AP BON, Asia-Pacific Biodiversity Observation Network

Motomi Ito

Tetsukazu Yahara (Japan)

GEO: Group on Earth Observation

10 year implementation: 2005-2015

History of GEO BON

2006: User Needs workshop, Geneva 23-25 October

2007: GEO Ministerial in Cape Town

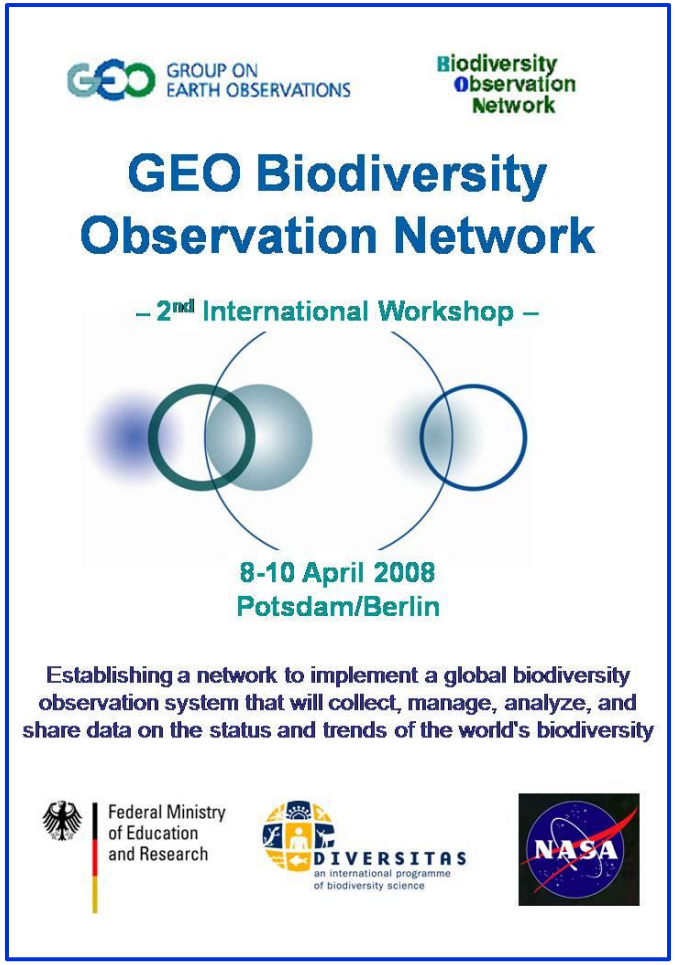
2008: Interim GEO BON Committee formed 14-16 January

2008: 2nd International workshop, Berlin/Potsdam 8-10 April

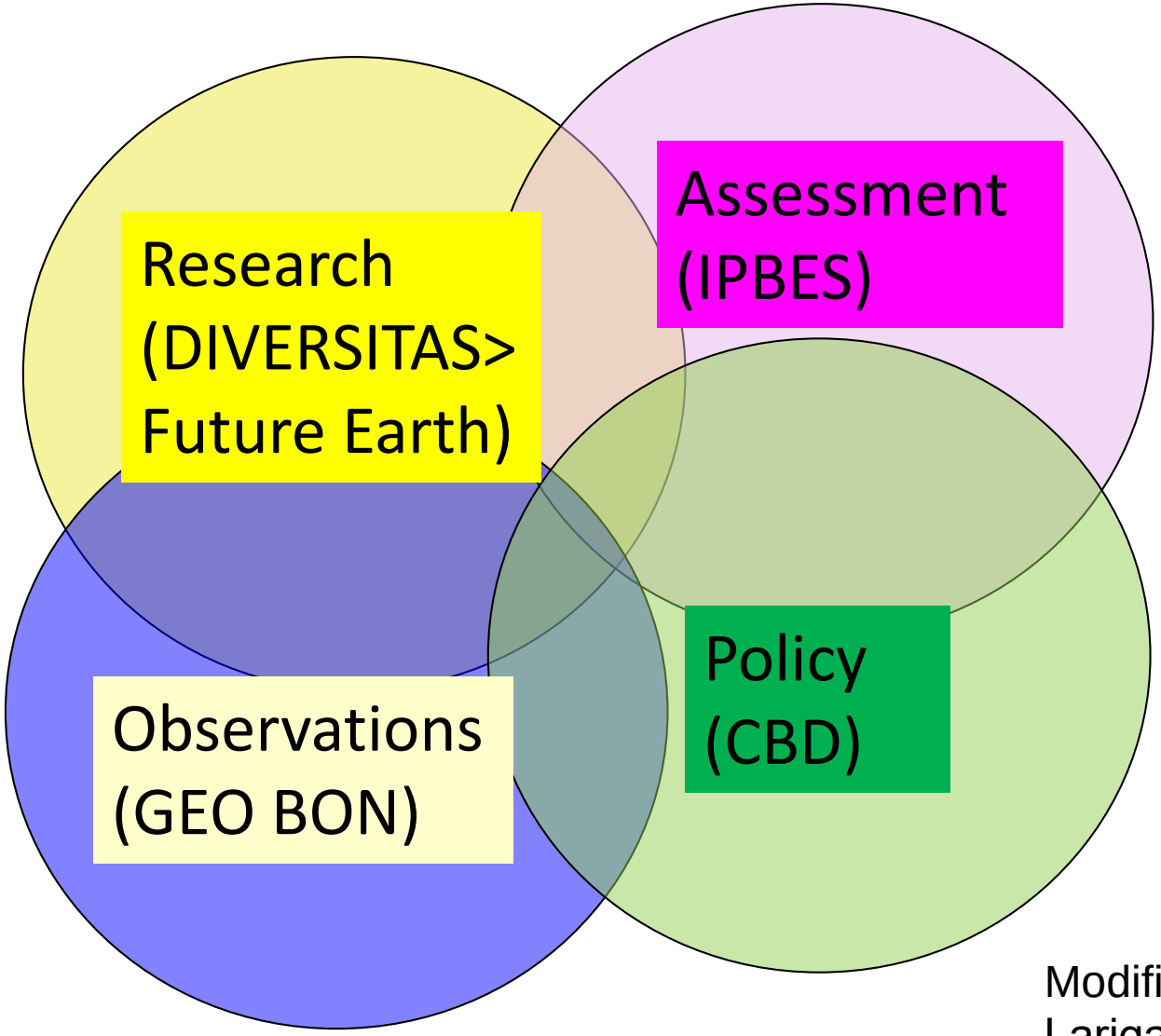
Draft GEO BON concept document

2009: GEO Plenary, Washington DC Nov 09

2010: IP drafting meeting, Asilomar 22-24 Feb



Global bodies on biodiversity



Modified from Anne Larigauderie's slide

Establishment of AP-BON

2009 1st AP BON meeting (July, Japan) & 2nd AP BON (December, Japan)

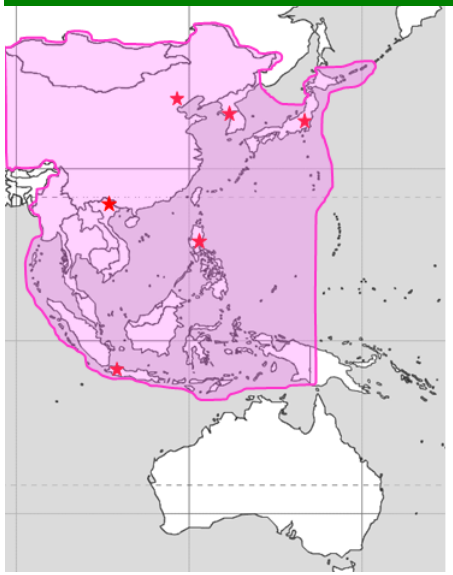
Co-chairs

- **Tetsukazu Yahara (Japan)**
- **Sheila Vergara (ACB)**
- **Eun-Shik Kim (Korea)**

Initiatives sponsored by MoE, Japan

ESABII

East and Southeast Asia Biodiversity Information Initiative



Targeting area: East and Southeast Asia

Biodiversity Centers ★

Japan: Biodiversity Center of Japan

Korea: National Institute of Biological Resource (NIBR)

China: Chinese Academy of Science

Indonesia: Research Center of Biology (RCB), LIPI

Vietnam: Center for National Resources Management and Environmental Studies (CRES) VNU.

ASEAN: ASEAN Center for Biodiversity (ACB)

S-CBD: Secretariat of Convention on Biological Diversity

AP-BON

Asia-Pacific Biodiversity Observation Network

Targeting East Asia and Pacific Region

- Identification of existing researches on biodiversity
- Distribution of Monitoring sites
- Development of standardized data collection
- Data integration, storage and analysis
- Capacity building for data collection and data analysis
- Provision and dissemination of the information

-Data provision/sharing

GEO-BON | GBIF

Collaboration

ILTER
NaGISA (CoML)
Other programmes

-Data collection and its standardization
-Data integration and analysis
-Capacity building

Contribution

Decision Making in Biodiversity Conservation

J-BON

a voluntary network of Japanese scientists

AP BON visions

- To establish a **coordinated** Asia-Pacific **network** that gathers and shares information on biodiversity and ecosystem services;
- To provide tools for **data** collection, **sharing**/exchange, analysis, and synthesis integration;
- To contribute to improving ecosystem management, **sustainable use** of biodiversity, and human well-being.

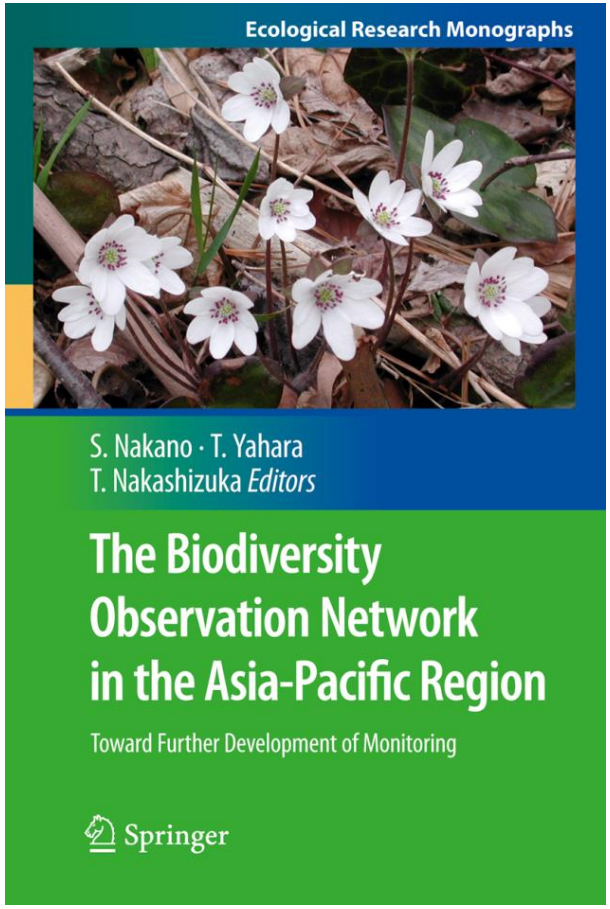
Yahara et al. 2014, p. 13

History of AP BON and Other Network Activities

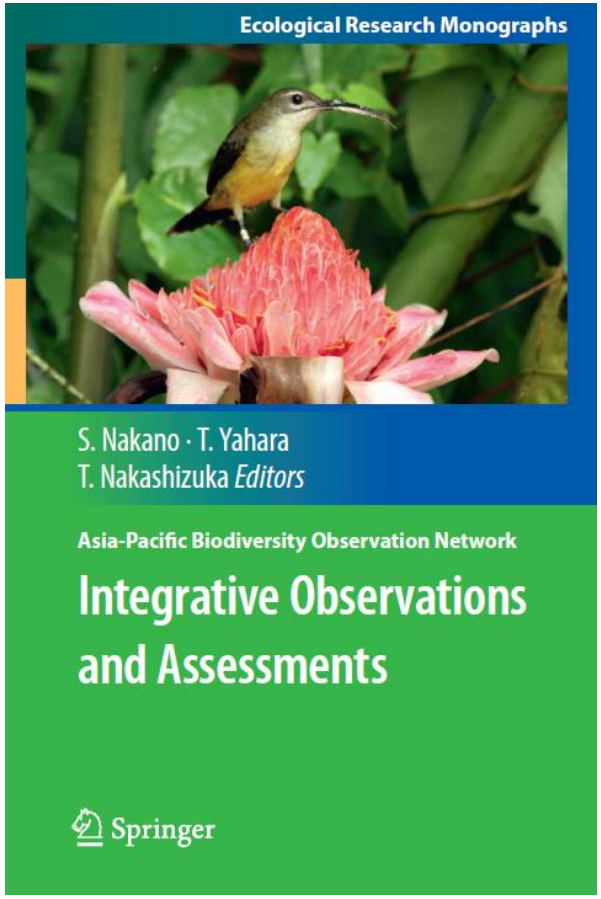
Year	GEOSS AP Symposia	GEO BON	AP BON Meetings	National BONs	CBD COPs	IPBES
2007	1st GEOSS AP					
2008	2nd GEOSS AP	GEO BON Conference			COP9	
2009	3rd GEOSS AP (Kyoto, February)		1st AP BON (July, Japan) 2nd AP BON (December, Japan)	Japan BON (May)		
2010	4th GEOSS AP (a session, Bali, March)	GEO BON Meeting (February, USA)	3rd AP BON (CBD COP10 Preconference, March, Japan)		COP10 (Japan, Side-event)	
2011			4th AP BON (December, Japan)			
2012	5th GEOSS AP (Tokyo, April)	GEO BON Meeting (December, USA)	WCC of IUCN (September, Korea)	Korea BON, Nepal BON, Bangladesh BON	COP11 (India, Side-event)	
2013	6th GEOSS AP (Ahmedabad, February)		5th AP BON (November, ACB, Philippines)	Philippines BON		Plenary-1
2014	7th GEOSS AP (Tokyo, May)	IC and AB (June, Germany)	6th AP BON (October, NIBR Korea)		COP12 (Korea, Side-event)	Plenary-2
2015	8th GEOSS AP (Beijing, September)	IC and AB (June, Germany)		Sino BON, Indonesia BON		Plenary-3
2016	2016-2025 A New GEO Strategy Plan Initiated	All-Hands Meeting (July, Germany)	7th AP BON (ACB, Thailand) 8th AP BON (Taipei, Taiwan)	WCC of IUCN (September, USA)	COP13 (December, Mexico)	Plenary-4
2017	9th GEOSS AP (Tokyo, Jan.)					

Publications of AP-BON Book

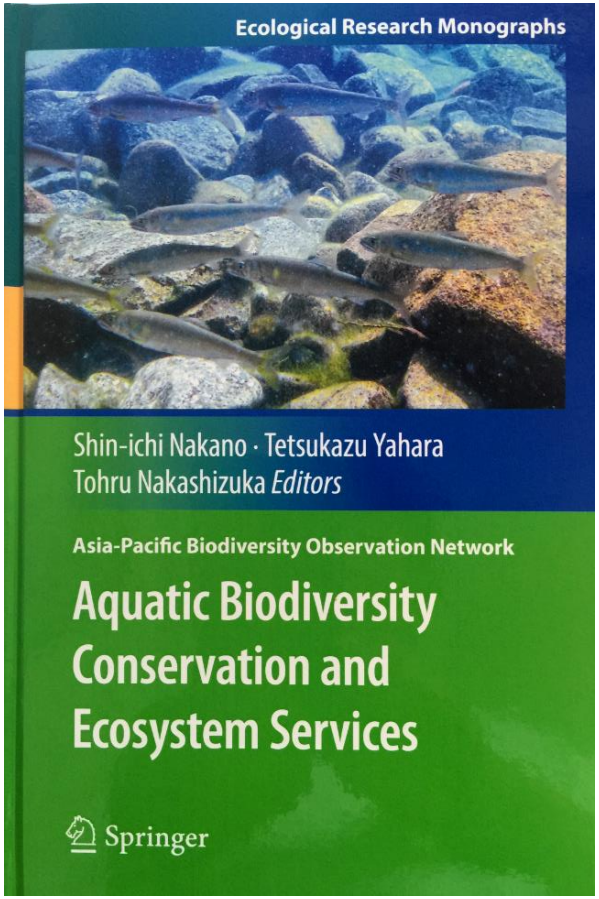
2012



2014



2016



AP-BON Vision

- **To establish a Coordinated Asian Network that gathers and shares information on biodiversity and ecosystem services**
- **To provide tools for data collection, sharing/exchange, analysis, and synthesis/integration, and**
- **To contribute to improving ecosystem management, sustainable use of biodiversity and human well-being**

AP-BON missions

- **Observing and analyzing changes in biodiversity over time.**
- **Improving delivery of biodiversity information and services to users, particularly decision-makers.**
- **Facilitating linkages among many countries, organizations and individuals contributing to biodiversity observations.**
- **Identifying gaps between existing biodiversity observation systems and promoting mechanisms/projects to fill them.**

Concept and Implementation

Developing a regional network of biodiversity observation in the Asia-Pacific region: achievements and challenges of AP BON

Yahara T, Ma K, Darnaedy D, Miyashita T, Takenaka A, Tachida H, Nakashizuka T, Kim ES, Takamura N, Nakano S, Shirayama Y, Yamamoto H, Vergara S.

The Biodiversity Observation Network in the Asia-Pacific Region: Integrative Observations and Assessments of Asian Biodiversity, [AP BON Book 2] 2014

5th AP BON Workshop in ACB (2013)

Potential products 2014 and onwards

- Regional Red List
- KBAs (Key Biodiersity Areas)
- Essential Biodiversity Variables
- Support for work on Mosses
- Publishing data papers

7th AP BON Workshop in Taipei (2016)

Updates on Initiatives identified in APBON-5

- Red Lists
  - No summary of red lists (a chapter in APBON book) an opportunity for redlisting in each country
  - Yahara – will distribute questionnaire to each country for a summary of redlists per country
- KBAs
  - China has identified hotspots
  - Japan has organized map grids to identify areas critical to biodiversity conservation
  - KBAs for mosses in East and Southeast Asia has been made,
  - KBAs for Asian Bryophytes identified (triggered by endangered mosses and liverworts, management criteria for manageability, relevant checklists must be available, people who propose a location must at least visit the area to see if the species are truly there. 6 places were identified (in China, Kinabalu, Gunung Tahan, Mt Tabayuk, one in Japan, province bordering China and Russia)
- Taxonomic Capacity Building
  - (Dedi) there is very low capacity in identifying species
  - The process has to be speeded up to contribute to data publication

AP BON: A turning point

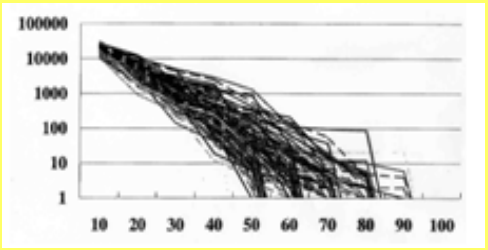
- A core project S9 sponsored by the Ministry of the Environment of Japan (MoEJ) ended in March 2016.
- IPBES assessments have started.
  - Linked to CBD 2020 targets (Aichi Targets)
- A New GEO Strategic Plan 2016-2025 is being implemented.
  - GEO BON new structure 2016-2019.

Integrative observations and assessments of Asian biodiversity (sponsored by MoEJ; 2011-2015)

- Developing models & tools to assess biodiversity & ecosystem services in AP
- Developing models and tools to identify hot spots and EBSA in AP
- Research plan and outputs co-designed with MoE (user)

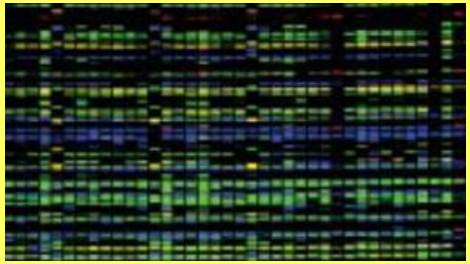
Theme 1

Modeling and mapping bio-diversity changes



Theme 2

Gene and species diversity changes



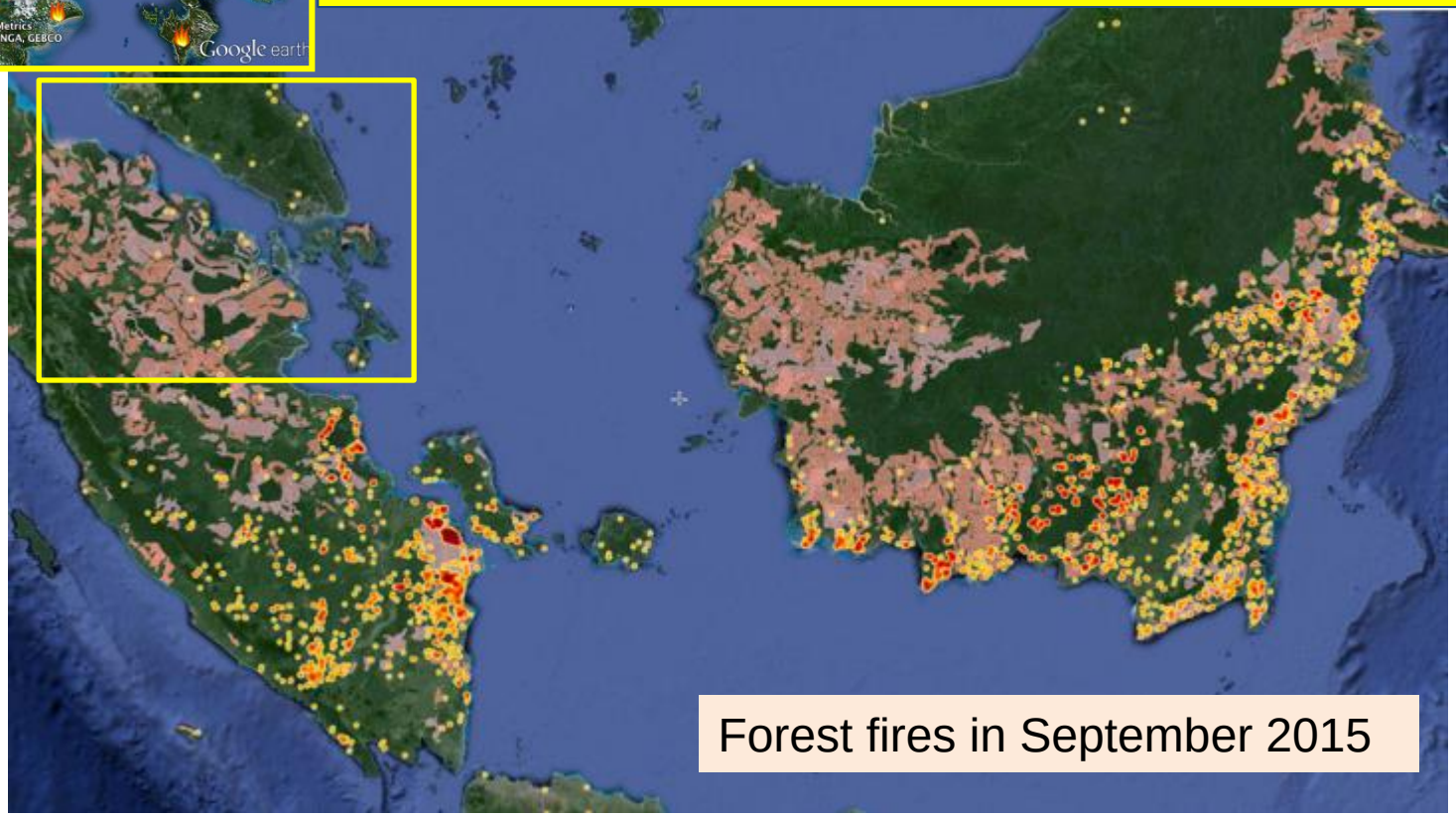
Theme 3-5

Forest, freshwater and marine ecosystems

Contribution to IPBES, GEO BON, CBD, REDD+, & National Strategy

Serious forest fire in Sumatra and Kalimantan

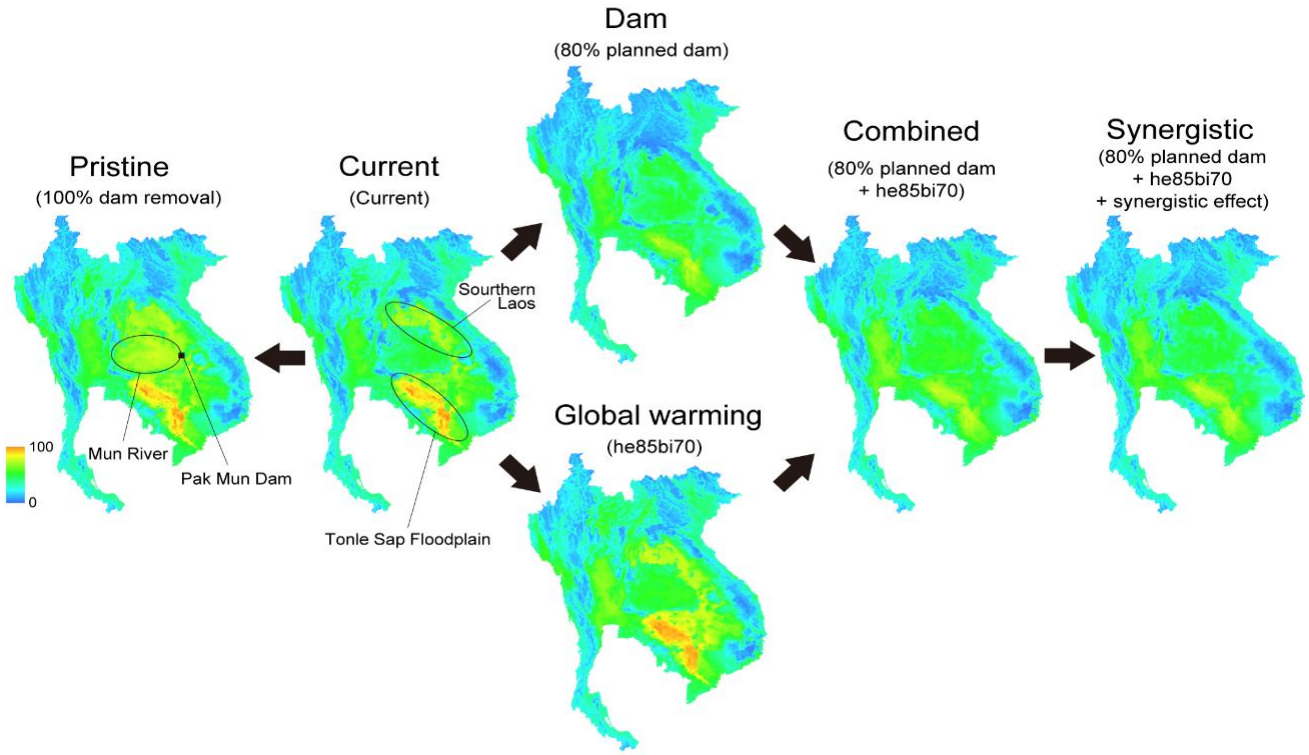
Japan is importing paper and palm oil from Indonesia



Forest fires in September 2015

Trends: freshwater fish diversity in Mekong

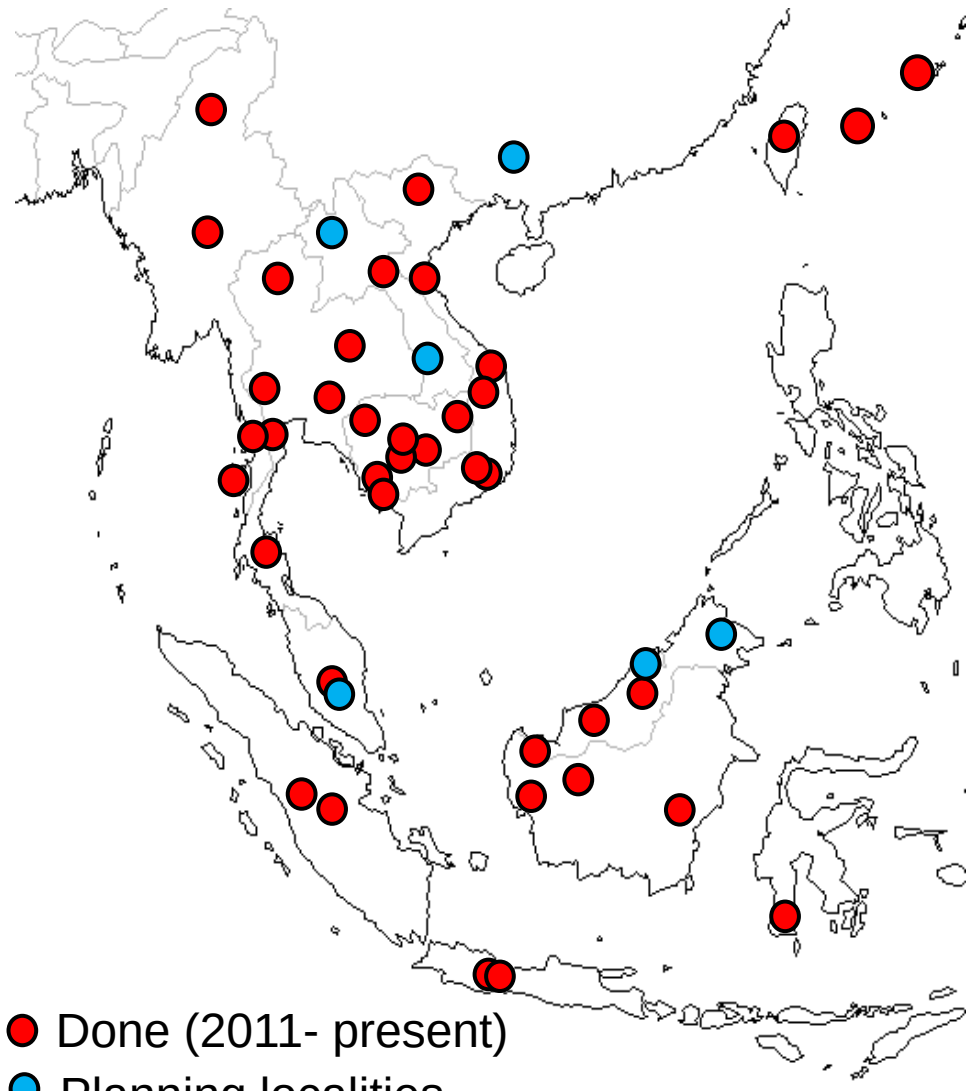
Threats of dam construction and global warming upon freshwater fish diversity in Mekong Basin (Kano et al. 2016, Plos One)



Fish bidodiversity index	Pristine	Current	Dam	Global warming	Combined	Synergistic
Mean species richness	39.6	37.3	32.8	41.1	36.1	34.2
Mean range size (km^2)	637,097	613,626	564,744	586,691	546,480	511,394
Threatened species	0.0%	4.7%	16.0%	35.0%	39.7%	40.5%

Collaboration through AP-BON network

40 observation localities(2011～2017)



Done (2011- present)

Planning localities

Collaborators

Cambodia

Phourin Chhang, Forest Administration of Cambodia

Thailands

Somran Suddee, Forest Herbarium

Sukid Rueangruea, Forest Herbarium

Dokrak Marod, Kasesart University

Laos

Souladeth Phelasy, National University of Laos

Vietnam

Son Van Dang, Institution of Tropical Biology

Hop Tran, University of Ho Chi Minh

Myanmer

Mu Mu Aung, Forest Research Institute

Malesia

Saw Leng Guan, Forest Research Institute

Lim Chung Lu, Forest Research Institute

Indonesia

Dedy Darnaedi, Research Center for Biology-LIPI

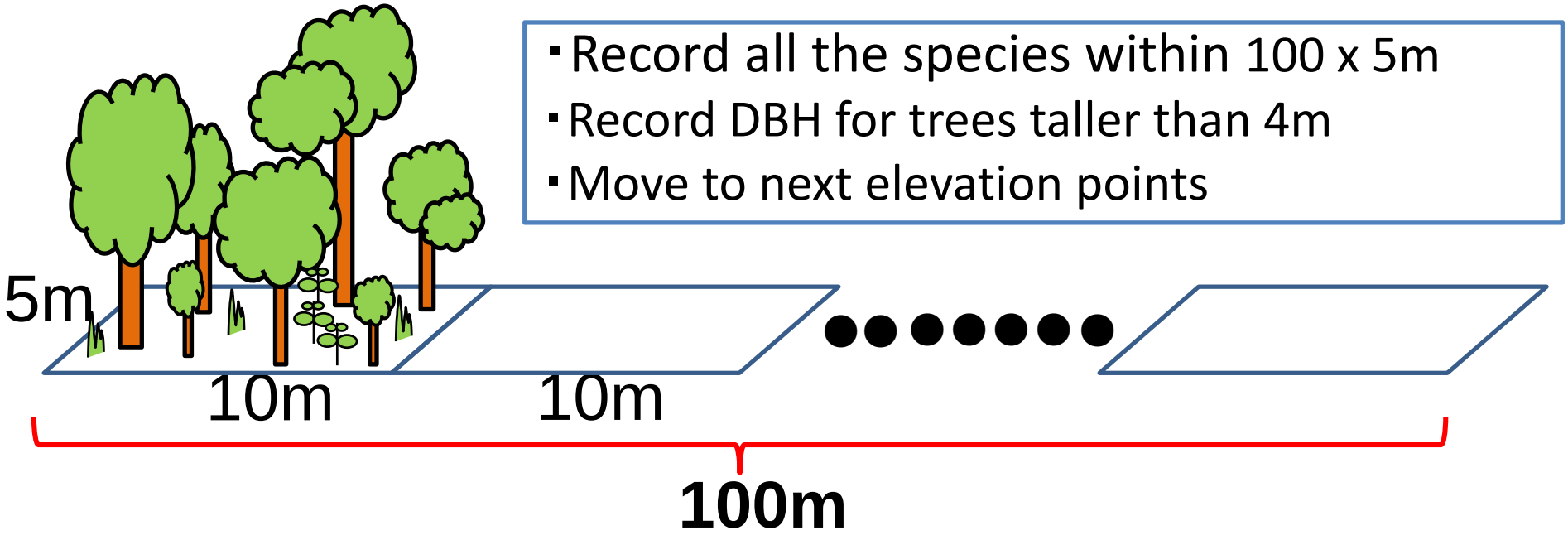
Marlina Ardiyani, Research Center for Biology-LIPI

Arief Hidayat, Research Center for Biology-LIPI

Anes Syamsuardi, Andalas University

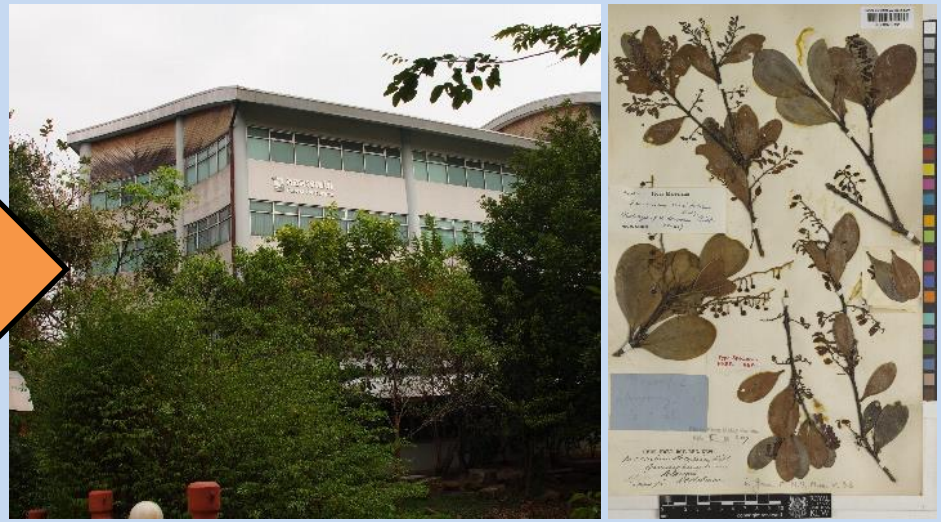
Ngakan Putu Oka, Hasanudin University

Standardized belt transect survey

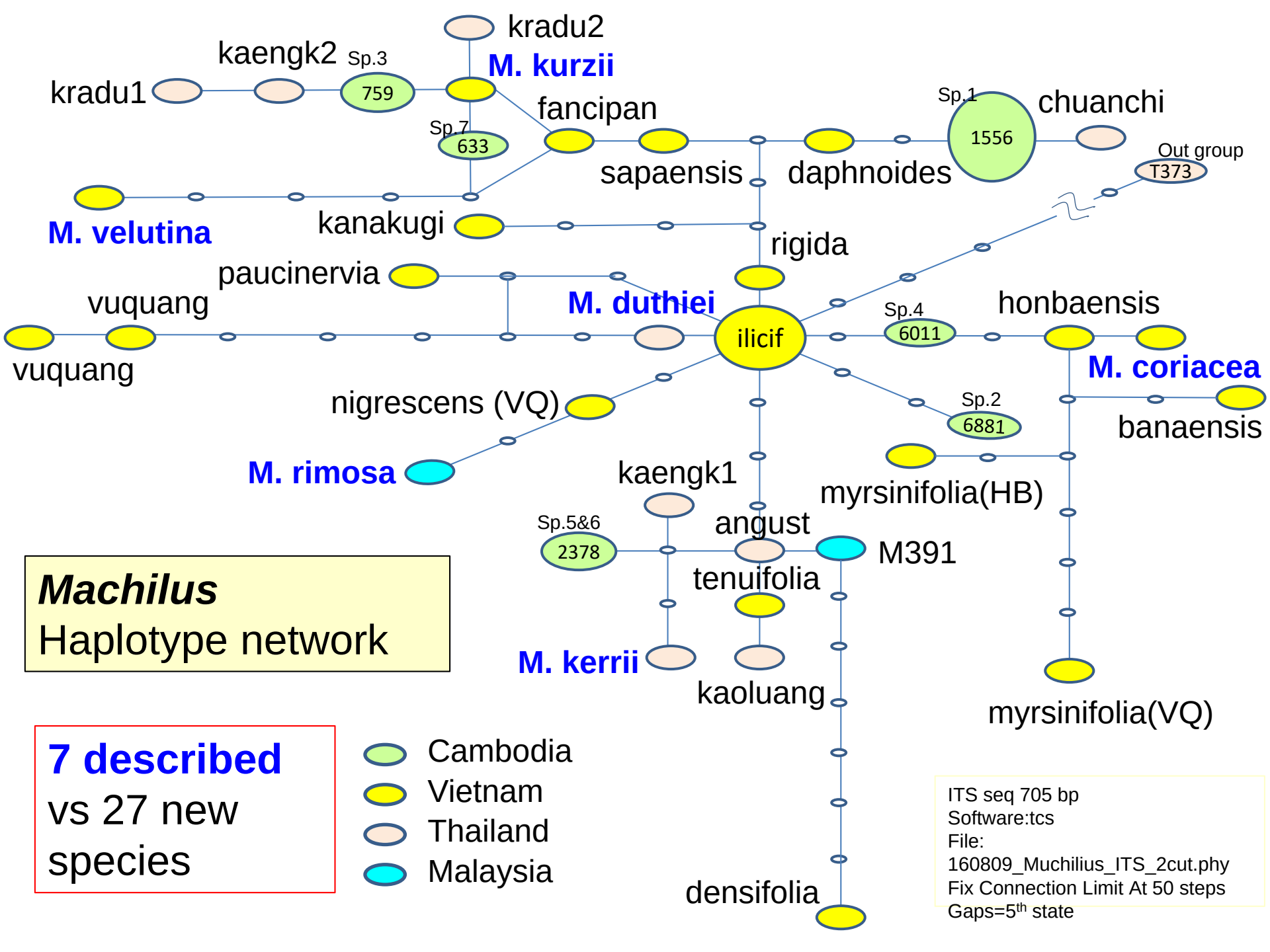


- Record all the species within 100 x 5m
- Record DBH for trees taller than 4m
- Move to next elevation points

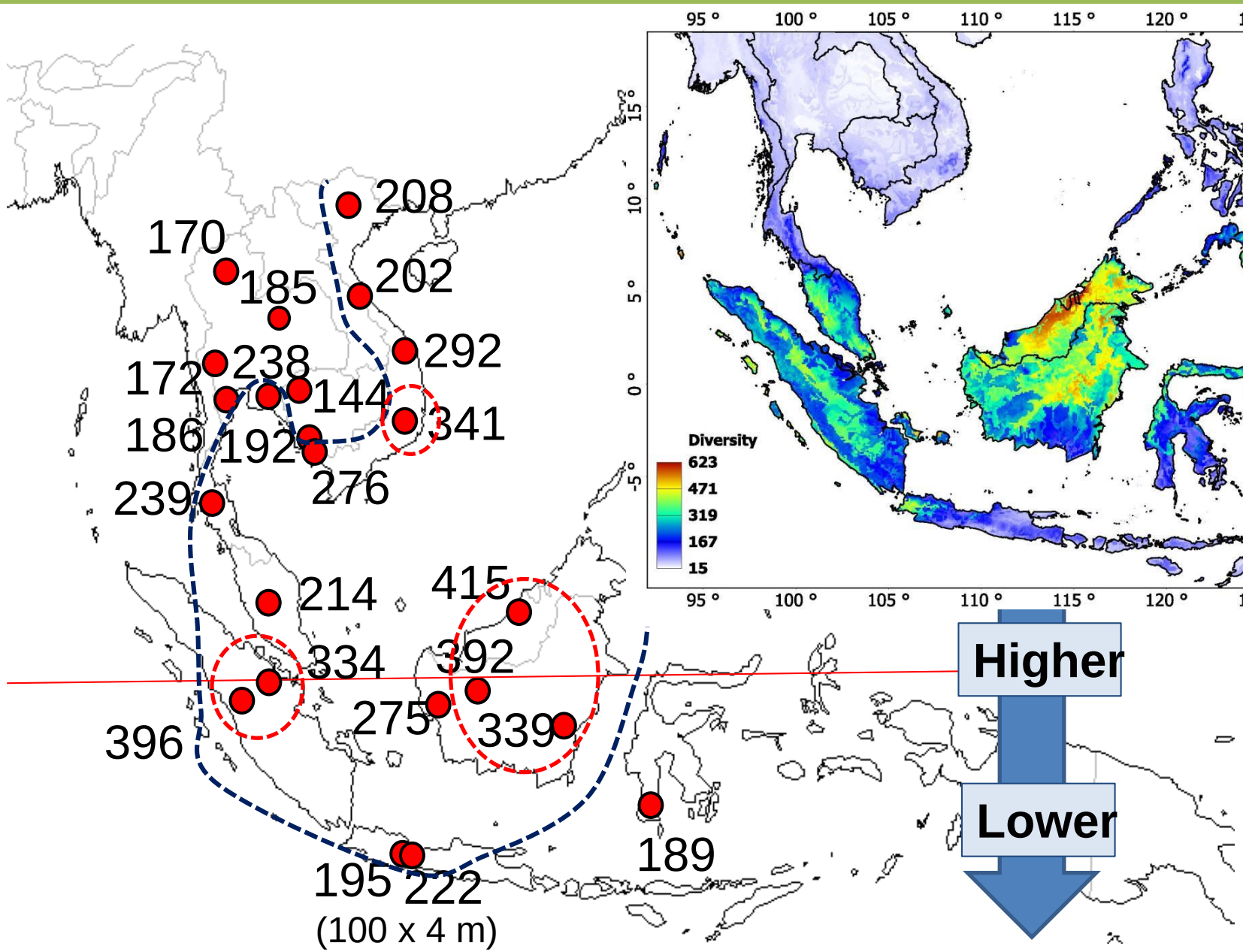
Collecting specimens and taking pictures



Identification using herbarium specimens


kradu2
kaengk2
Sp.3
M. kurzii
kradu1
759
fancipan
Sp.7
633
Sp.1
chuanchi
1556
sapaensis
daphnoides
Out group
T373
M. velutina
kanakugi
rigida
paucinervia
M. duthiei
vuquang
ilicif
Sp.4
6011
honbaensis
vuquang
M. coriacea
nigrescens (VQ)
Sp.2
6881
banaensis
M. rimosa
kaengk1
myrsinifolia(HB)
Sp.5&6
2378
angust
M391
tenuifolia
M. kerrii
kaoluang
myrsinifolia(VQ)
densifolia
Machilus
Haplotype network
7 described
vs 27 new species
Cambodia
Vietnam
Thailand
Malaysia
ITS seq 705 bp
Software:tcs
File:
160809_Muchilius_ITS_2cut.phy
Fix Connection Limit At 50 steps
Gaps=5th state

Vascular Plant Species Richness / Transect (500 m^2)



Many more new species: a case of Lauraceae




	Cambodia Bokor		Vietnam Hon Ba		Malaysia Fraser's Hill		Indonesia Gn. Gadut (Sumatra)		Total	
Genus	Known	Unknown	Known	Unknown	Known*	Unknown	Known	Unknown	Known	Unknown
Actinodaphne	1	0	1	6	5	0	3	0	10	6
Alseodaphne	0	0	1	0	0	0	0	0	1	0
Beilschmiedia	4	0	4	5	1	0	2	3	11	8
Cinnamomum	5 (2)	0	2	6	2	1	2	4	6	11
Cryptocarya	3	1	2	1	1	0	4	2	10	4
Dehaasia	2	1	0	0	0	0	1	0	3	1
Endiandra	0	0	1	0	1	0	2	1	4	1
Lindera	1 (1)	0	0	0	2	0	1	0	3	0
Litsea	6	0	7	3	6	0	8	5	27	8
Machilus	1	2	0	5	0	0	0	0	1	7
Neolitsea	3	2	2	2	2	3	1	2	8	9
Nothaphoebe	0	0	0	0	0	0	0	0	0	0
Phoebe	2	0	1	0	1	0	0	0	4	0
Total	28	6	21	28	21	4	24	17	94	55
	0.82	0.18	0.43	0.57	0.84	0.16	0.59	0.41	0.63	0.37

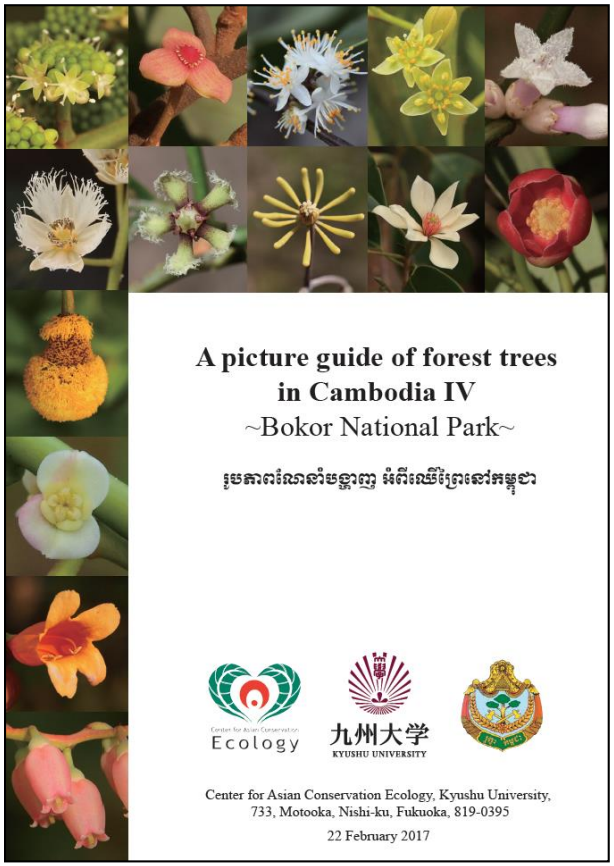
*Including known but undescribed spp.

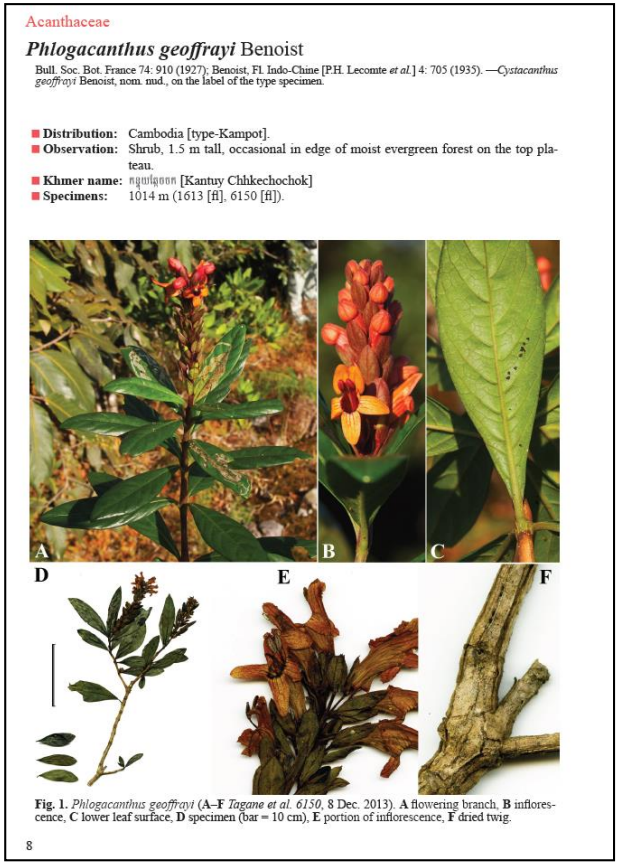
(Yahara unpublished)

Publishing Field Guide (Cambodia)

Toyama et al. 2012. A picture guide of forest trees in Cambodia I: Kampong Chhnang. 108 pp.
Toyama et al. 2013. A picture guide of forest trees in Cambodia II: Kampong Thom. 274 pp.
Tagane et al. 2015. A picture guide of forest trees in Cambodia III: Kratie. 104 pp.
Tagane et al. 2017. A picture guide of forest trees in Cambodia IV: Bokor National Park. 776 pp.

PDF is available from https://sites.google.com/site/pictureguides/




Acanthaceae

Phlogacanthus geoffrayi Benoist

Bull. Soc. Bot. France 74: 910 (1927); Benoist, Fl. Indo-Chine [P.H. Leconte *et al.*] 4: 705 (1935). —*Cystacanthus geoffrayi* Benoist, nom. nud., on the label of the type specimen.

- **Distribution:** Cambodia [type-Kampot].
- **Observation:** Shrub, 1.5 m tall, occasional in edge of moist evergreen forest on the top plateau.
- **Khmer name:** ក្អមជ្រូកពក [Kantuy Chhkechochok]
- **Specimens:** 1014 m (1613 [fl], 6150 [fl]).

Fig. 1. *Phlogacanthus geoffrayi* (**A–F** *Tagane et al. 6150*, 8 Dec. 2013). **A** flowering branch, **B** inflorescence, **C** lower leaf surface, **D** specimen (bar = 10 cm), **E** portion of inflorescence, **F** dried twig.

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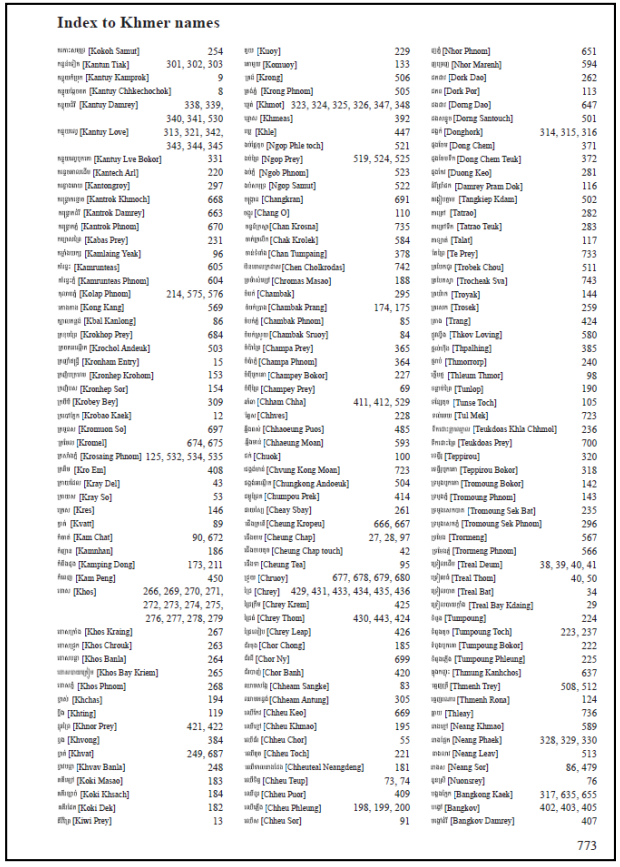
Index to Khmer names

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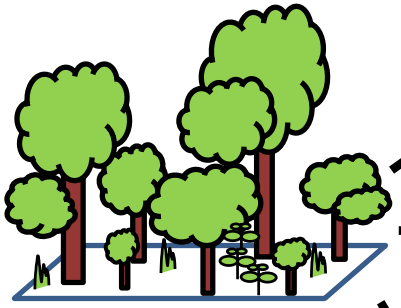
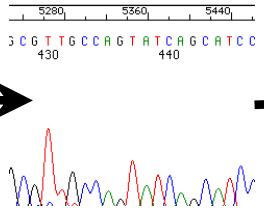
Materilas and Data flow



Field

Samples for DNA analysis



INSDC

Specimens

Herbarium

Data archive

Data Paper

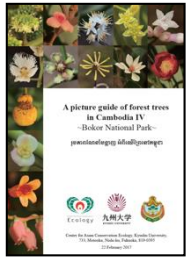
as Sample based data

Records

GBIF

Photos

Photo archive



Guide books

AP BON contribution to IPBES

AP BON Book 4

Being late to IPBES regional assessment
But for updating next IPBES report

- Specific indicator taxa: mammals, birds, amphibians, reptiles, fish, bee, orchids, ferns
  - Basic messages
- Threatened species
  - Extinction risk analyses: Fabaceae, vascular plants of Japan
  - IUCN Red List
  - National Red Lists
- Discovery of new species: Lauraceae, each country
  - No of new species published per year
  - Emphasis on the need for taxonomic capacity building for all taxa
- Hotspots of species richness and threats:
- Invasive alien species
- Function of species diversity