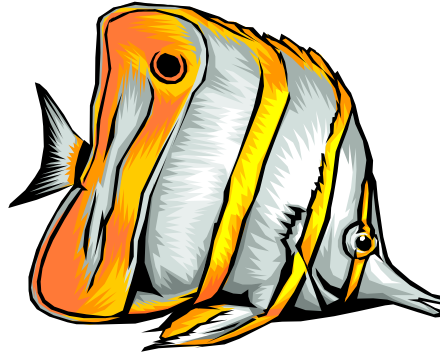


The New Guinea Tropical Ecology and Biodiversity Digest

September 1998



Issue 6

(please send all contributions and corrections to: Deb Wright, P.O. Box 15, Weikert PA, 17885-0015, USA; fax: (1) 717-922-1152; email: "ddwright@ptd.net"-- thanks!)

PLEASE NOTE: I will be away until April 1999, so please do not expect a reply to your correspondence until after March 1999-- Thank You! The next issue will be published shortly after I return, so please go ahead and send in your articles and new contact information; I will see it as soon as I return.



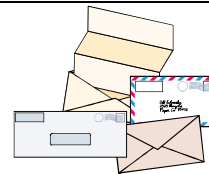
This issue we want to thank the Wildlife Conservation Society and Conservation International for providing xeroxing and mailing support -- this is much appreciated!

If you want to receive this newsletter on e-mail instead of in the mail (you could print out a hard copy and it would save us xeroxing and postage) (it is formatted in Word 97 for Windows 95) please send us a note saying that this is alright and include your current e-mail address. Thanks! Hopefully we will soon have the newsletter at a web site so you can look it up on the internet!

If you need back issues of the Digest, please let us know and we will mail them to you.

We try to get a new issue out every six months so the information stays up-to-date. Please don't forget to send in any information you can contribute!

Editorials and Letters



Anybody want to expound on his or her thoughts or solicit opinions about something? Please send in anything that you would like to see appear here!



New Guinea Conservation Projects

Updates anyone??

Conservation Melanesia, Inc.

from Anita van Breda

Since 1995, Conservation Melanesia (CM) has worked effectively in partnership with local communities to conserve the environment of Papua New Guinea. CM's mission is to conserve and sustainably utilize the terrestrial, marine, and cultural heritage of Papua New Guinea for the benefit of current and future generations. To obtain this goal CM seeks to research, develop, demonstrate, and promote strategies for conservation and sustainable development that are environmentally sound, economically viable, culturally appropriate, and socially equitable.

As a Papua New Guinean organization, CM plays a crucial role in building conservation capacity among the national citizenry. Through our grassroots approach, CM has assisted the Maisin People of Collingwood Bay-Oro Province, to reject proposals for large-scale destructive development of their customary lands. These efforts have resulted in the long-term conservation of approximately 262,000 hectares of tropical forest. Also, with CM's assistance, the Maisin formed a local CBO, the Maisin Integrated Conservation and Development (MICAD)

association. MICAD strives to promote livelihood schemes through integrated conservation and development activities as an alternative to the destruction of the forest.

In June-July 1998 CM will undertake in partnership with the Maisin people a flora, fauna and marine biodiversity survey of the Collingwood Bay area.

CM's five program areas focus on 1) support and training of community organizations taking part in environment conservation; 2) researching alternative eco-enterprise options; 3) providing environmental awareness and educational materials and programs; 4) developing environmental legislation and governing practices; 5) promoting marine resource conservation and sustainable resource utilization.

For more information contact:

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Biological Conservation Workshop in Manokwari

from Charlie Heatubun

A Biological Conservation Workshop was held in Manokwari, Irian Jaya, from 24 through 27 August 1998. It was conducted by the Biodiversity Study Centre of Cenderawasih University and the Mathematics-Natural Sciences Service Unit of the Faculty of Agriculture. Participants came from government institutions and NGOs like the Forestry Research Institute (FRI) of Manokwari, local government (BAPPEDA), WWF, YBLBC (local NGO for butterfly farming in Arfak Mountains), SSKSDA Manokwari (subsection in PHPA), Teluk Cenderawasih Marine National Park, Forestry Training and Education Institute, Study Centres from UNCEN

(Environmental Study Centre, Root Crops and Sago Research Centre, and Biodiversity Study Centre), etc.

Twenty-five papers were presented at this workshop, including a paper by keynote speaker Dr. Djoko T. Iskandar from ITB (consultant CIDA-EIUDP). The majority of papers discussed development patterns and strategic conservation management areas in Irian Jaya. Some recommendations came from the workshop. One important result of the workshop is that the Strategic Planning (RENSTRA) of the Biodiversity Study Centre of Cenderawasih University is now completed.

The Resource Management in Asia Pacific Project

from Anne Casson

In recognition of the growing importance of environmental and resource issues in the Asia-Pacific region, the Research School of Pacific and Asian Studies at the Australian National University in Canberra has gained funding from the Institute of Advanced Studies to establish a Project which addresses these issues. The Project seeks to further the process of cross-disciplinary dialogue within and beyond the forestry, water and energy, mining, agriculture, and marine resources within the East Asian, Southeast Asian and Pacific regions. Within this area, some emphasis on Indonesia and Papua New Guinea is anticipated.

The School is currently focusing a considerable portion of its future research effort on the social and economic transformation of the Asia-Pacific region, and on the social, political and environmental consequences of this transformation. The Project will draw upon the established research strengths of the School's five Divisions-- Archaeology and Natural History, Economics, Pacific and Asian History, Politics and International Relations, and Society and Environment-- where a large number of scholars are already engaged in research that either directly or indirectly addresses resource issues. The Project is intended

to provide some focus for this research, and to coordinate research efforts with other institutions.

The Projects' current research activities include:

- Mineral resources (PNG, Irian Jaya and New Caledonia).
- Social forestry (Indonesia, Thailand and Vietnam).
- Ecotourism (Indonesia, Thailand and Vietnam).
- Deforestation and plantation forestry (Indonesia, Thailand and Vietnam).

The Project has run fortnightly seminar series on resource management issues in the Asia-Pacific region since February 1996. These seminars aim to facilitate discussion and debate on critical resource management issues in the area, and to link scholars working in different disciplines and regions.

Working Papers drawn from these seminars have been produced and made available to the general public, scholars, policy-makers and other interested organizations in the region. These papers are available in hard copy or they

can be downloaded from the Project website :

<http://coombs.anu.edu.au/Depts/RSPAS/RMAP/rmapwww.html>

This project website advertises the seminar series, project publications and other events. It also provides resources such as tropical bibliographies and provides links to other relevant websites. Our ambition is to produce the leading internet location for resource and environmental issues in the Asia-Pacific region. (See the Available Publications list in this newsletter for a listing of some available articles from the Project)

For more information please contact: Anne Casson, Resource Management in Asia Pacific Project, Division of Pacific and Asian History, Research School of Pacific and Asian Studies, Canberra ACT 0200, Australia, phone: (61) 02-6249-4145, fax: (61) 02-6249-5525, email: casson@coombs.anu.edu.au

World Bank Prepares Possible Second Installment of Forestry Assistance

from Larry Orsak

A permanent endowment for funding conservation programs and projects in PNG may become reality in the next few years. This concept was piloted by The Nature Conservancy, who has engaged in extensive consultation with stakeholders over the past couple of years.

The project also tentatively plans to collaborate with the PNG government in a number of areas to further

strengthen forestry monitoring and assessments, and make protected area establishment more attractive to PNG's rural landowners. This is a further extension of work carried out under the old National Conservation and Forestry Action Plan (NFCAP).

GTZ Landowner Awareness Programme Comes to An End

from Larry Orsak

This program, funded by the German government and co-initiated with the Department of Environment & Conservation, has finished, sooner than many had hoped. The project had been developing eco-forestry projects at selected locations in PNG, but was probably most widely known for its production of Diwai, a newsletter that went to NGOs,

government departments, and interested individuals. Diwai was really the only means by which far-flung groups could share and learn about conservation happenings around the country. There is no word as to whether Diwai funding and production will be taken over, as originally intended, by the Department of Environment and Conservation.

WWF Kikori Integrated Conservation and Development Project

from Ed Colijn's newsletter

The Kikori ICDP covers the entire 2.3 million hectares of the Kikori river watershed, in the Gulf and Southern Highlands of south-western Papua New Guinea (PNG). At 6% of the terrestrial area of PNG it is by far the biggest ICDP in the country and the biggest ICDP operated anywhere in the world by WWF. It lies substantially within the geological Southern Fold Belt and accommodates a great diversity of habitats ranging from 3500 metre high mountains, to coastal mangroves, rugged limestone plateaus, sago swamps, perched lakes, lowland forests and marine systems.

The entire area has a population of 50,000 organised into seventeen ethno-linguistic groupings. Two thirds of the overall population is made up by the Huli tribe which is concentrated in less than one quarter of the watershed in the fertile highlands valleys of the Tari Basin in the north-western watershed. The population through the rest of the watershed is so sparse that there has been little, if any human impact on the environment which remains uniquely pristine.

A Conservation Needs Assessment funded by USAID, and carried out in 1992-93 by the the Biodiversity Support Program, on behalf of the Department of Environment and Conservation, designated the Kikori watershed very high to high priority for conservation because of (i) outstanding biodiversity value (ii) range of habitats (iii) important wetlands (iv) lack of scientific knowledge of the area.

In the mid -1980s an oilfield was discovered adjacent to Lake Kutubu in the upper watershed, leading to the development of the Kutubu Petroleum Development Project (KPDP) by a consortium of investors, the construction phase of which was completed in 1992. This was followed the discovery of a second oilfield in the middle watershed at Gobe. While the primary environmental impacts of the KPDP were very well managed by the operator Chevron, WWF was concerned that the development of extensive infrastructure through the area, exposed this pristine environment to very high risk from secondary environmental impacts, given the historical trends in Papua New Guinea (PNG), where industrial logging and large scale agriculture (principally oil palm plantations) have followed closely behind development

of infrastructure of any kind. These sorts of developments have brought environmental disaster on an unprecedented scale in PNG. Accordingly, WWF approached the consortium Kutubu Joint Venture Partners (KJVP) through the operator Chevron, with a proposal to establish an ICDP in the watershed that would help to mitigate the secondary impacts risk, with funding from the KJV. After a period of negotiation between WWF, KJV and the Government of Papua New Guinea, agreement was reached between all parties and the KJV agreed to fund the Kikori ICDP with US\$ 3.338 million for Phase I of the project (three years commencing July 1994). They have since agreed to fund US\$ 4.35 million for Phase II (three years from January 1998) The Kikori ICDP which commenced operations in June 1994, is also raising funds from other sources since the revenue from the petroleum field is in rapid decline and funding support cannot be expected beyond the current commitment for phase II.

The project currently operates with a multi-disciplinary team of 25 full time staff plus four volunteers and six mobile team members. Through phases III and IV, the involvement of WWF will scale down to accommodate more hands on participation by the community. By the end of phase IV the project will be entirely operated by the community.

Goal and Strategy:

The goal of the Kikori ICDP is to conserve the rich biological diversity of the Kikori watershed while laying foundations for current and future generations to meet human needs through the sustainable use of their natural resources. In formulating appropriate strategies to achieve this goal, Kikori ICDP identified the following threats to the realization of this goal:

- (i) industrial logging
- (ii) large scale agriculture
- (iii) mining (including petroleum development by less environmentally sensitive developers)
- (iv) large scale fishery
- (v) in-migration
- (vi) social disruption in transition from subsistence to cash economy

In order to meet its goal, the Kikori ICDP has developed the project plan which is comprised of six broad strategies which are being implemented under the following programs:

- (i) a biological survey program inventories the natural resources in the watershed and continually updates the baseline data developed by this program. This program is vital to the monitoring of developmental impacts in the watershed and also provides the information needed to make important community and government land use planning decisions.
- (ii) an education and awareness program is developing awareness and building capacity in the community to make informed choices in the use of their natural resources. This program also seeks to develop appropriate community organisational structures to serve community interests.
- (iii) a protected area development program sets aside areas selected by local communities for formal and informal protection, with technical assistance and training from WWF

(iv) a sustainable development program provides training, access to finance, and technical assistance to establish and run small to medium scale enterprises that are economically and ecologically sustainable, and are strongly linked to conservation.

(v) an external affairs program seeks to create an enabling environment through the development of an understanding of and support for the Kikori ICDP amongst the public and all stakeholders.

(vi) a monitoring and evaluation program tracks and measures the progress of the project against clearly defined plans.

Achievements of the Kikori ICDP Project:

In the past four years the project has achieved very significant progress against very heavy odds while struggling against three giant logging companies and a system that is designed to support industrial logging for the revenue that this sector brings to the government.

The achievements include:

- * comprehensive ecological and biological surveys formally documented baseline ecological and biological data which is being used to monitor changes in biodiversity status in watershed, and provide information for land use planning decisions
- * highly successful community fisheries resource monitoring and management study was completed at Lake Kutubu to analyse the cause of reported fish stock decline in size and numbers in the lake. With a new fisheries management plan in place the fish stocks in the lake are making a remarkable recovery
- * very effective environmental awareness program developed strong capacity to make informed decisions - many communities rejected industrial logging and last four years less than half a percent of the ICDP area logged.

Community institutions developed:

- * two wildlife management areas (WMAs) established and two additional WMAs in process. Lake Kutubu in process of registration as RAMSAR site
- * two community based eco-forestry projects established and operating successfully
- * central eco-timber processing and marketing and technical support facility established
- * eco-tourism pilot project established and operating at Lake Kutubu
- * butterfly farming and trading enterprises established at Mt Bosavi and Lake Kutubu
- * womens business enterprises established at Mot Bosavi through production and sale of billums and clothing.
- * overseas volunteers attracted to project to work on education and community development programs
- * project independently raising supplementary funding (institutional support for project by Department of Environment and Conservation, World Bank, NGOs and grass roots communities)

Conclusion:

The Kikori ICDP is making a very significant impact in the Kikori watershed. Community conservation awareness and has taken a quantum leap forward and is now being translated into strong community conservation action on a wide scale.

Community management of natural resources has become a priority for many communities who are now reaping the benefits from the ICDP's sustainable development program, as an alternative to destructive forms of development.

Daniel R. McCall
Project Manager
dmbf@chevron.com



Current Research Updates

If you have recently finished work or are currently doing a project, please send a summary for inclusion in the next newsletter--**thanks!** Remember that research articles should still be submitted to journals for publication. We just want to print a summary of your work to let people know what is going on without having to wait for the lag-time involved in regular journal publications and so that summaries of all current work can be found in one location. We want to make it easy for everyone to keep informed about all of the current research in New Guinea, so please send your information!

Cucus Thought to be Extinct found in Madang

from Felix Kinbag

A cuscus previously thought to be extinct has been confirmed to be inhabiting the Madang Province of Papua New Guinea. The Black-Spotted Cuscus (*Spiloglossus rufoniger*) was recently discovered as a living animal in the Bismark Ramu area of the Madang Province. The discovery was made by a team of specialists from the Department of Environment and Conservation's Biodiversity Conservation and Resource Management, the National Museum, the Forest Research Institute and the Christensen Research Institute during the 1995 Biological Survey Expedition in the area. It is

the largest of all the Palangerids in New Guinea and the second largest in the world weighing 6.5 kg.

The species was last recorded living from the Huon Gulf to the Irian Jaya border during the Archibald Expeditions in the 1930s. Only 15 specimens are represented in collections worldwide. Tim Flannery, an expert on NG mammals, has hailed the Department of Environment and Conservation discovery as a major international event of scientific importance.

Comparative Ecology of Mountain Cuscus (*Phalanger carmelitae*), Silky Cuscus (*Phalanger sericeus*), and Coppery Ringtail (*Pseudocheirops cupreus*) at Mt. Stolle, Papua New Guinea.

From Leonardo A. Salas, University of Massachusetts, Holdsworth Natural Resources Research Center, Amherst, MA 01003-4210, U.S.A. salas@forwild.umass.edu

This research was conducted at Mt. Stolle, Sandaun Province (some 50 Km NE of Tabubil), and comprised approximately 20 months of field work. The animals (numbers vary between years from 8-16 coppery ringtails, 9-17 mountain cuscuses, 2-4 silky cuscuses) were captured, fitted with radio-collars, and a luminescent tag (called "Betelight") was attached to some of them for night-time monitoring. Several ecological and behavioral data were collected from these animals, including: kind of hole used for sleeping, species of tree, dimensions of the tree, size and height of hole in the tree, and time when the animal is active. Those with luminescent tags were followed at night from when they leave their hole until 11:00pm (usually 4 hours), or until weather permitted. Approximately 100 hours of night-time observation were recorded for each both mountain cuscuses and coppery ringtails, and only 20 were recorded for the silky cuscuses. For these animals the following additional information was recorded: total distance traveled, relative distance traveled (a direct line from hole to place where recording stopped), home-range, diet, behavior performed in an instantaneous sampling (point sampling) every five minutes, and use of the ground. Sex, weight, response to induction with Ketamine, and reproductive status were recorded for all animals, and radio-collar dates will be used to estimate survival rates. Skin samples were also collected. To evaluate selectivity in diet and

tree use for sleeping, a sample of 5 hectares of trees DBH>10cm was conducted. Data is yet to be analyzed, but relevant outcome fits well with expected results. The coppery ringtails (the smaller, yet reportedly the most folivorous of the 3 species) seem move less and spend more time resting than the cuscuses. All three species eat frequently from a few *Podocarpus* and *Garcinia* species, and apparently somewhat less commonly from laurels, *Syzygium* species, and *Elaeocarpus* species. The fruits and leaves of several *Pandanus* species were eaten as well. These include one canopy species, one sub-canopy species, one understory species, and at least two climber species. Ringtails seem to use holes in moss beds more commonly than cuscuses, which were more commonly found in holes in trees. Cuscuses were seen foraging less than 1m above ground but always on a liana or next to a large tree, whereas ringtails used holes in the ground (within the roots of trees) and walked atop fallen logs or on top of bushes in canopy gaps. Mountain cuscuses were seen fighting with coppery ringtails and among themselves, even to the point of falling to the ground. Several observations support the contention that there is intra- and interspecific competition among these 3 species of arboreal marsupials. This research was supported by The Wildlife Conservation Society, Bronx, NY 10460, U.S.A.

The Palm Flora of Waigeo Island

from Charlie Heatubun

Palms belong to the family Arecaceae (Palmae) and have long been known to humans for their many uses in everyday life. Waigeo is an island in the Raja Ampat Archipelago and is interesting and important biogeographically because it is located on the Lydekker line and is just north of the New Guinea mainland. Thus, Waigeo Island acts as a bridge for invading species from the Phillipines and other ecotone areas. From our research, we obtained 23 species (17 genera and 4 subfamilies) of palms that occur on Waigeo Island. We found a high radiation of

species in the genus *Calamus*. Palms are used by local people on the island for five main purposes: food and beverages, traditional medicine, construction and building materials, tools and equipment, and weaving material. The majority of the palms we found are new records for the island and 4 were new species. We are preparing descriptions of the new species for publication (*Daemonorops waigeoana* Maturbongs sp. nova, *Calamus* sp. (Maturbongs 415), *Pinanga* sp. (Heatubun 97), and *Sommieria* sp. (Heatubun 96, Wally 705).

Some Species of Palms in Teminabuan Forest Area, Sorong, Irian Jaya

from Charlie Heatubun

The attraction of palms is not only their biological aspect, but also their beautiful and varied form and many uses. These plants are usually found in tropical lowland forest, however their habitat is threatened by deforestation due to an expansion of plantations and human settlement. This situation occurs in the Teminabuan forest area. The purpose of this research was to identify and describe the palm species in the Teminabuan forest area, Sorong, Irian Jaya, and to make a

determination key for palm species in the area. The results show that the palm diversity in Teminabuan forest is relatively high. Ten species from seven genera exist in the area: *Areca macrocalyx*, *Calyptrocalyx* sp. 1, *Calyptrocalyx* sp. 2, *Caryota rumphiana*, *Drymophleous beguini*, *Gronophyllum pinangoides*, *Licuala* sp. 1, *Licuala* sp. 2, *Pinanga* sp. 1, and *Sommieria* sp. 1.

Botanical Expedition in Salawati and Batanta Islands, Irian Jaya

from Charlie Heatubun

In 1996, Herbarium Manokwariense explored plant communities in Salawati and Batanta Islands, Sorong, Irian Jaya. Both islands are located in NW Bird's Head Peninsula and are part of the Raja Ampat Archipelago. Results of the expedition show that the flora on both of the islands is very interesting. Salawati Island is dominated by Arecaceae, Orchidaceae, Polypodiaceae, and Anacardiaceae. On Batanta Island there are many Moraceae, Orchidaceae, Commelinaceae, and Myrtaceae. We collected 3330 fertile

herbarium specimens. We also found that the vegetation differences on the islands were probably caused by three main factors. First the geomorphological aspect (terrane acretion) of the islands is different. Salawati Island is on the Kemum terrane and Batanta Island is on the Waigeo terrane. Second, there is a barrier between the islands. Sagewin straits, which averages 5 km wide, acts as a natural barrier to species invasion. Third, endemism of species has occurred due to geographical isolation.

Gulf of Papua Prawn Fishery-- Papua New Guinea

from Barre Kare and Lester Baule

Stock Assessment

In 1996 National Fisheries conducted a stock assessment of the fishery by fitting a production model to historic catch and effort data for the period 1974-1993. This work defined the maximum sustainable yield (MSY) and the effort required to achieve it. The work estimated an MSY of 534 to 584 metric tonnes of target species (banana prawns) and an optimum effort of 72,200 to 95,800 trawl-hours.

However, it is well known that most prawn stocks do not comply to the equilibrium assumption implicit in stock production models such as Shaeffer (1956) and Fox (1970). A better option was to use the biomass dynamic models. These models have been used for penaeid fisheries such as the Australian Northern Prawn Fishery and have been shown to perform well. This re-assessment of the stock was jointly conducted by National Fisheries Authority and the Commonwealth Scientific and Industrial Research Organization (CSIRO) of Australia, in which they fitted a dynamic pool model to the catch and effort data for the period 1974-1990. The data from these years seemed to be accurate after reviewing the database. This resulted in an estimated

MSY of 579 metric tonnes of banana prawns. The effort was estimated to be around 58,000 trawl-hours. The value of effort estimated was less than that estimated by previous authors, but the MSY was within the prior range.

Seasonal Area Closures

Area seasonal closures of the fishery are important management tools, keeping sensitive areas free from trawling and allowing protection of "nursery areas." In 1995, 1996 and 1997 an area seasonal closure of the fishery was introduced as a management strategy aimed at controlling the size at first harvest of the prawn stocks. The duration and timing of the seasonal closures have varied over the years in an attempt to increase catches and value of the export-sized prawns. The current area closure is effective from 1st December to 31st March for the trawl grounds from Iokea to Cape Blackwood. Trawling may take place outside these areas, such as south of the line of latitude 08° 24' 42".

Future Research

- Ecological and biological studies of the major species of by-catch. The duration of the research would be for one to two years.

- Survey of coastal areas to determine distribution of inshore spawners and assess possible impact of inshore beam trawl fishery on these spawners.
- Survey estuarine areas to assess levels of subsistence fishing for juvenile prawns.
- Mapping of the fishing ground. This work would identify on the map the major nursery grounds for prawns, how much fishing effort and catch each fishing ground contributes to the total catch, the abundance of each species at each ground, the total management area, the closure areas, etc. The work has already begun, but extra money is needed to complete it. It is estimated that the project would need in the vicinity of K10,000. The completed work would benefit the industry and the

government by ensuring that the prawn stocks are effectively managed.

Monitoring of Management Plan

During the area closure from 1st December to 31st March, NFA in collaboration with prawn companies, uses vessels from the industry to carry out monitoring of the prawn recruitment. A memorandum of understanding (MOU) is signed between NFA and the trawler owner. In the MOU, NFA agrees to pay the trawler owner the catch taken during the hire period, usually about four weeks. An officer is placed on board to collect biological and fisheries data on prawns and also performs surveillance work to ensure that the trawlers do not fish inside the closed area.

Notes on *Cyclosa insulana* (Costa) (Araneae; Araneidae) of Papua New Guinea

from Gary Dodson

The following is an abstract from an article submitted to the Journal of Arachnology by Gary Dodson, Department of Biology, Ball State University, Muncie IN 47306 USA and William McClintock, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara CA 93106 USA.

The population of *Cyclosa insulana* we observed in Papua New Guinea had several distinct features. We found no webs with circular stabilimenta, and all female and juvenile spiders had linear stabilimenta dramatically larger than those previously reported in Spain (Neet 1990). While

stabilimentum orientation may enhance web conspicuousness against the background, we found no evidence that spiders manipulate stabilimentum orientation in response to web damage. Given their courtship behavior, *C. insulana* provides an excellent species with which to study the importance of communication in intra- and inter-sexual selection or sexual conflict. Males use direct and indirect competitive tactics to monopolize access to potential mates.

For more information please contact: Dr. Gary Dodson, address above, email: 00gndodson@bsuvc.bsu.edu

Short Updates from the PNG National Museum Department of Natural History

from Frank Bonaccorso

Jim Animiato and Gary Pace (University of Michigan at Flint) are collecting snails in Milne Bay, Madang, Lae and Enga this year. Bulisa Iova is working with birds on the Collingwood Bay survey. Frank Bonaccorso will be radiotracking rhinoceros beetles (!) with scientists from the

Cacao and Coconut Research Institute in Madang to try to find the breeding sites of the females. Frank is also continuing his work with John Winkelmann at Kau Wildlife Area in Madang radiotracking *Macroglossus* and *Dobsonia minor* bats.

1997 Field Report of Tree Kangaroo Conservation Project in Papua New Guinea

from Lisa Dabek and William Betz

The tree kangaroo conservation project is part of the Association of Zoos and Aquariums' (AZA) Tree Kangaroo Species Survival Plan (TK-SSP). The project is led by Dr. Lisa Dabek, Research Coordinator of the TK-SSP, and William Betz, graduate student at Southampton University (UK). The project is determining the conservation status of wild tree kangaroos through the research efforts of the project's own scientists and by training, encouraging and collaborating with other researchers and students in Papua New Guinea (PNG). It also hopes to increase knowledge about the natural history of tree kangaroos, to record traditional stories/beliefs about tree kangaroos, to support existing conservation and education projects, to set up new conservation education programs, and to encourage conservation awareness among landowners. The project is committed to supporting local University of Papua New Guinea (UPNG) students throughout the study. Dabek is coordinating with UPNG Professor James Menzies (Biology) to select and supervise students.

The project is using two approaches to learn about tree kangaroo populations. The first involves censusing at field

sites using Distance Sampling, a statistical technique designed to accurately estimate populations of hard to observe animals (Buckland et. al, 1993). It is hoped that this method will help determine what levels of population given areas can support. The second approach being used is landowner interviews. The interviews will give information about regional tree kangaroo abundance in the past and present as well as information about tree kangaroo natural history. The use of landowner interviews should give a general picture of tree kangaroo abundance over relatively large areas, while the Distance Sampling work will give more detailed results for smaller areas and also serve as a means of confirming landowner declarations of tree kangaroo status.

The project has concentrated most of its work on the Matschie's tree kangaroo. This species is endemic to the Huon Peninsula in northeast PNG. A field site has been established in the Western Huon along the Upper Bunum River near the village of Kewieng 1 (near Teptep). A good working relationship had been established with the local landowners, and the project researchers are in the third year of study.

The project is also beginning research on the Doria's and Goodfellow's tree kangaroos. These species are found principally in the Central Ranges of New Guinea, and a field site has been chosen near the village of Miamafu in the Crater Mountain Wildlife Management Area (WMA) south of Goroka. By choosing to work there the project can take advantage of an existing infrastructure for research, and can support the conservation aims of the WMA. Field work at the Miamafu site is being done by University of Papua New Guinea students, Kasbeth Evei and Russell Terry, and project staff.

In an effort to support conservation, the project seeks to make landowners aware that tree kangaroo populations are more vulnerable to overhunting due to their low reproductive rate compared to other species (Dabek 1994). However, because tree kangaroo meat and fur is highly valued and because of the cultural importance that hunting commands, the project does not attempt to discourage the hunting of tree kangaroos per se, but rather to encourage landowners to hunt sustainably. The project asks three questions of landowners. One, how easy was it for your father to find and kill tree kangaroos? Two, how easy is it for you to find and kill tree kangaroos now? Three, do you think your children will have the same opportunities to hunt tree kangaroos when they grow up? These questions often lead into a discussion with the landowners as to what measures they can take now so that in the future their children will have the opportunity to hunt tree kangaroos. Landowners are encouraged to manage their own landholdings by setting aside no-hunting zones. The no-hunting zone has been presented as a "bank" for wildlife, an area whose wildlife resources the people will always have and whose "interest", young animals dispersing, help to maintain stocks in hunting areas.

Teptep/Kewieng 1

In Summer 1997 a network of over 300 survey points was established in the Dendawang/Jarim field site. In 1997 and 1998 documentation of tree kangaroo dung was made by teams of 2 individuals at each point. Fresh dung was collected for later confirmatory DNA analysis. DNA can be extracted from dung and identified to species level to confirm that the dung was produced by tree kangaroos. Results were encouraging, with enough dung being observed to allow Distance Sampling techniques to be used. Data will be analyzed in 1998-1999. In 1998 the project started to use remotely-triggered "trip cameras" to document the elusive tree kangaroos and other species at the field site. So far this method seems successful and could be used for other PNG projects as well.

Other research pursued at Dendawang was tree kangaroo food plant collecting. Data for Australian tree kangaroo species suggests that they are dietary generalists, eating a wide variety of plants (Procter-Gray 1985). The results from the project's enquiries indicates that this is also true for Matschie's and other New Guinea tree kangaroo species. From 1996 to 1998, over 80 specimens of plants and fungi that were said to be eaten by Matschie's tree kangaroos were collected with the local name of food plants recorded. Preliminary identifications to family or genus level have been given for 63 of the specimens. Tree kangaroos are particularly attracted to ferns (both ground and tree), a variety of ground

and tree dwelling orchids, *Impatiens* spp., gingers and other succulent herbs, various vines, and the leaves and shoots of several tree species. The project will be collaborating with Dr. David Christophel (University of Adelaide, Australia) who has developed a method of identifying plants by matching leaf stoma patterns with the patterns on undigested leaf cuticle remnants in dung. By collecting samples of dung and food plant leaves the project can show exactly what the animals eat, and hopefully confirm the accuracy of traditional knowledge.

Mambawe and other landowners gave the following information about the natural history and hunting of Matschie's tree kangaroo, or "Klapgaman" on the Huon Peninsula:

- 1) Tree kangaroos are crepuscular (most active near dawn and dusk).
- 2) Tree kangaroos spend more time on the ground during good weather, but will spend long periods in the trees during rainy/cold weather or when people/dogs are disturbing them.
- 3) In the absence of human hunting pressure the tree kangaroos will form family groups.
- 4) Tree kangaroos were said to prefer "colder" areas, and were not to be found in areas lower than approximately 1800 m (6000 ft.).
- 5) Tree kangaroos found on the tops of high mountains (with grasslands) are smaller and blonder in appearance than the larger and browner animals of the montane forest. This could well be the case. An animal sighted by Betz and Dabek in 1996 at high altitude (10325 feet) appeared to be smaller and much lighter in appearance than another individual seen at 8500 feet. It has been reported that Matschie's in captivity will often lose fur coloration (i.e. become blonder), presumably due to some sort of nutritional deficiency. Perhaps Matschie's at the upper end of their range face the same problem.
- 6) Tree kangaroos are the most highly prized game for hunting.
- 7) Hunting is always done with the aid of dogs. Good hunting dogs were said to be rare, and highly valued by their owners. Men will often have to wait years before they get another one. Many or most dogs can hunt small mammals like rats or possums, but only a few dogs have the intelligence, strength, and disposition to be tree kangaroo hunters. Good tree kangaroo hunting dogs are highly valued.
- 8) Female tree kangaroos with young are easier to locate and kill. Male tree kangaroos are more elusive.
- 9) Usually tree kangaroos are hunted for personal consumption, but sometimes the meat is sold. If an animal is captured, it will be kept as a pet until it is old enough to be eaten, or sold.
- 10) Hunting has virtually exterminated tree kangaroos in the forests within a day's walk from Teptep and greatly reduced their numbers in the forest close to Kewieng 1.

Mambawe and some other Kewieng 1 landowners have been highly receptive to the conservation ideas that the project has presented. Mambawe has agreed to demarcate permanent no-hunting zones on his land. He has also tried to persuade other landowners in the region to do the same. The long term goal would be for Kewieng landowners to organize a landowners' association with Wildlife Management Areas similar to Crater Mountain WMA.

Upcoming Kikori Basin Biological survey

from Larry Orsak

In November, a month-long biological survey will be carried out by the World Wildlife Fund Kikori Project in the Gobe area., the nation's second commercial oil field. Sites will be surveyed at elevations ranging from 50-1250 metres. The survey will encompass plant, mammal, moth, and frogs/other reptile assessments, relying mostly on available in-country expertise, including Tanya Leary, Larry Orsak and several mangi binatang from Madang, and Lawong Balun. A recent bird survey in the area last May by Jarad Diamond found excellent un-hunted bird populations, including Harpy Eagle, birds-of-paradise, and cassowaries. The road that

accesses the oil field unfortunately makes more of this area accessible, and the biological survey will utilize that road for its study sites. Since the road opened, numerous long-billed echidnas have been encountered by Chevron staff. A new species of rat found on Mt. Kemenagi is suspected to also occur in this area.

This will be the second extensive biological survey carried out by the project. Copies of the first biological survey are available on request from: Tanya Leary, WWF Kikori ICDP, P.O. Box 11, Moro, Southern Highlands Province, Papua New Guinea. Or email: tlea@chevron.com

WWF Kikori ICDP to Establish Long-Term Biological Monitoring Program

from Larry Orsak

A long-term programme to monitor the impacts of sustainable forestry on biodiversity is soon to begin in the Kikori Basin (Southern Highlands, Gulf provinces). Already, four landowner ecoforestry projects have been established with the assistance of WWF-USA. The program will begin in November, when baseline pre-logging surveys will be carried

out in at least 2 of those areas. The sites (which collectively will cover 5 different forest types) will be re-monitored 6-12 months after harvest begins. The plan is to focus the assessments on bats, small ground dwelling mammals, moths, and plants.

Nontimber Forest Product Survey in the Kikori Basin

from Larry Orsak

Barry Evans (Brisbane, Australia), known for his extensive work developing galip nuts as a commercial non-timber forest product in the Solomon Islands, spent a month in the Kikori area recently. He screened plants at Mt. Bosavi and lower Kikori River, focusing on nuts, resins, and oils. He also assessed the overall potential of Okari in the Kikori Basin, since there are significant stands of Okari growing in the

lower basin area. During his visit, he provided training to Kikori project staff member Pinsip Anip in carrying out rapid assessments of non-timber forest products. Pinsip will continue these inventories for subsistence as well as commercial potential non-timber forest products in the Gulf area of the Kikori Basin.

Flowering and Fruiting Phenology of Lowland Forest Plants in the Kikori Basin

from Larry Orsak

Data collection will start in November in the lower Kikori Basin. The study is being coupled with dietary studies of frugivorous bats and birds. The purpose is to identify keystone tree species occurring in these forests, which need to be protected whenever local landowners engage in sustainable logging operations. During the course of these data collections, the WWF Kikori Project also will gather

information about the tree species being logged by landowners, and seed and fruit dispersal of those species. The study area has exceptionally dense populations of cassowaries and other bird and mammal life, which clearly is related to low hunting pressure, but also is probably related to the particular plant species composition of the area.

Management and Utilization of Wetlands and Swamp Forests at Lake Kutubu, Southern Highlands Province, PNG

from Larry Orsak

In October, the Kikori WWF ICDP will be involved in vegetation mapping at Lake Kutubu in conjunction with the Queensland Herbarium and the Forest Research Institute in Lae. Hydrologists are coming later in the year for hydrological sampling of peat swamp forests found at the lake. Oftentimes these forests hold endemic or unusual species. Tanya Leary will conduct a mammal survey in conjunction with the vegetation survey in October. Dr. Jared Diamond completed a bird survey for this area in May. During these assessments, there will also be information collected on traditional usage of

species in the area, to provide data for better management. The assessment is being funded by Kiendran, a Japanese conservation organization. It is a joint project of Wetlands International (Oceania) and WWF.

The Kikori WWF ICDP and the PNG Department of Environment and Conservation have completed the nomination for placing Lake Kutubu on the RAMSAR registry of international wetland sites of global significance. The nomination is currently awaiting ministerial action at the Dept. of Environment & Conservation.

Local Resource Owners Continue Lake Kutubu Fisheries Monitoring

from Larry Orsak

Lake Kutubu monitoring of the exceptional endemic fish fauna, which is heavily utilized by local people, is now well established. During the next few months, the WWF-USA Kikori Integrated Conservation-Development Project, working with local landowners, will continue to establish visual swim time transects to assess fish stocks at specific sites in Lake Kutubu, where the resource owners are proposing "closed" sites to fishing. The intended closure will be for 12 months, and assessments made before and after to assess effectiveness of these closure strategies. Last year, Aaron Jenkins and Pete Buston carried out scuba diving transects and also time swim transects. They found that most of the fish are in the top 5 metres of the Lake. Bottom dwellers, however, could not be assessed through this method, hence the planned sampling

strategy in which catch per unit effort will be assessed by gill netting. One of the main species to be focused on is the Southern Tandan, Fimbriate Gudgeon.

This project has been a clear case where local people are motivated to conserve not by indirect economic incentives or other enticements, but by the depletion of the resource of concern. The people of Lake Kutubu depend heavily on the endemic fish stocks for protein, and they have been aware of declines in catch and fish size. Concerned with this deterioration of their resource, they approached the WWF Kikori project and have actively taken on a major role in developing a Wildlife Management Area surrounding the lake, along with schemes to assess the Kutubu fish populations and manage them for the future.



This section is for anyone to use. You can send in announcements (for example, to advertise an upcoming meeting). You can also send in any requests for information that you think other newsletter recipients could help with (for example, if you are writing a paper about forest structure and want to find out who is currently working in this area or who you could collaborate with or exchange info with). Please send any announcements or information requests to Deb. This section includes some announcements from Ed Colijn's email news server.

Forestry Seminar Scheduled for 8-9 December 1998

from Terry Warra

The PNG Forest Research Institute is organizing a seminar entitled "BEYOND THE FIRST HARVEST" for 8-9 December 1998. The seminar is sponsored by the PNG Forest Authority and the Japan International Cooperation Agency.

The broad objective of the seminar is to inform forest managers, developers and forest owners of the state of our knowledge on the country's natural forest resources, to encourage dialogue amongst key participants of the forest industry, and to promote the concept of sustainable forest management.

Specific goals include:

- Review the state of our knowledge on the status of the residual stands after initial logging.
- Review progress and research findings in key areas in natural forest management.
- Discuss policy issues pertaining to sustainable forest management in PNG.
- Review the development of the forest industry in PNG, and what the future holds for the industry.
- Discuss and debate the adequacy of our present knowledge in meeting stake holders' expectations.

- Identify future research and development priorities on sustainable forest management indicators.

The seminar will encourage open debate and discussion on issues affecting the future of forest management in PNG. A panel of experts will be nominated to formulate resolutions, so that the seminar makes a worthwhile contribution towards sustainable forest management efforts in PNG.

The seminar hopes to attract a balanced representation from the full range of the participants in the forest industry. This will include forest managers, forest owners, forest developers and scientists.

A field trip to Oomsis Silvicultural Demonstration trial will be organized depending on interest.

The tentative programme includes sessions on: the status of logged over forest, silviculture of indigenous species, and a general session with case studies.

For more information please contact: Mr. Terry Warra, the Seminar Chairman, PNG Forest Research Institute, P.O. Box 314, Lae, Papua New Guinea, phone: (675) 472-4188, fax: (675) 472-4357, email: enir@global.net.pg

Job Announcement

World Wide Fund for Nature - Indonesia Program is seeking a **CONSERVATION BIOLOGY DIRECTOR** for the Taman Nasional Kayan Mentarang Project in Kalimantan Timur.

Reports to: Project Executant

Scope: The Conservation Biology Director will plan and coordinate biological and ecological research and monitoring activities by project staff and community representatives to collect

information for the development of a management plan for Kayan Mentarang National Park. S/he will be the Activity Executant of the WWF Germany grant, and be the primary person responsible for the conservation biology components of the DANIDA grant. At least 65% of the time will be in the field.

Main Responsibilities:

1. Biological Surveys: Carry out program of rapid biological surveys of the park, including participating in the majority of the surveys, including continuation of the program of training and development for the 5 members of the survey team. (30%)
2. Lalut Birai Forest Station: Provide guidance and support to the Director of the Lalut Birai Forest Station in regards to the long term ecological research program being conducted there, personnel (particularly training) and facility management, and the budget. Also responsible for continuing the effort to develop a consortium of national and international research institutions to eventually take over management of the Station, as well as to develop and coordinate a Research Committee. (15%)
3. The National Park Management Plan: Be the primary author of the sections of the management plan that concern the management of the biological resources of the national park and its buffer area, as well as contribute to the writing and editing of other sections (20%)
4. Internal Zonation of the National Park: On behalf of the park's biological resources, contribute recommendations on the zoning of the park into Use, Wilderness and Core Zones, in cooperation with other project staff, communities living in and near the park, and PHPA; as well as provide input as to which traditional uses are sustainable in the Use and Wilderness Zones (15%)

5. Reports and proposals: Write internal project reports and external reports to donors (for final clearance by the Project Executant), as well as proposals for continued funding of the project. (10%)

6. Team Participation: Collaborate as a member of the WWF/IP senior project management team, particularly the Education, GIS, Community Development, and Policy components; and respond to other duties, as assigned. (10%)

Terms and Conditions:

- + Competitive remuneration package
- + Relocation package, for employee and dependents, if hired from outside Samarinda
- + Hospitalization insurance, for employee and dependents, and Medical Evacuation Insurance for employee only
- + One year contract base with annual extension

Requirements:

- + Holds an advanced degree in biological field
- + Experienced in managing a medium- to large-sized project
- + Good command of Indonesian and English, both written and spoken
- + Preferably available to start working immediately
- + Must be in good health, extremely fit physically
- + Must be able to tolerate camping in the field during surveys
- + Must be able to swim

Please forward your curriculum vitae as soon as possible:

HRD OFFICER

JL. KRAMAT PELA NO. 3

GANDARIA UTARA

JAKARTA 12140

FAX: +021 7395907

E-MAIL: MHORHORUW@WWFNET.ORG

Information and photos needed for Forest Dragons-- *Hipsulurus*

from Ulrich Manthey

Since De Rooij in 1915 few people have worked on the genus *Hypsilurus* (*Gonocephalus*). Because most types for the New Guinea members of that genus are in Germany, I am preparing a revision of *Hypsilurus* with descriptions of some new species. For the manuscript I urgently need photographs of living animals. A determination is not necessary, but because the manuscript will be finished in late 1998, I need the photographs as soon as possible. It would also be very helpful to get some information about the habits and habitats of various species in this genus.

I am a free collaborator of the Zoological Museum in Berlin. I will publish the revision in a herpetological journal, and I am also working on "A Handbook of Agamid Lizards" with two co-authors. If we can use the photographs for the book, which is planned for 1999, we could pay a fee for using them.

Thank you very much for help in this matter. Please contact: Ulrich Manthey, Kindelbergweg 15, D-12249 Berlin, Germany, fax: (49) 30-715-1882, email: manthey.sseah@t-online.de

Tree Kangaroos and Research Sites

from Lisa Dabek and Will Betz

We have established two bush camps in Papua New Guinea and would like to invite other researchers to use these camps if they wish. One is on the Ja River and is a 2 to 3 day hike from Maimafu village in the Crater Mountain WMA. The second site is on the Huon Peninsula on the Upper Bunum River just south of Teptep/Wantoat at 2400 m elevation. The camp on the Huon Peninsula has a helipad.

We are also interested in obtaining information on tree kangaroos and in coordinating with anyone working on

this group. We are currently studying Matschie's (Huon), Goodfellow's, and Doria's tree kangaroos in the field and are eager to expand our knowledge of all species of tree kangaroos. Please contact us at: Dr. Lisa Dabek, Director of Conservation and Research, Roger Williams Park Zoo, 1000 Elmwood Ave., Providence RI 02907, USA, phone: (1) 401-785-3510 ext. 335, fax: (1) 401-941-3988.

Request for information to help with wildlife filming

My name is Irena Toxopeus, and I am a researcher at Zebra Film Productions Ltd in the United Kingdom. We are a wildlife production company and are in the middle of the production of a three part series on the natural history of Indonesia for the BBC Natural History Unit, which will be transmitted in January 2000. The structure of the series is as follows:

- (1) "An Explosion of Life": the geological life history and biodiversity of the area
- (2) "Meeting the Waters": the marine natural history of the area
- (3) "From Elephant to Kangaroo": the meeting of the east and west the biography of the Wallacea line.

Our next shoot will be Irian Jaya, where we hope to film birds of paradise and marsupials. I have been researching the potential options of filming marsupials in

the wild and in captivity. I was really hoping that you could provide me with some further details on the location of marsupials in the wild, any guides or contacts who could help us locate them and any people who hold them in captivity. We are particularly interested in tree kangaroos (Grizzled, Dingiso, Dorias, Goodfellow, Huon), cuscus (Steins, Ground, silky, Spotted), sugar glider, new guinean quoll, striped possum, long-fingered triok, long-tailed triok, agile wallaby.

We will be going out at the beginning of September, so any help would be very much appreciated.

Thank you so much, and I hope to hear from you soon.

Yours sincerely,

Irena Toxopeus, Researcher, Zebra Films

Tel: (44) 117 970 6026

Fax: (44) 117 973 6866

Request for information about Sea Turtles

IUCN-The World Conservation Union, is beginning to look in detail at the status of marine sea turtle conservation in the Indian Ocean. In conjunction with our regional and country offices, Marine Turtle Specialist Group and others, we wish to develop a comprehensive picture of the current status of marine sea turtle conservation in the region.

I would be grateful for any information you may have on current sea turtle conservation projects, migration

routes, feeding and nesting grounds, as well as current threats to specific species.

Thank you for your assistance.

Timothy Bagley, IUCN - Washington Office, 1400 16th Street NW, Suite 502, Washington, DC 20036, Tel: 202-797-5454

Fax: 202-797-5461

E-mail: tbagley@iucn.org

Internet: www.iucn.org

Request for information about Pesquet's Parrot

Hello, my name is Maggie J. Teets, and I am a graduate student working to get a Ph.D. project together in PNG to study parrot behavior. My intention for my thesis work is to characterize the breeding biology of Pesquet's Parrot. It is my understanding that this parrot is used as part of the wedding ceremony of many native peoples in PNG. I would like to know more information regarding the exact hunting practices, the use of the feathers, and the feasibility of using captive bred birds instead of wild

caught birds. Any information that you can give me would be very helpful.

Thank you very much for your time.

Sincerely,

Maggie J. Teets, c/o David M. Watson, Natural History Museum and Biodiversity Research Center, 709A Dyche Hall, The University of Kansas, Lawrence, KS 66045-2454 USA

email: vergil@falcon.cc.ukans.edu

Request for specimens of Annonaceae

I am studying the Genus *Mitrephora* (Annonaceae) of Malesian region. I would be much thankful if someone can provide me pickled material of *Mitrephora* specially flowers and fruits for ultra-structural studies. And also I would like to know whether any taxonomist attached to an institute of this region could help me to make some field collections in an official way. I can finance myself for the field work.

Thanks very much!

Please contact: Aruna Weerasooriya, Department of Ecology & Biodiversity, Plant Systematics Laboratory, Rm 129, 1/F, Eliot Hall, The University of Hong Kong, Pokfulam Road, HONG KONG

email: aruna@hkusua.hku.hk

Request for information about New Guinea Frogs

from Anthony Parak

If anyone has any reprints on frogs of New Guinea, or could send xeroxed papers about frogs in New Guinea, I would appreciate it. Our local libraries do not have much material on this topic and since some of you are herpetologists working in New Guinea, perhaps you could help. Thank you very much.

Please contact or send papers to: Anthony Parak, National Museum and Art Gallery, P.O. Box 5560, Boroko 111 NCD, Papua New Guinea, email: pngmuseum@global.net.pg (address email to Anthony Parak please).

PNG Forestry College, Unitech, and Bulolo University College

from Lawong Balun

The former PNG Forestry College is now a campus of PNG University of Technology, and is now called Bulolo University College (BUC). The campus is now an integrated part of the Forestry Department at the

Taraka Campus. The academic head of the department is Mr Kulala Mulung (MSc-Bangor). The administration of the BUC campus is under the principalship of Mr Steven Sangau.

Entomology at Bulolo

from Lawong Balun

Dr. Michael Schneider of the Bulolo University College campus of the PNG University of Technology has done extensive field work on the insect pests of the Wau-Bulolo Pine plantation. He is currently researching into the food plants of the NG Birdwing Butterflies. Anyone

working in these areas is welcome to contact Dr. Schneider at Bulolo University College, P.O. Box 92, Bulolo, Morobe Province PNG, phone: (675) 474-5226, fax: (675) 474-5311, email: forcol@online.net.pg

Information Needed about Environmental Education in Papua New Guinea

from Alison Ormsby

I am seeking information about existing conservation and education programs in Papua New Guinea. If you have information about educators, literature sources, or funding opportunities for environmental education programs, please share by contacting me! I am embarking on a PhD focusing

my dissertation research on the environmental attitudes of the people in Papua New Guinea. Thank you for your advice and help: Alison Ormsby, 35-38 29th Street, Apt. 3R, Astoria NY 11106 USA, email: a_ormsby@hotmail.com

References by Tom Vigus Needed

I have been trying to get copies of papers by Tom Vigus (or Vigas?) on sustainable forestry in PNG. Could anyone help me with this? Please contact: William Ginn, The

Nature Conservancy, 90 Minot Road, Pownal, ME 04069 USA, fax: (1) 207-688-2235, email: wjginn@csi.com

Formation of Flora Malesiana Internet Discussion Group

The Flora Malesiana Network listserver's discussion group was setup as a respond to numerous requests made by participants in the Fourth Flora Malesiana Symposium in Kuala Lumpur (20-24 July 1998). It was felt that members of this fraternity were badly in need of an efficient means of information exchange. Other botanical initiatives have long been exploiting information technology in sharing their knowledge and recent data, planning future expeditions, and reporting progress of their revisions. The establishment of this electronic discussion group hopefully will also greatly enhance communications between botanists in overseas herbaria and local institutions.

The Flora Malesiana Network Discussion Group is currently hosted by the Malaysia Biodiversity Online server in the Herbarium Mohd Kassim Rejab (UKMB), Department of Botany, Universiti Kebangsaan Malaysia

<http://biodiversity.ukm.my>. The list was created, tested, and commissioned on the 23 July 1998, and is now open for free subscription to botanists interested in the flora of Malesia.

To join the group, as usual, you need to send an email from your system to: Listserver@herbarium.ukm.my and include in the body of message (not in the subject line) subscribe floramalesiana YourFullName (i.e. subscribe floramalesiana David Doe)

If you need further assistance, please do not hesitate to email us: pakdin@ukm.my, pakdin@tm.net.my or latiff@ukm.my

K Mat-Salleh & A Latiff
Herbarium Mohd Kassim Rejab (UKMB)
Department of Botany
Universiti Kebangsaan Malaysia
43600 Bangi

Shuffling at the Department of Environment & Conservation in PNG

from Larry Orsak

Although the transition to an office under the Department of Lands seems less clear-cut now, there has been a physical upheaval in the Department as staff from the traditional headquarters at the Central Government Office Building have been moved 5 minutes walk away, to the

privately owned Somare Haus. Somare Haus is the tall building located near the National Library and next to the old Australian High Commission building. Phone numbers have all changed!

Call for Research Grant Applications from Developing Country Scientists Working in the Field of Aquatic Resources

The International Foundation for Science (IFS) provides support to young scientists of merit in developing countries by awarding research grants and providing grantees with additional services such as travel grants and purchasing assistance.

Within the scope of Aquatic Resources, projects can relate to research dealing with the ecology and sustainable management of aquatic resources. Simple surveys should not be included.

Project proposals dealing with aquaculture research, ie site selection, selection, breeding, rearing, and nutrition of cultivable organisms, and disease control are invited. Relevant research in fisheries, aquatic biology and ecology, environmental impact including coastal zone management, and ecology of species and ecosystems can be proposed in applications.

Research grants are awarded up to a maximum value of USD 12,000 for a period of one to three years and may be renewed twice. They are intended for the purchase of equipment, expendable supplies, and literature.

Applicants must be citizens of, and carry out the research in, a developing country (countries in Europe, including Turkey and Cyprus, or the former Soviet Union, do not qualify for support). They should also be employed at a university or national research institution in a developing country. As well as being under the age of 40 (under 30 for applicants from China) and at the start of their research career, candidates must possess a higher academic degree, which should be at least an MSc or equivalent.

The IFS supports projects dealing with the management, use, and conservation of biological resources and their environment. The Foundation organizes its activities into six Research Areas, viz Animal Production, Aquatic Resources, Crop Science, Food Science, Forestry/Agroforestry, and Natural Products.

For further information and application forms in English or French write to:

IFS, Grev Turegatan 19, S-114 38 Stockholm, Sweden

Fax: +46-8-54581801

Email: info@ifs.se

Website: <http://www.ifs.se/>

WWF Kikori Integrated Conservation-Development Project Takes On New Staff

from Larry Orsak

Conservationists in PNG rarely go away, they just go on to other projects and NGOs. The Kikori project has recently taken on some well known faces. Max Kuduk, most recently of Village Development Trust, has become the Gulf Area manager for the project and is based at the Kopi Chevron Camp near the lower Kikori River. Olo Gebia, an experienced

forester formerly of Wau Ecology Institute and the Gulf Provincial Forestry, has become forest ecologist. Rejoining the project after a year's sabbatical with Northern Territories Parks and Wildlife, Tanya Leary is again in the environmental monitoring position. Larry Orsak is continuing as conservation education officer and trainer.

More on the International Symposium on the Biogeography of SE Asia 2000

from Ed Colijn's news server

The Quaternary marine (palaeo)biogeography of SE Asia is one of the 15 planned sessions of the International Symposium on the Biogeography of SE Asia 2000 to be held 4-9 June 2000, in Leiden, The Netherlands.

Organisation

The National Museum of Natural History, the Rijksherbarium/Hortus Botanicus (both in Leiden) and the Netherlands Research School of Sedimentary Geology (NSG), Amsterdam.

Marine biogeography and biodiversity

Scientists and students who have a serious interest in the biogeography of marine organisms and the biodiversity of marine ecosystems in SE Asia, such as coral reefs, may be interested to attend the session on Quaternary marine (palaeo)biogeography of SE Asia. Those who have suggestions for topics relevant to this session or would like to participate, and therefore would like to receive more information in the future, should contact the convenor.

Why SE Asia?

Southeast Asia has received much attention in recent years, both from earth scientists and biologists. It is a region where several lithospheric plates are colliding and this process of ongoing mountain building has resulted in a very complicated biotic history. It comprises major hotspots of global biodiversity. However, the natural environment is much under

threat and increased attempts are being made to study and to preserve what is left. It has become clear in recent years that the abiotic and biotic developments can only be understood if they are studied in an integrated way. Therefore both earth scientists and biologists are invited to share their knowledge of specific aspects concerning Southeast Asia.

The aim of the symposium

The main aim of the symposium is to give a comprehensive and integrated summary of the knowledge at the start of the new millennium. Although there will be ample room for short communications and posters, the accent is on review papers covering all aspects of historical biogeography of the area, including geological developments, palaeoclimatology, marine and terrestrial life, plants as well as animals. In addition, attention will be paid to methodology, and to "applied biogeography" and conservation. Special themes may include monitoring of Global Climatic Change and Biodiversity assessments. The meeting will consist of invited presentations, contributed lectures and posters, and workshops such as on computer applications and on multidisciplinary research themes.

It is intended to publish the review papers as a book that reflects the main aim of the symposium: a comprehensive and integrated summary of the knowledge at the start of the

new millennium. The other contributions will either be published separately or as part of the book.

The scientific programme is proposed to consist of five sections, each with several sessions. For each section several people have been or will be approached to act as convenor. Since the coverage is not yet complete, we invite you to suggest additional names, with particular emphasis on names of people from SE Asia. Convenors for a session will receive the addresses of the other convenors for the same section enabling them to act in concert.

1. Methodology
3 sessions: Geology; Palaeontology; Biogeography
2. Mesozoic
2 sessions: Geology & Palaeontology; Gondwana distribution patterns in recent organisms
3. Tertiary
3 sessions: Geology/Plate tectonics; Palaeontology; Tertiary distribution patterns in recent organisms
4. Quaternary
4 sessions: Geology & Climatic Change; Terrestrial (palaeo)biogeography; Marine (palaeo)biogeography; Human Impact

5. Applied Biogeography
3 sessions: Biodiversity Informatics; Global Change; Societal Needs & Conservation

Attendance from SE Asia

Researchers and students from the Southeast Asian Region are especially invited to attend the symposium and to contribute with lectures and/or posters. The Steering Committee and the International Organizing Committee will do their utmost to improve funding possibilities for participation by people from SE Asia.

Convenor for this session:

Hoeksema@Naturalis.nnm.nl
Dr. Bert W. Hoeksema
National Museum of Natural History Naturalis
P.O. Box 9517
2300 RA Leiden
The Netherlands
Tel.: +31.71.5687631
Fax: +31.71.5687666
E-mail: Hoeksema@Naturalis.NNM.nl

Internet Sites to Check Out: (this section aided by Ed Colijn's news server)

(and don't forget to sign up for Ed Colijn's weekly news server if you have email access (about conservation and research in Indonesia and PNG) -- contact Ed at: edcolijn@bart.nl)

<http://www.wcmc.org.uk/trees/>
<http://coombs.anu.edu.au/Depts/RSPAS/RMAP/rmapwww.html>
http://www.motherjones.com/coral_reef/indonesia.html
http://www.motherjones.com/coral_reef/papua.html
<http://win.tiho-hannover.de/croc/>
<http://ww3.datec.com.pg/CRC/default.html>
<http://www.wri.org/wri/indictors/reefrisk.htm>
<http://www.counterpart.org/png.htm>
<http://www.bishop.hawaii.org/bishop/natsci/ng/ngecol.html>
<http://www.sul.stanford.edu/depts/branner/vegmaps.htm>

<http://www.irja.org/conf.htm>
<http://www.wcmc.org.uk/forest/data/>
<http://coral.aoml.noaa.gov/lists/directory.html>
<http://www.anbg.gov.au/fm/>
<http://www.wcmc.org.uk/forest>
<http://www.irjava.or.id/>
<http://wbIn0018.worldbank.org/essd/forestpol-ensf/MainView?OpenView>
<http://glsun2.gl.rhbnc.ac.uk/seasia/html/abstracts.html> (abstracts of the Biogeography and Geological Evolution of SE Asia Meeting of 6-7 March 1996)

Research Stations



This section is for contributions describing research facilities in New Guinea. If you have information about a place where researchers are welcome to come and work, please send a summary. Include the location, altitude, available facilities, logistics of getting there, and a contact name, address and fax number. If you want to send some pictures too, we can scan them into the newsletter. Thanks!

Mekil Research Station

from Leo Salas

Mekil Research Station is located at Mt. Stolle (4° 48' S; 141° 39' E), Sandaun Province. The closest town to the mountain is Tabubil, approximately 50Km to the southeast. In a diametrically opposite direction to Tabubil there is a mining enterprise some 40Km away, the Nena River project, with a big airstrip at Friedda River.

Even though a large variety of wildlife can be found at Mekil, many of these typically use large home ranges (for instance, cassowaries and tree-kangaroos). Unfortunately, Mt.

Stolle has a very difficult topography and is too isolated to make research on these animals quite difficult, even though they occasionally eat and sleep around the house. Yet, many small ground-dwelling or arboreal mammals, reptiles, amphibians, and frogs are so common and use areas so small that Mekil is perfectly suited for research on them. These include, among the mammals, the painted ringtail, the coppery ringtail, the mountain cuscus, the greater-tailed triok, the western white-eared giant-rat, and some species of small mice.

Less common are the pygmy ringtail and some species of wallaby. Through occasional captures and a small trapping project Suzette Stephens documented at least 31 different species of mammals (only 2 bat species included, because no serious mist-netting effort has been done), and 59 species of birds around the house.

The locals made only occasional hunting trips up the mountain in the past, mainly because it is very wet, foggy, rainy, and cold most of the time. A few gardens are located at the base of the mountain and on the slopes of mountains nearby, but the middle and upper part of the mountain were never cleared for gardens, nor hunted intensively. The five or six families that maintain the closest gardens also built a few houses some 3 hours away from the border of the mountain. The two main villages are located some 12 Km away - at least 6 hours of walk. The total population of the landowners of Mekil is approximately 220 people, and they own an area exceeding 600 Km². Work opportunities at the mining project have also helped keep hunters away from the mountain.

In 1991 Keyt Fischer convinced the locals to protect an area of the mountain covering roughly 2,500 hectares for research and conservation. The border of the protected area is located at 1,400 m in elevation, and the protected area goes all the way to the top of the mountain, at 2,800 m. Thus, at least 4 different types of vegetation can be found within 2-3 hours of walk from the house.

The limited climatological records available for the research station indicate over 7,000 mm of rain a year, and temperatures ranging between 10° and 20° Celsius (upper 50's to mid 70's Fahrenheit). Clouds tend to accumulate almost every day around the house blocking the sun and making the temperatures commonly stay around 16° C.

Keyt Fischer and the locals built a house up in the mountain, and an area right next to it was cleared to act as a helipad to carry cargo, passengers, or to arrive in case of an emergency. The nearest airstrip is located in Mianmin village, some 16-18 Km away, at least 10 hours by walking. It is also almost 1,000 m in elevation lower than the house. Travelling to and from Port Moresby can be very expensive. The most

direct and economic way is by flying with MBA to Tabubil and making a connection with MAF to Mianmin. A round trip this way would cost around \$400. Unfortunately, Tabubil is also a very cloudy place and planes usually have difficulty landing there. It is not uncommon that a flight has to be diverted to Kiunga, or cancelled altogether. Because of this, and because buying supplies may take time, spending at least a night in Tabubil is almost mandatory. There is only one hotel in Tabubil (Hotel Cloudlands) and it offers three levels of accommodation. The cheapest is K90 (\$40). There is a big food store, hardware store and a pharmacy at Tabubil, all adequately supplied. MAF can also fly passengers from Mt. Hagen, Vanimo, and Wewak, all of which are more expensive than flying in from Tabubil, especially if heavy loads of equipment and food must be included in the flight.

The house is made out of plywood, with iron poles and tin roof. It is equipped with benches, 2 bedrooms, 2 kitchens and gas stoves, and 2 bathrooms. It has solar-powered lights, and solar-heated and fire-heated shower. Additionally, there is a 2Kwatts generator and 7 drums of diesel still full at the place. There are many repair and research tools in storage (torches, a scale, snare traps, kerosene stoves, power converters, etc.). We even made a clay oven to bake bread and pizzas!

Through the help of a couple of anthropologists (Robbie and Belinda Blinkoff), an agreement was made with the locals regarding workman salaries, porter salaries, research fees, food, etc. Also, there are more than 25 Km of trails that are demarcated and mapped, as well as a 5-hectare sample of trees of DBH>10 cm. This is the largest such sample ever made of trees so high up in the western highlands of PNG. The database, both with scientific and local names, is available to any future researcher.

A copy of the agreement with the locals, an inventory of the materials at the place, pictures, copies of the database and maps can all be requested to: salas@forwild.umass.edu or write to: Leo Salas, University of Massachusetts, Holdsworth Hall, Amherst, MA 01003; phone: (413) 545-4338; or fax: (413) 545-4358.

Diseases you should know about



This section is to make sure that we are all aware of the various diseases we need to look out for in New Guinea. Many diseases you would not get in town, but only by working in the forest or in a village, and doctors might not be able to diagnose these diseases easily. If you know about a disease that we should be aware of, PLEASE send in a description, or at least the name of the disease, so we can look up information on it to include in a future issue of this newsletter—thank you! Folks at the Institute of Medical Research—can you help us?

Malaria

The name malaria comes from “mal aria” which means bad air. People used to think that the disease was caused by breathing bad air. We now know that mosquitos from the genus *Anopheles* carry the parasite and when a female mosquito bites you the parasites are released into your bloodstream (male mosquitos eat only plant juices, not blood). They then travel to the liver where they multiply. After 9-16 days the parasites leave the liver and go back into the

bloodstream where they multiply in the red blood cells until the cells burst. This causes fever and anemia (loss of blood cells). *Anopheles* mosquitos only bite from dusk to dawn; so the evening hours, nighttime, and morning hours are when you can contract the disease. In endemic regions like New Guinea, many people develop a resistance to the parasites so that they have chronic low levels of felling ill, but do not have acute symptoms that are life-threatening.

There are two types of malaria parasites in New Guinea: *Plasmodium vivax* and *Plasmodium falciparum*. The latter is the most dangerous and can lead to fatal cerebral malaria (1% of all cases) where the infected red blood cells obstruct the blood vessels in the brain. In the same manner, other major organs can be damaged by the disease.

For over 2000 years people in China have used an infusion of the qinghao plant (*Artemisia annua*) to treat malaria. The active ingredient in this cure, qinghaosu (artemisinin) has only recently been isolated and identified and new drugs are being developed. In Peru people have used the bark of the cinchona tree since the 1400s to cure malaria.

This tree, *Cinchona ledgeriana*, is the source of quinine. Quinine is sometimes taken in conjunction with Fansidar as a treatment for malaria, but quinine has unpleasant side effects.

In New Guinea there are malaria strains with resistance to **all** of the drugs listed in the tables below (these drugs may not be effective in some areas of New Guinea). You should always try to avoid mosquito bites.

Symptoms: fever, shivering, pain in joints, headache (similar to onset of flu)

References: <http://www.cdc.gov/travel/index.htm>
<http://www.who.int/ctd/html/malaria.html>

Prevention: Take either Mefloquine, or Doxycycline, or a combination of Chloroquine and Proguanil.

Drug	Usage	Adult Dosage	Child Dosage
Mefloquine (Lariam®)	In areas where Chloroquine-resistant malaria has been reported. Take one week before going into infected area, weekly while there, and once a week for 4 weeks after leaving. Side effects: gastrointestinal disturbances and dizziness. Do not take if you have a history of epilepsy or psychiatric disorder or if you have a sensitivity to this drug.	228 mg base (250 mg salt) (one tablet), orally, once per week	< 15 kg: 4.6 mg/kg base (5 mg/kg salt) 15-19 kg: ¼ tab per week 20-30 kg: ½ tab per week 31-45 kg: ¾ tab per week > 45 kg: 1 tablet per week
Doxycycline	An alternative to Mefloquine. Take one day before going into infected area, every day while there, and daily for 4 weeks after leaving. Side effects: skin photosensitivity (wear sun-screen). Do not take if you are pregnant, under 8 years of age, or if you have a sensitivity to this drug. This is an antibiotic.	100 mg orally, once per day	> 8 years of age: 2 mg/kg, orally once per day, maximum dose of 100 mg per day
Chloroquine (Aralen®)	In areas where Chloroquine-resistant malaria has not been reported, or in combination with Proguanil (see below). Take one week before going into infected area, weekly while there, and weekly for 4 weeks after leaving. Side effects: upset stomach, headache, dizziness, blurred vision, itching.	300 mg base (500 mg salt) orally, once per week	5 mg/kg base (8.3 mg/kg salt) orally, once per week, maximum dose of 300 mg base
Proguanil (Paludrine®) (not available in the USA, but available in most other countries)	Used simultaneously with Chloroquine as an alternative to Mefloquine or Doxycycline in chloroquine-resistant areas. As with the chloroquine you will be taking, take one week before going into infected area, while there, and for 4 weeks after leaving.	200 mg, orally, once per day, in combination with weekly chloroquine as above	< 2 years: 50 mg per day 2-6 years: 100 mg per day 7-10 years: 150 mg per day > 10 years: 200 mg per day
Primaquine	You must be tested before use. This drug is used for post-exposure prevention of relapsing malaria (it kills the parasites living in your liver).	15 mg base (26.3 mg salt), orally, once per day for 14 days	0.3 mg/kg base (0.5 mg/kg salt), orally, once per day for 14 days

Treatment: Always take at least one dose of malaria treatment with you in case you get it. If you develop a fever and think it is malaria, take Fansidar (if you have no sulfa allergies), as directed below and **continue** to take your other preventative drugs for malaria.

Drug	Usage	Adult Dosage	Child Dosage
Pyrimethamine-sulfadoxine (Fansidar®)	For treatment only. DO NOT take if you have a history of sulfa allergy (can be fatal).	3 tablets (75 mg pyrimethamine and 1,500 mg sulfadoxine), orally, as a single dose.	5-10 kg: ½ tablet 11-20 kg: 1 tablet 21-30 kg: 1 ½ tablets 31-45 kg: 2 tablets > 45 kg: 3 tablets

Future of Malaria:

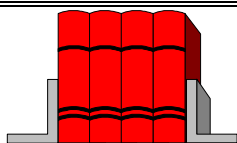
Several new drugs have been tested for prevention and treatment of malaria: **Halofantrine** is a relative of mefloquine, so unfortunately in mefloquine-resistant areas it will probably not be effective. The artemisinin derivatives **artemether** and **artesunate** are associated with malarial relapses after they initially treat the problem and they can cause neurotoxicity; these drugs will probably not be used except in cases where the malaria is life-threatening and nothing else will work. **Azithromycin** and **atovaquone** are prescribed in the USA for other things and so they have been shown to be safe. Azithromycin (an antibiotic) is being tested for prevention of malaria; it would be better than doxycycline because it is safe for pregnant women and children. The combination of atovaquone and proguanil (see table above, safest malarial drug) is very promising for treatment (dosage is 1000 mg atovaquone and 400 mg proguanil once a day for 3 days). This combination is very safe and is extremely effective for treating drug-resistant strains of *P. falciparum*. The unnamed derivative of primaquine, **WR238605** is extremely promising for treatment; it is ten times more

effective than primaquine (see table above) for treating the liver stages of malaria. Well known malarial drugs are also being used in different ways. A combination of chloroquine and doxycycline or tetracycline is being tested for treatment; the antibiotic makes the chloroquine more effective. Primaquine is being given daily as a preventative for chloroquine-resistant *P. falciparum* and *vivax*. 1995 Buletin Penelitian Kesehatan 23(3):49-58 (thanks to Burke Burnett).

New studies are showing that the organ damage done by *P. falciparum* may not be due to mechanical blockage of vessels as originally thought, but may be due to the release of cytokines and nitric oxide. However, these same factors, cytokines and nitric oxide, are thought to be important in developing a tolerance to malaria. 1997 International Journal for Parasitology 27(10):1237-1249 and 1251-1263.

Ciprofloxacin appears to block malaria parasite replication. Nov 27 1997, Nature 390(6658):407-409.

A protein particle vaccine with malarial epitopes works in mice. Nov 1997, Nature Biotechnology 15(11):1280-1284.



Available Publications and Items

If you know about any books or items we should know about, please send the details! To order the following publications, use the addresses in bold. Ed Colijn's news server aided this section quite a bit.

From Anne Casson, Resource Management in Asia Pacific Project, Division of Pacific and Asian History, Research School of Pacific and Asian Studies, Canberra ACT 0200, Australia, phone: (61) 02-6249-4145, fax: (61) 02-6249-5525, email: casson@coombs.anu.edu.au :

Larmour, P. (editor) 1997. The Governance of Common Property in the Pacific Region. NCDS, ANU.

Toft, S. (editor) 1997. Compensation for Resource Development in Papua New Guinea. Monograph No. 6. Law Reform Commission of PNG and NCDS, ANU.

Ballard, C. and G. Banks. (editors) 1997. The Ok Tedi Settlement: issues, outcomes and implications. Pacific Policy Paper. NCDS, ANU.

Filer, C. (editor) 1997. The Political Economy of Forest Management in Papua New Guinea. NRI Monograph 32. London and Port Moresby: NRI and IIED.

Burton, J. 1997. C'est Qui, Le Patron? Kinship and the rentier leader in the Upper Watut. RMAP Working Paper 1997/1.

Filer, C. 1997. Science, Capital and Politics in Papua New Guinea's Logging Industry. RMAP Working Paper 1997/2.

Bourke, M. 1997. Management of Fallow Species Composition with Tree Planting in Papua New Guinea. RMAP Working Paper 1997/5.

Johnson, K. 1997. Rainfall Patterns in the Western Pacific. RMAP Working Paper 1997/7.

Taylor, R. 1997. The State Versus Custom-- Regulating Papua New Guinea's Timber Industry. RMAP Working Paper 1997/9.

Hyndman, D. 1997. Changing Relations of Production in the Creation of the Ok Tedi Mining Enclave in Papua New Guinea. RMAP Working Paper 1997/11.

Burrit, R. 1997. Environmental Disclosures in Annual Reports of Australian Gold and Copper Mining Companies with Activities in Papua New Guinea and/or Indonesia. RMAP Working Paper 1997/13.

Weiner, J. 1998. The Incorporated Ground: the contemporary work of distribution in the Kutubu oil project area, Papua New Guinea. RMAP Working Paper 1998/17.

From World Resources Institute, 1709 New York Avenue NW, Washington D.C. 20006, phone: (1) 202-628-6300, fax: (1) 202-638-0036, email: laura@wri.org :

1998. Reefs at Risk: A Map-based Indicator of Threats to the World's Coral Reefs. 56 pages. ISBN 1-56973-257-4. \$20.00.

From the Conservation Resource Center, Project Manager, PO Box 165, Waigani NCD, Papua New Guinea, Fax +675 325 9192, Phone +675 325 4900, CRC@datec.com.pg :

N. Sekhran and S Miller editors. 1995. Papua New Guinea Country Study. 21 Chapters which review the current situation in PNG regarding the environment and development.

- Cathy Hair, editor. 1996. Lak Marine Survey and Ecological Assessment of Southern New Ireland, Papua New Guinea. Marine survey and ecological assessment of the coral reef and near shore environments of Southern New Ireland in the Lak electorate, Papua New Guinea.
- M. Hedemark, S. Hamilton and W. Takeuchi. 1997. Report on the First Bismarck-Ramu Biological Survey with Sociological and Logistical Comments. 16 chapters summarise results from a biological survey to the Bismarck Ramu area of Madang Province PNG.
- M Stuart and N. Sekran. 1996. Developing Externally Financed Greenhouse Gas Mitigation Projects in Papua New Guinea's Forestry Sector. A Review of concepts, opportunities and links to biodiversity conservation.
- Jamie James. 1996. Proceedings of the 1995 Meeting of Integrated conservation and Development Projects in Papua New Guinea.
- Nadine Grant. 1996. Community Entry for ICAD Projects- the Participatory Way.
- N. Sekhran, W. Ginn, F. Arentz, G. Gresham, M. Hedemark, and R McCallum. 1996. A Model Business Plan for a sustainable Forestry Enterprise in Papua New Guinea.
- Sally Brooks. 1996. Small Business Development in Papua New Guinea: Lessons.
- R. McCallum and N. Sekhran. 1997. Race for the Rainforest. Evaluating lessons from an Integrated Conservation and Development Experiment in New Ireland, Papua New Guinea.
- Michael Hedemark, and Nikhil Sekhran. Integrating Conservation & Development: The experiment in Papua New Guinea. United Nations Development Programme - Biodiversity Conservation & Resource Management Programme, Waigani, Papua New Guinea.

From IUCN Publication Services Unit, 219c Huntingdon Road, Cambridge, CB3 0DL, UK, Fax ++ 44 1223 277175, E-mail: iucn-psu@wcmc.org.uk, Web site: <http://www.iucn.org> or Milieuboek, Plantage Middenlaan 2h, Amsterdam Mail address: Postbus 18169, 1001 ZB Amsterdam, Fax ++ 31 20 6235203, E-mail: mil-boek@dds.nl :
The Economic Value of Non-Timber Forest Products in Southeast Asia
by: Jenne H. de Beer & Melanie J. McDermott. Second Revised Edition

From Wetlands International- Indonesia Programme, Jl. Arzimar III/17, P. O. Box 254/BOO, Bogor 16002, Indonesia, phone (62) 251-312-189, fax (62) 251-325-755, email: awb@server.indo.net.id or wi-ip@server.indo.net.id :
P. Wibowo and N. Suyatno. 1997. An Overview of Indonesian Wetland Sites. US\$9 plus postage and handling.

From the Information Officer, The World Conservation and Monitoring Centre (WCMC), 219 Huntingdon Road, Cambridge, CB3 0DL, UK, fax (44) 1223-277136, email: info@wcmc.org.uk :
CD-ROM. 1996. Tropical Moist Forests and Protected Areas; the digital files- Version 1. ARC/INFO and generic format GIS files of the world's tropical moist forests and of protected areas.
CD-ROM. 1997. A Global Overview of Forest Conservation including GIS digital files of forests and protected areas: Version 2.
These CDs have all of the GIS spatial files on forests, protected areas and ecological zones for all regions of the world, and analyses of these files with tables, figures, maps and discussion. The CDs were produced by WCMC and the Center for International Forestry Research (CIFOR). The normal price is US\$250 plus shipping and handling, but educational and non-profit organizations can purchase the CDs for US\$25 plus shipping and handling.

From Flora Malesiana, Publication Department, Rijksherbarium - Hortus Botanicus, P.O.Box 9514, 2300 RA Leiden, the Netherlands, email: zoelen@rulrhh.leidenuniv.nl or Backhuys Publishers, P.O.Box 321, 2300 AH Leiden, the Netherlands, email: backhuys@euronet.nl :

M.M.J.van BALGOOY. 1997. Malesian Seed plants. Vol.1: Spot-characters. An aid for identification of families and genera. Leiden. 154 pp., ills. ISBN 90-71236-31-5. Price Dfl. 50,00 (about \$ 25,00)

M.M.J.van BALGOOY. 1998. Malesian Seed plants. Vol.2: Portraits of tree families. Leiden. 308 pp., ills. ISBN 90-71236-36-6. Price Dfl. 100,00 (about \$ 50,00)

The recognition to which family a plant belongs, is the first, and often most important step to species identification, and consequently to all scientific and practical information on an unknown plant. Identification keys to the whole Malesian flora are not available. Regional work like the "Tree Flora of Malaya" and the "Flora of Java" fill important gaps in this respect, but there is a widely felt need for user-friendly identification means for the whole of Malesia. The series "Malesian Seed Plants" for the first time offers such a tool.

Volume 1 contains lists of spot-characters most of which, with some training, can be easily observed in herbarium material. These characters have been arranged in a more or less logical way, e.g., characters of stem, the leaves, the flowers, the fruits etc.

Volume 2 presents 111 families of Malesian seed plants that at least have one tree species with a diameter at breast height of over 10 cm or a height of more than 10 cm.

Volume 3 (Portraits of non-tree families) will be published later.

From Academic Press, New York (www.academicpress.com):

The Butterflies of Papua New Guinea by Michael Parsons, July 1998. Price: US \$275.00

For the first time, fanciers of New Guinea's butterflies will have a comprehensive text by which to identify specimens. 958 species are treated from the island as a whole, along with background information on island geography, habitats, butterfly ecology and conservation.

The book contains color photographs of about 3000 specimens plus 400 color photographs from life. Sections on butterfly status, conservation and commercial use address conservation interests. Especially useful is the fact that skippers (family Hesperidae) have been included, which heretofore has never been included in a book generally treating butterflies of the region.

Scientific Literature



If you haven't sent your publication list in yet (your papers about New Guinea), please send these citations to Deb so we can include them in a future issue. It doesn't matter if you have one paper, or 30 papers-- the rest of us want to know about it! We would really like to know what you have found out about New Guinea; that is the purpose for this newsletter—to share information. If you have more than one page of citations, please send your list on disk (preferably Word) if possible-- thanks! In addition, don't forget that we offer a reference-finding service for those of us without inter-library loan. If you need a particular reference and cannot find it or do not have access to it, please write and we will see if we can find it for you and send it to you. (Not just the citations in the newsletter, you can request any citation).

Simon Saulei-- Publication on NG flora

Saulei, S. M. 1996 (97?). A bibliography of the flora and vegetation of Papua New Guinea. PNG Journal of Agriculture, Forestry and Fisheries 36(2):20-168.

The Papua New Guinea Journal of Agriculture, Forestry and Fisheries was originally published as the New Guinea Agricultural Gazette in 1935 and is published by the Department of Agriculture and Livestock. Correspondence should go to: Secretary, Department of Agriculture and Livestock, attn: Senior Publications Officer, P.O. Box 477, Konedobu, NCD, PNG. (Thanks to David Frodin for this information!)

Jerry Allen-- Publication on NG fish

Allen, G. R. and M. Jebb. 1993. A collection of fishes from the Upper Purari River system, Papua New Guinea, with descriptions of two new species (Terapontidae and Elotrididae). Ichthyological Exploration of Freshwaters 4(3):233-240.

Barre Kare-- Publications on NG prawns

Evans, C. R., L. J. Opani and B. D. Kare. 1997. Fisheries ecology and oceanography of the prawn *Penaeus merguensis* (de Man) in the Gulf of Papua: estimation of maximum sustainable yield and modeling of yield, effort and rainfall. Marine and Freshwater Research 48:219-228.

Evans, C. and C. Tumi. 1997. Assessment of the prawn resources of Orangerie Bay, Milne Bay Province. Papua New Guinea Journal of Agriculture, Forestry and Fisheries 40:40-46.

Garrick Hitchcock-- Publication on NG anthropology

Hitchcock, G. 1996. A note on the abandonment of raised field agricultural systems in the lower Bensbach River area, southwest Papua New Guinea. Australian Archaeology 43:37-38.

Mary LeCroy-- Publications on NG birds

Gilliard, E. T. and M. LeCroy. 1961. Birds of the Victor Emanuel and Hindenburg Mountains, New Guinea. *Bull. American Mus. Nat. Hist.* 123:1-86.

Gilliard, E. T. and M. LeCroy. 1966. Birds of the middle Sepik region, New Guinea. *Bull. American Mus. Nat. Hist.* 132:245-276.

Gilliard, E. T. and M. LeCroy. 1967. Results of the 1958-1959 Gilliard New Britain Expedition: Annotated list of birds of the Whiteman Mountains, New Britain. *Bull. American Mus. Nat. Hist.* 135:173-216.

Gilliard, E. T. and M. LeCroy. 1967. Annotated list of birds of the Adelbert Mountains, New Guinea. *Bull. American Mus. Nat. Hist.* 138:51-82.

Gilliard, E. T. and M. LeCroy. 1968. Birds of the Schrader Mountain region, New Guinea. *American Mus. Novit.*, No. 2343, 41 pp.

LeCroy, M. 1969. *Acrocephalus arundinaceus orientalis*, first record in New Guinea. *Emu* 69:119-120.

LeCroy, M. 1969. Papua and New Guinea. An expedition to primitive Melanesia July 23rd to August 29th, 1969. Treasure Tours International, Inc., Montreal, Canada.

Gilliard, E. T. and M. LeCroy. 1970. Notes on birds from the Tamrau Mountains, New Guinea. *American Mus. Novit.*, No. 2420, 28pp.

LeCroy, M. 1971. Sympatry in bowerbirds of genus *Amblyornis*. *Emu* 71:143.

LeCroy, M. 1972. Study of the Greater Bird-of-paradise on Little Tobago, West Indies, 1958. (Report on a study by the late E. T. Gilliard) *Nat. Geogr. Soc. Res. Rep.*, 1955-1960 Projects, pp 83-84.

- LeCroy, M. 1972. [Review of] Birds of New Guinea, by A. Rutgers. *Auk* 89:686.
- LeCroy, M. 1972. The 1958-1959 Gilliard Expedition to New Guinea and New Britain. *Nat. Geogr. Soc. Res. Rep.*, 1955-1960 Projects, pp 77-82.
- LeCroy, M. 1974. [Review of] Avifauna of the Eastern Highlands of New Guinea, by Jared M. Diamond. *Auk* 91:192-194.
- LeCroy, M. 1974. Ornithological expedition to New Guinea, 1953-1954. *Nat. Geogr. Soc. Res. Rep.*, 1890-1954 Projects, pp 137-139.
- LeCroy, M. 1978. [Review of] Birds of New Guinea and Tropical Australia, by W. S. Peckover and L. W. C. Filewood. *Auk* 95:624.
- Peckover, W. S. and M. LeCroy. 1979. National animals. Birds of Paradise. Department of Lands, Surveys & Environment, Division of Wildlife, Konedobu, Papua New Guinea, 15 pp.
- LeCroy, M. 1979. [Review of] Birds of my Kalam country, by Ian Saem Majnep and Ralph Bulmer. *Auk* 96:440.
- LeCroy, M. 1979. [Review of] Upland birds of Northeastern New Guinea, by Bruce McP. Beehler. *Auk* 96:644.
- LeCroy, M. 1979. [Review of] Birds in Papua New Guinea, by Brian J. Coates. *Auk* 96:644.
- Diamond, J. and M. LeCroy. 1979. Birds of Karkar and Bagabag Islands, New Guinea. *Bull. American Mus. Nat. Hist.* 164:467-531.
- LeCroy, M. 1980. [Review of] Birds of Paradise and Bower Birds, by W. T. Cooper and J. M. Forshaw. *Nat. Hist.* 89:94-96.
- LeCroy, M., Alfred Kulupi and W. S. Peckover. 1980. Goldie's Bird of Paradise: display, natural history and traditional relationships of people to the bird. *Wilson Bull.* 92:289-301.
- LeCroy, M. 1980. [Reviews of] The birds of paradise, by Michael Everett; The great bird illustrators and their art 1730-1930, by Peyton Skipwith; and Birds of prey, by Gareth Parry and Rory Putnam. *Curator* 22:116-119.
- LeCroy, M. 1980. Bridgebuilders. *Paradise (Air Niugini)* 23:5-6.
- Peckover, W. S. and M. LeCroy. 1980. Down in the Forest. *Paradise (Air Niugini)* 25:10-13.
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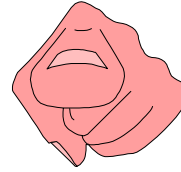
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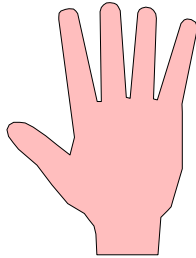
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