

Plant Conservation Efforts in Peninsular Malaysia

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Research Related to Climate Change and Biodiversity
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The Flora of Malaysia

- } The Flora of Malaysia is estimated to be over 15,000 species of vascular plants
 - } Peninsular Malaysia: *ca.* 8,300 sp.
 - } Sabah and Sarawak: *ca.* 12,000 sp.

} Trees

- } Trees of Peninsular Malaysia: 2,830 species
- } Trees of Sabah and Sarawak: *ca.* 3,500 species



Regional Endemism for Vascular Plants

} Peninsular Malaysia

- } About 2,500 species are endemic to Peninsular Malaysia (ca. 30% of species)
- } For trees, 746 species out of 2,830 species (ca. 26.3% of species)

} Sabah & Sarawak (Borneo)

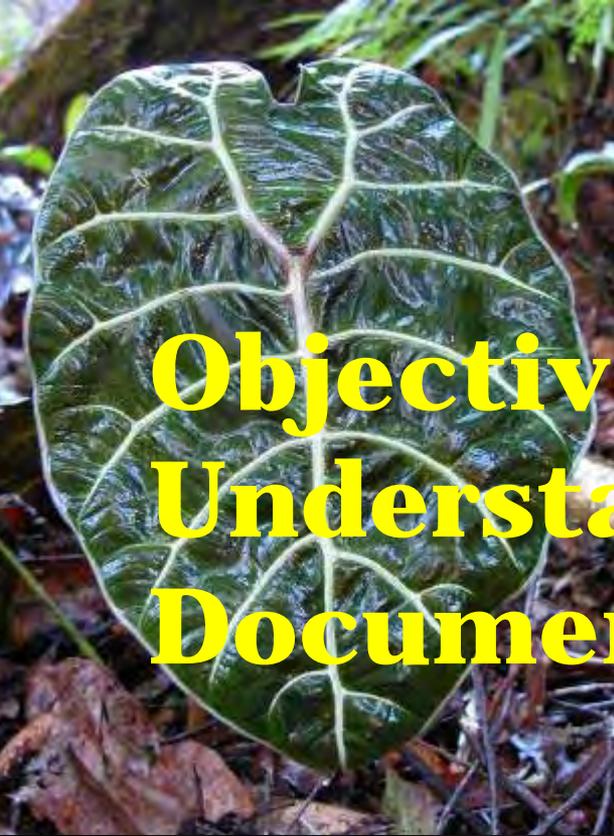
- } For tree species revised for the Tree Flora of Sabah and Sarawak project, 735 species out of 1,750 revised are Bornean endemics (ca. 42%)





MALAYSIA
National
Strategy
for Plant
Conservation

**Objective 1:
Understanding and
Documenting Plant Diversity**



Flora of Malaysia

} Tree Flora of Sabah and Sarawak

- } Started in 1990
- } Trees of ca. 3,500 species
- } Published 7 volumes, Volume 7 published in 2012
- } Till volume 7, 2,055 species in 75 families revised

} Flora of Peninsular Malaysia

- } Started in 2005
- } All vascular plants of ca. 8,300 species
- } Published 4 volumes in 2 series; Seed Plants and Ferns and Lycophytes, 991 species in 82 families revised



TREE FLORA OF
SABAH AND SARAWAK
Volume One
edited by
E. Soepadmo and K.M. Wong

TREE FLORA OF
SABAH AND SARAWAK
Volume Two
edited by
E. Soepadmo, K.M. Wong and L.G. Saw

TREE FLORA OF
SABAH AND SARAWAK
Volume Three
edited by
E. Soepadmo and L.G. Saw

TREE FLORA OF
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and R.C.K. Chung

TREE FLORA OF
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Volume Five
edited by
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and R.C.K. Chung

TREE FLORA OF
SABAH AND SARAWAK
Volume Six
edited by
E. Soepadmo, L.G. Saw
R.C.K. Chung and Ruth Kiew

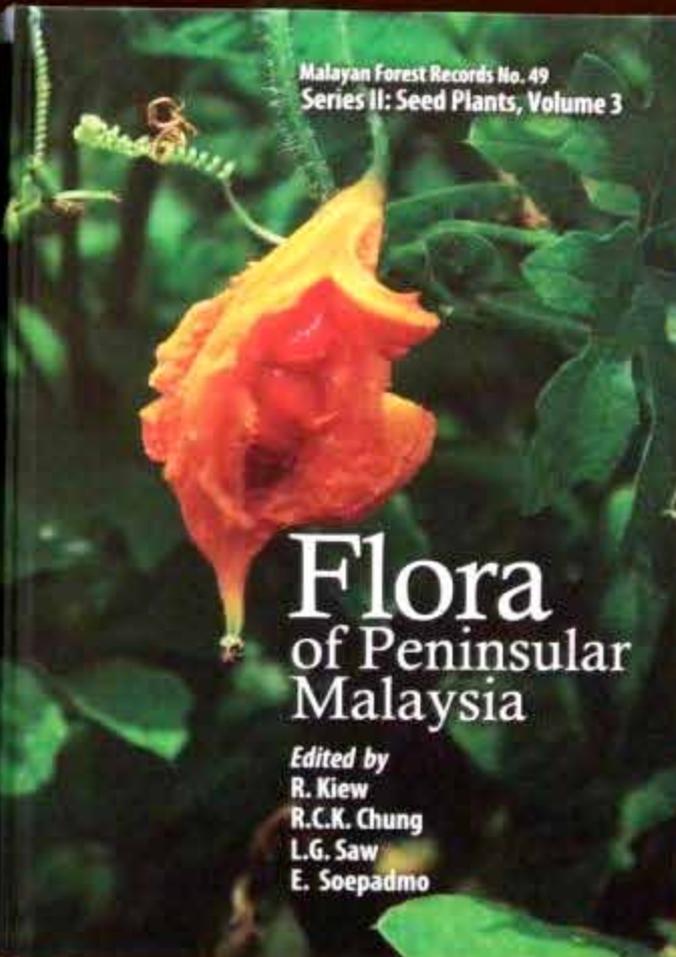
TREE FLORA OF
SABAH AND SARAWAK
Volume Seven
edited by
E. Soepadmo, L.G. Saw,
R.C.K. Chung and R. Kiew

MFR 48
Series I:
Ferns and Lycophytes
Flora of Peninsular Malaysia
Vol. 1

MFR 49
Series II:
Seed Plants
Flora of Peninsular Malaysia
Vol. 1

MFR 49
Series II:
Seed Plants
Flora of Peninsular Malaysia
Vol. 2

Malayan Forest Records No. 49
Series II: Seed Plants, Volume 3



Flora of Peninsular Malaysia

Edited by
R. Kiew
R.C.K. Chung
L.G. Saw
E. Soepadmo

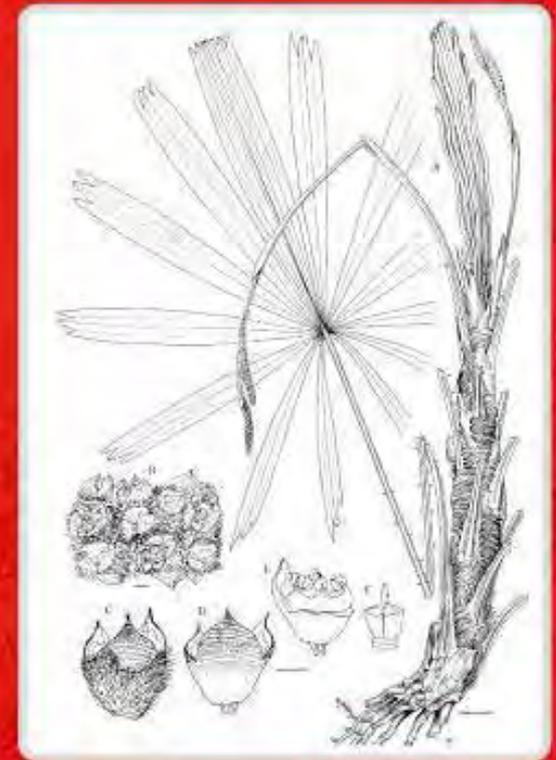
MALAYSIAN FLORA

Conservation of Rare and Threatened Plants of Peninsular Malaysia

- } Started in Aug. 2005
- } Threat assessment of selected families, Dipterocarpaceae, Palmae, Begoniaceae and endemic tree species
- } Detail conservation biology studies for some selected species, mainly hyper-endemics

Malaysian Plant Red Data Book

Guide to Contributions



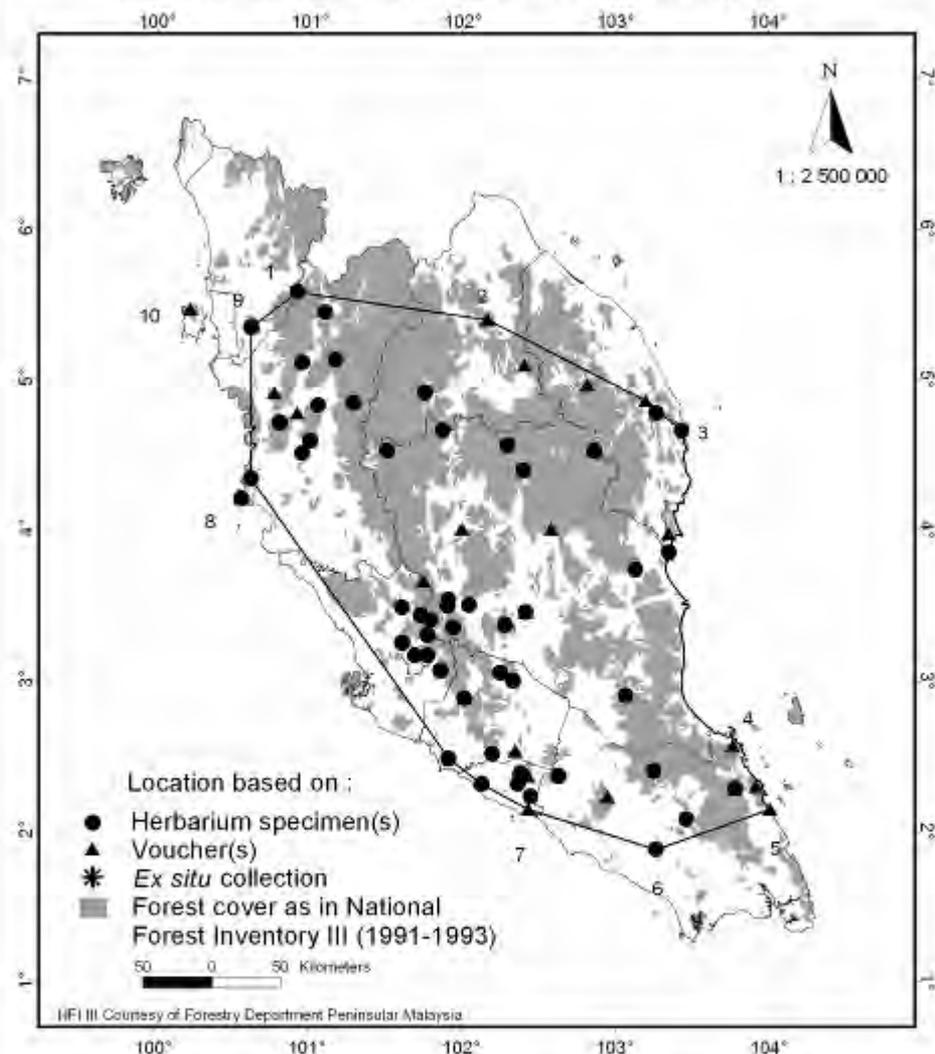
First volume for
Malaysia Plant Red List
– Peninsular Malaysian
Dipterocarpaceae

MALAYSIA PLANT RED LIST

PENINSULAR MALAYSIAN DIPTEROCARPACEAE



Geographical Distribution of *Anisoptera laevis* (Dipterocarpaceae) in Peninsular Malaysia



Selected Localities

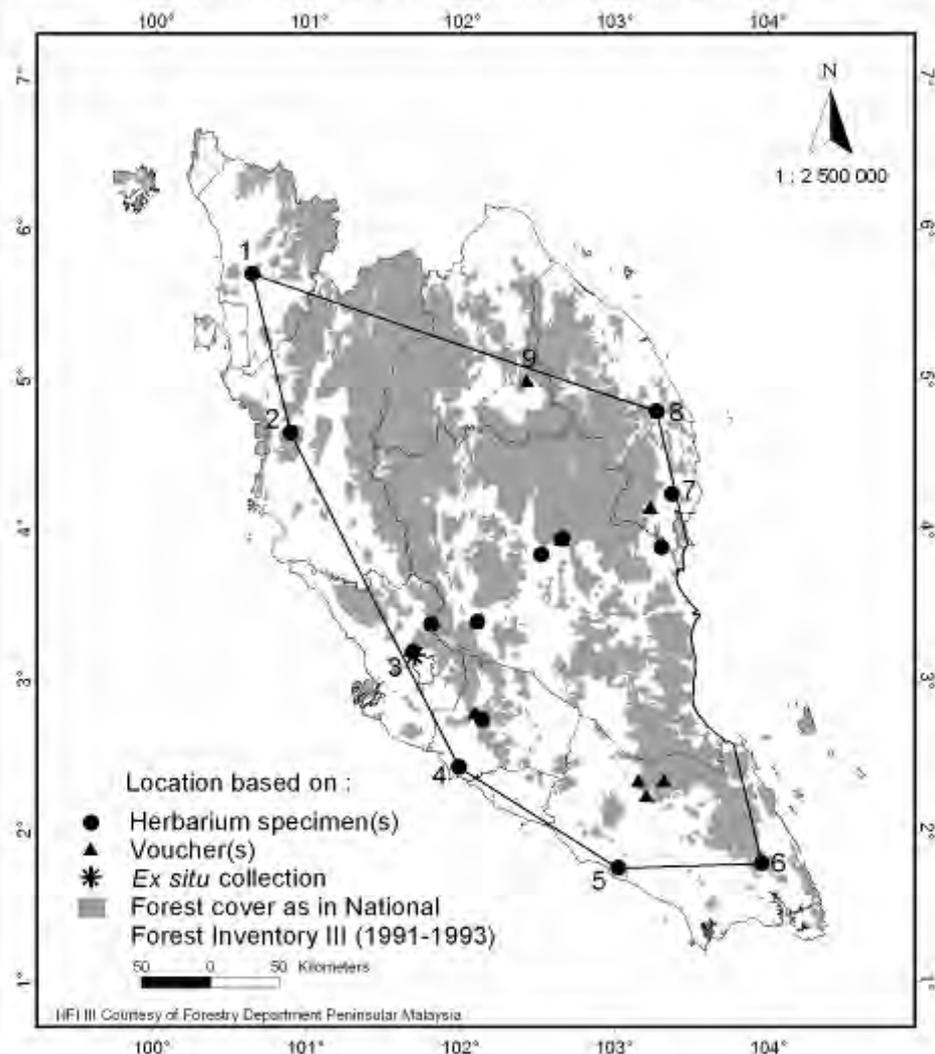
- | | |
|---------------------|-------------------------|
| 1. G. Inas F.R. | 6. Machap |
| 2. Ulu Temiang F.R. | 7. Sg. Udang F.R. |
| 3. Paka | 8. Pangkor Selatan F.R. |
| 4. G. Arong F.R. | 9. G. Bongasu F.R. |
| 5. Tenggaroh F.R. | 10. Telok Bahang F.R. |

Extent of Occurrence (EOO) :
92269 sq km

Area of Occupancy (AOO) :
276 sq km

Forest cover within EOO :
53 %

Geographical Distribution of *Shorea hopeifolia* (Dipterocarpaceae) in Peninsular Malaysia



Selected Localities

- | | |
|---------------------|---------------------------------|
| 1. Sungkop F.R. | 6. Panti F.R. |
| 2. Bubu F.R. | 7. Rasau-Kerteh-Ulu Chukai F.R. |
| 3. Bkt. Lagong F.R. | 8. Jerangau F.R. |
| 4. Sg. Menyala F.R. | 9. Relai F.R. |
| 5. Banang F.R. | |

Extent of Occurrence (EOO) :
84908 sq km

Area of Occupancy (AOO) :
84 sq km

Forest cover within EOO :
54 %

Conservation Status Assessment for Selected Plants of Peninsular Malaysia at 2012

Conservation status	Number of taxa
Extinct (EX)	4 (0.4%)
Critically Endangered (CR)	97 (10.0%)
Endangered (EN)	133 (13.6%)
Vulnerable (VU)	148 (15.2%)
Rare (RA)	29 (3.0%)
Total Conservation Concern Taxa	411 (42.2%)
Near Threatened (NT)	182 (18.7%)
Least Concern (LC)	327 (33.5%)
Data Deficient (DD)	55 (5.6%)
Total	975 (100%)



**Objective 2:
Conserving plant diversity**

Setting Research, Conservation and Monitoring Priorities for the Most Threatened Species



Species subjected to detail studies

- } Most are either EN or CR species
- } All have narrow distribution, some are single locality species



Methods

- } Population study
 - } Location of extant populations
 - } Spatial mapping and enumeration of population
 - } Population structure determined
 - } Ecology of species
- } Phenology study – to determine flowering and fruiting patterns
- } *Ex-situ* conservation
- } Proposals for *in situ* conservation
 - } Interaction with stakeholders to maintain *in situ* population



Summary of species under detail conservation studies

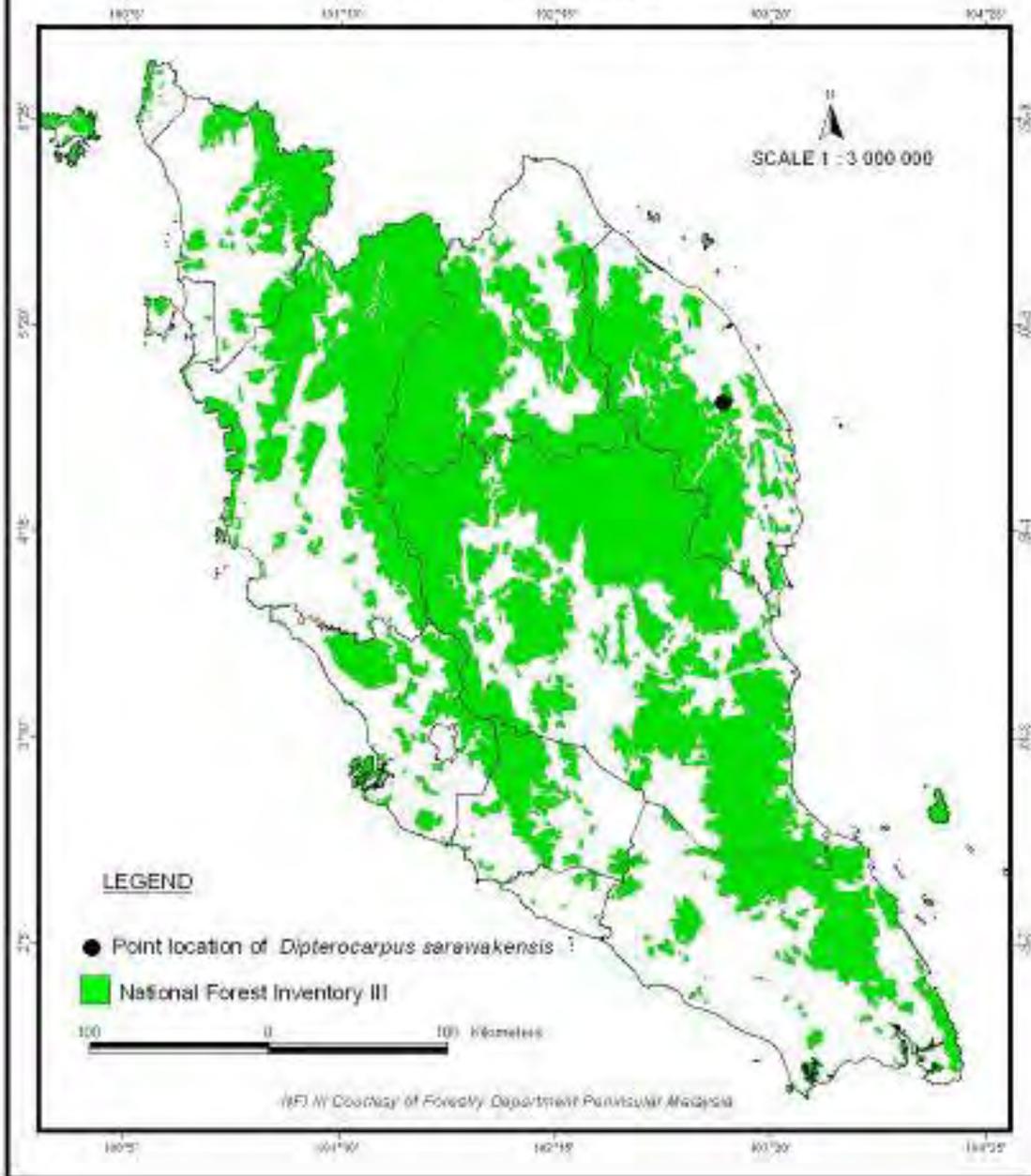
Families	Species number
Dipterocarpaceae	21
Begoniaceae	5
Cycadaceae	4
Palmae	2
Gesneriaceae	1
Total	33



Dipterocarpus sarawakensis (Keruing layang)



Geographical Distribution of *Dipterocarpus sarawakensis* (Dipterocarpaceae) In Peninsular Malaysia



Geographical Distribution

- } Sarawak, Brunei and Central Kalimantan
- } In Peninsular Malaysia known only from two locations in Terengganu

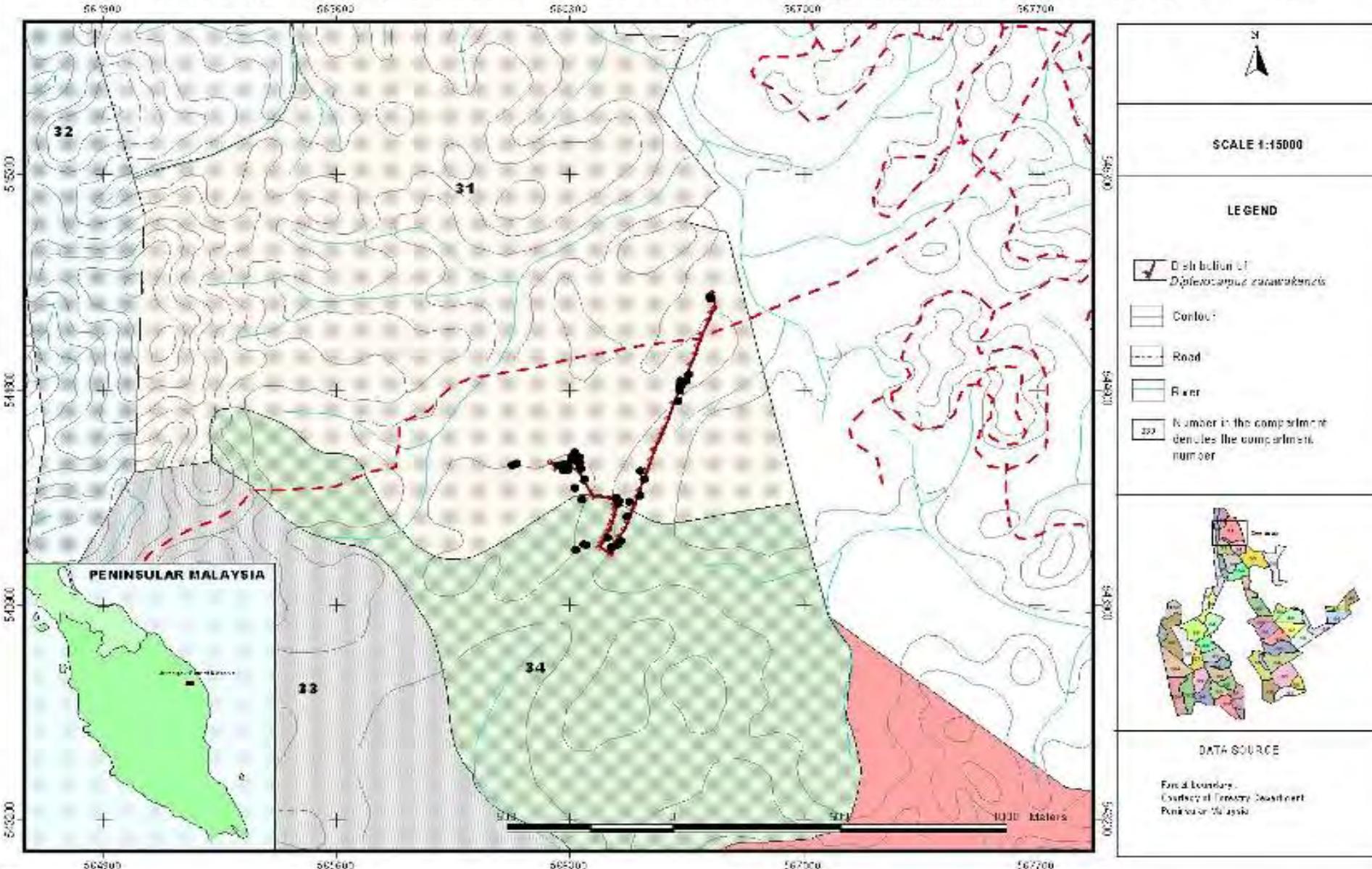
Population Status

- } Sg. Dadong's population cannot be located
- } Population in Jerangau FR, discovered in 2005, has 50 trees in Cpt. 31/34 and 64 trees in Cpt. 45

This species is **Critically Endangered (CR)**

Conservation. 63 ha in Compartment 31 has been set aside as protection area.

DISTRIBUTION OF *Dipterocarpus sarawakensis* IN COMPARTMENTS 31 AND 34 JERANGAU FOREST RESERVE, TERENGGANU



GENETIC RESOURCE AREA (GRA)
Pokok Keruing Serawak
Kompartmen 31 Hutan Simpan Jerangau
Kumpulan Pengurusan Kayu Kayan Terengganu Sdn Bhd

 SELAMAT DATANG 
PETAK POKOK KERUING SARAWAK
Dipterocarpus Sarawakensis
LUAS ± 63 HEKTAR
KOMPATMEN 31 HUTAN SIMPAN JERANGAU
JABATAN PERHUTANAN NEGERI TERENGGANU

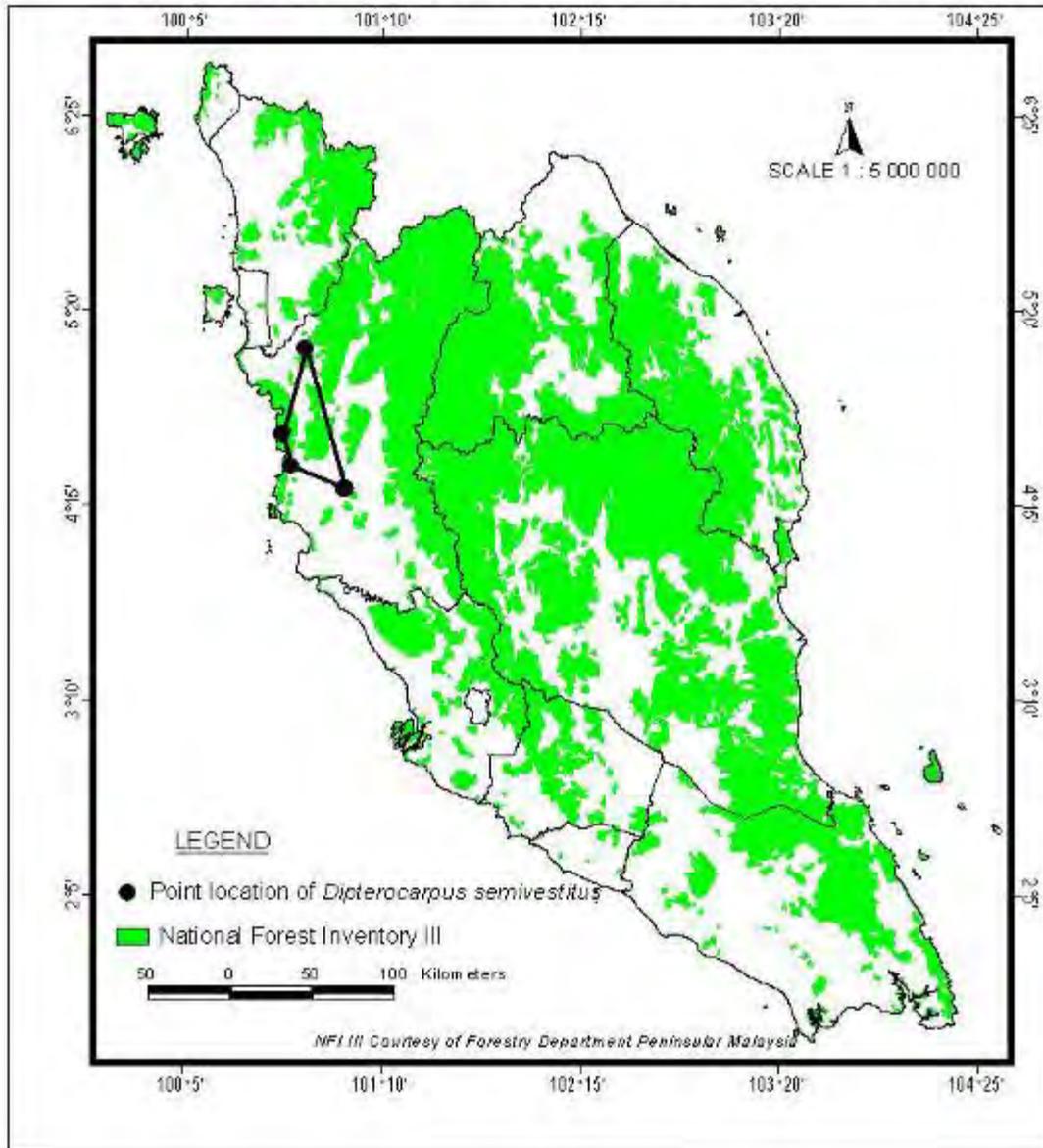
Dipterocarpus semivestitus
(Keruing Padi)

CHAN YM



Geographical Distribution of *Dipterocarpus semivestitus* (Dipterocarpaceae) in Peninsular Malaysia

1. POINT LOCATION OVERLAID ON NATIONAL FOREST INVENTORY III (1991-1993)



- Peninsular Malaysia and South Kalimantan (Marabahan District)
- Restricted to freshwater swamp forest in Parit (Kinta), Sg. Rotan dan Sg. Tinggi (Larut & Matang), Perak.



Marabahan, Indonesia

Image © 2012 TerraMetrics

Google earth

3°15'52.01" S, 115°00'14.35" E elev. 42 m

Eye alt. 100.12 km



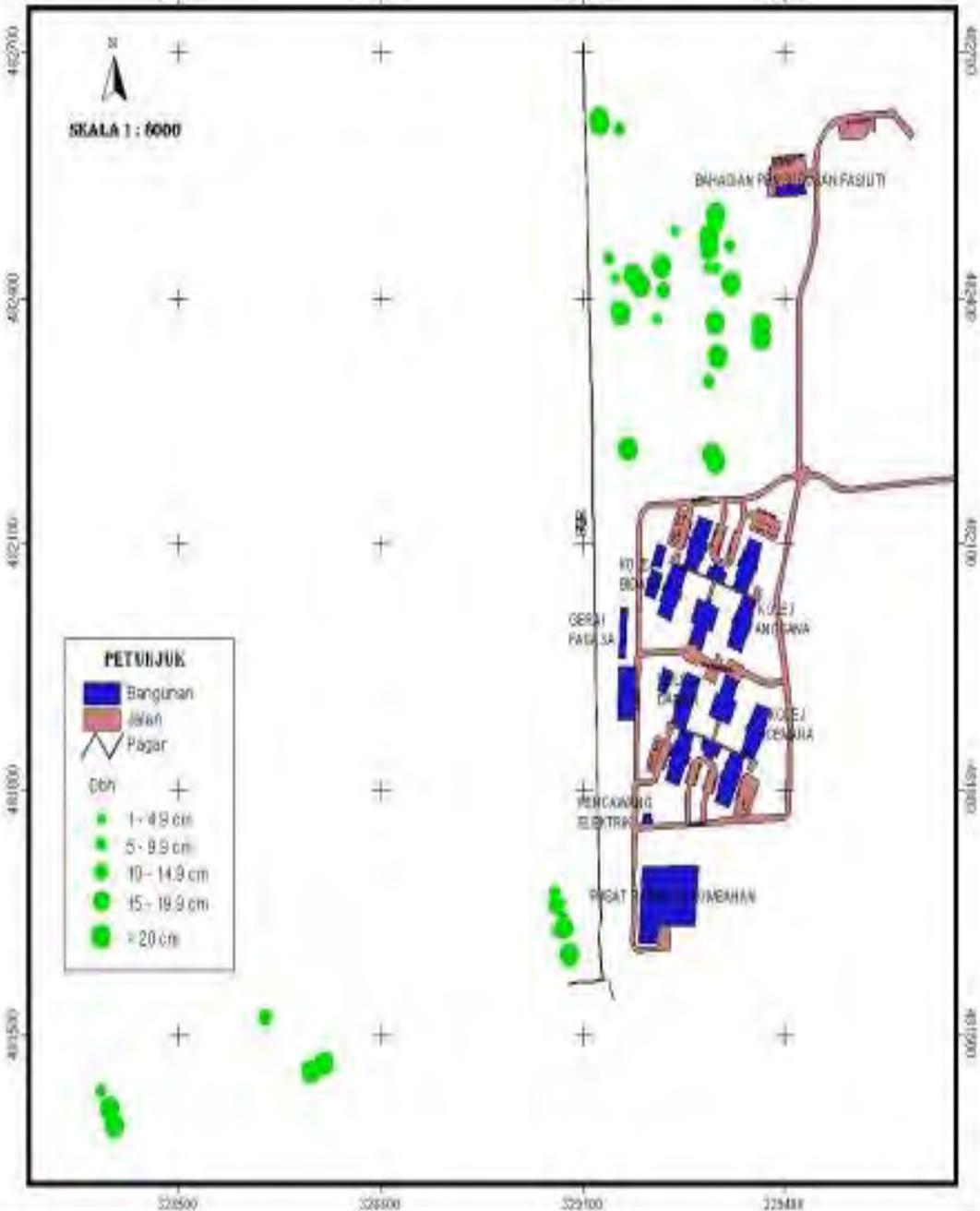
Image © 2012 DigitalGlobe

© 2012 MapIt

Google earth

TABURAN *Dipterocarpus semivestitus* BERHAMPIRAN KAMPUS UITM, SERI ISKANDAR, PERAK

228900 228900 229100 229400



Population Status:

One population comprising 53 trees found in the campus of Universiti Teknologi Mara, Seri Iskandar. No population in Sg. Rotan, Sg. Tinggi and Parit FR.

This species is **Critically Endangered (CR)**

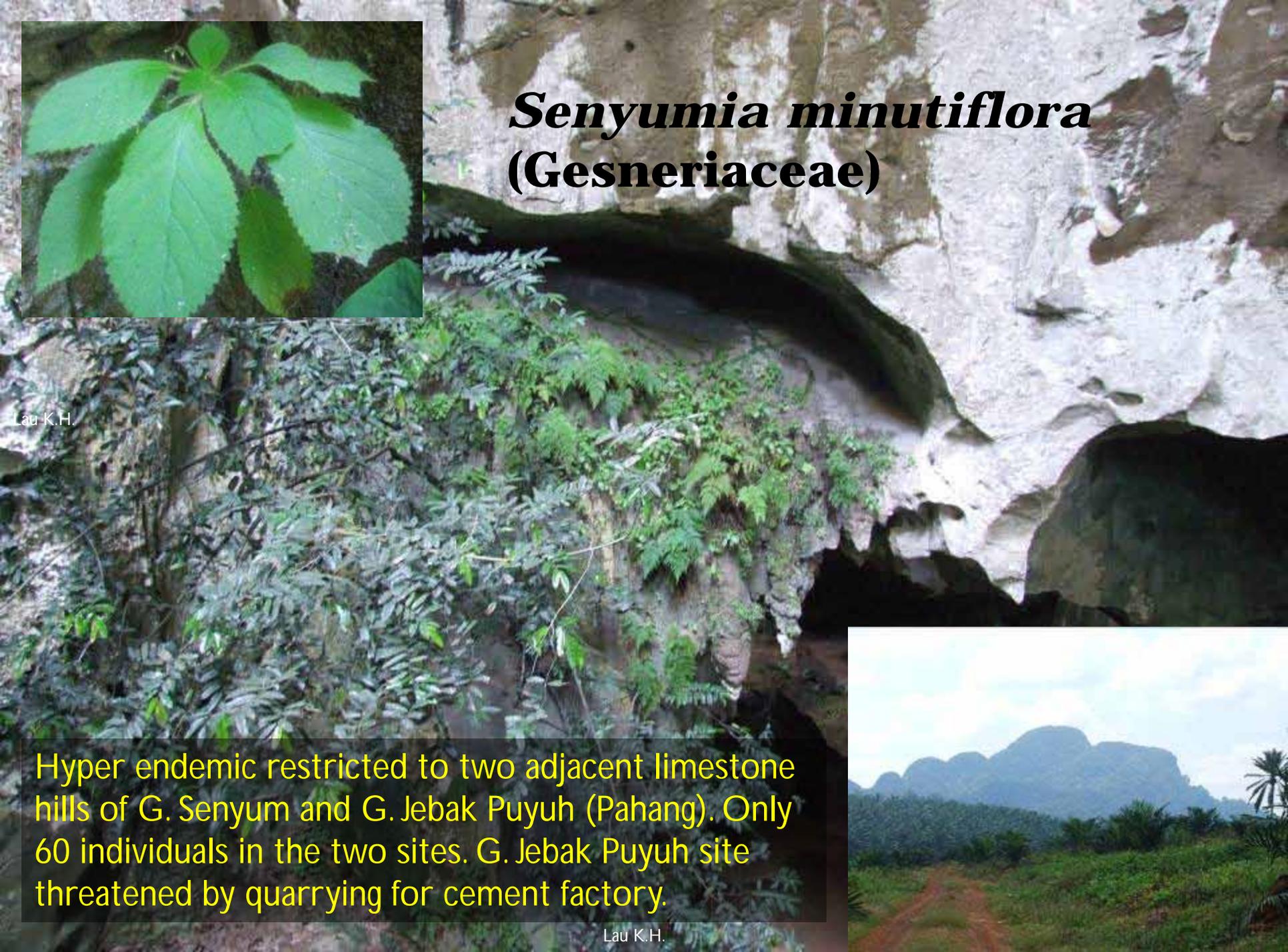
Conservation Action:

FRIM is currently working very closely with UiTM to protect the population. FRIM has forwarded a conservation action plan for consideration.



***Senyumia minutiflora*
(Gesneriaceae)**

Lau K.H.



Hyper endemic restricted to two adjacent limestone hills of G. Senyum and G. Jebak Puyuh (Pahang). Only 60 individuals in the two sites. G. Jebak Puyuh site threatened by quarrying for cement factory.

Lau K.H.



Begonia re-introduction studies

- } *Begonia herveyana* – CR
- } *B. aequilateralis* – VU
- } Habitat: moist rocks/boulders in valley or stream
- } Seeds dispersed by raindrop ballistic force



Identification of Important Plant Areas (IPA)

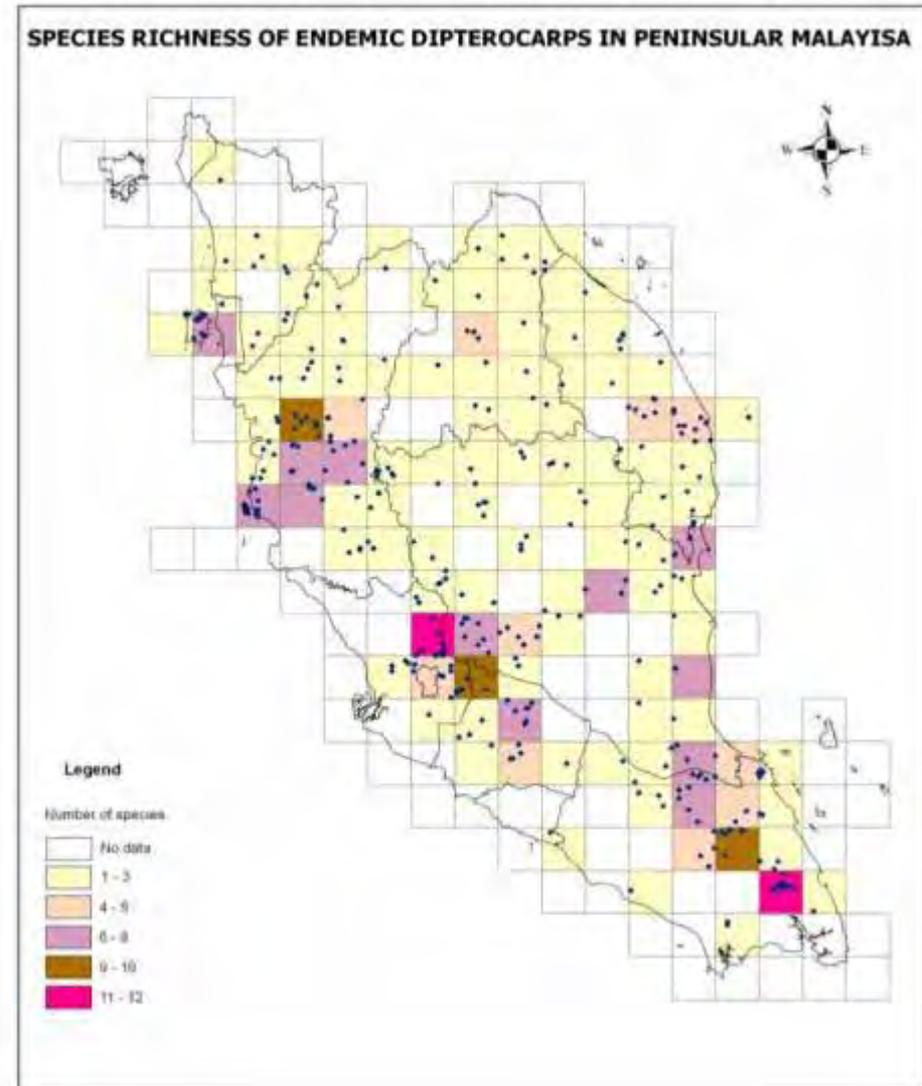
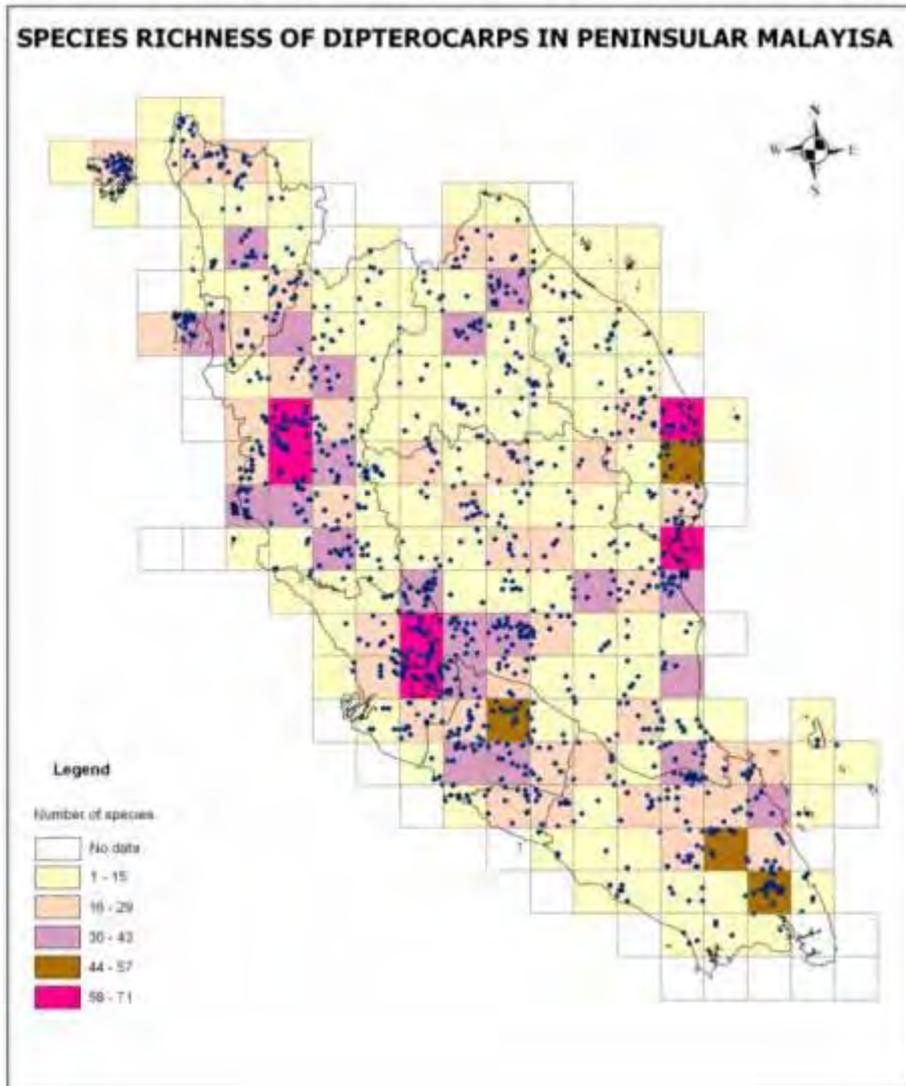
- } Initial phase of project
- } Using simple species richness maps to identify IPA



Identifying Important Plant Areas – Species Richness Maps

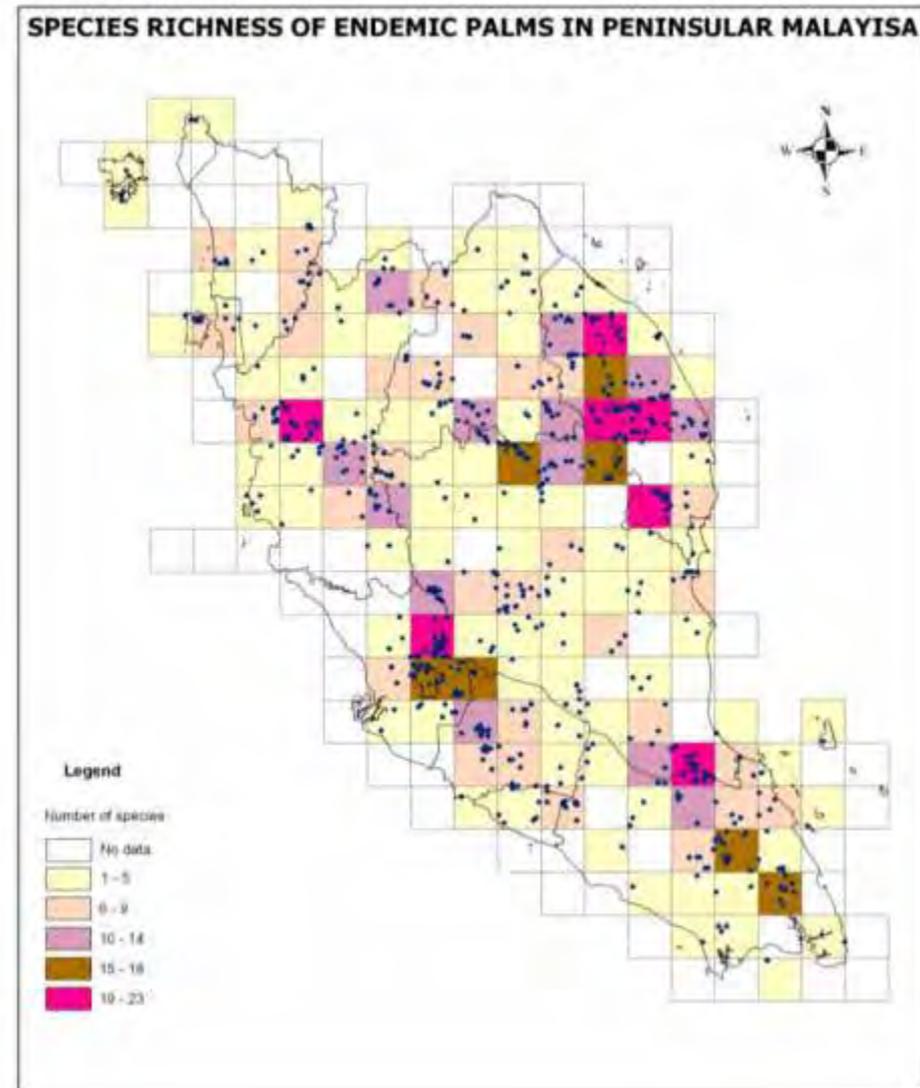
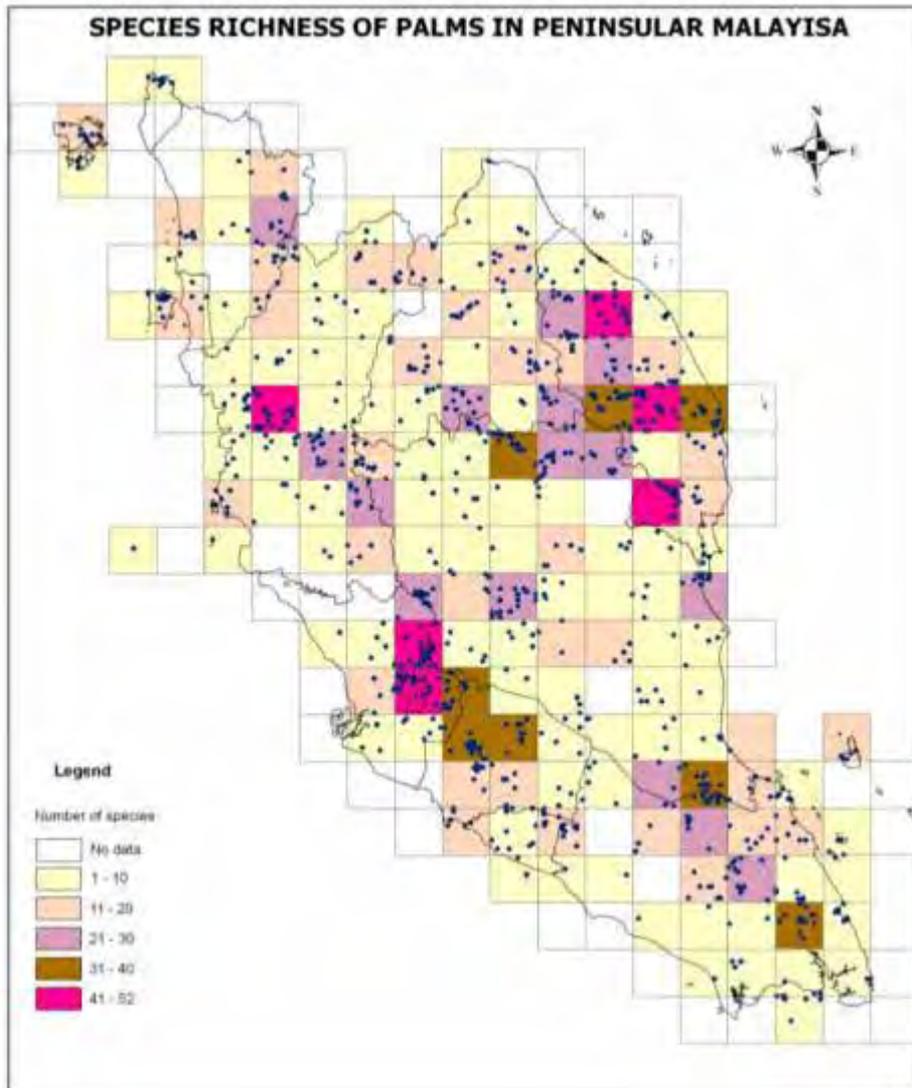
Species Richness Maps for Dipterocarps

-165 taxa, 34 endemic taxa, 8,686 specimens



Species Richness Maps for Palms

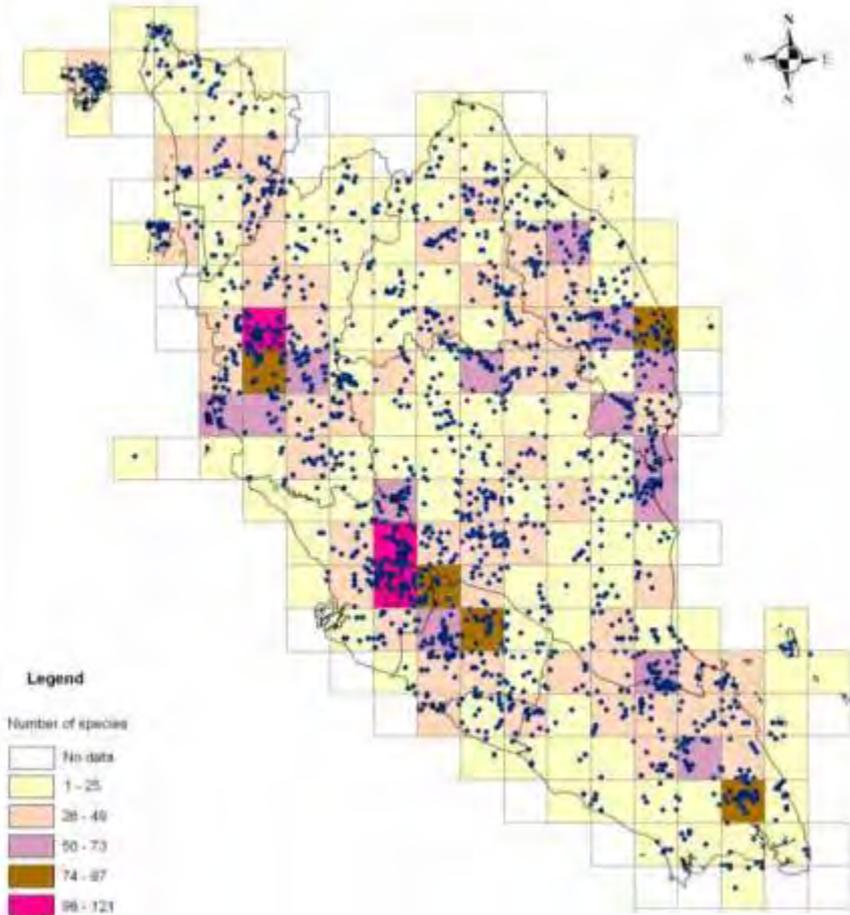
- 228 species, 118 endemic species, 3,578 specimens



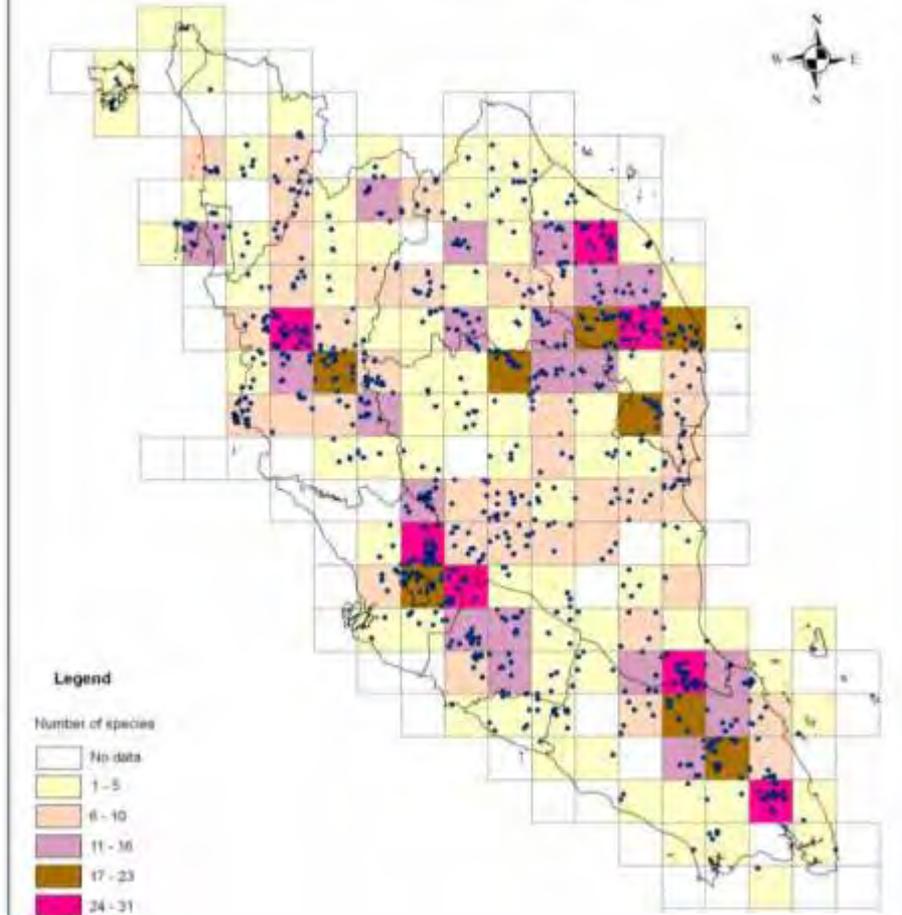
Species Richness Maps for Dipterocarps & Palms

- 393 taxa, 152 endemic taxa, 12,264 specimens

SPECIES RICHNESS OF DIPTEROCARPS AND PALMS IN PENINSULAR MALAYISA



SPECIES RICHNESS OF ENDEMIC DIPTEROCARPS AND PALMS IN PENINSULAR MALAYISA



What are the most important areas for plant conservation in Pen. Malaysia?

- } Need to have as much lowland dipterocarp forest as possible under HCVF
- } All forest types to have regional representation
- } Hot spot areas especially in lowland forest in
 - } East Coast (Terengganu)
 - } Main Range (Central)
 - } South Pen. Malaysia (predominantly E. Johor)
 - } Bintang-Keledang Saiong Range (Perak)



Conclusion – Flora of Malaysia

- } The documentation and inventory for a Flora of Malaysia can be done with resources in Malaysia and collaboration with our traditional partners
- } The Flora of Malaysia will continue with the geographical division of Peninsular Malaysia and Sabah & Sarawak
- } The flora is phased into the immediate short-term needs (checklists) and revisions of the two geographical floras
 - } Tree Flora of Sabah and Sarawak project
 - } Flora of Peninsular Malaysia project
- } After completion of the two above floras then initiate the Flora of Sabah and Sarawak ...
- } The Flora of Malaysia Project requires long-term planning and execution and must be supported by institutional and financial commitment



Conclusion – Plant Conservation

- } We have some degree of success
 - } Discovery of extant populations for possibly extinct species
 - } Conservation measures (*in situ* and *ex situ*) taken to protect threatened species through negotiations
 - } New discoveries
 - } Current study focused in Pen. Malaysia, work in Sabah and Sarawak has now started led by researchers at Forest Research Centres in both Sandakan and Kuching
 - } Way forward
 - } Continue with the assessment and detail studies
 - } Greatest challenge is to put in place legal framework for the protection of threatened species (esp. under EN and CR)
 - } We shall be moving towards habitat based conservation – monitoring of degradation and
 - } Funding
 - } Targets for Malaysian conservation strategy, no deadline set towards achieving all the targets – Revision to updated GSPC?
-



Cycas cantafolia
(described in 2010)

Thank you so much

