THREE APPROACHES FOR PLANT DIVERSITY ASSESSMENTS IN ASIAN TROPICAL FOREST

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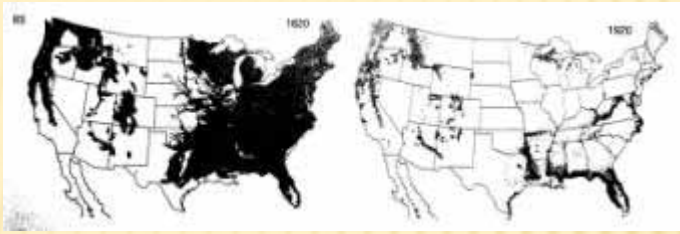
GLOBAL ENVIRONMENTAL THREATS

Global warming

Forest decline



Biodiversity loss

FCCC

- COP3 (1997)
  Kyoto Protocol

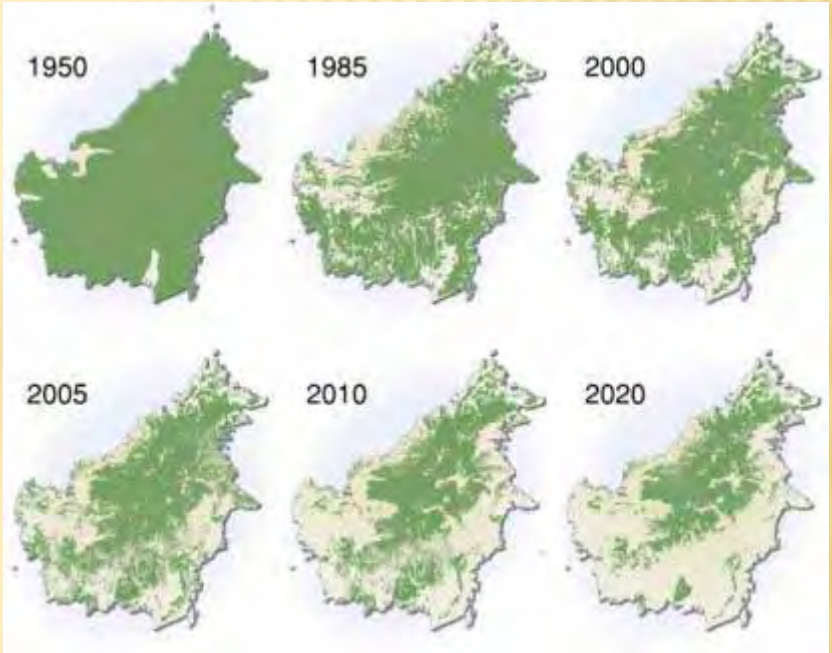
Earth summit 1992 at Rio

CBD

- COP 10 (2010)
  Aichi Target

Actions to Climate & Biodiversity Changes in progress

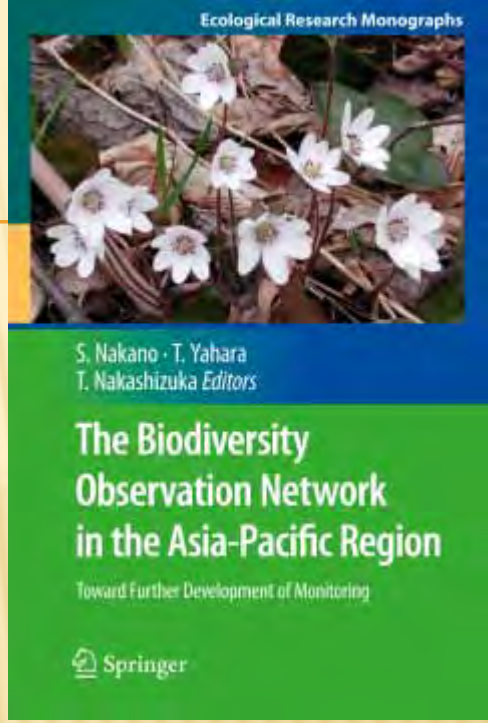
FOREST LOSS IN SOUTH EAST ASIA



http://maps.grida.no/region/geoasiap

How rapidly biodiversity is being lost ? What will be resulted?

THREE APPROACHES

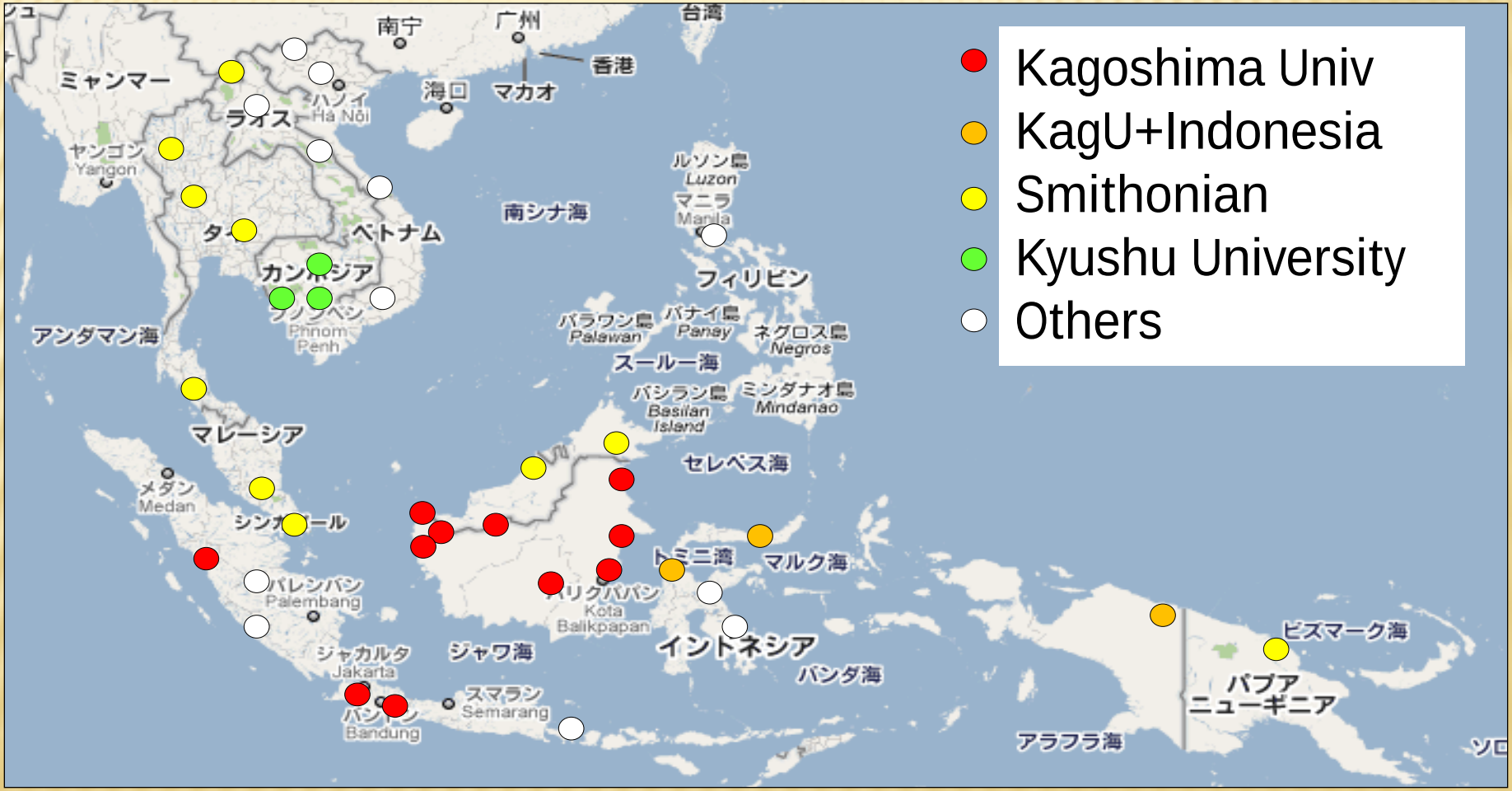


- Plot-based approach
  - Most detailed data including abundance etc
  - Limited data of herbs, shrubs and vines
  - Covering only limited areas
- Specimen-based approach
  - Presence data
  - Covering all the known species
  - Covering large areas although biased
- Transect-based approach
  - Detail data of distribution, abundance etc can be obtained
  - Not only trees but also herbs, shrubs and vines
  - Covering areas larger than plots, but still limited

Combining three approaches is the best solution

PLOT-BASED APPROACH

Forest Plots in SE Asia maintained by



Plot-based approach: example 1

- Permanent Sample Plots in Cambodia
  - 32 plots measured in 1998, 2000, 2004 & 2010.

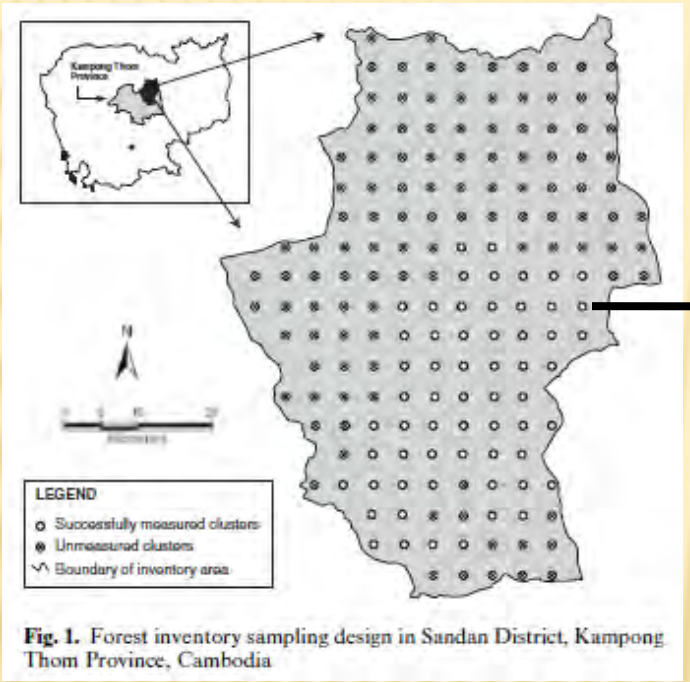
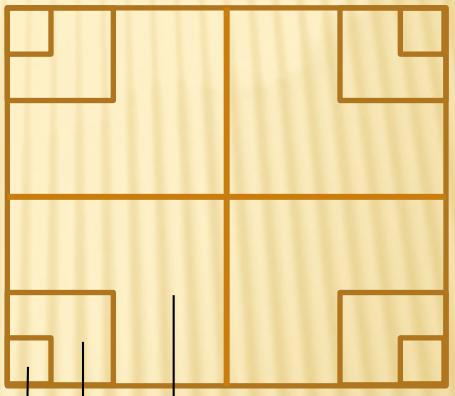


Fig. 1. Forest inventory sampling design in Sandan District, Kampong Thom Province, Cambodia

Top et al. 2004



4 plots = 1 ha

50x50: Trees with DBH 50cm<

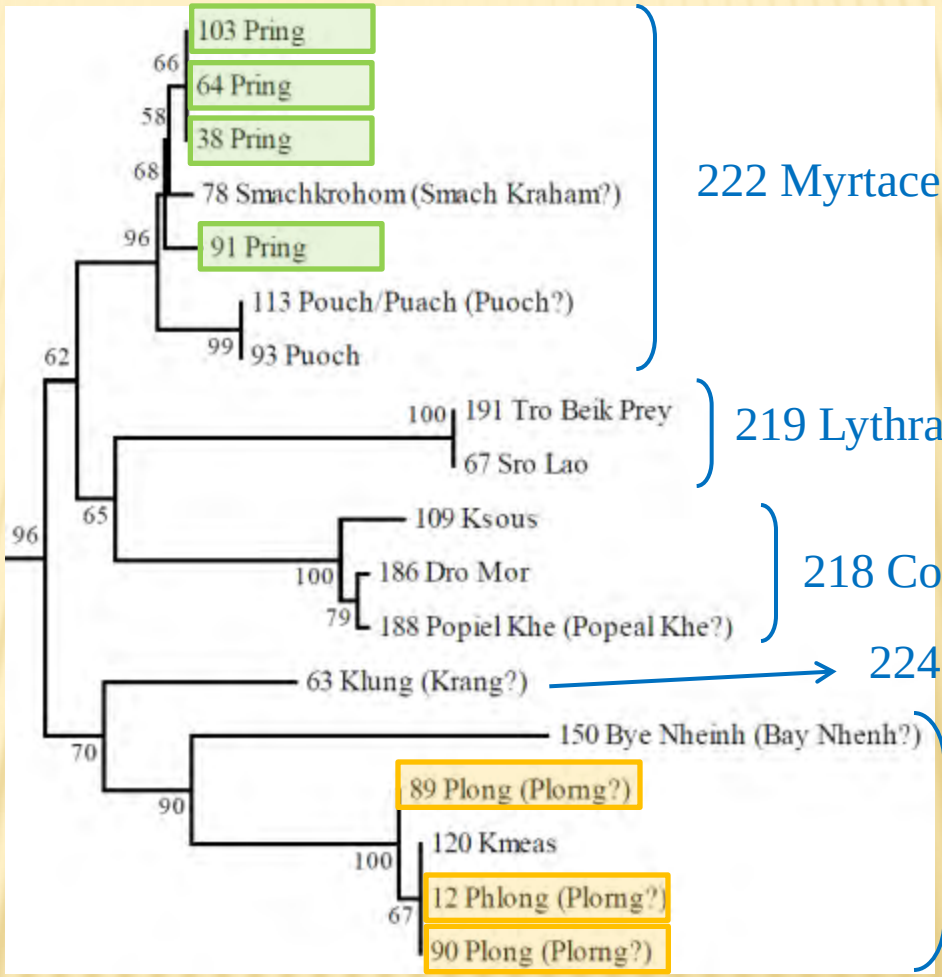
20x20: Trees with DBH 30cm<

5x5: All saplings and shrubs

Many species remained unidentified or misidentified.

Phylogenetical relationship in Cambodian trees

Myrtales



222 Myrtaceae

219 Lythraceae

218 Combretaceae

224 Crypteroniaceae

223 Melastomataceae

Same local name (Pring and Plong), but different species

5 families in Myrtales

Scientific name: Syzygium cordatum (522/522), S. cuminii (552/553)
~~Melastomataceae~~ ***Memecylon***
Local name:
Specimen No.: 2396

Scientific name: Melastomataceae ***Memecylon minutiflorum*** Miq.
Local name:
Specimen No.: 2078

rbcL
Memecylon nigrescens (516/516)
Memecylon ligustrifolium (516/516)

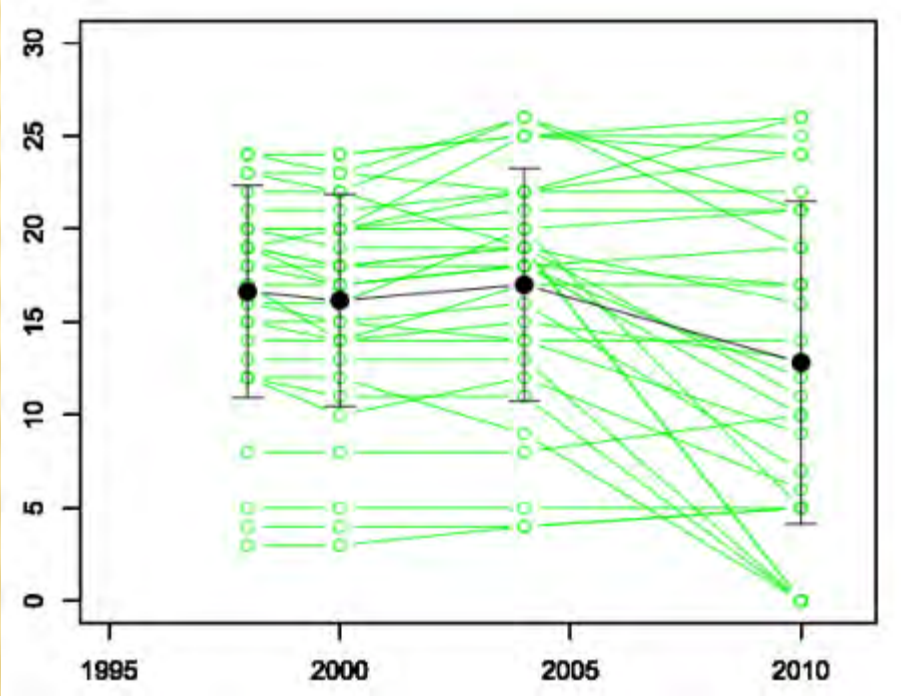
Scientific name: Myrtaceae ***Eugenia roxburghii*** DC.
Local name: Eugenia feijoi (551/553), Rhodomyrtus tomentosa (551/553)
Specimen No. 1651
Syzygium ? Memecylon ?

Scientific name: Myrtaceae ***Syzygium aff. claviflorum*** (Roxb.) A.M. Cowan
Local name:
No.: 2857
#

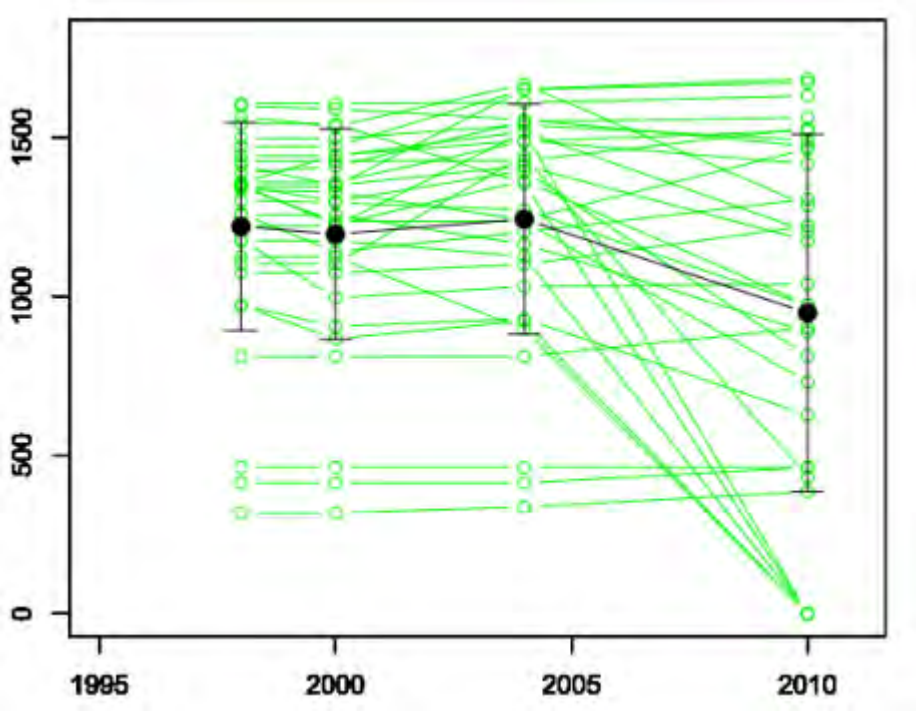

A plot was here

DIVERSITY LOSS IN CAMBODIAN FOREST PLOTS

Species Richness



Phylogenetic Diversity

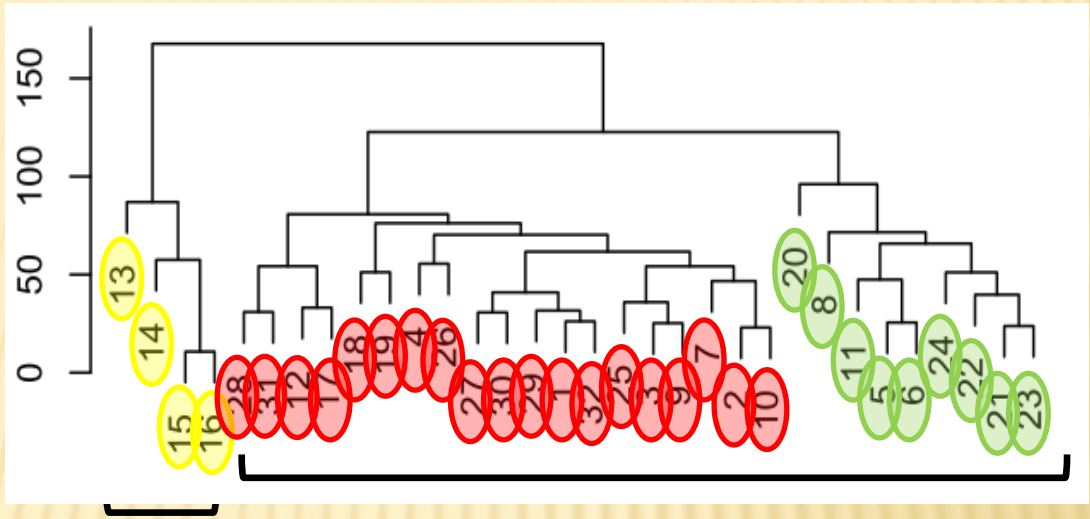


By H Toyama (Kyushu Univ)

CHANGES IN PHYLOGENETIC COMPOSITION

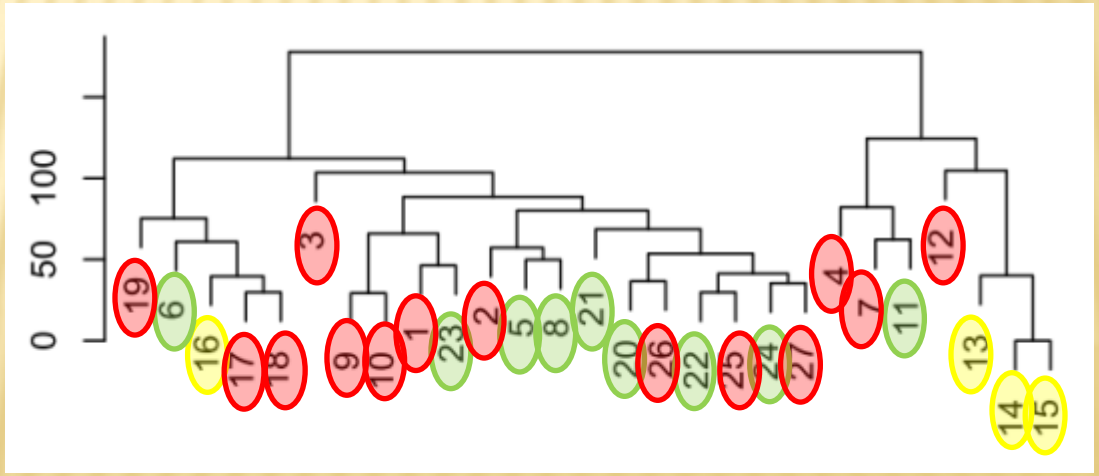
By H Toyama (Kyushu Univ)

1998



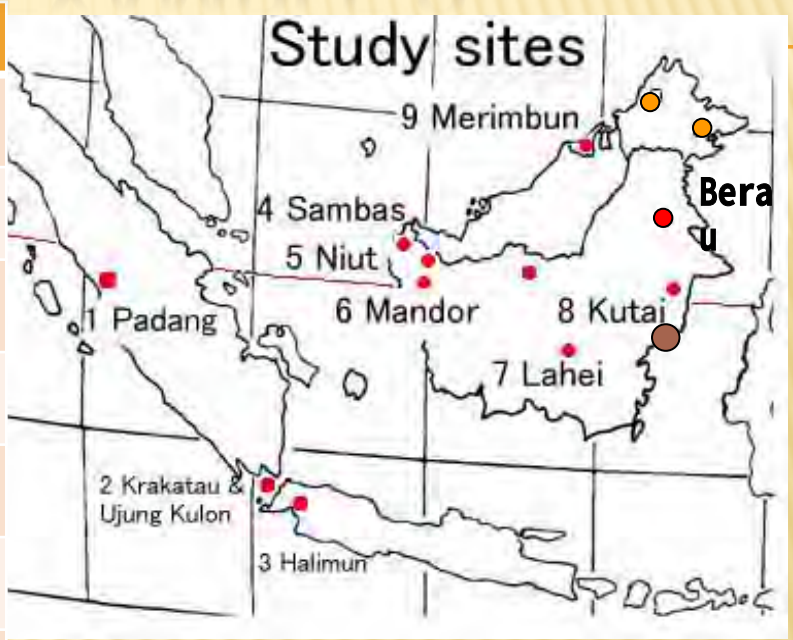
Deciduous forest Two groups of evergreen forest

2010



PLOT-BASED APPROACH: EXAMPLE 2

Year	Site	No. of plots	Area (ha)
1982	Krakatau, Java	27	1.08
1986	Kutai, East Kal.	12	1.30
1987	Mandor, West Kal.	4	1.08
1990-94	Niut, West Kal	29	11.42
1996-02	Halimun, West Java	3	3.00
1997-99	Central Kalimantan	4	3.04
1999-03	Merimbun, Brunei	4	4.00
2001	Betung KerihunW.K.	2	2.00
2002-03	Berau, E.K.	4	4.00
2005-07	Bukit Bangkirai,E.K.	6	6.00
2010	Halimun	4	1.00
2010	Pangandaran	2	2.00
	total	101	39.92

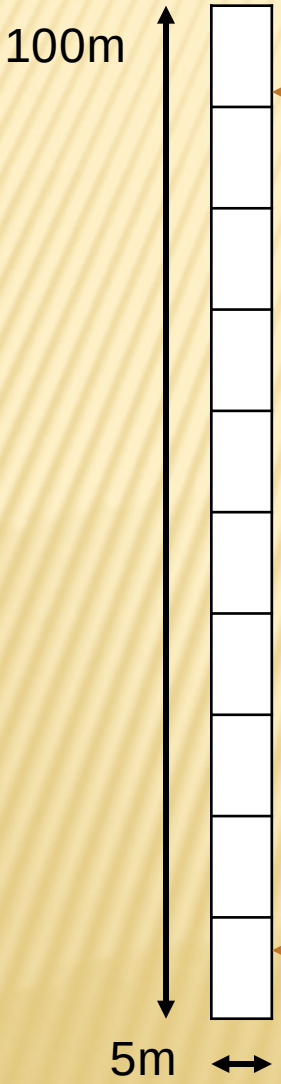


Plots placed by Eiji Suzuki (Kagoshima Univ)

MANDOR NATURE RESERVE, W KALIMANTAN

http://www.protectedplanet.net/sites/Mandor_Nature_Reserve

RECORDING ALL SPP IN 100M X 5M



No	Specimen	Date	Subplot		Family	Name
1	1	14-Sep		1	Dipterocarpaceae	Shorea stenoptera
2	2	14-Sep	out		Rubiaceae	Mussaenda
3	3	14-Sep		1	Thymeleaceae	Goniostylis
4	4	14-Sep		1	Connaracaea	Ellipanthus
5	5	14-Sep		1	Sapindaceae	Nephelium

DBH & height recorded for trees taller than 4m

328	328	16-Sep		10	Fabaceae	
329	329	16-Sep		10	Celastraceae	Lophopetalum エダミドリ
287	0	16-Sep		10	Burseraceae	Santiria 287
330	330	16-Sep		10	Dichapetalaceae	Dichapetalum?
5	0	16-Sep		10	Sapindaceae	Nephelium 小葉4枚
36	0	16-Sep		10	Gnetaceae	Gnetum 1
331	331	16-Sep		10		
332	332	16-Sep		10	Burseraceae	Dacriodes
333	333	16-Sep		10	Sapindaceae	Nephelium
334	334	16-Sep		10	Thymeleaceae	Goniostylis

Scientific name: Dipterocarpaceae ***Shorea stenoptera*** Burck
No. 1
#

1st record

Scientific name: Rubiaceae ***Lasianthus*** aff. ***angustifolius***
No. 32
#

Pictured guide as an output of Plant Diversity Assessment

Scientific name: Hymenophyllaceae
No. 224
With false veins

Scientific name: Centroplacaceae ***Bhesa paniculata*** Arn.
No. 351
#

Last record

Scientific name: Fabaceae ***Bauhinia integrifolia*** Roxb.
No. 145
#

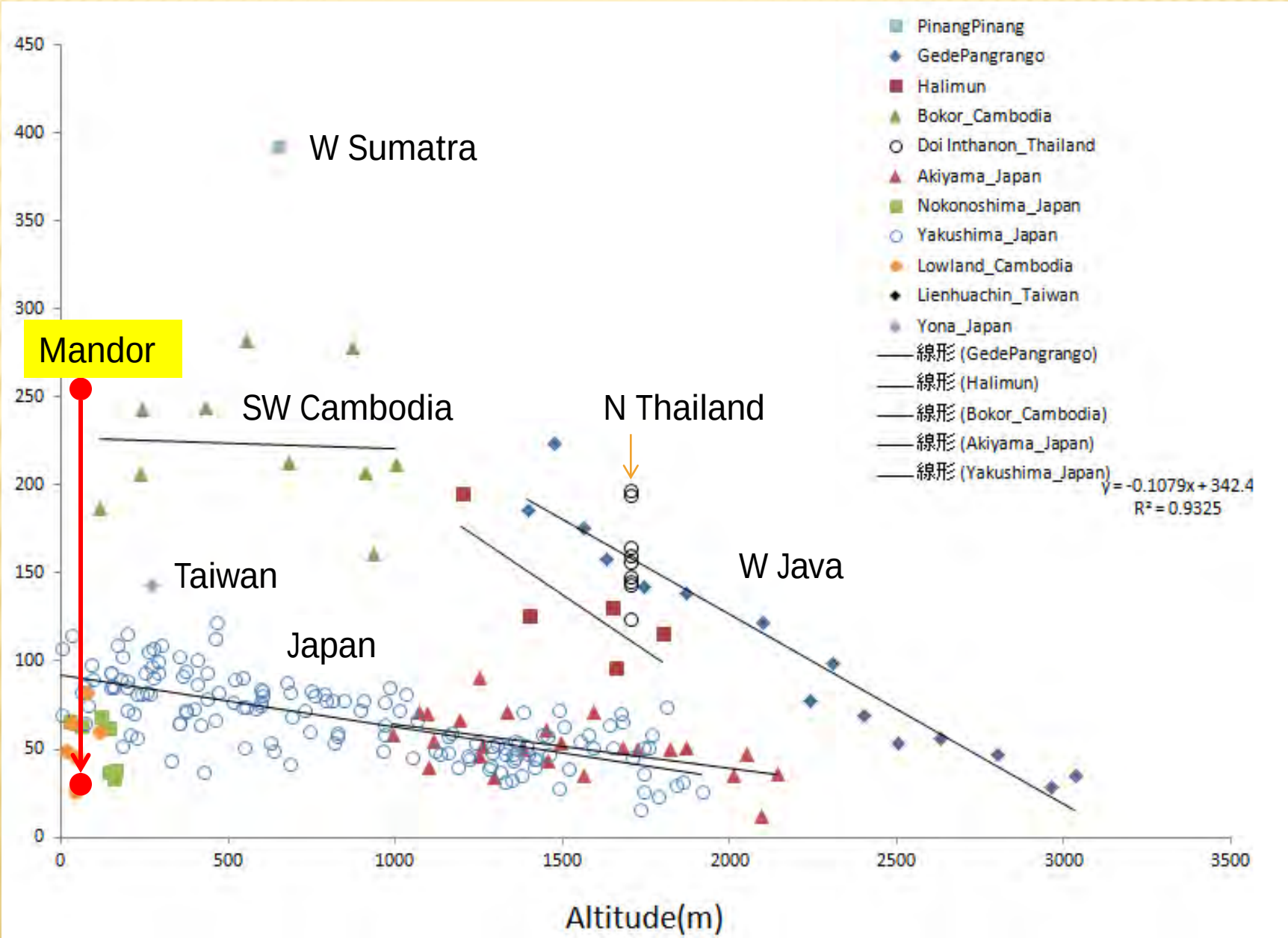
Scientific name: Fabaceae ***Bauhinia semibifida*** Roxb. var. ***bruneiana*** K. & S.S. Larsen
No. 146

Scientific name: Fabaceae ***Bauhinia menispermacea*** Gagnep.
No. 112
Flora Malesiana describes this species with "**petals yellow** with a dark red centre, narrowly obovate", but flower color may vary between Kuchin and Mandor.

Scientific name: Fabaceae ***Bauhinia kockiana*** Korth. var. ***velutina*** (dc Wit) K. & S.S. Larsen
No. 442
Gn. Raya Pasi




SPECIES RICHNESS VS ALTITUDE

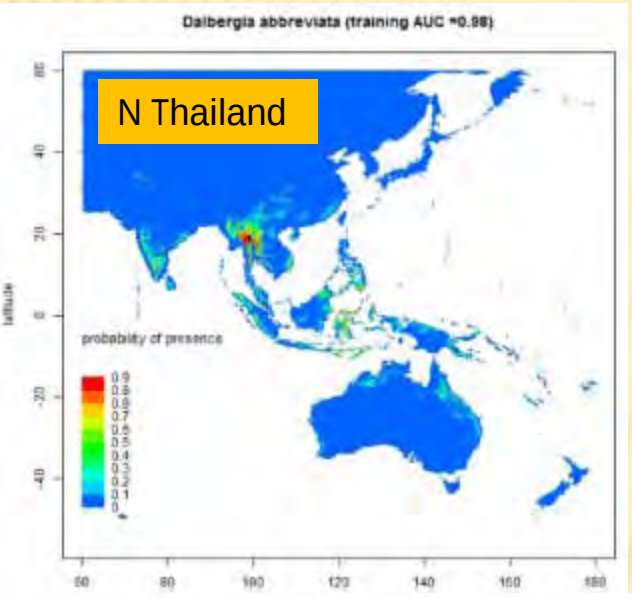


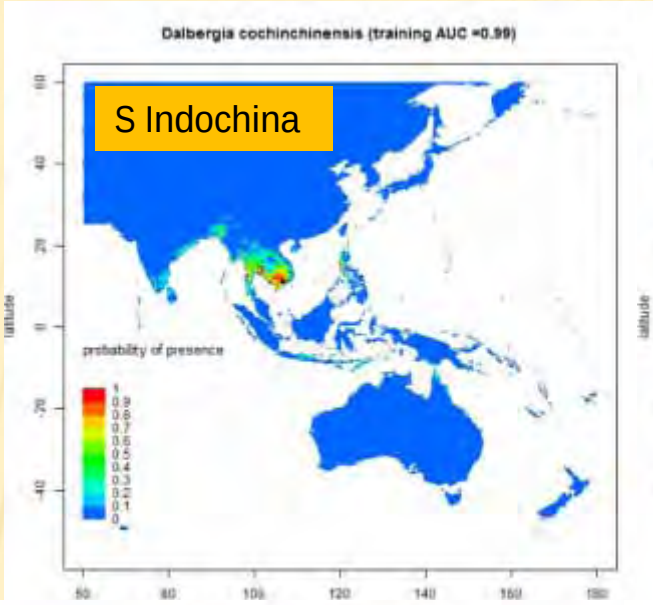
SPECIMEN-BASED APPROACH

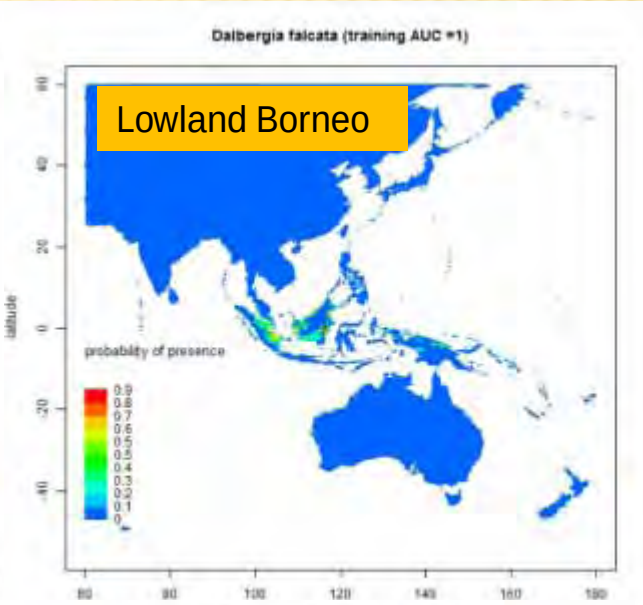
3	Dalbergia	dialoides	VIÊTNAM	Khanh Hoa	env. de Nha Trang, vallée du Sông Mau	12.245251	109.198957
4	Dalbergia	dialoides	VIÊTNAM	Dông Nai	Mt Lu		
5	Dalbergia	entadoides	CAMBODGE	Stung Treng		13.52349	105.974098
6	Dalbergia	entadoides	CAMBODGE	Stung Treng	entre Cheom Ksan et Anlong Veng		
7	Dalbergia	entadoides	CAMBODGE	Siem Reap	en bordure du Grand Lac	12.92765	104.053676
8	Dalbergia	entadoides	CAMBODGE	Pursat	Kompong Luong		
9	Dalbergia	entadoides	CAMBODGE	Prey Veng	Phnom Lovea		
10	Dalbergia	entadoides	CAMBODGE	Kandal	Phnom Penh	11.55	104.916667
11	Dalbergia	entadoides	CAMBODGE	Kompong Speu	Oudong		
12	Dalbergia	entadoides	CAMBODGE	s. loc.			
13	Dalbergia	entadoides	LAOS	Vientiane	en bordure de la Sa Ngôm		
14	Dalbergia	entadoides	VIÊTNAM	Dông Nai	Dinh Quan	11.206169	107.364187
15	Dalbergia	entadoides	VIÊTNAM	Hô Chi Minh Ville		10.769444	106.681944
16	Dalbergia	vietnamensis	CAMBODGE	Kandal	Phnom Penh	11.55	104.916667
17	Dalbergia	vietnamensis	VIÊTNAM	Khanh Hoa	env de Ba Ngoi	11.916798	109.146384
18	Dalbergia	vietnamensis	VIÊTNAM	Khanh Hoa	Cau Da		
19	Dalbergia	vietnamensis	VIÊTNAM	Khanh Hoa	Dông Bô		
20	Dalbergia	vietnamensis	VIÊTNAM	Khanh Hoa	île Tré		
21	Dalbergia	vietnamensis	VIÊTNAM	Khanh Hoa	Nha Trang	12.245251	109.198957
22	Dalbergia	vietnamensis	VIÊTNAM	Ninh Thuân	Tour Chàm	11.6	108.95
23	Dalbergia	vietnamensis	VIÊTNAM	Ninh Thuân	Ba Lap		
24	Dalbergia	vietnamensis	VIÊTNAM	Ninh Thuân	Phan Rang	11.56269	108.994797
25	Dalbergia	vietnamensis	VIÊTNAM	Ninh Thuân	Hoa Trinh		
26	Dalbergia	vietnamensis	VIÊTNAM	Ninh Thuân	Ca Na	11.383333	108.833333
27	Dalbergia	vietnamensis	VIÊTNAM	Ninh Thuân	O de Sông Mao		

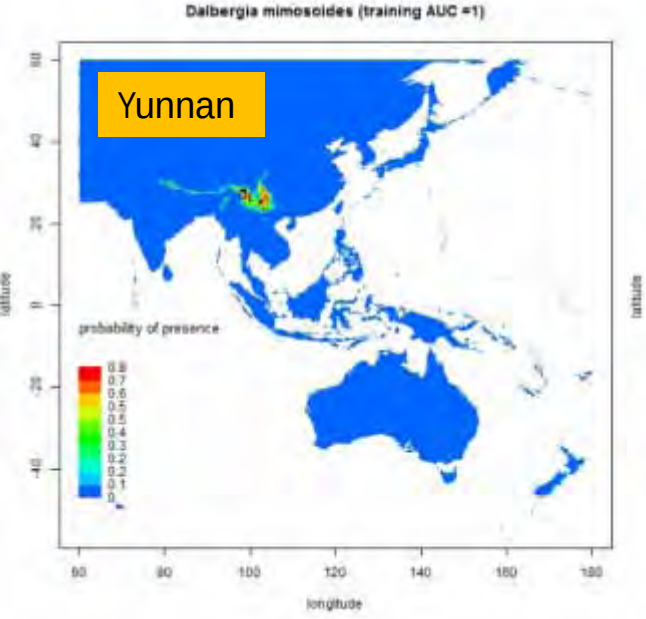
Modeling distribution of species：Dalbergia

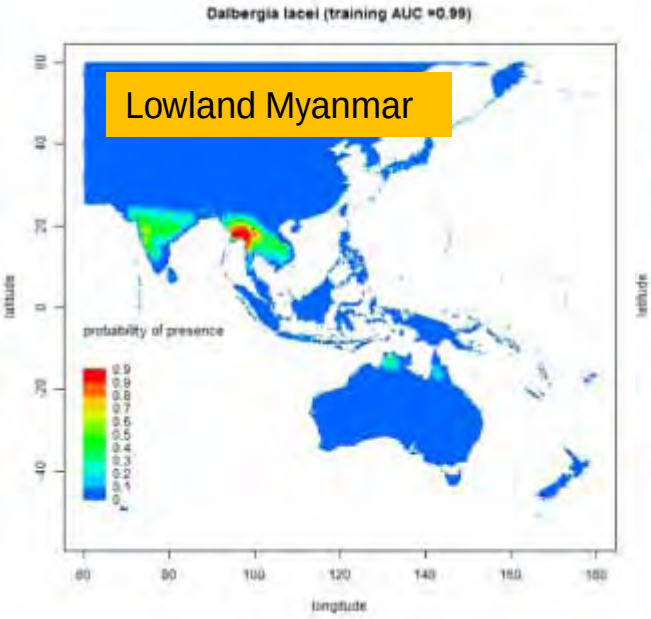
By Fumiko Ishihama (NIES)

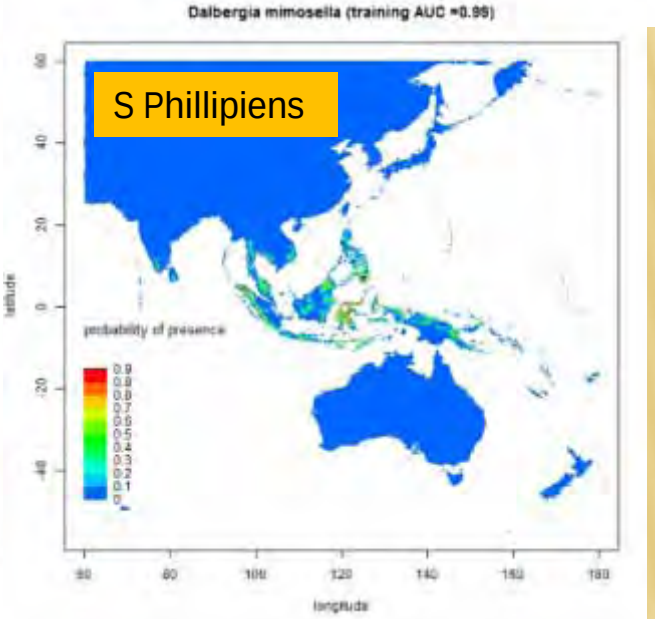




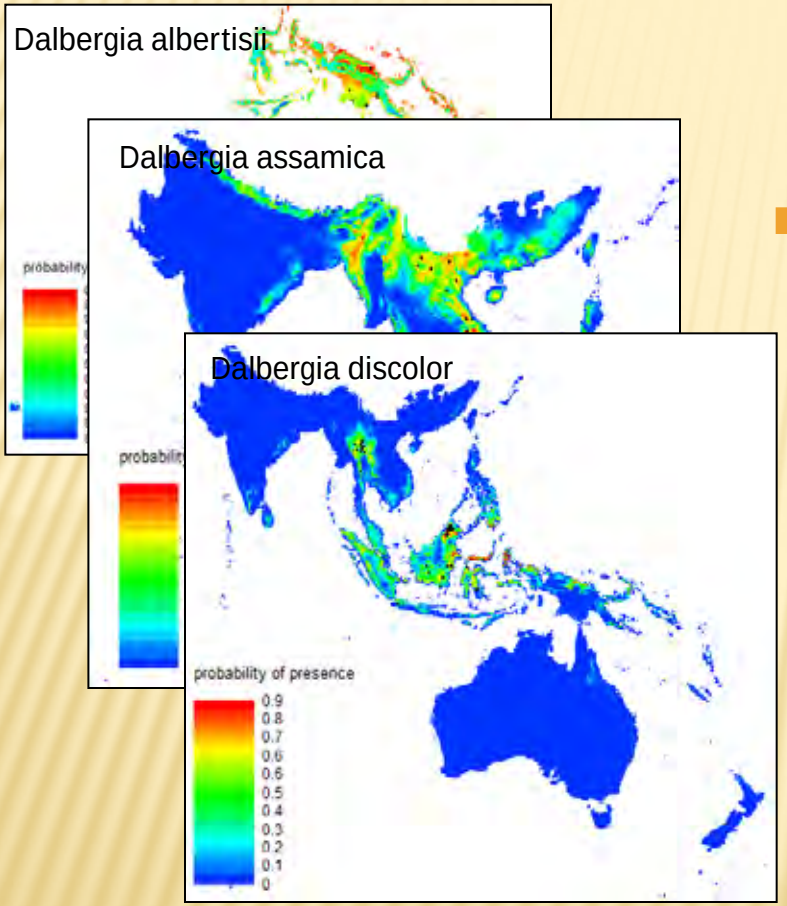




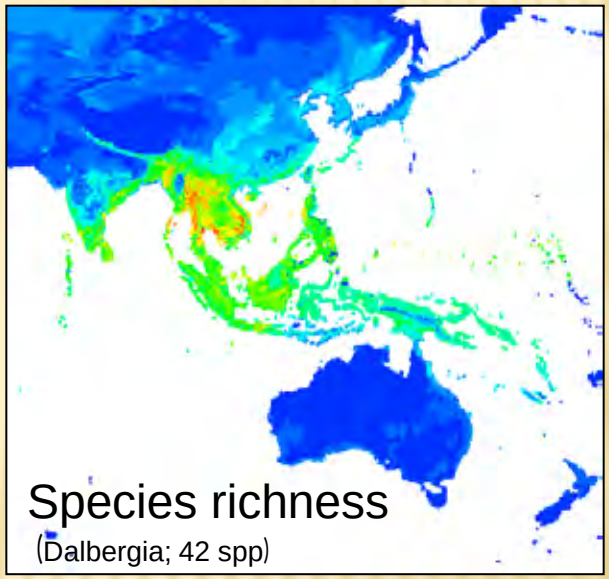


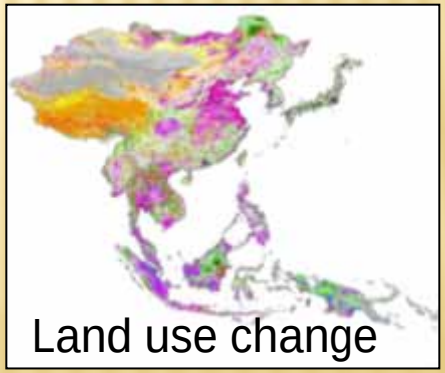


MODEL-BASED RISK ASSESSMENT



Distirbution models





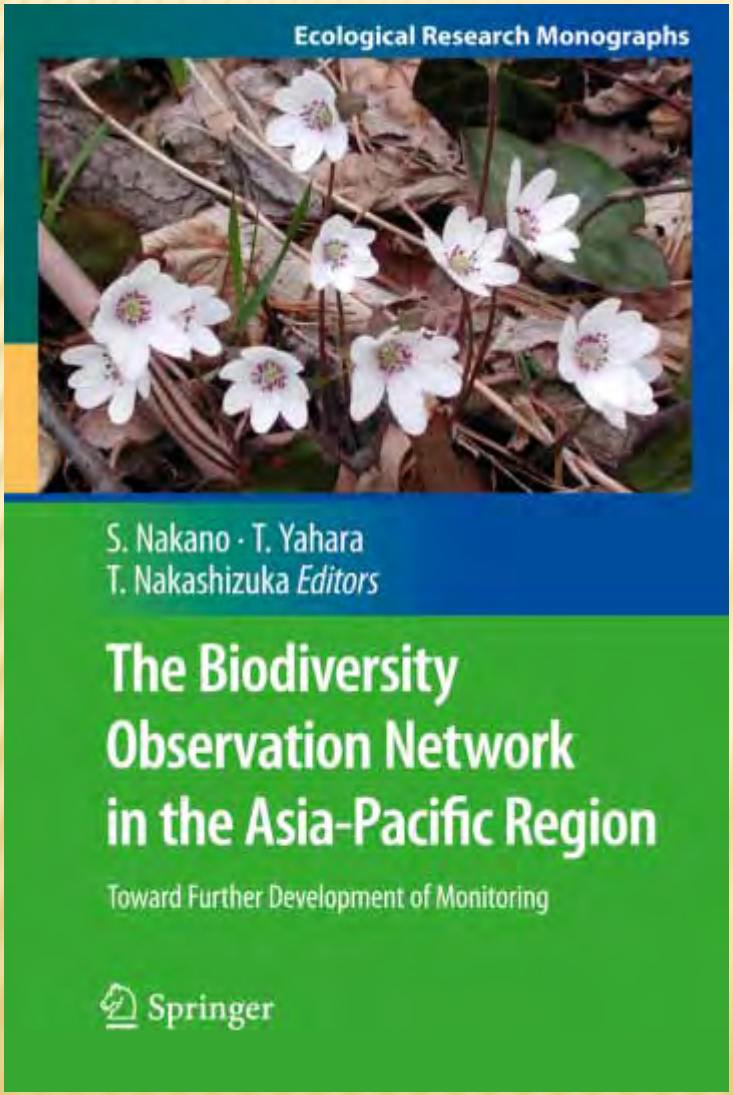
FAO GeoNetwork
http://www.fao.org/geonetwork/srv/en/metadata.show?id=37132

Identifying hot spots

CANDIDATE PLACES FOR TRANSECT SURVEYS

Collaboration of Asian botanists is inevitable

FIRST PUBLICATION OF AP-BON



- Part 1: General Introduction
- Part 2: Networks for Monitoring and Research on Biodiversity in the Asia-Pacific Region
- Part 3: Establishing a Biodiversity Database
- Part 4: New Methods and Analyses for Biodiversity Studies
- Part 5: Biodiversity and Ecosystem Services
- 31 chapters, 480 pages

GEO: GROUP ON EARTH OBSERVATION

10 year implementation: 2005-2015