WWF

REPORT

2011

Conservation | Climate Change | Sustainability

Final Frontier:

Newly discovered species of New Guinea (1998 - 2008)

WWF Western Melanesia Programme Office

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Front cover photo: *Varanus macraei* © Lutz Obelgonner.

This page: The low water in a river exposes the dry basin, at the end of the dry season in East Sepik province, Papua New Guinea.

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WWF is one of the world's largest and most experienced independent conservation organisations, with over 5 million supporters and a global Network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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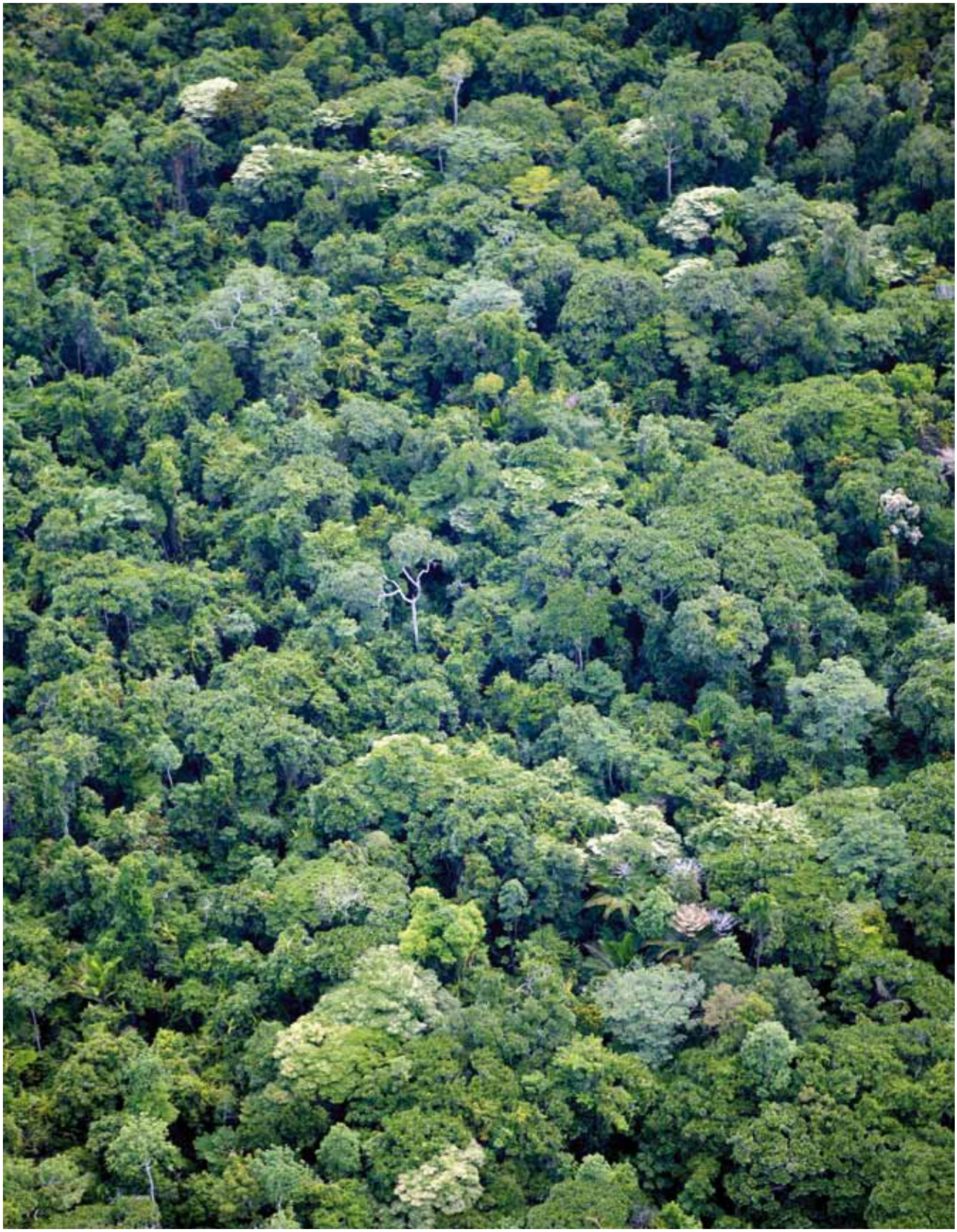

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Closed-canopy rainforest in New Guinea.

FOREWORD: A VITAL YEAR FOR FORESTS

New Guinea is home to one of the world's last unspoilt rainforests. This report shows, it's a place where remarkable new species are still being discovered today. As well as wildlife, New Guinea's forests support the livelihoods of several hundred indigenous cultures, and are vital to the country's development. But they're under threat.

Forest loss in other parts of the world mean that New Guinea now contains the planet's third largest block of rainforest, after the Amazon and Congo.

It's vital that New Guinea's forests are managed in a way that ensures they'll continue to sustain economic and social development – and support the island's fabulous wildlife. If we're to safeguard this 'final frontier', it'll require active partnerships between New Guinea's communities and a wide range of stakeholders.

This year has been designated the International Year of Forests, and WWF is redoubling its efforts to protect forests for generations to come – in New Guinea, and all over the world. Forests are home to 80% of all land-based species on Earth and 1.6 billion people rely on the resources that forests provide. They cover a third of all land area and are home to 300 million people worldwide[1]. Forests absorb and store carbon dioxide from the atmosphere, while emissions from deforestation are responsible for up to one-fifth of greenhouse gases. They play a fundamental role in regulating the climate and are critical in our fight against global warming.

Forests face major threats. A third of forests are used for producing timber and non-timber forest products, such as nuts and fruits[2], and this production is not always sustainable. Huge areas of forests have been cleared to make way for agriculture and plantation crops, such as oil palm. The result is that, since 1950, the world has lost half of its natural forest. That's half of all global forests in less than a human lifetime.

The forests of New Guinea make up the third largest rainforest in the world and the largest in the Asia-Pacific region. Here, much of the forest still remains, sheltering an extraordinary amount of unique biodiversity. But large-scale industrial logging and forest conversion for oil palm plantations threaten their future. The United Nations has declared 2011 the International Year of Forests to raise awareness of sustainable management, conservation and sustainable development of all types of forests.

Forests have been at the heart of WWF's work for half a century, and we're proud of our efforts to protect these amazing ecosystems. Today, we're working to halt deforestation around the world, from tropical rainforests to temperate forests. We've helped create national parks and other protected areas. We helped set up the Forest Stewardship Council (FSC) – the world's most reliable certification scheme for sustainable forestry. And we're working to tackle new threats, like the growing demand for bioenergy.

This year represents an opportunity to put forests in the spotlight. We're asking decision-makers in government and business to help us take a hard look at some of the biggest challenges facing forests today:

- How do we meet the world's demand for timber, paper and bioenergy while protecting forests for wildlife?
- Can carbon markets combat poverty and climate change at the same time?
- As the world population grows, how can we produce enough food without destroying more forests?

Throughout the year, our Living Forests Campaign is combining cutting-edge science, new perspectives from partners and our decades of experience on the ground to help answer these questions and trigger new thinking and innovative solutions. Our aim is to make sure there are living forests for generations to come. It couldn't be more urgent than in New Guinea, where the future of the island's forests hangs in the balance.
Find out more: www.panda.org/forests

EXECUTIVE SUMMARY

Over the last decade, an extraordinary number of new species have been discovered on the island of New Guinea. But the forests, wetlands and coastal regions where they live are under increasing pressure. This report introduces these remarkable new species, the threats they face, and what WWF and others are doing to secure their future.

© Tim Flannery

Spilocuscus wilsoni

Between 1998 and 2008 at least 1,060 new species were discovered in the forests, wetlands and waters of New Guinea. The newly described species include 218 plants, 580 invertebrates, 71 fishes, 134 amphibians, 43 reptiles, 2 birds and 12 mammals.

Scientists suggest that New Guinea is the last frontier for the discovery of such large numbers of new species.

New Guinea contains one of the world's last truly unspoilt tropical wildernesses. This final frontier on the edge of the Pacific covers less than 0.5% of the Earth's landmass, but is home to 6–8% of the world's species.

New Guinea is unique. It contains extraordinarily high levels of endemic species[I], together with an unprecedented cultural diversity – 1,100 languages are spoken.

Divided between the countries of Papua New Guinea in the east and Indonesia in the west, the island of New Guinea contains the third-largest tract of rainforest in the world, and its wetlands are the most pristine in the Asia-Pacific region. These habitats rival those on Borneo as well as the Amazon and Congo for richness. New Guinea is home to more than 800 species of birds, unique species of reptiles and amphibians, and extraordinary mammal species like tree kangaroos. Indeed, New Guinea's tally of terrestrial vertebrates – around 1,800 species – exceeds Borneo's by more than two-and-a-half times[II]. The plant diversity is also very high; the estimated number of vascular plants in New Guinea ranges from 25,000 to 30,000. The confirmed figure from 1980s data is 21,000 indicating that much is yet to be found on this under-studied island. Situated in the centre of the Coral Triangle, the reefs around New Guinea have the most species of coral and reef fish in the world[3].

Between 1998 and 2008, at least 1,060 new species have been discovered and officially described from the forests, wetlands and waters of New Guinea. Such is the extent of New Guinea's biodiversity that new species continue to be discovered even today. A 2009 expedition to the Southern Highlands of Papua New Guinea featured on the BBC series *Lost Land of the Volcano* found an estimated 40 new species, including at least 16 new species of frog, 2 new species of lizard, 3 new fish species, 1 new species of bat, and an undescribed endemic subspecies of the silky cuscus, a type of possum[4]. Another mammal, and the largest new species of animal discovered during the trip, was a woolly giant rat, found in the forest inside the crater of Mount Bosavi. Since 2008, more than 100 new species have been described by scientists[III], and clearly many more await scientific discovery and description.

If managed sustainably, the island's precious habitats such as reefs, rainforests and wetlands could continue to thrive into the next century. This is because, unlike most other parts of the world, these resources are, at present, relatively untouched[5]. Equally, because of the range in altitude (up to 4,884m) and the complex terrain offering numerous micro-habitats, rainforest species here have more chance to adapt to climate change than those in lowland rainforests. As the climate warms, they can move to higher ground – provided there is uninterrupted forest habitat connecting different areas[6].

As a developing region with high rates of poverty, development is essential for the people of New Guinea. However, only improved land-use planning and industry that follows best practice can deliver long-term ecologically sustainable economic growth. The environment of the island is increasingly under pressure from poorly planned, unsustainable development. Between 1972 and 2002, human activities resulted in a quarter (24%) of Papua New Guinea's rainforests being cleared or degraded[7]. New Guinea continues to face

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[I] Endemic refers to a species that is exclusively native to a specific region or island and found nowhere else. For example, the Kiwi is a bird endemic to New Zealand.

[II] Borneo has at least 150 amphibian and reptile species, 350 bird species and 200 mammal species.

[III] At least 76 plants, 10 fish, 23 amphibians and 2 reptiles have been discovered on New Guinea in the years 2009 and 2010.

growing threats from a wide range of activities, including illegal and/or unsustainable logging, subsistence over-exploitation, forest conversion for palm oil, commercial mining, road construction, invasive and/or exotic species, and unsustainable fisheries. These environmental threats are exacerbated by global climate change which is increasing the number of fires within forests and savannas, erosion, and seawater incursion into coastal habitats.

About nine million people depend on the forests and fresh waters of the island for their subsistence, livelihoods and cultural heritage. Forest management initiatives such as Reducing Emissions from Deforestation and Forest Degradation (REDD) could allow communities to derive economic benefits from natural resources while safeguarding the integrity of the rainforest for future generations.

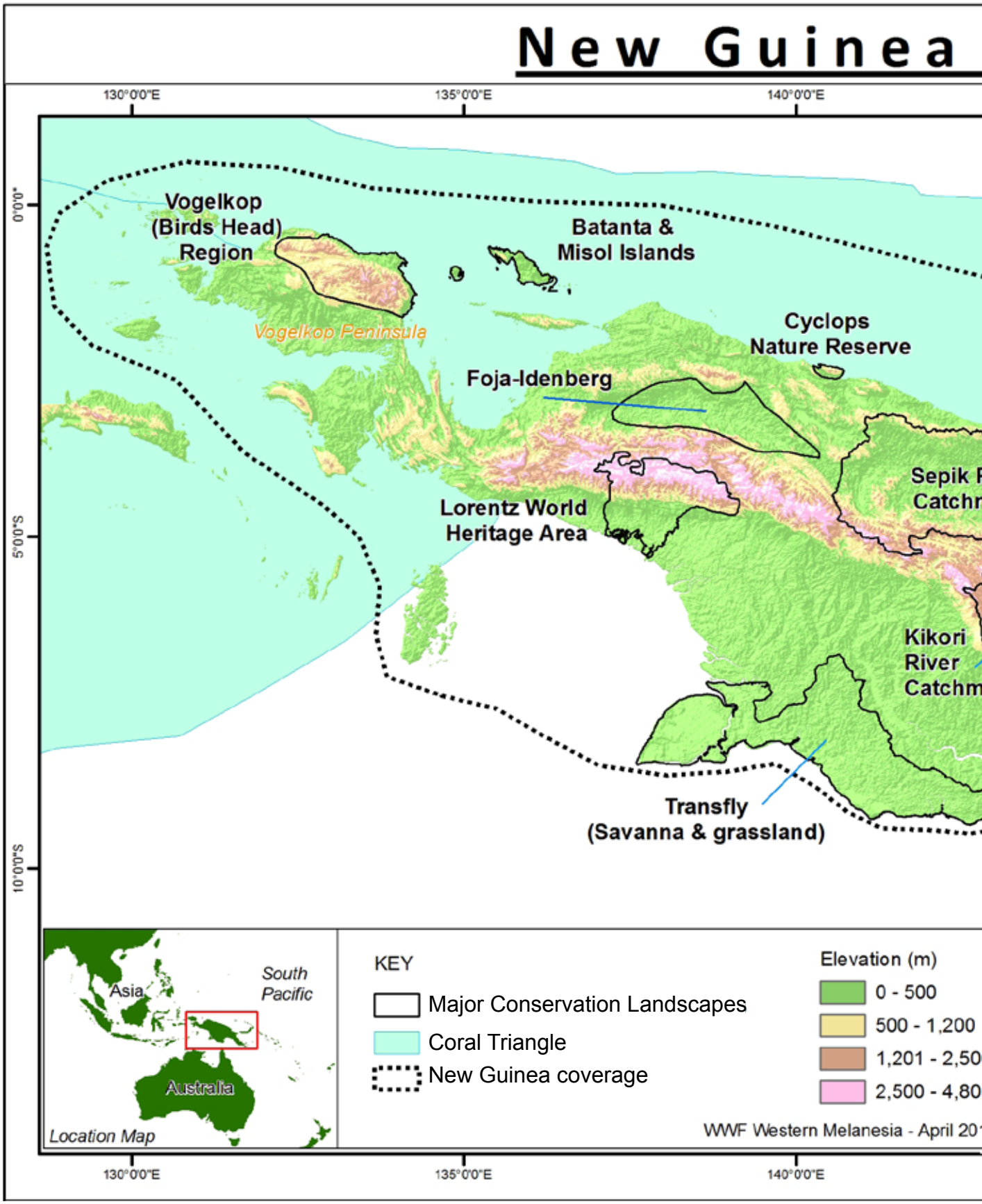
WWF has been involved in conservation in New Guinea since the early 1980s. We continue to work with local institutions and governments to help link community action with science and effective policy to promote the protection and sustainable use of forests, and freshwater and marine resources. Forests in New Guinea are partially or completely owned by local communities, so raising awareness and educating local people about their legal rights and obligations is a key part of successful conservation.

"As close to the Garden of Eden as you're going to find on Earth"

Dr Bruce Beehler, expedition leader, Foja Mountains, Papua, December 2005

© Paul Ritchie

Cyrtodactylus irianjayaensis


New Guinea
130°0'0"E
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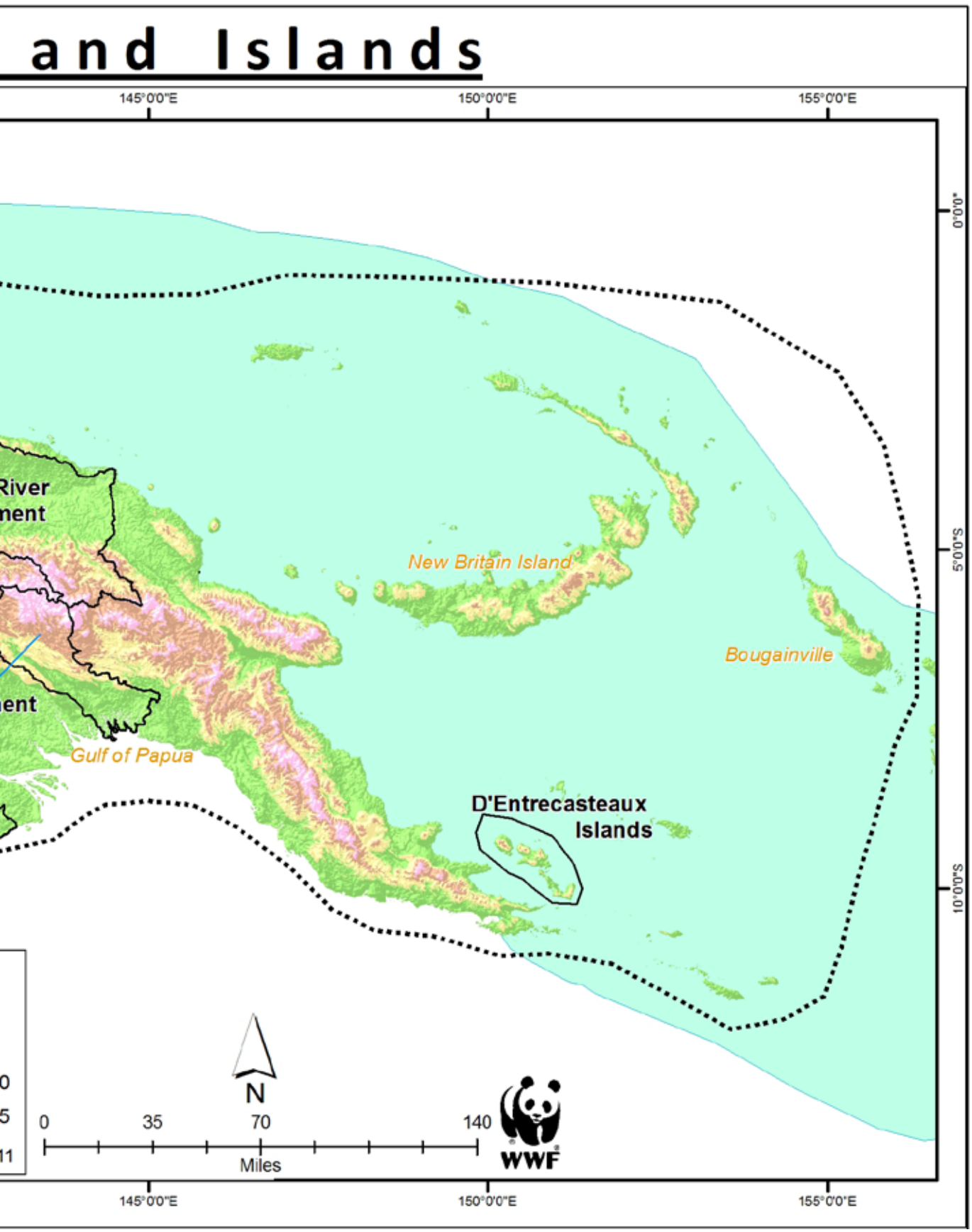
Vogelkop (Birds Head) Region
Batanta & Misol Islands
Vogelkop Peninsula
Cyclops Nature Reserve
Foja-Idenberg
Lorentz World Heritage Area
Sepik
Catchr
Kikori River Catchm
Transfly (Savanna & grassland)
Asia
South Pacific
Australia
Location Map
KEY
Major Conservation Landscapes
Coral Triangle
New Guinea coverage
Elevation (m)
0 - 500
500 - 1,200
1,201 - 2,50
2,500 - 4,80
WWF Western Melanesia - April 20



Map showing key New Guinea landscapes and areas of recent species discovery.

NEW GUINEA: THE LARGEST TROPICAL ISLAND ON EARTH

Geography

© Penny Ferguson / WWF WMPO

The WWF-supported annual crocodile festival, Sepik, Papua New Guinea, promotes conservation of the Sepik River and its totemic crocodiles as well as eco-tourism, which bring economic benefits to communities.

The largest and most mountainous tropical island on Earth, New Guinea (785,753 sq km) lies on the edge of the South Pacific and South-east Asia. The island is divided between the countries of Papua New Guinea (PNG) in the east and Indonesia in the west. Straddling the equator, two-thirds of New Guinea's surface is covered with tropical rainforests. In terms of size, the island's rainforests rank third in the world, after the Amazon and the Congo. Its seas encompass a large part of the Coral Triangle, a centre of global marine diversity.

New Guinea is one of the Earth's mega-diverse regions, owing much of this to its remarkable landscape and topography. Habitat types range widely, from flat grasslands and savannas, extensive mangroves, tropical marine environments, tall lowland and moist montane rainforests, to snow-capped mountains that soar to almost 5,000m.

Some nine million people inhabit New Guinea's unique landscapes. Amazingly, they speak one-sixth of the world's languages.

Biodiversity

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Matschie's tree kangaroo *(Dendrolagus matschiei)*. Despite a body designed to hop along the ground, tree kangaroos have evolved to live in the forest canopy.

In terms of its biological distinctiveness, New Guinea is more like a continent than an island, possessing a staggering array of endemic animal and plant species. Endemic species are those found only within a restricted area, meaning they're entirely reliant on the continued existence of the habitats in that area. The island's landmass is home to about 6% of the world's known land species, around half of which are strictly endemic. New Guinea's share of Earth's species rises to 8% when fish in its seas are taken into account.

The island is home to more than 800 species of birds[8], including 38 of the 42 known birds of paradise. It's estimated that a single square kilometre of lowland rainforest may contain as many as 150 species of birds[9]. The known herpetofauna (reptiles and amphibians) of New Guinea consists of 350 species of frogs and 400 species of reptiles (2 crocodiles, 17 turtles, 251 lizards and 130 snakes)[10].

Around 240 mammals are found in New Guinea – 4.5% of the world's total, a remarkable 9 times the average global density of mammal species[11]. Most of these mammals (62%) are endemic. The highest diversity of tree-dwelling marsupials in the world exists here, with

38 species[12]. The island is home to 12 of the 14 known tree kangaroos (of which 4 are critically endangered and 3 are endangered). Four species of echidnas (spiny egg-laying mammals) also inhabit New Guinea: the Short-beaked Echidna in the south west, and three species of the genus *Zaglossus*, or Long-beaked Echidna. New Guinea also supports 9 of the 11 species of forest wallabies. Bat species are more numerous than all other mammal species on the island – Papua New Guinea alone has 91 known species, 9% of the planet's 986 bat species[13].

Much of the interior of the island is covered with dense rainforest containing emblematic trees such as ebony, sandalwood, cedar and camphor. Rare trees include the Papua Ebony, *Diospyros insularis*, found only in a few locations on New Ireland in Papua New Guinea and the Solomon Islands. Trees of the genus *Gyrinops* and *Aquilaria*, which produce the rare and high-value fragrant resin eaglewood, still grow wild in parts of New Guinea. These forests are generally considered to support at least 21,000 plant species[14].

Very little is yet known about invertebrate life on New Guinea; this is a much understudied but exciting area for further scientific discovery. Scientists predict that New Guinea possesses *at least* 200,000 species of invertebrates[15]. The largest butterfly in the world, the giant Queen Alexandra Birdwing, which has a wingspan of up to 30cm, lives within the lowland coastal rainforest of the island; the male is spectacularly coloured, with iridescent yellow, blue and green markings.

The island's fauna and flora is a unique mix of elements from the neighbouring South-east Asian, Australian and Pacific regions. As a result of both this and the island's isolated habitats, the species of New Guinea have evolved in remarkable ways.

A LAND OF GIANTS

New Guinea holds many species world records, including:

- the largest **butterfly** (Queen Alexandra's Birdwing – *Ornithoptera alexandrae*)
- the largest **tree frog** (White-Lipped Tree Frog – *Litoria infrafrenata*)
- the largest **mosses** (*Dawsonia spp.*)
- the longest **lizard** (Salvadori's Monitor – *Varanus salvadorii*)
- the largest **pigeons** (crowned pigeons – *Goura spp.*)
- the largest **moth** (Atlas Moth – *Attacus atlas*)
- the most massive **orchid plant** (*Grammatophyllum sp.*)
- the largest **bandicoot** (Giant Bandicoot – *Peroryctes broadbenti*)
- the largest **bush grasshopper** (katydid – *Siliquofera grandis*)
- the largest **egg-laying mammal** (Eastern Long-beaked Echidna – *Zaglossus bartoni*)
- the tallest **tropical tree** (Klinki Pine – *Auraucaria hunsteinii*)

In addition to these, New Guinea's unique environment is also home to other extraordinary species:

- the world's only **poisonous birds**, the *Pitohuis spp.* (seven species)
- the highest diversity of **arboreal marsupials** in the world
- the highest diversity of rainbow **fishes** in the world
- the world's smallest **parrots** (*Micropsitta spp.*)

A LAND THAT TIME FORGOT

New discoveries at a glance, by species…

Plants	218
Invertebrates	580
Fish	71
Amphibians	134
Reptiles	43
Birds	2
Mammals	12

"New Guinea contains more strange and new and beautiful objects than any other part of the globe"

Sir Alfred Russell Wallace, 19th Century naturalist and co-proposer of the theory of evolution.

Although New Guinea attracted the interest and sparked the imagination of many early naturalists and explorers, other parts of the region were explored long before. This late start is due to New Guinea's remoteness – even today, this is reflected by the relatively poor knowledge we have of its geology, biological diversity and ecology, compared with other parts of the world. Serious expeditions into the interior of New Guinea didn't begin until the 1870s, and even then, these were largely driven by the lure of possible gold. However, rather than gold, the largest export item from New Guinea in the 19th century was bird of paradise plumes and skins destined for the fashion houses and collectors of Europe and Asia[16].

Despite its relative obscurity, New Guinea played a central role in the development of the modern sciences of evolution and biogeography[17]. New Guinea lies to the east of Wallace's Line, a biogeographical division that demarcates the Asian flora and fauna from the Australasian, a reflection of their very different geological histories and long separation. While South-east Asia and the western part of the Indonesian archipelago have tigers and monkeys, New Guinea has carnivorous marsupial quolls (so-called 'native cats') and kangaroos that live in trees. The isolation of this large island has enabled the evolution of all sorts of weird and wonderful creatures. As a result New Guinea has an incredibly high number of endemic species.

The discovery of new species, particularly mammals, is usually a rare event on any continent. By 1934, most of the mammal species recorded from Borneo had been discovered. By contrast, in the late 1980s and 1990s, several new species of mammals on New Guinea were described, including one species of cuscus (a small tree-dwelling possum), two species and one sub-species of tree kangaroo, a new species of wallaby, one species and three sub-species of bat and two species of mouse[18]. New mammals continue to be found including in 2009 an undescribed woolly giant rat (*Mallomys sp.*) inside the crater of Mount Bosavi in the Southern Highlands of Papua New Guinea.

Such is the extent of New Guinea's biodiversity that new discoveries are commonplace even today. **Between 1998 and 2008, at least 1,060 new species have been discovered in the forests, wetlands and waters of New Guinea. The newly described species include 218 plants, 580 invertebrates, 71 fishes, 134 amphibians, 43 reptiles, 2 birds and 12 mammals.** This is almost three times as many discoveries as were made on the South-east Asian island of Borneo over a similar period . Many other species have been found but are currently awaiting further analysis and official scientific descriptions. For example, the Bishop Museum in Hawaii has yet to describe about 150 species of frogs, snakes and lizards collected during recent expeditions to New Guinea[19].

More of New Guinea's species certainly await discovery. These can only add to the already vast array of fauna and flora found.

[IV] The WWF report *Borneo's Lost World: Newly Discovered Species on Borneo* (2005) showed that at least 361 new species had been identified and described on the island between 1994 and 2004. The number included 260 insects, 50 plants, 30 freshwater fishes, 7 frogs, 6 lizards, 5 crabs, 2 snakes and a toad.

© Wayne Harris

Cadetia kutubu

© Rainer Günther

Cophixalus balbus

© Fred Kraus

Tropidonophis dolasii, one of many discoveries made by scientists working for the Bishop Museum

The Bishop Museum – A long history of scientific exploration

There have been about 85 major collecting expeditions to Papua New Guinea since the 1850s. About a third were undertaken by the Bishop Museum, beginning in the early 1950s. Based in Honolulu, Hawaii, the museum was established in 1889 and is today the premier natural and cultural history institution in the Pacific, recognised throughout the world for its cultural collections, research projects, and public educational programmes. As part of its Pacific Biological Survey in 2000 the museum began a programme to determine the herpetological (reptile and amphibian) diversity of the New Guinea region. As a result, the museum has discovered many new frog, snake and lizard species, a number of which feature in this report. In August 2007, in recognition of the long relationship between WWF and the museum, we signed a joint cooperation agreement to strengthen and expand the scope of our research and programmes in biodiversity and conservation biology in the New Guinea region. The agreement will further much-needed conservation of important reptile and amphibian species such as pig-nosed turtles and Boelen's python in the Kikori region, venomous snakes in the Transfly region and Salvadori's monitor lizards.

For more information, visit www.bishopmuseum.org

MAMMALS

12 NEW MAMMAL SPECIES

It's perhaps New Guinea's mammal species that are the most astonishing in their diversity. One new mammal species has been discovered in the region on average every year over the past ten years.

The highest diversity of tree-dwelling marsupials in the world exists on New Guinea, with an incredible 38 species. One of these species, the Blue-eyed Spotted Cuscus (*Spilocuscus wilsoni*), a small possum endemic to Papua in Indonesia, was discovered in 2004[20]. Also from Papua, Sir David's Long-beaked Echidna (*Zaglossus attenboroughi*) was described in 1998 and named in honour of naturalist Sir David Attenborough[21]. This heavily clawed species with dense fur is the smallest member of the *Zaglossus* genus, also known as spiny anteaters; it lives in the Cyclops Mountains in Papua near the city of Jayapura. Long-beaked Echidnas have long slender snouts that function both as a nose and mouth. They have tiny spines on their tongues that help them capture their meals when they raid soft logs and anthills. Together with the platypus, these power diggers are the world's only egg-laying mammals, or monotremes.

The giant woolly rats of New Guinea live in alpine burrows and can grow up to a metre in length. In December 2007, a scientific team from Conservation International and the Indonesian Institute of Sciences (LIPI) venturing into the jungles of northern Papua in Indonesia encountered a giant rodent (*Mallomys sp.*) five times the size of a common rat[22]. Scientists believe this 1.4kg woolly giant rat is a new species but further studies are needed to confirm this. Indeed, new mammals continue to be found; in 2009 an international team of scientists and BBC filmmakers found another woolly giant rat (*Mallomys sp.*) in the forest inside the crater of Mount Bosavi in the Southern Highlands of Papua New Guinea. With a total length of 813mm, it weighed 1.5kg.

"The only region where altogether new and unimagined forms of life may perhaps be found."

Sir Alfred Russell Wallace.

© Tim Flannery

Spilocuscus wilsoni

Six smaller rodents were also confirmed as new species recently – four rats and two mice. The unique moss mouse, *Pseudohydromys germane*, from Milne Bay Province in south-eastern Papua New Guinea, has fewer and smaller teeth than any other rodent worldwide[23]. New water rats have been discovered across the island: *Leptomys arfakensis* in the Arfak Mountains on the Vogelkop (Bird's Head) Peninsula of Papua in Indonesia[24]; *Leptomys paulus* in the Owen Stanley Ranges of Papua New Guinea[25]; and *Hydromys ziegleri* in Papua New Guinea's northern Sepik region[26].

Microperoryctes aplini is a small striped bandicoot, a rabbit-like marsupial, discovered in 2004 high in the forests of the Arfak Mountains on the Vogelkop Peninsula. The species has sleek brown fur with a thick dark stripe down its back and a long tail with a distinct white tip. It's the world's smallest known bandicoot, leading scientists to name it the Arfak Pygmy Bandicoot[27] .

In 2005, scientists added two new species to the list of known bats from Papua New Guinea, including the greater monkey-faced bat (*Pteralopex flanneryi*)[28]. A fruit-eating species, this enormous bat is endemic to the country and is highly endangered. In 2008, an as yet undescribed species of long-eared bat (*Nyctophilus sp.*) was found in the Transfly.

In the waters south of New Guinea, an unexpected discovery was made in 2005. The snub-fin dolphin, *Orcaella heinsohni*, was once thought to be a member of the Irrawaddy species of dolphin. However, researchers found that snub-fins have different coloration, skull, fin and flipper measurements. That makes them the first new dolphin species recorded for at least 30 years[29]. A skull of the new dolphin species was collected from Daru, Papua New Guinea[30]. Scientists believe these dolphins occur mainly in protected, shallow, coastal waters, especially adjacent to river and creek mouths[31]. The expected range of *O. heinsohni* is the coastal zones of Australia and Papua New Guinea[32].

New mammal species are seldom encountered in the animal kingdom today. With 12 new species identified in just 10 years, 11 of which are forest-dependent, the New Guinea region is certainly the final frontier for mammal discoveries. Some scientists have even suggested that a large proportion of New Guinea mammals might yet remain to be discovered.

© Peter Schouten

Pteralopex flanneryi

© Guido J. Parra

Orcaella heinsohni

© David Patterson

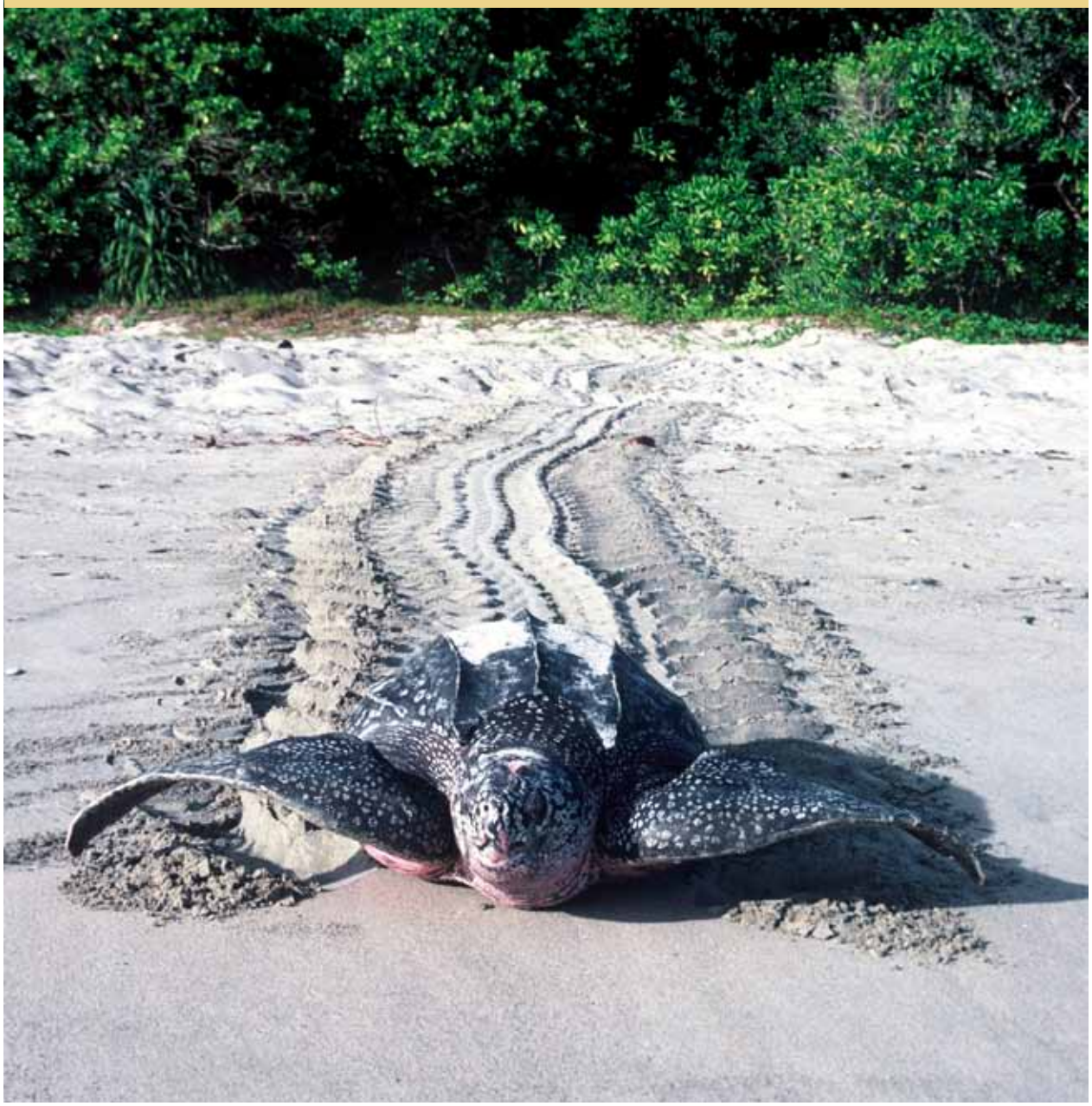
Tenkile – A conservation success story

New Guinea has 12 of the 14 known species of tree kangaroos. They have been described, somewhat unkindly – but accurately – as: 'ineffable tree-kangaroos, doing their clumsy best to fill the niches left vacant by missing monkeys', by author David Quammen[33]. These generally shy creatures are endangered by habitat loss and increased hunting pressures. For 10 years the Tenkile Conservation Alliance has been working to save 2 of the most critically endangered tree kangaroos, Tenkile, or Scott's Tree Kangaroo (*Dendrolagus scottae*), and Weimang (*Dendrolagus pulcherrimus*), from becoming extinct. These animals are range-restricted to areas near the Torricelli Mountains of Papua New Guinea. Australian mammalogist Tim Flannery was the first scientist to describe the Tenkile in 1989; it was one of the most endangered mammals in the world, with as few as 100 individuals remaining. The Tenkile Conservation Alliance's work involves community development and rabbit and chicken farming, providing vital protein alternatives to discourage hunting of the tree kangaroos. Communities have agreed to a hunting moratorium since 2005 and as a benefit communities receive development support. Apart from protein farming this involves installation of water tanks with major health benefits. Recent results are encouraging, estimating the Tenkile population at just over 300. However, there are always the looming threats of logging, oil palm and road incursions.

For more information, visit www.tenkile.com

New Guinea Landscapes: Vogelkop (Bird's Head) Peninsula

The largest of New Guinea's moist montane rainforests can be found in the Vogelkop, or Bird's Head, Peninsula (so called because the shape of the land resembles the head of a bird). It forms the north-west part of the province of West Papua in Indonesia. The region is a hotspot for endemic birds of paradise, tree kangaroos and other unique species. The Arfak Mountains of this area contain 42 mammal species, including the Arfak Long-beaked Echidna and the Arfak Ringtail. Nine of Vogelkop's bird species can be found nowhere else. The Arfak Mountains are also known for their diversity of birdwing butterflies. Most of the habitat in this region is still intact, but it's increasingly under threat from logging, population growth and agricultural encroachment. Vogelkop also has one of the most important Leatherback Turtle nesting beaches in the world and is famous for its visiting whale sharks.



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PLANTS

218
NEW PLANT DISCOVERIES

The third-largest rainforest in the world yielded 218 new plant discoveries between 1998 and 2008.

A new species of tree, *Aglaia mackiana*, belonging to the mahogany family was discovered in Eastern Highlands Province of Papua New Guinea in 1998 and immediately placed on the IUCN Red List of Endangered Species[V]. The species is named after Dr Andrew Mack, then working with Wildlife Conservation Society (WCS). He discovered an unrecognised seed in cassowary droppings and germinated it, and the recognition and description of the species followed.

The extent of *Aglaia mackiana*'s distribution in Papua New Guinea is not known, but experts consider the hardwood species rare enough to warrant critically endangered status, in that it faces an extremely high risk of extinction in the immediate future[34]. The country has a range of endangered tree species, including five species in the monsoon forests of the Transfly region. Almost the entire range of this forest type in the New Guinea region is threatened by land-use change, such as spreading road networks, agricultural expansion and logging.

The forests of New Guinea harbour a rich variety of flowering plants. Orchids are the prime example of this plant diversity, and 100 new orchid species from New Guinea were officially described between 1998 and 2008 alone. These include the magnificent pink *Dendrobium limpidum* from Papua New Guinea, described in 2003[35]. Expeditions by WWF scientists, between 1998 and 2006, have also added significantly to the known orchid diversity found on the island. Our teams collected some 300 species of orchids in Papua New Guinea's Kikori region. Eight of these were found to be new to science. They included *Cadetia kutubu*, with a fleshy flower, and the ornate and exquisite firework-like display of *Dendrobium spectabile*[36].

© Wayne Harris

Dendrobium spectabile

© Andrew Mack

Aglaia mackiana

© Peter T Lin

Dendrobium limpidum

© Wayne Harris

Cadetia kutubu

[V] The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on plants and animals that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction i.e. Critically Endangered, Endangered and Vulnerable. For more information, visit www.iucnredlist.org.

© Wayne Harris

Cadetia sp

© André Schuiteman

Dryadorchis dasystele

© E F de Vogel

Bulbophyllum macneiceae

© Wayne Harris

Taeniophyllum sp

© André Schuiteman

Dendrobium crassilabium

Dr Ed de Vogel, orchid taxonomist of the National Herbarium, Leiden, The Netherlands, reported during a recent presentation in Port Moresby that at least 10 to 20 previously un-encountered species of orchids are collected during any given survey day in Papua New Guinea's forests. Many species are awaiting formal description at the University of PNG and there are clearly many more undiscovered species in the forests.

Papua New Guinea already has more than 3,000 beautiful orchid species – a tally that is second only to Ecuador's 3,700 species. Scientists estimate that around 70 species of orchid that used to exist in the forests of neighbouring Indonesia have become extinct because of illegal logging activity[37]. These endemic plants all had limited distributions, highlighting the vulnerability of these species to forest loss.

Comparing New Guinea's plant life with other major centres of tropical biodiversity

The plants of New Guinea demonstrate an extraordinarily high degree of endemism as shown in the table below. The figure of 21,000 species[38] is likely to be an underestimation as the species figure is based on data from the 1980s; botanists now estimate that 25,000 to 30,000 species of vascular plants occur in New Guinea[39].

Region	Area(km²)	No. plant species	No. endemic plant species	Percentage of endemic plant species
New Guinea	785,753	21,000	16,000	80%
Borneo	743,330	25,000	7,000	35%
Madagascar	594,856	12,000	8,000	80%
Ecuador	256,932	21,100	4,000	23%
Cameroon	466,307	8,260	156	2%
Costa Rica	51,060	13,100	600	5%

EAGLEWOOD: THE LAST STAND

Eaglewood, or agarwood, is resinous wood that forms in the trunk and branches of trees of the genus *Gyrinops* or *Aquilaria* when they become infected by specific fungi. It's highly prized for its pleasing aroma, and has been traded since biblical times for cultural and medicinal purposes. While eaglewood has recently been cultured, wild stands are by far the most sought-after and produce the best quality resin. There are large markets in the Middle East and South-east Asia. Wild eaglewood is now extremely rare: the tree species that produce it are listed as threatened under the Convention on International Trade in Endangered Species (CITES) of wild flora and fauna. Currently, wild eaglewood can still be found in New Guinea but, with less than 10% of the potential host trees actually containing eaglewood, many uninfected trees are cut down needlessly.

In Papua New Guinea, we're working with government, landowners and communities to produce a government-endorsed sustainable management plan for eaglewood. It's the first step towards seeking a quota for legal international trade under CITES. At the same time, we're helping train local landowners in sustainable harvesting practices, developing nursery techniques for village plantations, and trialling inoculation techniques to artificially infect the trees to produce eaglewood resin. We're also training villagers in grading the harvested resinous wood, to help them achieve a fairer price.

With these various strategies, we're helping local people to make a decent living by using their eaglewood resources sustainably.

© Brent Stirton / Getty Images / WWF-UK

INVERTEBRATES

580
NEW INVERTEBRATE DISCOVERIES

Very little is yet known about invertebrate life on New Guinea – this is an exciting area for further scientific research and discovery. Scientists estimate that New Guinea could possess as many as 400,000 species of invertebrates[40]. These include a mind-boggling array of huge stick insects, horned beetles, bizarre antlered flies and a huge range of butterflies and giant moths[41].

The 580 new invertebrate species described between 1998 and 2008 have displayed a large variety of types. They include four *Delias* butterfly species from the Foja Mountains in Papua in Indonesia[42]. These add to the already impressive list of butterflies and moths, topped by the largest butterfly in the world, the giant Queen Alexandra Birdwing, which has a wingspan of up to 30cm, and the Atlas Moth, the world's largest moth.

Nine new species of snails have been discovered, in the Louisiade Archipelago and the Owen Stanley Ranges in Papua New Guinea[43]. These include *Paryphantopsis misimensis* and *Paryphantopsis vanatinensis*, two extraordinarily coloured snails found in 2006 in the forests of the Louisiade Archipelago[44]; the former species is a brilliant bright yellow and the latter, bright yellow and green.

© Henk van Mastrigt

Delias kristianiae

© Henk van Mastrigt

Delias durai

© Henk van Mastrigt

Delias cumanau

© John Slapcinsky

Paryphantopsis vanatinensis

© Fred Kraus

Paryphantopsis misimensis

The New Guinea apricot crayfish, *Cherax holthuisi*, was discovered in 2006 and is one of the smallest members of the *Cherax* genus (also known as 'yabbies' across Australasia), measuring 9-12cm long[45]. Dutch naturalist M. Boeseman first collected the brightly coloured species nearly 60 years ago on the shorelines of the Aitinjo Lake, about 25km south-east of Ajamaroe, in the Kais River Drainage in Papua Province, Indonesia. Nine specimens were given by local people to the scientist, but they remained in storage in the National Museum of Natural History, Leiden, until two crayfish hobbyists examined the species. Although new to science, wholesalers have already introduced the species to the European and Japanese pet market; however, the biology of the species in the wild, its distribution range, its conservation status and its value to local communities remain unknown. Despite its name, a fantastically blue variant of the species also exists.

© Chris Lukhaup

Cherax holthuisi

© Chris Lukhaup

Cherax holthuisi var.

© Chris Lukhaup

Cherax holthuisi var.

NEW GUINEA LANDSCAPES: OWEN STANLEY RANGES

The south-eastern end of the string of mountains that bisects Papua New Guinea forms the Owen Stanley Ranges. The ranges are most famous for the Kokoda Track that cuts through the mountains. The site of a major battle during World War II, the track was instrumental in turning the tide of war in the Pacific.

The region is iconic in the history of PNG and Australia. The Papuans were critical to Australia's success in the Kokoda campaign of World War II. Their practical experience on the track, combined with their invaluable bush skills, physical strength and dedication, enabled the Australians to create and maintain a human supply line between the front line deep in the jungle and the base at Port Moresby.

As a result, the 3,800m-high ranges attract thousands of tourists each year. The region contains a rich variety of vegetation types from savanna to cloud forest, and more than 4,000 plant species including many endemic to the area. That's more plant species than in the entire World Heritage-listed tropical rainforests of north Queensland. The mountains are one of the richest areas for birds on Earth with 510 species – almost two-thirds of all New Guinea birds – including 40 endemic species.

Maintaining this unique wildlife and habitat has enormous economic benefits. Research shows that the Kokoda Track Reserve could bring in over US$2.7million a year for community landowners and businesses if managed properly. With this in mind, trekking operators, in consultation with communities, asked WWF to help prepare a strategy for the area. The strategy, launched on Anzac Day (25 April) in 2006, intends to develop a World Heritage-listed sustainable eco-trekking destination along the Kokoda Track. In 2008, the PNG government made a historic decision, announcing the first ever rejection of a mining lease in the country in order to preserve the Owen Stanley catchments and support World Heritage listing of the Kokoda Track region.

© Genevieve Nelson / The Kokoda Track Foundation

FRESHWATER & MARINE FISH

38
NEW FRESHWATER FISH
33
NEW MARINE FISH

Some 38 species of freshwater fishes and 33 species of marine fishes new to science were identified in New Guinea between 1998-2008.

The eastern half of the island contains two of Asia-Pacific's longest free-flowing rivers – the 1,126km Sepik River in northern Papua New Guinea and the 1,050km Fly River, straddling Papua New Guinea's border with Indonesia. Virtually all of Papua New Guinea's rivers flow unopposed from its mountainous highlands to the sea, although recently several hydropower projects have been proposed, including a dam in the Purari river which would produce electricity for export to Queensland, Australia. As well as providing a vital source of fresh water for people, these rivers support many species of fish, amphibians and reptiles.

New Guinea has some of the most beautiful freshwater fishes found anywhere, including gobies, gudgeons and rainbow fish. Rainbow fish are small but breathtaking in colour, varying from a single vivid colour to a spectrum. Between 1998 and 2008, no fewer than seven new species of rainbow fish have been identified in Papua New Guinea and Papua in Indonesia, including the stunning *Glossolepis dorityi* discovered in 2001[46]. This species is also known as the Zig-zag Rainbow Fish, on account of the pattern of red-orange stripes running along its body. These stripes are found only on the males, and are especially prominent during courtship activities. The species is found in water no more than 1m in depth and can reach a maximum length of 11.5cm.

© Gerald R Allen

Chilatherina alleni

The most extraordinary new freshwater discovery must be the new species of river shark, *Glyphis garricki*, discovered in 2008 by New Zealand ichthyologist Jack Garrick who caught two newborn individuals in Port Romilly, Gulf District, Papua New Guinea[47]. River sharks move along shorelines and can be found in some of Asia-Pacific's largest rivers, including the Indus, Irrawaddy and Ganges. *Glyphis garricki* is the sixth species of the elusive *Glyphis* genus to be described. The largest specimen recorded of this new species, also called the Northern River Shark, is 2.5m in length. Despite its large size, the species is seldom seen and it remains rare, leading scientists to list the new species as Endangered on the IUCN Red List. Since its discovery, a total of 16 individuals have been recorded, scattered across localities off New Guinea and northern Australia.

New Guinea is centred in a region known as the Coral Triangle, which supports the most diverse marine ecosystems on Earth. In just 10 years, 33 new fish species have been discovered in the oceans surrounding the island, including the damselfish *Chrysiptera cymatilis*[48]. This striking blue fish was found in the waters of Milne Bay, Papua New Guinea, a region of pristine reef environments and home to a huge number of fish species (1,040)[49].

Similarly, the richness of the marine environment of the Vogelkop region of Papua in Indonesia was demonstrated by the discovery of *Cirrhilabrus cenderawasih* in 2006[50]. The fish was one of several flasher wrasses found, named for the brilliantly coloured displays which the normally drab males flash to entice females to mate. In the wake of an expedition led by Conservation International in 2006 that found more than 50 new species, scientists have said this area is perhaps the most biologically diverse in all the oceans – an "underwater world full of visual wonders"[51].

© Will White / CSIRO Marine & Atmospheric Research

Glyphis garricki

© Steven Clarke

Lentipes multiradiatus

© Gerald R Allen

Cirrhilabrus cenderawasih

© Gerald R Allen

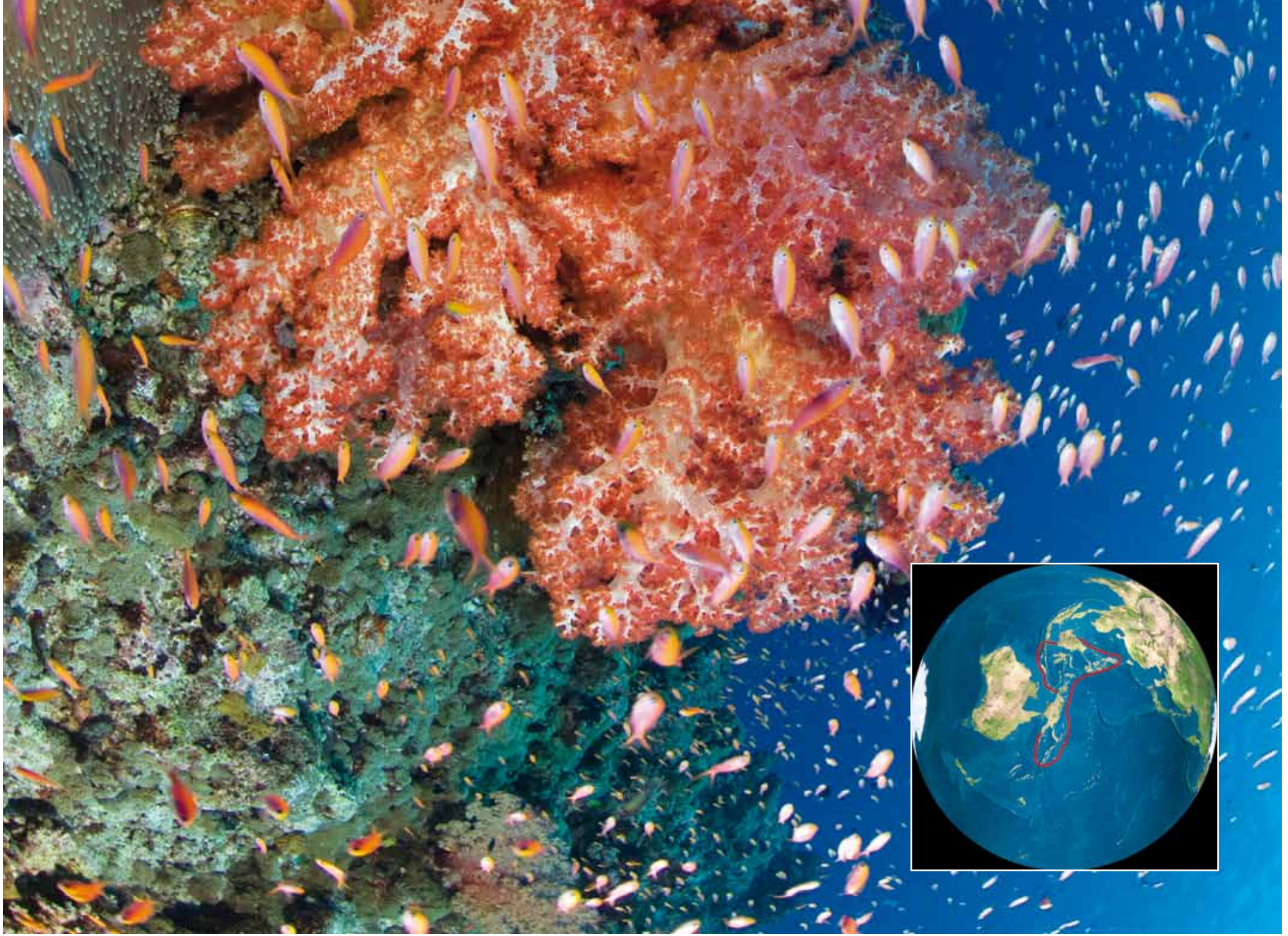
Chrysiptera cymatilis

NEW GUINEA LANDSCAPES: THE CORAL TRIANGLE – THE GLOBAL CENTRE OF MARINE LIFE

The Coral Triangle encompasses 6,000,000 sq km of the oceans of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands and Timor-Leste. These are the world's richest coral reefs, home to three-quarters of all known corals and 3,000 species of reef fish. Six of the world's seven species of marine turtles, many species of whales, sharks, dolphins, and the vulnerable dugong are all found in the region.

The Coral Triangle directly supports 120 million people and provides food and economic security for millions more. It's the source of a quarter of the global tuna catch – a multi-billion dollar industry – and other commercially valuable species.

We're helping communities to adapt to climate change impacts in the region and conserve their marine resources. We're driving reform in the tuna, live reef fish and tourism sectors by supporting sustainable and equitable enterprises. At a summit in 2009, for example, live reef fish traders agreed to introduce a quota that will cut catches by 27%, some 200 tonnes. These reforms are needed to avert the collapse of the US$810 million industry in the Coral Triangle and protect the livelihoods of more than 100,000 people. Similarly, PNG recently introduced a three-year moratorium on sea cucumber fishing.



© Jürgen Freund / WWF-Canon

AMPHIBIANS

134
NEW FROG SPECIES

At least 134 new frog species were discovered between 1998-2008.

After Madagascar, New Guinea has the highest frog diversity of any island in the world. Between 1998 and 2008, no fewer than 134 new species of frogs have been identified across New Guinea. Many more have been found but await official scientific descriptions – the abundance of frogs in New Guinea is reflected in the fact that of the Bishop Museum's 150 un-described amphibians and reptiles referred to earlier, over 100 are frogs[52].

Amongst the many new discoveries in the Kikori region of Papua New Guinea is the tree frog *Litoria sauroni*, named after Sauron of The Lord of the Rings fame in reference to its striking red and black mottled eyes. *Litoria sauroni* has been found only in trees in primary rainforest, where males call at night from high branches[53]. At even higher altitudes in the mountains of the region, *Litoria spartacus* was discovered in 2006. A green and brown frog with bright yellow thighs, it lives in trees overhanging torrential streams[54].

To the north of Kikori lies the Sepik River, part of the largest uncontaminated freshwater system in the Asia-Pacific region. With no large cities or development projects to spoil the river's waters and wildlife, the area has remained relatively unchanged for thousands of years – though it's threatened by the planned opening of a large gold and copper mine in the Upper Sepik. Here the frogs *Xenorhina arboricola*[55] and *Austrochaperina septentrionalis* were found[56]. Another large green tree-dwelling frog, *Litoria dux*, was discovered on the northern side of the Huon Peninsula, a 16,500 sq km area of montane and lowland forest surrounded by ocean. The frog's name comes from the Latin *dux*, meaning leader, alluding to its bright coloration and impressive appearance, particularly its red iris[57].

Elsewhere, on the south-eastern tip of New Guinea, an army of new frogs has been revealed in recent years, including *Albericus sanguinopictus*, *Cophixalus variabilis*, *C. timidus*, *C. sisyphus*, the tree frog *Litoria rubrops*[58], and on outlying islands, *Platymantis browni*[59] and the tree frog *Litoria bibonius*[60].

Many of the new frog species have unique characteristics. For example, males of the tree frog *Oreophryne minuta* recorded in 2000 are tiny, measuring just 1cm in length, while a frog recently found on Mount Bosavi sports what seem to be fangs.


© Allen Allison

Austrochaperina septentrionalis


© Stephen Richards

Litoria spartacus


© Allen Allison

Xenorhina arboricola


© Stephen Richards

Litoria sauroni


© Stephen Richards

Litoria dux


© Fred Kraus

Cophixalus timidus


© Fred Kraus

Austrochaperina yelaensis


© Fred Kraus

Litoria rubrops


© Fred Kraus

Austrochaperina novaebritanniae


© Fred Kraus

Choerophryne longirostris


© Fred Kraus

Albericus sanguinopictus


© Fred Kraus

Austrochaperina blumi


© Fred Kraus

Cophixalus variabilis


© Fred Kraus

Cophixalus sisyphus


© Fred Kraus

Litoria bibonius


© Fred Kraus

Albericus exclamitans


© Rainer Günther

Rana volkerjane


© Rainer Günther

Cophixalus balbus

NEW GUINEA LANDSCAPES: THE KIKORI RIVER BASIN

There are few landscapes in Melanesia (Fiji, New Caledonia, New Guinea, Solomon Islands and Vanuatu) as dramatic as the Kikori region. Its features include the extinct volcano of Mount Bosavi, the remarkable Hegigio Gorge and the spectacular Wassi and Wawoi waterfalls. This 23,000 sq km area supports a rich array of birds of paradise as well as around 100 mammal species. The area centres upon Lake Kutubu: an exceptionally clear high-altitude lake that, as a result of its biological importance, has been recognised as a Wetland of International Significance under the Ramsar Convention.

The region includes oil fields, and until recently we've been working with Oil Search Limited to make sure these are developed to the highest environmental and social standards. For example, in May 2006, our successful lobbying resulted in changes to the pipeline route, the scrapping of a proposed highway and the cancellation of four large logging concessions covering 4,000 sq km of rainforest. This was an about-turn on large-scale development plans that could have severely damaged the region. Later the same year, we supported the Kosua and Orogo people in establishing three new protected areas on their customary lands, together protecting more than 800 sq km of the largest remaining rainforest habitat in the Asia-Pacific.

© Francis Crome

Spectacular Wasi falls, Kikori region, Papua New Guinea.

REPTILES

43
NEW REPTILE SPECIES

Some 43 new reptile species were discovered on New Guinea between 1998-2008: this includes 5 snakes, 37 new lizard species and a soft-shelled turtle.

The snake *Tropidonophis dolasii*[61] was found in primary hill forest on the D'Entrecasteaux Islands, off the south-eastern peninsula of New Guinea. Officially described in 2004, the new species is large and yellow-brown, with a distinctive pattern of dark bands and blotches. In 2005, a blind snake, *Typhlops hades*[62] (named after the Greek god of the underworld, *Hades*), was discovered. Blind snakes are non-venomous[63], incapable of biting, and, as their name suggests, have scales that cover their eyes. Being nocturnal, they are rarely encountered; this dark brown species is thin and small, measuring 12-14cm in length.

A new species was also added to the list of known sea kraits (a type of sea snake) in 2005[64]: *Laticauda guinea* was discovered on an island surprisingly close to the Papua New Guinea capital, Port Moresby. Sea snakes belong to the *Elapid* family of venomous snakes. Scientists have observed that adult female sea kraits feed primarily on large conger eels. Despite its name, the new sea snake species returns to land to mate and lay eggs, making it particularly remarkable that it has remained hidden until now.

New lizards found in the decade 1998 to 2008 include 17 species of skinks, 12 geckos, 5 forest dragons and 3 monitor lizards. Skinks are the most diverse group of lizards in New Guinea. Discoveries in 2004 in Papua New Guinea include *Carlia mysi* from Morobe province, *Carlia aramia* from the Transfly, *Carlia aenigma* from the Kikori region[65] and *Sphenomorphus fuscolineatus*[66] from the Sepik region. At least three other species of skinks were discovered in late 2008 on a WWF trip in the Kikori region – these are yet to be described. The discovery of a gecko, *Cyrtodactylus murua*, in 2006 was particularly significant as it was the first endemic reptile described from Woodlark Island, off the south-eastern tip of Papua New Guinea[67].

The most striking new reptiles identified in New Guinea in the last decade are the three new monitor lizards discovered on tiny islands off the Vogelkop (Bird's Head) Peninsula of Papua in Indonesia. The Golden-spotted Tree Monitor (*Varanus boehmei*)[68] on Waigeo Island can grow to a metre and has a prehensile tail that allows it to scale trees. It feeds on insects such as locusts, cockroaches and crickets, as well as small mice and rats. Smaller than *V. boehmei*, growing to 80cm, the species *Varanus reisingeri* has striking bright yellow patterns adorning the length of its body; it's found only on Misol Island. *Varanus macraei*[69], found on the island of Batanta, is one of the most spectacular reptile discoveries anywhere. Capable of reaching a metre in length, this beautiful species is black with a mesmerising pattern of turquoise and blue.

© Lutz Obelgonner

Varanus boehmei

© Lutz Obelgonner

Varanus reisingeri

© Lutz Obelgonner

Varanus macraei

© Fred Kraus

Tropidonophis dolasii

© Fred Kraus

Sphenomorphus fuscolineatus

© Allen Allison

Cyrtodactylus murua

© Harold Heatwole

Laticauda guinea

© Fred Kraus

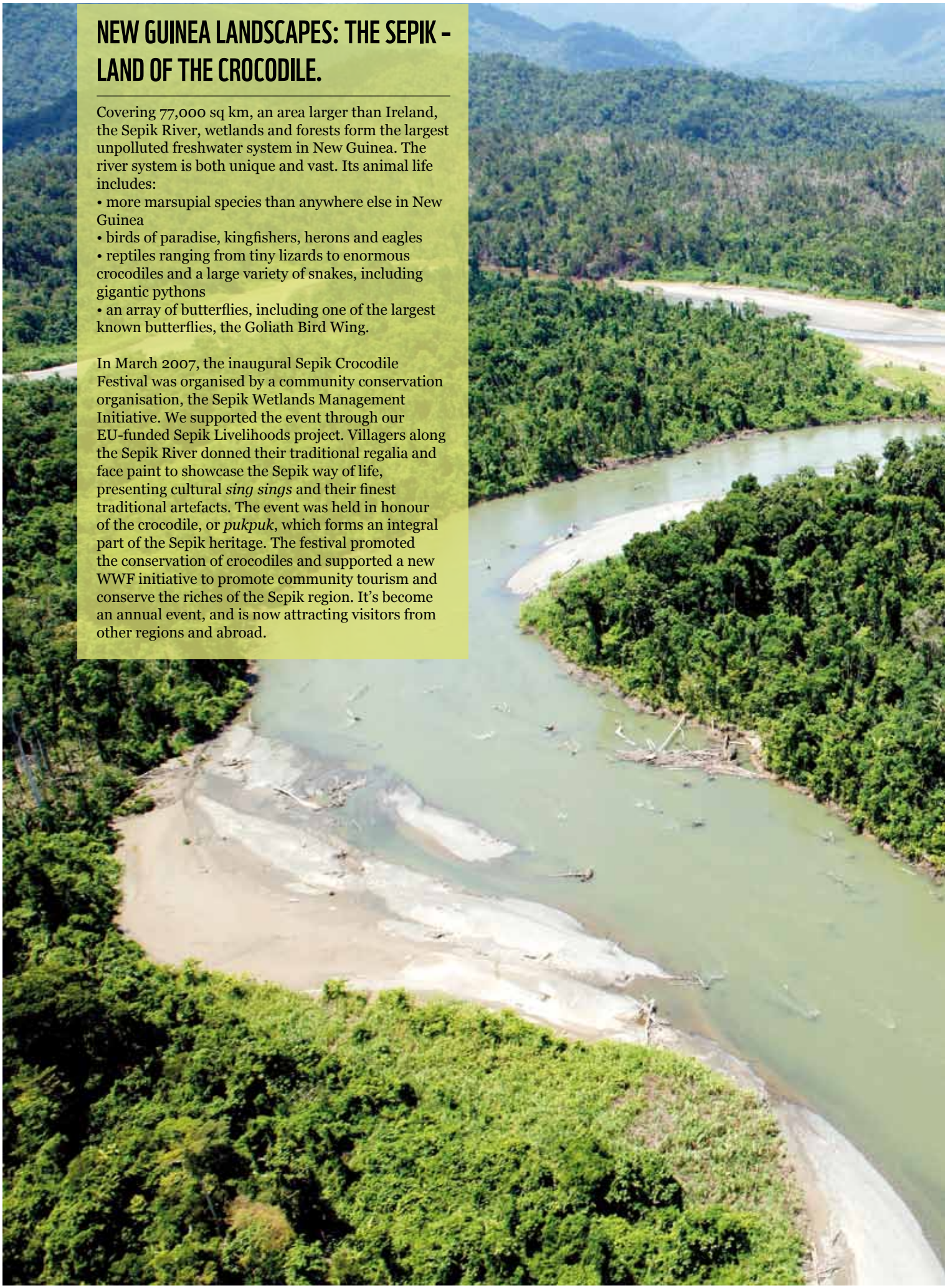
Carlia mysi

NEW GUINEA LANDSCAPES: THE SEPIK – LAND OF THE CROCODILE.

Covering 77,000 sq km, an area larger than Ireland, the Sepik River, wetlands and forests form the largest unpolluted freshwater system in New Guinea. The river system is both unique and vast. Its animal life includes:

- more marsupial species than anywhere else in New Guinea
- birds of paradise, kingfishers, herons and eagles
- reptiles ranging from tiny lizards to enormous crocodiles and a large variety of snakes, including gigantic pythons
- an array of butterflies, including one of the largest known butterflies, the Goliath Bird Wing.

In March 2007, the inaugural Sepik Crocodile Festival was organised by a community conservation organisation, the Sepik Wetlands Management Initiative. We supported the event through our EU-funded Sepik Livelihoods project. Villagers along the Sepik River donned their traditional regalia and face paint to showcase the Sepik way of life, presenting cultural *sing sings* and their finest traditional artefacts. The event was held in honour of the crocodile, or *pukpuk*, which forms an integral part of the Sepik heritage. The festival promoted the conservation of crocodiles and supported a new WWF initiative to promote community tourism and conserve the riches of the Sepik region. It's become an annual event, and is now attracting visitors from other regions and abroad.



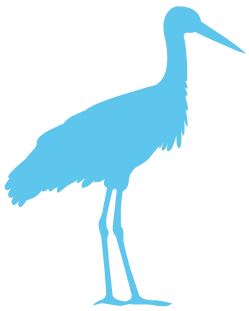
© Brent Stirton / Getty Images / WWF-UK

The mighty Sepik river with the Hunstein Range in the background.

BIRDS

2

NEW BIRD SPECIES



Two new bird species were found between 1998 and 2008. One, the Wattled Smoky Honeyeater, was discovered on Papua's sacred summits; the other, a bush-warbler, was found on Bougainville.

In November 2005, a team led by Conservation International landed by helicopter into a lost world deep in the forests of New Guinea's mist-shrouded Foja Mountains in Indonesia's Papua Province. Within minutes of arriving in this isolated range, the field team discovered a new bird species, the Wattled Smoky Honeyeater (*Melipotes carolae*)[70]. Another bird, the Odedi or Bouganville Bush-warbler *Cettia haddeni*, was recently described and named on Bougainville in Papua New Guinea. Found in montane forest on Crown Prince Range, it is a species in the Old World Warbler family[71] and was listed on the 2008 IUCN Red List as Near Threatened due to small scale clearance of its forest habitat for agriculture and predation by introduced carnivores.

These discoveries are particularly significant because they represent the first new bird species to be sighted on the island since 1939 – although bird watchers had long been aware of the likelihood of this warbler's existence, it proved difficult to actually see. Like much of New Guinea, the area is largely inaccessible and remote, hindering scientific exploration. The entire Foja forest tract covers some 9,712 sq km and is the largest road-free tropical forest in the Asia-Pacific. People from nearby villages do not enter the uplands, in part because of inaccessibility, but also because the summits are considered sacred. What also helped the honeyeater elude discovery was its silent nature. The scientists never heard or recorded the species making a sound, a characteristic that separates *Melipotes carolae* from other honeyeaters.

These montane inhabitants join an already impressive list of bird species for New Guinea. Birds are perhaps the best-studied of all the animal groups of the region and levels of endemism are high. The island possesses an impressive 831 species of birds[72], including cassowaries, prehistoric-looking flightless birds which can grow up to 2m tall. Two-thirds of the world's bowerbirds and a third of the world's kingfishers are endemic to the island. But it is New Guinea's stunning birds of paradise that are most famous; 38 of the world's 42 known species are found here.

© Bruce Beehler

Melipotes carolae

© Brent Stirton / Getty Images / WWF-UK

NEW GUINEA LANDSCAPES: THE TRANSFLY – HOME TO HALF OF NEW GUINEA'S BIRD SPECIES.

The Transfly is a 100,000 sq km coastal landscape of grasslands, savannas, wetlands and monsoon forests that straddles the international border of Papua New Guinea and Indonesia. The Transfly possesses more than half of New Guinea's bird species, including 80 that are endemic. The area provides habitat for marsupial cats, flying possums and the richest diversity of reptiles in New Guinea. It's home to more than 60 cultural groups, whose lives, customs and languages are linked with its landscapes.

For the last few years, we've played a key role in formulating a conservation vision for the region. This involved consultation, data collection and mapping to identify habitats and species, and to document the importance of the Transfly for traditional cultures and local people. Our social mapping work in Papua to document customary connections with the land has been embraced by the Indonesian Government as a model method to better link modern governance and traditional values. By promoting the protection and sustainable management of the Asia-Pacific's fresh water and forests, we're helping to ensure security for vital habitats and the people and species that depend on them.

THE THREAT OF FUTURE EXTINCTIONS

24%

OF PAPUA NEW GUINEA'S FORESTS CLEARED OR DEGRADED BETWEEN 1972-2002

Although New Guinea's natural habitats largely remain intact today, sadly, as in other tropical areas around the world, many are being lost at an alarming rate and others are threatened.

Richly endowed with timber, minerals, oil, natural gas, fertile soils, freshwater resources and fish, New Guinea has become a new frontier for natural resource exploitation. Industrial logging, forest clearance for plantations such as oil palm, minerals and petroleum exploration and extraction, and infrastructure development are expanding. This allows easy access to formerly remote regions. Often, there is little interest in sound environmental practices. China is the main market for timber products from PNG: 82% of all timber exported from PNG goes to China[73]. In addition, palm oil has replaced coffee as the country's largest agricultural export product. As areas of forest are opened up by access roads, opportunities to exploit the lucrative illegal wildlife trade have also increased.

In the seas, unplanned coastal development is harming water quality and marine resources through land-based pollution, urban expansion, siltation (also caused by erosion from the logging of river catchments) and mangrove clearing. Some coral reefs are exhibiting signs of stress due to pollution and climate change. In addition, destructive fishing is occurring and the rapid expansion of commercial tuna fishing may not be sustainable. Current plans to mine in the deep ocean trenches off New Guinea threaten a region whose biodiversity is scarcely known.

Mining has caused freshwater and marine contamination – most notably in the 1980s when a collapsed dam at the Ok Tedi mine allowed 80,000 tons of pollution per day to flow into the Fly River system, via the Ok Tedi tributary. The effects of this environmental disaster are still being felt today. Together with the increasing impact of a changing climate and the impacts of a rapidly rising population, the potential for species extinction is greater now than ever before.

Climate change poses a major threat to biodiversity in New Guinea. As one example of the likely impact of climate change, the upward advance of tree lines in response to rising temperatures has been documented in mountainous regions all over the world[74]. In New Guinea, not all species will be able to move. Those confined to the tops of New Guinea's mountains – from delicate flowers to small mammals – face extinction as their habitat shrinks.

Of all New Guinea's remarkable known species, 99 are now listed on the IUCN Red List of Threatened Species, including 59 mammals, 34 birds and 6 frogs. Yet this figure does not take into account the species that, while relatively abundant now, are threatened by habitat loss. Nor does it account for the innumerable species that may become extinct even before they are discovered, or species for which we have no reliable information.

© Jurgen Freund / WWF-Canon

Aerial view of expansive oil palm plantation, Kimbe Bay, West New Britain, Papua New Guinea.

All logged out by 2020?
An unsustainable industry

Poorly regulated and illegal logging and agricultural expansion pose the largest threat to the island's habitats.

Recent analyses revealed that between 1972 and 2002, 15% of Papua New Guinea's rainforests were cleared and 8.8% were degraded through logging[75]. Studies estimate that the forest clearance rate for forests accessible to industrial logging is 1.1 to 3.4% annually – much higher than previously reported. The major drivers of forest change in Papua New Guinea during that period are logging in the lowlands and subsistence agriculture throughout the country. The contribution from forest fires and mining are comparatively minor, but plantation establishment, such as for oil palm, is increasingly significant. Clearing rates in Papua could be even higher.

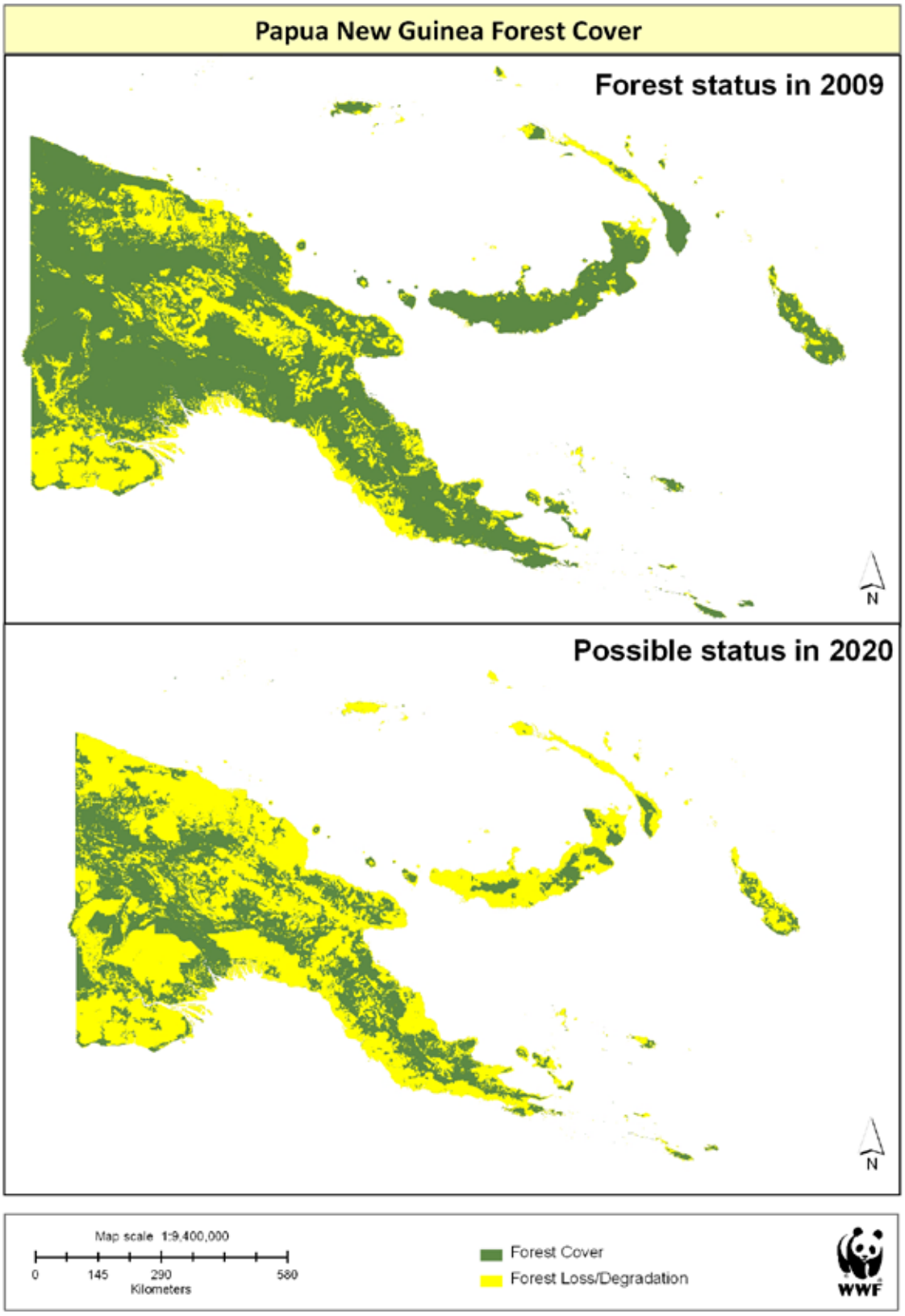
There are encouraging signs that existing oil palm producers in Papua New Guinea are keen to pursue certification through the Roundtable on Sustainable Palm Oil, the most credible sustainable palm oil scheme. Certified Sustainable Palm Oil (CSPO) has been available on world markets since November 2008; CSPO guarantees that primary tropical forests haven't been cleared and that environmental and social safeguards have been met during its production. However, the expansion of the industry in Indonesian Papua and an increasing number of unregulated new oil palm companies in Papua New Guinea pose a growing threat.

Despite these worrying trends, much of the island's forested area remains intact and inaccessible. But this too will change as the population continues to grow and road networks extend with new developments in oil, gas and mining.

We'll continue to work alongside other organisations towards better long-term planning for New Guinea. This includes improved communications between governments, local communities, non-government organisations and companies working towards a representative system of protected areas and sustainably managed areas, which complements New Guinea's customary land ownership. This system should not only be supported by governments, but sustainably financed through operating permits issued to responsible resource industries.

Opportunities exist through schemes that offer payment for environmental services. The crucial role of natural forests in the carbon cycle and the world's climate is generally recognised, and planning is well advanced for schemes such as Reduced Emissions from Deforestation and Degradation (REDD) – which pays developing countries for the carbon they store in their natural forests. Biodiversity offsets and water catchment levies also have potential to help developing regions, like New Guinea, better manage the Earth's last great natural habitats.

None of these solutions will be easy or fast. But these sorts of innovative programmes reflect an evolving belief that the world must revalue natural resources and be prepared to share the cost of regulating the climate and conserving the biodiversity we all depend on. If governments, corporations and communities take their responsibilities seriously, most of New Guinea's forests can survive. And that will benefit everybody.


Papua New Guinea Forest Cover
Forest status in 2009
N
Possible status in 2020
N
Map scale 1:9,400,000
0
145
290
580
Kilometers
Forest Cover
Forest Loss/Degradation
WWF

FUTURE-PROOFING NEW GUINEA

"Unlike many other places of the world, in New Guinea we're not saving the last scraps, we're saving large intact ecosystems ... that makes me hopeful."

Prof. Jared Diamond, biogeographer and author, September 2007.

An immense opportunity exists in New Guinea to conserve some of the world's last unspoilt terrestrial, freshwater and marine landscapes. These include highly biologically diverse habitats, possessing some of the highest levels of endemic species on the planet.

The future of New Guinea's species depends on the island's resources being managed sustainably. Economic development and environmental protection can and must be mutually supportive.

Managing these resources sustainably will allow the people of New Guinea and its islands to maintain their extraordinary natural and cultural heritage, while improving their livelihoods and developing the economy.

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Mother and child, Pukapuki village, East Sepik province, Papua New Guinea. The environment is the base for all human development. Good environmental management can help increase livelihood options and help secure food and freshwater availability for millions of people.

It's vital that New Guinea's forests, rivers, lakes and seas are managed in a way that ensures they'll continue to sustain economic and social development – and support the island's fabulous wildlife. If we're to safeguard this 'final frontier', it'll require active partnerships between New Guinea's communities and a wide range of stakeholders. Committed actions are needed by:

PNG and Indonesian governments:

- Enforce and improve on existing environmental and biodiversity conservation regulations and laws.
- Adhere to international conventions[VI] and subscribe to international best practices, such as the Extractives Industry Transparency Initiative[VII], and to principles for protecting ecosystem services (e.g. clean water).
- Conduct sustainable development planning that protects high conservation value areas (HCVA)[VIII], including cultural and spiritual sites, while striving for equitable socio-economic development.
- Focus on large-scale direct and indirect impacts on wildlife and people from the forestry, plantation and extractives sector (mining, oil and gas).
- Ensure biodiversity is fully represented in the network of protected areas in both countries, and improve collaboration with and support for local communities in protected area management.

Forest, agricultural and fishing industries:

- Reduce their adverse social and environmental impacts.
- Ensure zero net deforestation, so most existing forest survives as a carbon sink and a buffer to climate change[IX].
- Not develop infrastructure or allow systems that cause fisheries to be exploited beyond their capacity.
- Ensure illegal and unsustainable products are excluded from the global supply chain.
- Certify operations, exports and imports of products through the Forest Stewardship Council (FSC), the Roundtable on Sustainable Palm Oil (RSPO), and fair-trade coffee and cocoa certification schemes. This will ensure wood, paper, palm oil and other plantation commodities come from a legal and sustainable source and don't inadvertently contribute to habitat or species loss in New Guinea. Forest industries can seek further guidance from us and establish stronger market links by joining the RSPO or Global Forest & Trade Network (GFTN).

Extractive industries (mining, oil and gas):

- Strive for best environmental, biodiversity conservation and social management practices and benefit flows to ensure that no damage to people's health and wildlife from associated pollution is incurred, and that direct damage and damage caused directly or indirectly by associated infrastructure is minimised, and mine sites are appropriately rehabilitated on closure.
- Make provision for sustainable conservation finance for the areas affected by extractive operations through, for example, trust funds.

[VI] For more information, visit Convention on Biological Diversity (CBD) www.cbd.int, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) www.cities.org; Ramsar Convention Convention on Wetlands of International Importance www.ramsar.org, and others.

[VII] The EITI sets a global standard for transparency in oil, gas and mining. It is an effort to make natural resources benefit all; a coalition of governments, companies and civil society; a standard for companies to publish what they pay and for governments to disclose what they receive. For more information, visit www.eiti.org.

[VIII] For more information, visit http://www.hcvnetwork.org/about-hcvf.

[IX] Forests are the largest storehouse of carbon, after coal and oil. However, when forests are destroyed by activities such as logging and land conversion for agriculture, they release large quantities of CO_2 and other greenhouse gases into the atmosphere, a major contributor to climate change. For more information, visit www.panda.org/forestcarbon.

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The Global Forest & Trade Network (GFTN), supportive partnerships in forestry

The GFTN is a partnership between WWF and 275 members of the global forest industry. It reduces unsustainable and illegal logging and improves the management of valuable and threatened forests. We offer guidance to forest industries and help members establish stronger market connections.

GFTN is present in 34 of the most influential timber-producing and consuming nations around the globe, including the Asia-Pacific countries of Australia, China, India, Indonesia, Japan, Malaysia and Vietnam. GFTN members generate 2.8 million jobs and represent a fifth (19%) of all forest products traded internationally every year. Combined annual sales of US$73 billion present a compelling business case for the value of sustainable forest management to global economies. To date, we've facilitated 205 trading deals between GFTN timber importers and a network of responsible producers in Brazil, Cameroon, Indonesia, Russia and other WWF priority places.

We feel strongly that more transparent forestry management remains a priority for both countries in New Guinea. GFTN can help forestry companies interested in practising sustainable forest management in Papua New Guinea and Indonesian Papua, and global companies seeking to reduce consumption of forest products from unsustainable sources originating from New Guinea. Our partnerships have consistently shown that operating sustainably can overcome environmental challenges and open up more business opportunities, offering stronger long-term growth. **For more information, visit www.panda.org/gftn**

Photo above: Logging truck at Anus intersection, Indonesia's Papua Province, New Guinea

Banks and lending institutions:
- Implement a responsible lending policy to ensure investments are only made in activities that do not damage biodiversity and ecosystem services either directly or indirectly, are sustainable and follow the Equator Principles[X];

Government and other aid agencies:
- Help New Guinea develop in a genuinely sustainable way, by promoting development projects that respect HCVA[XI], other important habitats, and ecosystem services, and by strongly supporting the countries' environmental conservation establishments;

Local communities of New Guinea:
- Receive support to sustainably manage customary lands to ensure livelihoods and areas of cultural importance are maintained for future generations.
- Understand obligations and benefits from payment for environmental services opportunities.

Governments, universities and NGOs:
- Provide opportunities for people from the New Guinea region to develop skills and to undertake and publish international-standard research.
- Develop links between science and conservation within Indonesian Papua and Papua New Guinea, in order to support biodiversity conservation in an effective way.

Consumers:
- Only purchase products certified as sustainable by the FSC, Marine Stewardship Council (MSC) and RSPO, to ensure wood, fish, palm oil and other commodities are from a legal and sustainable source and don't inadvertently contribute to habitat or species destruction on New Guinea.
- When travelling, don't buy coral, shells, animal skins and other wildlife souvenirs[XII].

[X] The Equator Principles (EPs) are a voluntary set of standards for determining, assessing and managing social and environmental risk in project financing. For more information, visit www.equator-principles.com.
[XI] For more information, visit http://wwf.panda.org/what_we_do/how_we_work/conservation/forests/forestlandscapes/high_conservation_value_areas/
[XII] More than 800 endangered animal and plant species are banned from international trade, and 30,000 more require a special permit under CITES before they can be traded internationally.

APPENDIX

New Guinea new species 1998-2008

The term 'new species' is one used by the scientific community to indicate the first time a species has been officially discovered – that is, collected, recorded and described by scientists in a peer-reviewed journal.

This report presents a list of the new species from New Guinea over the period 1998–2008. The list was informed by a variety of expeditions and data retrieved from scores of scientific databases, appendices, reports and scientific journals. It was further informed and refined through advice received from experts working in museums, universities, government departments and non-governmental organisations in Indonesia, Papua New Guinea, and other parts of the world. Only the new discoveries that have been described in peer-reviewed scientific journals have been included in this report. In addition to the species listed here, many other species, which may eventually turn out to be new to science, have been encountered and collected in New Guinea over the past decade. These species are currently awaiting official scientific recognition, and have not been included in this report.

WWF was directly involved in the discovery of some of the new finds, including frogs and orchids. For many other expeditions, we assisted scientists from other institutions by organising research permits, liaising with local communities, identifying probable research locations, and providing funding and logistical support. However, this report also documents many discoveries made by non-WWF scientists and institutions.

MAMMALS

Species	Author	Year
Hydromys ziegleri	Helgen	2005
Hylomys megalotis	Jenkins & M. F. Robinson	2002
Leptomys arfakensis	Musser, Helgen & Lunde	2008
Leptomys paulus	Musser, Helgen & Lunde	2008
Microperoryctes aplini	Helgen & Flannery	2004
Myoictis leucura	Woolley	2005
Orcaella heinsohni	Arnold, Beasley & Robertson	2005
Paranyctimene tenax	Bergmans	2001
Pseudohydromys germani	Helgen	2005
Pteralopex flanneryi	Helgen	2005
Spilocuscus wilsoni	Helgen & Flannery	2004
Zaglossus attenboroughi	Flannery & Groves	1998

Subtotal 12

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Species	Author	Year
Acronychia richards-beehleri	Takeuchi	2007
Ajuga novoguineensis	Paton & Johns	2004
Amphineuron lindleyi	Takeuchi	2005
Anoectochilus rhombilabius	Ormerod	2002
Antiaropsis uniflora	Berg	2005
Antrophyum brassii	Linds.	2003
Aquifoliaceae Ilex obovata	Hicks	2007
Averrhoa dolichocarpa	Rugayah & Sunarti	2008
Begonia argenteomarginata	Tebbitt	2005
Blechnum puniceum	Chambers, Edwards & Johns	2006
Bulbophyllum argoxanthum	Vermeulen	2008
Bulbophyllum ascochilum	Vermeulen	2008
Bulbophyllum atroviride	Vermeulen	2008
Bulbophyllum barbavagabundum	Vermeulen	2008
Bulbophyllum biserratum	Vermeulen	2008
Bulbophyllum bombycinum	Vermeulen	2008
Bulbophyllum catillus	Vermeulen & O'Byrne	2003
Bulbophyllum chalcochloron	Vermeulen	2008
Bulbophyllum chlorolirion	Vermeulen	2008
Bulbophyllum chrysanthum	Vermeulen	2008
Bulbophyllum condensatum	Vermeulen	2008
Bulbophyllum corrugatum	Vermeulen	2008
Bulbophyllum cyrtophyllum	Vermeulen	2008
Bulbophyllum erythrosema	Vermeulen	2008
Bulbophyllum eutoreton	Vermeulen	2008
Bulbophyllum fallacinum	Vermeulen	2008
Bulbophyllum fibristectum	Vermeulen	2008
Bulbophyllum fruticulum	Vermeulen	2008
Bulbophyllum ichthyosme	Vermeulen	2008
Bulbophyllum intonsum	Vermeulen	2008
Bulbophyllum lagaroglossum	Vermeulen	2008
Bulbophyllum luteum	Vermeulen	2008
Bulbophyllum lyriforme	Vermeulen & O'Byrne	2003
Bulbophyllum macneiceae	Schuitema & de Vogel	2005
Bulbophyllum masdevalliacium	Harris	2006
Bulbophyllum myodes	Vermeulen	2008
Bulbophyllum odontostigma	Vermeulen	2008
Bulbophyllum pendens	Vermeulen	2008
Bulbophyllum planiplexum	Vermeulen	2008
Bulbophyllum ptychostigma	Vermeulen	2008
Bulbophyllum pyroglossum	Schuitema & de Vogel	2005
Bulbophyllum sannio	Vermeulen	2008
Bulbophyllum schuitemanii	Vermeulen	2008
Bulbophyllum scorpio	Vermeulen	2008
Bulbophyllum sinapis	Vermeulen & O'Byrne	2003
Bulbophyllum sphaenopus	Vermeulen	2008
Bulbophyllum staetophyton	Vermeulen	2008
Bulbophyllum stalagmotelos	Vermeulen	2008
Bulbophyllum stemonochilum	Vermeulen	2008
Bulbophyllum stockeri	Vermeulen	2008
Bulbophyllum tarantula	Schuitema & de Vogel	2005
Bulbophyllum tinekeae	Schuitema & de Vogel	2005
Bulbophyllum tricaudatum	Vermeulen	2008
Bulbophyllum variculosum	Vermeulen	2008
Bulbophyllum zygochilum	Vermeulen	2008
Bungarimba papuana	K.M.Wong	2004
Cadetia kutuba	Harris	2006
Calamus bankae	Baker & Dransf.	2002
Calamus dasyacanthus	Baker, Bayton, Dransf. & Maturb.	2003
Calamus pachypus	Baker, Bayton, Dransf. & Maturb.	2003
Calamus pholidostachys	Dransf. & Baker	2003
Calycosia mamosei	Takeuchi	2000
Cleisostoma clemensiae	Ormerod	2008
Cleisostoma isuaravanum	Ormerod	2008
Ctenopteris hymenophylloides	Parris	2004
Cyathea lamoureuxii	Takeuchi	2007
Dendrobium aethalodes	Ormerod	2007
Dendrobium bicristatum	Ormerod	2008
Dendrobium brillianum	Ormerod & Cavestro	2005
Dendrobium crassilabium	P.J.Spence	2004
Dendrobium efogiense	Ormerod	2008
Dendrobium eymanum	Ormerod	2005
Dendrobium flebiliflorum	Ormerod	2005
Dendrobium hooglandianum	Ormerod	2007
Dendrobium hooveri	Ormerod	2007
Dendrobium ianthinum	Schuitema & Puspit.	2005
Dendrobium kotanicanum	Ormerod	2008
Dendrobium lanuginosum	Ormerod	2005
Dendrobium limpidum	Schuitema & de Vogel	2003
Dendrobium pullenianum	Ormerod	2007
Dendrobium racieanum	Cavestro	2003
Dendrobium sleumeri	Ormerod	2003
Dendrobium spectabile	Harris	2006
Dendrobium spenceanum	Ormerod	2005
Dendrobium spinuliferum	Ormerod	2005
Dendrobium stipiticola	Ormerod	2005
Dendrobium widjajanum	Ormerod	2008
Dimorphanthera angiliensis	P.F. Stevens	2004
Dimorphanthera anomala	P.F. Stevens	2004
Dimorphanthera antennifera	P.F. Stevens	2004
Dimorphanthera cratericola	P.F. Stevens	2004
Dimorphanthera inopinata	P.F. Stevens	2004
Discocalyx kaoyae	Pipoly & Takeuchi	2004
Distyliopsis lanata	Brummitt & Utteridge	2003
Dryadorchis dasystele	Schuitema & de Vogel	2004
Elaeocarpus gardneri	Coode	2003
Eulophia lenbrassii	Ormerod	2003
Ficus biakensis	Berg	2004
Ficus boanensis	Berg	2004
Ficus carinata	Berg	2003
Ficus funiculicaulis	Berg	2003
Ficus jacobsii	Berg	2003
Ficus jimiensis	Berg	2003
Ficus morobensis	Berg	2004
Ficus myiopotamica	Berg	2003
Ficus paoana	Berg	2007
Ficus saruensis	Berg	2003
Ficus sclerosycia	Berg	2003
Ficus scopulifera	Berg	2004
Ficus stellaris	Berg	2003
Ficus subcaudata	Berg	2003
Fittingia paniculata	Takeuchi	2008
Freycinetia daymanensis	Huynh	2003
Freycinetia insueta	Huynh	2003
Freycinetia kamialiensis	Huynh	2003
Freycinetia neoglaucescens	Huynh	2003
Freycinetia rubripedata	Huynh	2003
Freycinetia scitula	Huynh	2003
Freycinetia starensis	Huynh	2003
Gardenia kamialiensis	Takeuchi	2004
Glochidion daviesii	Takeuchi	2003
Glochidion welzenii	Takeuchi	2008
Glomera pseudomonanthos	Ormerod	2005
Gomphogyne peekelii	W.J.de Wilde & Duyfjes	2007
Gossia longipetiolata	Snow	2006
Gossia scottiana	Snow	2006
Grammitis clavata	Parris	2004
Grammitis velutina	Parris	2004
Gynostemma intermedium	W.J.de Wilde & Duyfjes	2007
Gynostemma papuanum	W.J.de Wilde & Duyfjes	2007
Hippeophyllum microphyllum	S.C.Chen	2003
Homalomena impudica	Hersc. & A.Hay	2003
Hypserpa ademae	Takeuchi	2008
Hypserpa calcicola	Takeuchi	2008
Ilex emmae	Hicks	2005
Ilex toroidea	Hicks	2007
Inocarpus glabellus	Adema	2007
Licuala bifida	Heatubun & Barfod	2008
Licuala graminifolia	Heatubun & Barfod	2008
Licuala longispadix	Banka & Barfod	2004
Liparis brassii	Ormerod	2008
Liparis graminifolia	Ormerod	2008
Livistona brevifolia	Dowe & Mogea	2004
Livistona chocolatina	Dowe	2004
Macaranga amentifera	Whitmore	2008
Macaranga barkeriana	Whitmore	2008
Macaranga daviesii	Takeuchi	2007
Macaranga hartleyana	Whitmore	2008
Macaranga hengkyana	Whitmore	2008
Macaranga lumiensis	Whitmore	2008
Macaranga pepysiana	Whitmore	2008
Macaranga racemohispida	Whitmore	2008
Macaranga uxoris	Whitmore	2008
Macodes megalantha	Ormerod	2004
Miliusa lanceolata	Chaowasku & Kessler	2006
Miliusa novoguineensis	Mols & Kessler	2003
Neoachmandra lancifolia	W.J.de Wilde & Duyfjes	2006
Neonauclea subsessilis	Ridsdale	2008
Novaguinea rudalliae	Hind	2004
Paphia megaphylla	P.F. Stevens	2004
Paphia woodsii	P.F. Stevens	2004
Papuacalia milleri	Hind & Johns	2003
Papuacalia sandsii	Hind & Johns	2003
Papuacalia titoi	Hind & Johns	2003
Pilea craspedodroma	Monro	2005
Pilea jayaensis	Monro	2005
Pilea johnsii	Monro	2005
Pneumatopteris medlerae	Takeuchi	2007
Poikilogyne cornuta	Cellin. & J.F.Maxwell	2007
Poikilogyne lakekamuensis	Cellin.	2007
Polyosma rampae	Takeuchi	2007
Potentilla bidentula	Soják	2003
Potentilla biloba	Danet	2003
Potentilla pycnophylla	Soják	2003
Potentilla scorpionis	Soják	2006
Potentilla yonoweana	Danet	2003
Pseuderia takeuchii	Ormerod	2005
Pseudoliparis kortylewskiana	Marg.	2005

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Species	Author	Year
Pseuduvaria acerosa	Y.C.F.Su & Saunders	2006
Pseuduvaria brachyantha	Y.C.F.Su & Saunders	2006
Pseuduvaria clemensiae	Y.C.F.Su & Saunders	2006
Pseuduvaria coriacea	Y.C.F.Su & Saunders	2006
Pseuduvaria subcordata	Y.C.F.Su & Saunders	2006
Psychotria bulilimontis	Takeuchi	2003
Rhododendron dutartrei	Danet	2007
Rhododendron evelyneae	Danet	2005
Rhododendron gideonii	Argent	2003
Rhododendron kawir	Danet	2005
Rhododendron kerowagiense	Argent	2003
Rhododendron kogo	Danet	2007
Rhododendron reevei	Argent	2003
Rhododendron takeuchii	Argent	2003
Rhododendron tintinnabellum	Danet	2005
Rhodomyrtus guymeriana	Snow & Atwood	2008
Rhodomyrtus kaweaensis	Snow	2006
Rhodomyrtus longisepala	Snow & McFadden	2008
Rhodomyrtus mengenensis	Snow	2006
Rhodomyrtus misimana	Snow	2008
Rhopaloblaste gideonii	Banka	2004
Robiquetia brassii	Ormerod	2005
Ryparosa maculata	B.L.Webber	2006
Ryparosa milleri	B.L.Webber	2006
Saurauia taylorii	Takeuchi	2008
Scaevola burnettii	Takeuchi	2003
Tainia serratiloba	Ormerod	2005
Tapeinosperma magnifica	Pipoly & Takeuchi	2004
Trichadenia sasae	Takeuchi	2003
Urceodiscus arfakensis	W.J.de Wilde & Duyfjes	2006
Urceodiscus carrii	W.J.de Wilde & Duyfjes	2006
Urceodiscus hippocrepicus	W.J.de Wilde & Duyfjes	2006
Urceodiscus parviflora	W.J.de Wilde & Duyfjes	2006
Urceodiscus viridis	W.J.de Wilde & Duyfjes	2006
Vaccinium obatapaquiniorum	Takeuchi	2008
Vaccinium tectiflorum	Danet	2005
Zehneria erythrobacca	W.J.de Wilde & Duyfjes	2006
Zehneria pedicellata	W.J.de Wilde & Duyfjes	2006
Zehneria pisifera	W.J.de Wilde & Duyfjes	2006
Zehneria viridifolia	W.J.de Wilde & Duyfjes	2006

Subtotal 218

INVERTEBRATES

Species	Author	Year
Acanthotyla kaloboana	Brailovsky	2005
Acanthotyla kiungala	Brailovsky	2005
Acanthotyla nabirenia	Brailovsky	2005
Acanthotyla protenta	Brailovsky	2005
Adenobrechmos greeri	Bursey, Goldberg & Kraus	2006
Aegilipsicola auga	Polhemus & Polhemus	2004
Aegilipsicola insularis	Polhemus & Polhemus	2000
Aegilipsicola iriana	Polhemus & Polhemus	2000
Aegilipsicola peninsularis	Polhemus & Polhemus	2004
Aegilipsicola robinae	Polhemus & Polhemus	2000
Agorius baloghi	Szuts	2003
Agrilus papua	Holynski	2003
Allaeometrus bimaculatus	Goossens	2005
Amarygmus baehri	Bremer	2002
Amarygmus bellargus	Bremer	2002
Amarygmus bimaculatus	Bremer	2002
Amarygmus concameratus	Bremer	2002
Amarygmus conspicuus	Bremer	2002
Amarygmus cuccodoroi	Bremer	2005
Amarygmus dubius	Bremer	2002
Amarygmus fallax	Bremer	2002
Amarygmus gemellus	Bremer	2002
Amarygmus gratus	Bremer	2002
Amarygmus hartmanni	Bremer	2002
Amarygmus inopinus	Bremer	2002
Amarygmus irianus	Bremer	2002
Amarygmus pelliceiventris	Bremer	2006
Amarygmus reficiens	Bremer	2005
Amarygmus riedeli	Bremer	2002
Amarygmus varus	Bremer	2002
Amarygmus vialis	Bremer	2006
Ambulyx rudloffi	Brechlin	2005
Analophus vicksoni	Nylander & Komiya	2005
Anisocentropus bipustulatus	Botosaneanu & de Vos	2004
Anisocentropus gilvimacula	Botosaneanu & de Vos	2004
Anomotarus cordifer	Baehr	2005
Anomotarus darlingtoni	Baehr	2003
Anomotarus ornatellus	Baehr	2003
Anomotarus semisericeus	Baehr	2003
Anomotarus violaceipennis	Baehr	2003
Apanthura forceps	Negoescu & Brandt	2001
Apanthura monodi	Negoescu & Brandt	2001
Apirocalus carinirostris	Thompson	2005
Apirocalus fordi	Thompson	2005
Apirocalus grossus	Thompson	2005
Apirocalus perturbans	Thompson	2005
Apirocalus riedeli	Thompson	2005
Apirocalus scaber	Thompson	2005
Apirocalus specillifer	Thompson	2005
Apirocalus verrucosus	Thompson	2005
Aptinocoris boikiki	Polhemus & Polhemus	2000
Aptinocoris minutes	Polhemus & Polhemus	2000
Aptinocoris sogeri	Polhemus & Polhemus	2000
Aptinocoris ziwa	Polhemus & Polhemus	2000
Asiaephorus papuana	Kovtunovich & Ustyuzhanin	2003
Augustohahnia dilatitibia	Liang	2003
Augustohahnia sanguinifrons	Liang	2003
Aulacus enarotadi	Jennings & Austin	2006
Aulacus sedlaceki	Jennings & Austin	2006
Aulacus wau	Jennings & Austin	2006
Bactrocera torresiae	Huxham, Harry & Hancock	2006
Batrachomyia krausi	Evenhuis	2006
Birubius lowryi	Taylor & Poore	2001
Birubius wilsoni	Taylor & Poore	2001
Brachycarpus crosnieri	Bruce	1998
Brechivelia tufi	Polhemus & Polhemus	2004
Calcaribracon sarcoseparophilus	Braet	1999
Calodema hudsoni	Neef de Sainval	1998
Calodema sainvali	Nylander	2000
Calodema suhandae	Nylander	2004
Calodema vicksoni	Nylander	2006
Calyptobates kamoro	Polhemus & Polhemus	2000
Calyptobates kopi	Polhemus & Polhemus	2000
Carnoya caputbulla	Hunt & Moore	1998
Carnoya janiceae	Hunt & Moore	1998
Carnoya posterovulva	Hunt & Moore	1998
Castiarina holynskii	Nylander	2006
Castiarina hudsoni	Nylander	2001
Castiarina shelleybarkeri	Nylander	2006
Celantia wandelmanniae	Guilbert	2006
Cephalohygia decorata	Brailovsky	2004
Cerapus volucola	Lowry & Berents	2005
Cethosia vasalia	Muller	1999
Charinus papuanus	Weygoldt	2006
Cheletophyes occisor	Bochkov & Klimov	2005
Cherax holthuisi	Lukhaup & Pekny	2006
Chimarra formosa	Botosaneanu & de Vos	2006
Chimarra biramosa	Cartwright	2001
Chimarra guentheri	Mey	2006
Chimarra longpela	Cartwright	2001
Chimarra panguna	Cartwright	2001
Chimarra pinga	Cartwright	2001
Ciliometra minajerwi	Polhemus & Polhemus	2000
Ciliometra setosa	Polhemus & Polhemus	2000
Ciliometra waigeo	Polhemus & Polhemus	2000
Cinetus melancholicus	Buhl	1998
Cisseis miyama	Barker	2006
Cisseis wagneri	Barker	2006
Colasidia garainae	Baehr	2000
Colasidia wau	Baehr	2004
Colonomyia rakelae	Hippa & Jaschhof	2004
Columbicola claytoni	Bush & Price	2006
Columbicola malenkeae	Bush & Price	2006
Copelatus desii;	Balke	1999
Copelatus messeri	Balke	1999
Coptodactyla merdeka	Reid	2000
Cordyla jani	Kurina	2005
Coscinocera niepelti	Brechlin	2004
Cosmocerca tyleri	Bursey, Goldberg & Kraus	2006
Cosmocerca zugi	Bursey, Goldberg & Kraus	2005
Cosmophorus brevicaudatus	van Achterberg & Quicke	2000
Cosmophorus mesocaudatus	van Achterberg & Quicke	2000
Cottothucha minor	Guilbert	2006
Craspedosis latefasciata	Inoue	2004
Craspedosis rubicunda	Inoue	2004
Cryptophleps karkar	Bickel	2005
Cyamops papuensis	Baptista & Mathis	2000
Cydistomyia kamialiensis	Goodwin	1999
Cysteochila missimensis	Guilbert	2006
Delias akrikensis	Lachlan	1999
Delias binniensis	Lachlan	2000
Delias brandti	Muller	2001
Delias cumanau	van Mastrigt	2006
Delias durai	van Mastrigt	2006
Delias felis	Lachlan	2000
Delias fojaensis	van Mastrigt	2006
Delias inopinata	Lachlan	2000
Delias kristianiae	van Mastrigt	2006
Dennyus mimirogerorum	Clayton, Price & Johnson	2006
Deuterocopus devosi	Gielis	2003
Diadocidia papua	Sevcik	2003
Diadocidia cizeki	Sevcik	2003
Diadocidia halopensis	Sevcik	2003
Dicraspeda coeruleipennis	Baehr	2006
Dicraspeda glabripennis	Baehr	2006
Dicraspeda missai	Baehr	2006
Digenethle chaminadei	Antoine	2004
Digenethle juheli	Legrand	2006
Dirivultus spinigulatus	Humes	1999
Dolerocypria habra	Wouters	2001
Dolerocypria heylenae	Wouters	2001
Dolichoctis glabripennis	Baehr	2003
Dolichoctis novaeirlandiae	Baehr	2003
Dolichoctis erythrospinosa	Baehr	2006
Dolichoctis paradentata	Baehr	2006
Dolichoctis weigeli	Baehr	2006
Drepanosticta antilope	Theischinger & Richards	2005
Drepanosticta taurulus	Theischinger & Richards	2005
Embolemus searsi	Olmi	2004
Eothalassius platypalpus	Shamshev & Grootaert	2005
Ergasilus acusicestraeus	El-Rashidy & Boxshall	1999
Eudocima prolai	Zilli & Hogenes	2002
Euglesa clausi	Korniushin	2006
Eumanota jani	Papp	2004

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Species	Author	Year
Eumyrmococcus neoguineensis	Williams	1998
Euops aculeatus	Riedel	1999
Euops anggiensis	Riedel	2001
Euops armatus	Riedel	1999
Euops bicolor	Riedel	2001
Euops convexus	Riedel	2001
Euops fraterculus	Riedel	2001
Euops gressitti	Riedel	1999
Euops ibelensis	Riedel	2001
Euops kurulu	Riedel	2001
Euops monstruosus	Riedel	1999
Euops nothofagi	Riedel	2001
Euops paniaiensis	Riedel	1999
Euops paraconvexus	Riedel	2001
Euops paraspinosus	Riedel	1999
Euops parvus	Riedel	2001
Euops platyrostris	Riedel	2001
Euops porulosus	Riedel	2001
Euops pseudomonstruosus	Riedel	1999
Euops pygmaeus	Riedel	2001
Euops sedlaceki	Riedel	2001
Euops spinosus	Riedel	1999
Euops yali	Riedel	1999
Euops zimmermanni	Riedel	1999
Eupholus schneideri	Riedel	2002
Eupholus vlasimskii	Riedel	2002
Fistulococcus intsiae	Hodgson & Martin	2005
Fortagonum globulipenne	Baehr	1998
Fortagonum laevigatum	Baehr	1998
Fortagonum sinak	Baehr	1998
Fortagonum spinipenne	Baehr	1998
Fulvius constanti	Gorczyca	2004
Gastrotheus papuanus	Mendes	2002
Gekkotaenia	Bursey, Goldberg & Kraus	2005
Gekkotaenia novaeguineaensis	Komiya & Nylander	2005
Gnathonyx amplitarsalis	Komiya & Nylander	2005
Gnathonyx heteromandiblaris	Komiya & Nylander	2005
Gnathonyx inermis	Komiya & Nylander	2005
Gnathonyx orientalis	Muller & Tennent	1999
Graphium kosii	Polhemus & Polhemus	2006
Halovelia huniye	Polhemus & Polhemus	2006
Halovelia misima	Wouters	2001
Hansacypris motuporensis	Bolstad & Kensley	1999
Hansenium thomasi	Bolstad & Kensley	1999
Hansenium tropex	Guilbert	2006
Hebetingis iongai	Brailovsky & Barrera	2003
Heisshygia tafa	Slater & Brailovsky	2006
Heissothignus armatus	Slater & Brailovsky	2006
Heissothignus perfectus	Slater & Brailovsky	2006
Heissothignus reclusus	Rheinheimer	2004
Hellerrhinus platypterus	Rheinheimer	2004
Hellerrhinus viklundi	Gielis	2003
Hellinsia agassizi	Gielis	2003
Hellinsia carphodactoides	Gielis	2003
Hellinsia kaiapensis	Gielis	2003
Hellinsia tariensis	Gielis	2003
Hellinsia wamenae	Inoue	2001
Herdonia albipennis	Inoue	2001
Herdonia amabilis	Inoue	2001
Herdonia scintillans	Inoue	2001
Herdonia terminalis	Polhemus & Polhemus	2006
Hermatobates kula	Skalicky	2002
Heterocerus balkei	Skalicky	2006
Heterocerus heissi	Skalicky	2006
Heterocerus sinecorniger	Brailovsky & Barrera	2005
Heydonhygia lata	Brailovsky & Barrera	2005
Heydonhygia mucronata	Brailovsky & Barrera	2005
Heydonhygia prolata	Brailovsky & Barrera	2005
Heydonhygia venusta	Jach & Diaz	2000
Hydraena cyclops	Toledo & Hendrich	2006
Hydrocanthus balkei	Yagishita	2004
Hypochrysops aurantiaca	Lane & Edwards	2004
Hypochrysops lustrare	Guilbert	2006
Ideorhipistena occipitalis	Franciscolo	2000
Iobates ivimka	Polhemus & Polhemus	2002
Ischiopsopha chaminadei	Antoine	2004
Ithystenus cavicaudatus	Goossens	2005
Kerzhnerhygia nubila	Brailovsky & Barrera	2003
Larotingis nonareolae	Guilbert	2006
Larotingis pericarti	Guilbert	2006
Lebia weigeli	Baehr	2005
Lemodes nigrocaeruleus	Telnov	2004
Leuciacria olivei	Pace	1999
Leucolepas longa	Southward & Jones	2003
Limnebius acupunctus	Perkins	2004
Listrophoroides melomys	Bochkov & Fain	2003
Listrophoroides mordax	Bochkov & Fain	2003
Lomaptera frederici	Legrand	2006
Lomaptera bugeiae	Antoine	2004
Lorentzocassis riedeli	Borowiec	2003
Lothygia consocia	Brailovsky & Barrera	2003
Lothygia sordida	Brailovsky & Barrera	2003
Macroglossum mouldsi	Lis	2001
Macroscytus loksai	Shaw	2000
Macrostomion gnathothlibi	Baehr	2002
Mecyclothorax bilaianus	Baehr	1998
Mecyclothorax cuccodoroi	Baehr	2002
Mecyclothorax loebli	Gielis	2002
Megalorhipida deboeri	Lachlan & Kitching	2003
Megasyringophilus geoffroyus	Skoracki	2005
Melima papuaensis	Willen	2002
Melittia propria	Kallies & Arita	2003

Species	Author	Year
Mesocentrus reptus	Papp	2005
Mesovelia Melanesia	Polhemus & Polhemus	2000
Mesovelia stysi	Polhemus & Polhemus	2000
Metaxymorpha hilleri	Nylander	2004
Metaxymorpha hudsoni	Nylander	2001
Metaxymorpha landeri	Nylander	2001
Metaxymorpha marietta	Nylander	2004
Metaxymorpha nigrofasciatum	Nylander	2001
Metaxymorpha pledgeri	Nylander	2001
Meteterakis crombiei	Bursey, Goldberg & Kraus	2005
Metopidiothrix samuelsonorum	Shear	2002
Metopina andersoni	Disney	2003
Metopina grootaerti	Disney	2003
Metopina papuana	Disney	2003
Metrobatoides bifurcates	Polhemus & Polhemus	2002
Micronecta minajerwi	Tinerella & Polhemus	2004
Microphorella papuana	Shamshev & Grootaert	2004
Monomachus comptus	Musetti & Johnson	2000
Monomachus cracens	Musetti & Johnson	2000
Moolapheonoides utmas	Thomas	1999
Mycalesis mulleri	Tennent	2000
Myiomma amaranion	Herczek & Popov	2006
Myrmedonota papyriomyrmecis	Kistner	2003
Myrmedonota termitophila	Bourguignon & Roisin	2006
Myrsidea castanonotae	Hellenthal & Price	2004
Myrsidea leucostictae	Hellenthal & Price	2004
Mythimna abdita	Hreblay, Legrain & Yoshimatsu	1998
Mythimna brevica	Hreblay, Legrain & Yoshimatsu	1998
Mythimna leucomelaena	Yoshimatsu	2003
Neodiphthera habemana	Brechlin	2005
Neodiphthera roicki	Brechlin	2005
Neodiphthera schaarschmidti	Brechlin	2005
Neodryinus papuensis	Olmi	2001
Neohalohygia parallela	Brailovsky & Barrera	2004
Neohigonius longirostris	Goossens	2005
Neopeplus dogoni	Cherot, Malipatil & Schwartz	2003
Neophisis supiori	Gorochov	2004
Nesocypselas sarocepari	Guilbert	2006
Neusterensifer acuminata	Polhemus & Polhemus	2000
Neusterensifer aviavi	Polhemus & Polhemus	2004
Neusterensifer batantana	Polhemus & Polhemus	2000
Neusterensifer bowutu	Polhemus & Polhemus	2004
Neusterensifer dentrecasteaux	Polhemus & Polhemus	2004
Neusterensifer etna	Polhemus & Polhemus	2000
Neusterensifer femoralis	Polhemus & Polhemus	2004
Neusterensifer gamensis	Polhemus & Polhemus	2000
Neusterensifer goilala	Polhemus & Polhemus	2004
Neusterensifer hunteri	Polhemus & Polhemus	2004
Neusterensifer iriana	Polhemus & Polhemus	2000
Neusterensifer kula	Polhemus & Polhemus	2004
Neusterensifer kutubu	Polhemus & Polhemus	2000
Neusterensifer louisiadae	Polhemus & Polhemus	2004
Neusterensifer lubu	Polhemus & Polhemus	2000
Neusterensifer microrivula	Polhemus & Polhemus	2004
Neusterensifer misima	Polhemus & Polhemus	2004
Neusterensifer misoolicus	Polhemus & Polhemus	2000
Neusterensifer muyuw	Polhemus & Polhemus	2004
Neusterensifer pseudocyclops	Polhemus & Polhemus	2000
Neusterensifer sagarai	Polhemus & Polhemus	2004
Neusterensifer sulcata	Polhemus & Polhemus	2004
Neusterensifer tufi	Polhemus & Polhemus	2004
Neusterensifer yela	Polhemus & Polhemus	2004
Nippoptilia rutteni	Gielis	2003
Nososticta conifera	Theischinger & Richards	2006
Nososticta smilodon	Theischinger & Richards	2006
Notobitopsis novoguinensis	Brailovsky & Barrera	2001
Notobitopsis sandaracinus	Brailovsky & Barrera	2001
Ocheovelia heissi	Polhemus & Polhemus	2006
Octothrips lygodii	Mound	2002
Oculomenopon melampittae	Price & Hellenthal	2005
Oecetis nausinoos	Malicky	2006
Ohakunea ingegerdae	Jaschhof & Hippa	2002
Ohakunea papuensis	Jaschhof & Hippa	2002
Omniops fasciatus	Perkins & Short	2004
Omniops hanseni	Perkins & Short	2004
Onesia bergmani	Kurahashi	2003
Ophiomegistus spectabilis	Klompen & Austin	2007
Orectoscelis attenuatus	Degallier & Caterino	2005
Orectoscelis howdeni	Degallier & Caterino	2005
Orotingis maniltoae	Guilbert	2006
Orygmalpheus polites	De Grave & Anker	2000
Osphryon bispinosus	Nylander	1998
Osphryon wauensis	Nylander	1998
Pantoclis propodeata	Buhl	1998
Papuadessus pakdjoko	Balke	2001
Papuadytes atowaso	Shaverdo, Sagata & Balke	2005
Papuadytes hintelmannae	Shaverdo, Sagata & Balke	2005
Papuadytes marinae	Shaverdo, Sagata & Balke	2005
Papuadytes munaso	Shaverdo, Sagata & Balke	2005
Papuadytes vladimiri	Shaverdo, Sagata & Balke	2005
Papuamorbus rostellus	Brailovsky	2006
Papuanthicus aemulus	Telnov	2006
Papuanthicus papuanus	Telnov	2006
Papuavelia siculifera	Polhemus & Polhemus	2000
Paranacaena alticola	Gentili	2002
Paranacaena bacchusi	Gentili	2002
Paranacaena hebaueri	Gentili	2002
Paranacaena maculata	Gentili	2002
Paranacaena madangi	Gentili	2002
Paranacaena ovata	Gentili	2002
Paranacaena plana	Gentili	2002
Paranacaena rotunda	Gentili	2002

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Species	Author	Year
Paranacaena rubra	Gentili	2002
Paranacaena spurca	Gentili	2002
Paranacaena striata	Gentili	2002
Paranacaena sucinacia	Gentili	2002
Paranacaena tetrops	Gentili	2002
Paraputo chimbuensis	Williams	2005
Parathelandros alllisoni	Bursey, Goldberg, & Kraus	2008
Parendacustes derelicta	Gorochov	2006
Paryphantopsis abstrusa	Slapcinsky	2005
Paryphantopsis koragae	Slapcinsky	2005
Paryphantopsis lebasii	Slapcinsky	2005
Paryphantopsis matawanensis	Slapcinsky	2005
Paryphantopsis misimensis	Slapcinsky	2006
Paryphantopsis ubwamensis	Slapcinsky	2005
Paryphantopsis vanatinensis	Slapcinsky	2006
Paryphantopsis yawii	Slapcinsky	2005
Paryphantopsis yelensis	Slapcinsky	2006
Parzaommomyia incompleta	Gumovsky & Ubaidillah	2002
Pedinopleura chisochetonia	Braet	1999
Peltidiphonte furcata	Gheerardyn, Fiers, Vincx & De Troch	2006
Peltidiphonte maior	Gheerardyn, Fiers, Vincx & De Troch	2006
Pericalus novaeirlandiae	Baehr	2003
Periclimenes grandidens	Bruce	2006
Peritropis minor	Gorczyca & Chlond	2005
Pharyngodon novaeguineae	Bursey, Goldberg & Kraus	2008
Phasma marosensis	Hennemann	1999
Phatnoma dilatatum	Lis	2001
Phatnoma ornatum	Lis	2001
Pheidoliphila micra	Degallier & Caterino	2005
Phisis rani	Gorochov	2004
Phoreticovelia nigra	Polhemus & Polhemus	2000
Phoreticovelia rotunda	Polhemus & Polhemus	2000
Phyllium asekiensis	Groesser	2002
Physalopteroides milnensis	Bursey, Goldberg & Kraus	2005
Pilocnema anisopunctata	Hansen	2003
Pilocnema bacchusi	Hansen	2003
Pilocnema biroi	Hebauer	2004
Pilocnema brevisternum	Hansen	2003
Pilocnema clypealis	Hansen	2003
Pilocnema confusa	Hansen	2003
Pilocnema crassipes	Hansen	2003
Pilocnema grandis	Hansen	2003
Pilocnema humeralis	Hebauer	2004
Pilocnema kaindi	Hansen	2003
Pilocnema mianminensis	Hebauer	2004
Pilocnema obsoleta	Hansen	2003
Pogonoglossus giganteus	Baehr	2005
Pogonoglossus missai	Baehr	2005
Polyrhachis enigma	Kohout	2006
Polyrhachis aporema	Kohout	2006
Polyrhachis inflata	Kohout	2006
Polyrhachis integra	Kohout	2006
Polyrhachis sedlaceki	Kohout	2006
Polyrhachis strumosa	Kohout	2006
Polyrhachis tuberosa	Kohout	2006
Polyrhachis barryi	Kohout	2006
Polyrhachis conspicua	Kohout	2006
Polyrhachis dorsena	Kohout	2006
Polyrhachis hybosa	Kohout	2006
Polyrhachis inducta	Kohout	2006
Polyrhachis kyawthani	Kohout	2006
Pontonides asperulatus	Bruce	2006
Pontonides loloato	Bruce	2006
Priocnemioides modicus	Brailovsky	2006
Pristaulacus kiunga	Jennings & Austin	2006
Pristaulacus laloki	Jennings & Austin	2006
Prostomis weigeli	Schawaller	2003
Proteocephalus papuensis	Bursey, Goldberg & Kraus	2008
Pseudagrion fumipenne	Polhemus, Michalski & Richards	2008
Pseudocloeon involutum	Lugo-Ortiz, McCafferty & Waltz	1999
Pseudocloeon petersorum	Lugo-Ortiz, McCafferty & Waltz	1999
Pseudocloeon tuberpalpus	Lugo-Ortiz, McCafferty & Waltz	1999
Pseudocloeon vitile	Lugo-Ortiz, McCafferty & Waltz	1999
Pseudocloeon vultuosum	Lugo-Ortiz, McCafferty & Waltz	1999
Pseudocloeon xeniolum	Lugo-Ortiz, McCafferty & Waltz	1999
Pseudodipsas mulleri	Tennent	2004
Pseudoproto papua	Guerra-Garcia	2003
Psychonotis finisterre	Muller	2003
Psychonotis marginalis	Muller	2003
Psychonotis parsonsi	Muller	2003
Ptecticus danielsi	Rozkosny & De Jong	2003
Ptilomera arfak	Polhemus & Polhemus	2001
Ptilomera biroi	Polhemus & Polhemus	2001
Ptilomera bismarckensis	Polhemus & Polhemus	2001
Ptilomera etna	Polhemus & Polhemus	2001
Ptilomera insularis	Polhemus & Polhemus	2001
Ptilomera iriana	Polhemus & Polhemus	2001
Ptilomera jimi	Polhemus & Polhemus	2001
Ptilomera kiunga	Polhemus & Polhemus	2001
Ptilomera kutubu	Polhemus & Polhemus	2001
Ptilomera misoolensis	Polhemus & Polhemus	2001
Ptilomera morobe	Polhemus & Polhemus	2001
Ptilomera novabrittanica	Polhemus & Polhemus	2001
Ptilomera omo	Polhemus & Polhemus	2001
Ptilomera timika	Polhemus & Polhemus	2001
Ptilomera waigeo	Polhemus & Polhemus	2001
Ptilomera wapoga	Polhemus & Polhemus	2001
Ptilomera wewak	Polhemus & Polhemus	2001
Ptilomera yapenana	Polhemus & Polhemus	2001
Raillietnema nanus	Bursey, Goldberg & Kraus	2006
Rhantus anggi	Balke	2001
Rhantus bacchusi	Balke	2001
Rhantus dani	Balke	2001
Rhantus kakapupu	Balke	2001
Rhantus riedeli	Balke	2001
Rhantus supranubicus	Balke	2001
Rheovelia anomala	Polhemus & Polhemus	2004
Rheovelia anomala	Polhemus & Polhemus	2004
Rheovelia asymmetrica	Polhemus & Polhemus	2004
Rheovelia basilaki	Polhemus & Polhemus	2004
Rheovelia fonticola	Polhemus & Polhemus	2004
Rheovelia insularis	Polhemus & Polhemus	2004
Rheovelia insularis	Polhemus & Polhemus	2004
Rheovelia petrophila	Polhemus & Polhemus	2004
Rheovelia robinae	Polhemus & Polhemus	2004
Rheovelia truncata	Polhemus & Polhemus	2004
Rhopalum probolognathum	Leclercq & Menke	2000
Rhytiferonia julianae	Baehr	2001
Rhytiferonia oblongicollis	Baehr	2001
Rhytiferonia ophthalmica	Baehr	2001
Rhytiferonia paucistriata	Baehr	2001
Rhytiferonia punctigera	Baehr	2001
Riedelhygia wasiora	Brailovsky & Barrera	2005
Robertsia vaamondei	Van Noort & Rasplus	2005
Rosenbergia hudsoni	Nylander	2004
Sagocoris flavinotum	Polhemus & Polhemus	2000
Sagocoris intermedius	Polhemus & Polhemus	2000
Sagocoris irianus	Polhemus & Polhemus	2000
Saurokoilophilia kinsellai	Bursey, Goldberg & Kraus	2008
Scaphisoma coeruleum	Lobl	2002
Scaphisoma fenestratum	Lobl	2002
Scaphisoma frontale	Lobl	2002
Scaphisoma infirmum	Lobl	2002
Scaphisoma medium	Lobl	2002
Scaphoxium impeditum	Lobl	2002
Scaphoxium papuanum	Lobl	2002
Scaphoxium pigneratum	Lobl	2002
Schedotermoecia kaimanensis	Bourguignon & Roisin	2006
Schedotermoecia papuana	Bourguignon & Roisin	2006
Schuelea drumonti	Baehr	2004
Schuelea monstrosa	Baehr	2004
Sciophyrella submacroptera	Brailovsky & Barrera	2003
Sciophyroides splendidula	Brailovsky & Barrera	2003
Scioriedeli mandibularis	Brailovsky	2004
Scopodes aspericollis	Baehr	1999
Scopodes darlingtoni	Baehr	1999
Scopodes robustus	Baehr	1999
Scopodes wei	Baehr	1999
Skrjabinodon derooijae	Bursey, Goldberg & Kraus	2008
Skrjabinodon sheai	Bursey, Goldberg & Kraus	2008
Spauligodon zweifeli	Bursey, Goldberg & Kraus	2005
Speiredonia cthulhui	Zilli, Holloway & Hogenes	2005
Sphallomorpha oculata	Baehr	2004
Spiloscapha weigeli	Schawaller	2004
Stenhelia schminkei	Willen	2002
Stenhelia gundulae	Willen	2003
Stenhomalus komiyai	Nisato & Weigel	2005
Stenhomalus rajaampatensis	Nisato & Weigel	2005
Stenus cuccodoroi	Puthz	2004
Stephanacris draconius	Hennemann & Conle	2006
Stephanacris laeviceps	Hennemann & Conle	2006
Stephanacris multilobatus	Hennemann & Conle	2006
Stephanitis decasperni	Guilbert	2006
Striatacanthus arcuatus	Gibson	2003
Stygiobates iweka	Polhemus & Polhemus	2000
Stygiobates mubi	Polhemus & Polhemus	2000
Stygiobates rajana	Polhemus & Polhemus	2000
Tafaia chaminadei	Legrand	2006
Tafaia jullyae	Antoine	2004
Tanycricos jaetipi	Polhemus	2000
Tanycricos longiceps	Polhemus	2000
Tanycricos ziwa	Polhemus	2000
Tanyvelia bosavi	Polhemus & Polhemus	2000
Tanyvelia minima	Polhemus & Polhemus	2004
Tanyvelia papuana	Polhemus & Polhemus	2004
Tanyvelia tagulana	Polhemus & Polhemus	2004
Tarosvelia reclusa	Polhemus & Polhemus	2000
Tarsovelia bosavi	Polhemus & Polhemus	2000
Tarsovelia kikori	Polhemus & Polhemus	2000
Tarsovelia louisiadensis	Polhemus & Polhemus	2004
Tarsovelia rajana	Polhemus & Polhemus	2000
Tarsovelia ziwa	Polhemus & Polhemus	2000
Temnoplectron wareo	Reid & Storey	2000
Themaroides bicolor	Hancock & Drew	2003
Thlaspidula riedeli	Borowiec & Swietojanska	2001
Tiarodes melici	Baena	1998
Tingis waui	Guilbert	2006
Tmesisternus bezarki	Weigel	2006
Tmesisternus hoyoisi	Weigel	2006
Tmesisternus riedeli	Weigel	2006
Tomoderus glabricephalus	Uhmann	1999
Tomoderus globosus	Uhmann	1999
Tomoderus hirtipennis	Uhmann	1999
Tomoderus metallicus	Uhmann	1999
Tomoderus nigerrimus	Uhmann	1999
Trachys glyphica	Holynski	2003
Trachys gnoma	Holynski	2003
Typostola tari	Hirst	1999
Ullrihygia iriana	Brailovsky & Barrera	2003
Uroptychus edisonicus	Baba & Williams	1998
Vir colemani	Bruce	2003
Weltneria bekae	Kolbasov	2001
Xenasteia lansburyi	Ismay	2003
Xenobates kanakopi	Polhemus & Polhemus	2006

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Species	Author	Year
Xenothictis gnetivora	Brown, Miller & Horak	2003
Xenotingis kokodae	Guilbert	2006
Xixuthrus gressitti	Marazzi, Marazzi & Komiya	2006
Xixuthrus lameerei	Marazzi, Marazzi & Komiya	2006
Xixuthrus thomsoni	Marazzi, Marazzi & Komiya	2006
Xylora calyptogenae	Willen	2006
Xyroptila variegata	Kovtunovich & Ustjuzhanin	2006
Zeylanurotrema sphenomorphi	Bursey, Goldberg & Kraus	2005
Zeylanurotrematidae	Bursey, Goldberg & Kraus	2005
Zygota bismarckensis	Buhl	1998

Subtotal 580

FISH

Species	Author	Year
*Alionematichthys crassiceps**	Møller & Schwarzhans	2008
Allomogurnda flavimarginata+	Allen	2003
Allomogurnda hoesei+	Allen	2003
Allomogurnda insularis+	Allen	2003
Allomogurnda landfordi+	Allen	2003
Allomogurnda montana+	Allen	2003
Allomogurnda papua+	Allen	2003
Allomogurnda sampricei+	Allen	2003
*Amblyeleotris arcupinna**	Mohlmann & Munday	1999
*Apogon leptofasciatus**	Allen	2001
*Apogon oxygrammus**	Allen	2001
*Atelomycterus marnkalha**	Jacobsen & Bennett	2007
*Chaetodontoplus vanderloosi**	Allen & Steene	2004
*Chromis athena**	Allen & Erdmann	2008
*Chrysiptera cymatilis**	Allen	1999
*Cirrhilabrus beauperryi**	Allen, Drew & Barber	2008
*Cirrhilabrus cenderawasih**	Allen & Erdmann	2006
*Corythoichthys benedetto**	Allen & Erdmann	2008
*Ctenochaetus cyanocheilus**	Randall & Clements	2001
*Ctenogobiops phaeostictus**	Randall, Shao & Chen	2007
*Eviota raja**	Allen	2001
Glossamia timika+	Allen, Hortle & Renyaan	2000
Glossolepis dorityi+	Allen	2001
Glossolepis leggetti+	Allen & Renyaan	1998
Glyphis garricki+	Compagno White & Last	2008
Gymnoamblyopus novaeguineae+	Murdy & Ferraris	2003
*Haplolatilus erdmanni**	Allen	2007
*Hemigaleus australiensis**	White, Last & Compagno	2005
*Hemiscyllium galei**	Allen & Erdmann	2007
*Hemiscyllium henryi**	Allen & Erdmann	2007
*Himantura astra**	Last, Manjani-Matsumoto & Pogonoski	2008
*Himantura hortlei**	Last, Manjaji-Matsumoto & Kailola	2006
Kiunga bleheri+	Allen	2004
Lentipes crittersius+	Watson & Allen	1999
Lentipes dimetrodon+	Watson & Allen	1999
Lentipes multiradiatus+	Allen	2001
Lentipes venustus+	Allen	2004
*Lepadicyathus mendeleevi**	Prokofiev	2005
Leptachirus bensbach+	Randall	2007
Leptachirus kikori+	Randall	2007
Leptachirus robertsi+	Randall	2007
*Manonichthys jamali**	Allen & Erdmann	2007
Melanotaenia ammeri+	Allen, Unmack & Hadiaty	2008
Melanotaenia batanta+	Allen & Renyaan	1998
Melanotaenia kokasensis+	Allen, Unmack & Hadiaty	2008
Melanotaenia rubripinnis+	Allen & Renyaan	1998
Melanotaenia synergos+	Allen & Unmack	2008
Mogurnda kaifayama+	Allen & Jenkins	1999
Mogurnda maccuneae+	Jenkins, Buston & Allen	2000
Mogurnda mbuta+	Allen & Jenkins	1999
Mogurnda mosa+	Jenkins, Buston & Allen	2000
Mogurnda wapoga+	Allen, Jenkins & Renyaan	1999
*Neopomacentrus aquadulcis**	Jenkins & Allen	2002
*Opistognathus rufilineatus**	Smith-Vaniz & Allen	2007
Oxyeleotris stagnicola+	Allen, Hortle & Renyaan	2000
*Paracheilinus nursalim**	Allen & Erdmann	2008
*Paracheilinus walton**	Allen & Erdmann	2006
Pelangia mbutaensis+	Allen	1998
*Pomacentrus aurifrons**	Allen	2004
*Pseudochromis alticaudex**	Gill	2004
*Pseudochromis jace**	Allen, Gill, & Erdmann	2008
*Pseudochromis lugubris**	Gill & Allen	2004
Pseudomugil ivantsoffi+	Allen & Renyaan	1999
Pseudomugil pellucidus+	Allen & Ivantsoff	1998
*Ptereleotris crossogenion**	Randall & Suzuki	2008
*Pterocaesio monikae**	Allen & Erdmann	2008
*Pyrolycus manusanus**	Machida & Hashimoto	2002
Sicyopus mystax+	Watson & Allen	1999
Stenogobius watsoni+	Allen	2004
Stiphodon weberi+	Watson, Allen & Kottelat	1998
Stiphodon zebrinus+	Watson, Allen & Kottelat	1998

* Marine species

\+ Freshwater species

Subtotal 71

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Species	Author	Year
Albericus brunhildae	Menzies	1999
Albericus exclamitans	Kraus & Allison	2005
Albericus fafniri	Menzies	1999
Albericus gudrunae	Menzies	1999
Albericus gunnari	Menzies	1999
Albericus laurini	Günther	2000
Albericus rhenaurum	Menzies	1999
Albericus sanguinopictus	Kraus & Allison	2005
Albericus siegfriedi	Menzies	1999
Albericus swanhildae	Menzies	1999
Albericus valkuriarum	Menzies	1999
Austrochaperina adamantina	Zweifel	2000
Austrochaperina aquilonia	Zweifel	2000
Austrochaperina archboldi	Zweifel	2000
Austrochaperina blumi	Zweifel	2000
Austrochaperina derongo	Zweifel	2000
Austrochaperina guttata	Zweifel	2000
Austrochaperina kosarek	Zweifel	2000
Austrochaperina novaebritanniae	Zweifel	2000
Austrochaperina parkeri	Zweifel	2000
Austrochaperina rivularis	Zweifel	2000
Austrochaperina septentrionalis	Allison & Kraus	2003
Austrochaperina yelaensis	Zweifel	2000
Callulops marmoratus	Kraus & Allison	2003
Callulops pullifer	Günther	2006
Choerophryne allisoni	Richards & Burton	2003
Choerophryne amomani	Günther	2008
Choerophryne arndtorum	Günther	2008
Choerophryne burtoni	Richards, Dahl & Hiaso	2007
Choerophryne longirostris	Kraus & Allison	2001
Choerophryne microps	Günther	2008
Choerophryne nigrescens	Günther	2008
Cophixalus aimbensis	Hiaso	2002
Cophixalus balbus	Günther	2003
Cophixalus bewaniensis	Kraus & Allison	2000
Cophixalus humicola	Günther	2006
Cophixalus misimae	Richards & Oliver	2007
Cophixalus pulchellus	Kraus & Allison	2000
Cophixalus tetzlaffi	Günther	2003
Cophixalus timidus	Kraus & Allison	2006
Cophixalus tridactylus	Günther	2006
Cophixalus variabilis	Kraus & Allison	2006
Copiula exspectata	Günther	2002
Copiula major	Günther	2002
Copiula obsti	Günther	2002
Hylarana aurata	Günther	2003
Hylarana volkerjane	Günther	2003
Hylarana waliesa	Kraus & Allison	2007
Hylophorbus nigrinus	Günther	2001
Hylophorbus picoides	Günther	2001
Hylophorbus rainerguentheri	Richards & Oliver	2007
Hylophorbus richardsi	Günther	2001
Hylophorbus sextus	Günther	2001
Hylophorbus tetraphonus	Günther	2001
Hylophorbus wondiwoi	Günther	2001
Liophryne allisoni	Zweifel	2000
Liophryne rubra	Zweifel	2000
Liophryne similis	Zweifel	2000
Litoria auae	Menzies & Tyler	2004
Litoria biakensis	Günther	2006
Litoria bibonius	Kraus & Allison	2004
Litoria chrisdahli	Richards	2007
Litoria christianbergmanni	Günther	2008
Litoria dux	Richards & Oliver	2006
Litoria elkeae	Günther & Richards	2000
Litoria eurynastes	Menzies, Richards & Tyler	2008
Litoria flavescens	Kraus & Allison	2004
Litoria fuscula	Oliver & Richards	2007
Litoria hilli	Hiaso & Richards	2006
Litoria humboldtorum	Günther	2006
Litoria hunti	Richards, Oliver, Dahl & Tjaturadi	2006
Litoria kuduki	Richards	2007
Litoria kumae	Menzies & Tyler	2004
Litoria lodesdema	Menzies, Richards & Tyler	2008
Litoria macki	Richards	2001
Litoria mareku	Günther	2008
Litoria megalops	Richards & Iskandar	2006
Litoria michaeltyleri	Frost, Grant, Faivovich, Bain, Haas, Haddad, de Sá, Channing, Wilkinson, Donnellan, Raxworthy, Campbell, Blotto, Moler, Drewes, Nussbaum, Lynch, Green & Wheeler	2006
Litoria multicolor	Günther	2004
Litoria purpureolata	Oliver, Richards, Tjaturadi & Iskandar	2007
Litoria rara	Günther & Richards	2005
Litoria richardsi	Dennis & Cunningham	2006
Litoria rivicola	Günther & Richards	2005
Litoria robinsonae	Oliver, Stuart-Fox & Richards	2008
Litoria rostandi	Kraus	2007
Litoria rubrops	Kraus & Allison	2004
Litoria sauroni	Richards & Oliver	2006
Litoria scabra	Günther & Richards	2005
Litoria singadanae	Richards	2005
Litoria spartacus	Richards & Oliver	2006
Litoria umarensis	Günther	2004
Litoria verae	Günther	2004
Litoria viranula	Menzies, Richards & Tyler	2008
Litoria wapogaensis	Richards & Iskandar	2001
Oreophryne alticola	Zweifel, Cogger & Richards	2005
Oreophryne asplenicola	Günther	2003
Oreophryne atrigularis	Günther, Richards & Iskandar	2001
Oreophryne brevirostris	Zweifel, Cogger & Richards	2005

AMPHIBIANS

Species	Author	Year
Oreophryne clamata	Günther	2003
Oreophryne geminus	Zweifel, Cogger & Richards	2005
Oreophryne habbemensis	Zweifel, Cogger & Richards	2005
Oreophryne hypsiops	Zweifel, Menzies & Price	2003
Oreophryne kapisa	Günther	2003
Oreophryne minuta	Richards & Iskandar	2000
Oreophryne notata	Zweifel	2003
Oreophryne pseudasplenicola	Günther	2003
Oreophryne sibilans	Günther	2003
Oreophryne terrestris	Zweifel, Cogger & Richards	2005
Oreophryne unicolor	Günther	2003
Oreophryne waira	Günther	2003
Oreophryne wapoga	Günther, Richards & Iskandar	2001
Oxydactyla alpestris	Zweifel	2000
Oxydactyla coggeri	Zweifel	2000
Oxydactyla stenodactyla	Zweifel	2000
Platymantis adiastolus	Brown, Richards, Sukumaran & Foufopoulos	2006
Platymantis admiraltiensis	Richards, Mack & Austin	2007
Platymantis bimaculatus	Günther	1999
Platymantis browni	Allison & Kraus	2001
Platymantis bufonulus	Kraus & Allison	2007
Platymantis cryptotis	Günther	1999
Platymantis desticans	Brown & Richards	2008
Platymantis latro	Richards, Mack & Austin	2007
Platymantis mamusiorum	Foufopoulos & Brown	2004
Platymantis nakanaiorum	Brown, Foufopoulos & Richards	2006
Platymantis parilis	Brown & Richards	2008
Platymantis sulcatus	Kraus & Allison	2007
Platymantis wuenscheorum	Günther	2006
Pseudocallulops pullifer	Günther	2006
Xenorhina adisca	Kraus & Allison	2003
Xenorhina arboricola	Allison & Kraus	2000
Xenorhina lanthanites	Günther & Knop	2006
Xenorhina macrodisca	Günther & Richards	2005
Xenorhina varia	Günther & Richards	2005
Xenorhina zweifeli	Kraus & Allison	2002

Subtotal 134

REPTILES

Species	Author	Year
Carlia aenigma	Zug	2004
Carlia ailanpalai	Zug	2004
Carlia aramia	Zug	2004
Carlia bomberai	Zug & Allison	2006
Carlia caesius	Zug & Allison	2006
Carlia eothen	Zug	2004
Carlia mysi	Zug	2004
Cryptoblepharus richardsi	Horner	2007
Cryptoblepharus xenikos	Horner	2007
Cryptoblepharus yulensis	Horner	2007
Cyrtodactylus aaroni	Günther & Rösler	2003
Cyrtodactylus capreoloides	Rösler, Richards & Günther	2007
Cyrtodactylus epiroticus	Kraus	2008
Cyrtodactylus irianjayaensis	Rösler	2001
Cyrtodactylus klugei	Kraus	2008
Cyrtodactylus murua	Kraus & Allison	2006
Cyrtodactylus robustus	Kraus	2008
Cyrtodactylus serratus	Kraus	2007
Cyrtodactylus tripartitus	Kraus	2008
Cyrtodactylus zugi	Oliver, Tjaturadi, Mumpuni & Richards	2008
Hypsilurus hikidanus	Manthey & Denzer	2006
Hypsilurus magnus	Manthey & Denzer	2006
Hypsilurus ornatus	Manthey & Denzer	2006
Hypsilurus schultzewestrumi	Urban	1999
Hypsilurus tenuicephalus	Manthey & Denzer	2006
Laticauda guineai	Heatwole, Busack & Cogger	2005
Leiopython fredparkeri	Schleip	2008
Leiopython huonensis	Schleip	2008
Lipinia occidentalis	Günther	2000
Lipinia septentrionalis	Günther	2000
Lobulia alpina	Greer, Allison & Cogger	2005
Lobulia glacialis	Greer, Allison & Cogger	2005
Lobulia stellaris	Greer, Allison & Cogger	2005
Lobulia subalpina	Greer, Allison & Cogger	2005
Nactus acutus	Kraus	2005
Nactus sphaerodactylodes	Kraus	2005
Pelochelys signifera	Webb	2002
Sphenomorphus fuscolineatus	Greer & Shea	2004
Tropidonophis dolasii	Kraus & Allison	2004
Typhlops hades	Kraus	2005
Varanus boehmei	Jacobs	2003
Varanus macraei	Böhme & Jacobs	2001
Varanus reisingeri	Eidenmüller & Wicker	2005

Subtotal 43

BIRDS

Species	Author	Year
Melipotes carolae	Beehler & Prawiradilaga	2006
Cettia haddeni	LeCroy & Barker	2006

Subtotal 2

GRAND TOTAL
1,060

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New Guinea in numbers

100% RECYCLED

785,753km²

in size, the island of New Guinea has the third largest rainforest in the world. Two-thirds of the island is still covered with forests

24%

of Papua New Guinea's forests cleared or degraded between 1972 -2002

1,100

languages are spoken in New Guinea. The world's highest cultural diversity

1,060

new species were discovered in the forests, wetlands and waters of New Guinea between 1998-2008

WWF

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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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