



# Toward a biodiverse rubber estate: quick biodiversity survey of Bridgestone Sumatra Rubber Estate, North Sumatra

<b>Project title:</b>	Toward a biodiverse rubber estate: quick biodiversity survey of Bridgestone Sumatra Rubber Estate, North Sumatra, Indonesia
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<b>Timeframe:</b>	November 2010 to March 2011
<b>Funding partner:</b>	Bridgestone Japan
<b>Amount:</b>	USD 100 132
<b>Location:</b>	The Bridgestone estate is located in Simalungun district and Aek Tarum, North Sumatra, Indonesia.
<b>Partners:</b>	Bridgestone Sumatra Rubber Estate, Bridgestone Japan

## Objective

This project will assess the biodiversity of the Bridgestone Sumatra Rubber Estate and surrounding smallholder plantations, gathering and analysing data essential for any future planning to conserve and enhance biodiversity at the site.

The objectives of the research are to assess the biodiversity of

1. trees (saplings and tree stages) and
2. animals (birds and bats)

in the estate and surrounding smallholder plantations.

## Background

Rubber's introduction to Sumatra in the first decade of the 20th century sparked a revolutionary change in land use because the crop was found to be compatible with local forests. Rubber is also planted by smallholder farmers and managed with low intensity weeding and thinning, forming diverse biological systems. These plant and animal systems are known as complex rubber agroforests.

Research conducted by the Centre in other areas of Sumatra has shown that, in the case of so-called 'jungle rubber' or smallholder, complex rubber agroforests, the main 'service' that differentiates them from other tree-crop production systems is the diversity of plants and animals. With rubber trees (*Hevea brasiliensis*) typically

below 50% of the total tree basal area, the diversity of forest trees, epiphytes, birds, insects and mammals is around 50–70% of that in natural forests. In landscapes where natural forests are fast disappearing, species such as the endangered Sumatran tiger and *Rafflesia arnoldii*, the world's biggest flower, use jungle rubber for movement and dispersal. In many places in Sumatra, jungle rubber connects national parks and protected areas. These agroforests are also a primary source of daily income for millions of rubber farmers.



Rubber plantation with *Mucuna* cover crops in Simalungun (Photo: Asep Ayat)



**Left:** Strip weeding in a simple rubber agroforest in Simalungun (photo: Hesti L. Tata). **Middle:** Smallholder rubber plantation in Simalungun (photo: Asep Ayat). **Right above:** *Passer montanus* in a garden. **Right below:** Birds in rubber plantation (photo: Asep Ayat)

Our analysis of the estate and surrounding smallholder agroforests will assess overall biodiversity within the landscape continuum, identifying areas of higher and lower biodiversity and links between them, providing a detailed picture of the site's overall biodiversity health.

We will follow the Quick Biodiversity Survey guidelines (Nurharyanto and others 2008), undertaking the activities below and compiling a comprehensive report of our processes and findings.

- (1) Compile basic background information about the estate and surrounding smallholder plantations, including current land use and land-use change, using available maps and GIS datasets.
- (2) Conduct a survey of plant diversity by tree stage and saplings along a 1 km transect. We will also collect and record information about seed dispersal mechanisms (wind, long-range animal, short-range animal, large seed autochory) and form classifications based on wood density from our existing, comprehensive database.
- (3) Conduct a survey of bird diversity along the 1 km transect.
- (4) Conduct a survey of bat diversity with adjustments for vegetation density and structure.

- (5) Analyse biodiversity and functional ecology in the estate and smallholder plantations.
- (6) Create a report on the overall biodiversity survey. The report will include all relevant references from the literature, data and analysis.

## Planned publications

- Final report, February 2011
- ICRAF working paper, April 2011
- Panduan pengenalan jenis burung* (Introductory guide to bird species), March 2011

## Reference

Nurharyanto, Nugroho P, Jihad, Joshi L, Martini E. 2008. Quick Biodiversity Survey (QBS) guidelines for Rapid Agro-Biodiversity Appraisal (RABA). Leaflet. *Trees in Multi-Use Landscapes in Southeast Asia (TUL-SEA)*. Bogor, Indonesia: World Agroforestry Centre (ICRAF) Southeast Asia Program.