

Birds

- As with primates, observe birds along the 1-km transect between 6 am to 3 pm, the time when birds are most active.
- Record the bird counts following the Mackinnon Twenty Species List method (Mackinnon and Phillips, 1993). Mackinnon species lists consist of time, species and occurrence of birds.
- Each list consists of maximum 20 species. After 20 species are recorded in a list, a new list is started that may include species in the previous list. But in each list a species appears only once. If a species that is already recorded in the list is observed before the list reaches 20 species, it is included as another occurrence of the same species.
- Take photographs (and record sound if appropriate) of birds observed.
- Identify the birds (local and scientific names) if possible; describe them and site and time of observation.



Trees and saplings

Identification and counting of large trees and saplings are the objectives of the QBS method.

- Trees: set up 8 m x 8 m sample plot at every 100 m distance along the 1-km transect. Record all trees with girth of 31 cm and above; identify local and/ or scientific names, if possible their phenology (fruiting and flowering).
- Saplings: set up 4 m x 4 m sample plot at every 100 m distance. Record all plants below 31 cm girth but above 2 m height. Identify their local and/ or scientific names. Count the number of all saplings in each plot.
- If a plant (tree and sapling) cannot be identified positively, collect its specimen for later identification.
- Collect information about seed dispersal mechanism (wind, long range animal, short range animal and large seeded autochory meaning seeds and fruits dispersed through some kind of physical explosion) from the local people and/ or literature.



References

Kuncoro SA, van Noordwijk M, Martini E, Saipothong P, Areskoung V, Eka Dinata A and O'Connor T. 2006. Rapid Agrobiodiversity Appraisal (RABA) in the Context of Environmental Service Rewards. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office. 106 p.

Mackinnon, J and Phillips. K. 1993. Field Guide to the Birds of Sumatera, Borneo, Java and Bali (The greater Sunda Islands). Oxford University Press. Oxford.



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QUICK BIODIVERSITY SURVEY (QBS) GUIDELINE:

For Rapid Agro-Biodiversity Appraisal (RABA)

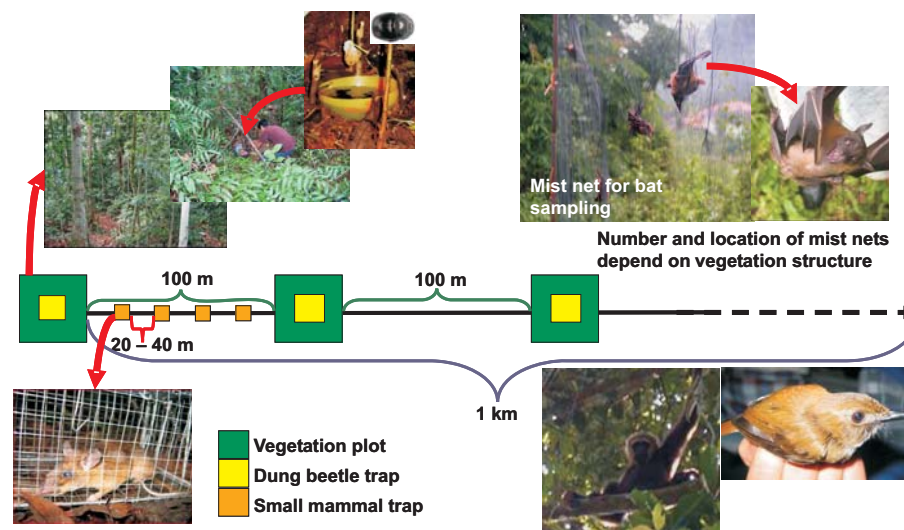
Trees in Multi-Use Landscape in Southeast Asia (TUL-SEA)
A negotiation support toolbox for Integrated Natural Resource Management

Principle and Approach

Species diversity or biodiversity plays an important role in sustaining an ecosystem at present and in future. Forest conversion to intensive agriculture and monoculture plantations leads to a loss of biodiversity in any landscape. Generally the rich biodiversity in natural or managed systems do not provide tangible benefits - a reason why local people may not be interested in conservation initiatives. Payment for Environmental Services or PES schemes are being proposed and tested in different contexts as a way to involve the local people in conservation practices. The Rapid Agro-Biodiversity Appraisal (RABA) (Kuncoro *et al.*, 2006) is a diagnostic tool designed to appraise perceptions of different stakeholders related to conservation in a target area and to assess the feasibility of a PES mechanism. Extensive consultations are held with both buyers and sellers of conservation services, usually in landscapes of high biodiversity value or that harbor species of special interest such as tiger, orangutan, rhino or endangered bird species. Data on such high-value species and biodiversity richness are usually available. Detailed biodiversity surveys are usually tedious, time consuming and can be conducted only by experts. Occasionally, however, where detailed recent biodiversity data are unavailable or where previous information on biodiversity may need to be validated, a rapid biodiversity survey of indicator plant and animal groups may provide sufficient information necessary for a RABA. The Quick Biodiversity Survey or QBS tool was developed for this purpose.

Quick Biodiversity Survey

QBS uses indicator animal groups - dung beetles, bats, small mammals, primates, birds - in addition to plants. The animal groups can be modified depending on their importance in the locality but the survey technique should be maintained for consistency and data comparison. The entire field work can be conducted in two weeks while the species identification should be done in consultation with experts. A local guide who is knowledgeable about local plants and animals is necessary for the field work. Indicator animals and plants are surveyed along 1 km long transects; the layout and frequency of sample points are determined by the animal groups being surveyed. Time and other resource permitting, the number of transects can be increased to improve the accuracy of survey data. In general, the survey, identification, data analysis and reporting can be completed in about six weeks.



Tools and Materials

Binoculars, hand counter, notebook, digital camera, sound recorder, compass, GPS (Global Positioning Satellite) equipment, altimeter, thermometer, vernier caliper, plastic rope, yellow bowl 750 ml capacity, plastic bottle 90 cc, pin set, scissors, machete, plastic box, plastic bags, alcohol 70%, light detergent, saline, naphthalene, chloroform, balance, mist net 30-32 mm mesh (6 m x 2.7 m and 10 m x 2.7 m), kasmin trap made from iron (26 cm x 13 cm x 13 cm size), bait (burnt coconut, salted fish or red color oil palm fruit), measuring tape, plastic rope (10 mm diameter) and fabric bags.

How to conduct QBS?

Bats (*Chiroptera*)

- Set up 6 m x 2.7 m mist net 0.5 m aboveground in high dense canopy vegetation; 10 m x 2.7 m mist net at 3 -5 m aboveground in medium dense canopy; and 3-10 m aboveground in open area.
- Install mist net in the evening at 5 pm for 2 to 4 nights; longer if it rains.
- The mist nets can be placed in strategic locations for maximum bat observations - open area, narrow space between hillocks and paths through dense forests. Three to four mist nets are required.
- Identify, count and release the trapped bats every 1 or 2 hours from 7 pm to 10 pm and again the next morning at 6 am.
- If a bat cannot be positively identified, kill it by injecting chloroform; record the body length, weight, tail, ears, tarsus, tibia and wing.
- Store the specimen in 70% alcohol in properly labeled plastic box for later identification.
- With the help of bat expert/s, identify the preserved specimens and their ecological functions.
- Mist nets are not effective for sampling insect bats (*Microchiroptera*) as they can "see" the nets with their echolocation capability. Harp nets, specially designed with catch bags, or other bat traps if available can be used. Use of bat detectors (for sound detection) or direct observation at nests, caves, coconut trees, banana trees, and house ceilings are other useful techniques.

Chiroptera

Megachiroptera

- Pollinating bats
- Seed dispersing bats
- Using eyes for recognition and detecting.



Microchiroptera

- Insect bats
- Using echolocation system to guide.



Mist net trap



Kasmin trap

Small mammals (mainly rodents)

- Use kasmin traps to collect small mammals.
- Put some bait (salted fish, burnt coconut or red color oil palm fruit) in the trap. Replace bait every alternative day.
- Install traps every 20-40 m distance along the 1-km transect for 3-4 days;

check every day; may require more days under wet weather condition.

- Collect the trapped animals every day (24 hours after setting the trap); identify, record and release positively identified animals.
- If an animal cannot be positively identified, kill it by injecting chloroform; record the body length, weight, tail, ears, tarsus and tibia.
- Store the specimen in 70% alcohol in properly labeled plastic box for later identification.
- With the help of expert/s, identify the preserved specimens and their ecological functions.



Dung Beetles (*Coleoptera, Scarabaeidae*)

- Set up the dung trap (yellow bowl) every 100 m distance along the 1-km transect for 24 hours.
- Put light detergent and salt in the bowl to kill the beetles that fall into the trap.
- Put baits (human feces) under the bowl with bait hanging from above.
- Collect trapped beetles and put in plastic bottle with 70% alcohol.
- Consult expert/s to identify morpho-species in laboratory and species if possible.



Dung trap



A pair of dung beetles rolling animal manure to their nest

Taxonomy

Most dung beetles belong to the family *Scarabaeidae*; sub-family *Scarabaeinae* and *Coprinae*. Few belong to *Aphodiidae*, *Trogidae* and *Geotrupidae*.



Coprinae (Tuneller)



Coprinae (Tuneller)



Coprinae (Tuneller)



Trogidae (Tuneller)



Geotrupidae



Scarabaeinae (Roller)



Aphodiidae (Dweller)

Morphological characters

- Hexapod with three distinct body parts - head, thorax and abdomen
- Generally black, some with metallic and bold chromatic form
- Head of Scarabaeidae beetles is spade-like with one or two horns
- Elongated protibia make sharp outer teeth
- Antenna with 3-4 elongated segments at end (Flabellate)

Primates

- Choose a good clear day and observe primates between 6 am to 6 pm while walking slowly along the 1-km transect. Continue 3-4 times (days). A good pair of binoculars and digital camera with zoom lens are useful equipments. Visual observation can be complemented with listening for characteristics sounds (can be recorded in a voice recorder).
- Identify the species; count the population in each group or age strata and sex ratio if possible.
- Note the bio-physical condition and fruit tree species in the habitat.



Hylobates agilis (gibbon)