



Forest Science News

Issue 2(8):August 2006

The Nature Conservancy-East Kalimantan Program

Samarinda and Berau, East Kalimantan, Indonesia

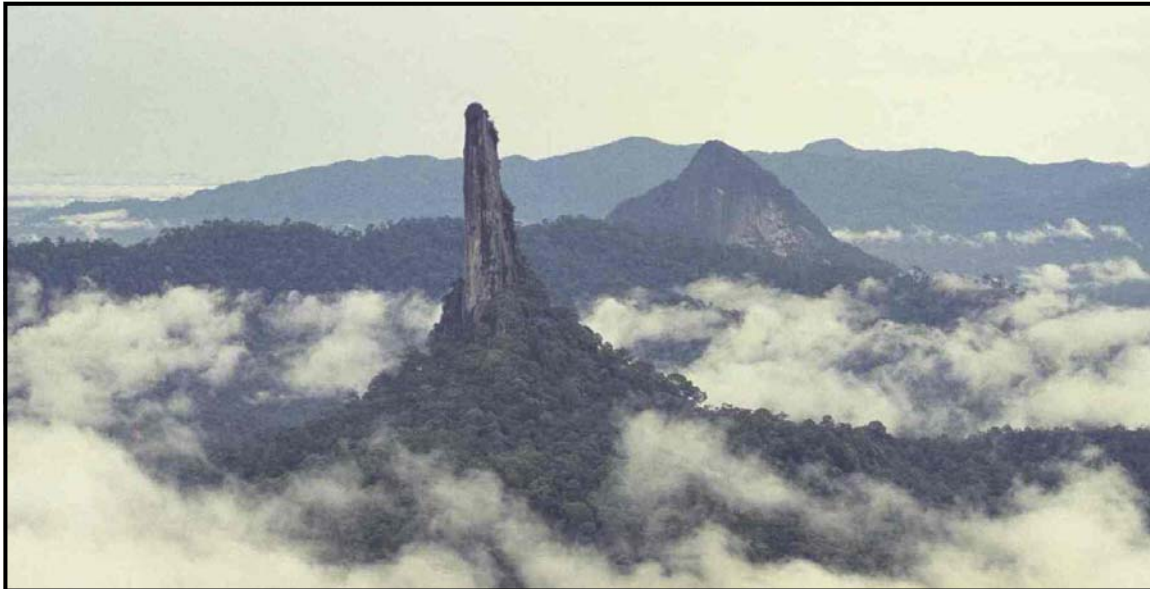


Table of Contents

What's on the Dinner Table at Lesan Dayak

High Conservation Value Forest assessment in Central Kalimantan

Carbon and co-benefits from sustainable land-use management in East Kalimantan

The Nature Conservancy-East Kalimantan Program

Keeping you informed on forest science issues

TNC-East Kalimantan Program
Jl. Gamelan No. 4, Komp. Prefab
Samarinda 75123
Kalimantan Timur, Indonesia

Telp : + 62-541-744069/744070/744071
Fax : + 62-541-738127
E-mail: emeijaard@tnc.org

*The Nature
Conservancy* 
SAVING THE LAST GREAT PLACES ON EARTH

Forest Science News

Photo on front page: This rock-climbers dream, a 400 m granitic intrusion rises out of the rainforest in the Kalimantan Gold Corporation contract area in northern Central Kalimantan. Photo by Mansur Geiger.

This newsletter informs about the latest findings, results, and plans from the TNC Indonesia's terrestrial science team. On a monthly basis, I and other contributors will provide updates about exciting discoveries, progress in our monitoring and measures work, our training programs, scientific collaboration with the forestry and plantation industries, and surveys and explorations. Science is often considered to be the realm of grey-haired, thick-glassed oddballs in white lab coats. Here we show you how exciting and important our work is and how we contribute to the overall goal of preserving the last great places on earth. I hope you find this information useful and inspiring.

Erik Meijaard, editor

What's on the Dinner Table at Lesan Dayak

Pip Schroor. Email: pschroor@samarinda.org

In March I introduced a hunter self-monitoring program to the community of Lesan Dayak. It is an ongoing project and I have gathered data and anecdotal evidence of hunting practices and traditions within the community.

I have discovered that hunting monitoring is not a new concept to the community. In times gone by, the hunters were conducting their own form of hunting monitoring. This was not done to evaluate the hunters own performance but rather to assess the performance of his trusted hunting companion-his dog. After each hunt the pigs lower jaw was cleaned and kept and at the end of the month the hunter would count the number of jaw bones. If the number had decreased from the previous month, the hunter would make a special powder ground up in a mortar and pestle and placed under the dog's nose to sniff. The belief being that the medicine would help the dog and increase its hunting performance. This form of monitoring is no longer practiced.



Picture 1. After a successful hunt. 1 pig and 1 long-tailed macaque

There is another custom that is no longer followed. Before the conversion to Christianity within the community, the animalistic believers were forbidden by traditional law (Dayak Meng Ga'i) to consume any other animal besides pigs, fish and domesticated chickens. All other species were protected and if they did consume them immediate death was to follow. The conversion to Christianity influenced beliefs to change and people started hunting for other species. Today in Lesan Dayak the data from my study shows a variety of animals are hunted for consumption, medicinal and commercial reasons including deer, porcupines, snakes, civets, pangolins and macaques. Interestingly though most primate species; orangutans, gibbons, proboscis monkeys and langurs are still viewed as a taboo to hunt. Perhaps this is a contributing factor as to why these species can still be found in relative abundance, upstream in the Lesan Conservation Area.



Dried Pangolin skin. Hunted for its skin and sold for Chinese medicinal purposes. One skin costs Rp 120,000 to 250,000 (~US\$ 15-30).

High Conservation Value Forest assessment in Central Kalimantan

Erik Meijaard and Chris Gordon. Email: emeijaard@tnc.org and chrisgordon@hotmail.com

Since 2002, TNC East Kalimantan have been at the fore front of developing assessment techniques and management guidelines for High Conservation Value Forests (HCVF) in Indonesia. These forests are vital for maintaining species diversity and the connectivity of large forest landscapes, and provide critical services to local communities in the shape of food, medicine, trade products, and clean water. Following HCVF identification, the management authority agrees to maintain or increase the High Conservation Values (HCV). Originally a tool developed for the forest industry, HCVF is now attracting attention from plantation developers, including the oil palm industry. And slowly the Indonesian Government is starting to see this as a tool to guide their land use planning. The latest arrival on the HCVF scene is the mining industry. The Kalimantan Gold Corporation (KGC) has asked us to assess the forests in their concession in Central Kalimantan Province. Together with Nardiyono, our survey coordinator, Umbar, our GIS and remote sensing technician, and Chris and Anne-Marie, our road survey volunteers, we have traveled to Palangkaraya, the capital city of this province for our latest HCVF assessment.

After meeting with the company staff we decide to split into two teams to cover as much of this remote area as possible. Nardi, Anne-Marie, and Umbar will go to the eastern side of KGCs contract area to focus on local communities. We (Chris and Erik) will follow a different river that that will lead us into the western side of the mine exploration site. Nardi and his team will tell their story in another issue of FSN.

A 3 hour car trip followed by a 1 hour boat ride and another 4 hour car ride takes us to Camp Bravo 5, one of KGC's base camps. We eat and sleep and get up 5.30 to do a road survey. Today's results are promising. Within an hour we have not just found tracks of the usual suspects like pig, deer and civet, but also of Pig-tailed Macaque, a group of leaf monkeys that crossed the road, and possibly Smooth Otter and Flat-headed Cat, to just name a few. This indicates a high species diversity and wildlife densities, suggesting that hunting pressure is low.

After breakfast we head off towards another camp, Bravo 4. A long hike takes us from about 400 to 800 m above sea level, during which we see some stunning primary rainforest. Massive tree stems rise above us and the open-structured undergrowth allows us to sometimes see over 100 m of forest ground, unlike the more common views of only a few meters that you get in logged forests. Towards the end the walk gets tough; steeply up and down over and over again. Erik's left knee is playing up making especially the descents hard and painful. When Camp Bravo 4 appears before us, it is indeed a sight both for sore eyes and knees. And what luxury it brings. Although nothing fancy, this must be one of the most comfortable forest maps ever designed, giving us exactly what we need: well ventilated spacious long houses where we sleep in dome tents, running water in clean, iron-wood bath rooms, a kitchen tent, and lots of hot coffee. Before eating Chris removed 4 fat leeches from his feet, working out that one pair of socks is rarely an obstacle for these primitive blood-sucking creatures.

After a rest, we walk back into the forest for some bird watching and call recording. It is a bit quiet, but we are delighted to see a rarely encountered bird which is high on the list of many bird watchers: the Bornean Bristle-



Forest Science News

head. The plumage of the neck and head of this odd-looking Bornean endemic is coarse and stiff, giving rise to the English name, but its unusual characteristics have also puzzled those that pondered the evolution of this species. In total it has been allied with no less than seven families spanning much of the bird radiation. Recent research has solved this mystery by showing that the Bornean Bristlehead represents a relict lineage from the early diversification of shrike-like birds across the Old World tropics. Why it only occurs on Borneo, and not on Java or Sumatra, is still completely unclear, like pretty much everything else about this bird. Tired from the day's walk and exciting species encounters we sleep well that night, a full 9 hours in our comfortable tents.

The next day we spend surveying the forest surrounding camp Bravo 4. There is remarkable variation in the vegetation types here. At a scale of a few kilometers, forests change from very nutrient poor heath forest, with stunted trees and tree species more commonly encountered along coastal beaches, like *Casuarina*. We also find a species of pitcher plant (see photo below) in a small swamp with high acidity levels; so far we have not been able to identify it and, considering its unusual habitat, it might well be a species new to science. Another interesting record, is the first recorded sighting of Brooke's Squirrel in this part of Borneo. This species has only been found in mountains of northern and eastern Borneo, and our record is a considerable extension of its range. These unusual species, and other even more remarkable ones reported to us by KCG staff—including a snake that changes its colour—probably mean two things: Firstly, very little, if any botanical and zoological collecting work has been done in this part of Borneo, and it is therefore largely unknown what occurs. Secondly, the unusual ecological characteristics of this mineral rich area may have created perfect conditions for local speciation to occur. Until more extensive biodiversity surveys are conducted, we will probably never know how environmental and ecological forces combined to create this apparently unique environment.

After another night in Bravo 4 and a visit to the helipad at 800 m asl, which offers beautiful views towards the Schwaner Mountains in the Heart of Borneo, we start our return. Another series of steep climbs and descents covered by the dense canopy of this primary forest takes us back to where we had started 3 days earlier. In the heat of the day we drive back in a 1981 Landcruiser through an active logging concession. Our driver is a complete maniac who seems to believe that there is no such thing as oncoming traffic. But somehow we manage to stay alive, and we settle for our final night in the basecamp of a timber concession.

Our trip back to Palangkaraya takes us through the wastelands of southern Central Kalimantan. White sandy soils and stunted regrowth resemble Fijian beaches or the sandy plains in southern France. The one difference is that we are 200 km from the coast and 20 years ago this area was still covered in lush rainforest. A few decades of over-logging, peat drainage, fire, and gold and zircon mining has left an infertile and barren land with little hope for recovery unless a stupendous amount of effort and funding is invested. Hopefully, TNC's work on forest management and HCVF will prevent more of such environmental disasters.



Mushroom, spider, lizard (*Aphaniotus* sp.) and Russell's Pit Viper photos by Mansur Geiger, all others by Chris Gordon

Forest Science News

Carbon and co-benefits from sustainable land-use management in East Kalimantan

Sandra Brown, Project Coordinator. Winrock. Email: sbrown@winrock.org

Background

The focus of the Carbon and Co-Benefits Initiative (CCBI) activities for 2006 is to expand the quality and availability of data for forestry activities that affect the carbon stocks on forest lands by measuring and analyzing the changes in carbon stocks.

The work in East Kalimantan will focus on one activity: application of methods developed elsewhere in the tropical forest region (Bolivia, Brazil, Congo, Mexico, Belize) to measure the impacts of forest logging on the carbon stocks of forests. These data will expand the existing Winrock data set developed from prior years of field work. This work will be used in developing a tools to improve and strengthen the capacity of US AID to report the carbon impacts across a selection of their forestry projects. By working with local and national organizations, Winrock also will disseminate experience and transfer knowledge on measurement and monitoring of USAID projects to improve the global reporting and integrity of land-use change and forestry activities.

Proposed work in logging concessions of East Kalimantan

Winrock proposes to conduct the field phase of this work in early August of 2006 in two logging concession in East Kalimantan: Aditya and Wanabahkti. All field work will be done in collaboration with staff of THC. The approach used for this field work will follow that used for work in CARPE and Brazil and will combine field work with aerial digital imagery acquisition (performed under another activity). In this study we will estimate the net impact of selective logging on the forest carbon stocks by quantifying many of the changes in carbon stocks shown in Figure 1.

In this study we focus on the carbon impact of tree felling and extracting the timber. We will not trace the processes of decomposition of dead wood or wood products, nor the conversion efficiency of processing mills. Instead we will estimate factors to determine the volume and biomass carbon extracted from the forest and the biomass carbon remaining in the forest to decompose based on field measurements.

The field work will focus on estimating, on a gap-by-gap basis, extracted volumes, the biomass carbon from the timber tree that remains in the forest, and the incidental carbon damage to surrounding vegetation. We propose to take measurements on at least 100 logging gaps to develop a robust data set (this has been the number of gaps used in previous studies and gives estimates with a desired precision of about a 95% CI of +/-10% of the mean). We use these data to create relationships between volume extracted, the size of canopy gap caused by logging, and the carbon impact.

Timber extraction

In each logging gap (about 100 gaps), four measurements will be taken on each timber tree: the diameters at both the stump and crown ends of each commercial log, the length of the commercial log and the diameter at breast height (dbh) of the tree, and if possible the species of the tree logged recorded. We hope that the measurements can be made before the log is skidded out (cut marks for the commercial log had already been made by the logging crew).

The volume of the extracted log will be calculated by multiplying length by the average of the cross-sectional areas at the foot and crown ends of each log. Biomass of the commercial log will be calculated by multiplying the estimated volume by the wood density. A species-specific density will be used when the species is identified or a mean tree density when the species was not known (obtained from Brown 1997 for SE Asia commercial species)

Field Measurements

Incidental-damage measurements

Damaged trees are those trees that are severely impacted by tree fall. Damage trees will be classified as either 1) snapped stem or 2) uprooted. To estimate the amount of damaged vegetation in each plot, a general biomass equation will be applied to measurements of dbh of the damaged trees. The minimum breast height diameter for

Forest Science News

measurement is 10 cm. During the felling of a large timber tree it is possible that large branches could be broken off from neighboring surviving trees. Careful inspection will be made in each plot to record such events and the biomass of the branches will be also estimated based on volume estimation and subsamples for wood density.

Skid trails and logging roads

An additional carbon impact results from the construction of roads and skid trails for extracting timber from the forest. In the field, the team will measure the dbh of all trees killed or severely damaged along ten skid trails, total length will depend on local conditions but be on the order of 3,000 m.

We will aim to calculate the impact of logging roads through correlating area of roads (measured from the imagery or obtained from the concession), with a measured C stock for unlogged forest per unit area. To obtain estimates of carbon stocks in unlogged forests we will take measurements in 15-20 randomly located plots in unlogged forests. We will use Winrock's standard protocols for these measurements of live trees only, based on nested plot design.

Estimation factors

To estimate carbon impact from readily available indicators, we will create factors linking: 1) extracted volume with extracted biomass and damaged biomass left as dead wood in the forest and, 2) area of logging gaps and extracted volume, extracted biomass and damaged biomass left as dead wood in the forest. This will be done in the Winrock office but a demonstration of how the data are analyzed will be given to the TNC field staff.

Relationships between tree dbh and crown diameter/area

We will test the ability of the imagery data for estimating biomass of the forests. To accomplish this we need to develop new equations for estimating tree biomass based on crown diameter or crown area with and without a measure of tree height. To develop the new equations, field measurements of tree dbh, crown diameter (at 8 radii) and tree height will be collected for about 20-30 trees representing a range of dbh (at least 15 cm to the largest being logged >60 cm). It is expected that these measurements will be taken along newly constructed logging roads where it is possible to see the top of the tree crown.

Products

Copies of all field data and analyses and resulting reports will be shared with TNC as will any imagery data that we collect as part of an accompanying study.

The data will be also be used in a simple model to estimate the baseline scenario of the existing logging practices over a number of years. This simple simulation model will then be used to construct additional scenarios of logging practices from stopping logging altogether to reductions in timber extraction by various amounts, and the corresponding carbon emission reductions estimated. This will demonstrate to TNC, the logging concession, AID, and the Indonesian Government MOF how such data can be used to estimate carbon benefits from changes in logging practices.

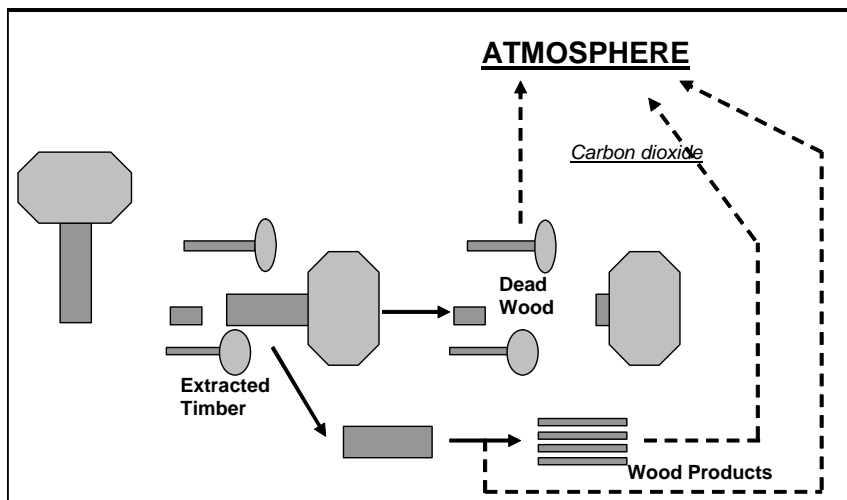


Figure 1. Schematic representation of carbon flow as a result of selective harvest in the tropics

Forest Science News

Faces to names



Together with Anne-Marie Stewart, Chris Gordon has worked as a volunteer for TNC since March 2006. They are developing a technique to quickly assess wildlife densities and species diversity in timber concessions by looking for animals tracks and other sign.

Here, Chris is taken a rest after the long walk to Camp Bravo 4 of the Kalimantan Cold Corporation contract area where TNC conducted an HCVF assessment.

Miscellaneous—the Storm’s Storks are back!

Our most exciting news comes from Lesan this month. During Roy Dennis’ visit earlier this year, he hypothesized that the storks could at that time not be in Lesan, because the turbid rivers would prevent them from finding enough food. He predicted that they would however return to the area at the start of the dry season, sometime in late July, which rather mystified our staff, because no one knew anything about this unstudied stork species, so how could Roy make such predictions. Remarkably, after two months of surveying the rivers, Pip and the TNC survey team, suddenly encountered a stork 5 days before the end of July. We are now conducting further, very careful, surveys trying to follow the animal to where it’s mate is nesting, at least that was another of Roy’s predictions. In September, Roy will return to catch a young stork and attach a satellite transmitter, work funded by the Sall Foundation. That should allow us to track the animal and reveal some its mysteries.

Science activities planned for August 2006

- Erik will conduct a training session with staff of Sumalindo Unit II in their upper Mahakam concession
- Pip will do further stork survey work together with TNC’s survey team who will also continue the orangutan nest decomposition work.
- Chris and Anne will conduct further road surveys in Wehea and start their data analysis
- We welcome Stephanie Spehar and Paul Mathewson, two short-term volunteers, who will work on primate flight behaviour in Wehea and Lesan
- We also welcome Monico Schagen, a Dutch student, who will conduct social studies along the Segah.
- On 21 August TNC will organize a meeting with WWF Indonesia and WWF Sabah to discuss the ecoregional planning for the whole of Borneo; what has been done and how, and can we agree on joint methods.

July 2006 publications (main publications and reports)

Gordon, C. and Stewart, A.-M. 2006. Report For Sumalindo Lestari Jaya. Hunting Assessment Surveys 25/05/06-20/06/06. TNC East Kalimantan Program, Tanjung Redeb, Indonesia.

Meijaard, E., Stanley, S.A., Pollard E. H. B. Gouyon, A. and G. Paoli, G. 2006. High Conservation Value Forest in East Kalimantan. A Guide for Practitioners. The Nature Conservancy, Samarinda, Indonesia. Translated into Indonesian as “Panduan bagi Praktisi; Mengelola Hutan Bernilai Konservasi Tinggi di Indonesia, Studi kasus di Kalimantan Timur”. [in English and also translated into Indonesian].

Errata: Some text was erroneously deleted from the whale story in issue 2(7). The text should have been: Preliminary checklist of Cetacea in the Indonesian Archipelago and adjacent waters. – Zoologische Verhandlungen Leiden 312: 1-48.