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**FIELD SURVEY OF BIODIVERSITY  
IN THE KIKORI RIVER BASIN  
PAPUA NEW GUINEA**

by

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Conducted as part of the WWF Kikori Integrated Conservation and Development  
Project with the financial and logistic support of the Kutubu Joint Venture  
and Chevron Niugini Pty. Ltd.

1995

## PREFACE

This is a compendium of technical reports submitted to WWF by the lead specialists that participated in the WWF Field Survey of Biodiversity in the Lower Kikori River Basin, Papua New Guinea, during February-March 1995. Each technical report is reproduced as received. The WWF Kikori Integrated Conservation and Development Project hopes to synthesize and edit each of these reports into an illustrated book for broader distribution.

## ACKNOWLEDGMENTS

The Field Survey of Biodiversity participants gratefully acknowledge the superb organization and support of the WWF/Kikori field offices in Moro and Kopi, the outstanding logistic support by Chevron Niugini Pty. Ltd., excellent field assistance by residents from Veiru Creek, Omo, Kopi, Kikori, Kantobo, Kafka, Kaipu and Ludesa Mission villages, and the helpful collaboration of the PNG Department of Environment and Conservation, National Museum, Bulolo Forestry College, Forest Research Institute, University of PNG, Christensen Research Institute, and Wau Ecology Institute.

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# Field Survey of Biodiversity in the Kikori River Basin, Papua New Guinea

## EXECUTIVE SUMMARY

WWF organized and led a five-week field survey of biodiversity (FSB) in the Lower Kikori River Basin of Gulf and Southern Highlands Provinces, Papua New Guinea (PNG), during February-March 1995. A majority of PNG scientists comprised the 16-person FSB team, with specialists covering mammals, birds, amphibians, reptiles, fish, butterflies, moths, aquatic insects, and plants. Principal FSB study sites were Veiru Creek, Omo Village, Wassi Falls Lodge near Kantobo, Hedinia, Moro, Iagifu Ridge, and Mt. Bosavi. Less intensive, opportunistic sampling was carried out at several additional sites near the focal locales, logistical bases, or while in transit. Amazingly, not a single day of field work was lost to logistic snafus, thanks to superb assistance and support by Chevron Niugini and the local WWF office staff.

Because of the expertise of the FSB mammal specialists, there are separate reports on the non-flying mammals (by Seri, Leary and Kinbag) and on bats (by Leary, Seri and Kinbag). The two principal authors of these reports were able to complement their FSB efforts with an additional two weeks during July-August 1995, for a total of 40 days of field surveys covering 12 sites. For the non-flying mammals a total of 30 species in 12 genera and seven families were documented. Museum records from the Kikori raise the total to 60 species, which is 40% of New Guinea's non-flying mammal fauna. Significant records were documented at Utiti Creek, Wassi Falls, Mt. Kemenagi and Mt. Bosavi. An undescribed species of Rattus was found on Mt. Kemenagi. The Kikori River Basin includes rare species of Lorentzimys nuhuysi, Macruromys major, Microhydromys richardsoni, Myoictis melas, Phalanger vestitus, Pogonomelomys bruijni, P. mayeri, Pogonomys loriae, Xenuromys barbatus, and Zaglossus bruijni. Significant range extensions were recorded for Dorcopsis lactuosa, Dorcopsulus vanheurni, and Rattus novaeguinea.

Bats are especially characteristic and species-rich in tropical rain forests, where they are important pollinators, seed dispersers, and insectivores. The Kikori FSB recorded 20 species in 12 genera and five families. Museum records raise the Kikori bat totals to 29 species in 14 genera, which is 39% of the bat species known for New Guinea. Eight rare species were recorded, including Golden-tipped Bat (Phoniscus papuensis), Wollaston's Horseshoe Bat (Hipposideros wollastoni), Round-eared Tube-nosed Bat (Nyctimene cyclotis), Javan Bent-wing Bat (Minopterus medius), Long-eared Sheath-tail Bat (Emballonura diana), New Guinea Sheath-tail Bat (E. furax), Western Horseshoe Bat (Rhinolophus arcuatus), and Large-eared Horseshoe Bat (R. philippinensis).

New Guinea's spectacular bird fauna are very well represented in the Kikori region. The FSB results are combined with those from a preliminary biological reconnaissance carried out in 1994 by the same expert (Dr. Ian Burrows). The bird results total 238 species in 137 genera in 48 families, of which 12 species are listed by IUCN as endangered or threatened. The more species-rich families are honeyeaters (27 species), pigeons and doves (21), parrots, lorries and cockatoos (18), whistlers, pitohuis and allies (12), birds of paradise (11) and hawks, eagles and allies (11). Rare species recorded include New Guinea Flightless Rail, Gurney's Eagle, New Guinea Harpy-Eagle, and Black Sicklebill. Several species vulnerable to human disturbance and/or hunting show robust populations in the Kikori, e.g., Dwarf Cassowary, Southern Cassowary, New Guinea Harpy-Eagle, Vulturine Parrot, Palm Cockatoo, Southern Crowned Pigeon and Blyth's Hornbill.

The FSB report on amphibians and reptiles (by Eliah Bigilale) is incomplete. Field observations indicate that the Kikori appears to be fairly rich in frog species. Local residents report that crocodiles are still found in the lowland rivers and delta.

Based on the FSB fish expert's (Dr. Gerald Allen) work, the Kikori fish fauna comprises 87 species in 55 genera and 34 families. The fish fauna is dominated by the Catfishes, Rainbowfishes, Gobies and Gudgeons. The lower Kikori River and Delta are represented by approximately 70 species, with dramatically lower species richness above the numerous water falls. The Kikori river system has more endemic species (14 species known only from here) than any other river system in New Guinea, including the much larger Fly and Sepik systems. Five new species were discovered in the Kikori system, including a blind cave fish (Oxyeleotris sp. novo) collected by local assistants near Kafka. Lake Kutubu, with ten endemic species, is the most exceptional lake habitat for fishes in PNG and Irian Jaya. Except for the occurrence of introduced Mosquitofish in Lake Kutubu, the extensive Kikori River system is uncontaminated by introduced species.

The FSB moth and butterfly reports (by Dr. Larry Orsak et al.) is incomplete.

Aquatic true bugs (Heteroptera) are excellent indicators and integrators of environmental quality. Dr. Dan Polhemus surveyed aquatic true bugs as well as damselflies (Zygoptera) and whirlygig beetles (Gyrinidae) at 33 sites in the Lower Kikori. Particularly rich sites include Lubu River waterfall at Omo, Veiru Creek, limestone creeks near Kantobo, forest creeks above Moro, and Mt. Bosavi. Aquatic water bugs averaged 7.5 species/site, whereas damselflies averaged 3.3 species/site and whirlygig beetles only 0.9 species/site. The aquatic water bugs totaled 75 species in 35 genera and 14 families, representing

approximately 27% of the island's species. Slightly more than half of the species collected represent undescribed species, of which ten were collected for the first time on the FSB. The 36 damselfly species show unusually high turnover among species across the collection sites. The whirlygig beetles were much more localized in distribution than were the water bugs and damselflies. One of the most interesting findings is no correlation between elevation and diversity of the three focal groups.

Detailed, quantitative sampling of plants (by Lawong Balun and Olo Gebia) at the principal FSB sites yielded 372 species over a total sample area of 1.8 ha. Highest species richness was from Omo (199 species; 170 m elevation), followed closely by Mt. Bosavi (185 species; 1350 m) and Hedenia (184 species; 630 m). There are no clear altitudinal trends of plant species richness. Some noteworthy plant records include: Eucalyptopsis sp. (with promising medicinal properties) on Iagifu Ridge and on Mt. Bosavi; Nothofagus grandis a common canopy dominant as low as 800 m elevation; and Tapeinocholos sp. at 800 m elevation.

More limited sampling (by Hartshorn) of tree species richness at each of the principal FSB sites yielded the expected trend of declining tree species richness with increasing elevation. Using a 100 tree (>10 cm dbh) sample, the highest tree species richness occurred at Wassi Falls (64 tree species; 400 m elevation), declining to 36 tree species at 1725 m on Mt. Bosavi.

The WWF Field Survey of Biodiversity (FSB) of the Lower Kikori River Basin clearly indicates that the region's vast forests and pristine streams have exceptional biological diversity. The incredible diversity of habitats of the watershed ranging from Lake Kutubu to the Great Papuan Plateau, the extensive tropical rain forests, old volcanoes, to the extraordinary delta system, makes it one of the most strikingly varied tropical landscapes in the world. Though only a limited number of study sites at low and middle elevations were sampled, the 2.2 million ha watershed (6% of PNG) harbors 30-50% of the island's species in several major animal groups.

Even more significant than its great species richness is that most of the forests are untouched by logging and the rivers are unspoiled. The healthy populations of rare species often hunted elsewhere in New Guinea as well as aquatic insects sensitive to environmental quality indicate the Kikori region is in excellent environmental condition because its extensive forests and numerous streams have not been damaged. Thus, this first FSB has not only documented the region's exceptional biodiversity, but also provided a baseline to monitor future development activities and their impact on the region's biodiversity.

## REPORT OUTLINE

### FIELD SURVEY OF BIODIVERSITY

#### WWF KIKORI ICDP, PAPUA NEW GUINEA

Executive Summary (1 page maximum)

#### Introduction

Put your taxon group in PNG context; why is it important for the WWF Kikori ICDP?

Include brief references to relevant scientific literature

#### Methodology

Give details of field sites surveyed, e.g., habitat type, elevation range, topography, substrate.

Describe specifically the methods/techniques used, e.g., plot size, number of mist nets, hours observed, streams sampled, such that someone else could repeat your work.

#### Results

Use summary table(s) with species grouped on left side by family or subfamily. Columns across top for each major site: Veiru, Omo, Kikori/Kopi, Wasi Falls, Bosavi, Kutubu/Agogo. Data entries can be actual numbers or presence/absence. For mammals, and possibly other vertebrate groups, it may be more informative to include an expected designation where local informants say that species occurs in the area. The preferred model is Table 1 (birds) in the PBR report.

#### Discussion

Comment on significance of your findings from several perspectives: conservation, population status, biogeography, impacts of development activities (e.g., petroleum, logging).

What was missed in this FSB? How can this be addressed?

Are there other taxonomic groups to be included next time?

How should we design conservation areas for the Kikori ICDP?

#### Conclusions & Recommendations

Give most significant conclusions

Please recommend how you would continue to inventory, evaluate and monitor your taxonomic group--don't be modest!

#### Literature Cited

Please give full citations

DEADLINE IS 15 JULY 1995 TO DR. GARY HARTSHORN