



FROM  
THE  
**KNOWN**  
TO  
THE ...

**DRAMATIC**

# DIVERSE

250

300

350

400

**REMOTE**

**REMARKABLE**

450

500

550

600

**EERIE**

**EXPLOSIVE**

650

700

750

800

**UNTOUCHED**

**UNKNOWN.**

850

900

950

1000





THE  
**KERMADECS**

Imagine a landscape studded with an arc of active volcanoes the size of Mount Taranaki and Mount Ruapehu. Imagine millennia of geological evolution laid bare at the site of two crashing tectonic plates. Imagine thriving colonies of microscopic organisms adapted to life among their sulphurous outpourings in searing temperatures. Could this be the origin of life on earth?

Imagine great forests built from the skeletons of billions of tiny animals that have survived unchanged for millions of years. Imagine giant predators that hunt an array of weird and wonderful prey among the rocks and across the vast open spaces. Imagine fish that fly. Imagine an extraordinary mix of life jostling and feeding in this place that they share.

Imagine that landscape entirely submerged 10,000 metres under the sea.



THE GRAND CANYON

2500

With a total marine area of 4,300,000 square kilometres, New Zealand has one of the world's largest Exclusive Economic Zones (EEZs) - 15 times the New Zealand landmass. The Kermadec region represents around 15% of this marine environment.

AORAKI MT COOK

5000

# 10,000M

7500

MT EVEREST

10000



# WHAT LIES BENEATH

In the vast expanse of ocean between the North Island and Tonga, where the tropical waters of the Pacific meet New Zealand's temperate seas, lies one of the last great wilderness areas on the planet. Remote and rarely visited, the largest volcanic islands of the Kermadec region – Raoul, Macauley, Curtis, Cheeseman and L'Esperance – are the only uninhabited subtropical island group in the Southern Hemisphere.

Beneath the waters surrounding these lonely islands is a truly remarkable world. The islands form part of the longest under water volcanic arc on the planet – more than 50 submarine volcanoes extend along the 2,500km collision zone between the Pacific and Australian tectonic plates. Mountains over 2,000 metres high rise to within 65 metres of the sea surface. The largest single volcano is 25 kilometres in diameter. Macauley Island is part of an explosive beast at least 35km in diameter with a rim capped by more than 30 vent cones – many of them recently active. It's a wondrous world where striking volcanic landforms and incredible displays of volcanism, submarine hydrothermal venting and geomorphic features are still being discovered.



↑ SEABIRDS

TURTLES

WHALES

VENT CRABS

2500

SEAPENS

ISOPODS

5000

GORGONIAN CORAL

DEEP SEA PRAWNS

7500

THE DEEPEST  
LIVE FISH FOUND  
IN THE SOUTHERN  
HEMISPHERE – SNAILFISH

AMPHIPODS

?

10000

The seabed around the islands is extremely deep. Almost all of it descends to over 1,000 metres. A third of it to over 5,000 metres. To the east of the islands, the Kermadec – Tonga trench plunges more than 10 kilometres beneath the ocean’s surface – about five times deeper than the Grand Canyon. It is the deepest ocean trench in the Southern Hemisphere and the second deepest on the planet. A mysterious unexplored world where the gloom stretches into the dark deep.

## WHO KNOWS WHAT LIES BENEATH?



## **A NURSERY FOR LIFE**

A stark seascape. Utterly remote. Yet teeming with life above and below the surface. The Kermadecs' high volcanic activity, extraordinary range of environments, and relatively unspoiled nature gives it a crucial role in ocean ecosystems. It is home to the endangered, the vulnerable, the known and the unknown.

Deep in the trench, where light cannot reach, new populations of organisms are still being discovered – feeding on dissolved minerals in super heated water emitted from thermal vents. Making their home in what would be a poisonous environment to most living things, these microscopic creatures – and the mussels, shrimps, worms and other animals that feed on them – form a unique ecosystem vital to the health of all the world's oceans.

Closer to the surface, the Kermadecs' environment offers breeding and feeding grounds for important populations of whales and dolphins, sea birds, and an extraordinary variety of fish and other species.





## WHALES AND DOLPHINS

The Kermadec region is an ocean highway for marine mammals making their seasonal journeys between the tropics and cooler waters around New Zealand and other southern islands. Eight species of whale – including the majestic blue whale, fin and sei whales – migrate through Kermadec waters. Some may breed in this special place.

The region is a hotspot for sperm whales and humpback whales. In the 1880s this was one of the most prolific whaling grounds in the South Pacific – with more than 150 whaling vessels working the region between 1830 and 1840. More recently, a survey in 2009 recorded more than 100 humpback whales off Raoul Island in a single day.

As many as thirty-five species of whale and dolphin may journey through the Kermadec region, but their presence has still not been confirmed.



## SEA BIRDS

The Kermadec Islands form a seabird refuge of major international importance. Of about 350 species of seabirds worldwide, 39 are found in the region, ranging from tiny storm petrels to large wandering albatrosses.

Some are found only in the Kermadecs, while others – many from mainland New Zealand and our subantarctic islands – forage for food in these waters or migrate through. These include wandering albatross, blackbrowed albatross, black petrel and white-chinned petrel.

Up to 6 million seabirds breed on the Kermadecs each year. These include the entire world populations of Kermadec storm petrels and Kermadec little shearwaters, and vulnerable species like the whitenaped petrel, white-bellied storm petrel, Tasman booby and New Zealand sooty tern.



## TURTLES

Incredibly, three of the world's seven sea turtle species are found in the Kermadecs: hawksbill, leatherback and green. These species regularly wander through the region en route south from their mainly tropical habitats. All are considered endangered or critically endangered.



## FISH

The Kermadecs have a unique range of fish species, many of which use the area as a migratory corridor between tropical and cooler waters. Without the protection of the islands as 'stepping stones', many would be unable to journey south to New Zealand and back again.

About 150 fish species are known to roam Kermadec waters – including large predators and many species of reef fish. From southern bluefin tuna and Harrison's dogfish to sharks, giant grouper, and bigeye tuna, the Kermadec seas are full of species that define ocean health and vitality. Some – such as Kermadec spiny dogfish – are unique to this place.

We are only just beginning to understand the Kermadecs' abundance of marine life. Large areas of its oceans – particularly those below depths of 600 metres – are virtually unexplored and it is highly likely that future surveys will reveal new and rare species.



## CRUSTACEANS

The region is unusual for its mix of tropical and temperate species of crustaceans (crayfish, crabs, prawns and shrimps). Altogether, 88 species of crustacean are known here, of which 17 are known only in the Kermadecs. Some are new to science and some are specialised for Kermadec habitats – for example, two species of 'vent crabs' have adapted to survive one of the harshest environments imaginable, including searing temperatures, high acidity and potentially toxic chemicals.



## BRYOZOANS

The Kermadecs have a unique population of tiny sea anemone-like animals known as bryozoans. Of 256 species identified so far, at least 38 are endemic and many are new to science. Some are 'living fossils', present in the oceans since the time of the dinosaurs tens of millions of years ago.

Also found at the Kermadecs are New Zealand's only subtropical hard corals. The cooler waters of the Kermadecs prevent these corals from forming the classic reefs that are found in the tropics. Soft corals make up part of the shallow water benthic communities, contributing a variety of colours and structures to the Kermadecs underwater environment.

2500

5000

7500

10000

## A DISTINCTIVE HISTORY

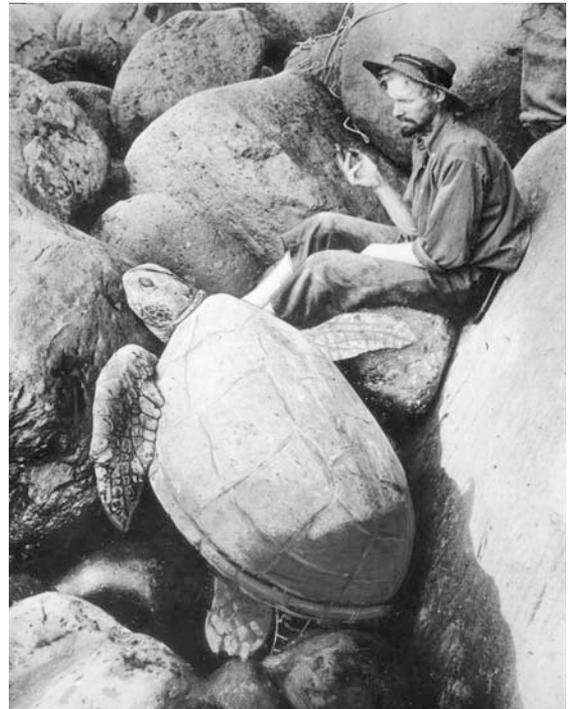
The Kermadecs are also rich in human history. Once a staging post for Polynesian voyagers to and from New Zealand, the islands were also significant for European voyages of discovery in the southern oceans, and for their role as a centre of 19th century commercial whaling.



MRS BELL WITH HER DAUGHTER FREDA AND TWO SONS ROY AND KING, OUTSIDE THEIR THATCHED VEGETABLE SHED, RAOUL ISLAND, 1908. ALEXANDER TURNBULL LIBRARY



MRS FREDERICA BELL IN THE DOORWAY OF THE SECOND HUT AT DENHAM BAY, RAOUL ISLAND, 1908. ALEXANDER TURNBULL LIBRARY



KING BELL AND SEA TURTLE BY ROCKS, RAOUL ISLAND 1908. ALEXANDER TURNBULL LIBRARY

Thomas Bell with his wife and young family settled on Raoul Island in 1878. He was to remain there apart from brief visits to New Zealand until 1914. His story is told in the book by Elsie K Morton, "The Crusoes of Sunday Island."

# 1937

Since 1937, the Kermadec Islands have been accorded nature reserve status.

# 1990

In 1990, the Kermadec Islands Marine Reserve was created, prohibiting all fishing and mineral exploitation in an area from the coastline to 12 nautical miles around each of the islands.

# 2007

In 2007, a benthic protection area was established, banning bottom trawling and dredging within 100 metres of the sea floor throughout the 200 nautical mile EEZ.



## DIVERSITY BEYOND MEASURE

We have so much to learn about the Kermadecs and its treasures. We know it is a place of astounding geological and marine diversity – of huge significance to New Zealand and the world. It provides a safe haven for species that are unknown or rapidly declining elsewhere, and a sub-surface wilderness that scientists and adventurers are only now beginning to explore.

One thing we do know is that recognising and celebrating the Kermadecs will inspire a sense of wonder. Wonder at the diversity that lies within the Kermadec region and at the promise of discovery it offers future generations.

IT IS A PLACE TO

# TREASURE

PRESENTED BY:



THE  
**PEW**  
ENVIRONMENT GROUP