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# A NEW CONSERVATION FOCUS FOR THE ASSOCIATION FOR TROPICAL BIOLOGY AND FOR BIOTROPICA

***By Richard Primack, 2002-2003 President of ATBC (primack@bu.edu)***

The membership of **ATB** has overwhelmingly voted to change our name to the **Association for Tropical Biology and Conservation**. Our journal ***Biotropica*** will now have a new section on conservation topics. These new developments reflect the changes occurring in the research of Association members. The Association and the journal will still publish and celebrate high-quality research in tropical biology. At the same time, we recognize that in most, if not all, tropical systems, human impacts along with natural ecological factors determine which species are present and how the biological community is structured and functions. Many members of the Association already investigate these impacts, and are restoring the damage that has been done. The change in name will help to identify the Association and journal with this expanding focus of inquiry and research. Conservation research was well-reflected at the symposia held in our two past meetings held in Panamá and Bangalore, and is apparent in the articles being published in ***Biotropica.*** Further symposia and a workshop at our upcoming meeting in Scotland will continue this direction. The following are a few of the major conservation themes which our society will take up in coming years.

## Threats to tropical ecosystems: destruction

Everywhere we look as tropical ecologists, we see habitats in peril, from forests to coral reefs to mangroves to tropical alpine zones. Rain forests have been tracked most completely, as they can be monitored using remote sensing. In many tropical countries of the world, particularly on islands and in locations where human population density is high, most of the original forest habitat has already been destroyed. In tropical Asia, fully 65% of the primary forest habitat has been lost, with especially high rates of deforestation in the Philippines (only 6% left), Thailand (22%), Sri Lanka (18%) and Vietnam (17%). The extent of loss is similarly high in areas of Africa and Latin America. Recent rates of deforestation vary considerably among countries, with particularly high annual rates of over 2% reported in such tropical countries as Malaysia (2.5%), the Philippines (3.7%), Thailand (2.8%), Costa Rica (3.1%), and El Salvador (3.5%). These high rates of habitat destruction affect species extinction and ecosystem processes, and represent major topics for tropical ecologists. What is the most effective way to protect biological communities in the face of this destruction? On a larger scale, how will forest loss affect regional weather patterns and evolutionary processes? How can habitats be restored once they have been damaged by human activities? If these aren't urgent and central problems, what are?

## Fragmentation

Even where habitat remains it is often extensively fragmented. Experimental studies carried out in the Amazon and elsewhere show that when a habitat is fragmented, the potential for dispersal and colonization of plants and animals is reduced. Fragmentation also changes the microenvironment at the fragment edge, impacting species composition. Important edge effects include changes in light, temperature, wind, humidity, and incidence of fire. Because species of plants and animals are often precisely adapted to temperature, humidity, and light levels, changes in these factors will eliminate species from habitat fragments. As large tropical areas are increasingly fragmented over large areas by logging, road construction and other human activities, we need to know how this affects the ecology of the region. In particular, how does habitat frag-

mentation affect the ability of invasive species, such as Africanized honey bees in Latin America, to enter tropical communities? We also need further studies of how the surrounding habitat matrix affects the ability of species to persist in fragments, and potentially even re-colonize land undergoing succession following logging and farming.

## Hunting

Even where habitats still appear intact, many tropical animals are being threatened with extinction, due to ever increasing intensities of harvesting. In recent decades, human populations in tropical areas have increased, the use of the environment by people has escalated, and methods of harvesting have become dramatically more efficient. This has led to an almost complete depletion of large animals in many areas, leaving strangely "empty" habitats, with animal densities reduced by 90% or more. People only appreciate how "empty" a typical modern forest or savanna is when they visit a place that is extremely remote or that has been vigorously protected, such as Tikal National Park in Guatemala or Barro Colorado Island in Panama. The extreme overhunting of animals throughout tropical regions, both for local consumption and for sale in towns, has been labeled the "bushmeat crisis." This crisis has become a cause for concern by conservation organizations and represents a major topic for conservation research. How will the loss of animal populations affect tropical communities, what can be done to protect and restore animal populations, and how can local human populations be supplied with alternative protein sources?

## National parks and local people

There is currently a vigorous – at times a fiery – debate about the best ways to conserve tropical biodiversity, a debate in which many members of ATB are already involved. Major areas of disagreement include the relative effectiveness of traditional national parks and community-based conservation initiatives, the role of indigenous people in protected areas, and the effectiveness of forest certification and similar initiatives in promoting sustainable use of tropical habitats. A recent study suggests that protected areas can be truly effective in keeping habitats intact (Bruner et al. 2001, Science 291: 125-128). Clearing of forests was far lower in 86 national parks in tropical countries, in comparison with control areas surrounding those parks. National parks also had much lower levels of hunting, grazing by domestic animals, and logging than surrounding areas. Clearly establishing new parks is necessary for conservation purposes.

Another element in conservation strategies is enlisting the support of local people to protect the parks near which or in which they are living, at the same time allowing them to maintain their culture and traditional livelihoods. In some cases, sustainable economic development is included to provide additional employment and income for these people, who are often poor. Such Integrated Conservation–Development Projects (ICDPs) are seen by some as conservation strategies worthy of serious consideration. However, other conservationists have doubts about the long-term viability of this approach. Such projects may be difficult to implement and maintain due to social and economic issues, and may even have a negative net impact on biodiversity if more people are attracted to the area by economic opportunities.

An alternative increasingly being discussed involves conservation groups making direct payments to individual landowners and local communities that protect critical ecosystems, in effect paying the community to be good land stewards. Such conservation payments have the advantage of greater simplicity than programs that attempt to link conservation and economic development. Such intense debates, with major practical consequences, should be discussed by ATBC members in the pages of ***Biotropica*** and ***Tropinet***.

And while the debate in academic circles has often been on how to create large conservation areas in remote areas, there is also a need to protect small reserves in urban areas. Bukit Timah Nature Reserve in Singapore is an excellent example of such a small reserve that provides long-term protection of numerous species and is the focus for conservation education and research. This 164-ha partially forested reserve represents 0.2% of the original forested area on Singapore and has been isolated from other forests since 1860. Yet Bukit Timah and the adjacent reservoir area still protect around 70% of the original flora, 50% of the original bird species, and 57% of the fish species. Evaluating such small reserves, and also "sacred groves" protected by local people, is much needed by tropical ecologists.

Jatobá (including *Hymenaea courbaril, H. intermedia, and H. parviflora*) on a logging patio near Santarém, Pará, Brazil. (Photo by Lyn Loveless)

## Conservation in the coming months

This change in the name of the Association reflects the ongoing process of review of research priorities in tropical biology being carried out by the ATBC Council, the Officers, and various colleagues. Many of the priorities being discussed are related to conservation issues, as described above. Further details are posted on the ATBC website. ATBC members can get involved with this process, and can express their views and experiences at the next ATBC meeting being held jointly with the British Ecological Society in Aberdeen, Scotland, this coming July. Alternatively, members can communicate directly with ATBC officers. This change in emphasis of the Association is a two-way, open-ended effort, in which the members and the officers can work together to make ourselves more effective in research and in dealing with urgent conservation issues. It will also help us articulate the goals of the Association to a wider audience, including the public, government agencies, foundations, and the media. We would invite all ATBC members to be part of this process. See you in Aberdeen!

**Notable new books:**

Two new books from INBio and SINAC-MINAE (Costa Rica) are part of the new series"Ecosystems of Costa Rica." They are "Ecosystems of the Osa Conservation Area," edited by Maarten Kappelle, and "Ecosystems of the Savegre Watershed," edited by H. Acevedo et al. Both are bilingual Spanish/English. To order these books, please visit:http://www.inbio.ac.cr/editorial/english/pages/ediprinen.html and click on the BOOKS button, then scroll down to the bottom. Or contact: editorial@inbio.ac.cr

# IDENTIFICATION, CONSERVATION AND MANAGEMENT PLANS IN THE AMAZON

BY MIKE HOPKINS and REGINA DA SILVA, SAPECA and EMBRAPA / AMAZONIA ORIENTAL, Belem, Pará, Brazil

The Amazon region still retains the largest area of rainforest on the planet and has the highest levels of plant diversity. Its forests probably contain 60,000 or more plant species, and of these perhaps only a third are known to science (M.Hopkins, unpubl.) Apart from its importance for biodiversity conservation and global environmental issues, the region is also important commercially, especially if its component species might be useful in agriculture, medicine and other areas. Potentially, forest products could provide a significant source of revenue for the region, and use of its products in sustainable ways could actively contribute to the survival of its forests. The main economic use of Amazonian forest trees is timber. If carried out in a way that causes minimal impact, logging too could contribute to long-term biodiversity conservation. Theoretically the Brazilian legislation controlling logging is designed to ensure long-term sustainability, as are the ecological attributes of the timber certification process.

In Brazil, forest inventories by timber companies use technicians skilled in identification using the common names of trees. These lists are then "translated" to Latin names for use in management plans, inspection, and trading. This process can cause difficulties. Local names for plants are often exactly that: local. The same species may be known by different names in different places (or by different plant identifiers), or the same name may be used for different species. A worse problem is that several biological species may be known only by a collective name, which really includes several closely related species that are difficult to distinguish in the field. When a forest plot of just one hectare may contain 300 or more of the larger tree species, including many species of taxonomically difficult genera such as *Pouteria, Ocotea* and *Protium*, a certain confusion of names is scarcely surprising, and the problem is compounded by a very real scientific problem of lack of investment in the collection and study of plants in the region.

The consequences of inaccurate identification can be serious at several levels. Confusion between species leads to an inconsistency in the final product. A buyer may wish to buy timber of a particular quality, but when reordering by the name he can have no guarantee that the new purchase will be of the same biological species, especially if the source is a different company or a different area. A lack of consistency in the name inevitably leads to a lack of consistency in the product, since timber properties (as well as pharmacological ones) vary considerably between species. This is a commercial [and conservation] problem that should attract the investment of logging companies in trained botanists and taxonomists.

Ecologists and conservationists should also be aware of the impact of inaccurate identifications on management plans. Accurate identification is essential for conservation. If the object of a management plan is to ensure local survival of a species through leaving mother trees as seed sources, the effect of confusion of several species under a single name invalidates the plan since some species (usually those that grow largest) may be 100% removed while the remaining trees, supposedly seed sources, may all belong to other species. Rare species treated as part of a common species would be especially susceptible to local extinction, including those that have not yet been scientifically catalogued.

While certification requires detailed plans for determining the selection of a certain percentage of seed-trees per species, little attention is given the problem of determining what constitutes a species, and this is not a part of evaluation for certification.

Although this problem may not be unique to Amazonia, the high biodiversity and the lack of literature available for the non-specialist user exacerbate it. One attempt to improve this situation was the production of the Guia da Flora da Reserva Ducke (Ribeiro *et al*, 1999), which treated about 2200 species using characteristics easily seen in the field. This book is used successfully in the teaching of botany in the region, as well as by professionals working with forest management. But it is only for one small region of central Brazil, and many important species are not included. More regional guides based on accessible field characters are urgently needed, but there is a conspicuous lack of investment towards that end.

Another approach to improved identification capacity specifically aimed at sustainable forest use is under way under the auspices of a project based in the city of Belém, near the mouth of the Amazon. The *Dendrogene Project* (Genetic Conservation in Managed Forests in the Amazon) is part of a bilateral collaboration program between Brazil and Great Britain (the Brazilian Agricultural Research Company-EMBRAPA and the Department for International Development-DFID). The botanical part of this project involves researchers of Embrapa Amazônia Oriental, SAPECA (The Amazonian Research and Conservation Society), MPEG (Museu Paraense Emílio Goeldi), UFPA (Universidade Federal do Pará), INPA (Instituto de Pesquisas da Amazônia), LPF-IBAMA (Laboratório de Produtos Florestais) and the IPT (Instituto de Pesquisas Florestais of São Paulo State). The aims include research to improve the capacity to identify plants in the region through the production of literature to aid identification of commercially important species and through training of those involved in identification. The project is described at http://www.embrapa.cpatu.br/dendro/index.

The botany training courses are for 20 students, with researchers and parataxonomists as teachers, and last for 6 days, with about 10 hours of instruction per day in basic botanical morphology, naming systems, collection methods, preparation of collected material, and the use of compass and GPS. The Flora of the Ducke Reserve is used as the text. The students also receive additional materials for later study. The course is field based, with as much as possible of the instruction being


given in the forest. Of course it is impossible to teach the details of how to identify all the tree species that foresters might encounter, and the main result is to break the barrier between local and common names. On the last day students who previously used only local names are talking amongst themselves using scientific names, the "-aceaes" have been implanted to help them arrange their local names in a scientific matrix, and they have the knowledge to start making good botanical collections. There are also courses of wood anatomy and identification undertaken by two researchers with three technical assistants, each course being five days of eight hours of instruction for 20 students. The students learn the importance of correct identification of woods, with reference to its exploitation and conservation, as well as collecting methods and the preparation and identification of wood samples. The courses take place at a sawmill and at the wood collection of Embrapa Amazônia Oriental, which includes 8000 wood samples, almost all from Amazonia.

Two types of publication are being produced by the project: **leaflets** for key species, and **booklets** for some problematic genera.

The leaflets are composed of text, photographs and drawings covering all plant parts including flowers and fruit, seeds and seedlings, leaf and trunk morphology, wood anatomy, technological data, as well as information about distribution, flowering and fruiting times, and taxonomic information. The project is initially producing leaflets for 50 species principally for use by the timber industry in Amazonia. The idea is that they can be obtained individually, and made up into collections of the relevant species, depending on the area.

The booklets are being prepared for five groups of frequently used timbers known colloquially as: "angelim" (*Hymenolobium* spp., *Dinizia excelsa*, *Andira* spp. - Leguminosae), "ipê" (*Tabebuia* spp.- Bignonianceae), "tauari" (*Couratari* spp. and *Cariniana* spp. – Lecythidaceae), "curupixá" (*Micropholis* spp. and *Diplõon* spp. - Sapotaceae) and "copaíba" (*Copaifera* spp. – Leguminosae). These were chosen because there is substantial confusion between the species known by these names, and separation of them into species has hitherto been very difficult for anyone without specialist knowledge. Each booklet will cover the Amazonian species with texts and illustrations to help separate the species in the field and the laboratory. The ultimate goal is to train parataxonomists to make species-level distinctions in the field, and to regularize identification surveys to make accurate and complete botanical identifications of forest trees.

*Members of the community of Piquiatafuba, on the Tapajos river near Santarém, Pará, Brazil, examine the botanical leaflets of some common local forest tree species.*

## WEB RESOURCES FOR ECOLOGY AND CONSERVATION

**Populus** is a software product that is ideal for teaching ecology and evolution. A new upgrade of this software, Version 5.2, is available for free download at the **Populus** website, http://www.cbs.umn.edu/populus. It will run on any version of Windows, or on Mac OSX, Linux or Unix.

The Ecological Society of America has produce a collection of materials for teaching Ecology at the college level, in both the field and the classroom. While the collection is not yet complete, several labs are available online and more will be added in the future. The collection is at http://www.ecoed.net/tiee/exps/experiments.shtml

The National Biological Information Infrastructure web site has established an electronic forum on Biocomplexity and Conservation, directed at researchers, students, policy makers, and others in the conservation community. The site offers an eForum for accessing topics and discussions submitted by users. Go to the web location at www.nbii.gov/datainfo/bestpractices/index.html for information about the elements of this electronic resource.

# Book Review

**By Mike Hopkins <sapeca@cpatu.embrapa.br>**
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## Guide to the Vascular Plants of Central French Guiana. Part 2. Dicotyledons. Scott A. Mori *et al.* New York Botanical Garden 2002. 776 pp. [Memoirs of the New York Botanical Garden vol. 76 part 2.]

This is the second of a two volume series that completes a local flora of a sizeable area (133,000 ha) in central French Guiana. Together, the two volumes (part one was published in 1997) cover almost 2000 species of plants, "ferns upwards." Volume 2, almost twice the size of volume 1, covers the dicotyledons. The layout and style follows that of the much-praised volume one: dichotomous keys to family, to genus within family, to species within genus, and brief formal descriptions of genera and species. There are line drawings of 326 of the 1483 species, and for about half of the species there are color photographs of flowers and fruits.

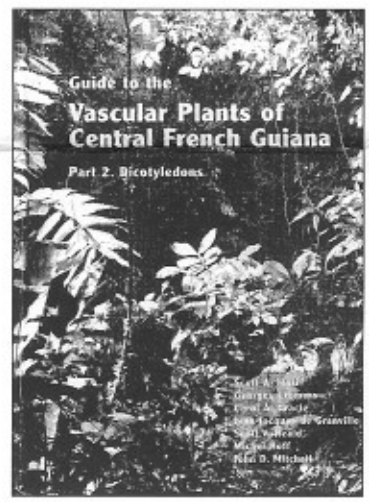
This book is a rare treat ... a complete flora for a Neotropical region, available in a (just about) portable size, relatively user friendly, and stunningly illustrated; the result of tremendous persistence over a very long period, involving numerous specialists (78 in this case), and substantial long term research support, initially through NSF (USA), and later through several private foundations. The authors deserve much praise for bringing this project to conclusion after some thirty years of collecting activity, and over ten years dedicated to producing this publication.

A flora like this one bridges two scientific necessities: the taxonomic need for delimitation and description based on good source material, and the need of other scientists (like ecologists) and lay-people to know what they are looking at in the field, or better still be able to find out for themselves what species they are dealing with from their collected material.

From the ecologist's viewpoint this flora is user-friendlier than a more traditional taxonomic treatise. The descriptions sometimes include "non-traditional" characters, i.e. those that aren't visible on a herbarium specimen - buttresses, bark and slash characters, though this varies greatly between families and sometimes even such obvious characters as flower color is missing. Most of the keys stress vegetative (not flower or fruit) characters, but again not consistently. The format of following taxonomic nomenclature often makes it harder to arrive at a genus than to a species, the user having to follow several within-genus keys when the generic key can't be used for lack of fertile material. With so many species and such a parallel diversity of contributors the book is as good as we could hope for in this regard. Volume one had 44 pages of "spot characters" lists and notes to help one "jump the key" using particularly striking vegetative characters. This is supplemented in volume 2, but the additions make it cumbersome to use, being spread over both volumes. We found the level of technical terms bearable; the more obscure ones are to be found in the glossary of volume 1. Ecologists can gain comfort that there is a trend towards use of field characters in identification. One hopes that the days are numbered when the first choice in a keying out a 50 m tree that flowers once every 10 years requires the presence of an obscure floral character. This flora is another step in this direction, though the constraints of a more traditional taxonomic organization and presentation somewhat compromise its utility for ecologists.

The flora is not intended to be an exercise in taxonomic revision. No new species are officially described, and citations of synonyms and specimens are kept to a minimum. References to relevant taxonomic works are given where appropriate. The taxonomic value of the book is more in providing fresh material for taxonomists and concentrating their minds on this part of the world.

What turns the book from being "just" a well researched and well presented identification guide into a work of art which is a pleasure to browse are the line drawings and photographs. Bobbi Angel's artwork is first class. Some of these beautiful plates are reproduced from earlier works, but many are newly drawn. They are uniformly excellent in their layout and detail, and will be widely appreciated far beyond the geographical center of French Guiana. Furthermore, many species are illustrated with delightful photographic vignettes, taken principally by Carol Gracie, mostly of flowers, in 120 colour plates. Some of the photographs are so beautiful that even Bobbi Angel has used them as the basis for her drawings. Just leafing through these plates will make any naturalist quiver with pleasure. There are also a few pictures of vegetative characters, but not enough to be seriously useful in identifying in the field. But with its weight and beauty few will have the ability or desire to take the book to the plant.




In criticising the book one has to resort to quibbles. Some of ours follow. The combined weight of the two volumes precludes its use as a field manual... might there be interest in developing a pocket-sized version in a format for the amateur naturalist? Volume one had a checklist, which is missing from volume two, though this is available on the web. Orientation on the colour plates is a little difficult; sometimes one has to check back to earlier pages to discover the family being illustrated.

We definitely feel that this flora was worth the time and investment, and dearly hope that its publication will encourage long-term investment in other such floras throughout the region.

The neotropical flora continues to be very poorly known. Publications like **Flora Neotropica**, and other regional floras (like the Flora of the Guianas, Flora of the Venezuelan Guianas), and local florulas such as the Pico das Almas, Reserva Ducke, Reservas de Iquitos) help piece together the immense diversity of the region, but the South American tropics suffer particularly from a lack of source material. Many areas remain totally unknown botanically, and doubtless many species remain to be discovered. Concentrated, long-term studies like this one in the Saül area should serve as models for other areas. The flora of the three Guianas is relatively well known and well mapped. If a dozen or so such projects could be installed with urgency in key areas of the Amazon basin we might be able to come close to knowing its species before it becomes irreversibly altered.

# Bats of Two Hemispheres

## BOOK REVIEW BY DON THOMAS

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**BONACCORSO, Frank. J., 2000. Bats of Papua New Guinea. University of Chicago Press, 492 p., paperback ISBN 1-881173-26-7**

**CHARLES-DOMINIQUE, Pierre, A. Brosset, and S. Jouard, 2002. Atlas des Chauves-souris de Guyane. Patrimoines Naturels 49, 172 pp., paperback ISBN 2-85653-535-6.**

Here we have two books to celebrate the impressive diversity of bats in the tropics. With about 986 species of frugivores, nectarivores, carnivores, piscivores, aerial and gleaning insectivores, and vampires inhabiting all the non-polar continents, bats (Chiroptera) form the most ecologically diverse and second most speciose order of mammals. Biologists having worked and traveled in tropical savannah and forest habitats fully appreciate the abundance and diversity of bats. In his book *Costa Rican Natural History*, Dan Janzen summed up the importance of bats in tropical ecosystems by heading one section with "Why do rat trappers become bat netters in the tropics?" Indeed, in Central and South American faunas, bats generally represent about 50% of all the mammalian species at a given site. *Bats of Papua New Guinea* and *Les chauves-souris de Guyane* provide an interesting comparison and contrast between bat faunas from two distinctly different biogeographical regions on opposite sides of the globe.

**Bats of Papua New Guinea**: Although slightly less speciose in the Paleotropics and oceanic islands through the Indian and Pacific Oceans compared with the Neotropics, bats still make up the dominant portion of the mammalian fauna in most of the Indo-Pacific region. One of the richest of these faunas can be found in Papua New Guinea, the archipelago state sprawling over 456,369 km² and including the eastern half of the island of New Guinea and some 600 adjacent islands. Since the time of Wallace this region has been viewed as a biogeographer's paradise. It is home to 20,000 species of vascular plants (roughly half of which are endemic), 200 species of amphibians (134 being endemic), and 242 species of mammals (57 of which are endemic). With 91 species known to occur in Papua New Guinea, bats comprise almost 40% of its mammalian fauna! It is for this reason that I welcome a new and lucid guide to the natural history of bats of Papua New Guinea.

Since assuming his position as Chief Curator of Natural History at the Papua New Guinea National Museum and Art Gallery, Frank Bonaccorso has made substantial contributions to our knowledge of both the biogeography and physiological ecology of bats of Papua New Guinea through scientific publications. Now he offers us a comprehensive and authoritative guide to the identification, distribution, natural history, and conservation status of this rich bat fauna.

The Bats of Papua New Guinea is divided into three principal sections. In the first section (Patterns and Perspectives: The Bat Fauna of Papua New Guinea), Bonaccorso explains the importance of the New Guinea region in terms of geography, species diversity, and levels of endemism. In this section, he takes us through a brief history of the discovery and identification of bat species during the 19th and 20th centuries. He then takes us on a brief who's who of the bats, describing distributions through the Australian, Indonesian, and Solomon Island regions, composition of the bat fauna in terms of diet and feeding strategies, and the effects of altitude on species richness. While the section is brief, it does provide interesting and useful background that helps put the individual species accounts in perspective.

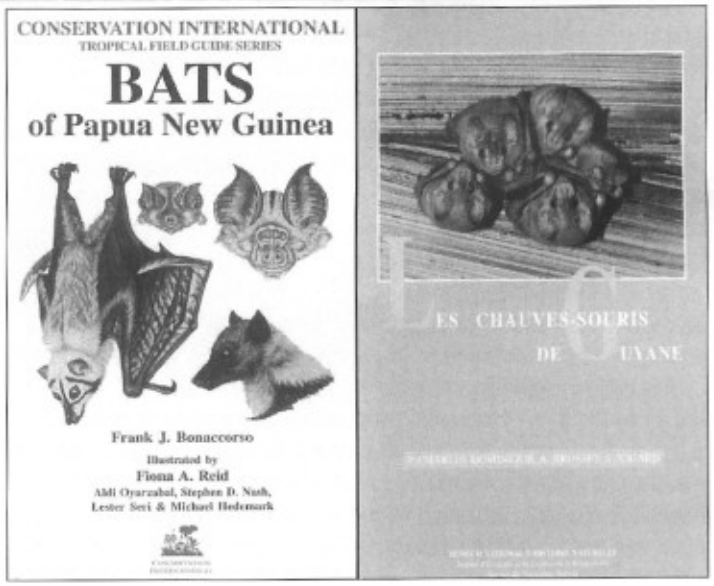
Section two presents a taxonomic classification of the bats known from Papua New Guinea, listing them by suborder (Megachiroptera and Microchiroptera), family (Pteropodidae, Emballonuridae, Hipposideridae, Rhinolophidae, Vespertilionidae, and Molossidae) and genus and species. This list is followed by an identification key that is backed up by some excellent diagrams explaining variation in the principal characters used in the key. I have not tried to use this key on live specimens; however, having used others, I am left with the impression that this one is sufficiently clear as to be easily applied in the field.

The third section of the book is devoted to species-by-species accounts of the Megachiroptera and Microchiroptera. Each species account is laid out in a similar fashion beginning with a written description of the key identifying characters, followed by a broad description of the geographical range (down to island), a brief résumé of what is known of the species breeding and natural history, and a statement on its conservation status. The account then lists all known capture localities, specimens held in the major museums, and the principal gross body measurements. These accounts are supported by 24 excellent colour plates drawn by Fiona Reid, grouped at the end of the book.

To prove that I had in fact read the book, I searched hard for criticisms, but could find few. On p22 (8 lines from the bottom) frugivory is misspelled. Figures 1.5 and 1.6 do not agree on how many species occupy the 0-500m altitude band. References to thermal conductance and regulation of body temperature for certain species are not supported by any explanation of the importance of physiological ecology in setting energy expenditures, body temperatures, and altitudinal distributions.

On the other hand, I could find several positive comments. Frank Bonaccorso shares with us his wealth of experience, which one senses while reading the species accounts. For example, on p138 (par.1), he notes that a previous identification of *Pteropus neohibernicus*, made by Flannery in 1990 at Madang township (and perpetuated by Micklebugh et al., in 1992), is erroneous and should be attributed to *P. conspicillatus*, this based on extensive visual observations with a 60x spotting scope. Descriptions of the wing beat frequencies, flight patterns, and sounds help provide a gestalt or feeling for how a bat might appear and sound when flying over. While this is not a book to take home and read on a cold winter's night, it certainly is a most welcome addition to my library. I can highly recommend it to those who may dream of far-flung tropical destinations to escape a cold northern winter.

**Les chauves-souris de Guyane** (The Bats of French Guiana), published as a miscellaneous contribution of the French Muséum National d'Histoire Naturelle in Paris, represents the culmination of roughly 20 years of formal and informal research on the bats of French Guiana. In the 1980's, French researchers shifted their focus from the Makoku field station in Gabon to French Guiana, which offered the benefit of being a French overseas territory. Those with South American experience will know that French Guiana has been spared from the savage deforestation that comes with intensive colonization, and so has the largest tracts of virtually untouched lowland tropical forest stretching from the Caribbean coast south to northern Amazonia. When establishing his research programme in French Guiana, Pierre Charles-Dominique recognized the important role that bats play as pollinators and seed dispersers in tropic forests, so he wisely chose to focus much of his energies on the ecology of the Phyllostomid fruit bats and their role in seed dispersal. Here, he teams up with André Brosset and Sylvie Jouard to



bring us an introduction to the natural history and identification of the 100-odd species of bats that can be found in this part of northern South America. Some of the older (and bilingual) bat researchers will remember André Brosset as the author of the excellent, but now dated, book, *La Biologie des Chiroptères* (Biology of the Chiroptera).

Unlike most books, *Les chauves-souris de Guyane* is not divided into clearly identifiable sections and numbered chapters. The book, however, is structured around two main sections, the first focusing on the biology and natural history of bats (78 pages) and the second providing a comprehensive identification key (57 pages). Separating the two sections are roughly 100 medium- to high-quality pictures of roughly half the species known to occur in French Guiana. Following the body of the book are four appendices with supporting information.

The first section is divided into 13 "chapters." Liberally translated, these are: History of research on bats of Guiana, The South American bat fauna compared with those of other continents, Systematics and the origin of the bats of Guiana, Distribution and ecological assemblages, Populations and guilds, Diets, Roosting ecology, Predation, Social organization, Relationships with Man, Bats and forest regeneration, and finally Observational and capture methods.

In the first chapter (History of research on bats of French Guiana), the authors present a brief overview of who has collected or studied bats in Guiana and what research has been done. The authors insist that this is a comprehensive review of the subject (only a few pages!) and they are right: little has been done within the political boundaries of French Guiana. However, this section in effect defines the scale and limits for the rest of the book. Do not look for a review or the integration of data from studies that were conducted outside French Guiana. If studies were conducted within the same biogeographical zone or forest type, but outside the borders of Guiana, they are not included.

The following two chapters (South American bat fauna compared with those of other continents, Systematics and the origin of the bats of Guiana) briefly state the primary difference between South American bat faunas and those of the paleotropics, namely that the megachiropteran fruit bats of the paleotropics are replaced by the smaller phyllostomid frugivores. We also learn that Guiana has few indigenous species, which is not surprising considering the mobility of bats, regional geography, and lack of historical refugia. Thus, the fauna of French Guiana is typical of the fauna of most of northern South America.

The next two sections (Distribution and ecological assemblages, Populations and guilds) start by providing a very general overview of the vegetation blocks that characterize French Guiana and the bats that are commonly found there. The authors then present data on the species-abundance and species-capture effort curves of primary forest and developed sites to demonstrate the extreme species richness, but relative rarity of bats in primary forest.

In the sections Diets, Roosting ecology, Predation, Social organization, Relationships with Man, and Bats and forest regeneration the authors provide a very general presentation of the topics supported with a large number of their personal observations.

The second section is composed primarily of keys or descriptions allowing the identification of the families, genera, and species of bats of French Guiana. It begins by presenting species, such as *Rhynchonycteris naso, Cormura brevirostris, Noctilio leporinus*, and others, that can easily be identified without using a key. The section then provides a key to the families, followed by a separate key to the genera, but only for the Emballonuridae, Phyllostomidae, Vespertilionidae, and Molossidae. Once bats have been identified to family and genus, the reader refers to the individual species descriptions for final identification. Each species description highlights the principle visual characteristics (eg. *Mimon crenulatum* is identified by a crenulated nose-leaf, trilobed low incisors, and a pale mid-dorsal stripe). Each species description is accompanied by a line indicating mean forearm length and range for males and females as well as by excellent line drawings showing the dentition, face and nose-leaf, lips, calcar, or tail. Some identification characteristics have numbers in superscript and it took me ages to figure out that these referred to statements in the following Appendix 1.

I have to admit that I am luke-warm regarding this book. Visually, it appears as a semi-professional job thrown together on a lap-top computer using an amateur publishing programme. For some reason, the lack of clearly defined and numbered sections and chapters irritated me. Cited references are loaded with typographical errors both in the text and the bibliography. However, my main reservations are twofold.

First, the book is extremely narrow in scope, limiting itself to a political unit (French Guiana) rather than a biogeographical or faunistic region. Although a considerable literature exists regarding the behavior, ecology, distribution, community structure, and diet and seed dispersal of bats in Central America and northern South America, virtually none of this literature is tapped to provide examples, comparisons, or contrasts. If a study was not undertaken in French Guiana, then it doesn't exist. For this reason, *Les Chauves-souris de Guyane* cannot be used to provide either a new analysis of the structure of bat communities or rapid access to the abundant literature on neotropical bats.

Second, I found it difficult to decide just what readership this book was aimed at. Because it doesn't address, integrate, or criticize any of the neotropical bat literature, those familiar with bats will find the book superficial. It is true that the authors present many anecdotal observations regarding the distribution, diet, roosting sites, or other aspects of the natural history of many species, but the density of new information is not great enough to make this book a "must buy." Rather, I was left with the feeling that the main readership would be young undergraduate biologists seeking something just slightly above the level of a general natural history book. *Les Chauves-souris de Guyane* is neither an stimulating book on general natural history, nor is it a serious scientific treatise on the biology of neotropical bats.

In my opinion, the main value of *Les Chauves-souris de Guyane* lies in the keys and species descriptions which are of great value for those planning an expedition to north-western South America. I am happy to have a copy and am happy to know that research is being undertaken in French Guiana, but would have preferred a more detailed synthesis of the ecology of neotropical bats.

## A NEW LOOK FOR *TROPINET*

The new logo and masthead for *Tropinet* were designed by Katherine Hartman, an art major at The College of Wooster in Ohio, USA. We hope this new look and the larger, 8-page format will let us bring you more news and views in coming issues! Mike Benchoff, Wes Tree, and Jan Lewis also helped with the production of this issue. Thanks!

## MEETINGS AND CONFERENCES

**Society for Conservation Biology 17th Annual Meeting**, 28 June–2 July 2003. Duluth, Minnesota, USA. See: http://www.d.umn.edu/ce/conferences/scb2003/

**Annual Meeting of the Association for Tropical Biology and British Ecological Society, Special Symposium** 7–10 July 2003, University of Aberdeen, Scotland, UK. "Biotic Interactions in the Tropics: Their Role in the Maintenance of Species Diversity". Details: http://www.atbio.org/atb2003.html

**International Association for Landscape Ecology 2003 World Congress**, 13-17 July 2003, Darwin, Australia. See: http://www.iale.ntu.edu.au/

**International Botanical Gardens Conference**, 15–18 July 2003, Bali, Indonesia. For information, email: kriblipi@bogor.wasantara.net.id or inetpc@indo.net.id

**Botanical Society of America**. 26–31 July 2003, Mobile, Alabama, USA. See: http://www.2003.botanyconference.org/

**88th Ecological Society of America Annual Meeting**, 3-8 August, 2003, Savannah, Georgia. See: http://www.esa.org/savannah/

**IV Congreso Ecuatoriano de Botánica and II Congreso de Conservación de la Biodiversidad en los Andes y en la Amazonîa**. 25-30 August, 2003, Loja, Ecuador. See http://www.sur.iucn.org/vitrina/evento.cfm?passcodevent=128

**IUCN Vth World Parks Congress**, 8-17 September 2003, Durban, South Africa. See: www.iucn.org/wpc2003/

**XII World Forestry Congress**, 21–28 September 2003, Québec, Canada. See http://www.wfc2003.org/en/index.php

**II Symposium on Island Ecosystems**, 5-9 October, 2003, Funchal, Madeira Island, Portugal. See http://www.uma.pt/investigacao/Ccbg/swebs/simposium/index.html

**7th International Conference on the Ecology and Management of Alien Plant Invasions**. 3-7 November, 2003, Ft. Lauderdale, FL. See: http://www.esa.org/ipinams-emapi7/

**VI Brazilian Congress of Ecology**, Fortaleza, Ceara, Brazil, 9-14 November, 2003. Information from: geograf@ufc.br and vcs@ufc.br (Dra Vanda Claudino Sales)

**15th Annual Society for Ecological Restoration Conference**, 19-22 November 2003, Austin, Texas, USA See: http://www.ser.org/meeting.php?pg=annualconference

**2004**

**Second Tropical Montane Cloud Forest Symposium**, 28 July – 2 August 2004, Waimea, Hawaiian Preparatory Academy, Hawaîi. Contact Lawrence Hamilton\: hamiltonx2@mindspring.com or tel/fax +802-425-6509

**2005**

**XXIInd IUFRO World Congress** 8–13 August 2005, Brisbane, Australia iufro@forvie.ac.at or hainesr@qfril.se2.dpi.qld.gov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ATBC is an international society that promotes tropical biology and conservation in its broadest sense. ATBC publishes the quarterly journal BIOTROPICA and sponsors annual meetings and symposia. Information: W. John Kress, ATBC Executive Director, Smithsonian Institution, US National Herbarium, Department of Botany, NBH 166, Washington, DC 20560.

OTS is a non-profit consortium of 65 academic and research institutions in the United States, Australia, Latin America, and Asia. Its mission is to provide leadership in education, research and the responsible use of natural resources in the tropics. Graduate, undergraduate and professional training and research facilities are provided at three field stations in Costa Rica. Information on OTS and *Tropinet* contributions: OTS, Box 90630, Durham, NC 27708-0630 USA.