Kimberley monsoon rainforests

ISLANDS IN A SEA OF SAVANNA

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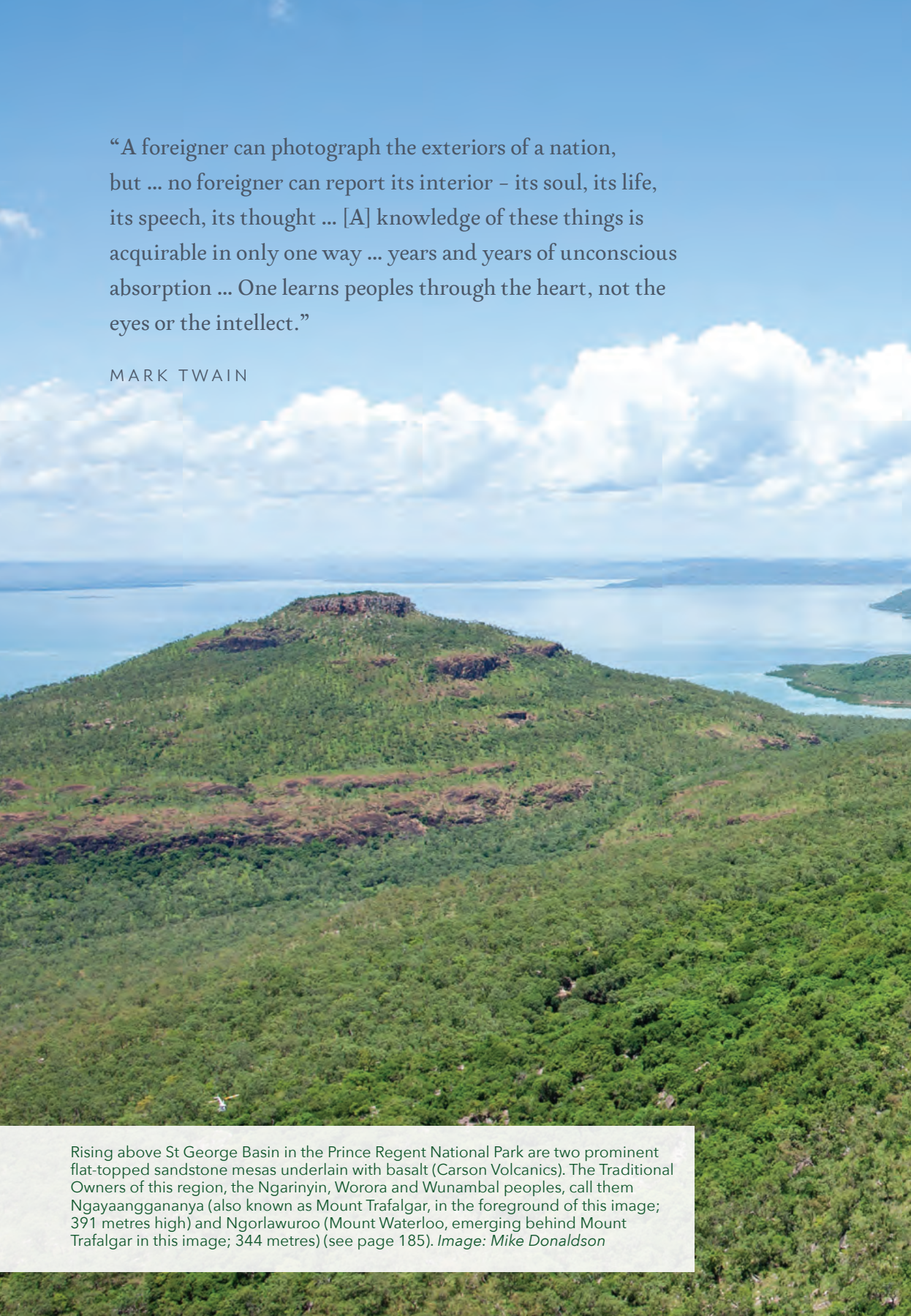
"A foreigner can photograph the exteriors of a nation, but ... no foreigner can report its interior – its soul, its life, its speech, its thought ... [A] knowledge of these things is acquirable in only one way ... years and years of unconscious absorption ... One learns peoples through the heart, not the eyes or the intellect."

MARK TWAIN



Rising above St George Basin in the Prince Regent National Park are two prominent flat-topped sandstone mesas underlain with basalt (Carson Volcanics). The Traditional Owners of this region, the Ngarinyin, Worora and Wunambal peoples, call them Ngayaangganya (also known as Mount Trafalgar, in the foreground of this image; 391 metres high) and Ngorlawuroo (Mount Waterloo, emerging behind Mount Trafalgar in this image; 344 metres) (see page 185). *Image: Mike Donaldson*

Torres Strait Islander and Aboriginal peoples are advised that this book contains images and stories of people who have passed away. Permission has been given by the relevant Traditional Owners for the use of this material. Any person to whom this may cause distress or offence should exercise care in reading this book.

I acknowledge and pay my respects to all Indigenous and Traditional peoples of the Kimberley, especially those who have been extremely generous over many decades in conducting me through Country and sharing their vast knowledge, wisdom, culture and beliefs – all of which has given me a far greater appreciation of this ancient landscape that is their home.

Species names

Each species is described using its scientific name (in Latin and italics) and, where possible, its common name. Indigenous names are denoted by italics.

In cases where a species has more than one common or Indigenous name, I have listed

Images

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ABOVE

Wanjina. *Image: Russell Ord for Wunambal Gaambera Aboriginal Corporation*

OPPOSITE

Catherine Goonack. *Image: Russell Ord for Wunambal Gaambera Aboriginal Corporation*

Foreword

I am delighted to introduce Kevin Kenneally's new book on rainforests of the Kimberley. My family and I live at Kandiwal Community at Ngauwudu (Mitchell Plateau) where we live close to wulo (rainforest patches). Some wulo places have important cultural stories and they also hold culturally important animals and plants. I am also chairperson of Wunambal Gaambera Aboriginal Corporation who are responsible for managing the Uunguu Indigenous Protected Area which includes the majority of the Kimberley's rainforest patches including the largest patches at Bariaba (Bougainville Peninsula). Our Uunguu Rangers manage fire, weeds, feral animals and other threats to wulo and our corporation is also working with Traditional Owner families to address issues related to development pressure and to apply conservation zoning to further protect wulo in our country. Through our Uunguu Visitor Pass we also welcome everyone to visit and enjoy our wulo places both coastal and inland.

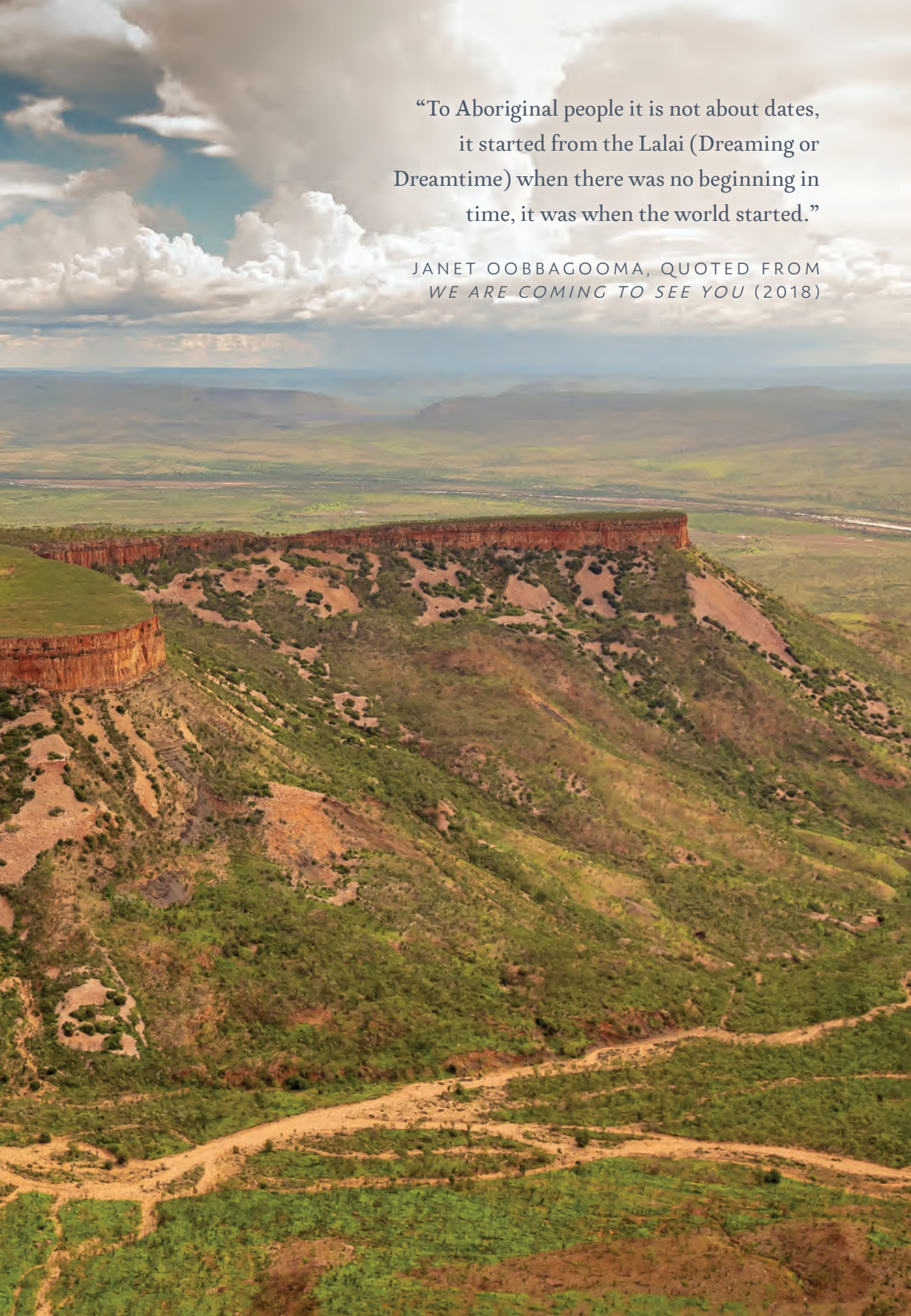
Kevin has a long history of working on our country and working with our old people. His botanical knowledge and experience is unsurpassed. He first encountered rainforest patches on our country in the 1970s when he joined the WA Herbarium and went on to take part in a number of significant biological surveys in the Prince Regent River area and Mitchell Plateau followed by a dedicated Rainforest survey from 1987 to 1989. These surveys helped raise scientific awareness of our wulo and their conservation significance. Importantly for us, Kevin and his colleagues often collaborated with our elders on these biological surveys. My uncle, the late Mr Geoffrey Mangolamara, contributed a chapter on Wunambal knowledge to the Kimberley Rainforests book published in 1991 following the survey. Kevin has kindly shared some photos of elders he has worked with over the years from his personal collection.

This new book is a valuable resource for everyone who lives, works or travels in the Kimberley, pulling together all of the available knowledge of rainforest into one place. It shows us how our local species are related to rainforest plants across Northern Australia and beyond our shores. Importantly, it also recognises the cultural importance of rainforest to Traditional Owners across the Kimberley and the important role we play in looking after country. I am sure you will treasure this book as much as I do.

Goonack

CATHERINE GOONACK
CHAIR, WUNAMBAL GAAMBERA ABORIGINAL CORPORATION

The Cockburn Range has remnant patches of rainforest on scree slopes. *Image: Philip Schubert/Shutterstock*



"To Aboriginal people it is not about dates, it started from the Lalai (Dreaming or Dreamtime) when there was no beginning in time, it was when the world started."

JANET OOBBAGOOMA, QUOTED FROM *WE ARE COMING TO SEE YOU* (2018)

Bunjani (Little Mertens Falls), Mitchell River National Park. *Image: Lochman Transparencies*

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The Banded Honeyeater (*Certhionyx pectoralis*) is common in closed-canopy riverine vegetation dominated by paperbarks, such as the Silver-leaved Paperbark (*Melaleuca argentea*). *Image: Janelle Lugge/Shutterstock*

INTRODUCTION

The plant communities of the Kimberley, including Australia's tropical rainforests, are the most biodiverse ecosystems of Australia and, in many ways, the least understood.

Tropical rainforests are among the most complex and species-rich ecosystems ever to have existed. Of all Earth's ecosystems, tropical rainforests exist at the extremes of temperature, rainfall, biodiversity and structural complexity. Once covering 14% of the Earth's surface, they now make up only 6%. Since 1947, the total area of tropical rainforests has been reduced probably by more than half, to about 6.2 to 7.8 million square kilometres.[1]

Tropical rainforests are characterised by enormous numbers of species and life forms. Such luxuriance can usually only be sustained by high rainfall and a tropical climate.[2] The evolution of rainforest hyper-diversity is not well understood.[3] Although the intense diversification of species in tropical rainforest is often suggested to have evolved over a long time, there is recent evidence of rainforests expanding rapidly from ancestral species into a multitude of new forms. Important climatic predictors of plant diversity at the global scale are related to energy and water availability, which suggests that the highest diversity will be found in the wet tropics, where the largest number of plant species can co-exist and therefore evolve. In the tropics, the amount and timing of precipitation strongly influence the distribution of both ecosystems and plant species richness.[4]

Across northern Australia, tropical rainforests and the animals living with them face many environmental threats, including intense wildfires, feral animals, introduced ants, weed invasion, disturbance to rainforest aquifers, and climate change.[5] Given the multiplicity of these threats, management and conservation of these biodiverse, generally remote and naturally fragmented patches of rainforest are not easy tasks, particularly in the Kimberley. Just recognising the value of rainforests in the landscape is not sufficient. They need legislative protection to ensure their conservation and survival.

Indian Prickly Ash (*Zanthoxylum rhetsa*). *Image: Tim Willing*

A sound understanding of ecosystem structures and processes, as well as systematics, is a prerequisite to good conservation policy. This is especially true in poorly studied areas where living creatures are exterminated before they can be discovered and described.

When I published the first checklist of Kimberley vascular plants in 1989, only 1860 species of angiosperms (flowering plants), gymnosperms (non-flowering plants) and pteridophytes (ferns and fern allies) had been recorded.[6] The Western Australian Herbarium's Florabase now lists around 3500 species of angiosperms for the Kimberley, and several hundred more species have been discovered but not yet formally described.[7] Many of these newly discovered species have been found only in the Kimberley, can be locally restricted, and may be rare or threatened. The first step to ensuring their conservation is to describe them formally. At the same time, we urgently need further research on the systematics, ecology and conservation of all Kimberley flora.

Many plant species in the Kimberley rainforests have been traditionally used by Aboriginal people in the region and by other cultures in South-East Asia as sources of food as well as pharmaceutical and medicinal compounds. The full potential of these plants has yet to be investigated.

Graham Donation and Martina Dixon in 1988, up a *Gubinge* tree in Broome.

In addition, several species of fruit-eating birds and mammals move seeds between tropical rainforest patches and require many patches to maintain their populations. Consequently, every patch has value, and we cannot afford to lose these 'jewels in the crown' scattered throughout the savanna woodlands of the Kimberley. Using the precautionary principle, we need to balance rainforest conservation with present and emerging uses in the Kimberley.[8]

This book reviews what we do and don't know about Kimberley rainforests and why we need to acknowledge their value, not only to the biodiversity of northern Australia but also in terms of their traditional use and cultural significance to Aboriginal peoples, as well as their relationship to the monsoon rainforests of South-East Asia. During my many years of studying the flora and vegetation of the Kimberley (including rainforests), I have benefitted greatly from collaboration with Indigenous Australians. I have sat with and listened to Aboriginal people as they shared their extensive knowledge and culture, and as they guided me through Country and allowed me to document and photograph this journey.

Boca de Valeria, a village on the edge of the Amazon rainforest, Brazil.

Logging in the Amazon rainforest in the Tapajós National Forest, Brazil.

CHAPTER 1

Tropical rainforests

Rainforest canopies are generally so dense that they let very little sunlight reach the ground. As a result, a humid and relatively stable micro-climate develops in the understorey that supports and protects a myriad of lifeforms. Falling trees disrupt the integrity of the forest canopy, creating various regeneration niches.

Tropical rainforests store large amounts of carbon, but agreement is lacking on their net contribution to the terrestrial carbon balance. A study of tropical forests in South America, Africa and Asia (between 23.45°N and 23.45°S, excluding Australia) showed that tropical rainforests – which until recently had a key role in absorbing greenhouse gases – are now, as a result of large-scale deforestation since the 1960s, releasing 425 billion kilograms of carbon annually.[1] This is more than the annual carbon generated by all the vehicles in the USA.[1–3] Since the 1960s, disturbance has reduced the biomass in these rainforests by up to 75%. As the lead author of the study explained: "As always, trees are removing carbon from the atmosphere, but the volume of the forest is no longer enough to compensate for the losses. The region is not a sink anymore."[4] The researchers concluded that the priority is to protect pristine forests with high carbon density. The most effective way of doing this, they said, was to support land rights for Indigenous people.

The world's largest rainforest is the Amazon, which spreads across nine countries, covers nearly 40% of South America, and accounts for just over half the primary forests in the tropics. Over one-third of all plant species in the world live in the Amazon rainforest, making it the most biodiverse tropical forest in the world. An area greater than Australia's entire rainforests is cleared annually in the Amazon basin.[5] Since 1978, about one million square kilometres of Amazon rainforest have been destroyed across Brazil, Peru, Colombia, Bolivia, Venezuela, Suriname, Guyana and French Guiana.[6]