Non detrimental Finding Procedures

Gonystylus bancanus (Miq.) Kurz (Thymelaeaceae)

Ramin

Criteria, parameters and/or indicators

- Phytogeographical patterns and habitat preferences;
- Extent of the PSF areas and demarcation of PSF into areas belonging to the State and areas under private ownership;
- Biological characteristics and life history;
- Current stocking based on sound inventory methods and predicting future stocking using prediction growth models;
- Threats;
- Management system, controls and monitoring;
- Harvesting techniques;
- Conservation;
- Production derived from cultivated sources;
- International trade (consumption and trend).

MAL/UNDP/GEF

INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA
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MAL/UNDP/GEF

Phytogeography

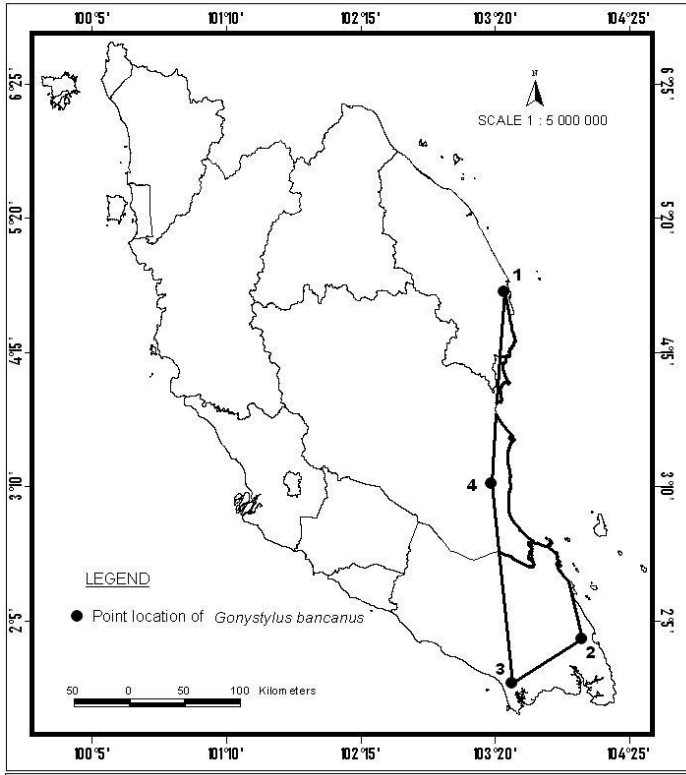
- Indonesia (Sumatra, Kalimantan)
- Malaysia (Peninsular Malaysia, Sabah, Sarawak)
- Brunei

Habitat

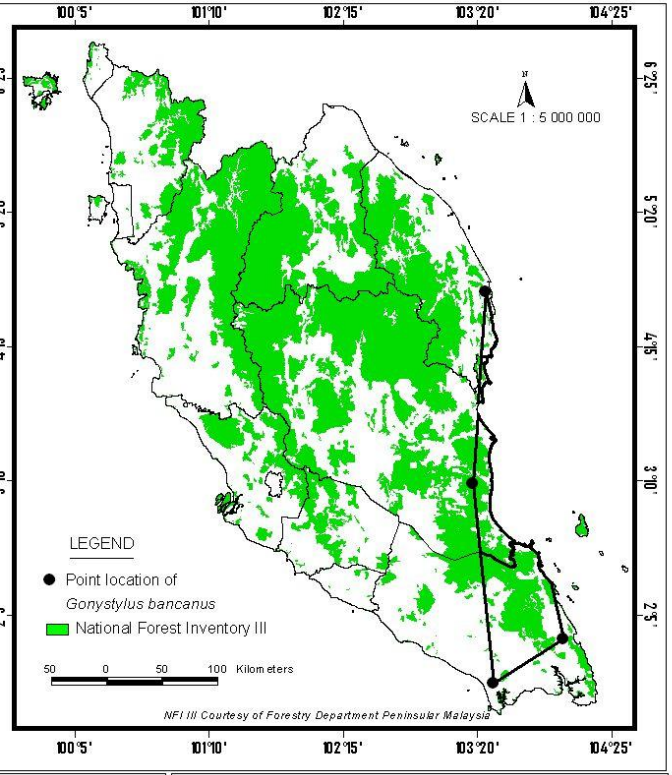
- Tropical lowland peat and mixed peatswamp forest
- Tropical lowland freshwater swamp forest
- Heath forest

Geographical Distribution of *Gonystylus bancanus* (Thymelaeaceae) in Peninsular Malaysia

1. POINT LOCATION MAP (Data extracted from KEP)



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

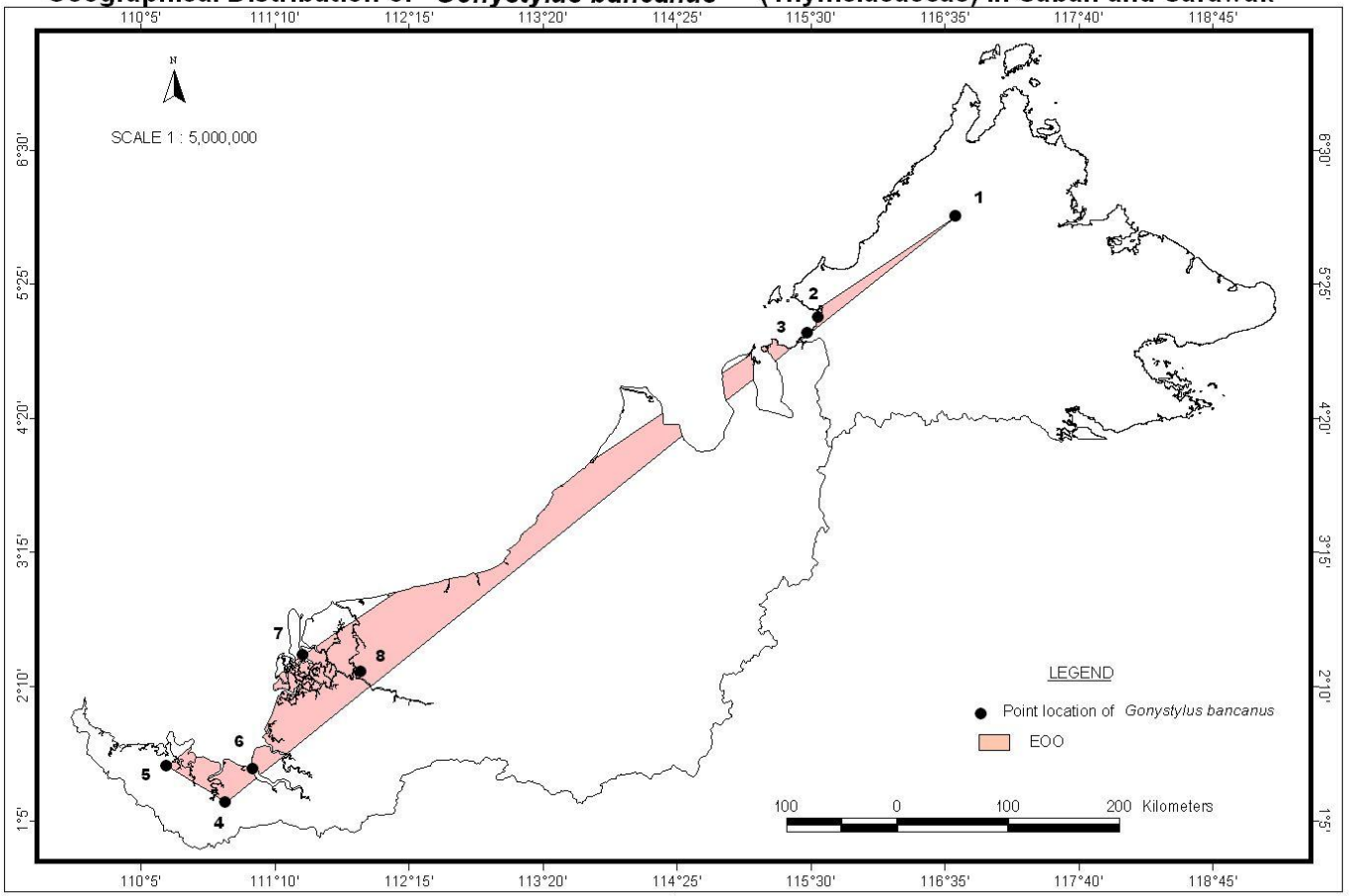


LOCALITIES

1. Bukit Bauk FR
2. Bkt. Piatu
3. Pengkalan Raja
4. Nenasi

EOO : 8677.22 sq km
AOO : 4,362.16 sq km = 50.27 %

Geographical Distribution of *Gonystylus bancanus* (Thymelaeaceae) in Sabah and Sarawak



LOCALITIES

1. Ranau
2. Sianggau FR
3. Mengalong FR
4. Simunjan FR
5. Setapok FR
6. Batang Lupar
7. Sg. Semup
8. Bukit Lima FR

EOO = 21,218.78 sq km

Malaysian peat swamp forests (PSF) in 2005

Estimation

- Peninsular Malaysia : 300,000 hectares
- Sarawak : 940,000 hectares
- Sabah : 120,000 hectares

Main Sources of Data*

- Third and Fourth National Forest Inventories (Peninsular Malaysia),
- Permanent Sample Plots (Growth & Yield Plots, Growth Plots), and
- Academic research.
- Pre- and post-felling inventories in targeted areas.

* These are sample-based and field-evaluated.

Life History

- flowers and fruits regularly in a primary PSF, Pahang. In Sarawak, flowering season is irregular.
- Period from flowering to fruit ripening is 3-4 months.
- Predation occurrs throughout the stages of fruit development and detachment.
- Poor germination on the forest floor.
- Seedlings and saplings are relatively shade intolerant, surviving better and growing most rapidly in partial sunlight.
- Juveniles are concentrated in the vicinity of adult trees indicating that ramin has limited seed dispersal.

Gonystylus bancanus stocking in virgin, logged-over and stateland PSFs

Forest Class	Diameter Class 15-30 cm		Diameter Class 30-45 cm		Diameter Class > 45 cm		Total	
	Stem no.	Volume (m^3)	Stem no.	Volume (m^3)	Stem no.	Volume (m^3)	Stem no.	Volume (m^3)
Virgin PSF	211,029	111,994	284,893	330,692	369,520	1,515,645	865,442	1,958,331
Logged over PSF	405,205	136,849	178,921	150,079	70,095	214,886	654,221	501,814
State land PSF	5,699	3,487	0	0	1467	4744	7,166	8,231
Total	**621,933**	**252,330**	**463,814**	**480,771**	**441,082**	**1,735,275**	**1,526,829**	**2,468,376**

Fourth National Forest Inventory (NFI 4) Peninsular Malaysia

Population Structure

Number of ramin trees per hectare by diameter class and forest subtype in Pekan Forest Reserve, Pahang

Forest subtype	Diameter Class (cm)				
	15-29	30-44	45-59	60-74	75+
Gonystylus-Calophyllum	0	8.1	9.6	4.6	0.4
Koompassia-Gonystylus-Durio (MXD-1)	1.9	1.4	3.5	2.4	2.3
Koompassia-Gonystylus-Durio (MXD-2)	2.3	2.8	3.0	1.5	1.1
Litsea-Gonystylus (MDG-2)	15.0	3.3	4.2	1.7	0
Mixed Zone	2.5	3.8	1.3	0	0

Malaysia/UNDP/GEF project (2001-2006)

- Peninsular Malaysia. Mean annual dbh increment of 0.57±0.36 cm sd. Highest increment (0.79 cm) observed for class 30-39 cm. Classes <30 cm and >40 cm had increments lower than the mean.
- Sarawak. Similar trend with lower increment figures. Ramin has mean mortality rate of 1.1% ha/yr with mortality being highest in 10-20 cm and 40-50 cm dbh classes. Mortality rates were twice or more than recruitment rates in eleven out of fourteen YP sites. Between 1987 and 2001, data from 64 YP established in Sarawak's mixed PSF between the years 1971 and 1987 showed a decline in ramin stocking.

Conservation status

- IUCN Red List : VU A1cd (2007)
- National status : VU A4c (2007)
- Main threats in Malaysia: habitat loss/degradation (human induced), fire, presence of drainage and irrigation canals, long-term intrinsic factors resulting from the alteration of hydrological regimes etc., unsustainable harvesting of its resources.

Management in Malaysia

Selective Management System (SMS) (Peninsular Malaysia)

- Annual harvest quota. Data is acquired through the long-term monitoring of growth parameters and responses of forest growth under various cutting options with respect to stocking density of healthy residual trees, growth, mortality and recruitment rates in permanent sample plots (growth plots and growth & yield plots).
- Cutting cycle of 50 years.
- Minimum cutting limit of 45 cm dbh (50 cm in the state of Pahang).
- Reduced Impact Logging.
- No harvesting permitted in areas gazetted as Totally Protected.

Sarawak

- Forest Management Plan for concession area;
- Minimum diameter cutting limit of 40 cm;
- Annual permissible harvest;
- Cutting cycle of 45 years;
- Silvicultural operations e.g. determining sampling of stocking density, species composition and degree of competition;
- Reduced Impact Logging.

Integrated Management Plans

- PSFs of Selangor, prepared in collaboration with DANCED (1999) (Bach 2000);
- Southeast Pahang, prepared in collaboration with UNDP/GEF/Danida (2001-2005);
- Loagan Bunut (Sarawak), prepared in collaboration with UNDP/GEF/Danida (2001-2005);
- Klias Peninsula (Sabah), in collaboration with UNDP/GEF/Danida (2001-2005);
- Ramin Technical Report for Sarawak, prepared in collaboration with the Netherlands.

Monitoring system used in Peninsular Malaysia

Year	Operation
n-2 to n-1	Pre-felling forest inventory of 10% sampling intensity using systematic line plots to determine appropriate cutting limits (cutting regimes)
n-1 to n	Tree marking incorporating directional felling • Marking of trees to be felled • Marking of seed/mother trees • Marking of protected trees • Marking of trees for road construction • Demarcating boundary of buffer zones for permanent watercourses
n	Felling of trees
n¼ to n½	Forest survey to determine damage to residuals and royalty on short logs and tops
n+2 to n+5	Post-felling forest inventory of 10% sampling intensity using systematic line plots to determine residual stocking and appropriate silvicultural treatments
n+10	Forest inventory to determine regeneration status of the forest

Conservation

- Small fragments of PSFs gazetted under Virgin Jungle Reserves, water catchment areas and National Parks (Maludam and Loagan Bunut).
- Ecosystem conservation as recommended in the Integrated Management Plans.
- *In situ* PSF gene bank in Klias Peninsula (Sabah).
- *Ex situ* conservation as a part of trial planting.

Cultivated sources

None at the commercial scale. Restoration trials only.

Legal Framework and Law Enforcement

- National Forestry Policy 1978 revised 1992;
- National Forestry Act 1984 amended 1993;
- International Trade in Endangered Species Act 2008;
- Ramin Logs Prohibitions of Export Order 1980;
- Ramin Shorts and Ramin Squares Prohibition of Export Order 1991;
- Customs Prohibition (Amendment) Order 2006;
- Sabah Forest Enactment 1968, amended 1992;
- CITES compliance;
- Tri-National Task Force on Ramin (Malaysia, Indonesia and Singapore)

Uses and Trade

- Main products : sawntimber (35%), dressed timber (25%), picture frames (15%), mouldings (10%) and baby cots (10%).
- Main importing countries : Europe, USA, Australia, Japan, Taiwan and Hong Kong SAR.

Export figures for *Gonystylus* (cubic m) (parts & derivatives) between 2004 and 2007

	2004		2005		2006		2007	
	export quota	volume	export quota	volume	export quota	volume	export quota	volume
PM & Sabah	-	46,200		25,569	23,000	11,643	20,000	4,757
Sarawak	-	n.a.	-	19,678	22,000	12,161	12,875	8,306

PM = Peninsular Malaysia

Summary

Non detrimental Finding Procedure (NDFs)

Criteria, parameters and/or indicators used to obtain non detrimental findings are based on :

- Ecological, biological and demographic data.
- Extent of the PSF areas and demarcation of PSF into areas belonging to the State and areas under private ownership.
- Stocking data derived from National Forest Inventories, permanent sample plots, pre- and post-felling inventories, academic research and various other data that produced integrated management plans. These are sample-based and field-evaluated.
- Harvesting controls in place – annual coupe, cutting limit, cutting cycle, retention of mother trees, forest harvesting/management plan, implementation of Reduced Impact Logging, logs accompanied by removal pass, export quota, permit system, forest certification scheme, legal entity and law enforcement.

Cont.

- There is sufficient data to conduct an NDF. Data quantity, particularly with respect to growth and yield and harvest management, is not lacking. Quality of assessment is, to a small degree, compromised because biological aspects, e.g., reproductive capacity and natural regeneration patterns in primary and disturbed PSFs and responses to habitat loss are not clearly understood.
- There is full confidence in the present monitoring system.
- Main problems, challenges or difficulties found on the elaboration of NDF. Challenges are mainly technical in nature e.g. recovery rates and taxon identification in finished products.

Photos courtesy of
Ismail P (FRIM)

Thank you