

Ecological & Biodiversity Monitoring of Tropical Peat Swamp Forest in Malaysia

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FRIM



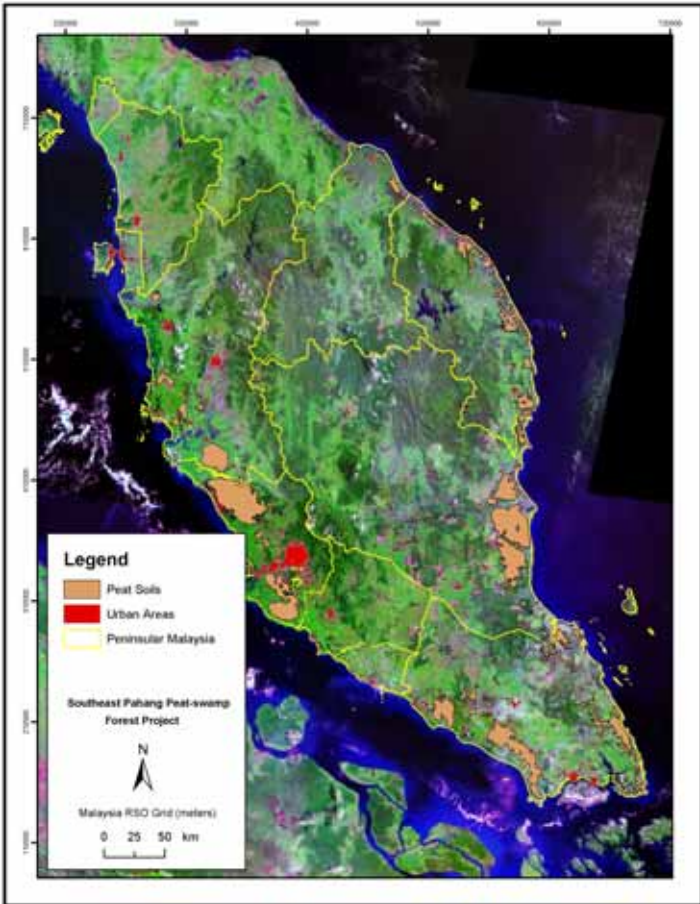
Peatland and peat swamp forests comprise >70% of wetlands in Malaysia

- A special type of ecosystem that forms and survive under unique conditions
- Presence of rare and threatened species
- Provides vital services & functions ie “ecosystem services”
- Faced with various threats

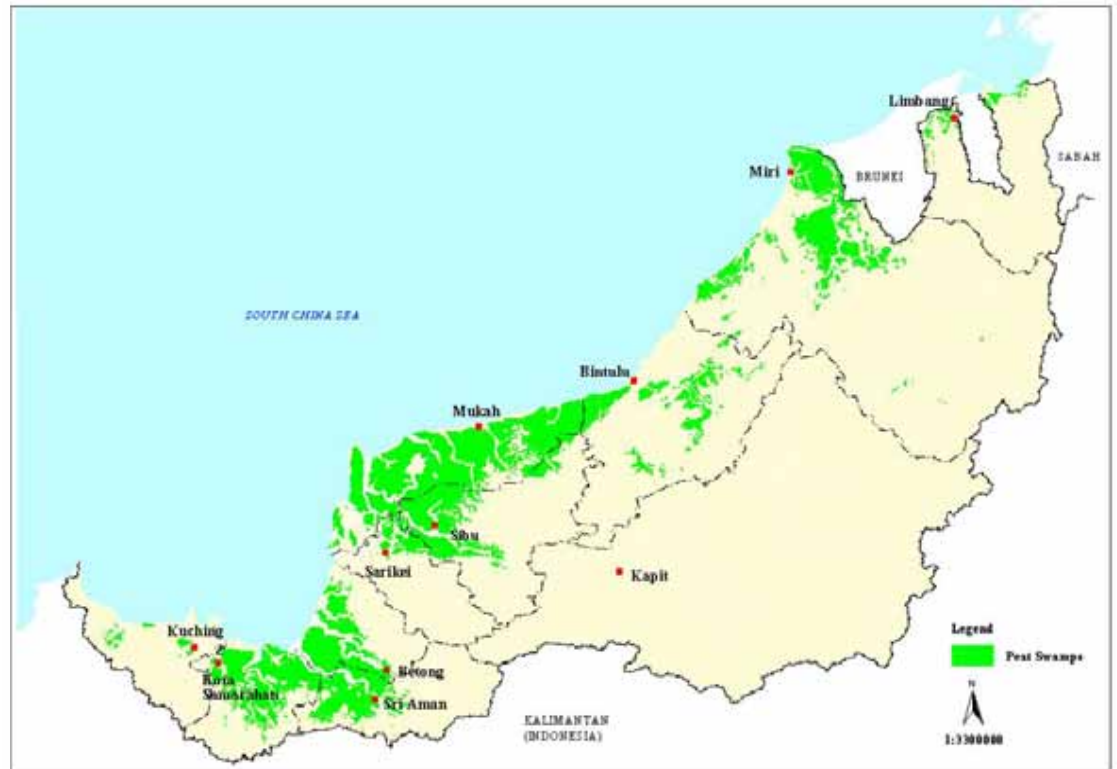


Extent of Peatland in Malaysia

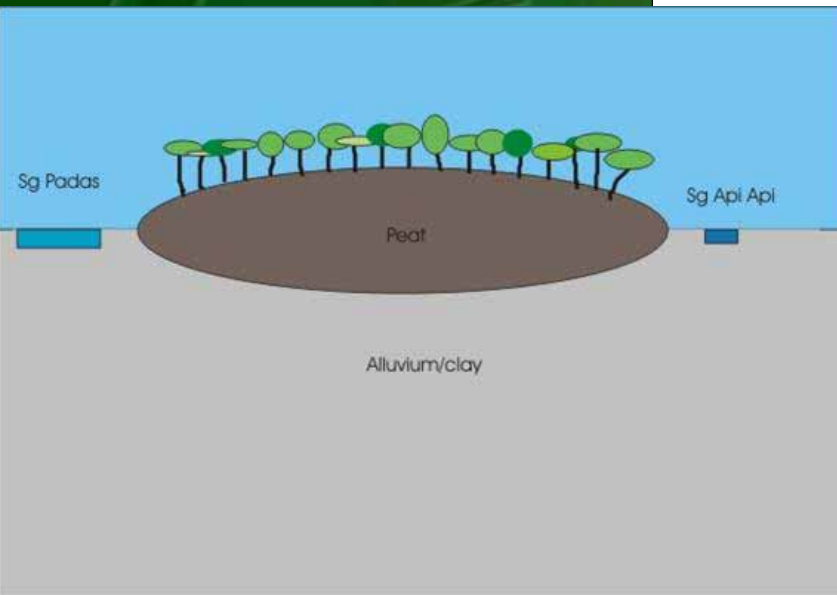
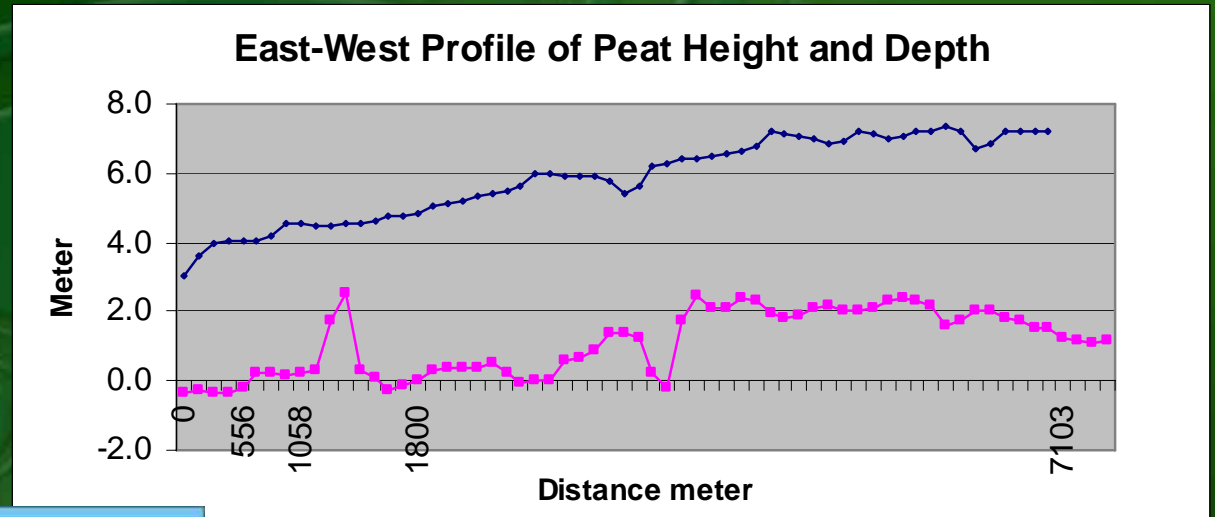
21. Extent of peat swamp in Peninsular Malaysia



2.1 mil ha



Peat Depth & Profile



Peatlands are unique ecosystems which provide various benefits and functions –“ecosystem services”

Provisioning

Goods produced or provided by ecosystems

- food
- fresh water
- fiber
- biochemicals
- genetic resources

Regulating

Benefits obtained from regulation of ecosystem processes

- climate regulation
- flood regulation
- detoxification

Cultural

Non-material benefits obtained from ecosystem

- recreational
- aesthetic
- educational
- communal

Supporting

Services necessary for production of other ecosystem services

- Soil formation
- Nutrient cycling
- Primary production

Issues and threats related to PSF

- Fragmentation of wetlands & peat swamp complex
- Lowered water table due to:
 - Drainage activities
 - Land conversion activities
 - Harvesting activities
- Leading to amongst others, increased fire hazard, land subsidence, enhanced oxidation & CO₂ emission
- Loss of biodiversity resources

Peat Swamp Forest Project

- Initiated by the M'sian Govt and UNDP/GEF the five-year project started in June 2002.
- Promote conservation & sustainable use of PSFs and associated wetlands ecosystems
- Develop & implement plans, which encourage processes to ensure conservation of globally significant biodiversity
- Contribute towards better understanding & management of PSFs in M'sia and in the region.

PROJECT AREAS



PEAT SWAMP FOREST PROJECT

Main Activities:

- Ecological, hydrological & biodiversity assessments
- Forest survey & Timber assessment
- Socio-economic appraisals
- **Management Plans development**
- Demonstrations by MP implementation
- **Database and Monitoring system**
- Awareness Raising
- Strengthening Local Capacity

How to manage these resources?

- Approach

- Ecosystem Approach (Convention Biological Diversity; IUCN; UNEP)

“A strategy for integrated management of land, water and living resources that promotes conservation and sustainable use”

- Framework for action under CBD

Ecosystem Approach (Landscape Approach)

- considers the entire range of goods and services
- Attempts to optimize the mix of benefits within a given ecosystem and across ecosystems
- Uses adaptive management
- Ensures inter-sectoral involvement & cooperation

Development of Site Specific Integrated Management Plan

**Consultative Process
(Core Team)**

**Information Multi
Landscape Assessment**

**Identification of System, Stress,
Sources, Strategies & Success**

**5 S Framework for
Conservation
Planning**

Objectives of Management

Proposed Management Zoning

**Adaptive
Management**

Proposed Immediate Actions:

**Synchronization with the local area planning exercise
(ESA ZONATION)**

- Guidelines for State Land Logging (Interim)
- Guidelines for Agric Development (Interim)

**WIDER
STAKEHOLDER
CONSULTATION**

Integrated Management Plan



KEY STRATEGIES

- Implement zonation of peatland & PSF
 - Zones requires Multi-agency management attention
- Develop Integrated Management plans to synchronize with Local Area Plans
- Establish planning procedures that integrate biophysical and socio elements
- Establish ecological & biodiversity monitoring systems
- Endorsement by policy makers & state authority

Monitoring Systems:

- Establish a realistic and institutional monitoring system
- Implemented over a long-term by respective institutions
- Choice of indicators represents a cost effective format for monitoring
- Adopt relevant tools with practical applications
- Develop Standard Operating Procedures (SOP)

SUMMARY OF MONITORING ACTIVITIES BY SITE

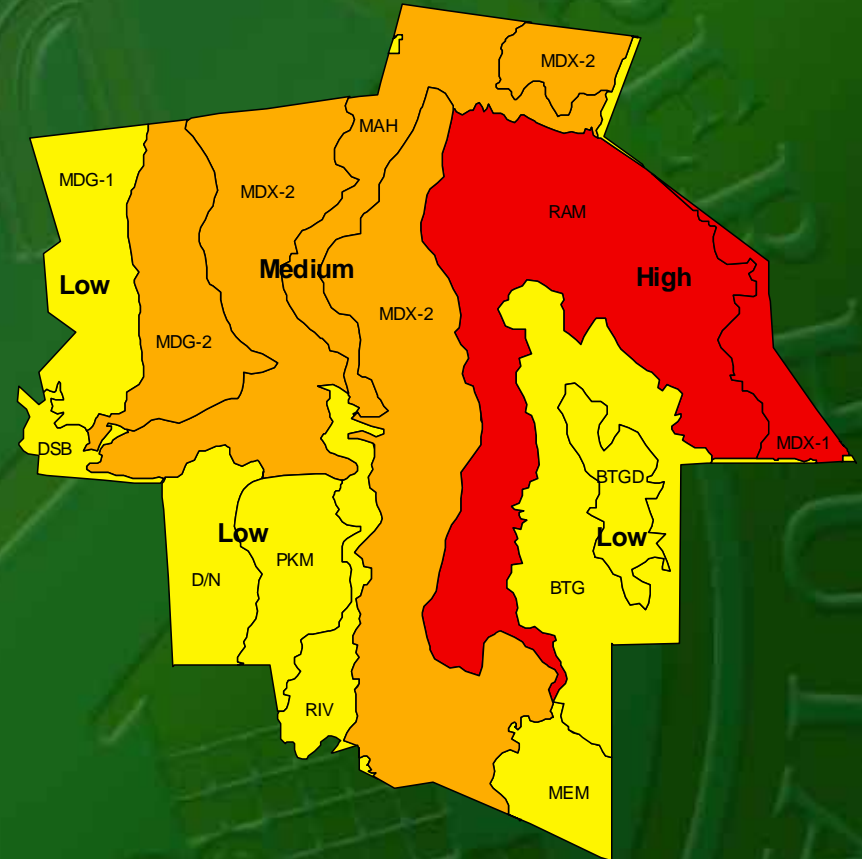
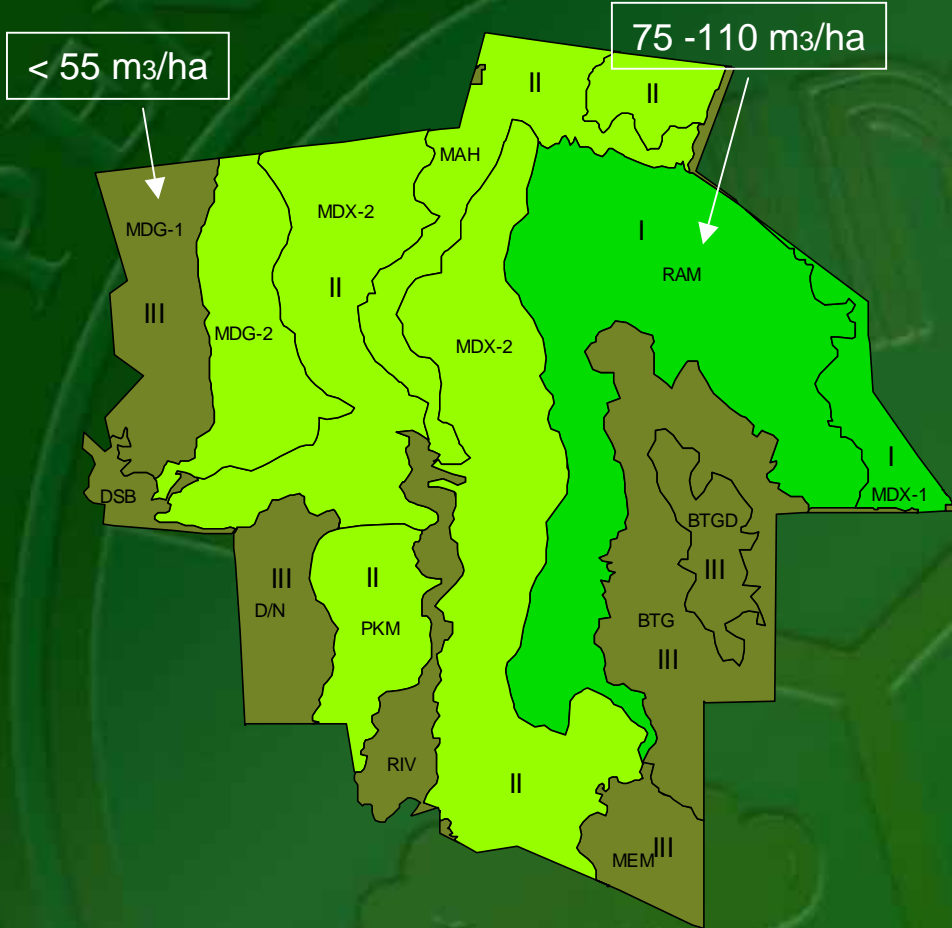
<i>Component</i>	<i>Indicator</i>	<i>Pekan</i>	<i>KLIAS</i>	<i>LBNP</i>
Ecological/ landscape monitoring	Distribution and areas of forest types			
	Integrity of riparian zones			
	Interface areas (boundaries)			
Hydrological monitoring	water quality			
	Water table fluctuations			
	Peat subsidence			
	Siltation			
	(Indirect indicators)*			
Biodiversity monitoring	Key tree species regeneration, growth and increment			
	Key animal species			
	(Biodiverse groups)*			
Socio-economic monitoring	Use of NTFPs			
	Fish landings			

<i>Indicator</i>	<i>Threats</i>	<i>Methods</i>	<i>Timing and frequency</i>	<i>Resources</i>	<i>Personnel</i>	<i>Cost</i>
Water table fluctuations in PSF	Lowering of water table through changing hydrological regime	Sampling of water level in wells	Checking auto-loggers. Measurement of manual wells every three months.	Transport. Automatic logger and/or dip meters	establish two teams of 3 persons to undertake water quality and water level monitoring.	

Timber Assessment

Volume of commercial timbers

Value of commercial timbers



FLORA



Koompassia malacensis
(Kempas)



Gonystylus bancanus
(Ramin)



Calophyllum ferrugineum
(Bintangor)

Durio carinatus (Durian)



Monkey Lipstick



Cissus sp.

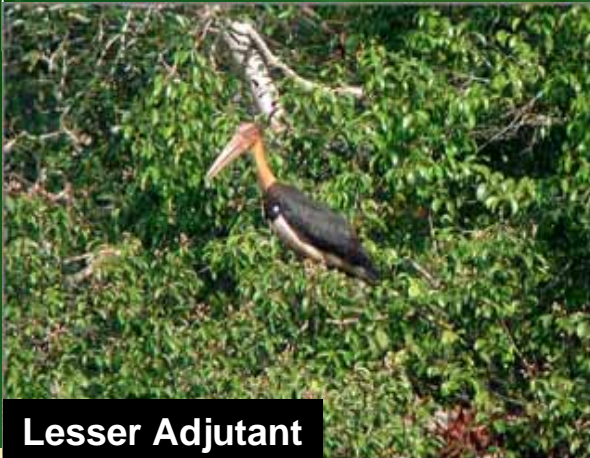


Periuik Kera

Biodiversity

AVIFAUNA

- *3 Globally Vulnerable species in Pekan, Pahang (Lesser Adjutant; Large Green Pigeon; Short-toed Coucal),*
- *37 Globally Near Threatened species*



Lesser Adjutant



Crimson-winged Woodpecker



Bushy-crested Hornbill

Fisheries: Southeast Pahang produced 20.5 t (*Baung, Kerai, Lampam Sungai dan Tapah*)



Rasbora sp.



Rasbora sp.



Six-banded Tiger Barb



Cyclocheilichthys apogon



Giant Catfish

Mangrove Snake



Butterfly Lizard



False Gharial



Monitor Lizard



Malayan Giant Turtle



Malayan Soft-shell Turtle



Dark-headed Cat Snake



Spiny Terrapin

Socio-economy of local community



- 63% depends on fish from PSF

- 36% depends on forest produce



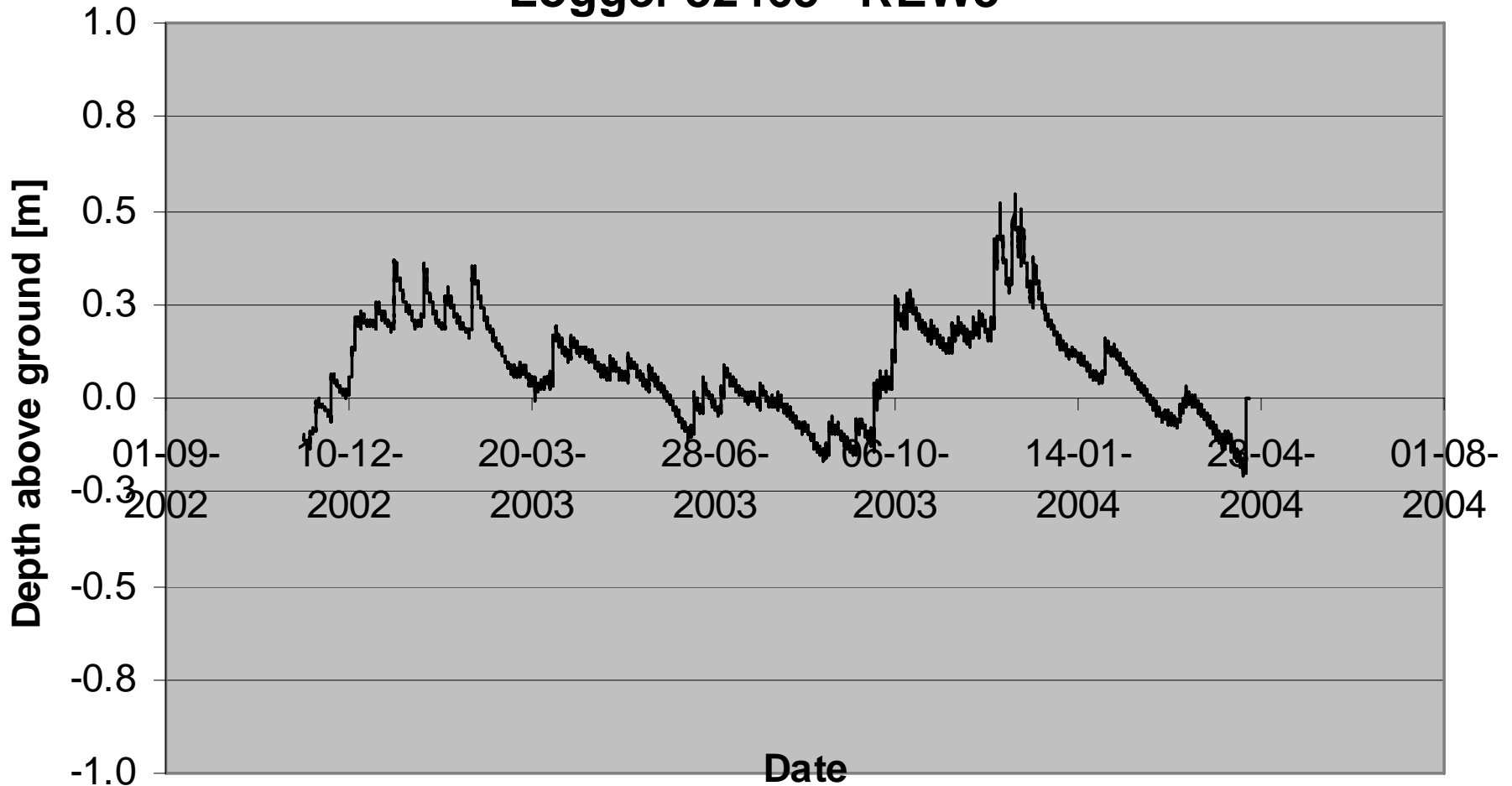
Hydrological Monitoring & Assessment

- Installation of dip wells
- Peat coring
- Conductivity tests
- Data loggers

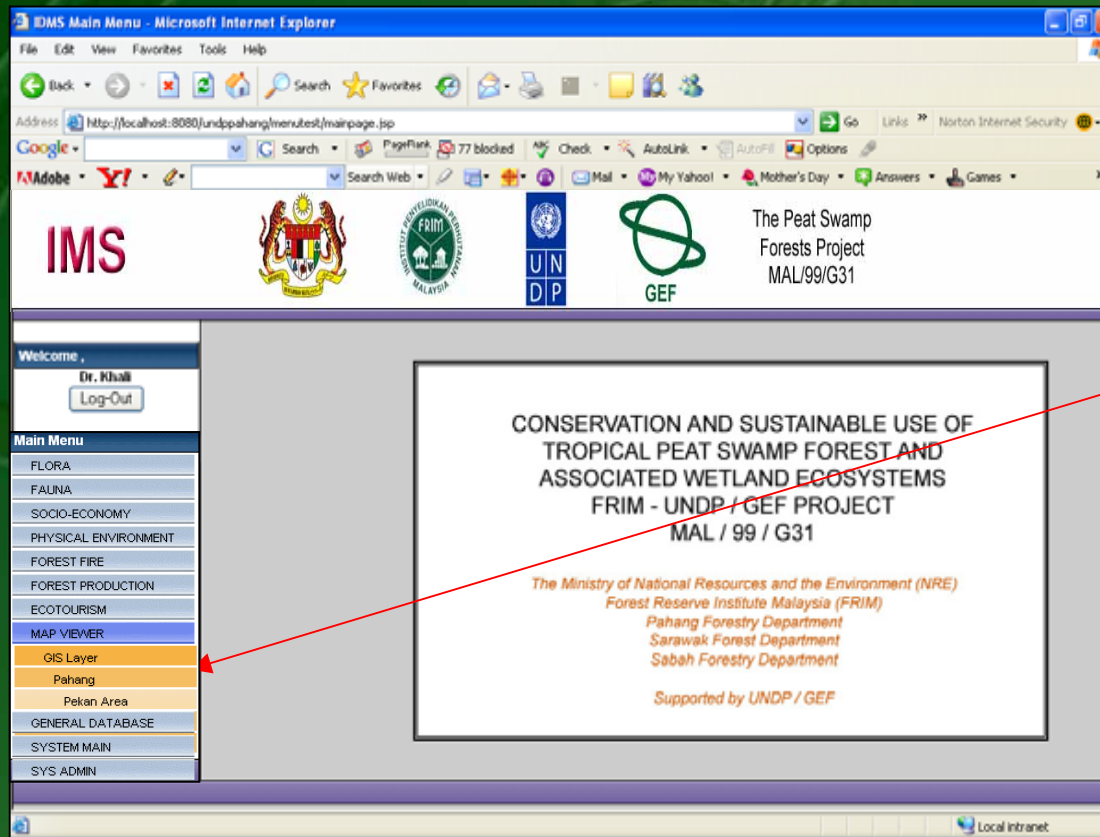


Water level under undisturbed PSF

Logger 32465 - REW3



Integrated Database System



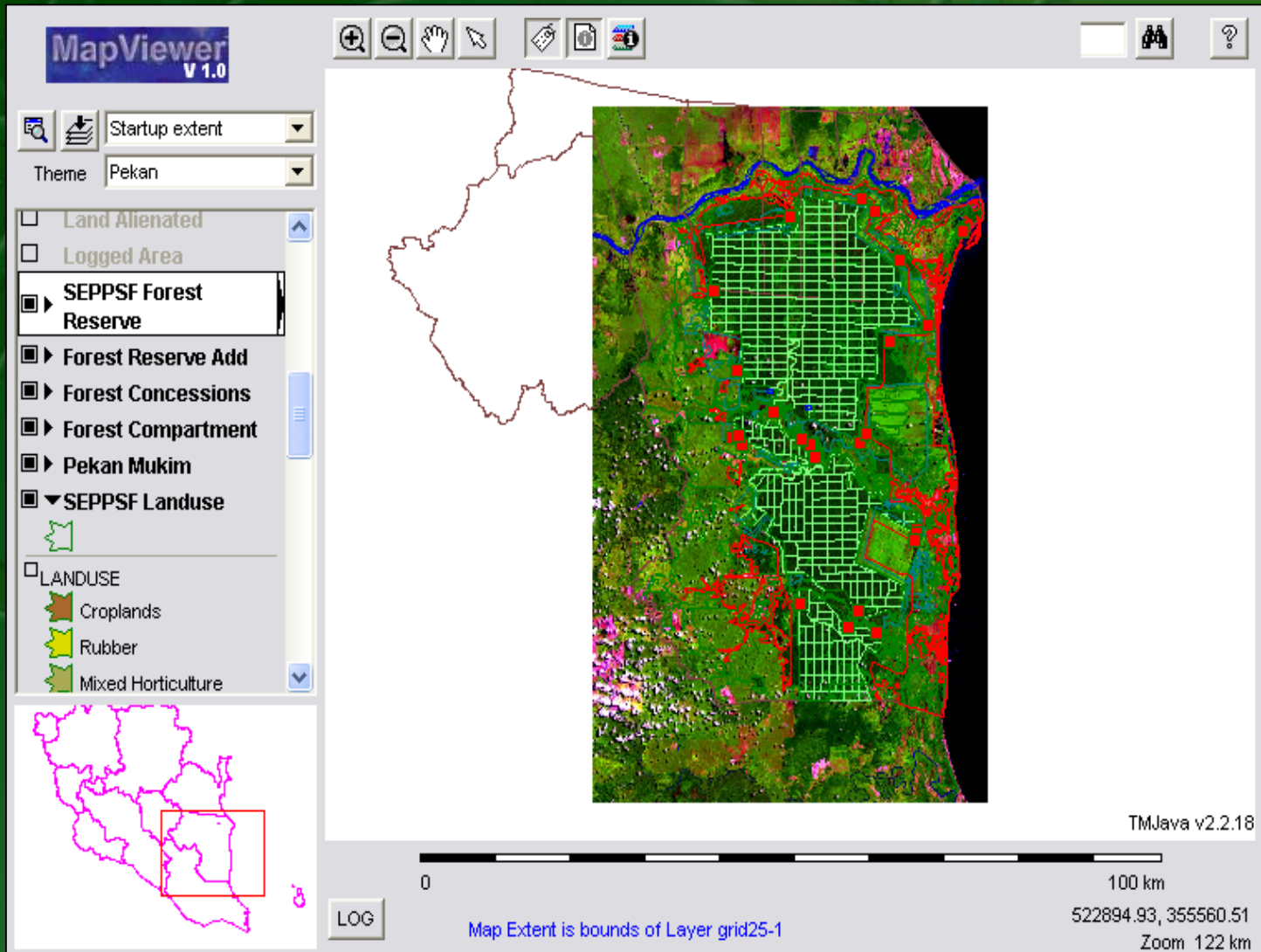
Main Menu
FLORA
FAUNA
SOCIO-ECONOMY
PHYSICAL ENVIRONMENT
FOREST FIRE
FOREST PRODUCTION
ECOTOURISM
MAP VIEWER
GIS Layer
Pahang
Pekan Area
GENERAL DATABASE
SYSTEM MAIN
SYS ADMIN

Map Viewer - Button

System Interface with MAP VIEWER menu

PEAT SWAMP FOREST PROJECT

Map Viewer



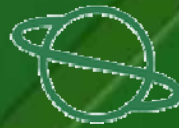
Interface of Map VIEWER

PEAT SWAMP FOREST PROJECT

Conclusions:

- Adopted a Landscape approach in managing peat swamp forests
- Integrity & Sustainability of the ecosystems:
 - balance and integrate conservation vs wise use,
 - involve all relevant sectors
- Develop & Implement Integrated Management Plan
 - Action plans & guidelines
 - **Monitoring system implemented**
- **Develop comprehensive & integrated database for policy decision**

Thank you



Danida