



ANIMA MUNDI

Adventures in Wildlife Photography

Issue 9, Year 3 - 1st Quarter, January 2013

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■ A lovely portrait of an Indri Indri indri - see Bjorn Olesen's homage to the endangered lemurs of Madagascar from page 44.

ANIMA MUNDI

Adventures in Wildlife Photography

Welcome to our third anniversary!

It's a wonderful feeling as we enter 2013 and our successful third year of life - welcome to Issue 9! As we are writing these lines we've just come back from a spectacular 30-days long exploration of the pristine forests of India's Western Ghats, we're getting prepared for a month-long trip to Madagascar in April and we're busy organizing two other August and November 2013 trips, respectively to Namibia's Etosha National Park and Peru's Tambopata Nature Reserve. Expect an avalanche of fascinating travel articles and above all stunning images in our forthcoming issues - but for the time being, be patient and enjoy the present one, we can guarantee you won't be disappointed.

We start with some amazing images of the crazily colorful *Pterochroza ocellata* flashing katydid from the Amazon - while certainly not new to science, a more surprising insect is truly difficult to imagine, and we were very lucky to witness its dazzling nocturnal defensive display while trekking in Eastern Ecuador's rainforest. Jump to page 4 and be stunned by our Scoop!

After the dark, humid and slightly oppressive night of the Amazon, a more serene, luminous feature awaits you on page 9 with our new contributor Olivier Esnault's highly informative and splendidly illustrated trip report on the two somewhat "forgotten islands" of the Indian Ocean - discover with us the dazzling beauty and elegant charm of Réunion and Rodrigues, with their tropical volcanic environments rich in beautiful endemisms and unique species. You'll be enchanted by Olivier's delicate photographs, as we have been!

And since we are in the area, we then take a relatively short hop on page 44, travelling a few hundred miles West and visiting the giant isle of Madagascar. Be charmed - as we have been - by

our new contributor Bjorn Olesen's visual homage to the "Red Island"'s gentle goblins, the impossibly cute but sadly greatly endangered lemurs. Bjorn is very active in wildlife photography and conservation (he just authored together with Fanni Lai the coffee-table book *A Visual Celebration of Giant Pandas*), and his touching images will soon grace the pages of ANIMA MUNDI - *Adventures in Wildlife Photography* again.

It's a giant leap then - from the endangered lemurs of Madagascar to the technicolored, iridescent birds of Costa Rica, Peru and Ecuador - thanks to the stunning (and humbling!) images featured in the Personal Portfolio by our Canadian friend and new contributor Glenn Bartley - his extraordinary hummingbird images qualify as true art, and Glenn is more than willing to share the behind-the-scenes secrets of the multiframe technique he has developed to create these unique images. Fly to page 59 and be amazed by his hummingbird portraits - these are truly beyond comparison.

Our feature on Shrimp gobies wraps the issue up - in this issue we take you diving in the warm, shallow waters of the Indo-Pacific's Coral Triangle to discover the fascinating life habits of these underrated, exceptionally colorful little benthic fish, which share a touching and rather unique symbiotic relationship with their commensal blind Alpheid shrimp. Sounds too exotic to you? Don't worry, turn to page 70 and find out why "Two is a Company".

We hope you'll enjoy this issue. And the next one will be even better! In the meantime...

Have a good trip!
Andrea & Antonella Ferrari
www.animamundimag.com

We appreciate your feedback - constructive criticism, useful suggestions and interesting contributions are most welcome.

Please drop us a line at nautilus@reefwonders.net

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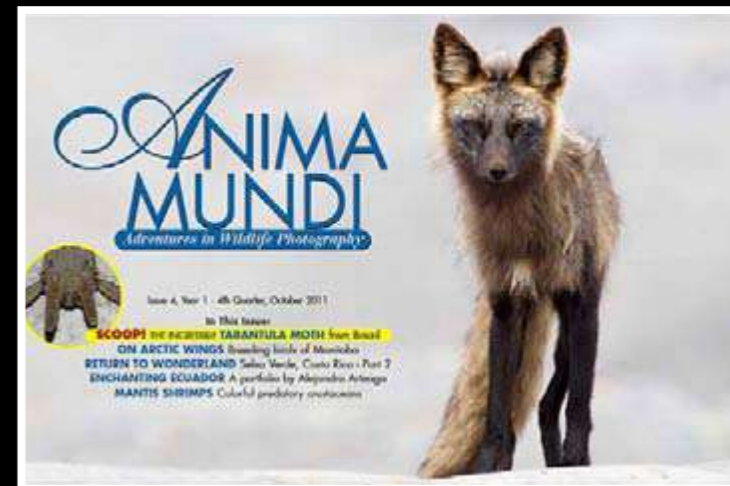
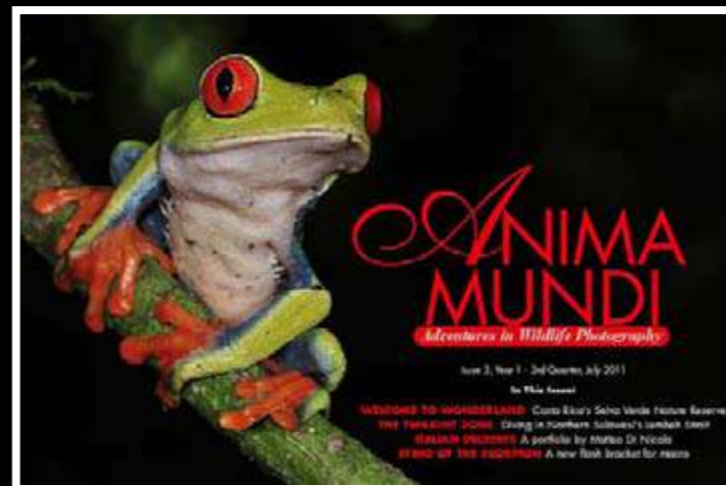
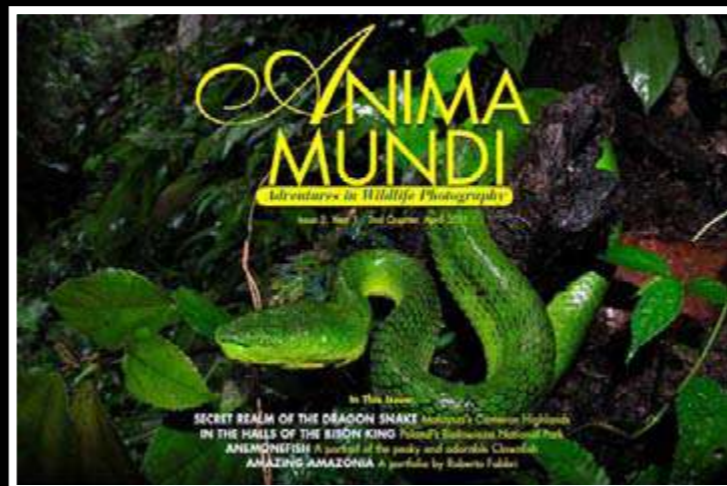
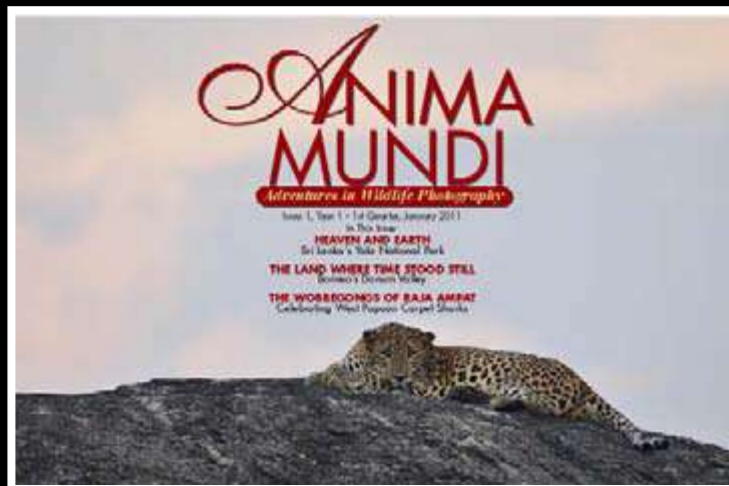
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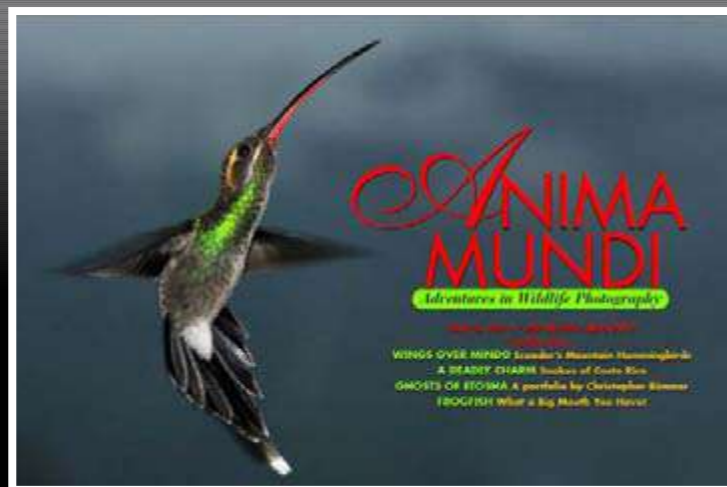
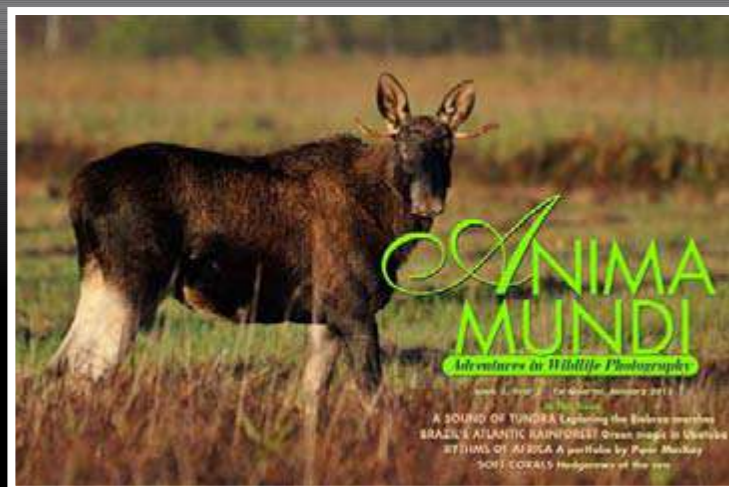


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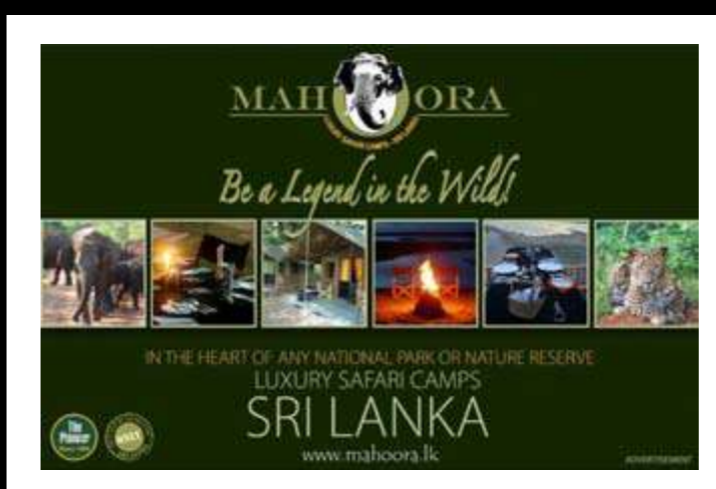
ADVERTISE ON ANIMA MUNDI - ADVENTURES IN WILDLIFE PHOTOGRAPHY

With more than 15,000 downloads worldwide per issue (as per August 2012), ANIMA MUNDI has seen its readership consistently and rapidly growing in the brief span of only two years and eight published issues. Its authoritative and unbiased travel reports and wildlife articles offer a high level of scientifically-correct information - at absolutely no cost - to thousands and thousands of nature and photography enthusiasts all over the world. Each and every issue of ANIMA MUNDI - Adventures in Wildlife Photography is permanently available for FREE downloading - our mission is the dissemination and condision of information to promote nature awareness and habitat conservation, and we are proud to reach out on a quarterly basis to a world of passionate, highly motivated, seriously interested readers who all share our passion for wildlife photography and travelling. This is a sample - among many others - of what our readers say:

Dear Andrea & Antonella,

I have just finished reading your latest edition of Anima Mundi and I was inspired to write and say how much I am enjoying your publication and following your adventures. My wife and dive/photo partner Cherie and I were so inspired by your feature on Yala National Park that we booked a Safari with Eco Team and we had a fantastic time. It was exactly as portrayed in your article and we also followed your recommendations for visiting the cultural triangle in Sri Lanka. As we were leading one of our dive tours on a live aboard exploring the Maldives last June, a private side trip to Sri Lanka was clearly not to be passed up due to your information. So, I guess it's good news for you both that others are reading and responding to your work. So, we just wanted to give you some feedback, say hello and wish you all the best with your future adventures. Keep up the great work.

Kevin & Cherie Deacon
Dive 2000
Sydney, Australia.
www.dive2000.com.au



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SCOOP!

4

SHOCKING FLASHER OF THE AMAZON

A NOCTURNAL ENCOUNTER
IN THE LOWLAND RAINFOREST
OF ECUADOR WITH
A GIANT LEAF-MIMIC KATYDID
LEAVES US DUMBFUNDED -
SCROLL ON AND DISCOVER WHY



■ *Pterachroza ocellata* in its restive state, showing how it has successfully evolved to perfectly mimic a large leaf. This is how it can be observed in the field - with some luck and good eyesight.



The sudden flashing of the inner wings and wing covers reveals a confusing pattern of bright colors, which never fail to surprise the observer.

TEXT BY ANDREA FERRARI
PHOTOS BY ANDREA & ANTONELLA FERRARI

As we stumble on the muddy, slippery, leaf-littered yellow soil of the Ecuadorian Amazon rainforest at night, I seem to perceive a slight, hesitant movement among the thickly leaved branches along the trail - just a hint, with the corner of my eye. A tree frog, possibly, or maybe, with some luck, even a tree viper? The light beam of my headlamp swings around in the pitch dark as the ever-so-slight trembling of a large green-brown leaf is repeated. But wait - that is no leaf, that is a huge, absolutely spectacular leaf-mimic katydid! My jubilant cry alerts our companions as we illuminate the large insect, openly poised on a branch. Its body camouflage is absolutely stunning - even the delicate veining of a real large leaf is perfectly

reproduced, down to the minutest details - tiny spots of mold here, small dried-up areas there. We gaze in stupefied admiration at this miniature masterpiece of deceit, but there's more to come - as I put my hand forward to gently coax it in a better position for a photo, the leaf-mimic katydid suddenly shudders, simultaneously raising and flashing open its large wings and wing covers, revealing a blinding, confusing array of bright colors and patterns, dominated by two enormous ocelli, at the same time starting to bounce around in short, grotesque hops as some displaying or wounded bird! Admittedly startled by this unexpected and rather unnerving behavior, we step back with a gasp - proof, if needed at all,

of the extraordinary success of its defensive ruse. It's like facing a monstrously beautiful, unknown creature made of living, raw flesh - or a living, hopping and very big flower, who knows? So here we introduce to you this wonderful creature - *Pterachroza ocellata* is its scientific name - which first successfully pretends to be a leaf to disappear in the rainforest vegetation, and then puts on a sudden and equally successful show to shock and awe its would-be predators. Fascinating indeed! We would find a few more specimens of this same species, during other nightly explorations, often showing different colors and patterns - but always eliciting in us the same childish enthusiasm and sense of wonder. Isn't our *Pterachroza* an incredible creature?



Another image of the leaf-mimic katydid *Pterachroza ocellata* in its normal state. Far right, the flashing sequence of another individual, possibly belonging to a different *Pterachroza* species - notice different coloration and patterns.



Two images of the same *Pterachroza ocellata* individual - frontally on the left, from the back on the right - show in detail its "flashing" defensive behavior, a strategy which greatly increases its perceived size and confuses would-be predators about its real identity and possible defensive means.



TO TRAVEL IS TO LEARN.

When Giovanna Holbrook took on the challenge of leading two University of Florida science professors and a group of naturalists to the Galápagos Islands in 1971, she had no way of knowing the lasting impact that experience would have on her life and on the lives of those traveling with her. The group journeyed throughout the archipelago aboard a retired navy vessel, propelled by their spirit of adventure and thirst for knowledge. At that time, the Galápagos was just celebrating its twelfth year as a national park, conservation work at the Charles Darwin Research Station was still in its infancy, and tourism in the islands was virtually non-existent.

More than thirty years later, Holbrook Travel continues to serve the needs of teachers, students, academic institutions, and nature lovers. Although many changes have taken place over the years, Holbrook Travel has taken great care to remain true to its roots. As news of environmental concerns and world conflicts continue to fill the airwaves, it seems more important than ever to help people gain a better understanding and appreciation of the natural world and other cultures through firsthand experiences. In the words of Andrea Holbrook, president: “Our goal is to try to continue the great work my mother started.”

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RÉUNION AND RODRIGUES, THE OTHER MASCARENES
THE FORGOTTEN ISLANDS

Close to well-known Mauritius, two remote islands in the Indian Ocean are a secret haven for many endemic, fascinating species

A cluster of islands alive with fire and water

TEXT AND PHOTOS
BY OLIVIER ESNAULT

Réunion and Rodrigues islands belong to the Mascarene archipelago in the Indian Ocean. Both are a nature destination that should not be missed under any circumstance! Let's discover these two islands characterized by wild nature and exceptional environments. The Mascarene archipelago consists of three islands: Réunion, Mauritius and Rodrigues island. They are a thousand kilometers away from the east coast of Madagascar, between the nineteenth parallel south and the Tropic of Capricorn. Mauritius is definitely the most popular destination of this archipelago for tourism. Its large white sand beaches, luxury hotels and mass tourism are particularly popular with tour operators. Unfortunately, on this island, the environment has been damaged due to economical development. Rodrigues island is small (108 sqkm), surrounded by a lagoon twice as big as its terrestrial surface. Rodrigues is part of the Republic of Mauritius but has benefited independence on some matters in 2002. The population is around 40,000 inhabitants and the capital is

Port Mathurin. It is located about 800 km East of Réunion island.

Réunion island is a French overseas department, located about 700 kilometers East of Madagascar. It is 2,512 sqkm and its highest peak, the Piton des Neiges, is 3,075 meters high. Its growing population is of 800,000 inhabitants and is expected to reach 1 million by next decade.

The volcanic islands of the Mascarene archipelago are all originated from the hotspot that feeds the Piton de la Fournaise in Réunion island. This volcano is the only active one in the region. Volcanism reliefs are omnipresent and may be seen in every landscape. Rodrigues was the first of the Mascarene islands to emerge, followed by Mauritius and then Réunion island, that emerged about three million years ago.

Réunion Island being the youngest island of the archipelago, its relief is still very steep. The combination of volcanism, tectonic landslide events, heavy rainfalls and stream erosion have formed a rugged and dramatic landscape of striking beauty,

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*A volcanic eruption on Réunion; on the opening spread, a Fairy Tern *Gygis alba* on Rodrigues.*

■ *The rugged coastline
at Saint-Philippe, on Réunion.*





■ Nesting Brown Noddy *Anous stolidus* on the Ile aux Cocos, Rodrigues.

dominated by two towering volcanoes, the dormant Piton des Neiges and the very active Piton de la Fournaise. Other major landscape features include "remparts", steep rock walls of varying geological age and character, and so-called "cirques", which can be described as massive natural amphitheatres with an imposing height and verticality. There are also deep, partly forested gorges and escarpments, with subtropical rainforests, cloud forests and heathlands, thus creating a remarkable and visually appealing mosaic of

ecosystems and landscape features. In the Piton des Neiges massif, several peaks dominate above 2,200 meters: Cimendef, Roche Ecrute, Grand Bénare. "Pitons", "cirques" and "remparts" of Réunion island were integrated to the UNESCO world heritage sites on August 1st, 2011.

The last eruption of the Piton de la Fournaise took place on December 10th, 2010 and lasted about a day. Being a spectator of an eruption is a magical moment that remains etched in your memory. Eruptions from the Piton de la Fournaise are effusive, which

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*A paradise for naturalists
in search of endemics*



Lesser Noddy *Anous tenuirostris*,
fishing in shallow water
at the Ile aux Cocos, Rodrigues.



 The stunning, otherworldly landscape of the Plaine des Sables on Réunion.



Left, Réunion's Green Gecko *Phelsuma borbonica borbonica*; right, top, Green Gecko of Manapany *Phelsuma inexpectata*; right, bottom, another image of the same species.



The supreme grace of the soaring Tropicbird




makes them relatively safe to watch from close distances. The many hiking trails on the slopes of the volcano are fully secured and clearly marked. The climate at such a high altitude (2,632 m) is very inconstant and it is not uncommon to suffer as much from heat as from cold. One must therefore be equipped appropriately and forget neither a windbreaker nor sunscreen ! On Rodrigues island, traces of volcanism are older and consequently harder to identify. A few basalt peaks are reminders of the presence of ancient magmatic chambers. Old lava flows are still distinct in the eastern part of the island, especially on the coast. The relief is much more attenuated than that

of Réunion island and the highest peak, Mont Limon is 398 meters high. These variable reliefs affect local climatology. Generally speaking, the climate is tropical humid, with a fairly strong seasonality. The dry season starts in April/May and ends in September. The rainy season lasts the rest of the year, when tropical storms and hurricanes occur. The numerous microclimates in Réunion island (117 identified microclimates) are mainly due to the geography of the island. In the highest regions, frosts are not uncommon during the dry and cold season, and it may occasionally snow. The climate is also very different between the eastern windward shore

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Far left,  African Grass Blue *Zizeria knysna*; center, Panther Chameleon *Furcifer pardalis*; right, *Zisina antanossa* - all three species taken at Réunion.



■ Another far-ranging, stunning landscape of volcanic origin at the Rivière de l'Est on Réunion.



Left, Changeable Lizard *Calotes versicolor*; right, top, Rodrigues Yellow Fody *Foudia flavicans*; right, bottom, Common Waxbill *Estrilda astrild* on Rodrigues.



and the western lee shore. Due to a relatively low relief, the climate of Rodrigues island is much more uniform than that of Réunion island.

ENDEMISM AND SPECIES

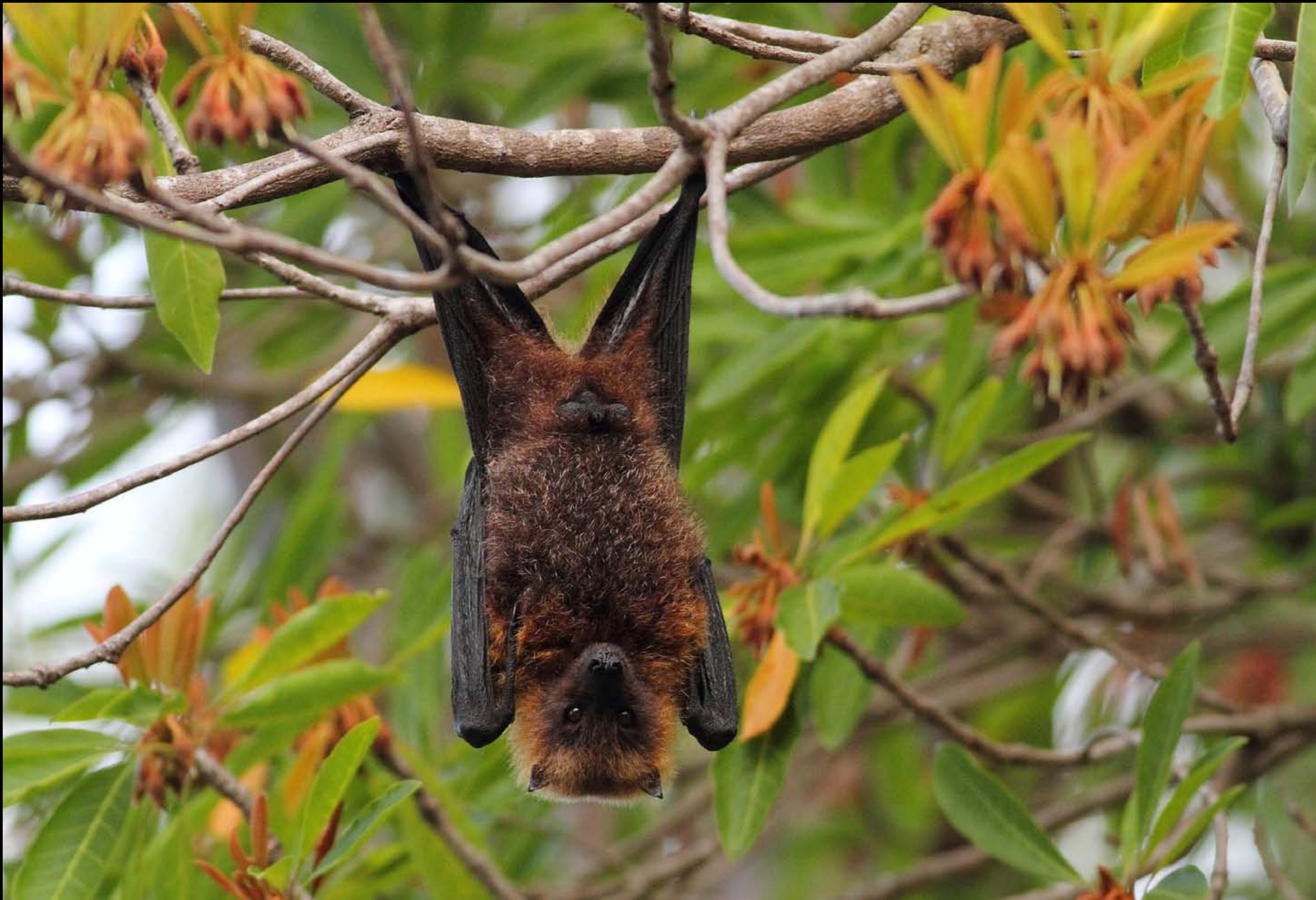
In the Mascarenes, indigenous species may be found on various islands whereas endemic species only exist on one of the islands, in specific habitats. Both indigenous and endemic species were present before man, who arrived with many exotic (and often invasive) animal and plants species. The main naturalistic attraction of Réunion and Rodrigues is their incredibly high endemism rate. For example, Réunion island is a paradise for botanists with over 200 species of indigenous and endemic ferns; over 150 orchid species

(mainly originary from Madagascar), are distributed in various ecosystems. Excluding a few bat species, there aren't any endemic mammals either in Réunion or Rodrigues island. On the other hand, there are endemic reptiles. These have all disappeared from Rodrigues island but three green diurnal gecko species remain in Réunion island (*Phelsuma inexpectata*, *Phelsuma borbonica borbonica* and *Phelsuma borbonica mater*). The green gecko of Manapany (*P. inexpectata*) is located in an area of a dozen square kilometers in the South of the island. Numerous other *Phelsuma* have been introduced from other islands (Madagascar, Mauritius, Seychelles, etc.) and proliferate, often to the detriment of endemic species. On Rodrigues Island, two endemic bird species may be seen: the Rodrigues

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Fairy Tern *Gygis alba*
with its single egg at the
Ile aux Cocos on Rodrigues.





Rodrigues
Flying Fox
Pteropus
rodricensis
roosting
during the
day at
Solitude,
Rodrigues.

■ Left, the beach at Saint-Pierre;
right, the lunar landscape
of the Plaine des Sables -
both on Réunion island.



warbler *Acrocephalus rodericanus* and the Rodrigues fody *Foudia flavicans*. The Réunion harrier *Circus maillardi* is the only endemic bird of prey of Réunion island. Other endemic bird species exist on the island, such as the Réunion Olive White-eye *Zosterops olivaceus* and the Réunion Grey White-eye *Z. borbonicus*. The Réunion stonechat, also called "tec-tec" in the creole language (*Saxicola tectes*) is a bird familiar to high regions. The Mascarene paradise flycatcher – locally called "zoizo la vierge" (*Terpsiphone*

bourbonensis bourbonensis) and the Réunion bulbul *Hypsipetes borbonicus* live in forests. Two seabirds are endemic to Réunion island: the Reunion petrel *Pseudobulweria aterrima* and the Barau's petrel *Pterodroma baraui*. Last but not least, the Réunion cuckooshrike or "tuit-tuit" *Coracina newtoni* is critically endangered, being a victim of the proliferation of rats. Where butterflies are concerned, many species can easily be observed on Rodrigues island, such as *Junonia rhadama*, although there isn't any

endemic species. There exist a few endemic butterflies and moths on Réunion island. One species, *Salamis augustina augustina*, is critically endangered due to the disappearance of its host-plant *Obetia ficifolia*. Some individuals are bred at the insectarium in the city of Le Port and may be observed there. As for Odonatas, there are almost 15 species in Reunion, including dragonflies and damselflies. One pretty endemic damselfly, *Coenagriocnemis reuniensis*, lives near water falls.

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A Humpback Whale *Megaptera novaeangliae* breaches briefly at Saint-Gilles on Réunion.





■ Left, Brilliant Blue *Junonia rhadam* at the Etang Salé on Réunion; right, Reunion Grey White Eye *Zosterops borbonicus* at Le Tampon, again on Réunion.





■ The atmospheric waterfall of the Bassin la Paix on Réunion.



Left, dawn on the coral reefs at Grands Bois on Réunion; right, top, Curlew Sandpiper *Calidris ferruginea* at the Rivière Saint-Etienne, Réunion; right, bottom, Grey Plover *Pluvialis squatarola* at the Etang du Gol on Réunion.



IMPACTS ON BIODIVERSITY

Man has had - and still has - direct or indirect disastrous impacts on the biodiversity of both islands. In the past, Réunion and Rodrigues islands were supply stops for ships sailing through the Indian Ocean. In order to refill fresh meat, hundreds of giant turtles were loaded aboard the ships. It was a good way to avoid deficiencies of vitamins or proteins. Furthermore, turtles were able to survive quite a long time on a boat. The populations were thus very quickly reduced to almost nothing before disappearing from both islands. The same sad story has happened to numerous endemic flightless birds, such as the Rodrigues solitaire *Pezophaps solitaria*. The development of human settlements made the populations of introduced rats and cats increase. These

two species have a huge impact on breeding seabirds like the Barau's petrel. Rats, for example, are responsible for the near extinction of the "tuit-tuit" and the extinction of the Réunion owl *Mascarenotus grucheti*. Noddies and tropic birds are quite common in Rodrigues. A small island North-West of the lagoon, l'Île aux Cocos, is worth the detour. One side of the sandy islet is open to visitors where huge populations of Brown Noddies *Anous stolidus* and Lesser Noddies *A. tenuirostris* can be seen. In the high season, there are over 50,000 thousand noddies on the island – more than the inhabitants of Rodrigues! Sooty Terns *Onychoprion fuscatus* have established their colony in the area closed to visitors. Finally, the delicate and subtle Fairy Tern *Gygis alba* lays its single egg in the hollow of unstable

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■ A Réunion Harrier
Circus maillardi soars above
 the forest at Tévelave on Réunion.



Top left, Red Fody Foudia madagascariensis at Le Tampon, Réunion; bottom left, Common Waxbill Estrilda astrild again at Le Tampon; left, Village Weaver Ploceus cucullatus at Petite Ile, Réunion.

*Secret glimpses
of a forgotten Eden*



■ Rainforest landscape with waterfalls and rocky stream at Grand Galet on Réunion.



■ Left, Red-Whiskered Bulbul *Pycnonotus jocosus* at Le Tampon; right, Reunion Stonechat *Saxicola textes* at the Plaine des Cafres on Réunion.





Pounding surf at the ■
Pointe au Sel on Réunion.



■ Top, Whimbrel *Numenius phaeopus* at the Rivière Saint-Etienne, Réunion; right, Reunion Stonechat *Saxicola textes* at the Plaine des Palmistes; far right, Mascarene Paradise Flycatcher *Terpsiphone bourbonnensis*.

branches. Réunion and Rodrigues islands are salutary migratory halts for numerous species, especially shorebirds. Species present in the summer are practically the same on both islands. The Eurasian Curlew *Numenius phaeopus* is certainly the most common shorebird. Although Rodrigues is much smaller than Réunion island, it is host to a higher species diversity and to a greater quantity of individuals. Encountered species are:

Curlew Sandpiper *Calidris ferruginea*, Sanderling *Calidris alba*, Common Sandpiper *Actitis hypoleucos*, Common Greenshank *Tringa nebularia*, Grey Plover *Pluvialis squatarola*, Common Ringed Plover *Charadrius hiaticula*, Greater Sandplover *Charadrius leschenaultii*, Bart-tailed Godwit *Limosa lapponica*, Lesser Sandplover *Charadrius mongolus*, Crab Plover *Droma ardeola*. I am always amazed at the capacity of migratory birds to

Curlew Sandpiper ■
Calidris ferruginea,
 Rivière Saint-Etienne, Réunion.



cross oceans to spend the summer in the lagoons of tiny islands. In 2010, I was lucky to watch Terek Sandpipers *Xenus cinereus* in the estuary of Saint Etienne river (Réunion island). And these birds reproduce in northern Scandinavia! The two individuals I observed stayed for two days before flying off to an unknown destination. Two migratory falcon species, Eleonora's Falcon *Falco eleonora* and

Sooty Falcon *Falco concolor* also stop on Réunion island.

CONSERVATION PROGRAMS

All of these frail insular ecosystems are protected on both islands. In 2007, a National Park was created in Réunion island. It covers a large area of the island and its main goal is to preserve endemism. In Rodrigues island, the

Mauritian Wildlife Foundation manages a nature reserve of about fifteen acres. A big restoration program has been established and many endemic plants are being reintroduced. This environment allows the survival of the two endemic birds and the endemic Rodrigues flying fox *Pteropus rodricensis*.

Rodrigues is also a diving paradise with a lagoon that is rather well preserved. One may also bask on the numerous great

white sand beaches. On Réunion island, the so-called lagoons are actually fringing reefs. However, they are full of fish and very nice for scuba diving. During winter, these islands are on the humpback whales' migration route. It's a magical show to observe whales, but this must be done in good conditions, with respect towards the animals. One may see mothers with their new-born calves, mating males and impressive jumps. ●



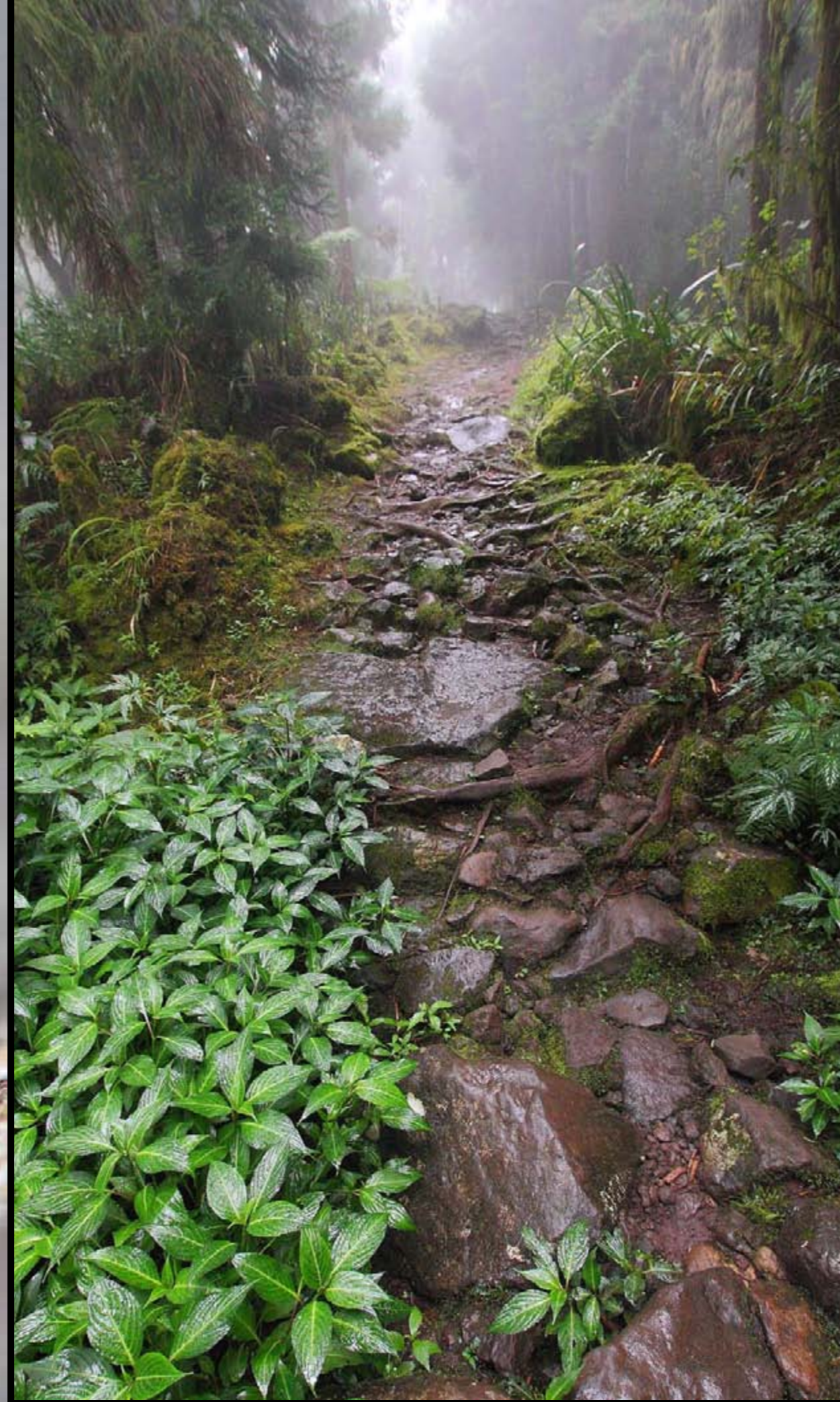
The spectacular, ■ far-ranging view at Piton des Neiges on Réunion.



■ *Hovering
Fairy Tern
Gygis alba
at the Ile aux
Cocos on
Rodrigues.*



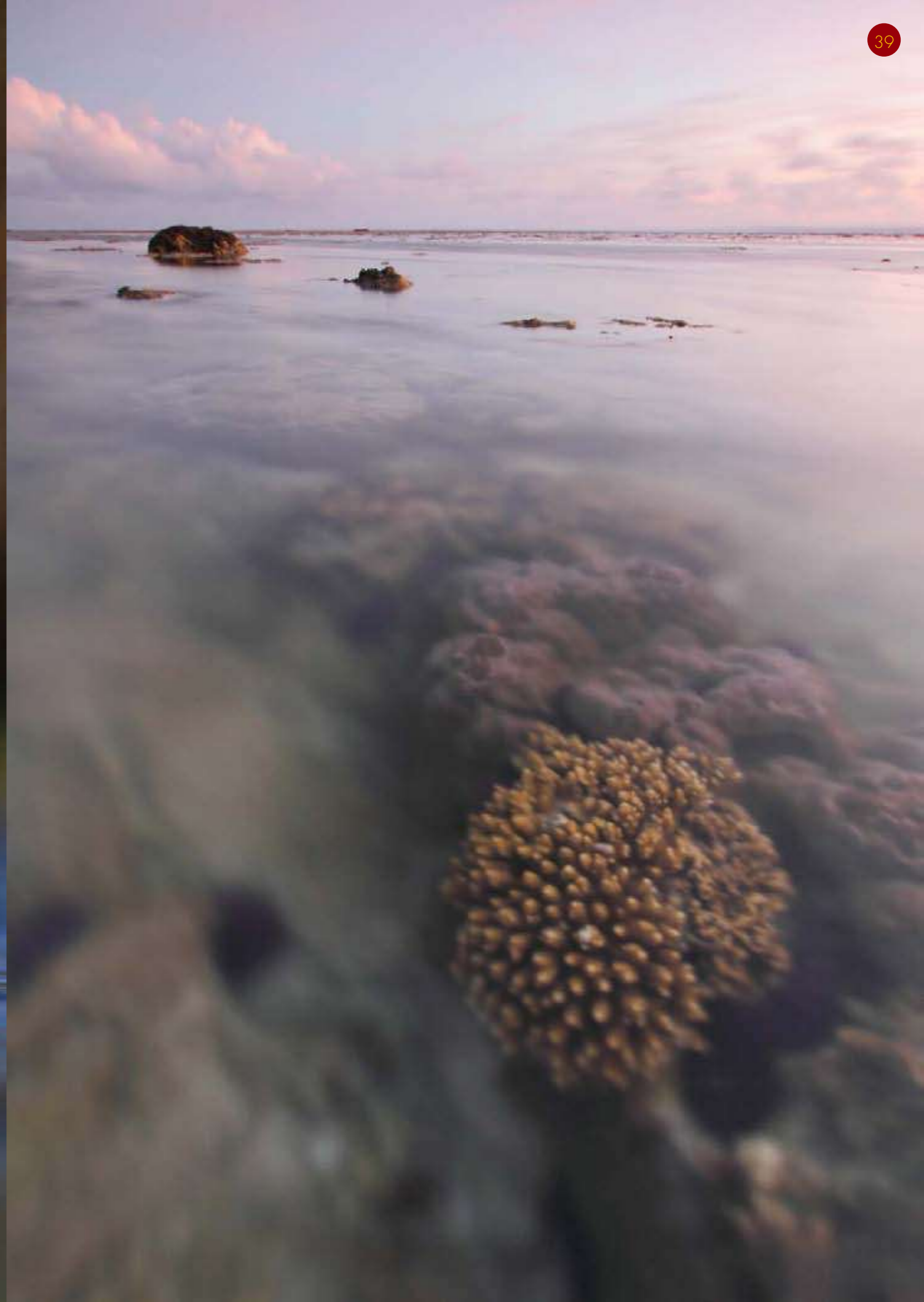
Rocky shore
at Saint-Philippe, Réunion.




■ Far left, the endemic Réunion damselfly *Coenagriocnemis reuniensis*; center, a forest trail at Hell Bourg on Réunion; right, Barau's Petrel *Pterodroma baraui* at Saint-Étienne, Réunion.



Common
Greenshank
Tringa nebularia
at the Rivière
Saint-Etienne;
right, dawn on
the coral reef
lagoon at Grands
Bois on Réunion.



*Clouds at dawn
set afire by sunlight*

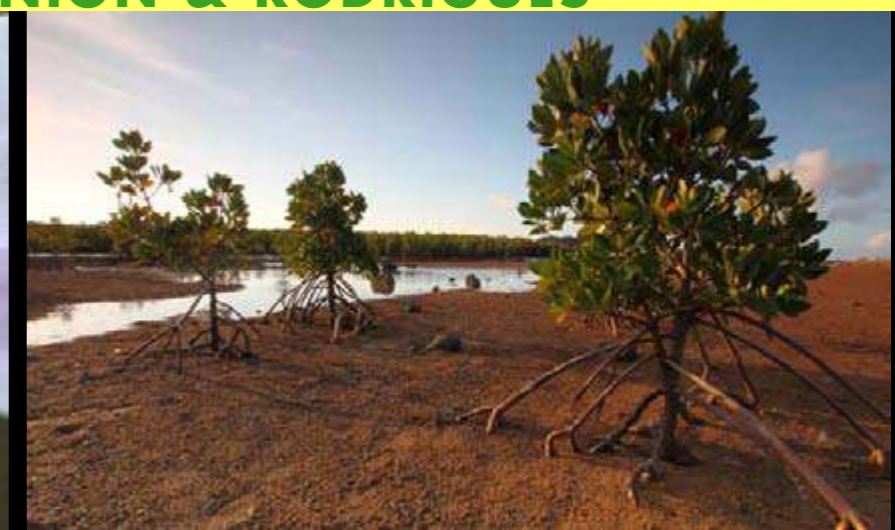
Sunlight and clouds at the 
Plaine des Cafres on Réunion.



■ Ghost Crab *Ocypode saratan*
at the Grande Anse beach
on Réunion island.

At-a-glance travel guide

COUNTRY OF DESTINATION: RÉUNION & RODRIGUES



USEFUL TIPS FOR YOUR EXPEDITION

Some simple, common sense, field-tested advice and information to make the best out of your trip and avoid hassles, worries and problems

ROUTE: La Réunion is served by three airlines (Air Austral, Air France and CorsairFly) with departures from France. You can also fly with Air Mauritius, via Mauritius. There are two international airports on the island: Saint-Denis (Roland Garros) and Saint-Pierre (Pierrefonds).

Contacts:
Saint-Denis: +262 262 48 80 00
<http://www.reunion.aeroport.fr/>
Saint-Pierre: +262 262 96 80 00
<http://www.grandsudreunion.org/>

Best time to travel: each season has its own charm but the best periods, climatewise, are April/May and October/November. In December and January,

you will be able to gorge yourself on lychees and mangoes. Summer is also the best moment to observe numerous migrating birds and insects. During winter, in July and August, you will definitely see humpback whales.

Rodrigues is served by two airlines (Air Austral and Air Mauritius), with a compulsory stop in Mauritius. Sir Gaëtan Duval airport is located in Pointe Corail, South West of the island.

Contact: +230 832 78 88
<http://www.airportofrodrigues.com/>

Best time to travel: all year round, with maybe a recommendation for April/May and September/November.

MEANS OF TRANSPORT: Local car and scooter rentals possible and suggested, many offers both in Réunion and Rodrigues. Wildlife photographers should be prepared for long - although very pleasant - walks in a tropical climate.

CURRENCY: Mauritian Rupee for Mauritius and Rodrigues, French Franc in Réunion.

ACCOMODATION: In Réunion many local guest houses, a few luxury hotels. In Rodrigues many local guest houses. We suggest to avoid staying in luxury hotels, because that's really not the best way to discover Rodrigues and its inhabitants.

Indian Ocean islands with an amazing incidence of endemisms



FOOD: Typically Indian Ocean/Creole food with fresh vegetables, rice and fish dishes - a lovely (and occasionally hot!) fusion between Indian, Chinese, Malay, African and European cuisine. The main local specialty is curry, a savory stew of meats, fish or shellfish, simmered with garlic, onions, ginger, cloves, turmeric, and other local spices. Curry is served with white rice, legumes (beans or lentils) and a spicy condiment called *rougail* made with tomatoes, lemon, and pistachios. Don't miss the local fruit such as mangoes or lychees when in season.

LANGUAGE: French and Creole, plus Chinese Hakka and Malay in a few areas.

WORRIES: None worth mentioning, but like in so many other places it's definitely better avoiding late night walks alone, especially if carrying expensive camera or video equipment.

HEALTH: No serious risks of dangerous tropical diseases. However it is worth mentioning that in 2005 and 2006, Réunion was hit by a crippling epidemic of chikungunya, a disease spread by mosquitoes. 255.000 people on Réunion had contracted the disease as of 26 April 2006. French Prime Minister Dominique de Villepin sent an emergency aid package worth 36 million Euro (57.6 million U.S. dollars) and deployed approximately five hundred French troops in an effort to eradicate mosquitoes.

CLIMATE: All the islands experience a humid tropical climate with monsoon rains from November to April. It might be worth noting that between 15 and 16 March 1952, Cilaos at the centre of Réunion received 1,869.9 millimetres (73.62 in) of rainfall. This is the greatest 24-hour precipitation total ever recorded on Earth. The island also holds the record

for most rainfall in 72 hours, 3,929 millimetres (154.7 in) at Commerson's Crater in March 2007, from Cyclone Gamede. Commerson also holds the record for most rainfall over all periods ranging from 4 to 15 days from a storm in 1980.

BESIDES: Given the warm and humid climate, we strongly recommend to travel light when visiting these islands. A good reflex camera, a medium focal length (a multipurpose 300mm f/4 is really useful), a wide-angle and a trans-standard zoom are enough. The fauna is not that wild, so very long focal lengths are not necessary and possibly not even useful. In certain cases, like in primary forests, a luminous lense, such as a 300mm f/2.8 is really adapted. Don't forget a tripod for landscapes. ●

(Special thanks to H el ene Deglaire and Zo e Gl enard for the help).



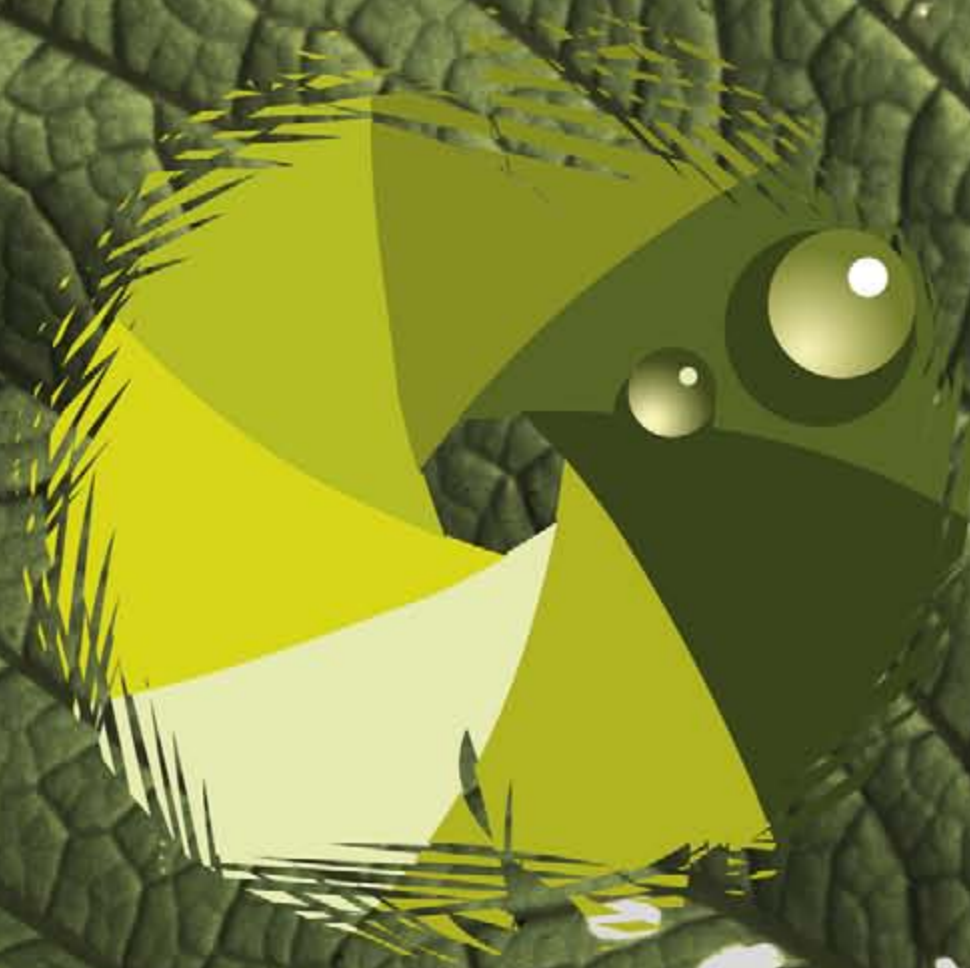
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Ancient, harmless, much loved worldwide and desperately endangered at home - meet the adorable denizens of the Red Island's disappearing forests



Propithecus coquereli

The endangered Coquerel's Sifaka *Propithecus coquereli* (also on the title page) has a matriarchal system where all adult females are dominant over males. Many local Malagasy traditions prohibit hunting of the Coquerel's Sifaka - however, these protective taboos are breaking down, so hunting is widespread including in and around National Parks. I took these images in Anjajavy Private Reserve.

Nikon D3s 300mm 2.8 f/5.6 1/320 ISO 2500

TEXTS AND PHOTOS BY BJORN OLESEN



Daubentonia madagascariensis

The Aye-aye *Daubentonia madagascariensis* is the most remarkable mammal that I have ever seen: body of a cat, bat's ears, beaver's teeth, a very long bushy squirrel tail, a middle finger which looks like a long dead twig - and big eyes like those of ET! This photo has been taken in a captive environment in Madagascar.

Nikon D3s 24-70mm VR 2.8 f/2.8 1/50 ISO 3200

My greatest pleasure as a wildlife photographer is when my images can be used to promote conservation, and in all such cases I do this work on a pro bono basis. I am happy to say that many of my images have been used by WWF, Traffic, National Geographic News Watch, the Nature Society of Singapore, and the Malaysia Nature Society to name a few. During my travels, primates always fascinate me; this goes back to 1998, when I saw my first wild Orang Utan at the Kinabatangan River in Borneo. It was moving around in a huge fig tree, when suddenly it was attacked by a swarm of buzzing bees: it tried to ignore them, but eventually had to move. Another memorable encounter was in Mahale Nature Reserve, Tanzania, when I saw a female Chimpanzee feed its sick-looking youngster with what looked like a big wild lemon, presumably to make it get better. It is encounters like these which you remember forever. Nowadays I do most of my primate photography with Nikon D4 or D3s with the Nikon 600mm VR f/4 or 300mm VR f/2.8 lenses. With teleconverters these lenses give you a lots of flexibility without sacrificing too much of image quality. For landscape and close-ups I mostly use the D800E with the Nikon 14-24mm zoom or the Micro 105 mm VR. All that said, there is really too much emphasis on equipment these days, and it is therefore nice to see that many award-winning wildlife photos have been taken with non-professional equipment. For primates, there is one place in the world that stands out, and that is Madagascar, with its 103 species of Lemurs - all of which are endemic. Unfortunately, 91% or 94 these lemurs are now assessed as being in one of the Red List threatened categories, according to the President of Conservation International, Russ Mittermeier. Madagascar today is suffering from a fluid political situation, which is affecting the good initiatives done by the previous democratically elected government, and at the moment conservation laws are poorly enforced there. However, in spite of all the bad news coming out of Madagascar, it is a nature photographer's paradise, and one of my favourite destinations. My advice is: visit this veritable "Treasure Island" as soon as you can! ●

Bjorn Olesen is a retired corporate executive, award-winning wildlife photographer, and a passionate conservationist. He is a long-term resident of South-East Asia, and his photos and articles have appeared in local and overseas publications and on the web; all his 40,000+ premium images are available free-of-charge to non-profit NGOs, as his commitment to support to conservation. He can be contacted through his website <http://www.bjornolesen.com>.



Varecia variegata editorum

A curious Black and White Ruffed Lemur *Varecia variegata editorum* from Analamazaotra Special Reserve. In areas where there is no hunting pressure, the lemurs are very approachable and have little fear of humans. Moving slowly, I was able to approach this individual to a distance of only 6 meters.

Nikon D3s 70-200mm 2.8 VR II f/9 1/50 ISO 640



Avahi laniger

The nocturnal Eastern Avahi *Avahi laniger* is native to the eastern rainforest belt up to at least 1,600 mt above sea level. These two owl-like individuals were watching me intensely from high up in the canopy, in the eastern Analamazaotra Special Reserve. Their white eyebrows are quite special.

Nikon D3s 300mm 2.8 VR II f/3.5 1/200 ISO 1600 SB900 flash



Microcebus murinus

Grey Mouse Lemur *Microcebus murinus* in Ankarafantsike National Park. They are nocturnal and omnivorous, and found along the western coast in various types of forests. Sleeps during the day in tree holes lined with leaf-litter, and may use up to a dozen different tree holes that are shared with up to 15 other individuals. At a body length of around 13 cm they are tiny - this individual was quite unconcerned by my presence, and the photo was taken at a distance of less than 4 m.

Nikon D3s 300mm 2.8 VR II f/5.6 1/60 ISO 1600 SB 900 flash



Propithecus diadema

The endangered Diademed Sifaka *Propithecus diadema* is here seen in Mantadia National park; I think it is one of the most beautiful of all Malagasy lemurs.

Nikon D3s 70-200mm VR II 2.8 f/5 1/2000 ISO 3200.



Propithecus diadema

Nikon D700 70-200mm VR II 2.8 f/10 1/80 ISO 500



Eulemur fulvus

A curious Common Brown Lemur *Eulemur fulvus* watching with a two-weeks' old infant in Anjajavy Private Reserve. I selected September to visit Madagascar, when the Lemurs have babies.

Nikon D3s 300mm 2.8 VR II f/6.3 1/125 ISO 2000



Varecia variegata editorum

Another inquisitive Black and White Ruffed Lemur *Varecia variegata editorum* from Analamazaotra Special Reserve. In areas where there is no hunting pressure, the lemurs are very approachable and have little fear of humans.

Nikon D3s 300mm 2.8 VR II f/8 1/800 ISO 800 SB 900 flash



Cheirogaleus major

This Greater Dwarf Lemur *Cheirogaleus major* watched me calmly during a night walk in Amber Mountain National Park. Interestingly, most of their fat reserves are stored in the tail - before "hibernation" the normal weight is around 600 gr., which drop to 250 gr. in September.

Nikon D3s 300mm 2.8 VR II f/2.8 1/60 ISO 1600 SB 900 flash



Eulemur coronatus

The Crowned Lemur *Eulemur coronatus* remains active both day and night throughout the year, and fruit dominates its diet. Location: Amber Mountain National Park.

Nikon D3s 70-200mm 2.8 VR II f/7.1 1/60 ISO 2500 SB 900 flash



Lepilemur ankaranensis

The Ankarana Sportive Lemur *Lepilemur ankaranensis* is a vertically clinging lemur and one of the smallest Sportive Lemurs with a body length of 280 mm. It is nocturnal, with leaves forming the bulk of its diet. From Ankarana Special Reserve.

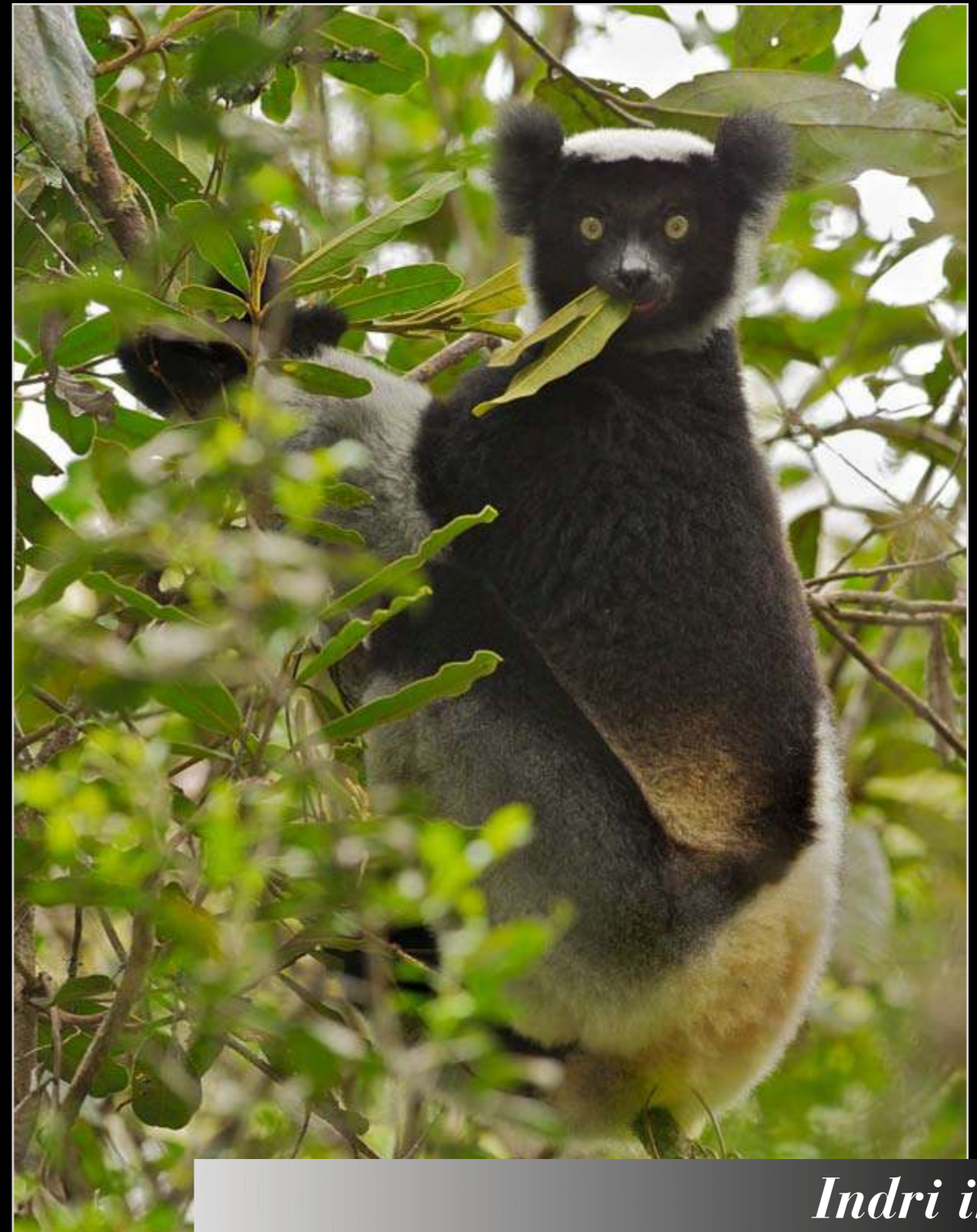
Nikon D3s 300mm 2.8 VR II Tele-converter 1.7 f/6.3 1/400 ISO 2000



Eulemur rufus

A Red-fronted Brown Lemur *Eulemur rufus* with a 3-week-old baby in the Analamazaotra Special Reserve. They are found in two distinct populations in the Eastern and Western parts of the island.

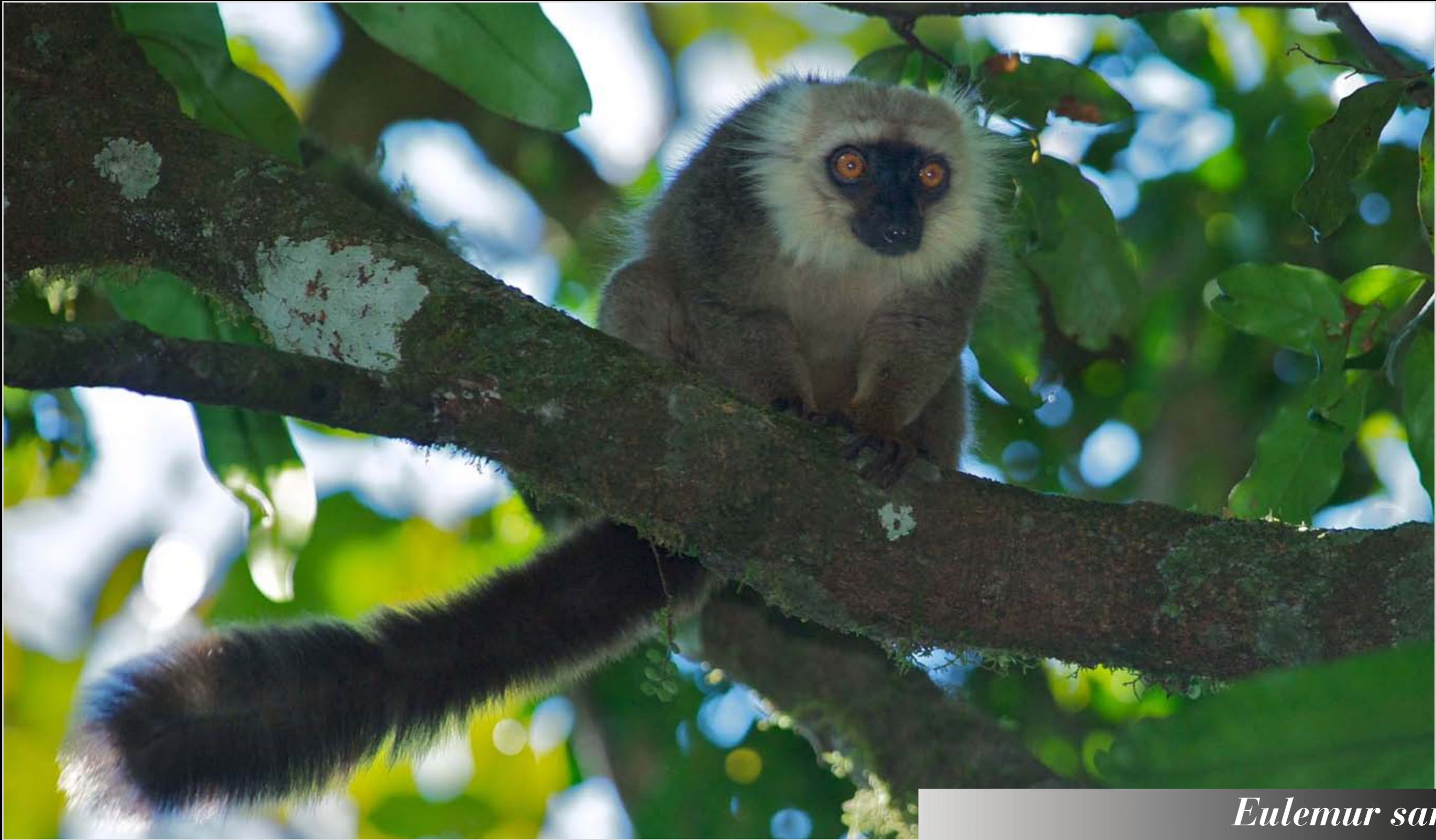
Nikon D3s 70-200mm 2.8 VR II f/8 1/1600 ISO 1600



Indri indri

Among the lemurs being indiscriminately hunted is the Indri *Indri Indri*, the largest of the living lemurs. This spectacular species leaps from tree to tree like an arboreal kangaroo and looks like a cross between a teddy bear and a giant panda.

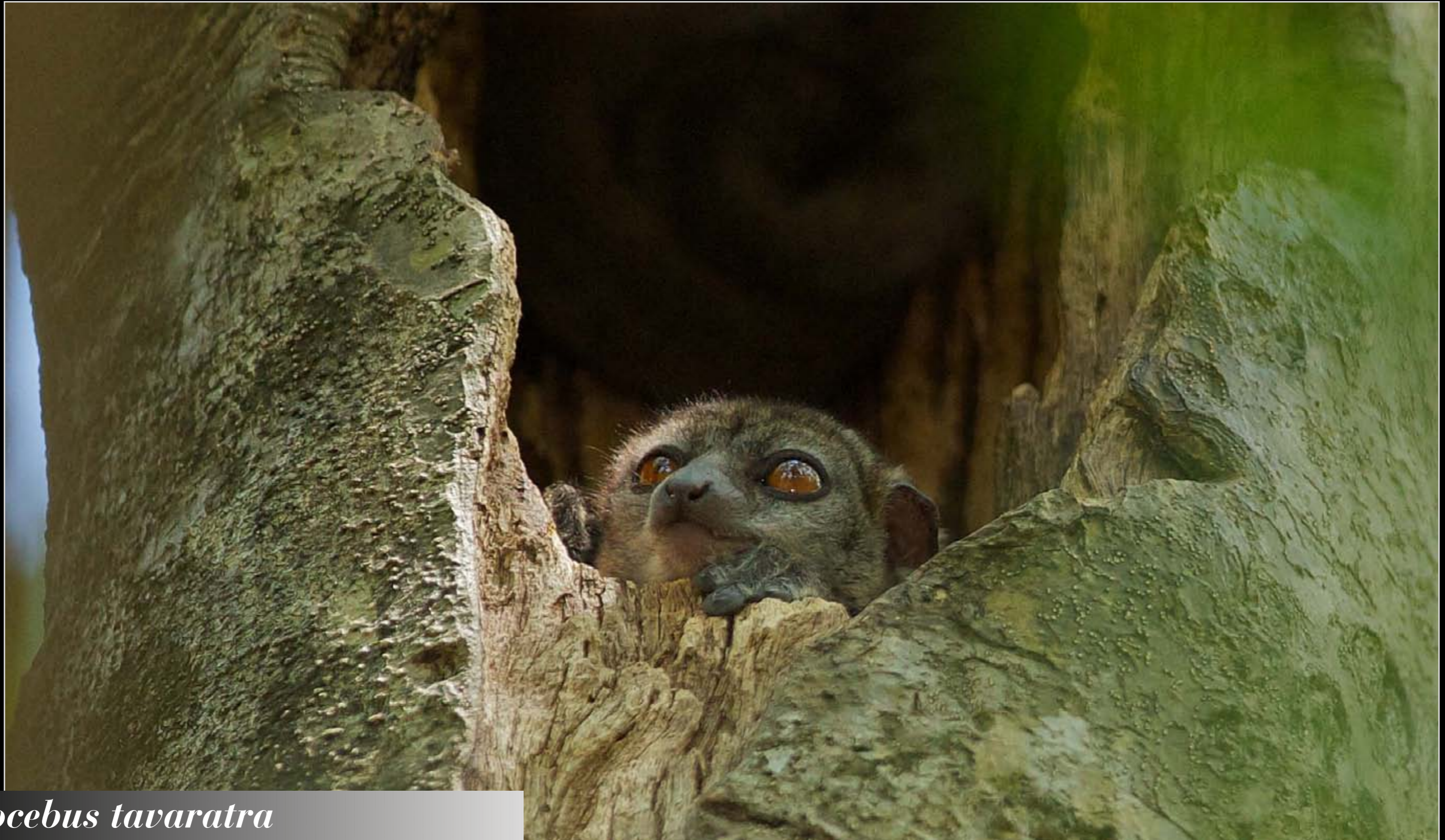
Nikon D3s 300mm 2.8 VR II f/5.6 1/250 ISO 1600 SB 900 flash



Eulemur sanfordi

A Sanford's Brown Lemur *Eulemur sanfordi*. Amber Mountain National Park, in the extreme North of the island. Taking photos in the forest is not always easy with the backlights, and many times a flash is necessary, something that I always try to avoid.

Nikon D3s 300mm 2.8 VR II Tele-converter 1.7 f/6.3 ISO 1600 SB900 flash



Microcebus tavaratra

The rare Northern Rufous Mouse Lemur *Microcebus tavaratra* has been only recently described, and is currently found in one location only, Ankarana Special Reserve. Without an experienced local guide I would never have spotted this individual hiding in a tree hole. Head/body length is only around 12 cm. It is yet to be studied.

Nikon D3s 300mm 2.8 VR II Tele-converter 1.7 f/4.8 1/640 ISO3200 SB 900 flash



Cheirogaleus crossleyi

This Furry-eared Dwarf Lemur *Cheirogaleus crossleyi* was observed in the Analamazaotra Special Reserve in the eastern part of the island. They are only seen during the summer (April-October) when they are most active.

Nikon D3s 300mm 2.8 VR II f/5.6 1/60 ISO 1600 SB900 flash



Sadly, Madagascar is one of the world's most heavily impacted countries in terms of recent habitat destruction. Nearly 90 percent of its original vegetation has already been lost (an incredible 89.2% of all plants on Madagascar are endemic), and erosion on the island is severe. On a more positive note, it is remarkable that we still continue to discover new lemur species, actually more than 40 new species have been described since 2000, and there are now 103 different lemurs known to man. I am sure that Madagascar, the "Red Island", still has many natural treasures yet to be discovered.



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David Hemmings - President, Nature's Photo Adventures



"My experience was EXCEPTIONAL! The trip exceeded my expectations in all areas. I hoped to get in a position to see owls and couldn't possibly have been happier. It was abundantly clear that David invested significant time and effort prior to the arrival of the group in scouting the area around Quebec and Ontario. He knew exactly where to go to find every species of owl. His knowledge and efforts were very much appreciated by the entire group. My primary objective was just getting in a position to photograph owls and was not expecting much in the way of photographic instruction. I was very pleasantly surprised and was very happy with the instruction. Prior to the trip I had a love/hate relationship with auto focus as it applies to photographing birds in flight. I've struggled with this for years. While I have a lot more to

learn, and need to work at honing my skills, the trip with NPA helped me tremendously in being able to photograph birds in flight. Photographing birds in flight was my main objective. Prior to the trip I was nearly clueless in comparison to my skills after the trip. You can also see from my bird list that I found the trip productive from a birding perspective as well".
Kevin McCarthy, USA

"I recommend NPA workshops! The level of services by workshop leaders was excellent. Quality of photographic instruction was exceptional and they

were always on hand to solve issues that arose, and I had more than my share of equipment issues. Quality of wildlife provided was good and I was amazed at how easily the subjects accepted new setups provided. Locations visited were right on for the species targeted. My most memorable moment was using the flash setups the first time and capturing an image of the Swordbill Hummingbird. I feel that my level of photography has improved with the custom functions that were set up on my camera for me and the resulting images that I obtained. Overall experience and

expectations were achieved and we were fortunate to have a very compatible group on our tour, which made it very enjoyable. This was my first workshop and I would recommend them to friends".
Rosemary Harris, Canada

"Great trip, great experience and great workshop leader. Great opportunity for capturing images of magnificent and uncommon (in southern USA) birds. Organizers contribute to great group dynamics and superb attitude. Cool techniques".
Eric Grossman, USA



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The Hummingbird Whisperer

A selection of spectacular, unique portraits by a professional nature photographer from Canada - whose personal technique and intimate images of birds from the Neotropical Region are admired, envied and imitated throughout the world



Glenn Bartley – A Wildlife Photographer in his own words

My love for photography started as a child many years ago in a backyard in Ontario, Canada. I was lying under a hummingbird feeder with a simple 35mm camera trying desperately to capture an image of these mesmerizing birds. The photos that I captured that day may not have been very good – but the experience led to a love of nature and photography that would one day blossom. Many years later I traveled to Australia for a university semester abroad. The opportunity motivated me to buy a capable camera and to learn more about the art of photography. In those days of slide film and with only a short telephoto zoom lens birds were, for the most part, still out of range. My passion for photography however was growing. Before long digital SLR's became the norm and I had purchased a 300mm f/4 lens. I finally had a set up capable of capturing some good bird images. After completing my undergraduate degree in Environmental Studies I traveled to Costa Rica for 6 months to immerse myself in nature photography. That trip solidified my love of bird photography and, from then on, much of my free time was spent learning this craft. After achieving a Masters of Science degree in Ecological Restoration I once again set off for the New World Tropics. This time my goal was to spend 6 months in Ecuador and do nothing but bird photography. On this trip I practiced and developed my techniques for tropical bird photography and especially multiframe hummingbird photography. By the time I returned to Canada many people were starting to take notice of my unique

ability to create stunning images of rare and nearly impossible birds to photograph. Today my images are well respected and represented around the world. I am an award winning photographer whose work is regularly featured in North American and International nature books, calendars and publications. My work is regularly featured in magazines such as Audubon, Birdwatching, Canadian Wildlife, Birders World, and many more. My images regularly appear in books on birds including several by National Geographic. I have also published several books of my own including my most recent books *Birds of Ecuador* and *Birds of Vancouver Island*. My primary equipment includes Canon digital SLR camera bodies and an assortment of Canon lenses. By far the lens that sees the most use is the Canon 500mm F4 L often coupled with a 1.4x Canon teleconverter. I also use the Canon 400mm F5.6L, 300mm F4L, 70-200mm F4L and the 17-40mm F4L for wide angle shots and landscape photography. I shoot most images using a sturdy tripod. I use the Gitzo 3540 XLS carbon fiber tripod and a Wimberly gimbal head. I use a variety of Canon flashes including the Canon 580EX II with a Better Beamer flash extender, 430EX and MR-14EX macro flash. In addition to my own photographic pursuits, I also lead instructional photographic workshops to exciting destinations throughout the Americas. These tours are designed to take advantage of my extensive experience in this region and teach participants to capture their own spectacular images of tropical birds.



Tufted Coquette - Trinidad

One of the most extravagantly adorned birds in the world, the Tufted Coquette can be found on the Island of Trinidad.

Camera Model: Canon EOS 7D

Shutter speed: 1/200 sec

Aperture: 5.6

Exposure compensation: -2/3

Flash: On

ISO: 800

Lens: EF500mm f/4L IS USM

+1.4x



Rainbow Starfrontlet - Ecuador

Multiflash hummingbird photography works by eliminating most or all of the natural light in the image. By controlling the light on the subject and background, using artificial sources, the photographer can also control the duration of light that exposes the image. If the flash fires for only 1/16000 of a second then only that brief moment is recorded in the image.

In this way the photographer can freeze the rapid wing beats of a hummingbird.

Camera Model: Canon EOS 50D

Shutter speed: 1/250 sec

Aperture: 9

Flash: On

ISO: 200

Lens: EF500mm f/4L IS USM



Bearded Mountaineer – Peru

Endemic to southern Peru, this species feeds most commonly at the Nicotina flower. This image was captured by waiting at the birds favourite flowering bush and using natural light.

Camera Model: Canon EOS 7D

Shutter speed: 1/640 sec

Aperture: 5.6

Flash: On

ISO: 400

Lens: EF500mm f/4L IS USM +1.4x

Buff-tailed Coronet – Ecuador

In this classic multiframe hummingbird photograph the goal was to create a natural looking scene using artificial light from 5 flashes, an artificial background and a staged flower.

Camera Model: Canon EOS 50D

Shutter speed: 1/250 sec

Aperture: 6.3

Flash: On

ISO: 200

Lens: EF500mm f/4L IS USM



Ruby Topaz - Tobago

The iridescence of hummingbirds is often brought out by the positioning of the flash/es. Would-be spectacular images may not live up to their potential if the delicate angle of iridescence is not successfully captured.

Camera Model: Canon EOS 7D
Shutter speed: 1/250 sec
Aperture: 8
Flash: On
ISO: 400
Lens: EF400mm f/5.6L USM

**Black-crested Coquette -
Costa Rica**

The Coquette's are some of the smallest and cutest hummingbirds. They are typified by not only their small size, but also the amazing ornamental feathers that the male birds possess.

Camera Model: Canon EOS 7D

Shutter speed: 1/4000 sec

Aperture: 5.6

Flash: Off

ISO: 800

Lens: EF500mm f/4L IS USM +1.4x



Wire-crested Thorntail - Peru

The long tail and strange head feathers of the Wire-crested Thorntail give it an "out-of-this-world" appearance.

Camera Model: Canon EOS 7D

Shutter speed: 1/1000 sec

Aperture: 5.6

Flash: Off

ISO: 800

Lens: EF500mm f/4L IS USM +1.4x





Fiery-throated Hummingbird - Costa Rica

A truly spectacular species of the Costa Rican highlands, the Fiery-throated Hummingbird has an iridescent throat that is unlike any other hummingbird.

Camera Model: Canon EOS 7D

Shutter speed: 1/640 sec

Aperture: 5.6

Flash: On

ISO: 800

Lens: EF300mm f/4L IS USM

White-necked Jacobin - Ecuador

The White-necked Jacobin is one of the most wide ranging tropical hummingbird species. It is easy to identify by its unique blue head and contrasting white neck.

Camera Model: Canon EOS 50D

Shutter speed: 1/250 sec

Aperture: 7.1

Flash: On

ISO: 200

Lens: EF300mm f/4L IS USM





Sword-billed Hummingbird - Ecuador

The Sword-billed Hummingbird has an unbelievably long bill. It is so long and heavy that these birds must perch with their bills straight up in the air or risk tipping over. Watching these birds sip nectar from the long tubular flowers high in the Andes, it is easy to see how these birds have evolved along with the flowers that they feed upon.

Camera Model: Canon EOS 50D
Shutter speed: 1/250 sec
Aperture: 8
Flash: On
ISO: 200
Lens: EF300mm f/4L IS USM +1.4x

Great Sapphirewing - Ecuador

One of the largest hummingbirds in the world, the Great Sapphirewing lives in the highlands of the Andes. Their large wings beat slower than many smaller species giving them an appearance that almost resembles a large butterfly.

Camera Model: Canon EOS 50D
Shutter speed: 1/250 sec
Aperture: 8
Flash: On
ISO: 200
Lens: EF300mm f/4L IS USM





Marvelous Spatuletail - Peru

Perhaps the most spectacular of all the hummingbirds, the Marvelous Spatuletail lives only in a small area in Northern Peru. The males have incredibly long tails that truly must be seen to be believed.

Camera Model: Canon EOS 7D

Shutter speed: 1/250 sec

Aperture: 7.1

Flash: On

ISO: 200

Lens: EF500mm f/4L IS USM



Gray-chinned Hermit - Ecuador

The Hermits are not the most flashy of all the hummingbirds. Generally gray and brown with decurved bills, these birds often feed at the flowers of *Heliconia* plants. (1)

Camera Model: Canon EOS 50D

Shutter speed: 1/250 sec

Aperture: 9

Flash: On

ISO: 200

Lens: EF500mm f/4L IS USM



Violet Sabrewings - Costa Rica

A large hummingbird of the cloud forests of Costa Rica, the Violet Sabrewings is truly unmistakable. (2)

Camera Model: Canon EOS 7D

Shutter speed: 1/200 sec

Aperture: 6.3

Flash: On

ISO: 250

Lens: EF300mm f/4L IS USM





Rufous-crested Coquette - Peru

Sometimes a simple portrait of a species allows the viewer to best admire the characteristics of these amazing birds.

Camera Model: Canon EOS 7D

Shutter speed: 1/400 sec

Aperture: 5.6

Flash: On

ISO: 400

Lens: EF500mm f/4L IS USM +1.4x



Violet-crowned Woodnymph - Costa Rica

Hummingbirds, like all birds, must bathe to keep their feathers clean. These birds are also very habitual about where they take their baths. This image was captured using a multi flash technique at a location where I had seen hummingbirds bathing repeatedly. After waiting for several days I finally captured an image of one of these beautiful birds emerging from the water.

Camera Model: Canon EOS 7D

Shutter speed: 1/200 sec

Aperture: 5.6

Flash: On

ISO: 800

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Spotlight

Shrimp goby species can often be very colorful - this is the Yellow Shrimp Goby *Cryptocentrus cinctus*. Note the commensal alpheid shrimp standing by its side.



THE SECRET SOCIAL LIFE OF SHRIMP GOBIES
TWO IS A COMPANY

The complex relationship between several species of gobies and their commensal shrimps offers a fascinating example of marine symbiosis

TEXT BY ANDREA FERRARI
PHOTOS BY ANDREA & ANTONELLA FERRARI

Several species are little known and easily confused - this is a Black Shrimp Goby *Cryptocentrus fasciatus* with its attendant alpheid shrimp.

We have a fetish for shrimp gobies. They admittedly are an acquired taste – a bit like our own English Bull Terriers – since one must know them well to fully appreciate their beauty and curious habits, but once it's got you you're done for good. We started being intrigued by them during our countless dives in the shallow waters of the Ligitan Reefs of Borneo. Japanese divers – always sensitive to beauty that requires a great deal of patience – are very fond of them, and it was their frequent visits there that gradually spread the passion about these little gems so commonly observed around their own island of Okinawa. Most divers however simply ignore the majority of shrimp gobies or won't even see them at all, since these bottom-dwelling little fish are very shy and alert, and always ready to bolt down their tunnel dug in the substrate at the earliest sign of disturbance: but those who are shown them and take the time to patiently observe their antics will usually and easily fall for them.

IT'S ALL ABOUT SHARING

Shrimp gobies are so called because they usually share their oblique burrow with a blind alpheid shrimp, which first digs the tunnel and then keeps it in good shape and clean of debris; this association is species-specific (ie gobies belonging to a certain species will usually be found together with shrimps

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The Metallic Shrimp
Goby *Amblyeleotris fasciata* is one of the most colorful species belonging to this group of fascinating, small-sized benthic fish.





Clockwise, from top left: Yellow Shrimp Goby *Cryptocentrus cinctus*; top right, Diagonal Shrimp Goby *Ambyeleotris diagonalis*; bottom right, Ray-fin Shrimp Goby *Tomyamichthys* sp.; bottom left, Broad-banded Shrimp Goby *Ambyeleotris periophtalma*.

■ *Showy, unmistakable and larger than most shrimp gobies, this is the beautiful Orange-spotted Shrimp Goby *Amblyeleotris guttata*.*

of a particular species, and vice versa) and while being commonly observed, it is still far from being fully understood. First of all, when does it start? And, like the chicken and the egg story, which comes first? Does the goby look for his shrimp or is it the opposite? We have occasionally observed extremely small gobies (ie less than two centimeters long) already sharing a miniature

burrow with an equally tiny shrimp, so their relationship must start at a very early age. From what we have seen it would seem logical to deduct that – once settled on the substrate after leaving the larval stage – the tiny shrimp digs a small burrow and then openly advertises its “for rental” sign, hoping to attract a young goby looking for a house. It is also very common to

observe one single goby sharing its burrow with not one but two shrimps (presumably a pair), and yet it is much rarer finding two gobies sharing their tunnel with a single shrimp.

SILENT COMMUNICATION

The symbiotic behavior of the two small creatures is quite fascinating to watch.

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One of the most striking and easily identified Indo-Pacific species of shrimp gobies - this is the Sailfin Shrimp Goby *Amblyeleotris randalli*.

■ The stunning Black Sailfin Shrimp Goby *Flabelligobius* sp. is very rarely observed by divers and it is usually found in pairs.



More variations on a common theme: right, top, Diagonal Shrimp Goby *Amblyeleotris diagonalis*; right, bottom, Red Margin Shrimp Goby *Amblyeleotris gymnocephala*; far right, top, a *Cryptocentrus* sp.. Note attendant alpheid shrimps, all belonging to different species.



The blind (or semi-blind) shrimp frantically and industriously moves around, in and out of the little tunnel, reinforcing its perennially crumbling walls and cleaning its opening from fallen grains of sand and little bothersome pebbles, looking at all effects like a busy and very tidy caterpillar/prime mover/housekeeper (some actually believe the burrow is fully rebuilt every day); while the often wildy colorful goby commonly sits out in the open just in front of the opening of the burrow, perching on its ventral fins and keeping its little frog-eyed head well proud and high, attentively scanning the surroundings for any sign of intruders or impending danger. In fact, a good trick you can learn from us old hands is to check for the presence of

gobies from high above, hovering a few meters off the substrate and carefully scanning the sand below for the tell-tale foot-long shallow trenches left in the soft bottom by the skipping of the goby.

THE ODD COUPLE

But back to our odd couple. As soon as another goby approaches, our very territorial and pugnacious little fish will defiantly display in all its iridescent glory, jumping up and down, greatly agitated, flaring its gills, widely opening its dorsal fins and stretching its mouth open in the effort to intimidate its adversary: it may even happen that the two competitors will lock jaws and enter in a strong-arm contest, frantically

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Restricted to silty bottoms in turbid waters, the Singapore Shrimp Goby *Cryptocentrus singaporensis* is a rarely encountered, spectacularly-marked species of relatively large size.





Beautiful but more shy than other species, this is the spectacularly-patterned Flag-tail Shrimp Goby *Amblyeleotris yanoi*.

pushing each other in a swirl of mud and sand, dangerously oblivious of any passing predator, but most disputes are normally solved by displaying alone. These brief contests offer great opportunities to patient photographers! If however the intruder is not another conspecific goby but a larger creature (or a diver), our little fish will immediately alarm its shrimp partner, invariably waiting for it to disappear first down the tunnel before following it in a flash. Careful observation of the behavior of the two species will reveal

that communication between them occurs by the continuous use of antennae (by the shrimp) and the caudal fin (by the goby). The alarmed or puzzled shrimp will delicately and repeatedly touch the back of the alert goby with its long antennae, as questioning its partner about the situation; the fully alerted goby will then communicate its state of excitement to the shrimp by using a fast series of almost imperceptible tail movements, which will most often prelude to the disappearance of both down the


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Another bejewelled, finely ornamented species is the beautiful Steinitz's Shrimp Goby *Amblyeleotris steinitzi*. As most other superficially similar species, it features a pale, dark-barred livery.





■ A Metallic Shrimp Goby *Amblyeleotris fasciata* caught outside of its burrow. Notice how in gobies the specialized ventral fins are used to perch on the substrate.

Top right,  Gorgeous Shrimp Goby *Amblyeleotris wheeleri*; bottom right, a displaying Yellow Shrimp Goby *Cryptocentrus cinctus*, whose dark phase demonstrates the difficulties encountered when trying to identify shrimp goby species in the field; far right, top, a spectacular Black Sailfin Shrimp Goby *Flabelligobius* sp.



burrow (in which, by the way, both spend the night, comfortably sealed in by the daily masonry of the industrious shrimp). Isn't it amazing? These two completely different and unrelated species actually talk to each other! We would like to see some detailed studies on the tail movement patterns, as we are convinced the goby can and will pass completely different messages, depending on the situation and "alert" status. Some patterns actually even seem to reassure the shrimp of a past danger, being the equivalent of a human pat on the shoulder. Shrimp gobies are commonly found on soft, sand or silt substrates, from very shallow to very deep but always in sheltered areas. Several species are exquisitely camouflaged for living on

coral rubble bottoms, others are spectacularly marked with colorful – usually red – banding and iridescent metallic green, blue and gold dotting. Some species are quite gregarious and live in spread-out colonies with sharply defined ranges, others seem to prefer deeper water or current-swept areas. Prime hunting areas in the central Indo-Pacific area for goby-obsessed divers and photographers include most of Sabah's shores (Kota Kinabalu, Mantanani, Matakang, Lankayan, Mabul and Kapalai), Manado and the Lembeh Strait in Northern Sulawesi, Bali and several locations in the Philippines, but the truth is they're found almost anywhere on shallow sand or silt bottoms, even close to brackish estuaries and mangrove forests.

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■ The Broad-banded Shrimp Goby *Ambyeleotris periophtalma* - albeit extremely variable in its livery - is one of the most commonly encountered species in Indo-Pacific coastal waters.

■ Like several other deep-dwelling species restricted to turbid waters and very silty, muddy bottoms, this dazzling *Vanderhorstia* sp. is stunningly iridescent. Such species are very uncommonly observed by non-specialized divers.



UNDERWATER PHOTOTIPS

Observing and photographing shrimp gobies requires a Zen-like attitude and great psychological focusing, and this is why the Japanese are so good at it. These small benthic fishes are extremely wary subjects, and they often take a long time to reappear after they have been spooked into their burrow, so it is quite common to devote one full dive to photographing just one or two of them. You will need to be alone and to be ready to lie down on the sand for long periods, minimizing breathing and movement, using every air intake and subsequent rise in buoyancy to push yourself a little further. Some can be surprisingly compliant, but be prepared for a lot of frustration, as most will wait for you to be ready to click before disappearing in a flash down their tunnel. All require a great deal of patience and almost complete immobility on the bottom for extended periods of time to be fully observed and photographed, but their beauty and interesting habits have few rivals in the macro realm of underwater critters. ●

■ A very unusual sight as two Yellow Shrimp Gobies *Cryptocentrus cinctus* share a burrow and even two commensal shrimps - this is a foursome!



An aerial photograph of the Raja Ampat archipelago in Indonesia. The image shows numerous small, forested islands of varying shapes and sizes scattered across a vast expanse of water. The water's color transitions from a deep, dark blue in the open ocean to a vibrant turquoise and light green near the coastlines, indicating shallow reefs and sandy bottoms. The islands are densely covered with lush green vegetation, primarily palm trees. The sky is filled with soft, white clouds, and the overall scene is bright and scenic.

Raja Ampat ...

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The Parting Shot



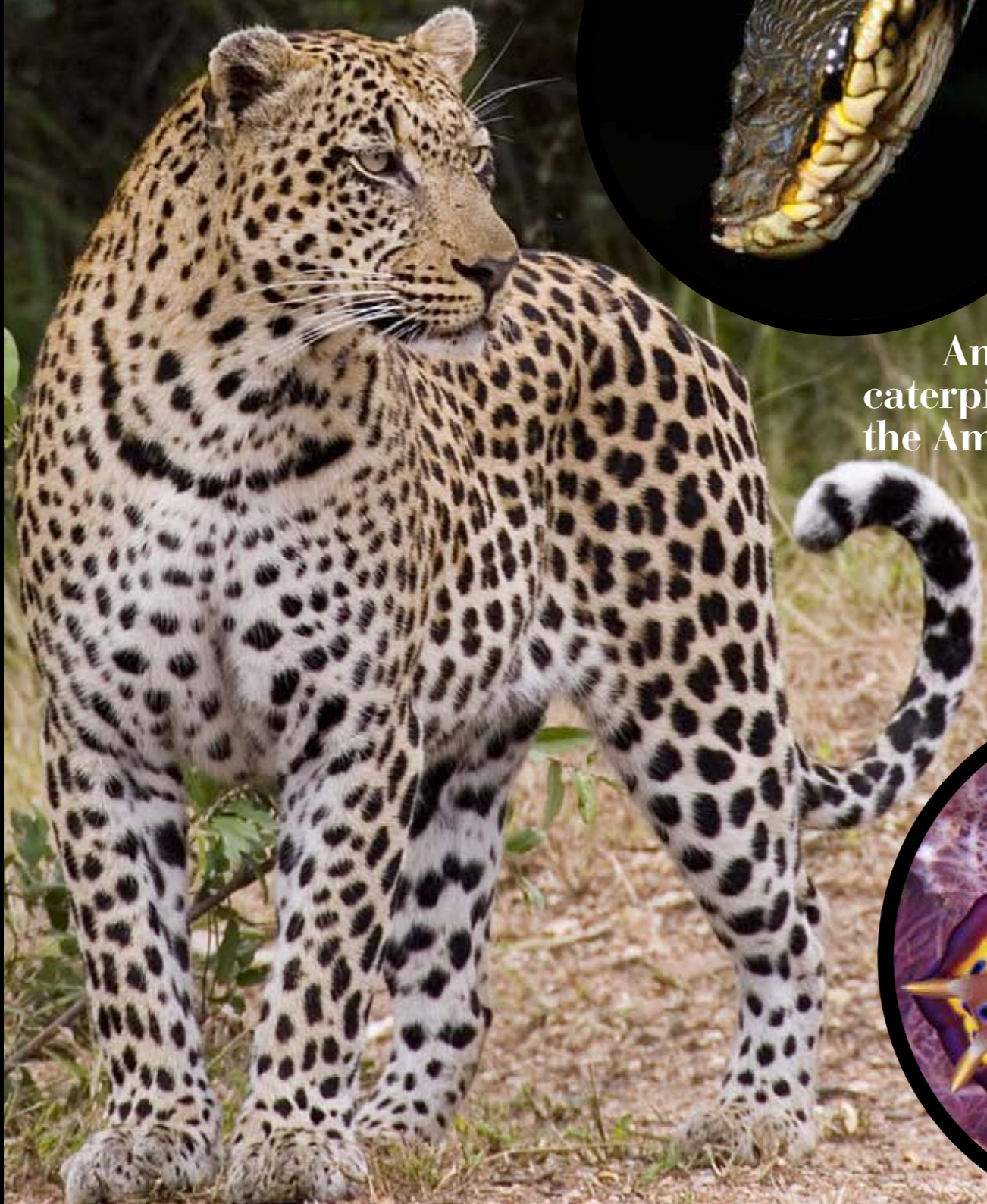
It's a dark, moonless night in the South African lowveldt. As the invisible rays of our friend Donald Strydom's ultra-violet light shine on it, the huge Flat Rock Scorpion *Hadogenes troglodytes* freezes for a few seconds, bathed in the mesmerizing glow of an eerie blue-green luminescence. Open-mouthed, we stare in utter fascination - a plain brown-black in daylight like most of its brethren, the scorpion is now burning a pale blue fire, emitting its own glowing light. We had already observed the phenomenon of bioluminescence while diving at night in tropical

seas, but never on dry land. Bioluminescence is defined as the production and emission of light by a living organism as the result of a chemoluminescence reaction during which chemical energy is converted to light energy. Scorpions - technically speaking - are not bioluminescent, since they only fluoresce under external exposure to UV light at 365 nm. We don't really know much how this happens, or in fact even why. Their fluorescence might be a form of sun block, signaling dangerous levels of radiation (which seems rather unlikely, given that most if not all

scorpion species are strictly nocturnal today); an evolutionary trait/adaptation in feeding and/or attracting prey; an evolutionary trait developed to attract a mate; and, perhaps best of all, a phenomenon which "*plays no biological role*" at all, according to some. Given that today's scorpions are basically land-based "crabs" from the middle Silurian - a period dating back to more than 400 million years ago - their fluorescence is then, quite possibly, an inherited artifact of a biological adaptation from the deep seas they originally came from. ●

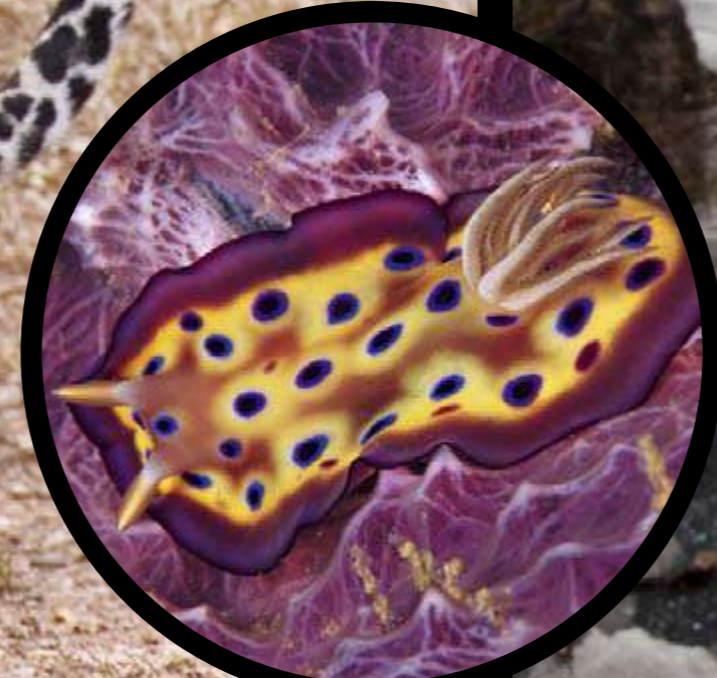
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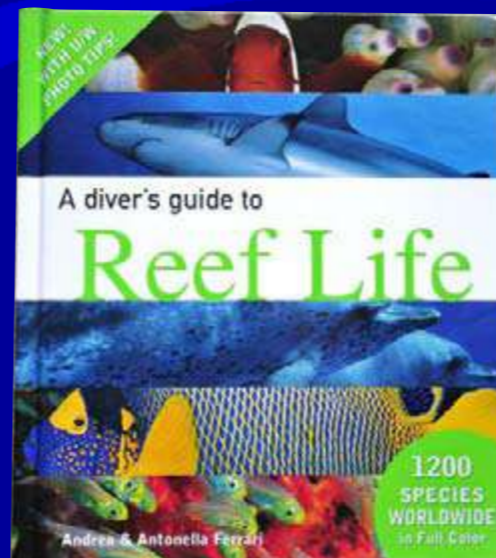
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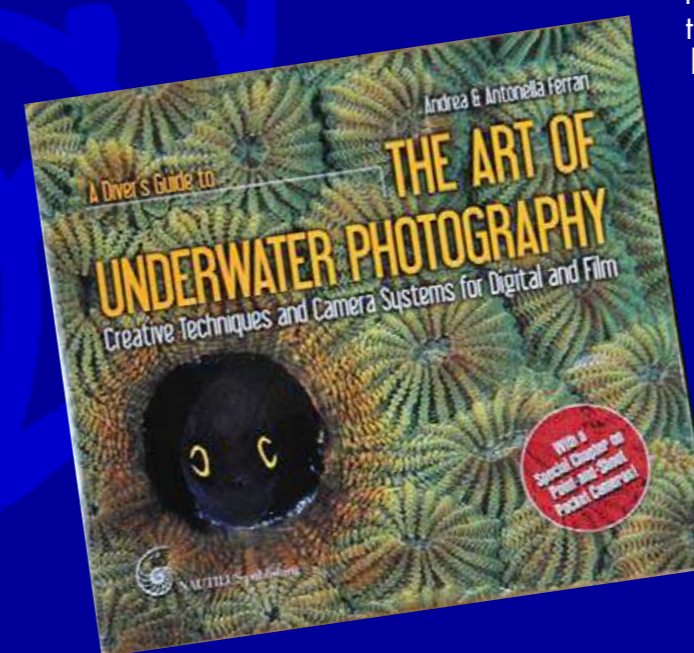
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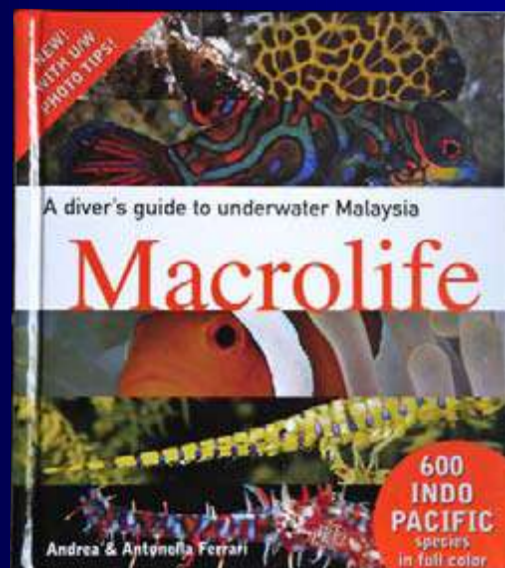
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