

Cambodian Journal of Natural History

Cambodia's biodiversity
revealed

A new primate for
Cambodia

Amphibians and reptiles
of the Cardamoms

The Protected Area Law

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Cover photo: (© L.L. Grismer) *Micryletta inornata*, commonly called the 'plain narrow-mouthed frog' or 'deli paddy frog', typically inhabits disturbed forested areas where it hides under fallen logs or rocks during the day. It breeds in small, still pools of water. In Cambodia, this beautiful frog has been found in the Cardamom Mountains, Bokor National Park (see Grismer *et al.*, this volume) and limestone areas near Kampot. It is also native to India, Indonesia, Malaysia, Thailand, Vietnam, Laos and China.

Editorial - Cambodia's biodiversity revealed

Jenny C. Daltry

The past ten years have seen a revolution in our understanding of the status, ecology and management needs of Cambodia's biological diversity.

This rise in environmental knowledge can be charted by the number of species known to occur in Cambodia. In the 1997 '*Cambodia: A National Biodiversity Prospectus*', ecologist David Ashwell collated and summarized all of the available information on the country's natural resources. Nearly all of the 410 species of birds and 2,308 vascular plants he recorded had been found in surveys prior to the 1970s. The *Prospectus* also listed 132 mammals in Cambodia, but fewer than 100 species had actually been confirmed by 1997 - the rest were inferred from their presence in neighbouring countries. Ashwell made no attempt to assess the number of species of reptiles, amphibians or insects. Only a few years earlier, the World Conservation Monitoring Centre (WCMC, 1994) recorded 82 species of reptiles and 28 amphibians in Cambodia, but many of them were unconfirmed: a perusal of the available literature suggests that only nine species of amphibians had been verified in Cambodia by the late 1990s. WCMC (1994) also reported the number of freshwater fish species in Cambodia to be ">215". In comparison with neighbouring countries, all of these figures were suspiciously low. It was, as Ashwell (1997) observed, "clear that there are many more species yet to be discovered."

As predicted, the number of species known to inhabit Cambodia has shot upwards since the late 1990s, largely due to collaborative surveys by national and international scientists. The number of confirmed mammal species has reached 146 (UNEP-WCMC, 2008), with many of the latest additions being bats, rodents and other small mammals. To this figure can be added the red-shanked douc, *Pygathrix nemaeus* (Rawson & Roos, 2008 - this volume). 552 birds have been confirmed within Cambodia's borders, with a further 20 reported but unproven (F. Goes, pers. comm.). At least 474 species of native freshwater fishes have been positively confirmed, according to FishBase (Froese & Pauly, 2008), but several authorities put this figure at over 500 or even 1,000 species. Grismer *et al.* (2008 - this volume) list over 97 species of reptile in Southwest Cambodia alone. These include several new species records that should be added to the UNEP-WCMC (2008) database, which currently lists 165 reptiles nationwide. In 2008, a new guidebook will document at least 63 species of amphibians that have been collected in Cambodia, several of which still lack scientific names (Neang & Holden, in press). The number of known plants is also rising steadily, although many hundreds of specimens collected in recent years remain unidentified.

Published information on invertebrates remains even more scattered and incomplete. The UNEP-

Table 1 Number of species confirmed to be in Cambodia (see text for references)

	1990s	2008	Percentage increase
Mammals	c. 100	147	c. 47%
Birds	410	552	35%
Reptiles	82	>165	101%
Amphibians	28 (9)	63	125% (600%)
Freshwater fishes	>215	>474	120%
Butterflies and moths	31	>513	>1,555%
Vascular plants	2,308	(Not assessed)	-

WCMC database and older sources list only 31 butterflies and moths in Cambodia, but a 12-day survey in the Cardamom Mountains found 292 species belonging to one moth family, Pyraloidea, alone (Nuss, 2000) and an eight-day survey in 2006 collected 221 species of butterflies in one small part of Pursat province (M. Yago, University of Tokyo, pers. comm.). Readers of this journal may know of other, equally astonishing records.

While most of Cambodia's newly recorded species were previously known from neighbouring countries (e.g., Thomas *et al.*, 2007), some have proved to be completely new to science, including a mite (Haitlinger, 2004), orchid (Liu & Chen, 2002), snake (Daltry & Wüster, 2002) and tree (Wilkie, 2007). A number of the new species are believed to be endemic, or unique, to Cambodia, including a recently discovered bat from Kirirom (Csorba & Bates, 2005), a new fish genus from the Tonle Sap (Motomura & Mukai, 2006) and a green-blooded tree frog from the Cardamom Mountains (Grismer *et al.*, 2007).

The figures in Table 1 may be hotly disputed, but one thing is clear - the number of known species in Cambodia will continue to increase for the foreseeable future. This is partly because many areas are only just beginning to be explored for the first time. Of the 23 protected areas established in 1993, for example, ground-based surveys had been carried out in only four or five by 1997. In the intervening ten years, *all* of the protected areas have been visited by one or more biologists, and 15 or more have been subjected to baseline surveys of at least the birds and mammals. These statistics illustrate the tremendous progress that has been made during the past ten years, but there is still a very long way to go before Cambodia's biodiversity is fully documented and understood.

The rapidly growing body of research by Cambodian and international biologists is mirrored by burgeoning research in the fields of human livelihoods and natural resource consumption. While the bulk of this work has focused on fisheries, an increasing number of studies have been conducted

on the use and management of forests and other terrestrial resources. Some examples of these can be downloaded from the MekongInfo website (www.mekonginfo.org). The social scientists have demonstrated that well over 8.5 million Cambodian people depend very heavily upon fisheries and forest resources for their daily consumption and during times of hardship. As McKenney & Prom (2002) put it: "Cambodia's natural resources not only provide a foundation for food security, income, and employment for most of the population, but also an essential 'safety net' for the rural poor". The diversity and quantity of species used by people in this country is breathtaking. For example, at least 300,000 tonnes of fish are taken out of Cambodian rivers and lakes every year (Nao & van Zalinge, 2000), and around 600 native plant species are collected for medicinal purposes (Walston & Ashwell, 2008).

Just as we are starting to realise how diverse and important Cambodia's biodiversity is, it is beginning to disappear. Unsustainable logging, hunting and fishing, land speculation and encroachment in protected areas and forests, alien invasive species, and the transformation of natural habitats by roads, plantations, mines, and hydroelectric dams are all taking their toll. Arguably the biggest challenge facing Cambodia today is finding a way to develop its economy and improve infrastructure without decimating the natural systems that more than half of its people depend on. Making the right choices will require an more rounded understanding of the diversity, status, distribution, ecology, threats, human use and management needs of Cambodia's incredible biological wealth.

The Editors hope that the *Cambodian Journal of Natural History* can play a useful role in this regard. The idea of launching a national environmental science journal sprang from the realisation that while there is a wide array of exciting research being carried out in Cambodia, very little of this work is being made available to other scientists or decision makers to share within the country. Notwithstanding the references cited below, many of the most important discoveries in the past decade can be found only in technical reports to donors

or published in expensive and often unattainable foreign journals. Even more data, from interviews, field observations and experimental studies, remain confined to personal notebooks and risk being lost forever.

The primary mission of this journal is therefore to encourage and enable more scientists in Cambodia to share their findings with a wider international and national audience, including many of the nation's leading advisers and decision-makers.

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Ongoing publication project: an annotated checklist of the birds of Cambodia

Frédéric Goes

Background

No comprehensive work on Cambodia's avifauna has been published since Thomas and Poole reviewed the 399 species that had been recorded before 1970 (in *Forktail* 19, 103-127). After the country returned to peace in the mid-1990's, the amount of new information has grown exponentially. Today, there is an obvious need for a national checklist reference for the conservationists, ornithologists and increasing flocks of birdwatchers to Cambodia.

Scope

The book will cover the 552 species recorded to date, plus another 20+ unconfirmed, provisional or potential additions. Each species will be listed by their scientific, English, Khmer (plus transliteration)



Moustached barbet *Megalaima incognita* (photo by Xavier Rufay).



Collared owlet *Glaucidium brodiei* (photo by Xavier Rufay).

and French names. Species accounts will give information on status, abundance, distribution, habitat, breeding and conservation. An introduction will feature habitat and protected area maps and present the country's geography, habitats, ornithological history and coverage, as well as threats and conservation importance. The book should also include photos of particular species or habitats.

Plea for contributors

The author would be grateful to any visiting or resident birders, bird tour guides, conservation organisations, or anyone else for sharing relevant information such as survey reports, trip accounts, observations, publications, etc. Photos of species, natural habitats or threats taken in Cambodia would be much appreciated and the photographers fully acknowledged. Finally, should any person or organisation be interested in contributing funds for this project, this would be most welcome because there is currently no funding secured to cover layout and printing costs. To contribute information and photographs, please write to: Frédéric Goes, e-mail fredbaksey@yahoo.com