Journal of Tropical Ecology (1998) 14:561–566.

Book Reviews

STRUHSAKER, T. T. 1997. *Ecology of an African rain forest: logging in Kibale and the conflict between conservation and exploitation*. University Press of Florida, 15 N.W. 15th St., Gainesville, Florida 32611-2079, USA. 456 pp. ISBN 0-8130-1490-5. Price US$ 39.95 (cloth).

This remarkable book summarizes the work done in the forest at Kibale, Uganda, from 1970, much of it amidst terrible conditions. The introduction gives a hint of some of the horrors which Struhsaker endured and of his success in not only developing the primate work but defending the trees and mammals in what was a lawless country.

The author's zoological bias is obvious in the ecological overview, plant ecologists will be disappointed by the weak soil data and the lack of adequate forest physiognomic descriptions. The later parts of the book are much better and include a detailed consideration of the effects of logging on the forest and its mammals. Although there are some methodological problems one has to accept that at Kibale, moderate and heavy logging has greatly reduced tree species richness, density and basal areas, including those food species important to primates. The author notes that 'Twenty-four years after heavy logging occurred there was little indication of tree regeneration'. Accepting that the situation in Kibale was exacerbated by the lack, even in undisturbed forests, of the smaller size-catorgories of the commercial trees, there is no doubt that logging had an adverse impact on the survival of tree seeds and seedlings. The poor survival was at least partly because of greatly increased herb cover. Struhsaker concludes that if post-logging forest regeneration is to occur by natural processes, then harvest levels and incidental damage due to logging, must be greatly reduced – to about 5% of the canopy or less – and gaps should be no larger than 300 m^2 and at at least 150 m apart. This is well below what is currently deemed the minimum commercial tree harvest.

Struhsaker's pessimism is just as marked when he discusses the influence of logging on primates (which are particularly abundant in Kibale) and in this his views differ from those of other researchers (e.g. Plumptre & Reynolds 1994). However Struhsaker makes a convincing case that his view is correct and shows that logging reduced the densities of social groups of all but one of the seven species of diurnal primates in Kibale. He shows in subsequent chapters that logging also has adverse effects on duikers but increases the numbers of elephants and rodents both of which slow down forest regeneration.

The last two chapters deal with the policy and practice of tropical rain forest management, and with the causes of forest destruction. His view that top priority should be given to dealing with proximate causes of forest loss, and thus that protection and law enforcement should be put before education and community involvement, will not be popular This and many other opinions in the book may be interpreted as contentious, but we must take seriously the views of a man who has first hand experience of the forest and the people for nearly thirty years. Over four fifths of the Ugandan rain forest has gone and the biome covers less than 2.7% of the country. One hopes that the great efforts of Struhsaker and others will help stop this decline.

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Plumptre, A. J. & Reynolds, V. 1994. The effect of selective logging on the primate populations in the Budongo Forest Reserve, Uganda. *Journal of Applied Ecology* 31:631–641.

WHITTEN, T., SOERIAATMADJA, R. E. & AFIFF, S.A. 1996. *The ecology of Java and Bali*. The Ecology of Indonesia Series. volume II. Periplus Editions, (HK) Ltd. xxiii + 969 pp. ISBN 962-593-072-8. Price £50.00 (hardback).

The loss of tigers from Java and Bali is just the tip of the iceberg of the ecological crises in these islands: the effects of population growth (in 1995 Java had an average of 862 people km^{-2}), inappropriately managed material wealth, land degradation, loss of agricultural land, reduced

water availability and habitat fragmentation are all taking their toll on these lands and their people. The authors have three aims: to record the current ecological state of the islands; to act as a catalyst for change; and to provide guidance to Indonesian agencies and others responsible for management and development in these islands. They hope that their book will be as influential in Java and Bali as Rachel Carson's 'Silent Spring' was in the USA and Europe.

Early in the book the ecological problems evident in Java and Bali are set out . There is a thought provoking discussion on the inability of modern economies to reconcile growth with sustainable development. Widely used measurements of economic growth which omit the depletion and degradation of the environment and natural capital are severely criticized. This section also covers population pressures, land efficiency and food supply, water resources, tourism (particularly in relation to Bali), biodiversity loss, climate change, and the intrinsic need for sustainable development. At times these read rather like a manifesto, but they are persuasive in their arguments and set the framework for the rest of the book.

Sections follow which describe the past and present physical, biological and human ecological aspects of the islands, and ecosystems: natural, urban and agricultural, the latter contains interesting information about the plantation and agroforestry industries. The importance and benefits of each of the natural ecosystems are spelt out. The fourth part of the book looks at conservation issues, and extols the wise use of natural resources. The rationale behind conservation in social, moral and economic terms, is covered in some detail. The loss of biodiversity and the need to preserve genetic variation are also summarized here. The final part of this section lists the major existing and potential conservation areas in Java and Bali, and outlines the problems they face; many of these areas are protected on paper only.

The final part of the book, 'Finding a path for the future', draws together all the threads introduced in the volume, and also describes a philosophical basis for change influenced by a knowledge of ecological principles. This section makes it clear that the national philosophy of Indonesia, Pancisila – belief in God, humanity, national unity, democracy, and social justice for all – is entirely consistent with sustainable development. The book ends with a summary of the challenges for the future, including the need for institutional reform, the involvement of local communities with sustainable development at local and higher levels, the need for people to adopt a lifestyle based on sustainable principles, and greater protection of protected areas.

The book is available in both English and Indonesian, and should be readily accessible to a broad audience. It is extensively cross-referenced, with very little repetition or extraneous information. It promotes tough action and is uncompromising in its stance to forge a new agenda for development projects in Java and Bali. The combination of Asian ethics, environmental pragmatism from an Indonesian perspective, and a strong focus on philosophical as well as practical considerations, may strike many western readers as idiosyncratic, but the book should succeed in winning over its primary target (Indonesian decision makers) without giving offence, and should provide other readers with a great deal of food for thought. It could easily be used as the blueprint for the problems, issues and solutions to the question of sustainable development elsewhere in the world.

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WILSON, D.E. & SANDOVAL, A. (eds) 1996. *Manu: the biodiversity of Southeastern Peru, la biodiversidad del sureste del Perú* . The Smithsonian Institution, Washington, D.C. 679 pp. ISBN 1-56098-710–3. Price $35.00 (paperback).

In 1977 the Peruvian government created the 1.5-million hectare Manu Biosphere Reserve (11–13° S). It stretches from paramo (4000 m elevation) down to Peru's Amazonian lowlands. Two low-elevation research sites have been developed in Manu: Cocha Cashu, intensively studied by John Terborgh and others, and, 21 km away, Pakitza (elevation 356 m). The latter was one of the first locales for intensive inventory studies under the BIOLAT (Biological Diversity of Latin America) program, initiated in 1987 by Terry Erwin of the Smithsonian Institution. This edited book focuses on the studies at Pakitza and consists of 29 reports (20 in English, nine in Spanish).

The volume provides an eclectic window into the first stages of research at a tropical site. For future researchers at Pakitza or environs, the book is a must because it presents the existing

knowledge on diverse biota. Species checklists and keys, often with annotations on habitat, diet, or abundance, are given for the palms, bamboos, butterflies, velvet ants, carabid beetles, caddisflies, dragonflies and damselflies, fish, reptiles and amphibians, birds, mammals, and bat ectoparasites. These studies provide numerous of the 'oh my' gems expected from Amazonian inventories; for example, Pakitza is the richest collection locale to date for carabid beetles (over 600 species), and more cicada species are known from Pakitza than from Venezuela or Bolivia. These chapters also include hands-on collecting tips and give a sense of the logistic challenges and ingenuity that imbue biotic inventories in remote tropical areas.

An interesting data set for tropical forest ecologists comes from the mapping and identification of all trees >10 cm in diameter in a 1-ha plot in each of four distinct river-associated habitats: bamboo-dominated forest regenerating from previous indigenous settlement, a seasonally inundated site, a rarely-flooded lower alluvial terrace, and a stream-bisected slope. These plots are the backbone of the BIOLAT inventory design at Pakitza. With their individualistic site and floristic characteristics, they also highlight the challenges involved in trying to design sampling schemes for tropical landscapes.

The diverse topics of other chapters range from the discharge characteristics of Pakitza's electrical fishes, to ithomiine butterfly flight patterns, to soil nutrients. Also included are descriptions of two new ectoparasites and an essay on Peru's bryophyte flora.

This book is a compendium of initial findings from a very interesting Amazonian site. It underscores the strong binational science collaboration at Pakitza, with Peruvian scientists authoring more than half the contributions. The volume suffers, however, from a lack of tight editing. Maps, descriptive text, and data are repeated, and there are frequent typographical errors and some tables and figures of little general interest. For many tropical biologists, having this volume in a nearby library will be more useful than adding it to their personal collection.

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RIELEY, J.O. & PAGE, S.E. (eds). 1997. *Biodiversity and sustainability of tropical peatlands*. Samara Publishing, Tresaith, Cardigan, Dyfed SA43 2JG, UK. ISBN 1-873692-10-2. Price £45 (hardback).

This book publishes 38 papers from an Indonesian conference. Two Ministers contribute statements, which highlights the perceived importance of the nation's 200,000 km^2 of peatswamp forest. The title is grossly misleading as the focus is strongly on Indonesia (especially Kalimantan) and Africa and America are not included (Colombia alone has 3400 km^2 of peat).

First are four chapters on Context. Second are six on History, including a useful summary for Kalimantan (Rieley *et al*.) that unfortunately clashes with the next (Radjangukguk), then comes an excellent chapter on radio-carbon ages of four Indonesian peats (Neuzil). Section 3 has seven chapters on Peatland Characteristics, one of which shows that roots are a major component (Brady). Section 4 (Forest Structure & Biodiversity) includes work in progress after three field seasons by the editors' research groups (floristics, vertebrates), an irrelevant paper on a Peruvian freshwater swamp forest (Nicholson) and a comparison of a floristic inventory (trees >1 cm diameter) of an unlogged peat Swamp forest with that from one logged in 1996 (trees >5 cm diameter) (Ibrahim). Finally, Section 5 (13 chapters) includes eight excellent, authoritative papers on agronomy by Indonesians.

Production has been commendably speedy and presentation is attractive but editorial intervention is imperceptible (see above). Numerous papers give (slightly differing) areas of Indonesian peats. Six are irrelevant (one a fascinating account for Ireland (Bradley), another a squib by Bellamy). A valuable analysis of orang utan distribution (Meijaard) seems misplaced.

The wise use of peats (Petterssen) omits any mention that the best and probably only sustainable use of deep tropical peats is careful selective timber production. It is amazing to find no reference to Sarawak's very considerable silvicultural experience. It is repeatedly stated that agriculture is only feasible on shallow peat. Several authors make passing mention of the current megaproject to clear 1 M ha of the Kalimantan peat forest for agriculture. This must

have been on all participants' minds, but no one drives home the conclusion that a megadisaster is in the making. Editorial intervention could have clarified and emphasized both this and more general conclusions. Chapter abstracts would have been invaluable so would an index. There is also the philosophical question as to whether unrefereed pamphlets gain credibility if cited in an unrefereed hardback book, does modern tropical science thus 'progress'?

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EMMONS, L. & FEER, F. 1997. *Neotropical rainforest mammals: a field guide*. (Second edition.) University of Chicago Press, Chicago, Illinois 60637, USA. 396 pp including 72 pages of plates. ISBN 0-226-20719-6 (cloth), 0-226-20721-8 (paperback). Prices $US 80.00 (cloth), $US 25.95 (paperback).

Seven years after the first edition comes this revision with 10% more species of Neotropical rain-forest mammal described (more than five new species of mammal are being discovered each year), i.e. there are 560–600 species listed (according to taxonomy). There is an introduction to each order (11 in all), family and sub-family, followed by the description of each species, including identification, notes on similar species, natural history, geographic range, status and references (there is no final bibliography, which should not be a problem).

There are 29 colour plates of excellent quality, and seven black-and-white plates, with numerous line drawings throughout the text. Equally impressive are the distribution maps, which seem to cover absolutely every species, usually with several species on each map of excellent clarity. Finally, there are five appendices – a short glossary, detailed keys to the families and genera of most of the orders, discussion of the classification, study, biogeography and conservation of these Neotropical rain-forest mammals, tracks of large mammals, and a checklist and index of scientific names.

More used to Asian field guides, I find that this one really is impressive for its thoroughness, quality and compactness. Some minor errors and omissions are inevitable in such a major undertaking, but they must be much less numerous than in comparable volumes. (I could only detect a few in the Primates.) It will be invaluable to mammalogists in particular, and biologists and naturalists in general – especially those researchers and wildlife authorities in the countries concerned.

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