, a Committee to oversee all research activities within the Park is proposed. The Committee will comprise representatives from government agencies , universities and research organisations. The major responsibilities of the Committee include :

- to ensure that the approved research programmes are in the categories of research priorities of the Park;
- to ensure that research outputs are documented in an organised form that is easily accessible and retrievable for management purposes;
- to establish guidelines for the deposition of research specimens in the Park;
- to provide a channel through which research funding can be requested and awarded to competent researchers; and
- to promote and enhance research activities among local scientists and students.

**RECOMMENDATION 13: To Implement Guidelines for Research Collaboration and Specimen Collection**

It is recommended that Sabah Parks clearly establishes a set of guidelines for research collaboration and the use of specimen collections housed at the Herbarium or Museum. The detailed requirements and criteria to be considered when formulating the guidelines include :

- **Research Collaborations**
  - research scientists wishing to conduct studies in Kinabalu Park must forward a written request outlining their projects and needs to the Director;
  - visiting scientists are required to include at least one local collaborator from within the Park's research staff ;

- 
- research scientists using the Park's equipment and facilities will at all times be responsible for any damage or loss during the period of use;
  - the Park will not provide any expendable items (eg.chemicals) not explicitly referred to in written agreement with the researcher;
  - all research publications resulting from studies carried out in the Park should give proper acknowledgement for the use of facilities and/or specimens. Where a member of the Park assisted in the research he/she should be opted as co-author in the published research work. Two copies of such publications must be forwarded to the Director of Sabah Parks; and
  - all studies must have the prior approval of the Parks before publication.

- **Specimen Collection**

- all specimen collections from the Park must be made in accordance with Federal and State laws and regulations;
- a duplicate of every locally collected species or specimen must be deposited in the Park's Herbarium or Museum. In the case of unicate specimens at least 50 per cent should be deposited with the Park;
- the Park must be informed of all photos, recorded audio and visual materials, maps etc. produced during the study. Appropriate copies may be requested for deposit with the Park;
- the Park has the right to determine specimens that cannot be removed from the Park or shipped out of Sabah;
- any shipment of specimens or materials must have the prior written consent of the Director of Sabah Parks. The Curators of Herbarium or Museum will advise the Director on such matters; and
- the visiting research scientists shall bear the cost of the shipping of any personal specimens. The Park will bear the costs for shipments of donated specimens, specimen exchange or for identification purposes.

**RECOMMENDATION 14: To Establish Field Study Centres in Areas of Scientific Values**

Kinabalu Park provides special opportunities for scientific research due to its unique geological features and diverse flora and fauna. Despite these features of special scientific significance, a large proportion of Kinabalu Park remains to be explored, researched and documented, particularly the eastern portion of Mt. Kinabalu. Since research is one of the important components of management of Kinabalu Park, appropriate areas in the Park should be set aside for research. These areas must have special scientific value which represent important ecosystems and harbour special flora and fauna in Kinabalu Park. Table II-4 identifies three specific areas (see Figure II-15) deemed suitable to be set aside for the purpose of scientific research.

**Table II-4 Proposed Areas of Scientific Value Within Kinabalu Park**

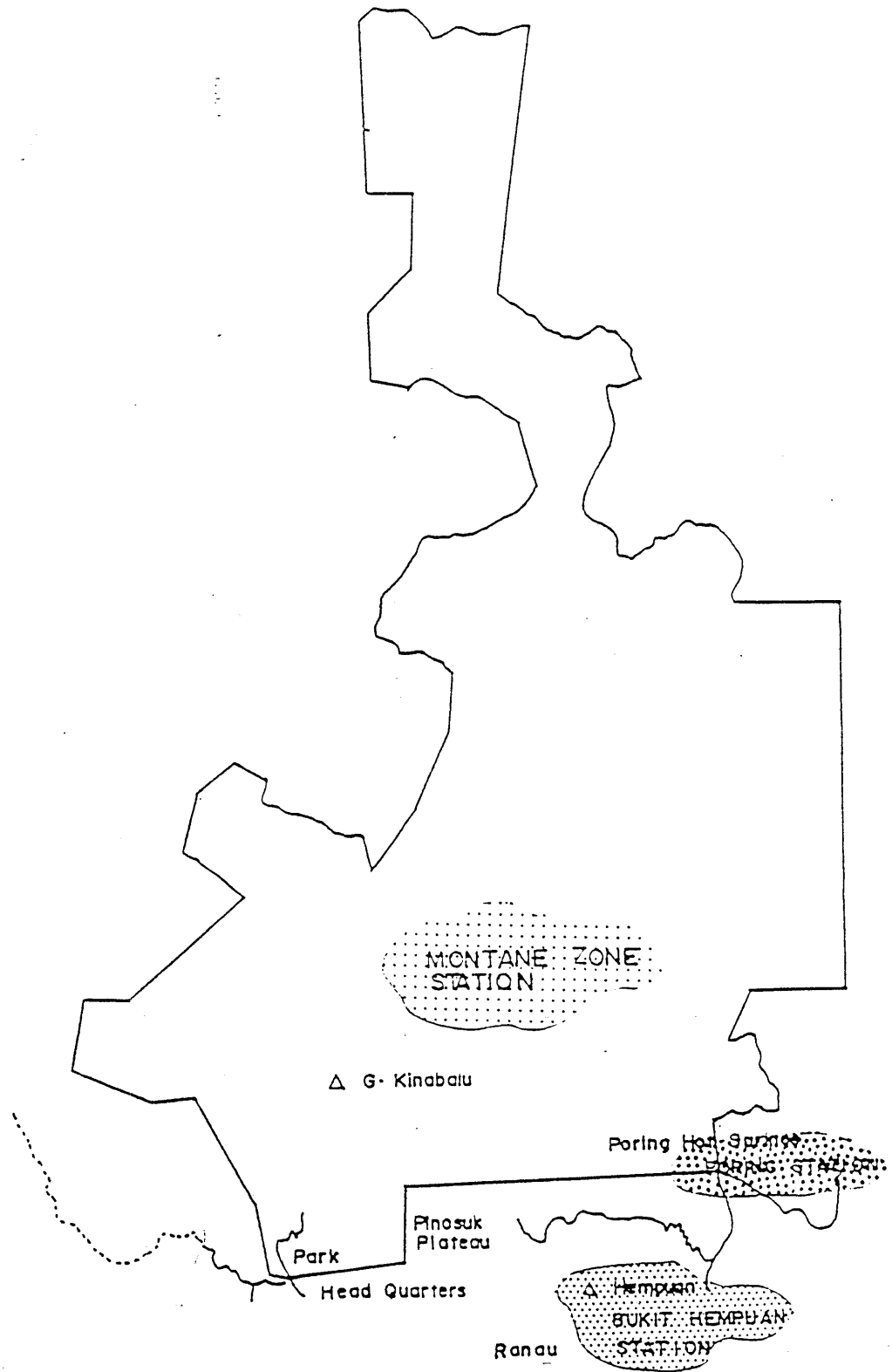
Area Description	Outstanding Scientific Value
Bukit Hempuen	Endemic plant species found on ultrabasic outcrop.
Montane Zone (2,469 - 3,084m)	A plethora of <i>Nepenthes sp.</i> exist in this zone including <i>N. rajah</i> , the largest species within the genus.
Poring Canopy walkway and surrounding areas (lowland forest)	Epiphytes and faunal communities in the canopy; several known <i>Rafflesia</i> sites on the ground.

The Sabah Parks management is encouraged to develop the three areas of scientific value as an educational resource, to be known as (i) Bukit Hempuen Field Research Station, (ii) Montane Zone Field Research Station and (iii) Poring Research Station. Each of these research stations represents unique ecological features and can also serve the Sabah Parks Management in :

- specialist training;
- field courses in field ecology for Park Rangers, students etc.
- training in jungle survival for Park Rangers, students etc.

It is anticipated that these centres will also provide an effective catalyst for developing the educational potential of Kinabalu Park. The generation of essential information on the ecology of ultrabasic outcrop of Bukit Hempuen, the Montane forests and the lowland areas at Poring will proceed at a much faster rate with the establishment of these research facilities and the involvement of scientists from both local and international institutions. Joint research programmes on forest ecology, flora and fauna, geology etc. can be initiated with agencies having interest in these areas of scientific value.

FIGURE II-15: PROPOSED AREA OF SCIENTIFIC VALUE WITHIN KINABALU PARK



**RECOMMENDATION 15: To Develop the Kinabalu Park Heritage Inventory**

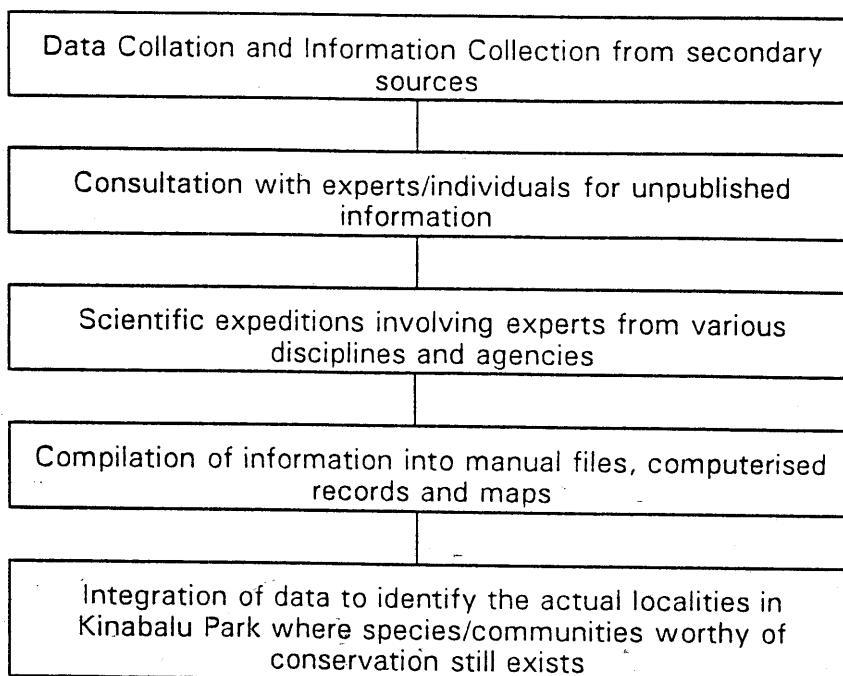
Sabah Parks must embark on a relatively large-scale information reorganisation effort to be known as Kinabalu Park Heritage Inventory. This can be achieved in cooperation with other State agencies like the Sabah Wildlife Department, Sabah State Museum, Forestry Department and the Universiti Kebangsaan Malaysia Sabah Campus. The objectives of the Heritage Inventory are:

- to accumulate and re-organise information about "the elements of ecological diversity"; and
- to determine which part of Kinabalu Park contribute the most to the perpetuation of these "elements". The "elements" include all of the recognisable community or ecosystem types as well as the habitats of all rare or endangered species. The development of Kinabalu Park Heritage Inventory must be seen as an effort to identify the most basic facts about the Parks biological resources including rare or endangered species and populations and their habitats.

To maximise efficiency in the collection of information, Sabah Parks must first concentrate on secondary sources, gradually building an organised data base which will be enlarged and updated. This stage should involve examination of existing publications, museum collections, available field notes and reports, and maps derived from aerial reconnaissance. Later, consultation with experts or individuals with knowledge pertaining to specific areas or biological components can be undertaken. To confirm the continued existence of species or communities that the secondary information has pinpointed, scientific expeditions could be organised by Sabah Parks to these areas (see Figure II-16).

**Figure II-16**

**STEPS IN THE DEVELOPMENT OF KINABALU PARK HERITAGE INVENTORY.**



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**RECOMMENDATION 16: To Establish the Kinabalu Park Herbarium and Museum of Natural History**

Most of the biological specimens (plants and animals) previously collected from Kinabalu Park and curated as reference materials for research, are currently housed in herbaria and museums scattered throughout the world. The Park Management must aim at developing research facilities including a herbarium, a natural history museum and supporting infrastructure of international standards, to serve as a depository and source of reference for tropical fauna and flora. This can be done by upgrading the present herbarium and museum to meet international standards.

The Herbarium and Museum of Natural History of Sabah Parks will basically constitute a collection for research purposes. Display of specimens for the public will be occasionally arranged in collaboration with the Interpretative Division/Unit of the Park. The principal role of both the Herbarium and the Museum is to serve as a readily accessible depository and source of reference for plant and animal species of the region, particularly of Sabah Parks. It is hoped that they will be regularly consulted by local, regional and international scientists and students for study and research.

**RECOMMENDATION 17: To Establish a Park Interpretative Unit**

Interpretative activities are an important aspect of a National Park and public education. An effective interpretative programme should be conducted and managed by a special Park Interpretative Unit (PIU). The PIU staff should have certain qualifications and be knowledgeable about the Park whilst being creative and able to communicate effectively. The staff must be specially trained to ensure the success of the PIU and could include the park ecologist and rangers as support staff.

Programmes should be interesting, stimulating, educational and structured in various levels to suit the different skills of the audience. Emphasis should also be made on improving the behaviour of park visitors, which includes what to do and how to do things in the Park.

Interpretative programmes and related facilities must be reviewed regularly to ensure that they suit the clients. Addition of new themes, development of new interpretative trails and distances, increase of programme duration and locality should be pursued accordingly. Any programmes that are redundant and not interesting should be improved on or omitted.

The Park will conduct short courses on nature and conservation by engaging resource specialists/instructors. These speakers will be invited occasionally to cover such subjects as ornithology, biology, mammalogy, botany and environmental studies that are related to the Park. This programme can be conducted on a weekly or monthly basis at the Centre. The audience can be made up of nature/conservation groups, individuals and park personnel.



The Park interpretative programme must be tailored to visitors needs and expectations and could include some of the following programmes :

- **Interpretative Talks and Presentations**

The Park should promote extension programme for the public especially to the local villagers and parties that have interest in the Park. These efforts are to awaken and maintain the communication with the people concerned. News items such as current events, developments, experiences and information that are related to the Park will be disseminated to the mass. The programme will be extensively promoted through feature articles in the mass media, talks, slide shows or audio-visual presentations. The Park ecologist will act as the public relations resource person and to manage the programme.

This programme can be based on the Park's natural history, ecological processes, wildlife, botany, geology, cultural activities and other conservation efforts. Talks can be held at the visitors' centre showing room, open amphitheater or at campsite.

- **Interpretative Programme Through Projected Media.**

Movie projection or video tape programme is an effective technique for disseminating knowledge and enhancing the education process. This programme can be conducted by slide projection and synchronised sound. Participants may be allowed to operate the machine themselves with assistance provided.

- **Interpretative Programme Through Non-Projected Media**

This programme can supplement other interpretative programmes. There can be several types of simulation of the actual objects. The objects are made up of life or non-life models. Models or displays of nature can represent the formation of mountain, panoramic settings, biological species or certain objects of cultural significance. These displays must have themes and messages behind it.

- **Park Junior Programme**

In keeping with the effort to promote education, the Park can also initiate the Park Junior Programme. Here, participants will be made up of interested youths from schools. The programme will introduce the related disciplines and orientate them towards conservation .

Park Junior Programme should be promoted in a similar way to the Boys Scout movement. The main activities can include park patrols and policing, cleaning up of litter and to eventually act as a reference group for others to follow.

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**RECOMMENDATION 18 : To Establish an Aromatic Plant Garden**

Development of scientific programmes along with the 'Eco-garden' is to instill awareness among various people on the importance of preservation of nature and its elements. Here, displays of living items are preserved, to be appreciated by visitors.

While it will best serve the educational and research functions of Kinabalu Park to exhibit living collections of the rich flora found there through the establishment of an arboretum, it would be useful to establish at an early stage an Aromatic Garden. As the name implies it is an arboretum set up specifically for selected flora which produces sweet smell as the flowers flush in season. Other dedicated arboretum with different themes can be established over time. Edible fruits, medicinal plants, conifers and non-conifers arboreta are among the different types which can be considered.

**RECOMMENDATION 19 : To Establish Thematic Interpretative and Nature Trails**

This involves short and long loop trails describing certain biological and unique features along the route. This programme involves two-types of approaches i.e. self-guiding and guided walks by the Park's interpreters. Several planned stops or stations are established at certain localities or point of interests. The former is self-explanatory where the visitors are provided with booklets and maps as a guide. The information in the booklet are keyed to numbered stops or stations. The visitors will be able to do the activities at their own pace.

Meanwhile, guided walks would involve the Parks' interpreter leading a large group of visitors along the thematic trail with stops at several points of interests. The interpreters will explain the objects and subjects at these points.

Printed media in the form of bulletins or pamphlets for nature appreciation and outdoor recreation activity participation is an added advantage where information can be disseminated more widely. Some visitors want to learn at their own speed and engage in more detailed studies. Printed materials are effective in wilderness setting where conducted activities are not appropriate and create disturbances to the atmosphere.

The design of the printed materials must be functional, informative and educational with colour illustrations. They should be handy and durable enough to be used in outdoor activities. Since the production of the bulletin can be costly, charges can be passed on to the users.

**RECOMMENDATION 20: To Establish a Nature and Outdoor Education Centre**

The Park will highlight organised interpretative programmes to be participated by targetted groups, mainly school children and youth groups. These will try to immerse the youngsters in their natural and cultural heritage, and to instill proper attitudes towards nature and conservation.

These programmes will be conducted through the Nature and Outdoor Education Centre and the Centre's nature programme. Special facilities will be set up as in camps and nature trails where young people will be familiarised with nature. Learning by 'first hand experience' will be encouraged.

The programme will involve schools and cater to different levels of ages and skills. School biology teachers are encouraged to be the instructors with assistance from Park Personnel and schools are also encouraged to set up Nature Clubs so that the Park will have direct links with the school.

Nature study centres/camps can provide opportunities for participants especially youth, organised groups and teachers to learn and appreciate nature at a conscious level in actual environment setting. This centre or camp can be located in the Resort. The structural component of the camp is simple with hostel or cabin that can accommodate 30 sleeping units. Other structures include hall and classroom, kitchen and outdoor activities centre (amphitheater). The scope of the activities can include nature/recreational games, nature/outdoor activities, nature arts and crafts, nature and conservation, social and spiritual activities, special events etc. This organised camp concept is to be managed by Sabah Parks personnel as supervisor teachers, instructors and councillors. This is to reduce cost and not to burden the present staff of the Park. Certificates will be issued to the participants upon completion of the project.

A Project about understanding the environment and its processes can be conducted at the Centre. This environmental conservation education could involve teachers and school children or school nature club. This is a day activity where participants are exposed directly to nature to observe natural processes in actual settings. Teachers are encouraged to be the instructors and leaders after short courses conducted by Sabah Parks. The project is made up of a series of modules where the group has to visit the Park several times to complete the project. Certificates will be issued to participants upon completion of the project.

#### **RECOMMENDATION 21: To Conduct Regular Scientific Expeditions**

Regular scientific expeditions should be organised to collect and collate information relating to specific areas of interest in Kinabalu Park. The aims of these expeditions are:

- to document the geology, physiography, hydrology, soils, vegetation, flora and fauna of the area; both for its scientific interest and to provide information for management decisions on conservation ;
- to provide training and expedition experience to Park rangers and interested members of the public (students, scientists, school-children etc.) ; and
- to scientifically document the habitats together with their interesting biological components, as a record for any future conservation efforts.

Sabah Parks should lead the expedition and invite participation from all other agencies, local and international, interested in the area.

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## RECOMMENDATION 22 : To Develop Educational and Interpretative Programmes

*"One of the most important functions of a national park is to provide for public enjoyment, education and inspiration"* (Conference of State and Commonwealth Ministers responsible for National Parks, 1970). The Kinabalu Park management is thus encouraged to develop a range of facilities providing educational and interpretative programmes related to natural, aesthetic and scientific themes of the Park.

Using different techniques of park interpretation, the various uniqueness and interesting attributes of the Park can be used to make a visit to Kinabalu Park an enriching and educational experience. The overall aims of the interpretative programmes are thus :

- to provide a vehicle for disseminating ideas and for enhancing appreciation of the Parks objectives and roles.
- to develop a better understanding of the scientific values of the Park and gain cooperation from various classes of visitors in relation to nature appreciation and conservation.

Suggested facilities to provide educational opportunities and interpretative programmes at Kinabalu Park are :

- **Nocturnal Animal Display**

Live nocturnal animals featuring bats, civet cats, owls etc. can be displayed in a large room that can be lit up with red light at the press of a button by a visitor.

- **Reptile House**

A display of live snakes, frogs and skinks that would otherwise be almost impossible to catch a glimpse of by day-trippers to the Park.

- **Insectarium**

The diversity of insect species found in the Park can be displayed to explain their importance as pollinators or pests.

- **Gallery for Extinct and Endangered Species.**

To enhance awareness and understanding of species extinction in tropical forests, plant or selected animal species under threat of extinction can be displayed for public viewing.

- **Educational Trail Walks**

Visitors to Kinabalu Park come from diverse backgrounds and include students, biologists and the public at large. Nature trails that exist in the Park presently have aroused in all of them a better appreciation of the tropical forest and, more importantly, a concern for its future. Undoubtedly

even in their present settings, the many trail-systems radiating from Kinabalu Park Headquarters have created an enduring interest in the Park's flora and fauna among visitors. With this overwhelming interest, it is suggested that Kinabalu Park management provide improved features to the existing trail systems in the park by :

- introducing more trails/nature-walks which are less strenuous to follow but are short and interesting.

The distance that visitors prefer to walk varies greatly between individuals or interested groups. A route taking about 20 - 30 minutes is probably the most popular among the day-trippers but long hiking trails are preferred by the overnight-visitors :

- showing and marking features of interest that occur along the trails (eg. rattan, strangling figs, termite nests, various branching forms and root structures etc.); and
- providing a manual/pamphlet for a self-guided tour of the nature trail.

A self-guided manual will serve as an excellent tool for explaining in greater detail the biology and interdependence of the flora and fauna of the complex forest ecosystem. It will give an average person the experience of the complicated ecological interactions and hopefully create in him a great awareness about nature.

- **Guided Tours**

As a rule, all staff of the Park must be made to participate in formal as well as on-the-job training in matters relating to enhancing appreciation of the Park. Thus, a park ecologist or ranger can become the main agent of the Park's educational and interpretation programmes. An effective method is for these staff to be directly involved in providing guided tours along the trail system in the Park. As they become more competent and knowledgeable, these staff can be made to accompany or even lead specialist groups that come to the Park for more specific recreational activities like birdwatching, night-walks, etc.

- **Printed Educational Materials**

Over the years, Sabah Parks has produced many pamphlets and books for distribution or sale to visitors. There is a high demand for a much wider array of educational materials, suitable for students, local visitors and tourists. Among these include an illustrated booklet on general features of interest in the Park or a map showing the nature trails and other points of interest.

**RECOMMENDATION 23: To Designate Zones Possessing Special Scientific Value and Adopt the Proposed Management Objectives and Practices**

Kinabalu Park provides some special opportunities for scientific research (see Figure II-17) into environmental features and processes. It is possible that all places within the Park can accommodate research as one of the objectives of management. This is true for the zonal units listed in Table II-5, where research is one of the important components of management.

Despite the wide range of Park areas that contain features of scientific significance, several large areas have been identified for conservation and research. The zonal units identified in this are areas of reasonably intact natural resources with special nature conservation and scientific value, which represents important ecosystems in the park or pockets of diversity. They require careful protection from disturbance.

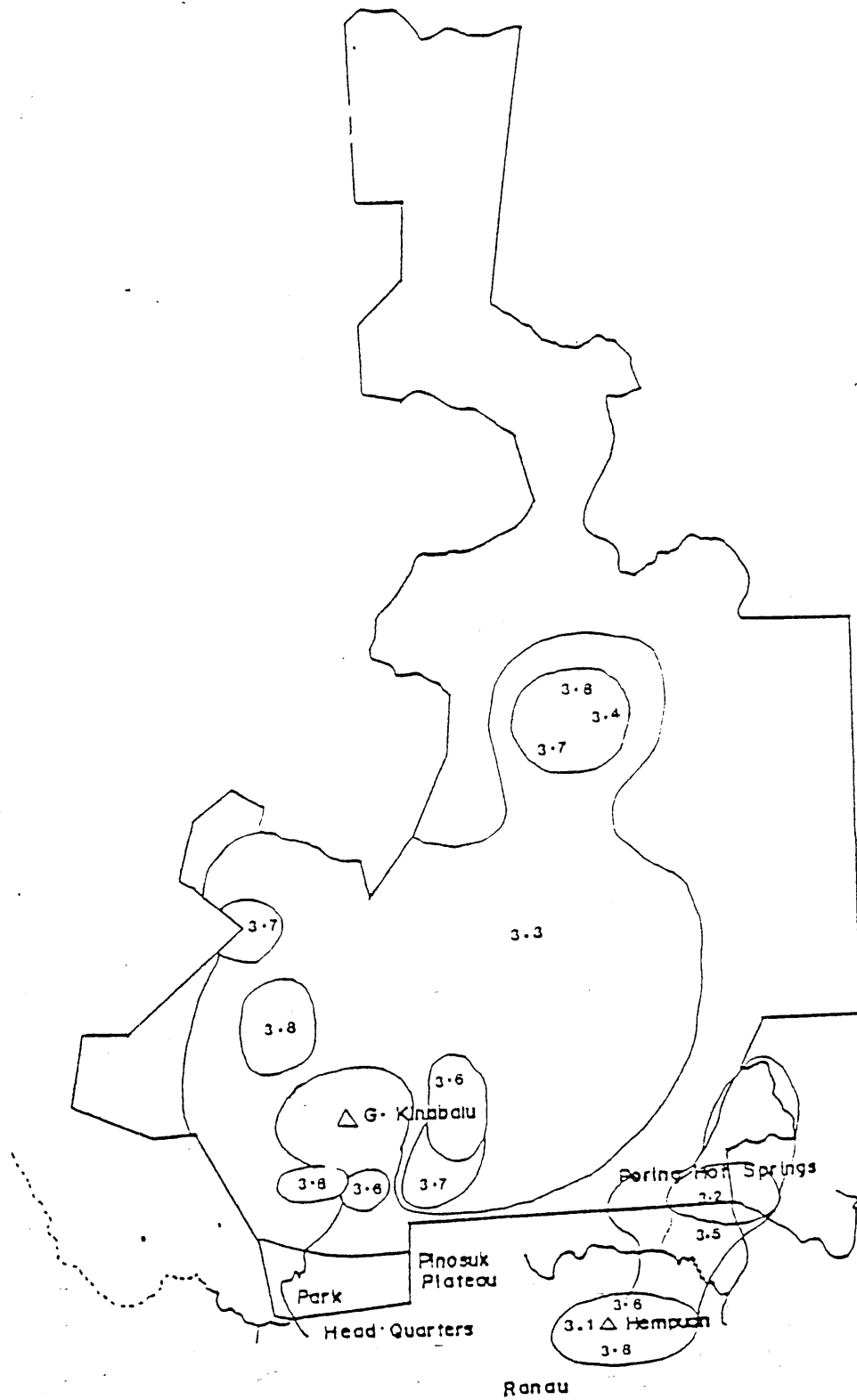
Table II-5 Zones of Special Scientific Value

Reference on Zone Map	Zonal Unit
3.1	Bukit Hempuen
3.2	Canopy Vegetation - Poring
3.3	Montane Forest
3.4	<i>Rafflesia</i> belt
3.5	Rare Slipper Orchid Belt
3.6	<i>Nepenthes</i> Belt
3.7	Ultrabasic Vegetation

The proposed objectives and practices of zones possessing special scientific values:

- to maintain or promote the high biological diversity by allowing natural biological processes to continue with as little disturbance as possible ;
- to protect the plant and animal communities and their habitats by minimising the problems caused by artificial boundaries and human influences in adjacent areas through the establishment of "buffer zones" around the Park;
- to ensure continued survival of natural communities for logistic and aesthetic reasons and potential recreation; and
- to provide opportunities for scientific inquiry into the biological processes and the natural components within the ecosystem.

FIGURE II-17: ZONES POSSESSING AREAS OF SPECIAL SCIENTIFIC VALUES



The recommended implementation plans are as follows :

- identification of areas of special scientific importance and protect them from disturbance ;
- encourage scientific research into the unique features and natural components of the area ;
- monitor the level and effects of research and other human activities and the natural state and dynamics of these areas ;
- allow natural biological processes to go on without disturbance and rehabilitation of disturbed environment;
- control of predation effects and potential competition from non-indigenous plant and animal species. Any introduced species deemed to be a threat to the well-being of native species and habitat will be eliminated;
- introduce programmes in public education to increase awareness of the special scientific value of the areas among visitors to the Park ;
- construct climbing trails or nature-walk trails away from rare and fragile plant populations. For instance, areas harbouring rare species such as *Nepenthes lowii* along the summit trail at 2,438-3,048 m.; the *Rafflesia* sites below the canopy walkway and the *Paphiopedillum* habitats on Bukit Hempuen and Pig Hill, should be subjected to the minimum possible disturbance ;
- intervene when forest fires threaten to spread to sensitive ecosystems during dry seasons particularly along the Bukit Hempuen and Poring Park boundaries where slash-and-burn farming practices are widely practised; and
- prevent forest clearance for purposes of construction or other infrastructural development in areas known to harbour rare and fragile plant populations.

### 6.3 Strategic Thrust Three: Increasing Recreational and Touristic Activities

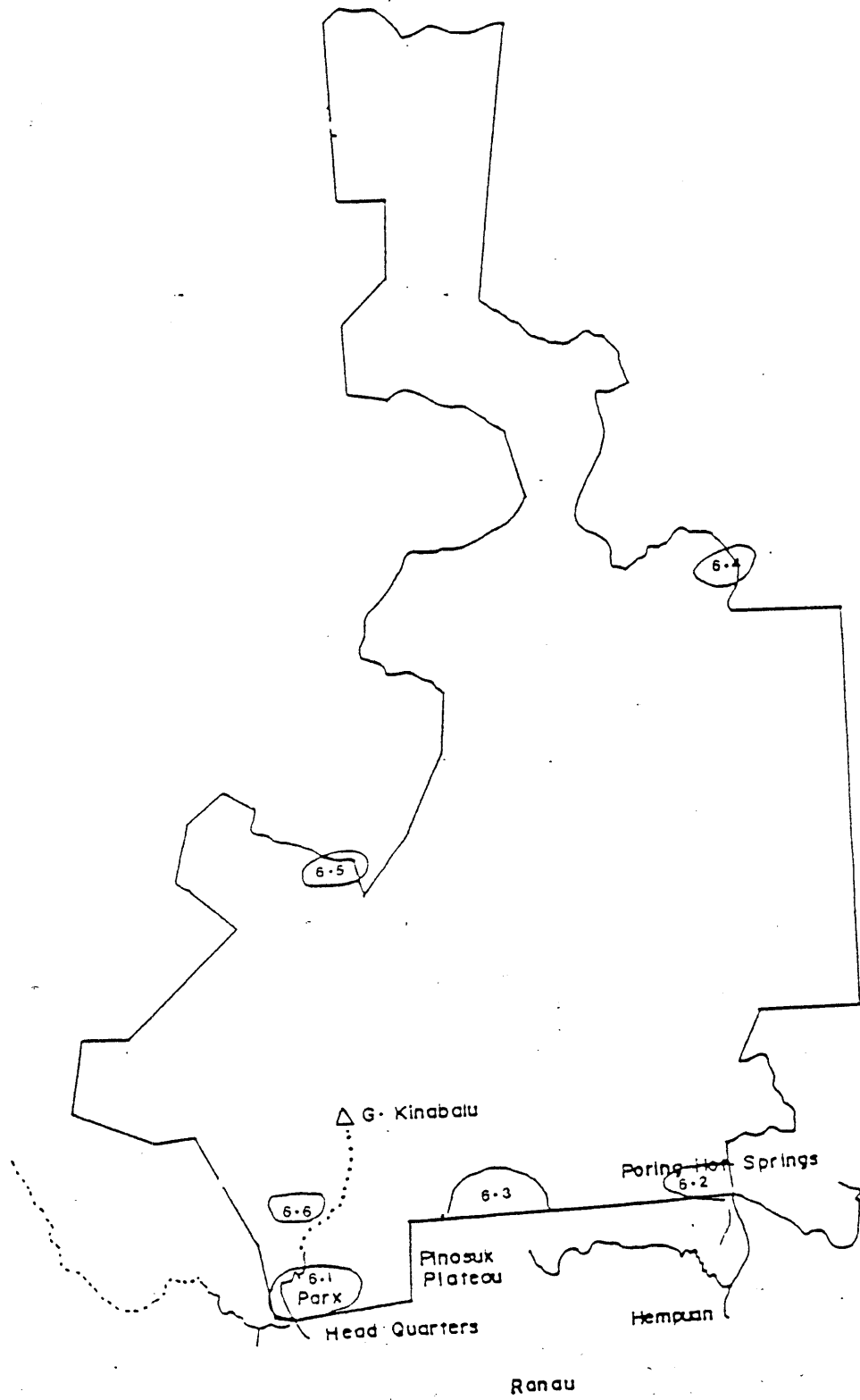
#### RECOMMENDATION 24: To Designate Zones Possessing Potential for Recreation and Tourism

Six areas within the Park are identified for development as recreation and tourism (see Figure II-18). Two of the areas are already well-known:

- The Kinabalu Headquarters Complex has perhaps reached its maximum developmental level. It provides a haven for climbers and daytrippers.
- The Poring area is fast developing into a research-recreation area.



FIGURE II-18: ZONES POSSESSING AREAS OF TOURISM AND RECREATION



There are proposals to further develop the Kota Belud and Serinsim areas. Of immediate concern, is the Mesilau and the adjacent Golf Course area. This area will be planned for the development of the Kinabalu and Golf Resort. Volume III details out the development concept, recreation programme and operational guidelines for the Resort.

**Table II-6: Zones of Tourism and Recreation**

Reference on Zone Map	Zonal Units
6.1	Kinabalu Park Headquarters Complex
6.2	Poring Hot Springs Complex
6.3	Proposed Kinabalu Park Nature and Golf Resort
6.4	Serinsim, Kota Marudu Station
6.5	Sayap, Kota Belud Station
6.6	The Summit Trail and Overnight Areas

*Proposed Objective and Practice of the Recreation and Tourism Zone*

It is proposed that the primary objectives of management relating to the zones with potential for development as recreation be :

- to provide an educational programme for visitors, especially among students and community groups;
- to provide the broadest possible range of recreational and touristic opportunities appropriate to the resources and consistent with other management objectives;
- to make available the recreational and touristic opportunities to as many and as wide range of people as possible;
- to provide suitable access and visitor facilities for different activities in appropriate parts of the Park;
- to provide measures to ensure public safety;
- to study and monitor use patterns, and the attitudes and interests of visitors, as a basis for selecting the most equitable distribution of use-opportunities and controls on activities that may be in conflict with other management objectives or other uses;
- to provide information on features and recreation opportunities to enable visitors to enjoy Kinabalu Park;

- to liaise with state tourism authorities to coordinate programmes for visitors within the Park;
- to promote an understanding of the objectives and principles of natural resource management; and
- to develop a guideline for recreation and tourism. A proposed concept is provided in Appendix II-3.

**RECOMMENDATION 25: To Actively Involve the Public in the Planning and Management of the Park.**

It is also proposed in this Plan that Park officers establish efficient communication with Park users so that they understand the attitudes, expectations and changing needs of users. The information and public relation services function of field managers will be emphasised, both within the Park and throughout the region. Programmes that assist the visitor to enjoy and understand the Park will be maintained, and Park staff will be heavily committed to this aspect of public involvement. Opportunities for the public to be involved with the planning and management of the Park will be encouraged for important issues.

Providing an avenue for public input on important issues which affect the long-term management of the Park is important as it may affect its recreation, landscape, nature conservation and other values. This can be achieved in several ways by which issues can be publicly exhibited and be made available for comments. Park's policy statements can then be announced.

It is proposed that the public be involved in the following manner :

- to establish procedures for the systematic collection and analysis of public input on Park planning issues.
- to emphasise direct contact between Sabah Parks' staff and the public through visitor centres, talks, lectures and others interpretation programmes, and activities. And, to suitably deploy staff resources for purpose; and
- to monitor public awareness of the activities in the Park, it is proposed that special considerations be given also to the region surrounding the Park including;
  - providing regular reports to the local media of events occurring within the Park;
  - maintaining regular contact with local education authorities, as a basis for studying the Park, its natural environment and management; and
  - maintaining regular contact with local community groups and organisations through lectures and talks and/or field days inside and outside the Park.

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**RECOMMENDATION 26: To Develop an Effective Interpretation and Information Services for Kinabalu Park**

This provision of interpretation and information services within Kinabalu Park is fundamental to providing visitors with an appreciation of the resources of the Park, its size, complexity and special natural values.

It is proposed that the main themes of interpretation and information within Kinabalu Park be as follows :

- **The Park and the opportunities it provides** - Information concerning the geography of the Park, special features of interest, activities and other attractions in the Park will be prepared. Some of this information may be prepared in liaison with other authorities. The natural and cultural history and the present conditions of the Park will be explained, along with a summary of the broad range of opportunities available to visitors;
- **Natural history** - Kinabalu Park contains a rich and varied assemblage of landform, vegetation and communities, native fauna, endemic and other important natural phenomena. In interpreting the natural history of the Park it is proposed that emphasis be given to specific features ie., where a better understanding of the natural phenomena present would assist in the protection of the Park and in other management programmes and the opportunity to contrast characteristic features of the Park with features elsewhere in the state or country.
- **The management of Kinabalu Park** - It is desirable that the public be aware of Park Management Programmes. It is proposed that this interpretation theme would cover subjects such as policy decisions of Park Managers and the reason for them; and explanatory statements at sites where active work projects are under taken, annual review of the accomplishments of basic Park management programmes such as servicing visitor facilities; and annual reviews of research programmes that are active or just completed within the Park.

**RECOMMENDATION 27: To Improve Public Access Into and Within Kinabalu Park**

Providing public access within the Park complements the objectives of allowing the Park to be used for multiple purposes. It is also important because access by the public can be monitored. At present, vehicular access within the Park is only provided at the Kinabalu Headquarters and Poring Hot-Springs Complexes. A vehicular road system is proposed for the Kinabalu Park Nature and Golf Resort (see Volume III).

It is proposed that access within the Kinabalu Park be provided to fulfill the following objectives :

- to provide access to recreational facilities such as overnight accommodation, indoor sports complex and picnic areas;

- to provide access to the viewing sites natural and cultural features, where such access is not detrimental or to the features scenery or to the local environment;
- to provide access to trail heads from which visitors may gain access, as appropriate to the zonal unit concerned on foot;
- to provide for recreational scenic drives; and
- to provide through-access.

The present vehicular roads for public use is very limited. This situation will remain because a major part of the Park is relatively inaccessible and the construction of vehicular roads will be difficult and expensive. Within the time span of this plan, it is envisaged that such roads would not be feasible. Access to the other parts of the Park will be in the form of foot trails. Roads will be limited to the fringes of the Park.

The proposals to improve public access are as follows:

- it is proposed that Park interpretative programmes include maps of the public vehicular access system with up-to-date details of closures and restrictions;
- it is proposed that only overnight residents are allowed access into accommodation areas;
- it is proposed that whenever appropriate, certain roads may be restricted to one-way traffic only;
- it is proposed that the design of speed criteria for road maintenance and construction within the Park be based on existing standards. The design of speed criteria for any major reconstructions or new road construction will be determined by the management, paying full regard to the need to properly landscape the alignment and manage traffic speeds to a level appropriate to a natural Park;
- overnight car-parking may be restricted in some areas of the Park for safety reasons; and
- it is proposed that new tracking trails be identified within the Park in order to make it more accessible to the public for recreational use.

Some additional considerations in improving public access are in order:

- Park fees will continue to be collected from visitors at entrance stations on the main access routes into the Park;
- facilities at roadside tops and trailheads that give access to the Park on foot or horseback will be designed to facilitate these activities, and contribute to provide the widest possible range of recreation opportunities in the Park. The facilities may include constructed parking areas, picnic facilities, pit

toilets, information signs and markers, and, in appropriate circumstances, a carefully designed basic shelter structure. It is proposed that the development of any such facilities be consistent with the objectives of the zonal units concerned;

- safety features of road access to be improved are:
  - access road to the proposed Kinabalu Park Nature and Golf Resort needs further extension and resurfacing;
  - access road to Poring Hot Spring needs better directional signposting;
  - access to Sayap, Kota Belud, Serinsim and Kota Marudu stations need to be considered;
  - new access trails within the Parks is needed at Low's Gully, from the eastern plateau to Kinabalu to Poring Hot Springs, from the top of Bukit Hempuan to the existing Ranau-Poring road;
- parking spaces at the following sites to be expanded:
  - parking area outside the Kinabalu Park Complex should be provided with either a zebra crossing or an overhead ramp parking area at Timpohon should be expended and spaces clearly demarcated;
- trail up Mt. Kinabalu should be graveled at slippery sections and in some stretches, stripped plank board-walk should be constructed;
- it is proposed that there be continuing development and maintenance of carefully located walking tracks in many areas of the Park; such tracks would be constructed only in locations where they are justified by existing or potential use, and marked or maintained in a way that is consistent with the objectives of management of the zonal unit(s) concerned;
- it is proposed that any form of infrastructural development and design should take into consideration the topographical characteristics of the proposed site;
- although the Park management has no control over the use of airspace over the Park, it should, however, have control over any landing of aircraft in the Park. It is proposed that no private or commercial aircraft be permitted to land, except in emergencies, at any location in the Park and that Sabah Parks seek the co-operation of the Department of Civil Aviation in controlling the use of the airspace over Kinabalu Park so that the objectives of management in the various management zones are to be achieved; and
- Park management should investigate the topographical suitability of placing two new stations at Serinsim and Sayap.

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**RECOMMENDATION 28: To Identify and Develop Suitable Activities and Facilities which are in consonance with Resource Carrying Capacity for Recreation and Tourism**

The Park will identify recreational activities for the enjoyment, quality experience and satisfaction of visitors which are compatible with society's norms and values. The development of the facilities for recreation will be in a manner consistent with the desired Park setting and the environment.

The Park will provide a variety of activities and experiences, by adopting concept of Recreational Opportunity Spectrum (ROS) by providing the opportunities for a range of experiences through the development of various facilities and programmes. The ROS provides the framework for classifying different types of outdoor recreation. The recreational experiences and settings to be developed may include land based, water based, forest based, mountain based, social based, etc. A provisional list of activities is given in Appendix II-3.

It is crucial that the management be aware of the hazards and risks involved in these activities and take the necessary steps to ensure public safety. Control and surveillance of visitors need to be conducted at certain times while permitting them to pursue their interests.

The Park will at intervals assess the use of and impact on the Park's natural resources by adopting the Limits of Acceptable Change (LAC) technique which is being utilized by United States Forest Service. Changes to the resources will lead to degradation of both the quality of the Park and experience of the visitors.

Through the LAC method, the management will make a decision at the point where the impact has exceeded the capacity i.e., the conditions under which the resources cannot tolerate any further exploitation.

LAC should be the standard for recreation areas and measures to control and limit have to be implemented to minimise the impact. Management judgement therefore, is vital for the effective implementation of the LAC technique in the Park.

Park personnel will be directly involved in the organisation and management of selected recreational activities. Certain activities will need commitment by the organisers in order to run smoothly; and allow maximum and equitable participation. These can make the activities more meaningful. These include special events, nature education, interpretation, rock climbing, traditional games, outdoor archery and blowpipe shooting. In the meantime, the Park management should consistently search for more recreational features that could highlight the uniqueness of Kinabalu Park. New unique features should be presented to the visitors and additional recreational activities/programmes offered to gain new experiences and keep visitors patronising the Park.

The development necessary to promote tourism in the Park include improving tourists facilities and upgrading of the old products facilities to meet the universal standard. Matters that are of concern include the access within and near the Park, trails, signposting, picnic sites, buildings and related services/tourist interests. Enhancement of visitors enjoyment should be the priority.

The Sabah Parks system could be considered self-saleable. However the marketing effort should be increased to cover a wider market. More advertisement and promotional campaigns should be pursued internally and internationally. New elements of attractions should be explored and offered to potential tourists.

To sustain enthusiasm among the tourists, emphasis on quality services should be maintained at all times by the management and the private enterprise. The management must oversee the operations in the Parks and any slackening on the part of service operators must be redressed immediately and any shortcomings by the management must be explained to the tourists.

The Park could not operate smoothly on inadequate funds and staff. Therefore, for certain facilities or services, fees or charges should be levied. Revenues would then be generated to cover or subsidise certain operations and expenditure.

A proposed guideline for recreation and tourism is given in Appendix II-4.

*Proposed Management Practices for Developing Suitable Facilities which are in Consonance with Resource Carrying Capacity for Recreation and Tourism.*

The Proposed Management Practices are:

- to provide alternative or contingency activities for climbers on poor weather days;
- to provide reimbursement for unused accommodation when climbing up the mountain is disallowed by the authorities due to bad weather;
- to upgrade the weather data collecting instruments and analyse the record regularly and prepare weather charts (rainfall and windthrows) so as to provide a yearly prediction for the best time to climb;
- to provide more weather pits for the climbers on the trail up the mountain;
- to collect information on the problem of fires in the Park area or outside the boundary of the Park;
- to identify areas which are prone to landslide;
- to constantly monitor soil maintenance particularly in wet areas when designing nature trails;
- to limit the sources of pollution by siting development away from the major water system;
- to rehabilitate the Mamut River which flows through the Poring Section of the Park which is now not safe for human consumption;
- to link a trail to spectacular waterfalls along the escarpment;
- to develop potential recreational opportunities at the Langanan River and Sayap Waterfalls;



- to upgrade or renovate the older accommodation and facilities, particular attention should be paid to the choice of materials used for developing the facilities and the concept and design of buildings and structures should blend with the natural surroundings;
- to upgrade the supply and provision of selected recreational equipment;
- to reassess the range of activities provided at the Park and Mt. Kinabalu so as to ensure that resource carrying capacities are developed in line with the Park's development policy (this includes environmental, physical and economic carrying capacities. In case physical carrying capacity has been exceeded, there is a need to develop more areas for visitor use i.e., a new resort area.);
- to provide alternative activities for climbers in case of bad weather; and
- to study the recreational behaviour of visitors so as to aid in the preparation of guidelines for visitors.

#### 6.4 Strategic Thrust Four: Preserving Cultural and Historical Values

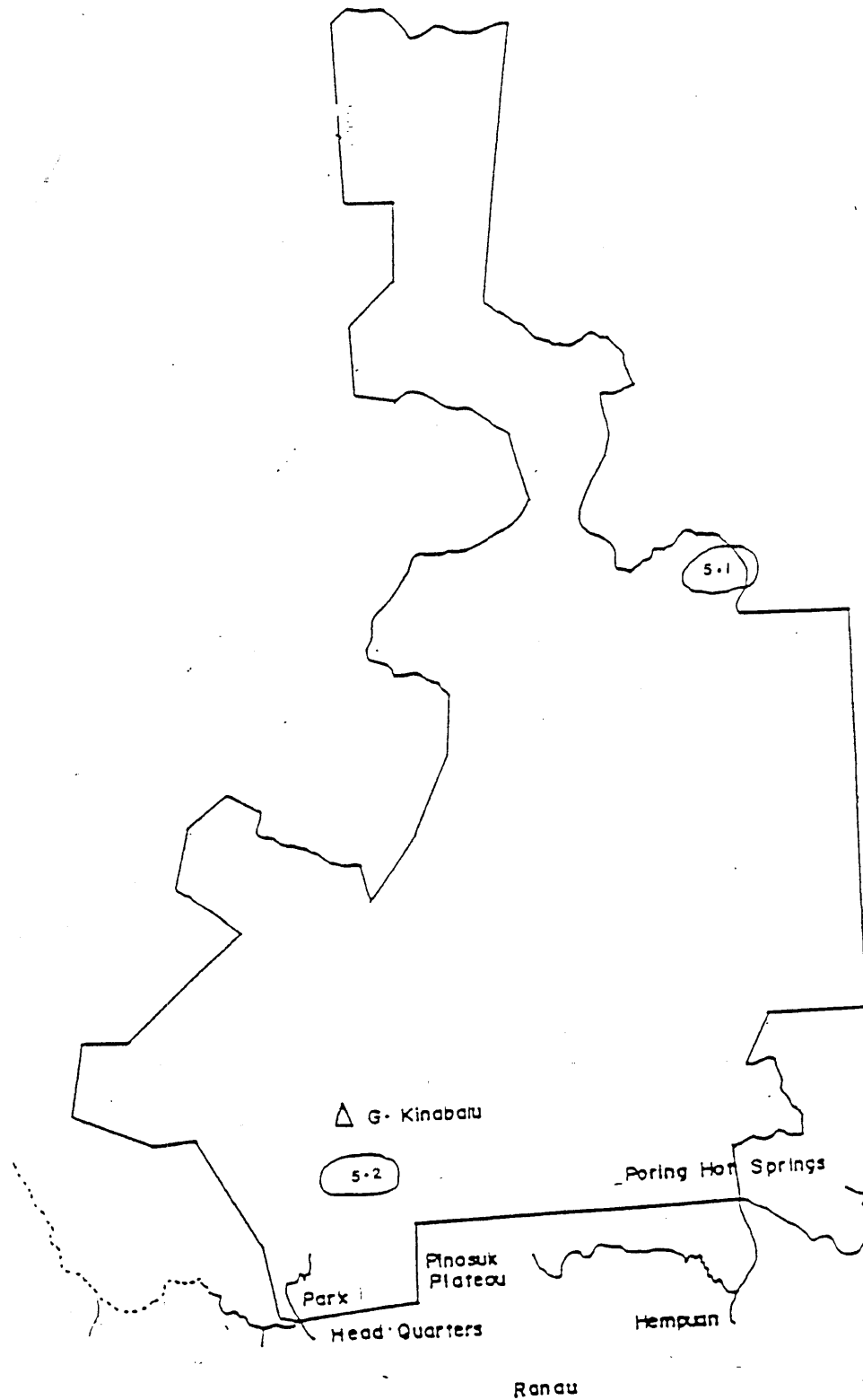
##### **RECOMMENDATION 29: To Identify and Preserve Sites Possessing Cultural and Historical Features.**

Kinabalu Park contains several important historic landmarks (see Figure II-19) and the Park has a responsibility to conserve those historic features. Some parts of the Park were well covered by certain pioneering individuals before the present level of use and development. These individuals gained historic significance associated with particular natural features of the Park, for example, in the housing of certain peaks and valleys. Kinabalu Parks also contains several sites that were associated with legends and cultural beliefs of the highland inhabitants; including certain sites for sacrifices to their God.

As development proceeds, structures were built and through the passage of time they in turn will be of historical significance. Criteria for defining significance are necessarily subjective. What matters is that the opportunity to protect the historic value of any site, structure of feature, even if it has little established value at present, be retained as far as possible. In some cases, protection of the outstanding natural scenery or natural features of the Park may mean that structures that are identified as having historical value should be removed or modified. In such cases any historic values must be carefully documented at the outset.

Besides the above, the Park has identified two sites which possess some historical significance: the burial ground of Gunting, a Dusun warrior and the Paka Cave. This plan proposes that these two sites be designated "historic" areas in recognition of their importance and to allow special management practices to be applied. Perhaps in due time, some individual buildings and structures (in Kinabalu Headquarters and Poring Hot-Springs Complexes), be protected individually and are designated in the plan as "historic places". Sites or places should be periodically identified and if appropriate, designated as historical places.

FIGURE II-19: ZONES POSSESSING AREAS OF CULTURAL AND HISTORICAL VALUES



The Park will undertake measures to : protect, conserve and present structures, objects and sites of historic significance; protect and maintain important cultural landscapes; and protect the traditional setting of historic features, including as appropriate the protection of garden plots and introduced trees some of the proposed management practices are as follows:-

*Proposed management objectives and practices*

The primary objective of management of cultural or historical interest within the Park to conserve structures, objects and sites of historic, cultural, archaeological and architectural importance.

The following secondary objectives of management will apply throughout the Park as long as that they are consistent with this objective and the objectives of management of the zonal units concerned :

- to provide visitors with the opportunities to appreciate the history of the Park and of the broader historical implications of the cultural or historical features;
- to provide opportunities and promote historical, cultural, archeological and architectural research into historic and cultural sites;
- identify and investigate potentially important historic features. Initial assessment of sites will be made either during environmental planning for developments or during specific research projects initiated by the Park or by other research bodies;
- undertake continuous assessment of the effectiveness of conservation methods applied to historical features, and the level and effect of visitor and/or Park operational use;
- create visitor awareness of the cultural or historical significance of sites through effective promotion and marketing methods;
- provide visitor facilities at suitable locations consistent with management objectives;
- ban the removal of historical relics or artifacts dating from before 1900 except with the prior approval of the Park authority;
- initiate public relations programmes to increase knowledge and cultural importance of the Park among the locals;
- initiate conservation strategies, cultural seminars and discussions with the local population;
- encourage writings on the history of the Park; and
- encourage anthropologists to conduct research on the characteristics of recreational activities and its impact on the local population; and document any outstanding traits for future research purposes on the history of the Park.

## 6.5 Strategic Thrust Five: Instituting Management Procedures to Support Other Strategic Thrusts.

### **RECOMMENDATION 30: To Adopt a Procedure for Carrying Out Development Projects.**

It is proposed that a standard procedure be adopted for all works, developments or other operations undertaken by Sabah Parks or any lessee, licensee or other persons or organisations, to ensure that all operations within the Park are consistent with the Development Masterplan. Such a procedure will incorporate the requirements of the Sabah Park Enactment, other Departmental Codes and the Environmental Impact Assessment procedures into one standard procedure. The basic objectives of developing the management procedures are as follows:

- to ensure that development and work proposals are consistent with the Development Masterplan;
- to minimise and where possible avoid the environmental impact of any approved development work and other operations which took place within the Park; and
- to ensure that the any operations do not exceed acceptable carrying capacity of the resources.

It is proposed that the following procedures be adopted:

#### **Stage I: Proposal**

- a brief statement outlining the nature of the proposed project will be submitted to the Park in the case of concessionaires or licenses. The statement will identify how the proposed project is undertaken; and
- only those activities which are consistent with the development and management plan will proceed.

#### **Stage II: Review of Environmental Factors**

- a brief review of environmental factors, identifying the likely environmental impact of the proposed project will be submitted to the Deputy Director to adjudicate on whether an Environmental Impact Assessment is needed;
- the review of environmental factors will include an assessment of whether the proposed project :
  - is fully consistent with the objectives of development and management of the Park;
  - will disturb important Park environments, especially the sub-alpine environments, rare native fauna and flora habitat, and other rare endemic or endangered species, communities or important environments; and
  - will be in conflict with alternative recreational use by the public.

- depending on the results of the Environmental Impact Assessment where relevant, the proposal may be rejected or allowed to proceed to Stage III with or without conditions or modification resulting from any procedures and/or specifications given by the Director; and
- any proposal to expand development beyond concession will be subjected to the approval of the Director and/or the Minister where necessary.

**Stage III: Final Project Proposal**

- in all cases, a final project design will be submitted to the Director for approval; and
- in the case of leases and licenses, final building approval will be sought under the Park's approved building codes.

**Stage IV: Implementation**

- the approved project will commence subject to the development and management plans, the Park's approved building code, any attached conditions and supervision by the Park personnel; and
- project contractors will be required to pay adequate compensation for breach of contract terms.

**RECOMMENDATION 31: To Plan and Provide for Safety Measures for Park Users.**

The responsibility for public safety rests with the police. The safety of visitors to the Park is the responsibility of Sabah Parks. Local knowledge and experience is an important requirement for the efficient operation of search and rescue activities. In this context, the police will benefit from the assistance of Park personnel who are in most cases, in the best position to help in the organisation and conduct of a search especially in the back-country areas of the Park.

The major aspects of public safety in Kinabalu Parks is associated with mountain climbing, principally the climb up Mt. Kinabalu and other less accessible parts of the Park. The other forms of recreational activities in the developed areas of the Park is less prone to accidents and thus less critical in terms of public safety.

The development of policy, guidelines and procedures for mountain climbing safety is high on the priority list. The Park has considerable experience with search and rescue of climbers in back-country areas. Helicopters and personnel will only be deployed with the approval of the Director. Specific practices will have to be instituted to ensure that:

- all climbers register at Kinabalu Headquarters Complex giving details of their intentions to climb any particular mountain peak;
- back-country users to register at ranger stations or contact centres, giving details of their intentions;

- a group of patrollers will be scheduled to patrol high-density use areas. Although their main function is to prevent injuries, patrollers should be trained in first aid and when accident occurs, the injured person is treated on the spot and then taken immediately to the nearest medical outlet where a nurse and/or doctor can provide further treatment;
- there is ongoing training of selected and voluntary personnel for specialist rescue procedures (such as mountain climbing, rock climbing and caving);
- there is training of personnel in basic search and rescue techniques;
- at all times, Park personnel are adequately prepared and that the necessary equipment to handle emergencies is available and properly maintained; and
- a search and rescue operations manual will be compiled in consultation with all interested parties and will be regularly reviewed.

The search and rescue operations manual for public safety generally within the Park will contain contact lists and lists of equipment, personnel (and where appropriate, qualifications), and specific procedures to be used during emergencies.

#### **RECOMMENDATIONS 32: To Enhance Park's Hygiene Through Measures Including Rubbish Disposal**

In resort and facility areas, the accumulation of rubbish can pose a health hazard and diminishing appreciation. Proposed objectives are :

- to minimise the impact of rubbish on the Park;
- to minimise the amount of rubbish requiring disposal;
- to establish an efficient rubbish-removal and disposal system; and
- to minimise the effect of rubbish on Park-users' appreciation of this Park and to protect the public from any health risk associated with rubbish.

The Park will :

- promote public awareness and behavior to reduce rubbish *per se* and minimise its effects by interpretation and law enforcement;
- gradually provide alternatives to the rubbish tips and pits existing in the Park by finding suitable alternative locations outside the Park; and
- utilise private contractors for rubbish collection wherever possible.

In future, modern rubbish- disposal techniques that are consistent with health and pollution-control requirements will be essential.

The guiding principle with respect to climbers and back-country rubbish is that all disposable material brought in must be taken out. It is no longer acceptable in areas along the summit trail, around huts, regular campsites and other back-country

areas for rubbish to be buried or left in bins for removal. Implementation of this policy relies on effective interpretation and where necessary, enforcement. The "pack-in, pack-out" ideal will be heavily promoted. Rubbish disposal is costly and requires considerable resources. Thus it is seen as a major priority that people be aware that they must accept the responsibility for their own rubbish in these areas.

### **RECOMMENDATION 33: To Institute Linkages with Other Organisations**

The Sabah Parks maintains close liaison with many state, national and international organisations in the administration of Kinabalu Park. Sabah Parks also endeavours to maintain close links with its neighbours and in particular representatives of the local communities and local authorities.

As far as possible, close contact will be maintained with adjoining landowners and land managers, and with other organisations that operate within the Park. Wherever possible, the Park will undertake cooperative management programmes aimed at protecting both the Park and the interests of neighbours and other organisations.

In dealing with other organisations, Sabah Parks seeks to fulfil the requirements of the Enactment and to facilitate the legitimate operations within the Park. Emphasis is placed on cooperation and negotiation with a view to establishing and maintaining benefits for all parties concerned.

Proposed objectives for interaction with other organisations are :

- to maintain active liaison with all other organisations that operate within the Park;
- to maintain active liaison with other organisations or individuals who are responsible for the management of lands adjoining the Park;
- to facilitate the legitimate operations of other organisations within the Park consistent with the development and management plan;
- to minimise any adverse effects on natural park values that may result from the operations of other organisations;
- to seek the most appropriate and efficient operation of visitors and management facilities within the Park;
- to ensure the appropriate rehabilitation of any disturbed site;
- to encourage land use practices and utilisation that are compatible or complementary to those of the Park on land adjoining the Park. This can serve as a reasonable buffer zone outside the boundary of the Park;

- as soon as is practicable, Sabah Parks should build up relationship with other organisations to provide a basis for license agreements or consent to be granted in accordance with set management practice. In the formulation of the terms and conditions for each license, concession or lease, it will include as appropriate :
  - clear definition of the facilities, work or organisations covered by the agreement or authorisation;
  - recognition of the application for any existing agreements between the Minister and/or Director and the other organisation;
  - prescription of and conditions for the use of routes for vehicles;
  - conditions relating to the applications of herbicides, other chemicals, and prescribed burning;
  - the responsibilities of the organisation in such matters as the prevention of soil erosion, removal of rubbish, protection of cultural and historical sites and the control of introduced plants and animals;
  - the amount of fees, charges, compensation or rental as well as any payment to cover administrative expenses, or the amount of any contribution from Sabah Parks to the other organisation to defray costs;
  - requirement for personnel of the other organisation to comply with the provision of the Enactment, regulations and the provisions of the development and management plan; and
  - responsibilities of the removal of any facility when it is no longer required, and the nature and extent of rehabilitation work to be carried out.

*Proposed Management Practices in the Support of Other Strategic Thrusts.*

The Proposed Management Practices are:

- to formalise a Planning Committee within the management system to undertake systematic planning of the Park's development;
- to restructure the current organisational structure to meet new challenges and planned developments; for example, the divisions within the Park's organisation structure should be functionally specialised and divided as such:
  - Park's Management and Operations;
  - Finance and Administration; and
  - Research/Education and Planning Department.
- to form three separate units within the Park's Management and Operations Division; ie., enforcement, recreation and services and maintenance;



- to seek input involvement of the local population in the management of the Park;
- to provide appropriate communication facilities along with the proposed developments;
- to seek an alternative communication system for the management of climbers on Mt. Kinabalu; guides should carry a set of walkie-talkie which can be used when mishaps occur;
- to provide landline communication to service senior staff houses from the base stations in case of emergencies after office hours; or disruption of communication caused by atmospheric interference;
- to prepare guidelines for risk management;
- to document and map out all villages and their characteristics close to the Park; and
- to prepare comprehensive public relations strategy and programmes (focus should be directed towards younger age groups).

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## 7. CONCLUSION

The Board of Trustees of Sabah Parks is charged with heavy responsibility of managing the six natural parks in the state. It must serve to balance two fundamental natural resource management options i.e. *preserve or conserve*. This management challenge is greatest at Kinabalu Park where the resources are subject to increasing use for recreation, tourism and physical development; illegal extraction of forest produce and encroachment; and potential hazards arising from land-use patterns outside the Park's boundary. For the remaining five Parks, the challenge is to continuously preserve the undisturbed state by limiting use to non harmful activities only.

The Kinabalu Park Development Masterplan underpins the conservation option for natural resource management. As opposed to preservation which means zero-use of the renewable biological and non-renewable physical resources, conservation seeks to find the optimum balance between resource use and its carrying capacity. While it is fully recognised that the dynamics of renewable resources are such that it is able to return to a new stable state after damage is done, the rate of return can be dismal and may perhaps occur only after a long gestation period. Further, it is doubtful whether the new stable state is at its original optimum level. Given this character of natural resources, the Masterplan adopts a very cautious development stance by providing some 33 recommendations under five strategic thrusts: conserving the biological and physical resources; spearheading scientific research and enhancing educational values; increasing recreational and touristic activities; preserving cultural and historical values; and instituting management procedures to support other strategic thrust.

In Volume III, a development model which emphasises the eco-development thrust is proposed for the Kinabalu Park Nature and Golf Resort.

***VOLUME II***  
***APPENDICES***

## APPENDIX II-I The Native Flora of Kinabalu Park

### ● Common Trees and Shrubs

The Ericaceae is a large family comprising mainly shrubs of many well known genera such as *Rhododendron*, *Gaultheria* (wintergreen), *Erica* (Heath) *Diplycosia* and *Vaccinium* (blueberries, etc.). There are about 280 species of *Rhododendron* in the Malaesia and nine of the 26 species found in Kinabalu Parks are endemic. *Gaultheria* with 24 species in Malaesia has only the species *Gaultheria borneensis* occurring in Kinabalu Park. On the other hand, *Diplycosia*, an ally of *Gaultheria* flourish in the park. Of the 93 species occurring in the Malaesia, 25 are found here and 22 of these are endemic. *Vaccinium* has about 240 species in the Malaesia, 11 are found in Kinabalu Park and six are endemic.

The density and occurrence of the endemics varies according to the different environmental factors in the Park. For example, *Rhododendron ericoides*, a shrub with needle-leaves set closely around the twigs begins to appear on ridges at about 2,438m. and continues abundantly almost to the summit where it is dwarfed to a bush scarcely a foot high. *R. lowii* is common especially in the gullies at 2,743m. *R. brookanum* found widely in Borneo, occurs even in the lowland at altitudes lower than *R. lowii*. A shrub *R. fallacinum* is common on ridges from 1,524m. upwards.

Kinabalu Park also houses many primitive genera from the families *Winteraceae* and *Magnoliaceae*. Such concentration of plant families are not found in any other areas of comparable size in the world. From the lowlands on the eastern side up to 3,200 m., there exists the genera *Magnolia*, *Michelia*, *Elmerrilia* and *Talauma*, totalling eight species from the *Magnoliaceae*. Well illustrated by *Michelia champaca* (cempaka) and *M. Montana*, they occur on Kinabalu at about 914 to 1,524m. as trees up to 30 m. tall. Another species of the *Magnoliaceae*, *Talauma giltingensis*, a sprawling shrub with very fragrant creamy yellow flowers, grows on the rocky banks of streams up to 914 m.

*Drimys piperita* (*Winteraceae*) is the only species in the genus which extends into Malaesia. This genus illustrates an excellent example of the South Pacific migratory route. *D. piperita* is abundant from 1,524 to 3,353 m. on Mt. Kinabalu and it was assumed that Borneo is its western limit. The species is also known to occur in the Philippines, Celebes, Flores, the Moluccas Islands, New Guinea and Australia.

*Prunus javanica* and *Photinia davidiana* are among the small trees conspicuous for their pink new foliage and the scarlet of their withering leaves. Both occur along the ridges, the former from 5.2 m. upwards while the latter from 274-3,353 m. *Prunus spp.* is the large north temperate genus of plums, apricots, almond, peach and cherries. Four species have been recorded in the Malaesia and Kinabalu Park houses the endemic *Prunus mirabilis* which is found on the eastern ridge. *Photinia* with some 50 species, mostly in the Sino-Himalayan region, has five species in the Malaesia. Both *Prunus* and *Photinia* represent the continental element from Asia in the flora of Kinabalu.

Numerous species of *Ardisia* occur as shrubs and small trees on Kinabalu. *Rapanea* which is allied with *Myrsine* (both *Myrsinaceae*), has nine species of small trees or shrubs in Kinabalu Park and mostly occur above 152 m. About eight species of *Ilex* (Hollies) grow in the Park as small trees from 1,522-3,353 m. The common *Ilex havilandii* is abundant on the ridges while *R. ericoides* abound in areas of the Park which have decimated from the original forest. There are some 70 species distributed from eastern Asia to New Guinea, with two species in tropical Africa. 17 species of *Adinandra* occur in Borneo, of which 12 occur in Kinabalu and eight are endemics viz. *Adinandra caudatifolia*, *A. clemensiae*, *A. colombanensis*, *A. impressa*, *A. maghiflora*, *A. nunkokensis*, *A. quinquopartita* and *A. verrucosa*.

*Leptospermum* (mountain gelam), *Tristania* and *Eugenia* are the three common genera found in the mountain forest. The mountain gelam is represented by the widespread *L. flavescens* (1,524-2,590 m.) and the endemic *L. recurvum* which occurs at higher altitudes, even to the summit peaks where it is dwarfed into a little shrub. Kinabalu Park houses one of the few examples of the local endemic, *L. flavescens*.

The genus *Weinmannia* (*Cunoniaceae*) occurring in tropical America, Madagascar, Malaesia, Polynesia and New Zealand is a genus of small trees and are found in abundance on ridges and in dwarf forests on the upper slopes of Kinabalu Park. It is easily recognised from the opposite pinnate leaves with paired orbicular stipules, reddish pink new leaves and scarlet withering leaflets. 12 species occur in the Malaesia, four of which are found on Kinabalu and one, *W. clemensiae* is endemic.

Borneo has 135 species of wild figs (*Ficus*) and more than half (78 species) can be found in the Park (Corner, 1962). The Park has 14 endemic species and five endemic varieties of other species making Kinabalu Park the richest area of fig-flora of any comparable size in the world. Most species do not ascend above 1,524 m. but one endemic. *Ficus deltoidei* var. *kinabaluensis* can be found on rock slabs at 3,230 m. near the Matterhorn on the eastern ridge. The preceding endemic variety is also outstanding because it is the highest latitudinal record for the genus.

Kinabalu Park stores living steps in an evolutionary sequence from one growth-habit to another with corresponding change in twig, leaf, flower, fruit and habitat as is exemplified by the figs. For example, in deep gullies at 914 to 1,524 m. one can find the coarse sapling-like *Ficus cereicarpa* with large leaves (up to 20 x 20 cm) accompanying *F. fraxisci* which has smaller leaves, along streams. Then on the valley-sides, the endemic *F. virescens* occur, which in turn, leads to the geocarpic *F. treubii*.

*Drapetes ericoides* (*Thymelaeaceae*) a shrubby little plant, 0.6 m. high that occurs in wet places and in the rocks on the summit zone, is one the many surprises on Kinabalu because it has not been found elsewhere except on the mountains of New Guinea. The other species of the genus occur in Australia, New Zealand and temperate South America.

One of the greatest botanical discoveries of this century is *Trigonobalanus verticillata*, (*Fagaceae*) an endemic to Kinabalu Park. *Trigonobalanus* is restricted to Borneo, Celebes, Northern Thailand and Malaysia. It is called beech-oak because it has the triangular nuts of the north temperate beech-trees (*Fagus*) borne in acorn-cups, has leaves and timber of tropical oaks (*Quercus*, *Lithocarpus*) and the seedlings of beech. The existence of *T. verticillata* unifies all southern beeches (*Northofagus*) of South America, New Zealand, Australia, New Calodonia, New Britain and New Guinea by drawing them closer together.

Another truly characteristic species, is the Australasian element in the Kinabalu Park flora, *Phyllocladus hypophyllus*, a conifer. It is distributed from New Guinea to Sarawak across the north of Borneo, and the Philippines but it does not reach the Asia mainland. In Kinabalu Park, it occurs between 1,524 to 2,658 m. and is one of the common trees on ridges between 1,828 to 2,243 m. At lower altitudes, it is a tree over 30 m. high and, at the higher altitudes, it is dwarfed to a bush. Unlike other conifers which occur in the mountain forest (*Agathis*, *Dacrydium* and *Podocarpus*), *Phyllocladus* has been regarded as the most primitive living conifer or gymnosperm due to its reduced leaf system as is found in the early Devonian fossil seed ferns.

Kinabalu Park is not just a natural meeting place for plants of Asia and Australia. Remarkable as this is, it is also a store-house of evolution and one wonder how many of these supposed immigrants in fact originated on the earlier massifs of North Borneo.

#### ● Herbaceous Plants

There are some 36 species of *Ranunculus* in the Malaesia, in the mountains of Sumatra, Philippines and New Guinea. Of these, only *R. lowii* (Kinabalu buttercup) is found in Borneo and only on Mount Kinabalu between 2,987 to 3,962 m. where it grows in abundance together with other alpine herbs. Another widespread *ranunculaceous herb*, *Clematis smilacifolia* which is endemic to Borneo is also found in the Park in the montane forest zone.

*Potentilla*, a rosaceous group has nine species in the Malaesia, of which only three occur on the summit of Kinabalu viz: *P. borneensis*, *P. parvula* and *P. polyphylla*.

Other herbaceous groups of plants that can be found in the Park are the *Gentianas*, *Umbellifers*, *Composites*, *Violets*, *Sonerila*, *Gesneriads*, *Saxifragaceas*, *Rubiaceae*, *Havilandia* and *Sonerila*. The distribution pattern, number of species and those endemics to the Park are summarised in Table (II-i).

Table II-i : Some Common Herbaceous Plants in Kinabalu Park

Taxonomy	Species endemic to Kinabalu Park	Distribution in Park
<i>Euphrasia</i>	<i>E. borneensis</i>	from 244 m. upwards
<i>Gentiana</i>	<i>G. lycopodioides</i> <i>G. borneensis</i>	2,286 to 3,962 m.
<i>Havilandia</i>	<i>H. borneensis</i>	from 3,048 m. upwards
<i>Trachymene</i>	<i>T. saniculifolia</i>	2,134 m. to summit
<i>Hydrocotyle javanica</i> <i>Sanicula europea</i> <i>Oreomyrrhis andicola</i>		up till 2,996 m. 1,524 to 2,986 m. summit zone
<i>Gnaphalium luteoalbum</i> <i>Vernonia arborea</i>		Steep and wet banks lowland to gullies to 2,438 m.
<i>Myriactis javanica</i>		2,743 m. to summit
<i>Viola sumatrana</i> <i>Viola curvistylis</i>		1,372 to 2,743 m.
<i>Asfible rivularis</i>		3,048 m.
<i>Saxisfragraceae</i>		
<i>Hedyotis</i> <i>Phyllocrates</i>	<i>H. macrostegia</i> <i>P. gibbsiae</i>	2,743 to 3,658 m. 2,743 to 3,658 m.
<i>Sonerila</i> (Melastomaceae)	<i>S. crassiuscula</i>	2,743 m.

The herbaceous plants of Kinabalu Park exudes some flora history: *Oreomyrrhis* for example exemplifies what is known as the South Pacific track which linked South America and Australia by way of Antarctica, and then with the continental drift in the Mesozoic period these lands separated. Mt. Kinabalu is also the stepping stone in the long excursion of little *Nertera granadensis* (*Rubiaceae*) conspicuous from the red berries among the light green ovate leaves, which besides being found creeping on paths, rocks and damp shady places at 3,048 to 3,353 m., is also dispersed from central and South America through the mountains of Malaesia to South China and Madagascar.

- **Blackberries and Raspberries**

Some eight species of *Rubus* (*Rosaceae*) can be found above 122 m. on Mt. Kinabalu. One high mountain species, *Rubus lowii* is found at 2,743 to 3,962 m. From 1,219 to 2,438 m, three species of blackberry viz. *R. moluccanus*, *R. glomeratus* and *R. elongatus* are found while at mid-altitudes, three common species viz. *R. fraxinifolius*, *R. lineatus* and *R. angulatus* occur.

- **Pitcher-plants**

From 1,524 to 3,353 m. galleries of pitcher-plants occur. Most the pitcher plants seem to enjoy the poor soil and climb on the shrubs and trees. The pitchers are actually modified leaves; the true blade is the pot with its lid, the stalk becomes a narrow blade and the length of midrib between the two becomes a sensitive stalk that twines as a tendril round an object of support. The pitchers are insectivorous in nature to compensate for the lack of nourishment from poor soils.

Of some 65 species of *Nepenthes* described by Danser (1928), 28 occur in Borneo and of these, eight species exist in the park. However, only four species are endemic to Kinabalu Park i.e. *Nepenthes burbidgeae*, *N. endwardsiana*, *N. rajah* and *N. villosa*.

- **Parasitic Flowering Plants**

There are about a dozen species of Mistletoe (*Loranthaceae*), which are parasites with green photosynthetic leaves in the Park. The stem parasite *Rafflesia* and the root parasites *Balanophora* and *Mitrostemon* which have no roots or foliage leaves attach to their hosts by means of suckers. Except for *Rafflesia*, all other known genera of parasitic flowering plants are not endemic to the Park.

*Rafflesia*, one of the rarest plants known, grows from the trailing stems of wild grape-vines *Tetrastigma* spp. especially of *T. lanceolarium*. Reported to be one of the rarest of all plants, it is found only in very few locations in Borneo. *Rafflesia* has been agreed by many to be one of the greatest wonders of the scientific world with respect to their size, parasitic mode of life and rarity. Of the 13 or so species known, all from South East Asia, two are suspected to be extinct. Measuring from less than a foot across in some species and up to three feet wide in *R. arnoldii* of Sumatra, the bright red open flowers with marbled white spots often emit a strong smell of carrion. The flower fades into dull crimson and finally dirty brown.

Borneo is assumed to be the centre of diversity for the *Rafflesia*, with at least four species documented. There are three species of *Rafflesia* in Sabah, *R. keithii*, *R. pricei* and *R. Tengku Adlini*, found in three different localities (see Table II-ii), which extends from Mt. Kinabalu to Tenom between 450 to 1,200m.



Table II-ii: Bornean Rafflesia

Species	Locality
<i>R. arnoldii</i>	Sarawak and South Kalimantan
<i>R. borneensis</i>	North Eastern Kalimantan
<i>R. keithii</i> *	Sabah
<i>R. pricei</i> *	Sabah
<i>R. tengku-adlinii</i>	Sabah

Note: \*also found in Kinabalu Park.

### ● Orchids

The number of orchid species is estimated at around 2,000 in Borneo, out of which more than 1,000 species in more than 60 genera exist in the Park. This suggests that the diversity of the Borneo orchid flora lies in Kinabalu Park itself.

The most famous orchid species of the Kinabalu Park is the slipper orchids of the genus *Paphiopedillum*. There are at least five species of *Paphiopedillum* here. The most desirable and finest in the genus, is *P. rothschildianum*, which is endemic to the Mt. Kinabalu. This species has long green strap leaves arranged in fans from which a purple hairy scape bears several large flowers almost 13 cm wide. Another striking species, *P. dayanum* with tessellated leaves is also endemic to the Park. Another remarkable Borneo orchid first discovered in Sarawak by Low, and found in Kundasang, Kinabalu Park is *Arachnis lowii*, which grows quite high up on trees near streams.

Borneo is also known for its *Phalaenopsis* species and there are a few species from Mount Kinabalu. Most *Phalaenopsis* species occur below 1,000 m. *P. amabilis*, the wild orchid once very common below Kundasang are now rarely seen but can still be found growing and flowering at Poring at 700 m.

Among other lowland species that can be found in the forest at Poring Hot-Springs is the Giant Orchid *Grammatophyllum speciosum*, with inflorescences over two m. long. A closely related genus that grows into large clumps on the trees is *Cymbidium atropurpureum* which is endemic to Borneo with rich dark purple flowers and the unusual scent of 'deshicated coconut'. The most strongly scented orchid in the lowlands is *Aerides odoratum*, seen together with the common *Acriopsis javanica*.

*Dendrochilum* and *Philodota* are represented by many species on Mt. Kinabalu extending over a wide latitudinal range. They are commonly seen on the ground at high levels and up as far as the Panar Laban huts where they are seen growing on the pine *Dacrydium* spp.

Other orchid endemics in the Park include *Bromhedia divaricata*, *B. rigida* and *Eulophias ovalifolia*.

● **Ferns**

There are about 450 species of ferns documented in the Park. This is almost as many found in the whole of Africa. Kinabalu Park provides representatives of almost all the principal genera of the Old World. This relatively large number of species found in a small area is due to the wide range of habitats provided by the forest, a range of temperatures and constant humid climate in the Park. A list of some common ferns found in the Park is shown in Table II-iii.

**Table II-iii: Some Common Ferns in Kinabalu Park**

Fern Group	Common Group
Roadside fern	<i>Gleichenia spp. Blechnum orientale</i>
Tree fern	<i>Cyathea contaminans</i>
High-Altitude Thicket ferns	<i>Hypolepis brooksiae, Histiopteris stipulacea</i>
Shade ferns	<i>Thelypteris</i>
Mountain ridge ferns	<i>Dipteris</i>
Ferns of high altitudes	<i>Cyathea havilandii, Polystichum spp., Blechnum spp.</i>
Epiptytic ferns	<i>Polypodium spp., Davallia Asplenium spp.</i>
Filmy ferns	<i>Hymenophyllum spp.</i>
High-Altitude epiptytes	<i>Grammitis spp.</i>

● **Some Plants of Peculiar Interest in Kinabalu Park**

The Park houses some very interesting floristic elements. These include relics such as *Scyphotegia borneensis*, *Drimysc spp*, and *Borneodendron aenigmaticum*, a highly disjunct *Euphorbiacea* found near Poring which has its nearest relative in New Caledonia and Australia, and the *Magnolias*. Other known plants of relic nature are *Agathis borneensis* and a composite, *Vernonia arborea*.

A Philippine species *Buxus rolfii* is found in Bukit Hempuen. Some plants of taxonomic interest would be *Daphniphyllum borneense*, a small tree up to 7 m. high, and *Terminalia* with branching, common in gullies at 2,743 - 3,353 m. and is an endemic of Kinabalu Park. The taxonomy of this genus is still is question: whether to place it in the family *Euphorbiaceae* or *Buxaceae*.

APPENDIX II-2

Altitudinal Distribution of Mammals and Frogs and Toads in Kinabalu Park

Lowland Mammal Species and Maximum Altitude (in metres) Recorded in the Park.

Lowland Mammal Species	Altitude (m)
South-east Asian white-toothed shrew ( <i>Crocidura fuliginosa foetida</i> )	1,676
Lesser Treeshrew ( <i>Tupaia minor minor</i> )	1,067
Large Treeshrew ( <i>Tupaia tana paitana</i> )	1,006
Colugo or Flying Lemur ( <i>Cynocephalus variegatus natunas</i> )	488
Large flying fox ( <i>Pteropus vampyrus</i> )	488
Short-nosed fruit bat ( <i>Cynopterus horsfieldi brachyotis</i> )	1,676
Horsfield's fruit bat ( <i>Cynopterus horsfieldi persimilis</i> )	1,460
Trailless fruit bat ( <i>Megaerops ecaudatus</i> )	914
Greater sheath-tailed bat ( <i>Emballonura alecto rivalis</i> )	701
Lesser false vampire ( <i>Megaderma spasma kinabalu</i> )	914
Borneon horseshoe bat ( <i>Rhinolophus borneensis borneensis</i> )	*
Acuminate horseshoe bat ( <i>Rhinolophus acuminatus sumatranus</i> )	1,676
Greater woolly horseshoe bat ( <i>Rhinolophus luctus foetidus</i> )	1,524
Whiskered myotis ( <i>Myotis muricola muricola</i> )	1,494
Black myotis ( <i>Myotis ater nugax</i> )	1,494
Javan pipistrelle ( <i>Pipistrellus javanicus javanicus</i> )	1,600
Least pipistrelle ( <i>Pipistrellus tenuis nitidus</i> )	1,494
Narrow-winged pipistrelle ( <i>Pipistrellus stenopterus</i> )	488
Greater bamboo bat ( <i>Tylonycteris robustula</i> )	1,067
Gilded tube-nosed bat ( <i>Murina rozendaali</i> )	149
Large bent-winged bat ( <i>Miniopterus magnater macrodens</i> )	149
Slow loris ( <i>Nycticebus bancanus borneanus</i> )	at least 1,280
Western Tarsier ( <i>Tarsius ncanusorneanus</i> )	below 914
Grey leaf monkey ( <i>Presbytis hosei hosei</i> )	1,219
Red leaf monkey ( <i>Presbytis rubicunda</i> )	3,048
Long-tailed macaque ( <i>Macaca fascicularis fascicularis</i> )	1,219
Pig-tailed macaque ( <i>Macaca nemestrina nemestrina</i> )	762
Borneon gibbon ( <i>Hylobates muelleri funereus</i> )	1,524
Orang-utan ( <i>Pongo pygmaeus pygmaeus</i> )	1,463
Pangolin ( <i>Manis javanica</i> )	1,676
Giant squirrel ( <i>Ratufa affinis sandakanensis</i> )	1,676
Prevost's squirrel ( <i>Callosciurus prevostii pluto</i> )	549
Plantain squirrel ( <i>Callosciurus notatus dilutus</i> )	1,676
Ear-spot squirrel ( <i>Callosciurus adamsi</i> )	*
Horse-tailed squirrel ( <i>Sundasciurus hippurus pryeri</i> )	*
Low's squirrel ( <i>Sundasciurus lowii lowii</i> )	1,067
Four-striped ground-squirrel ( <i>Lariscus hosei</i> )	1,524
Tufted ground squirrel ( <i>Rheithrosciurus macrotis</i> )	762
Horsfield's flying squirrel ( <i>Iomys horsfieldi thomsoni</i> )	1,829

Lowland Mammal Species	Altitude (m)
Black flying squirrel ( <i>Aeromys tephromelas phaeomelas</i> )	1,607
Thomas's flying squirrel ( <i>Aeromys thomasi</i> )	1,615
Temminck's flying squirrel ( <i>Petinomys setosus setosus</i> )	1,646
Grey-cheeked flying squirrel ( <i>Hylopetes spadiceus everetti</i> )	1,036
Smoky flying squirrel ( <i>Pteromyscus pulverulentus borneanus</i> )	549
Red giant flying squirrel ( <i>Petaurista petaurista rajah</i> )	914
House rat ( <i>Rattus rattus diarjii</i> )	1,646
Malaysian field rat ( <i>Rattus tiomanicus</i> )	1,646
Ricefield rat ( <i>Rattus argentiventer</i> )	1,615
Polynesian rat ( <i>Rattus exulans ephippium</i> )	1,646
Muller's rat ( <i>Rattus argentiventer</i> )	1,615
Dark-tailed tree rat ( <i>Niviventer cremoriventer kina</i> )	1,524
Red spiny rat ( <i>Maxomys surifer bandahara</i> )	1,676
Chestnut-bellied spiny rat ( <i>Maxomys ochraceiventer</i> )	1,676
Small spiny rat ( <i>Maxomys baeodon</i> )	1,372
Whitehead's rat ( <i>Maxomys whiteheadi whiteheadi</i> )	2,134
Long-tailed giant rat ( <i>Leopoldamys sabanus</i> )	3,109
Grey tree rat ( <i>Lenothrix canus malaisia</i> )	549
Common pencil-tailed tree-mouse ( <i>Chiropodomys muroides</i> )	1,067
Ranee mouse ( <i>Haeromys margarettae</i> )	914
Long-tailed porcupine ( <i>Trichys fasciculata</i> )	914
Common Porcupine ( <i>Hystrix brachyura</i> )	914
Sun bear ( <i>Helarctos malayanus euryspilus</i> )	2,286
Yellow-throated marten ( <i>Martes flavigula saba</i> )	1,524
Malay weasel ( <i>Mustela nudipes</i> )	1,524
Malay civet or Tangalung ( <i>Viverra tagalunga tagalunga</i> )	762
Banded linsang ( <i>Prionodon linsang gracilis</i> )	1,433
Masked palm civet ( <i>Paguma larvata ogilbyi</i> )	2,134
Binturong ( <i>Arctictis binturong penicillata</i> )	1,524
Small-toothed plam civet ( <i>Arctogalidia trivirgata stigmatica</i> )	1,524
Banded Palm Civet ( <i>Hemigalus derbyanus boiei</i> )	762
Clouded Leopard ( <i>Neofelis nebulosa diardi</i> )	914
Leopard cat ( <i>Felis bengalensis borneonsis</i> )	1,433
Bay cat	1,676
Asian two-horned rhinoceros ! ( <i>Dicerorhinus sumatrensis</i> )	*
Bearded pig ( <i>Sus barbatus barbatus</i> )	2,438
Lesser Mouse-deer ? ( <i>Tragulus javanicus klossi</i> )	487
Large mouse-deer ( <i>Tragulus napu borneanus</i> )	610
Common barking deer ( <i>Muntiacus muntjak pleiharicus</i> )	3,353
Sambar deer ( <i>Cervus unicolor brookei</i> )	3,353

- \* no records available of maximum altitude on Mt. Kinabalu  
 ? these subjects recorded only through unconfirmed sightings  
 ! probably now extinct on Mt. Kinabalu

(Sources: Im and Heyneman (1968); Medway, 1977; G. Musser, *in litt.*: Payne 1988; Payne *et al.*, 1985, and A. Phillipps (unpublished report).

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Bay cat	1,676
Asian two-horned rhinoceros ! ( <i>Dicerorhinus sumatrensis</i> )	*
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 ! probably now extinct on Mt. Kinabalu.

(Sources: Im and Heyneman (1968); Medway, 1977; G. Musser, *in litt.*: Payne 1988; Payne *et al.*, 1985, and A. Phillipps (unpublished report).

Montane Mammal Species Known From Kinabalu Park and the Altitudinal Range (in metres)  
within which they have been recorded in the Park.

Lowland Mammal Species	Altitude (m)
Lesser Gymnure ( <i>Hylomys suillus dorsalis</i> )	1,219-3,353
Black shrew ( <i>Suncus ater</i> )	1,676
Kinabalu shrew ( <i>Crocidua baluensis</i> )	1,646-3,658
Sunda shrew ( <i>Crocidura monticola</i> )	1,524
Himalayan water shrew ( <i>Chimarogale himalayica phaeura</i> )	457-1,676
Mountain treeshrew ( <i>Tupaia montana baluensis</i> )	914-3,170
Smooth-tailed treeshrew ( <i>Dendrogale melanura baluensis</i> )	914-3,353
Grey fruit bat ( <i>Aethalops alecto aequalis</i> )	1,067-2,743
Kinabalu squirrel ( <i>Callosciurus orestes venetus</i> )	549-1,676
Jentink's squirrel ( <i>Sundasciurus jentinki jentinki</i> )	914-3,139
Brooke's squirrel ( <i>Sundasciurus brookei</i> )	488-1,067
Red-bellied sculptor squirrel ( <i>Glyphotes simus</i> )	1,371
Bornean mountain ground squirrel ( <i>Dremomys everetti</i> )	1,067-3,414
Whitehead's Pigmy squirrel ( <i>Exilisciurus whiteheadi</i> )	1,067-3,414
Spotted giant flying squirrel ( <i>Petaurista elegans banksi</i> )	549-2,987
Summit rat ( <i>Rattus baluensis baluensis</i> )	1,067-1,676
Mountain giant rat ( <i>Sundamys infraluteus infraluteus</i> )	2,134-3,353
Long-tailed mountain rat ( <i>Niviventer rapit</i> )	914-2,926
Mountain spiny rat ( <i>Maxomys alticola</i> )	488-3,353
Ferret-badger ( <i>Melogale personata everetti</i> )	1,067-3,353
Hose's civet ( <i>Hemigalus hosei</i> )	* 610-1,219

\* records from Crocker Range and Sarawak

(Source: Medway, 1977; G. Musser, *in litt.*; Payne *et al.*, 1985;  
A Phillips (unpublished report); Thomas, 1988).

**Altitudinal Distribution of Frogs and Toads in Kinabalu Park.**

Zone	Species
Summit Zone (Above 3,050m.)	<i>Ansonia fuliginea, Philautus miobergi, Pelophryne misera</i>
Upper Montane Zone (1,830-3,050m.)	<i>Leptobranchella baluensis, Lakophrynus baluensis, Leptolalax gracilis, Amolops jerboa, Ansonia fuliginea, Philautus amoenus, A. hanitschi, P. longicrus, A. longidigita, P. mjobergi, Pelophryne misera, P. peters</i>
Lower Montane Zone (1,220-1,830m.)	<i>Leptobranchium montanum, Rana hosei, Loptolalax gracilis, R. kuhli, Megophyrya baluensis, R. luctuosa, Megophrys nasuta, R. palavanensis, Kaloula pulchra, Staurois latopalatus, Kalophrynus baluensis, Staurois tuberilinguis, Bufo juxtasper, Polypedates leucomystax, A. guibei, Philautus mjobergi, A. banitschi, P. petersi, A. longidigita, Phacophorus acutirostris, A. amoropalamus, Rhacophorus baluensis, Amolops jerboa, R. bimaculatus, A. orphnocnemis, R. everetti, Occidozyga baluensis, Nyxtixalus pictus.</i>
Lowland Zone (Below 1,220m.)	<i>L. montanum, R. chalconota, Leotolalax gracilis, Rana finchi, Megophyrya baluensis, Rana hosei, Megophyrya nasuta, Rana kuhli, Kalophrynus pleurostigma, Rana luctuosa, Kaloula pulchra, R. nicobariensis, Chaperina fusca, R. palayanensis, Microhyla borneensis, R. signata, Bufo divergens, Staurois latopalatus, Bufo juxtasper, Staurois natator, A. albomaculata, Staurois tuberilinguis, A. hanitschi, Nyctixalus pictus, A. longidigita, Philautus hosei, A. platysoma, Polypedates, colletti, A. spinulifer, P. leucomystax, Leptophryne bornonica, P. macrotis, A. amoropalamus, P. otlophus, A. cavitympanum, Rhacophorus acutirostris, A. jerboa, R. appendiculatus, A. orphnocnemis, R. dulitensis, A. whiteheadi, R. gauni, Micrixalus baluensis, R. pardalis, Occidozyga baluensis, R. blythi</i>

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## **APPENDIX II-3**

### **Proposed Recreation Activities**

Adequate facilities and proper settings are important and opportunities must be available to all and should produce minimal environmental disturbance. Conservation of the natural resources must be the priority and activities that support the awareness and appreciation of nature should be encouraged without altering the natural appearance of the surrounding. Some of the proposed activities and facilities are as follows:

- **Pony and Horse Trail**

Pony or horse rides can provide pleasure, relaxation and even transportation to certain destinations. The trail distance can be varied with all the trips ending at the trailhead. A fairly big number of ponies or horses are required but only a certain number may be allowed at a time to avoid congestion and reduce impact on trails. The trails constructed should be easily managed.

The rides and trips must always be attended by Park's personnel or hired locals with related experience. Programmes to improve riding skills may also be conducted for the future development of skill in this activity.

- **Rock Climbing**

Kinabalu Park possesses prominent rocky and rugged features that will certainly attract rock climbing enthusiasts. Cliffs of varying heights and degrees of difficulty will provide a challenge to different levels of climbers. Opportunities in this popular activity must be offered to climbers of different levels of skills.

Rock climbing activities involve a certain level of fitness, confidence and skills and the climbers must always be made aware of the risks involved. Rules and regulations must be enforced by the Park. Areas with cliffs for rock climbing activities must have available footholds, handholds and bridging spots. The Park will also have to set up a rescue team should emergencies arise.

- **Children's Adventure Playground**

This will promote creativity and building the spirit of adventure among children in a natural setting. The construction of the facilities must tally with the play nature of children and as an outlet for their emotions. Such facilities include objects for climbing, crawling, running, balancing, hanging, swinging and passing through obstacles. The atmosphere of play must not be restrictive and the children must be able to move freely. Certain age limits must be enforced to avoid bullying. The size of the playground should be spacious enough to generate feeling of fun and freedom.



- **The Forest Maze**

The forest maze can be incorporated within the children's adventure playground. This activity is to develop the children's ability to explore and to find their way from any puzzling situation.

Shrubs and small plants will be planted on both sides of the paths constructed. The children will be provided with a sketch plan at the starting point and they will have to use their skills and imagination to successfully find their way out.

- **Traditional Game Area**

A forest environment will be necessary to meet the needs of the traditional game area. The games may be held annually and be developed following the special event format. The games must cater for different levels of skills, be balanced and allow the participation of large numbers of people. This will foster goodwill, cooperation and enjoyment among the participants.

Traditional game events must encourage healthy competition among participating teams and individuals in team-play. Facilities required would include an open space and relevant equipment.

The management or interested parties can sponsor and organize the games. The games to be held should include environmentally selected games and the wise use of natural resources should be the foremost of any traditional games conducted.

- **Tree Climbing Area**

The climbing facilities will supplement the children's adventure playground activity. Parks are able to offer safe opportunities for climbing trees something which is hardly found in other areas particularly in the cities.

Trees with strong branches should be located adjacent to the playground and offer footholds and handholds for climbing. Artificial aids in climbing such as ropes and ladder can be provided to reduce difficulties in climbing and bridges constructed for movement between trees. Proper climbing techniques and care must be taught to the children involved in this activity.

- **Tree Houses**

This activity is to promote understanding about the primitive age when people lived on trees to escape from enemies and environmental hazards. The facilities to be set up may be incorporated into the children's adventure playground. The houses should not be too high and must be regularly checked. Accident preventive measures such as hand rails and grills must be built.

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The houses should be able to accommodate a certain number of children only. The Park's staff should supervise the children and their activities at all times while they are playing on the tree houses.

- **Campgrounds**

Campgrounds with a forest background are essential parts of national park recreation. Besides the experience of living in a natural environment, visitors can avoid the high cost of hotel accommodation and expensive restaurants.

Attractive sites with clean water supply and sanitary facilities must be provided. Natural building materials should be used when developing the campgrounds. Soil properties (texture of surface layer, wetness), drainage patterns and vegetative quality must be appraised before any construction of campgrounds is initiated. The setting must be pleasant and certain levels of vegetational screening will have to be incorporated for the privacy of the campers.

The campgrounds can be divided into central and backcountry types.

- *Central Campground*

This type of campground will cater for large number of people. Adequate basic amenities will have to be provided. These include clean water supply, toilets, showers, fireplace grills, tables and benches.

The central campground should be located on a flat ground near the the Park Headquarters where a certain level of convenience and security exists. The design must blend with the natural surroundings and appropriate alterations such as hardening of tent sites and trails are necessary to reduce undesirable impacts on the natural surroundings.

Each campground will have 10 to 15 tent sites, considerably spaced out for privacy. Campers may use their own camping equipment or rent it from the Park.

- *Backcountry campground*

Backcountry campground is designed to allow a 'wilderness experience' for the campers. Hence, the campgrounds will be more dispersed in nature.

The concept of low-impact camping is adopted here. Only limited basic facilities are provided. Campers have to use spring water for cooking and other necessities although toilets are provided for waste disposal.

Each campground should only accommodate between five to ten tents at specific locations. Trails to the campgrounds should be well-marked so that the campers can head straight to the camps without straying away. 'Pack in pack out' litter and garbage should be encouraged to ease the problem of disposal and to reduce maintenance costs.

Efforts however, should be made to close down the campgrounds which are causing unacceptable levels of damage to the environment. Alternate grounds should be sought to help meet the change.

- **Mt. Kinabalu Climb**

- Climbers must adhere to all the rules and regulations set by the management with respect to climbing Mt. Kinabalu;
- All climbing must be accompanied by guides registered with the management or guides approved by the Park authority;
- It is proposed that all climbers will have to acquire life assurance before a climb is approved; and
- All climbers should follow the trails designated by the management and under circumstances should they create their own trails.

- **Mountain Climbing**

- It is proposed that the Park authority set guidelines on the climbing of other mountains within the Park. These guidelines should be adhered to by all climbers; and
- Mountain peaks that possess ecologically sensitive habitats should not be permitted to be climbed unless for scientific purposes.

- **Camping**

- At present, car-based camping facilities are not provided. The Park will introduce overnight camping facilities within the Park for visitors if there is demand. Emphasis will be to provide low-key facilities in natural or semi-natural settings;
- It is proposed that opportunities for vehicle-based camping (including campervans and caravans) be provided at several specific camping areas;
- It is proposed that vehicle-based camping be banned along roadsides except at designated camping areas;
- It is proposed that the management permits "wilderness" camping in identified areas;

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- Camping may not be permitted at or near any management facility or other installations operated by the Park or other organisation authorized by the Park; and
  - Camping on a semi-permanent basis will not be allowed.
  - **Cooking and Camp Fires**
    - The lighting or use of any fire in the Park is subject to restrictions imposed by the Park authority;
    - It is proposed that no fires be permitted on any of the sub-alpine areas of the Park i.e. at or above the treeline. Subject to any total fire ban, the use of portable gas, liquid or solid-fuel stoves will be permitted;
    - It is proposed that no fires be lit on any trail or roadside, at any picnic or camping area except in a fireplace provided by the Park authority;
    - No live or green timber, fenceposts, plants, boards or other relics, may be used for firewood; and
    - In addition to above restrictions in the sub-alpine areas', the lighting or use of fires may be prohibited in any area of environmental disturbance or at any rehabilitation or research sites.

- **Hang-gliding**

Hang-gliding will be permitted in the Park, subject to specific prior approval from the Park Director and any specified conditions.

- **Picnic Sites**

Picnic sites and facilities in forest settings should be established as these are popular among park visitors. The picnic sites are mainly used by day-trippers comprising families and large groups of users. Facilities to be developed should include shelters (wakaf) and basic amenities such as tables with attached seats, fireplace for cooking, flush toilets and changing facilities. Trash collection facilities should be provided here.

Trees and shrubs should also be planted in appropriate areas to provide shade, beauty and also to attract wildlife. Other necessary modifications can be carried out to enhance attractiveness of the area.

Picnic sites should be located near water sources and have good shades overlooking scenic views. A play area for children can be built if necessary and picnic sites must be able to cater for large group of users and for special occasions.

- **Obstacle Course**

Facilities related to the obstacle course will comprise trail loops of specific distance with obstacles constructed at specific points along the route. A range of skills testing and difficulties are introduced which involves running, clearing hurdles, climbing steps and walls, running past moving footbridges and barriers.

The endurance and fitness of the participants will determine their success. This activity can be tied in with the traditional games.

- **Nature Trails**

Forests are highly valued as a place for recreation and nature education. To maximize their potential, trails may be constructed. Nature trails are the most important component of any national park and these trails can take visitors around the forest and foster an appreciation for nature. All trails to be constructed must specify a purpose and messages with a nature theme displayed. Information about natural features and objects can be placed at any point of interests along the trails for the benefit of those following the trail. Trails can be made up of short-loops and longer loops to cater for various categories of users. They should be well-marked, colour-coded and easy to follow. Nature trails should not make the average user physically strained.

- **Touch and Smell Nature Trail**

This kind of trail can encourage visitors especially school children to increase their knowledge about nature and to educate them about the contributions of natural resources to mankind. It can supplement the eco-garden programme where visitors can have first-hand experience observing, touching and smelling indigenous plants, flowers and other objects in nature. Explanations about the functions and usefulness of the elements along the trail should be conveyed in simple terms. The Park's ecologists and other trained staff should coordinate and supervise this program.

- **Outdoor Archery and Blowpipe Forest Range**

These activities can be promoted for the visitors who are interested in learning how primitive hunting was pursued. It will also improve archery skills and create an interest in blowpiping. A shooting range is needed for these activities and trained staff to supervise are required as a high degree of care is vital.

Specific requirements would include a large open space (46 x 76m) on level ground, located well away from other activities and any concentration of visitors. The area must be free from rocks and logs and warning signs such as a flag pole must be constructed to advise other park visitors when the range is in use.

- **Indoor Game Facilities**

These involve games and other recreational pursuits whether active or passive which take place within a building. Activities involved include indoor games such as cultural games, social events and activities such as art and craft sessions.

A building with an adequate hall area and a few rooms will have to be built to accommodate these games. The Park's staff will have to supervise the activities, building and equipment.

It is important that schedules be introduced and the facilities reserved before any use. Care of the facilities and equipment must be the responsibility of the users and charges imposed when using these facilities.

- **Nature and Golf Resort**

Most of the activities suggested above can be developed in a new resort area. The justification for a new resort and details of its development are included in Volume III of the study.

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#### **APPENDIX II-4** **Kinabalu Park Development Guidelines for Recreation and Tourism**

- The development and operation of visitor facilities will be based, as far as possible, on feedback from the studies on user groups;
- The Sabah Parks will be solely responsible for defining the functions and management objectives of every visitor facility within the Park except where covered by lease or license agreements;
- The development of new facilities or the modification of existing facilities will be through a Development Masterplan and will be preceded by the environmental planning procedures;
- The development or modification of any visitor facility will be preceded by an analysis of existing and demonstrated potential user patterns and needs, and a review of all other options for achieving the same management objectives;
- Facilities may be developed or operated under concession wherever it is more efficient and in the public interest to do so;
- Sabah Parks will be solely responsible for the provision of visitor facilities in interior Park areas. No visitor facilities will be developed or operated under concession in any area that is not directly served by public vehicular access;
- With respect to facilities provided under concession, site premiums and rentals will be determined by public tender process. Where premiums and rentals are determined by Sabah Parks, they will include provisions for all attributable costs and will reflect contemporary valuations; and
- Development and operation of visitor facilities by concessionaires, and to the relevant extent by the Sabah Parks or any other agency, will be subject to the relevant agreement(s), development application procedures, the objectives of management of the area concerned, the Environment Impact Assessment Act, 1984, and any other relevant legislations.

Future management of major visitor facilities at various localities throughout the Park, consistent with the objectives and procedures above, will be proposed in a separate development plan specific to the project concerned.

The essential requirements in the development of any facilities within the Park are that their location, design, construction and use will be consistent with the objectives of management of the area concerned, and that they make a significant contribution to providing opportunities for activities that are appropriate to the Park. The natural character of the Park's attractions must be maintained. For this reason, urban artificial recreation facilities such as swimming pools, sports grounds, tennis courts, golf courses, and the like, or amusements, are not regarded as appropriate in a natural park as they conflict with the objectives of management.

**A MANAGEMENT AND DEVELOPMENT MASTERPLAN  
FOR THE BOARD OF TRUSTEES OF  
SABAH PARKS**

***VOLUME III***  
**A DEVELOPMENT PLAN FOR KINABALU  
PARK NATURE AND GOLF RESORT**

*by*

*Coopers & Lybrand Management Consultants Sdn Bhd  
and  
Sun Chong & Wong*

**DECEMBER 1992**



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## 1 INTRODUCTION

### 1.1 Background

The Board of Trustees of Sabah Parks has identified the need for a range of leisure and recreational facilities to be established in Kinabalu Park. Besides the existing and on-going developments at the Kinabalu Park Headquarters and Poring Hot Springs Complexes, there are proposals to integrate the following areas for future development :

- *the Mesilau area.* The Development and Management Plan of Kinabalu Park identified the Mesilau section of the Park as the most suitable area for the development of a resort. The proposed area is situated on the southern border of the Park; in between the present Park Headquarters and Poring Hot Springs Complexes. It is located some 5km from the Park Headquarters (Figure III-1) and about 5 km from Kundasang town. It is situated at about 2000 metres above sea level and is also close to the Pinasuk Plateau. The Mesilau River flows through the proposed area, on the eastern side of the Plateau.
- *the area adjacent to Mesilau.* There is an adjacent area to Mesilau which was initially developed for golfing. This area lies outside the Park's boundary.

It is proposed that the two areas be reshaped into the Kinabalu Park Nature and Golf Resort.

### 1.2 Scope of Work

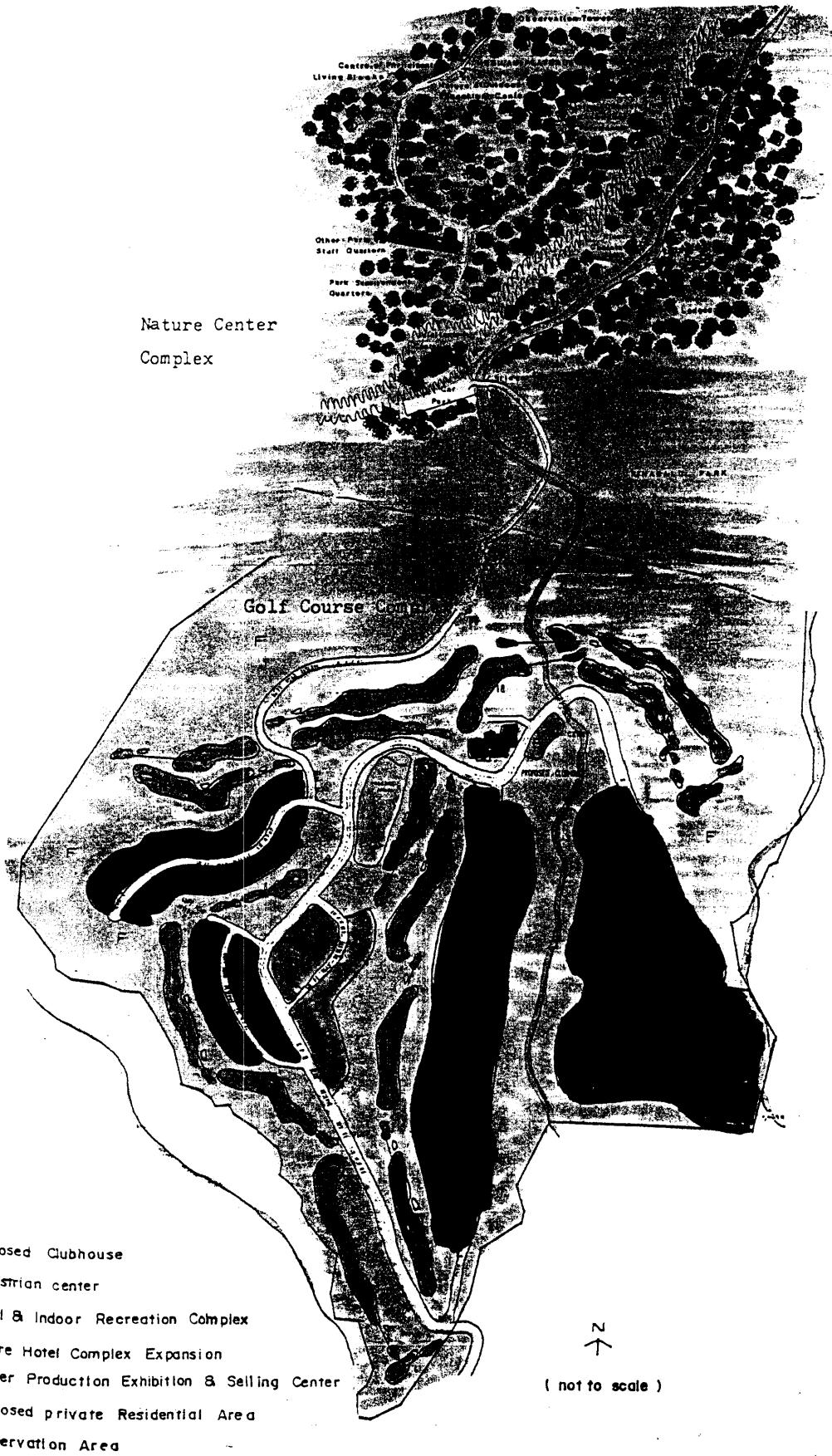
The objective of this Report is to propose a development plan for the Kinabalu Park Nature and Golf Resort. The terms of reference provided by the Trustees identified the following tasks for the study:

- to conduct a preliminary appraisal of the two identified areas for development as an integrated resort;
- to propose a concept for the development of the two areas;
- to suggest and recommend the suitable types of infrastructure, facilities and activities to develop; and
- to propose an operational management system for the Resort.

It must be stressed at the outset that this study is only conceptual in nature. A more detailed assessment and appraisal are needed before the proposals are implemented.

### 1.3 Structure of the Report

This Report follows several weeks of work during which the idea to develop the Resort was conceived and a development framework established. The general concept and proposed development design are supported by a preliminary layout of design sketches for selected infrastructures and facilities.



Nature Center  
Complex

Golf Course Complex

- A Proposed Clubhouse
- B Equestrian center
- C Hotel & Indoor Recreation Complex
- C Future Hotel Complex Expansion
- D Flower Production Exhibition & Selling Center
- E Proposed private Residential Area
- F Conservation Area

N  
↑  
( not to scale )

For the purpose of this study, a series of discussions with resource persons and Board members provided the much needed inputs to ensure that any initial thoughts on the proposed Resort are consistent with state policy matters and objectives.

## **2 PROJECT BENEFITS**

Efforts to develop the Kinabalu Park Nature and Golf Resort will generate the following benefits:

- revenue from tourism and related business. The Resort will serve both local and foreign tourists ;
- the proposed eco-development model effectively projects the image of Sabah Parks. The effort which balances conservation and development will be a point of reference at the local, national, regional and international levels ;
- the new project can help reduce the pressures currently experienced at the Kinabalu Park Headquarters' and complements on-going developments at the Poring Hot Springs Complexes. Exploitation of the untapped recreational and touristic resources for the proposed areas would redirect and offer alternative recreation to Park visitors. The selected development options are as follows:
  - the Mesilau area can be developed to provide for nature-based educational, passive and active recreational activities, and programmes; and
  - the Golf Course area can be developed into a first class golf setting that is unique and distinct from others in the region.
- an opportunity for a living model of development different from those found in the existing complexes.

## **3 PLANNING IMPERATIVES**

The development of a resort within a nature park requires careful consideration of several factors. Key among them is the effect on the natural environment of the park. Environmental consequences should be minimised so as not to adversely affect the image of Sabah Parks as a key national player in environmental conservation.

Hence, the development of the resort should blend with the natural characteristics of the proposed area. However, environmental considerations should not detract the quality of facilities to be developed. These planning imperatives will form the benchmarks that will determine the Park's success in planning for development.

## 4 DESCRIPTION OF THE PROPOSED DEVELOPMENT AREA

A visual inspection of the proposed area suggests that the physical site conditions favour the development of the Kinabalu Park Nature and Golf Resort.

### 4.1 Accessibility

The proposed area is accessible from the Kota Kinabalu-Ranau Road. The immediate access point is the junction at Kundasang. The road from Kundasang is metalled up to the border of the Golf Course. Work has already proceeded to upgrade and extend the road from Kundasang to the Golf Course area.

Before reaching the Golf Course area, extensively agriculture land can be seen on both sides of the road. This is interspersed with scattered settlements.

Presently, the access through the Golf Course area is by gravel road. From the Golf Course area, the gravel road leads to the Park area. The gravel road from the Golf Course crosses the Mesilau River at two points before it terminates at a steep embankment on the western border of the Park.

Within the Golf Course, there is a network of smaller feeder roads. For the Mesilau area, user movement would be through a system of walking trails.

### 4.2 Physical Features

The *Mesilau area* is a virgin forest within the Park's boundary. Several distinct physical features exist here:

- there is the Pinasuk Plateau which is relatively large and therefore quite ideal for the siting of buildings as this will lead to lower cost and minimal site construction problems. The Pinasuk Plateau is relatively flat with fairly thick vegetation cover. This Plateau rises inwards to form the foothills of the Mesilau Peak.

The steep eastern side of the River is steep and it forms the Mentaki Ridge with a small strip of flat land alongside. The Mesilau Cave is situated east of the river. The river valley depicts a rugged image but provides a panoramic view of the total Mesilau landscape.

- there is also the East Mesilau River valley with its steep river banks, rugged contours and littered with large boulders. The river and valley is by itself an attractive feature. However, any siting of structures along the banks requires substantial cost and ingenuity in engineering and construction work to minimise erosion; and
- the topography is steeper inwards. Several viewing points can be found on the higher slopes. These high points also provide panoramic views of the potential resort area.

The *Golf Course* area has been cleared to a large extent of its natural vegetation. Actions must be taken to ensure that the intended development in this area complements the efforts in Mesilau to achieve the overall development concept for the proposed Resort. This includes:

- careful planning and siting of the facilities to be provided at the Golf Course area and appropriate designing and construction of infrastructure which blends with the natural surrounding; and
- initiation of a Conservation Plan including the replanting of sites within the Golf Course area with trees and other vegetation so as to protect the environment from the adverse impact of the proposed development. Areas bordering Mesilau should be preserved to act as green buffer zones.

#### 4.3 Vegetation

The vegetation in Mesilau is mainly characterised by temperate-like forests. The vegetation is of the oak-mossy sub-montane type. Although the trees are not as tall relative to others in the Park, the three-storeyed structure comprising diverse species is still evident. The undergrowth is not very thick. Several parts of the Mesilau Plateau area are extensively covered with ferns and rattan.

In contrast, natural vegetation has been cleared and turfed for the 18-hole Golf Course. There are small pockets of the original sub-montane vegetation left and the indigenous trees were replaced by *Pinus spp.* An abundance of wild flower species grow along the roadside and on the cut-off slopes. In December, wild-weeds in full bloom add colour to the environment.

#### 4.4 Rivers and Hydrology

The presence of water and its elements has always been an attraction to visitors. The East Mesilau River flows through the proposed Resort. Small arterial streams, some of them seasonal, feed into this main river. The West Mesilau and the Mentaki Rivers border the Mesilau area. This adds a peace dimension to the area. The waters attract birds and other animals. The river and valley also allow a constant flow of fresh air from the mountain ranges through the funnel effect. The same River flows through the Golf Course area, giving rise to similar effects.

#### 4.5 Climate

The climate in the proposed development area is similar to that experienced at the Kinabalu Park Headquarters Complex. The driest months are from January to April and the wettest from August to December. Rainfall can reach as high as 450 mm. or as low as 20 mm. The Golf Course area can be foggy and misty in December.

Since Mesilau and the Golf Course are located on high altitude compared to the Kinabalu Park Headquarters Complex, the temperature is slightly lower. Average monthly temperature ranges between 15°C to 20°C.

A distinct climatic feature of the area is the windy condition. The wind is noticeably stronger and its downward flow more clearly felt relative to that observed at the Kinabalu Park Headquarters Complex. This is attributed to the location of the two areas at the foot of the massive mountain range and the presence of Mesilau Valley.

## 5 PACKAGING THE RESORT AREA

### 5.1 Resort Product Appeal

As discussed above, the proposed site has several significant natural characteristics which could be capitalised upon. The attributes emanating from them can be summed up as ;

- *panoramic views.* The proposed development site is at the base of a large, self-imposing mountain range. This makes the highland image very distinct. The rugged mountain range which is densely covered with trees conveys a wilderness character. Above the tree line, the massive exposed rocks produce a panoramic view not found in any other parts of Malaysia. The Golf Course area in contrast, creates an "open" environment.
- *cool and exotic environment.* The cool climatic condition in the highlands combines with mist and ever green environment to create an exotic atmosphere. It offers a setting quite different from that of temperate mountain resorts.
- *sense of isolation, seclusion, serenity and solitude.* Although the site is only 5 km from the Kota Kinabalu-Ranau highway, it is perched high up in the mountains. With the East Mesilau River Valley at the back of the Golf Course area, solitude and mystery surrounds the site.
- *strong sense of nature.* The Mesilau River valley and the Pinasuk Plateau is richly endowed with flora and fauna.
- *storybook appearance.* The high mountain ranges with cloud-covered peaks, dense forests, valleys and open spaces provide a real life environmental setting and image often associated with storybooks' highland hideaways or places of cool tropical paradise. The sites' physical qualities and environmental character conjure associations with nature, mystery, adventure, tranquility, and timeless legends.

These special attributes set the proposed Kinabalu Park Nature and Golf Resort apart from all other major resorts in Southeast Asia. It will certainly be appealing to the recreational-tourist niche markets. Indeed, the Kinabalu Resort site will be the first resort in the country that combines golf with nature. In resort planning jargon, it will attract the *allocentric* visitors -- people who have travelled widely, are the first to 'discover' a new area, seek new adventures and love immersing themselves in new experiences and activities while maintaining a sense of nature about them.

The very different atmosphere and recreational experience altogether of the Kinabalu Park Nature and Golf Resort will complement the existing Kinabalu Park Headquarters Complex's climbers' resort and the Poring Hot Springs Complex research facility.



## 6 MEETING THE DISCERNING DEMANDS ARISING FROM MARKET AND PRODUCT DIFFERENTIATION

It is the Board's principal objective to establish an integrated resort of the highest quality to cater for both local and regional/international visitors. The demands by these classes of potential visitors are not similar. And, the nature and characteristics of the proposed site are quite specific and unique in several ways. Not all markets would potentially use the resources and amenities provided. In this sense, the market is segmented and the resources and amenities provided may not be always compatible.

No studies have been undertaken to identify or segment in detail the specific markets which the proposed resort should cater for. Some potential conflicts in attempting to build a resort which appeals to a very broad, and undefined international and local visitors are inherent.

The market can perhaps be segmented and described as follows;

- *local and regional visitors* will generally place less emphasis on local Malaysian traditions. Instead, more emphasis will be placed on modern facilities and active or passive activities. Local day visitors will generally seek pleasant environments for sightseeing and more passive recreation with food and beverage facilities serving local and relatively inexpensive food ; and
- *international visitors* will attach importance to the natural attractions of the Park or its conservation and heritage values. Yet, there are international travellers who favour large crowds and constant action in the form of discotheques and other night entertainment and day time sporting activities; while others desire a more quiet environment with fewer people and more passive activities.

In matching the discriminating needs of potential users with the character and location of the Mesilau and the Golf Course area, an alternative approach would be classification according to length and/or purpose of stay. The potential users classified by this criteria, includes Day Users, Overnight Users, International Tourists, Special Interest Groups, and Real Estate and Holiday Home Makers.

### 6.1 Day Users

It is envisaged that the Kinabalu Nature-Golf Resort will appeal to three principal types of day users:

- *international/regional visitors* on overnight stops in Kota Kinabalu who might be attracted to Kinabalu Park to experience the Park's scenic attributes. This category of visitors will be further discussed under Section 6.3 below ;

- *local residents* who visit Kinabalu Park on weekends and public holidays. Their activities generally include sightseeing, climbing Mt. Kinabalu, picnicking, walking, and enjoying the site's natural and cool environment. They will not typically be the *big spenders* and prefer to either bring a picnic lunch or buy inexpensive local food and drinks available in the area. While the Resort's guest facilities will attract their attention and curiosity, they prefer to have their own spot with basic facilities provided nearby ;
- *local travellers* who might want to utilize specific resort facilities such as the golf course (assuming it is available for public play), hotel food and beverage or banquet facilities. They will be willing to pay the going prices for use of the facilities and should therefore be considered as a significant weekend and holiday market .

## 6.2 Overnight Users

The principal overnight visitors will be the young adult nature lovers; local, regional and international family groups; groups of mountain climbers; and regionally-based golfers. It is noted that there is a growing number of ASEAN families and younger people (principally from Singapore) who are seeking such adventure holidays. The services, facilities and activities to be provided can include the following ;

- those resembling the allocentric international visitors. However, more emphasis should be provided for family-type activities ;
- those with families, will favour self-contained accommodations with reasonable but good quality services. This type of accommodation is often referred to as "chalet", "villa", "condominium" or "holiday flat". The units typically contain a kitchen, dining alcove, living room and one or more bedrooms. In most instances, housekeeping services are provided. Guests will often prepare one or more meals per day within the unit;
- like hotels, self-contained accommodations could be located within the Golf area and guests have access to selected services and recreational amenities within the complex;
- for the expatriate, regional or local groups, golf will be an important recreational pastime and the Course should also be designed to attract international tournaments; and
- the regional and international overnight visitors will also have interest in nature court sports, and shopping.

## 6.3 International Tourists

It will appear that many, if not most, international travellers visiting Sabah and Sarawak over the next ten years will continue to be first time visitors on multi-destination Southeast Asian tours. They will generally have short duration stays of between two to three days in a particular destination.

The travel itinerary for international tourists may include hotel accommodation in Kota Kinabalu (the gateway city) before proceeding to other destinations. For these short-stay visitors, accommodation at Kinabalu Park Nature and Golf Resort may be viewed as too distant from Kota Kinabalu and thus inconvenient as a stopover.

It is envisaged that Kinabalu Park Nature and Golf Resort will not benefit from the mainstream of short duration international traffic for some time in the future.

The primary international trusts will appear to be holiday travellers with different motives who come from Western Europe, Japan, Korea, Hong Kong, Taiwan and to a lesser extent, North America.

These holiday makers seek resort experience in Southeast Asia. The new, friendly, unspoilt and exotic destinations will be particularly appealing. These allocentric visitors are adventurous and will typically either be,

- single individuals or married couples travelling without children; or
- of varying age groups and income levels; and/or
- desire both passive and active recreational activities.

Their preference will be to stay for an extended period of time (between five to ten days), depending on what the Resort can offer.

Another potential group of international visitors are the Japanese and Korean golfers. The Kinabalu Park Nature and Golf Resort will have to compete for this market with other established Southeast Asia golf resorts.

#### **6.4 Special Interests Users**

The Kinabalu Park Nature and Golf Resort is expected to attract not only visitors who have a special interest in outdoor recreational activities; but who are also keen nature lovers whose main preference lie in enjoying the scenic beauty of the natural environment. Kinabalu Park will continue to be an attractive place for them and others who seek, adventure and mountain climbing. The richness of the Park's flora and fauna will continue to attract this category of visitors.

The Kinabalu Park Nature and Golf Resort can also be planned for special groups interested in structured nature education programmes. There is great potential in catering for such needs even among the domestic tourists, especially the children and youth groups.

#### **6.5 Real Estate and Holiday Home Investors**

The Golf Course area in its present state could be attractive to investors, principally the local or regional investors either desiring a second or holiday home in a resort environment or to own one or more income producing units.

## 7 THE DEVELOPMENT CONCEPT FOR KINABALU NATURE AND GOLF RESORT

### 7.1 The Continuous and Dynamic Process of Resort Planning

A tourism-recreational service such as that planned by Sabah Parks principally provides touristic and recreational experiences and support services to its clientele.

The *conceptualisation* of the Resort is the first step in the *planning process*. With proper planning, the first step towards effective management is achieved. The purpose of planning is to ensure that the necessary means, including human, physical and support facilities are well considered to provide a wholesome experience.

The effectiveness of a resort management system is judged not so much from the standpoint of the material facilities it provides (chalets, vistas, golf course, trails and the like) and the manner in which the properties are maintained but from the *activities* and other opportunities it conducts, sponsors, or coordinates and their contribution to individual and group satisfaction, enjoyment, personal growth, social objectives, and values.

Tourism and recreational area planning must be viewed as a *continuous and dynamic process* of conceptualisation, directing and provision of experiences. It cannot be limited to facility design and development alone. The planning for Kinabalu Park Nature and Golf Resort should be *experience* as well as *development directed*.

### 7.2 Resort Design and Development Concept

The conceptualisation of the Resort must observe some key guiding principles :

- that everything created must have a purpose;
- the design must be for the people and the environment;
- both function and aesthetic values must be satisfied;
- aims at establishing substantial recreational experience;
- achieves an appropriate resort living experience;
- satisfies technical requirements;
- meets needs at reasonable costs; and
- provides for efficient management and supervision.

The Resort itself should be designed to convey a timeless storybook, nature, leisure and adventure characteristics. Buildings and structures should be sympathetic to the site's dominant physical and scenic qualities. They should be low-rise and so sited as to create minimal disturbance to the natural terrain and vegetation. They should also reflect the natural heritage in design, form, building materials, and colours. The introduced landscape at the Golf Course should be simple and natural in character. Formal and urban-type landscapes should be avoided. The overall resort should convey the nature and adventure associated with its rugged but idyllic setting.

The Mesilau Nature and Golf Course areas possess contrastingly different characteristics. The recreational activities that can be conducted in the two areas will thus have to be slightly different. However, since the areas are adjacent to each other, they possess complementary features. For this reason, the development theme for this resort district will principally encompass the four major elements of *Nature, Education, Golf and Recreation*.

The end product is to create an *integrated* Kinabalu Park Nature and Golf Resort which provides quality accommodation and a variety of recreational activities in harmony with the scenic beauty and natural integrity of the site and the environment.

### 7.3 Design Concepts for Buildings

In line with the overall design and development concept and the guiding principles discussed earlier, the construction of buildings and activity sites which are economical, attractive and functional and at the same time sympathetic to the natural features of the area is a prime consideration. The idea is to create and identify a source of attraction for users, visitors and residents. The twin considerations of *development and conservation*, provide the foundations for the Plan.

To satisfy the principles outlined in the overall design and concept, the following ideas could probably be adopted in the architectural design of buildings and activity sites :

- . structures are built on stilts where possible
- . terraced platform
- . staggered forms
- . provide maximum view
- . safe and adequate security
- . dynamic and attractive architecture.

A clear departure from traditional design concepts is called for. The buildings do not have to feature any cultural elements (local or national) but must suit the natural surroundings and the purpose. It can be modern in concept and design or it can be functional, sturdy and easy to maintain. There will be necessary adjustments to architecture as dictated by the landscape.

## 8 OBJECTIVES OF THE RESORT DESIGN AND DEVELOPMENT PLAN

Following from the above discussions on development concepts, the objectives for the Plan in line with the eco-development thrust can be defined as follows :

- on *conservation* :
  - the maintenance of the natural identity of the Mesilau area as the dominant theme of the Resort ;

- the re-vegetation of the golf area with local species and the initiation of a plan for environmental conservation which should include green lungs within the Golf Course. The introduction of exotic flowering trees and extensive introducing of ornamental plantings which compete with the natural vegetation should be avoided ; and
- the conservation and management of the natural resources of the areas to ensure sustainability of recreational activities generated.

- on *development*:

- the location of buildings and facilities should be on sites which are visually attractive, provide good views, gain the benefits of mountain or valley breezes and presents limited engineering and environmental constraints. Such sites should be viewed as essential components of recreation programmes development;
- provide separate accomodation areas for day users and residents ;
- discourage entry of motorised vehicles into the Mesilau area and provide a safe parking area for vehicles belonging to visitors and residents ;
- the arrangement of buildings, facilities and activity sites and where necessary the separation of such components to allow for a functional flow of programme schedules ;
- to maintain the Mesilau area as a principal conservation piece, any development of activities within the area should reflect this natural character ;
- to allow intensive developments in the Golf Course area in line with the objective of providing the best setting for golf ; and
- as the areas are developed, structural development should be subordinate to the scenic backdrop, water and land forms.

## RECREATION PROGRAMME CONCEPTS

The concept of "programmes" is used to describe the full range of leisure-related activities and services within the *Nature, Education, Golf and Recreation* development theme of the Kinabalu Park Nature and Golf Resort. The major types of programmes and services include :

- organised recreation and activities ;
- nature education and outdoor skills development ;
- golfing ;
- a variety of leisure and recreation experiences ;

Under the respective recreation programme concept, facilities and activities are proposed. Those will be discussed below. Of course, the facilities and activities for a particular programme tend to be interrelated and could be jointly used

All these begin with the entrance into the Mesilau Nature Resort which should create the feeling of peace and tranquility. Mesilau must remain a remote area far removed from the highly developed environment in the Golf Course area.

- *Entrance to Kinabalu Park Nature and Golf Resort.* Upon arrival at the Resort's main entrance, the main road extends to the Resort Hotel, Golf Club House, Equestrian Centre and the proposed residential area. There is a secondary road from the hotel road junction to the Hotel leading to the Mesilau nature area.
- *Entrance to Mesilau.* The approach into Mesilau must remain in its natural state. Any signs introducing the area must be constructed and sited so as not to be obtrusive to the environment. The introduction to Mesilau must reflect the objective and concept of the nature resort.

There are three options for entry into the Mesilau area: first, by motorised vehicle ending at the Visitors' Centre; second by foot along the main access described above from the Golf Course area starting from the Club House; and third, by foot along the riverside trail off the Equestrian Centre. This riverside trail will lead to the Mesilau Visitor Centre. Whatever the option, the creation of a feeling of suspense and anticipation must persist.

The Golf Course environment is of great contrast to that of the Mesilau area.

- *Car Park.* The car parking area in Mesilau will be sited at the base of the Visitors' Centre.

It must be clearly understood that recreation programmes involve more than just the providing of a narrow range of play opportunities carried out for fun alone. Instead, they must be goal-oriented and must satisfy a range of personal and societal needs.

This does not mean that recreation programmes should be grim, or lacking in pleasure. Obviously, fun is the key motivation for most participants, in terms of building enthusiastic participation, providing emotional release and improving their quality of lives.

Beyond this, recreation programmes should be planned to contribute to the physical, emotional, intellectual, social and spiritual needs of individual. It must be stressed that if the Kinabalu Nature Golf Resort is to succeed, users must perceive the programmes as *worthwhile*.

The provision of facilities should not only add comfort but also serve both organised or unstructured recreational experiences. These outdoor facilities should be sited at locations that would not only add character to the area but also facilitate management and maintenance. The design should be attractive, durable, functional and at the same time, not obtrusive to the natural setting. The design of activity sites varies from one activity to another. Some will need built-up structures while others require only a setting or space.

### 9.1 Organised and Self-Directed Recreation Programmes

The first and most important programme to consider is the provision of opportunities for leadership through direct participation in a wide range of organised recreational activities. The Kinabalu Nature and Golf Resort will also provide a variety of facilities for largely undirected or unscheduled participation. These facilities can include forest trails, adventure trekking, cabins or equipment.

The facilities recommended under this programme include :

- *Visitors and Administrative Centre.* The recommended site for the siting of the Centre is at the end of the road entering the Mesilau area. It will be the first structure encountered by users and arriving residents. The site is slightly elevated on a slope and will provide an excellent view of the river valley, Golf Course and the immediate surroundings. The Center will have the following:
  - reception/information/registration counters
  - office/security
  - general store room
  - restaurant
  - shopping arcade (snacks, book store, souvenir shops)
  - toilets
  - verandah for viewing
- *Amphitheater and Campfire Site.* The Site should be located close to the Visitors and Administrative Centre. The forest surrounding the theater would interface people and nature. The Site will have the following features :
  - staggered seating positions ;
  - the Amphitheater and Campfire Site will be of semi-circle configuration ;
  - the camp fire place is located in front ; and
  - space in front for demonstrations and performances
- *Riverside Chalets.* The individual chalets should be sited along the western embankment of the Mesilau East River. There is, however, very limited level sites along the bank . The chalets will therefore have to be built on stilts and be multi-levelled. The living room will have a verandah-like platform overlooking the river valley or placed close to the river surface. All chalets can be linked together on the riverfront by a boardwalk. The units can include :
  - two-bedroom units for families with kitchen and shower
  - one-bedroom units for couples with kitchen and shower
  - simple indoor furniture
  - viewing and sunbathing verandah
  - outdoor barbecue pits.



- **Jungle Lodges.** The jungle lodges are designed to cater for the needs of small groups. The concept of group lodgings can promote friendship and social integration. Each lodge can accommodate a group of up to six persons and will consist of a central kitchen and meeting place. This concept of small group accommodation under a single roof is to avoid some of the difficult problems faced with the larger dormitory concept. Families would also be able to enjoy the jungle lodges.

The jungle lodges emulate the *log-cabin* design and is somewhat *primitive* in outlook. However, comfort and safety are assured. Each lodge is separated by a buffer vegetation to ensure that they are somewhat in isolation of one another. The most suitable area for the jungle lodges can be found on the eastern side of the Mesilau East River. The jungle lodges will be sited away from the River. The jungle lodge can include :

- . Type A which accommodate four persons and Type B which can accommodate six persons ;
  - . common bathroom and shower ;
  - . simple indoor furniture ;
  - . outdoor barbecue pits ; and
  - . pathways joining the riverfront trail
- **Vistas.** These are located at locations with attractive and panoramic views of the valley, river and forest. As many of the sites for vistas are somewhat fragile and sensitive to development, proper manipulation and engineering would be required.

The vistas will include :

- . viewing platforms ;
  - . shelters where necessary ;
  - . tables and benches ; and
  - . interpretative boards describing the views.
- **Observation Tower.** The Tower serves the Centre's nature educational programme as well as a vantage point for a panoramic view of the Resort. Features of the Observation Tower include:
- . a suitable height and stable tower;
  - . designed like a tree-house with possible overnight accommodation;
  - . observation platform
- **Trail Design Concepts.** Visitors, residents and Centre's participants would only be able to move from one place to another by foot. Thus, a system of walkways and trails must be provided. Trails and walkways should be carefully and creatively designed and constructed. The trail should be designed to pass through some of the interesting features of the Resort. It is important that the trails are designed to provide easy and safe movement as well as servicing and maintaining them.



- SWIDY -



- 541DY -

- **Main Trail.** The main access leads to the Visitor and Administration Centre. The main trailhead which starts at the Centre leads to and links the various buildings. Features of the Main Trail will include :
  - . a trail for visitors, residents and Centre's participants ;
  - . attractive and functional sign-posting ;
  - . serve to control access to some areas ;
  - . lighting ; and
  - . durable surface preferably made of natural material.
- **Secondary Trails.** The configuration of the trails will depend on the location of the buildings, activity spaces and facilities. Features of the Trails will include :
  - . links from one building to another ;
  - . links from one activity space to another ;
  - . links from buildings to activity spaces ;
  - . durable surface made of natural material
  - . some may be opened to residents but not to visitors .
- **Residential Area.** Two separate areas are allocated for private residential development in the Resort. The two areas are separated by the Mesilau East River with a reasonably intact riverine vegetation.

The residential area will consist principally of holiday residential units integrated with the 18-hole championship Golf Course, Club House and commercial complex.

Several types of residential units can be built depending on the terrain of available lots. These could include either :

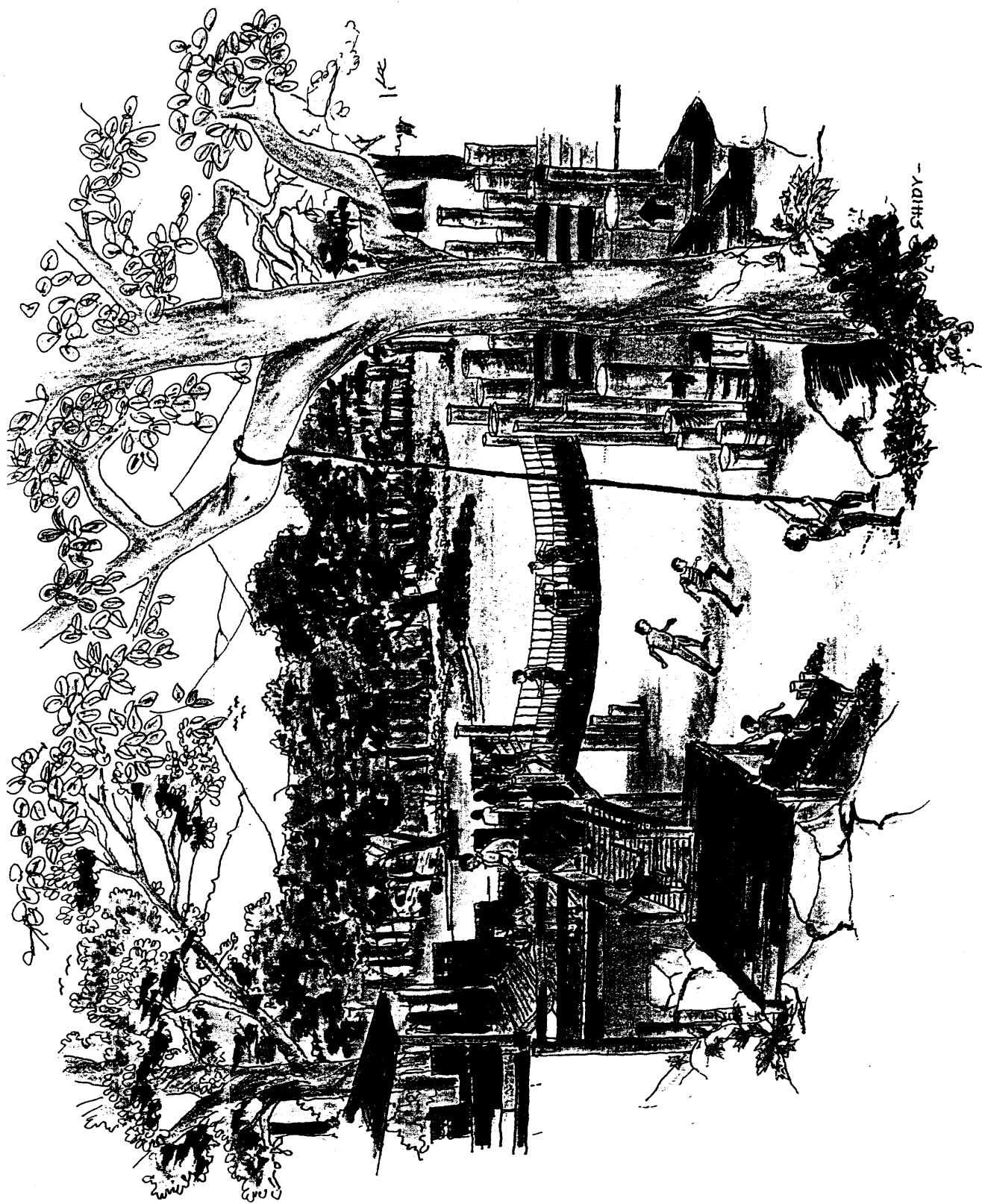
- detached residential lots with a density of three to four lots per hectare ; or
- one to two-storey town houses or villa-style units at a density of eight to ten units per hectare.

Each of the attached or detached units could be sited to enjoy spectacular views of the Golf Course and the mountains in the foreground. Residents of the private residential area would have pre-arranged access to other Resort facilities.

## 9.2 Promotion of Nature Education and Outdoor Skills Development Programme

Effective recreation programmes must do more than simply provide opportunities for recreational participation. They must seek to broaden people's horizon and to motivate them to the fullest and most creative use of their leisure time.

This is especially applicable for school children and youth. School and public holidays can be spent in educational activities. Nature education provides such an experience for opportunities in Kinabalu Park Nature and Golf Resort.



-SHIDY-

At the Kinabalu Park Nature and Golf Resort, a Nature and Outdoor Education Centre cum Interpretative Centre will be developed to conduct nature and outdoor skills development programmes. This Centre will provide the avenue for educating the present generation for tomorrow's conservation efforts.

The proposed facilities for this programme include;

- *Nature and Outdoor Education Centre.* The Centre requires an extensive land area. It should be located further in the forest away from the other developed areas. The most appropriate area for the Centre can be found on the Mesilau Plateau. It is located on a slightly higher elevation but relatively flat terrain.

The Centre consists of several buildings. The design concepts to be adopted are circular, hexagonal and/or octagonal in shapes. There will be a central building with others sited around it. All buildings will be built on low stilts. The buildings will be linked to one another by raised wooden platforms which help reduce the impact of trampling on the forest floor and vegetation.

Features at the Nature and Outdoor Education Centre will include :

- . reception/registration ;
- . administration office;
- . multi-purpose hall;
- . lecture, resource and work rooms;
- . equipment storage room;
- . audio-visual facilities;
- . central prayer room;
- . toilets; and
- . mess/kitchen for centre participants.
- *Rope Obstacle Course.* This Course needs steady anchor points for which the large trees are best suited. The Course can run over a gorge or even on relatively flat terrain. The proposed site for this Course is at the back of the Nature and Outdoor Education Centre. The Course provides :
  - . a range of obstacles;
  - . a sense of challenge and risk-taking;
  - . opportunities for development of skills among participants; and
  - . safety features.
- *Outdoor Archery and Blowpipe Range.* This activity is mooted to help develop skills in the art of archery and blow-piping. Archery and blow pipe targetting will be part of the skill development programme of the Centre. The Range includes :
  - . an archery range that conforms to international standards;
  - . safety features; and
  - . a challenging blowpipe range with target practice area interspaced by natural tree barriers.



- ***Orienteering Course.*** This will require an extensive area with varied topography. The entire resort area could be developed into an orienteering course. The Course will have the following facilities:
  - permanent checking stations; and
  - variable checking stations;
  - equipment which includes orienteering maps of the area and compasses.
  
- ***Abseiling.*** This activity creates the feeling of challenge and application of skills in descending down a slope. Sites for such activities can be located wherever suitable within the Resort area. Features of the abseiling area include:
  - good anchoring points (for instance, the trees);
  - stable abseiling surface; and
  - proper and safe equipment.
  
- ***Wall Scaling .*** It could be placed anywhere in the area but preferably near the Centre. This is to allow easy access and close supervision. The Wall will have:
  - artificial climbing surface made of stone and concrete; and
  - reasonable level of difficulty.
  
- ***Nature Trail.*** A Nature Trail will be identified and marked. The Trail will traverse as many natural features, and unique flora and fauna habitats for nature interpretation activity. The Trail will have:
  - stable trail surface;
  - trail furniture will be provided where necessary;
  - sign-posts and interpretative signs indicating features that can be found in the spot to be erected;
  - controlled use; and
  - easy to walk trail and not one to test endurance.
  
- ***Adventure Trails.*** The Adventure Trails are for overnight walking and they could be designed to link one part of the Park to another. The Trails should be of varying distances featuring the uniqueness of the area. The Trails could start from the Observation Tower. The Trails will have:
  - overnight camping facilities and sites along the trails;
  - interpretative sign boards;
  - directional sign-posts; and
  - stable trail surface.
  
- ***Equestrian Centre.*** Equestrian stables and activities generally require relatively large areas of land and because of associated odours and the attraction of flies, should be situated some distance from tourist accommodation and residential units. As such the equestrian centre will be located a distance away on the eastern side of the Club House, close to the Mesilau East river.





- **Pony or Horse Trail.** This is to complement the existing Equestrian Centre. The Equestrian Centre is located in the Golf Course grounds. The proposed Trail will start from the Equestrian Centre and lead into Mesilau. It is proposed that the trail be constructed along the Mesilau East River which flows through the Golf Course . The Pony or Horse Trail will have :
  - stable trail surface;
  - low level of difficulty; and
  - proper supervision.

### 9.3 Promotion of the Golf Experience Programme

Golfing is a recent leisure-recreation craze in Malaysia. There are not many highland golf courses in the region. The uniqueness of the Golf Course at the Kinabalu Park Nature and Golf Resort which distinguishes it from other golf-courses is its location with an adjacent natural park setting as a backdrop. This setting is, under the law, permanent.

Golf is a highly specialised form of recreational activity. It can be a relatively expensive game. Being highly specialised and competitive, the sport is usually managed by professionals. International affiliation and reputation on the international circuit must be built. With the natural setting, harmonious design and layout of the Course, the Golf Course offers tremendous development potential .

The area development plan for the Golf Course area is shown in Figure III-2. The siting of facilities in the area was based on an earlier plan prepared by the former management. Any newly suggested developments must principally conform to the existing features in the Golf Course area.

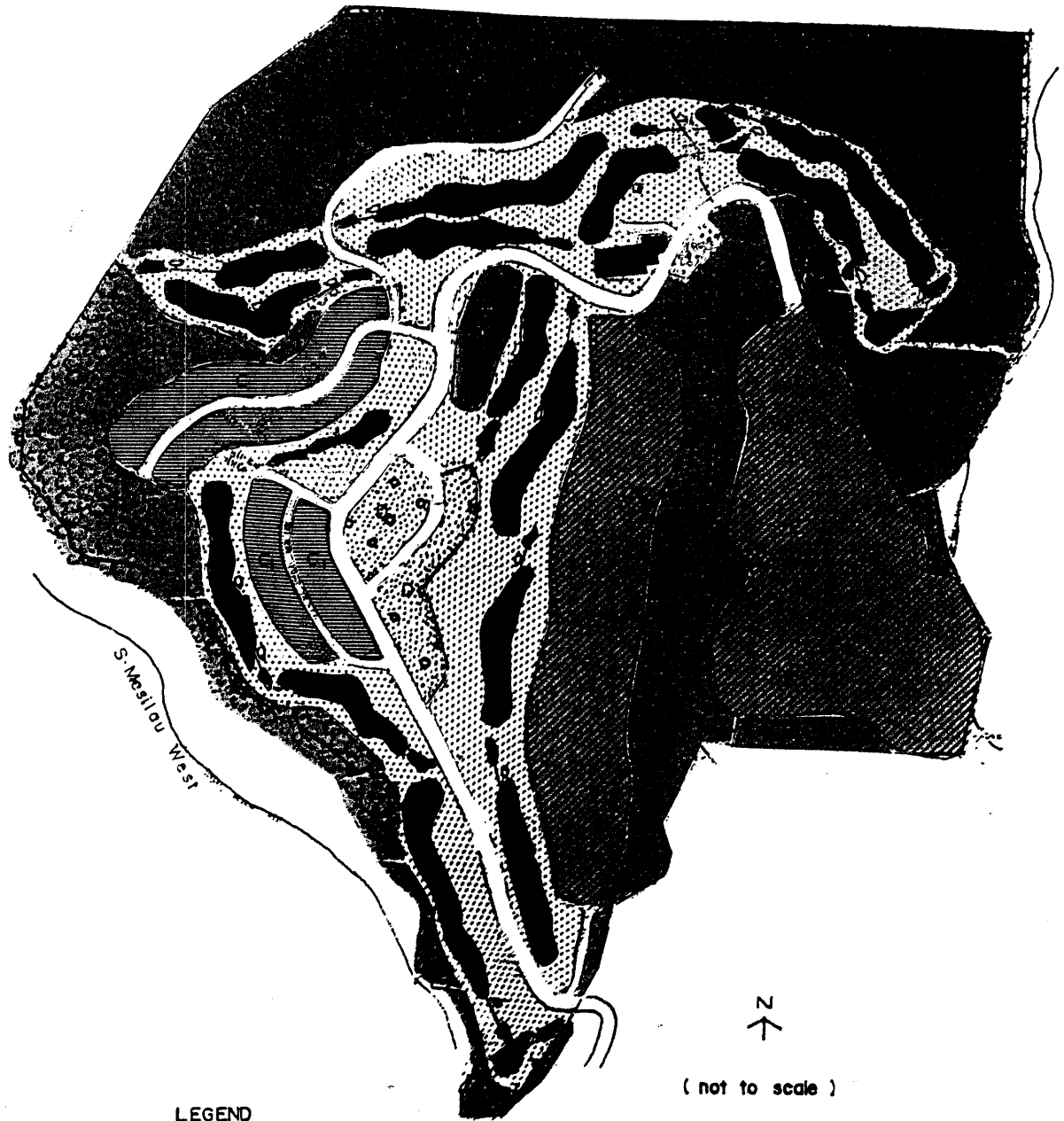
Three developments presently existing or under construction in the area will not be discussed here. These are the Club House, the construction of the remaining nine holes and the existing road network system within the area. The additional buildings, activities and facilities suggested to enhance the potential of the Golf Course area are described below :

- **Resort Hotel.** The proposed Resort Hotel with 150 guest rooms/units will be site on the north western side of the Golf Course. The building structure will be low-rise so as not to drastically contrast with the massive mountain range in the background.









A separate low-rise structure comprising reception area , food and beverage facilities, administration, and other public spaces will be sited to the southwest of the guest units.

The Hotel will also house several shops and will act as a small commercial centre for the Resort ; in addition to those located at the Club House. Future expansion of the Hotel is be possible with the construction of guest chalets or other units on the low-lying land along the main access road.

FIGURE III-2: GOLF COURSE COMPLEX



LEGEND

-  Proposed Clubhouse
-  Equestrian center
-  Hotel & Indoor Recreation Complex
-  Future Hotel Complex Expansion
-  Flower Production Exhibition & Selling Center
-  Proposed private Residential Area
-  Conservation Area
-  Practice area

- *Sports Complex.* The proposed Sports Complex is to be situated in the low-lying area close to the Hotel. The Complex will include two to four tennis courts and an indoor stadium for games such as squash , badminton , gymnasium, aerobics area, sauna and possibly a health spa.
- *Flower Production, Exhibition and Florist.* This is to be located along the main access road into the Resort. A substantial acreage will be provided for the operator to grow the flowers and plants. Flowers can also be supplied by other growers and sold at the Florists.

At present, there is no suggestion for a commercial complex. It is proposed that some shops will operate at the Hotel and some at the Club House.

#### 9.4 A Variety of Leisure and Recreation Experiences Programme

Depending on the richness of the resources available in a particular setting, a variety of activities can be developed and provided. The natural characteristics of the Resort can provide for a spectrum of leisure and recreational experiences to be developed.

Generally, the related activities can be divided into passive and active. Walking and sightseeing may be considered passive if they involve short distances on easy terrain. The facilities recommended under the programme include :

- *Mountain Biking.* One possible outdoor activity that is gaining popularity among holiday makers is *mountain biking*. The Resort's network of roads including that leading to the Mesilau area provides excellent mountain biking trail. In future, special mountain biking trails can be built within the forested environment.
- *Jogging.* Another favourite activity among active holiday makers is *jogging*. Some roads and pathways within the Resort should be designated as jogging trails. It is also possible to develop them as a Par Course.
- *Pools and Dams.* Several parts of the river can be dammed to impound water. The dams will be constructed using naturally-existing materials such as rocks and wood. The Pools and Dams will have :
  - cascading effects to create the "sound" element ; and
  - the pools of water created are not for the purpose of bathing or swimming but to enhance attractiveness of the river.

- **Outdoor Furniture and Facilities.** These will be located at appropriate points throughout the area. They should be made of durable materials and their design should reflect the natural setting. The Outdoor Furniture and Facilities will include ;
  - pedestrian walkways;
  - lighting;
  - rubbish bins;
  - steps;
  - bridges;
  - tables and benches;
  - hand railings;
  - information boards;
  - directional sign-posting;

## 10 OPERATIONAL GUIDELINES

### 10.1 Critical Success Factors of the Programmes

There are a number of guidelines or principles governing the operation of Kinabalu Park Nature and Golf Resort programmes. The recreation programmes :

- must meet important community needs and promote the values of a democratic society ;
- should serve all individuals in the community, families, children, youth and adults ;
- must be realistically planned and geared to meet the individual and group needs, abilities and interests ;
- activities should have diversity and balance ;
- should involve challenge, continuity and depth ;
- should be meaningfully related to each other ;
- activities must be scheduled at appropriate times to ensure maximum participation ;
- activities must make the most efficient and imaginative use of other existing resources and facilities ;
- should employ suitably qualified professionals to hold key Resort management positions and provide relevant training for junior staff ;
- should be meaningfully interpreted to the public at large through effective public relations, marketing and promotion ; and
- programmes should be regularly and systematically evaluated .

## 11 HOUSING FOR SUPPORT STAFF OF SABAH PARKS

### 11.1 Employee Housing

The Resort will generate considerable employment and employee housing will be an issue which will have to be addressed by Sabah Parks. Some employees may prefer to live in towns and commute to work as the Resort is, only about half an hour drive from Kundasang town.

However, there will be demand for new housing near the Resort. The limited land for development precludes the provision of employee housing except for some key staff. One possible location for employee housing is in areas near Kundasang.

### 11.2 Living Quarters for Other Personnel

The Mesilau area should also be able to accommodate several types of living quarters. Permanent staff will be based at the area and participants of the Nature and Outdoor Education Centre will be residents of Mesilau.

Participants of the programmes at the Centre will be placed in dormitory blocks similar to the jungle lodge concept described earlier. These blocks will be single storey and circular in shape but with more space for bunk beds in a single open room. The centre of the circular block will serve as a living room.

Several units of accommodation will be built for the permanent staff and invited resource persons who will be called to help conduct the programmes.

The permanent living quarters should be located away from the Centre and the invited resource persons living quarters should be located close to the participants blocks. Several types of living quarters will be provided to cater for single or family groups. A single unit will be constructed for the Park Superintendent.

Features to include :

#### Staff quarters

- |                   |   |                           |
|-------------------|---|---------------------------|
| i) Superintendent | - | 2 bedroom unit            |
| ii) Staff         | - | 2 bedroom units (married) |
|                   | - | 1 bedroom units (singles) |
|                   | - | bathroom and kitchen      |

#### Invited resource persons quarters

- |   |   |
|---|---|
| - | 1 bedroom unit with attached bathroom and kitchen |
|---|---|

#### Participant living quarters

- |   |  |
|---|--|
| - | two 10 bunk beds units with centralised shower rooms and toilets |
|---|--|

#### Pathways leading to the Nature and Outdoor Recreation Centre

## 12 DELIVERY OF LEISURE AND RECREATION SERVICES

The key to successful recreation management is the role played by administrators and supervisors. They are the professionals responsible for planning, organising and carrying out leisure-recreation operations.

### 12.1 Private Sector Participation

The Consultants are of the opinion that leisure-recreation management can no longer be thought of as primarily or exclusively the domain of the public sector. Recent trends also indicated that the government's fiscal austerity drive has limited the development of recreation and much of it is now left to the private sector.

For the *Golf Resort*, development of the 600-hectare Golf Course can be undertaken by the private sector with the Trustees acting as Regulators. Two other options are available:

- sub-contracting of selected services ; and
- contracting out the entire management to a single company with the flexibility of allowing this company to further develop the business into a profitable commercial venture.

For the *Mesilau area* which is basically developed to divert the increased number of visitors from Kinabalu Park Headquarters Complex, the consultants are of the opinion that the management of this Resort should continue to be under the jurisdiction of the current management of Sabah Parks. This will obviously burden the duties and responsibilities of the present Park Warden. New staff will have to be recruited by the Parks, new senior positions introduced, and the current position of the Park Warden upgraded. The manpower requirements for the next ten years is discussed in greater detail in Volume I of this Report.

### 12.2 Management Aspects

There are several other aspects of management which has to be considered. These include :

- *Management is a multi-level process.* Management is much more than just the top position making all the decisions and giving orders. Policy making, programme development and operation of facilities must be shared by individuals at all levels of service if they are to be carried out successfully.

As a multi-level process, management includes such elements as providing inspiration and acting as a model for others, facilitating and coordinating efforts, promoting jointly sponsored programmes and other forms of synergy and enriching community awareness of leisure-recreational needs and opportunities.

- *Holistic Management.* This concept rejects the idea that managerial functions such as personnel supervision or facilities design and maintenance can be understood or dealt with effectively in isolation.

Instead, all managerial functions must be seen as a closely interwoven and dependent elements of components of the system. To illustrate, it would be impossible to consider developing new programmes without considering their personnel requirements, or the facilities that would be required.

It is essential to recognise that resort recreation management is a highly skilled and demanding profession, requiring specialised training and continuous effort to keep abreast of the times, current issues and challenges. A sense of professional identity and affiliation with appropriate national and international bodies will provide support for the management of the Kinabalu Park Nature and Golf Resort.

- *New Forms of Related Services.* Managers should also assume varied human-service responsibilities. The Resort may conduct fitness programmes, coaches and instructors courses, recreation personnel training, rangers training, recreation counselling, cultural and arts appreciation, photography courses, etc. Managers with the requisite expertise and personal capability should move into the broader arena of multi-service programme operations.

## 13 TOWARDS SERVICE EXCELLENCE

### 13.1 Formulating a Philosophy of Service

The Kinabalu Park Nature and Golf Resort should formulate its own objectives. Managers must take the lead in determining what these values and objectives are, and express them in terms of the goals of the organisation. To support the goals, at least three factors must be considered :

- *Financial Management*

In terms of fiscal management, the Resort should be resourceful in seeking out new and innovative forms of programme support, revision of fees and charges, expansion of concessions or contracting arrangements, encouraging cooperative programme sponsorship, and seeking government businesses. The Resort should not just respond to expressed public needs and wishes, but seek out and promote new forms of service and programmes and vigorously market the leisure-recreational products .

The user-pay principle can be adopted for admission to the Park and use of the facilities provided. The charge can take any of the following forms;

- schedules that assign users' time to participate ;or
- that requires a membership card or fee ; and or
- other forms of user restriction.



- *Emphasis on Accountability and Productivity*

Closely related to financial management, is the emphasis place on developing a full measure of fiscal accountability and employee productivity at all levels of service. The Resort should employ new performance monitoring procedures and efforts must be made to systematically identify needs and objectives. These will ensure continuous productivity improvements in service delivery.

- *Caring for the Environment*

It is recognised that leisure-recreation, although socially and economically desirable is not always compatible with the environment. Outdoor recreation in particular may be destructive to waterways, wildlife and the natural environment. It is essential therefore, that the management is aware of the environmental impact of their programmes and services. Attempts to minimise them must be made.

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## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### KINABALU PARK (SABAH, MALAYSIA)

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#### 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-20<sup>th</sup> 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.

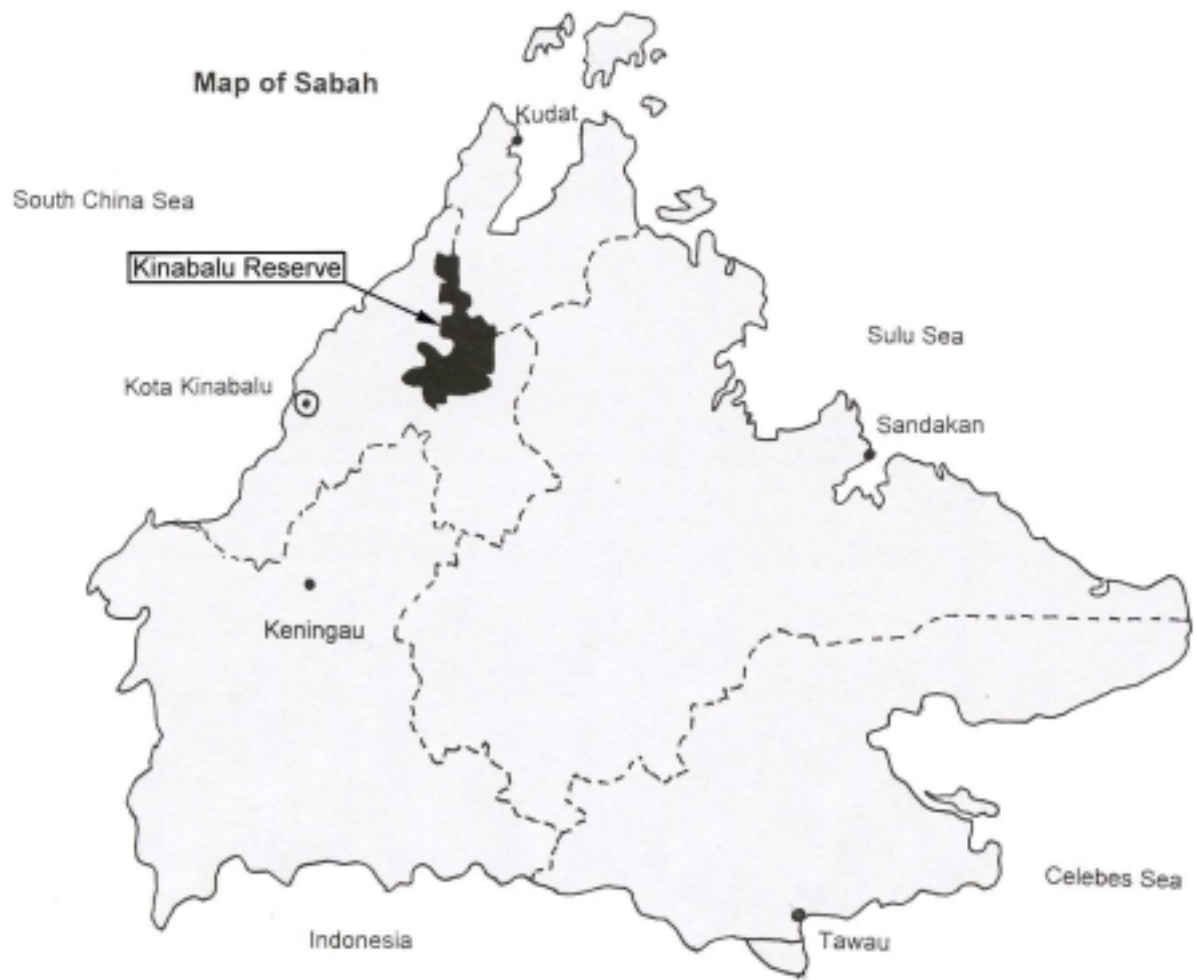
The case for natural criteria (i) and (iii) was not convincingly made in the nomination document. Although there are high geological values and the park is the dominant landscape feature on the island, these are considered secondary to Kinabalu's primary natural values under criteria ii and iv.

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.

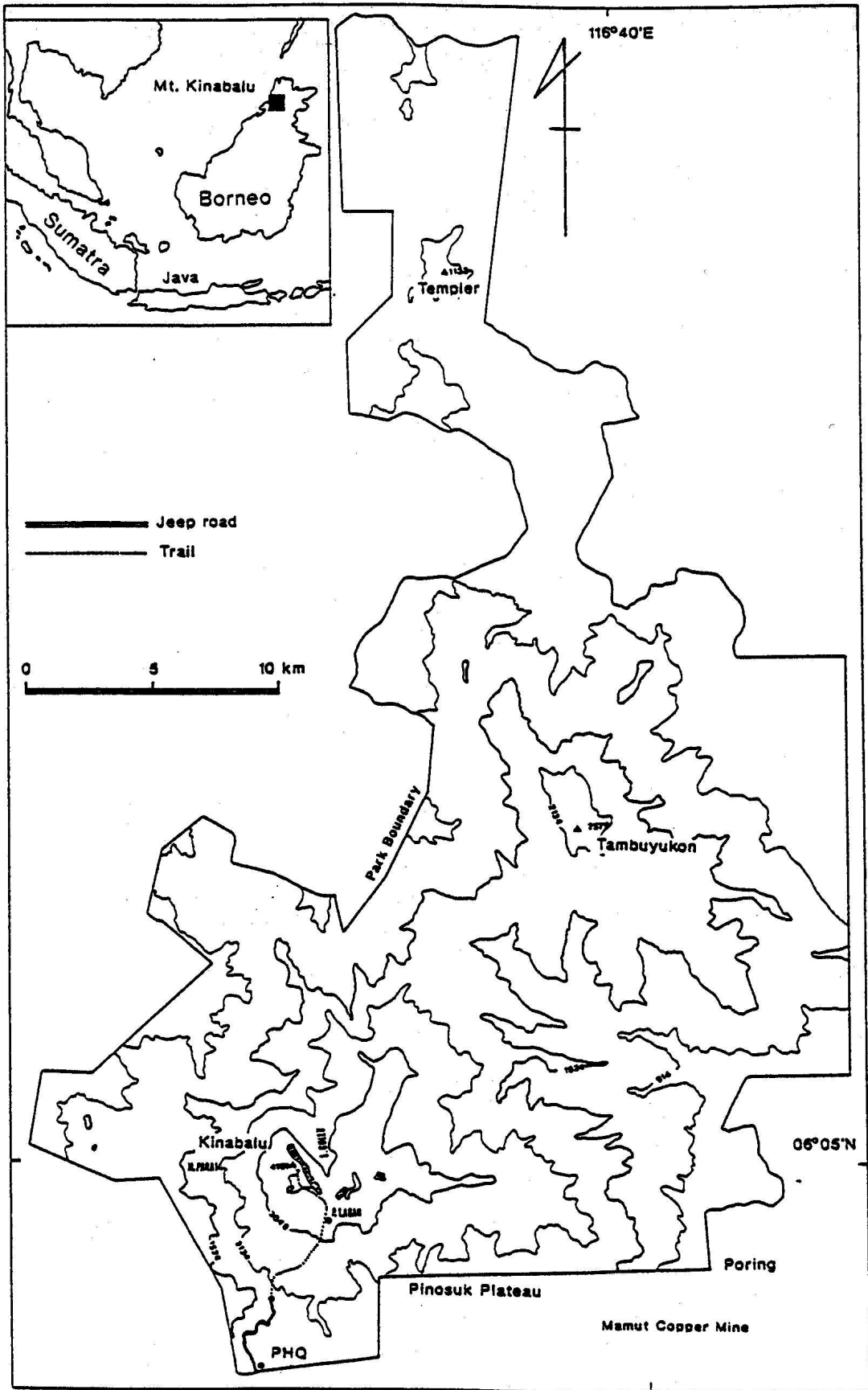
The Committee may also wish to commend the State Party for responding to the Bureau's request to minimise impacts on the Park, by carefully regulating activities in proximity to its borders. A letter was received by the Centre from the State Party on 20 September 2000 outlining measures in place to regulate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

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# CANDIDATURE AU PATRIMOINE MONDIAL - ÉVALUATION TECHNIQUE UICN

## PARC DU KINABALU (SABAH, MALAISIE)

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### 1. DOCUMENTATION

- i) **Fiches techniques UICN/WCMC** (16 références)
- ii) **Littérature consultée:** 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 évaluateurs indépendants, fonctionnaires du Département des forêts du Sabah.
- iv) **Visite du site:** Jim Thorsell, janvier 2000.

### 2. RÉSUMÉ DES CARACTÉRISTIQUES NATURELLES

Le mont Kinabalu (4095 m) est la plus haute montagne entre la chaîne de l'Himalaya et la Nouvelle-Guinée et, de ce fait, joue un rôle particulier pour le biote d'Asie du Sud-Est. Le Kinabalu est une intrusion de granit formée il y a 15 millions d'années par le durcissement d'une masse de roches en fusion surgie de dessous les roches sédimentaires du massif Crocker Range, à Bornéo. Il y a un million d'années, ces roches des profondeurs ont été propulsées par des mouvements tectoniques qui se poursuivent encore aujourd'hui. La molasse et les schistes qui couvraient autrefois le granit ont été érodés pour révéler la roche sous-jacente. Au Pléistocène, les glaciers ont couvert le sommet du Kinabalu, érodé le plateau granitique et aiguisé les pics déchiquetés au-dessus de la glace. La calotte de glace a disparu il y a 10 000 ans. Depuis, le vent et l'eau ont sculpté les sommets, créant des pinacles et des vallées profondes.

Le Parc du Kinabalu présente un large éventail d'habitats sur une fourchette altitudinale de 152 mètres à 4095 mètres, sur une superficie de 75 370 hectares. La végétation naturelle couvre 93% du parc de riches forêts ombrophiles tropicales de plaine et de colline (dominées par les Diptérocarpacées) formant 35% de l'ensemble. La forêt tropicale de montagne couvre 37% supplémentaires du parc et l'on trouve, plus haut en altitude, des forêts subalpines et des buissons sempervirentes. Les types de végétation qui se sont développés sur les roches ultramafiques (serpentes) sont tout particulièrement importants pour la conservation. La végétation ultramafique couvre environ 16% du parc et contient de nombreuses espèces inféodées à ce substrat.

Kinabalu est considéré par l'UICN et le WWF comme un Centre de diversité des plantes. Malgré sa jeunesse géologique, il est exceptionnellement riche en espèces, présentant des éléments des flores himalayenne, chinoise, australienne, malaise et pantropicale. Le parc compte entre 5000 et 6000 espèces de plantes vasculaires dont 1000 sont des orchidées. Il est particulièrement riche en *ficus* (78 taxons), en fougères (610 espèces) et en *Nepenthes* (9 espèces). *Rafflesia*, une plante parasite rare, s'y trouve aussi. La flore de montagne comprend des «fossiles vivants» divers tels que *Phyllocladus rhomboidalis* et le «*trig oak*» qui constitue le lien évolutif entre les chênes et les hêtres.



La faune aussi est diverse, avec 90 espèces de mammifères des plaines et 22 autres qui vivent dans la zone montagneuse. On y trouve quatre espèces de primates et 326 espèces d'oiseaux. Le mont Kinabalu est donc à la fois riche en espèces et un centre d'endémisme important. La moitié des oiseaux de Bornéo, des mammifères et des amphibiens, y compris de nombreuses espèces rares et menacées d'extinction sont présents dans le parc. Les deux tiers des reptiles de Bornéo et au moins la moitié des espèces de plantes y sont représentés.

### 3. COMPARAISON AVEC D'AUTRES AIRES PROTÉGÉES

L'île de Bornéo est une province biogéographique en soi qui comprend cinq autres parcs nationaux de la Catégorie II UICN, plus grands que le site proposé. Aucun ne possède le gradient altitudinal (près de 4000 m) et la variété des zones écologiques de Kinabalu. Malheureusement, les aires protégées qui se trouvent dans la partie indonésienne de l'île ont été gravement dégradées et Kinabalu est considéré comme l'un des deux seuls sites de l'île (avec Gunung Mulu) qui ait un intérêt potentiel en tant que bien naturel du patrimoine mondial. Bien qu'il y ait 28 centres de diversité des plantes et d'endémisme à Bornéo, «de loin, le site le plus important de Bornéo est le mont Kinabalu» (Davis, 1995, p. 258). En outre, «le mont Kinabalu est sans doute, par sa superficie, le site le plus riche en espèces d'Asie à l'ouest de la Nouvelle-Guinée et l'une des rares montagnes de l'Ancien Monde dont la diversité en espèces puisse être comparée avec les Andes de Colombie et d'Équateur» (Davis, id., p. 250).

Bien qu'il y ait plusieurs autres montagnes dans la région (Crocker Range, Bukit Raya), aucune ne présente la zone alpine, ni la diversité des espèces, ni le paysage spectaculaire du Kinabalu. La seule exception remarquable est le Bien du patrimoine mondial de Lorentz en Irian Jaya (inscrit en 1999) de plus haute altitude (4884 m), et 30 fois aussi grand, qui va jusqu'à la mer et contient des glaciers étendus. En fait, les communautés de plantes de la zone du sommet du mont Kinabalu ont des affinités étroites avec la végétation alpine des montagnes de Nouvelle-Guinée, plus hautes et plus vastes. La géologie des deux sites est très différente cependant, car Lorentz a été surélevé en bordure de deux plaques continentales entrées en collision. Le biote est également différent car Lorentz se trouve dans un domaine biogéographique différent (Océanie) ainsi qu'à l'est de la ligne biologique de Wallace. Lorentz est en outre occupé par 6300 personnes, des populations autochtones, tandis qu'à Kinabalu il n'y a que quelques familles vivant dans une petite enclave à l'intérieur du parc.

On trouve ailleurs des structures en dôme granitique, notamment dans les Biens du patrimoine mondial de Huangshan et de Yakushima et dans la Réserve naturelle du Suriname central (proposée en 1999). Kinabalu est le plus haut mais ses formations sont moins spectaculaires que celles de Huangshan. Les substrats ultramafiques (c'est-à-dire de roches contenant de hautes concentrations de magnésium et de fer) occupent moins de 1% de la superficie terrestre mais leurs flores inhabituelles et hautement spécialisées ont suscité un intérêt scientifique important. Il y a d'autres biens du patrimoine mondial qui possèdent des flores ultramafiques, dans le sud-ouest de la Nouvelle-Zélande et à Puerto Princessa à Palawan, Philippines, ainsi que dans d'autres sites (dans le haut Tibre, en Italie, dans le nord de Honshu, au Japon et sur Skye, en Écosse).

En conclusion, le mont Kinabalu est un des centres de diversité des plantes les plus exceptionnels dans le domaine biogéographique indomalais et, en fait, dans le monde. Le massif du Kinabalu possède une flore remarquablement riche présentant des éléments des flores himalayenne, chinoise, australienne et malaise. Sa géologie et ses paysages sont des caractéristiques naturelles supplémentaires qui font de Kinabalu un parc de grande valeur pour la science et pour la conservation de la nature.

### 4. INTÉGRITÉ

#### 4.1. Limites

Les limites du Parc du Kinabalu englobent la masse principale de la montagne, y compris les dernières pentes portant des forêts naturelles. Le site présente donc la diversité naturelle et les habitats qui constituent les valeurs essentielles de Kinabalu pour le patrimoine naturel. Il y a des établissements et on exploite le bois jusqu'aux limites, en plusieurs endroits, mais les limites du parc sont clairement marquées et font l'objet de patrouilles régulières. Il n'est pas prévu d'établir des zones tampons et il serait utile que le gouvernement de l'État du Sabah réglemente rigoureusement le développement, dans des points stratégiques clés en dehors du parc, tant qu'il le peut encore.

Deux modifications aux limites ont entraîné une diminution de l'intégrité du Parc du Kinabalu. En 1970, 2555 ha ont été exclus pour permettre l'exploitation d'un dépôt de cuivre. La mine est aujourd'hui épuisée mais les traces restent évidentes. En 1984, une vaste zone forestière a été exclue pour établir un terrain de golf, un projet d'urbanisme et une ferme d'élevage dans la région de Pinosuk. Plusieurs sites importants de plantes ont été détruits et une bonne partie de la

forêt également. Bien que cette diminution de la superficie du parc ait été compensée, les pertes à Pinosuk ont été importantes. Ces deux cas de réduction de la superficie du parc sont malheureux mais la majeure partie des valeurs naturelles clés est intacte.

## **4.2. Législation**

Du point de vue de la législation et des structures institutionnelles, les parcs nationaux font l'objet d'une juridiction conjointe au titre de la constitution malaisienne. L'État et le gouvernement fédéral ont le pouvoir de promulguer des lois à condition de se consulter. Au Sabah, les parcs nationaux, y compris Kinabalu, sont établis et gérés au niveau de l'État dans le cadre de la loi de 1984 sur les parcs de l'État du Sabah et son amendement de 1996. La loi sur les parcs nationaux de Malaisie ne s'applique pas au Sabah (ni au Sarawak) et c'est donc le gouvernement de l'État qui sera principalement responsable de la mise en œuvre de la Convention en Malaisie (comme c'est le cas dans d'autres systèmes fédéraux).

## **4.3 Gestion**

Un plan de gestion a été préparé en 1993 et il sera bientôt nécessaire de le mettre à jour. Le plan s'appuie sur une législation adéquate et sur un document directif de l'État. Du point de vue de la recherche scientifique, Kinabalu est le site le plus productif de Bornéo et possède une excellente collection de spécimens ainsi que des laboratoires. Le personnel et le budget sont suffisants. Les pressions du tourisme sont fortes mais les impacts sont raisonnablement bien contrôlés. Les zones d'accueil des visiteurs se trouvent en périphérie du parc. Les valeurs paysagères de Kinabalu sont partiellement dégradées par la construction de plusieurs tours de transmission construites sur les hauts sommets; malheureusement, elles ont été construites avant l'établissement du parc et il est improbable qu'elles puissent être détruites.

## **4.4. Menaces**

Il y a eu, autrefois, un certain empiètement - agriculture et exploitation du bois illicite - mais les limites étant rigoureusement marquées et faisant l'objet de patrouilles, cette menace est minime. Il y a également eu une surexploitation et un braconnage des orchidées et des *Nepenthes*. Les autorités du parc ont obtenu la coopération des villageois qui signalent les vols de plantes rares et participent à un projet d'ethnobotanique. Douze personnes pratiquent une agriculture de subsistance, sur une parcelle de 40 hectares du parc mais elles sont là depuis toujours et envisagent volontairement de se reloger à l'extérieur du parc. Près des refuges de montagne, plusieurs plantes envahissantes posent un problème et il sera nécessaire d'y prêter attention afin de garder la situation sous contrôle.

En résumé, le Parc du Kinabalu est un modèle de gestion pour les aires protégées d'Asie du Sud-Est. Bien qu'une partie de la forêt de plaine ait été transformée et livrée à d'autres usages, et que le parc devienne une île dans un océan de développement agricole et forestier, il est encore en bon état. Les seules menaces potentielles concernent les modes d'occupation des sols dans les terres attenantes et les pressions agricoles persistantes le long des limites du parc.

## **5. AUTRES COMMENTAIRES**

Jusqu'au milieu du 20<sup>e</sup> siècle, le mont Kinabalu était considéré comme une montagne sacrée par le peuple Dusan qui vivait au pied des collines avoisinantes. C'est une des raisons pour lesquelles cette partie du parc est restée intacte.

## **6. APPLICATION DES CRITÈRES DU PATRIMOINE MONDIAL**

Les quatre critères naturels sont invoqués pour justifier l'inscription du Parc du Kinabalu. Toutes les évaluations menées en Asie du Sud-Est par la FAO, le PNUE, la BASD, l'UICN, le WWF et Conservation International placent le mont Kinabalu comme l'une des premières priorités biologiques dans la région indomalaise. Le Parc du Kinabalu est, de toute évidence, un bon candidat à l'inscription sur la Liste du patrimoine mondial, sur la base des deux critères suivants:

### **Critère (ii): processus écologiques**

La grande diversité des espèces présentes à Kinabalu provient de plusieurs facteurs:

- l'important gradient altitudinal et climatique qui va des forêts tropicales à des milieux alpins;
- la topographie escarpée qui crée un isolement géographique réel sur de courtes distances;

- la géologie diverse avec de nombreuses conditions édaphiques localisées, en particulier les substrats ultramafiques;
- les oscillations climatiques fréquentes influencées par le phénomène El Niño;
- l'histoire géologique de l'archipel malais et la proximité du massif Crocker beaucoup plus ancien.

Les processus cités ci-dessus créent des conditions idéales pour un biote divers, un taux d'endémisme élevé et un taux d'évolution rapide. L'UICN considère que le site proposé remplit ce critère.

#### **Critère (iv): diversité biologique et espèces menacées**

La recherche sur le biote du mont Kinabalu est intense et a permis d'établir que le parc possède une flore riche en espèces et constitue un centre d'endémisme des plantes d'importance mondiale. On estime que le parc contient 5000 à 6000 espèces de plantes vasculaires, et notamment des représentants de plus de la moitié de toutes les familles de plantes à fleurs. La présence de 1000 espèces d'orchidées, 78 espèces de *ficus* et de 60 espèces de fougères est indicatrice de la richesse botanique du parc. Les habitats très variés de Kinabalu comprennent six zones de végétation allant de la forêt ombrophile des plaines aux broussailles alpines, à 4095 mètres d'altitude. La diversité de la faune est également élevée car on y trouve la majorité des mammifères, des oiseaux, des amphibiens et des invertébrés de Bornéo (dont beaucoup sont menacés et vulnérables).

Il est clair que le parc de Kinabalu contient «les habitats les plus importants pour la conservation *in situ* de la diversité biologique». L'UICN considère que le site proposé remplit ce critère.

L'application des critères naturels (i) et (iii) n'est pas convaincante. Bien que l'on soit en présence de caractéristiques importantes et que le parc soit l'élément paysager dominant de l'île, tout cela est considéré comme secondaire par rapport aux valeurs naturelles principales de Kinabalu répondant aux critères (ii) et (iv).

Le site satisfait à toutes les «conditions d'intégrité» connexes, décrites au paragraphe 44 b) des Orientations mais il conviendra d'accorder une attention à l'atténuation des impacts extérieurs.

## **7. RECOMMANDATION**

Le Bureau recommande au Comité d'**inscrire** le Parc du Kinabalu sur la Liste du patrimoine mondial au titre des critères naturels (ii) et (iv). Le Bureau a noté que le site possède un biote très diversifié et un fort degré d'endémisme. Le gradient altitudinal et climatique, de la forêt tropicale aux conditions alpines, se combine à la topographie escarpée, à la géologie diversifiée et aux fréquentes oscillations climatiques pour offrir les conditions idéales au développement de nouvelles espèces. Le parc contient une forte diversité biologique, avec des représentants de plus de la moitié des familles de plantes à fleurs. La majorité des mammifères, oiseaux, amphibiens et invertébrés de Bornée (dont beaucoup sont menacés et vulnérables) se retrouvent dans le parc.

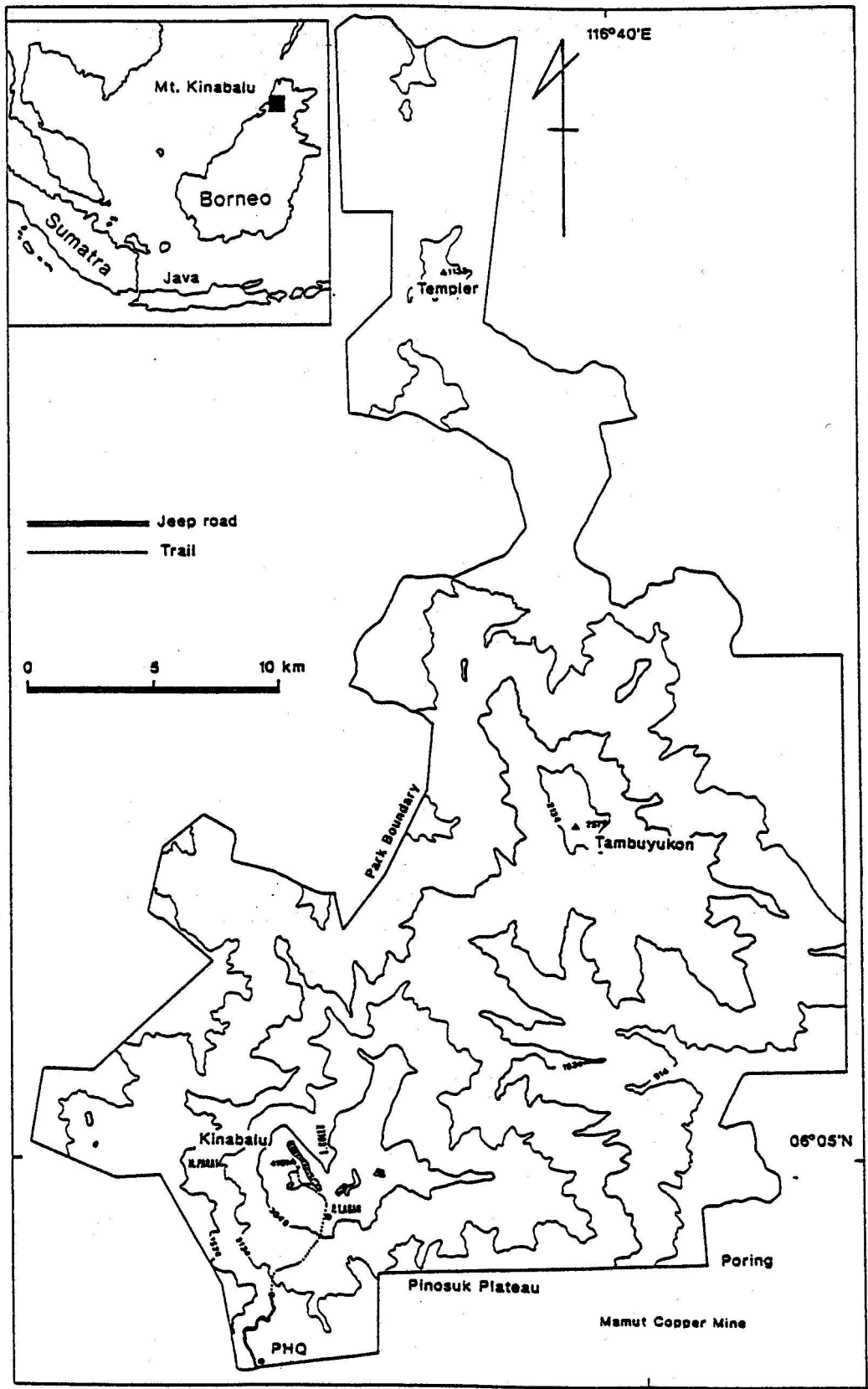
Le Comité souhaitera peut-être aussi féliciter l'État partie d'avoir répondu à la demande du Bureau en vue d'atténuer les impacts sur le parc en réglementant soigneusement les activités à proximité des limites. Une lettre de l'État partie, reçue par le Bureau le 20 septembre 2000, souligne les mesures mises en place pour réglementer les activités à proximité des limites du parc.



**Map of South East Asia**



**Carte 1: Localisation – Parc du Kinabalu**



Carte 2: Carte du site – Parc du Kinabalu