

A small bird with a red head and black body is perched on a dark branch. The bird has a white belly and a yellowish breast. It is surrounded by red flowers and green foliage. The background is blurred.

FIJI |

# State of Birds

| 2013

*A Guide for Conservationists,  
Policymakers and Communities*



*NatureFiji  
Mareqeti Viti*



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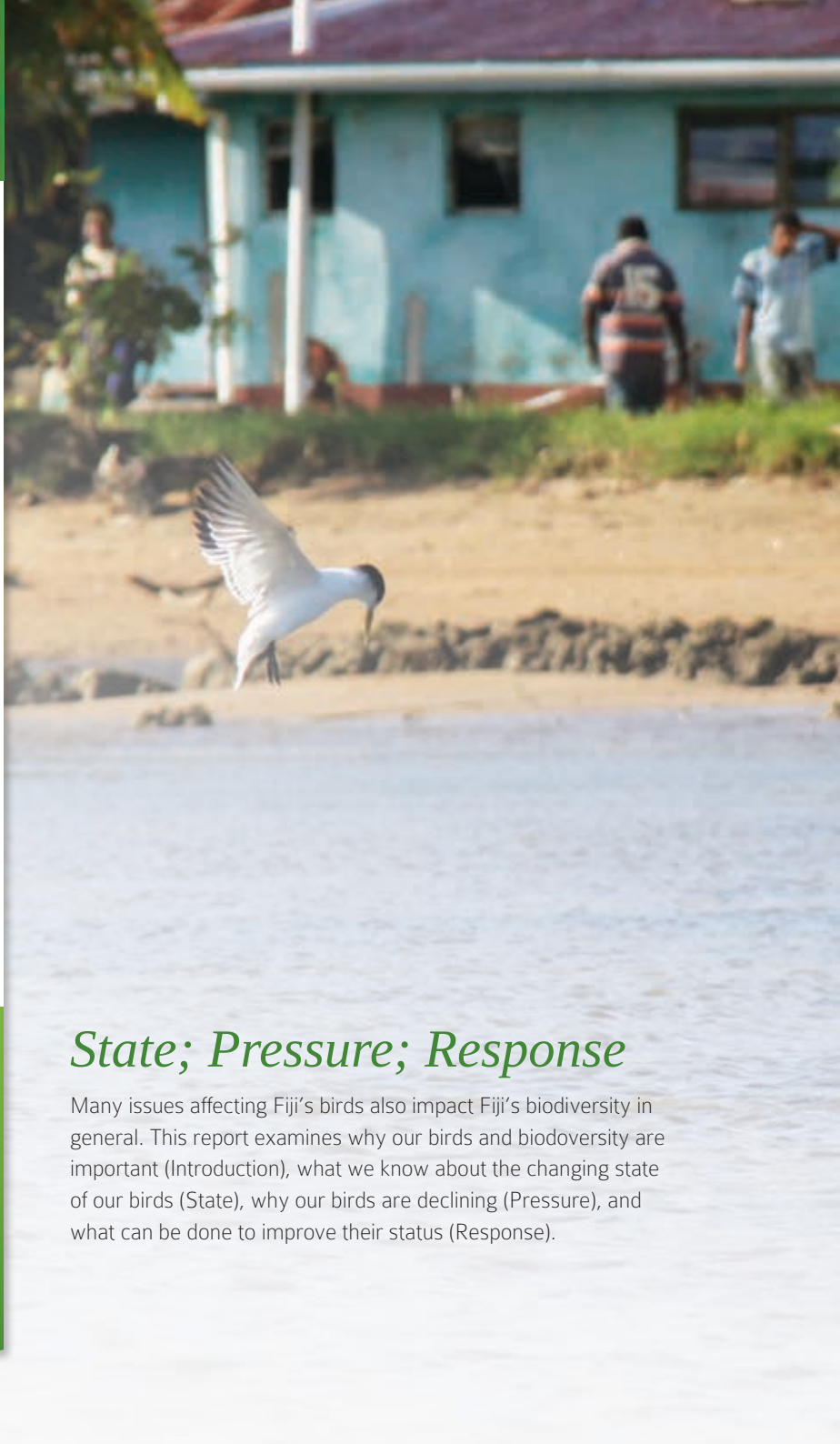
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Front/back cover: Orange-breasted Myzomela *Myzomela jugularis*. This endemic Fijian bird is equally common in suburban gardens and mountain forest © Mark Fraser.

Inside front/inside back cover: Crested Tern *Sterna bergii* has strong coastal affinities, though it is rarely seen far from land. Its habitat range extends from the West, South and Central Pacific to the Indian Ocean © Mark Fraser.

This page, top left and top right: Black Noddy *Anous minutus* ventures offshore following schools of tuna © Steve Cranwell; Fiji Parrotfinch *Erythrura pealii* is a forest dweller © Paddy Ryan. Opposite page: Plumage of the Kadavu Shining Parrot *Prosopiea splendens* © Jörg Kretzschmar.



## State; Pressure; Response

Many issues affecting Fiji's birds also impact Fiji's biodiversity in general. This report examines why our birds and biodiversity are important (Introduction), what we know about the changing state of our birds (State), why our birds are declining (Pressure), and what can be done to improve their status (Response).

# CONTENTS

## INTRODUCTION

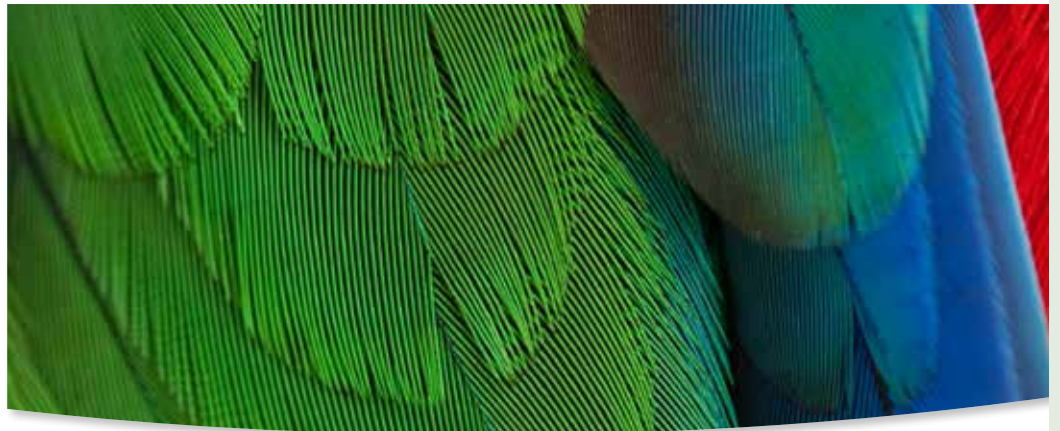
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Fiji: An Island Nation	2
Why Birds?	3
Fiji's Birds	6
Endemic Birds	6

## CRITICAL CONSIDERATIONS

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Knowledge Base: What do we Know?	8
Threatened Birds	12
Protected Areas	17
The Importance of Forest	22
Seabirds and Shorebirds	26
Introduced Predators	32
Laws, Restrictions and Sustainable Natural Resource Use	38
Climate Change	42



## INTRODUCTION

# FIJI: AN ISLAND NATION

Fiji is a central Pacific archipelago comprised of at least 320 islands, of which about 100 are inhabited, including the four main islands of Viti Levu, Vanua Levu, Taveuni and Kadavu. The land area totals 18,333 km<sup>2</sup>, 87% of which is on Viti Levu and Vanua Levu. Most islands are of geologically recent volcanic origin, while some are atolls or raised reefs (*makatea*). Fiji also has a marine EEZ of 1,290,000 km<sup>2</sup>, though the distribution of birds at sea is poorly known.

The Republic of the Fiji Islands has been an independent nation since 1970 and had an

estimated population of 837,000 in 2007, with a growth rate of about 0.7% per year.

Fiji has a strong tourism industry as well as large sugar and textile industries, and has one of the more developed of the Pacific Island economies.

Amongst ethnic Fijians, traditional values remain strong, especially those relating to ownership of and connection to the land.



## INTRODUCTION

# WHY BIRDS?

Birds have been of immense cultural significance to Fijians in a variety of ways – they were key to successful inter-island navigation; the feathers of some were important as a trade item and prized for edging fine mats; and some were an important food source. Today, many *mataqali* (landowning clans) have a bird as their clan totem.

Birds are wonderful flagships for conservation, for several reasons:

- They are by far Fiji's most conspicuous form of terrestrial wildlife – they sing, they are fairly easy to observe and identify, and there is a limited number of species. Biodiversity conservation in Fiji requires the support of landowners and the populace, who can better understand, participate in and support conservation if they are familiar with and knowledgeable about the species of concern.
- Birds play a key role in the dispersal of seeds, thereby maintaining the health and diversity of our native forests.
- Birds are distributed around the world in similar patterns to other biodiversity. The best-known bird species are flagships for all other biodiversity and the habitat where they are found. Surveying the birds of one hectare of Fiji forest takes an experienced team two mornings, while it would take years to adequately survey all the small animals and plants in this hectare.
- Birds are excellent predators of agricultural pests. Our owl probably consumes more rats than all other predators in Fiji.
- Birds can tell us what is happening to our environment. This information may be important not only to their survival but to ours too. Birds are likely to be excellent indicators of climate change.
- Birds are inspirational. They are the best-known faunal group worldwide and many bird species are much-loved. Therefore they can help us to disseminate conservation messages to local, regional and global populations.



Birds have long been used as indicators of the state of the world's ecosystems, providing insights into habitat loss, deterioration, and pollution.

Left: Kadavu Shining Parrot *Prosopeia splendens* © Jörg Kretzschmar. Above: Barn Owls *Tyto alba* © Jörg Kretzschmar.

## INTRODUCTION WHY BIRDS?

### BIRDS AS INDICATORS OF ENVIRONMENTAL PROBLEMS

Birds offer us life-saving information about the environment we share with them. This was vividly demonstrated by the decline of birds of prey and especially the Peregrine Falcon (*Falco peregrinus*), which in the 1950-70s declined almost to extinction as a result of pesticides such as DDT. It was the decline of the birds that led to exposure of the persistent toxic chemicals in the environment, and the international outcry was stimulated by a widespread interest in birds. Subsequently, the recovery of these birds of prey in continental North America and Europe is one of the great conservation success stories of all time.



Peregrine Falcon *Falco peregrinus nesiotus*  
© Clayton White.



As the best-studied group of living things (after humans), birds are a strong indicator of how climate change will affect other, less well-studied groups.

Fiji has recently released a new Fauna and Flora series of banknotes and coins with a strong representation of birds including the Fiji Petrel, the Red-throated Lorikeet, the Kadavu Shining Parrot and the Peregrine Falcon.

Left: Fiji's new currency denotes fauna and flora © Reserve Bank of Fiji. Right: Climate change and habitat loss pose significant threats to some of Fiji's endemic bird species © Jörg Kretzschmar.



### BIRDS AND CLIMATE CHANGE

Climate change is a significant threat that many of Fiji's birds, habitats and biodiversity may already be facing. By using birds to measure and predict the implications of changing climate and landscapes, we will be much better placed to counteract these threats.

Climate change can affect birds directly, through changes in temperature or rainfall. It can affect the timing of events like migration or breeding. It can also lead to increased pressure from competitors, predators, parasites, diseases and disturbances like fires or storms.

Climate change can also combine with other major threats like habitat loss and alien invasive species to make the overall impact worse.

### FIJI'S FUTURE CLIMATE

([www.pacificclimatechangescience.org](http://www.pacificclimatechangescience.org))

- Temperature will continue to increase
- More very hot days
- Changing patterns of rainfall
- More extreme rainfall days
- Less frequent but more intense cyclones
- Sea level will continue to rise
- Ocean acidification will continue

## INTRODUCTION FIJI'S BIRDS

Fiji is home to a variety of very special birds, and some of these have been of great cultural significance as Fijians evolved their national identity. As a group of oceanic islands, Fiji does not have a large number of bird species, but many of those that can be observed here can be found nowhere else in the world. Their conservation is therefore Fiji's responsibility.

Fiji's best-known birds are the landbirds, of which there are 57 native breeding species. There are also 12 introduced landbird species that have become established; some of these, such as the Mynas and the Bulbul, are well known because they live in close association with humans.

Also well known are Fiji's seabird species, 20 of which breed in Fiji. A further 39 species of seabird do not breed here but migrate through Fijian waters on an annual basis or visit periodically. Some seabird migrations through Fiji waters are spectacular, especially the southern migrations of the Short-tailed Shearwater back to their breeding islands in Australia's Bass Strait, and Cook's Petrel and the Mottled Petrel back to certain offshore islands of New Zealand.

Fiji is an important staging post or destination for a poorly known group of birds – the migrant shorebirds that breed in the Arctic and fly to Fiji to escape the northern winter. In Fiji, they are found on the mudflats and coastal areas throughout the islands, most commonly between March and September. To date, 21 migrant shorebirds have been recorded and many of these visit our shores in varying numbers annually.

Right: Orange Dove *Ptilinopus victor* © Thomas Boysen.

The annual migration of these birds is one of the wonders of the animal world and Fiji is fortunate to be a destination for some of them. Unfortunately, birds undertaking annual migration are highly vulnerable to a variety of threats including severe weather during the migration, collisions with man-made structures (e.g. wind turbines and mobile phone towers) and habitat loss along their migration route or their wintering grounds. Many of Fiji's migrant shorebirds need mudflats; these are not plentiful and in some places, such as the Suva Peninsula, mudflats are under threat from habitat conversion.

Together, these total 163 species of bird confirmed for Fiji.

### ENDEMIC BIRDS – FIJI'S SPECIAL RESPONSIBILITY

All of Fiji's birds are special but some are particularly important. These are our endemic birds – those that are found only in the Fiji Islands. Fiji has 27 endemic birds, comprising nearly half of our landbirds. There is just one endemic seabird, the Fiji Petrel. To emphasise how special our avifauna is, there are few countries with a higher proportion of endemic birds than Fiji. Indeed the island of Kadavu, with four endemic birds, has the highest number of endemic birds per land area in the world. This highlights the extent of our responsibility for their protection and well-being. This significance is magnified greatly if we also consider the recognised races or subspecies of birds – in general those on different islands, for we have 85 subspecies endemic to Fiji.



## INTRODUCTION ENDEMIC BIRDS

ENGLISH NAME	SCIENTIFIC NAME	COMMON FIJIAN NAME	DISTRIBUTION IN FIJI
Fiji Petrel	<i>Pseudobulweria macgillivrayi</i>	Kacaunigau	Gau
Fiji Goshawk	<i>Accipiter rufitorques</i>	Reba, Latui	Widespread (not S.Lau)
Barking Pigeon	<i>Ducula latrans</i>	Soqe	Widespread
Golden Dove	<i>Ptilinopus luteovirens</i>	Ko, Bunako	Viti Levu, Ovalau, Gau
Orange Dove	<i>Ptilinopus victor</i>	Bune, Bunedamu	Vanua Levu, Taveuni + islands
Whistling Dove	<i>Ptilinopus layardi</i>	Soqeta	Kadavu, Ono
Collared Lory	<i>Phigys solitarius</i>	Kula	Widespread (not S.Lau)
Red-throated Lorikeet	<i>Chamosyna amabilis</i>	Kulawai	Viti Levu, Taveuni, Ovalau
Masked Shining Parrot	<i>Prosopiea personata</i>	Kaka, Ka	Viti Levu
Red Shining Parrot	<i>Prosopiea tabuensis</i>	Kaka, Vaga	Vanua Levu, Taveuni, Koro, Gau
Kadavu Shining Parrot	<i>Prosopiea splendens</i>	Kaka	Kadavu, Ono
Silktail	<i>Lamprolia victorise</i>	Sisi	Taveuni, Vanua Levu
Fiji Bush-warbler	<i>Cettia ruficapilla</i>	Maya, Biliwi, Tikivili	Larger islands (excl. Gau)
Long-legged Thicketbird	<i>Trichocichla rufa</i>	Manukalou	Viti Levu, Vanua Levu
Kadavu Fantail	<i>Rhipidura personata</i>	Bui-iri	Kadavu, Ono
Slaty Monarch	<i>Mayornis lessoni</i>	Sasaire	Widespread
Ogea Monarch	<i>Mayornis versicolor</i>		Ogea + offshore islands
Blue-crested Broadbill	<i>Myiagra azureocapilla</i>	Batidamu	Viti Levu, Vanua Levu, Taveuni
Black-faced Shrikebill	<i>Clytorhynchus nigrogularis</i>	Kiro	Larger islands (excl. Gau)
Fiji White-eye	<i>Zosterops explorator</i>	Qiqi	Larger islands
Orange-breasted Myzomela	<i>Myzomela jugularis</i>	Delakula	Widespread
Rotuma Myzomela	<i>Myzomela chermesina</i>	Armea	Rotuma
Kadavu Honeyeater	<i>Xanthotis provocator</i>	Kikou, Visilou	Kadavu, Ono
Giant Forest Honeyeater	<i>Gymnomyza viridis</i>	Sovau, Ikou, Cavucavuvalu	Viti Levu, Vanua Levu, Taveuni
Fiji Parrotfinch	<i>Erythrura pealii</i>	Kulakula, Qiqikula	Widespread
Pink-billed Parrotfinch	<i>Erythrura kleinschmidti</i>	Sitibatitabua	Viti Levu
Fiji Woodswallow	<i>Artamus mentalis</i>	Sikorere	Widespread

# STATE KNOWLEDGE BASE: WHAT DO WE KNOW?

Worldwide, birds arguably are the best-known and monitored group of animals. In Fiji too, we know much more about birds than other groups; however, our knowledge is superficial. At present the only bird in Fiji whose ecology has been the subject of a detailed study is the introduced Red-vented Bulbul, in its role as an agricultural pest and competitor of native birds.

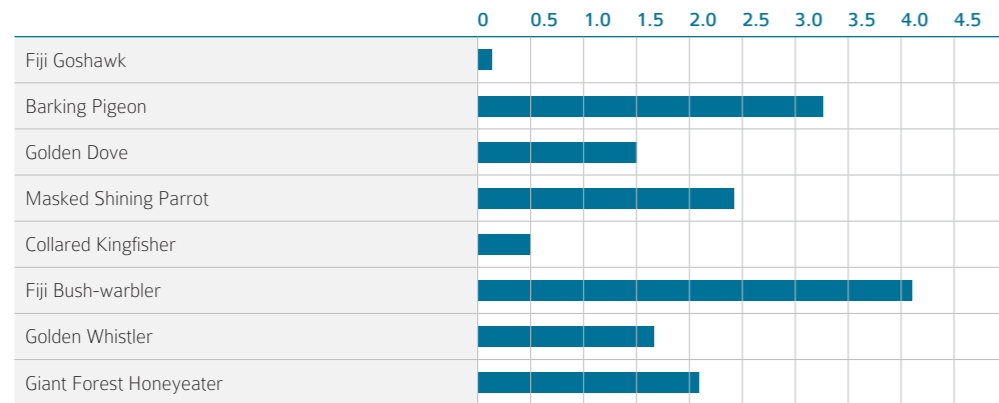
Unlike most developed and many developing countries, Fiji has no national monitoring system in place. Monitoring and research informs and enables Government-led management. Without it, we are unable to provide scientific evidence of the trends in our bird populations which could tell us a lot about the environmental, developmental and other pressures affecting our biodiversity, and we are also likely to be ill-prepared for

anticipating the effects of climate change.

## MONITORING FOREST BIRDS

The BirdLife International Fiji Programme undertook 43 surveys in forest areas around Fiji. The encounter rates of birds were recorded and when compiled, provided an average bird encounter rate per hour (Figure 1). This constitutes the only broad baseline monitoring of Fiji's landbirds undertaken to date. Combined with important research on seasonal changes in the detectability of forest birds (for example Figure 2, Naikatini 2009) and numerical estimates of three endemic forest birds (Giant Forest Honeyeater, Masked Shining Parrot and the Golden Dove (Jackson & Jit 2008), this provides a platform for future monitoring of forest birds and IBAs.

FIGURE 1: ENCOUNTER RATES OF SOME BIRDS IN FOREST SURVEYS (ENCOUNTERS/HR)

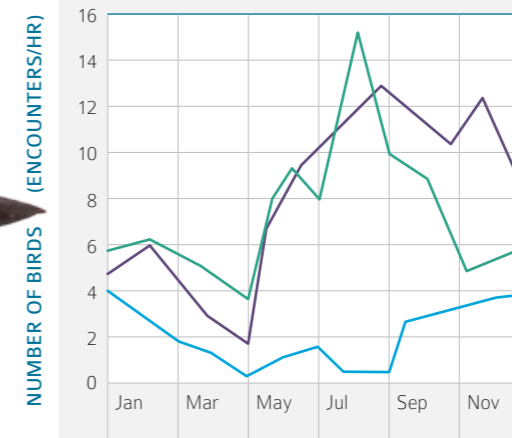


Source: Masibalavu & Dutson (2006)

Right: White-collared Kingfisher *Todirhamphus chloris* on Koro © Chris Thompson.



FIGURE 2: SEASONAL DETECTABILITY



Source: Naikatini (2009)

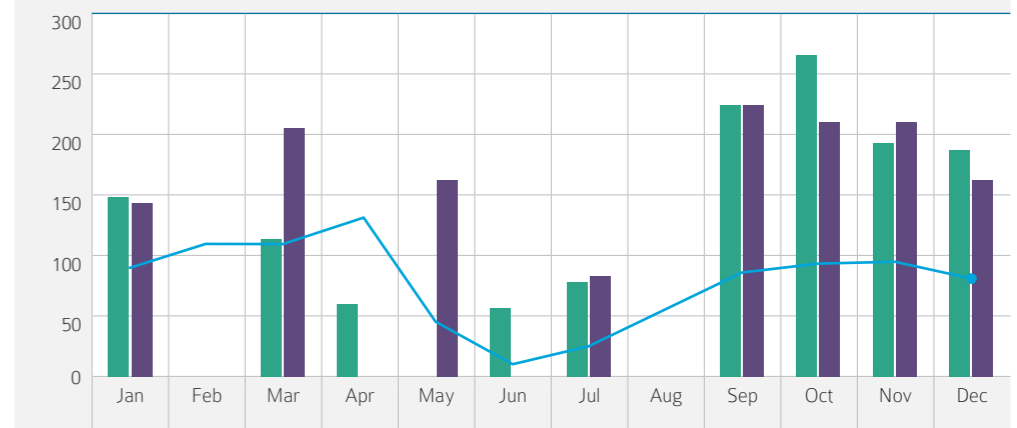
Legend: Barking Pigeon (purple line), Collared Kingfisher (blue line), Wattled Honeyeater (green line)

## SHOREBIRDS AT SUVA POINT

The mudflats around Suva Point are an important wintering area for migrant and staging shorebirds. Their numbers have been monitored since 1998, and up to 1000 shorebirds have been recorded. Figure 3 shows the number of Wandering Tattler recorded. The line indicates the maximum count for each month, averaged across the 10 years between 1998-2007.

Each of the bars indicates the numbers recorded in 2011 and 2012. Numbers recorded in the last two years are significantly higher (i.e. double) the numbers recorded ten years previously.

FIGURE 3: WANDERING TATTLER NUMBERS RECORDED ON SUVA POINT MUDFLATS



Source: Mark O'Brien (unpubl.)

Legend: 2011 (green bar), 2012 (purple bar), 1998-2007 (blue line)

## PRESSURE KNOWLEDGE BASE: WHAT DO WE KNOW?



Bird populations are constantly changing. Cyclones can cause widespread mortality: immediately after Tropical Cyclone Evan in December 2012, small straggling flocks of Barking Pigeon started flying in to Suva looking for food. Most of these birds will have died. Changes in water temperature affect fish distribution, impacting colonially nesting seabirds.

Weather changes, food supply, and predators frequently affect wild bird numbers. While these are generally short-term changes, in contrast there are changes in population trends over time that reflect the consequences of more serious threats to some species. These include habitat loss, spread of invasive predators, development

pressures, climate change and other threats.

Currently, there is no Government-enabled research or monitoring on any of Fiji's birds. Support organisations such as NatureFiji-MareqetiViti and BirdLife International are undertaking the research of Fiji's threatened birds (Fiji Petrel, Collared Petrel, Red-throated Lorikeet), monitoring of some IBAs and follow-up monitoring of seabird islands from which rats have been removed. Meanwhile, Vilikesa Masibalavu has been steadily increasing our knowledge of the distribution of the recently re-discovered Long-legged Thicketbird.

Above: Forest of the Viti Levu interior © Jörg Kretzschmar.  
Right: Youth group birdwatching, Ovalau. © Guy Dutson.



## RESPONSE KNOWLEDGE BASE: WHAT DO WE KNOW?

### KNOWLEDGE IS POWER

Information gathered from monitoring bird populations is essential if we wish to provide decision-makers with the evidence of how birds and other biodiversity are faring in the face of changing environmental and climatic conditions, and what conservation or other action is required.

Professional expertise in ornithology has been greatly improved recently with a programme of post-graduate studies at the University of the South Pacific which includes three MSc research studies on Fiji's native birds – the first ever undertaken. This needs to be continued before any response to such issues as climate change, shooting seasons and endangered species is made, as we need to know the basic biology of our birds. Conservation of our threatened species requires this, as well as a knowledge of their applied ecology.

Methodologies for surveying our forest birds have been developed and the baseline bird density data collected during the identification of the IBAs, coupled with knowledge of seasonal detectability changes, provides an initial platform for an effective monitoring system. There remains to be developed a national monitoring framework that would enable monitoring to be undertaken regularly as well as an appropriate response to findings.

### eBIRD

There is now an opportunity for interested amateurs to become involved in bird monitoring through an online bird recording system called 'eBird'. eBird ([www.ebird.org](http://www.ebird.org)) is a web-based global bird-recording database co-ordinated by the Cornell Lab of Ornithology. The Fiji component forms part of the global programme that was established in 2010.



Figure 4: Distribution of observations reported for Fiji. Each grey square represents a 20x20 km<sup>2</sup>, within which at least one checklist has been reported.

Since then, 50 separate observers have reported around 1000 complete checklists, recording the location of 114 different species, with records going back to 1984. Information is available through maps of the distribution of each species as reported by observers. In addition, data can be downloaded through the web-based Avian Knowledge Network.



## STATE THREATENED BIRDS

Since the arrival of man to the islands, Fiji has already lost at least 12 birds to extinction. Two of these, the Barred-wing Rail and Wandering Whistling Duck, became extinct in historic times. Several more birds are now seriously threatened

or endangered. Some of these are globally threatened birds while for others it is the Fijian population that is threatened.

ENGLISH NAME	COMMON FIJIAN NAME	THREAT STATUS	REASON FOR THREATENED STATUS
<b>GLOBALLY THREATENED SPECIES</b>			
Fiji Petrel	Kacaunigau	CR	Predation by cats, rats, feral pigs
Red-throated Lorikeet	Kulawai	CR	Predation by rats; habitat loss
Long-legged Thicketbird	Manukalou	EN	Predation by mongoose, cats, rats; habitat loss
White-throated Storm-petrel		EN	Predation by rats
Collared Petrel	Kacau, Lagio	VU	Predation by cats, rats, feral pigs
Bristle-thighed Curlew		VU	Migrant, threat mainly on stopover/wintering grounds, especially while moulting
Friendly Ground-dove	Ruveniqele	VU	Predation by mongoose, cats, rats; habitat loss
Kadavu Shining Parrot	Kaka	VU	Habitat loss; domestic pet trade
Pink-billed Parrotfinch	Sitibatitabua	VU	Predation by rats
Ogea Monarch		VU	Restricted distribution
Black-faced Shrikebill	Kiro	VU	Predation by rats; habitat deterioration
Rotuma Myzomela	Armea	VU	Restricted distribution
<b>NATIONALLY THREATENED SPECIES*</b>			
Peregrine Falcon	Ganivatu	AR	Not known; possibly inbreeding
White-browed Crake		CC	Mongoose, feral cats
Audubon's Shearwater		DD	Historic breeder, no recent breeding records; mongoose?
White-tailed Tropicbird	Lawedua	CC	Rats, cats, harvesting
Masked Booby	Gutulei, Toro	AR	Only 4 known breeding sites – in low numbers; harvesting
Brown Booby	Gutulei, Toro	CC	Harvesting
Lesser Frigatebird	Kasaqa	CC	Harvesting
Sooty Tern		AR	Only 3 colonies; harvesting
Bridled Tern		CC	Harvesting

\* From Watling (2004): AR – At Risk; CC – Conservation Concern; DD – Data Deficient



How do we determine if a bird is 'threatened'? The International Union for the Conservation of Nature (IUCN) Red List of Globally Threatened Species is widely recognized as the most authoritative system of assessing the global threat status of birds. It has four threat categories:

- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near-Threatened (NT)

Fiji has 11 Globally Threatened breeding birds.

Two of these are Critically Endangered – the Fiji Petrel and the Red-throated Lorikeet; two are Endangered; and seven are Vulnerable. Another Globally Threatened bird, the Bristle-thighed Curlew, is an annual migrant to Fiji in small numbers.

Very important for us in Fiji too, are those birds whose populations are Nationally Threatened, most of these are seabirds which survive in good numbers elsewhere in the Pacific. The exception is the Peregrine Falcon – Ganivatu which may have no more than 20 pairs currently surviving in Fiji (White et al. 2000).

Left: White-tailed Tropic Bird *Phaethon lepturus*, a nationally threatened species © Stuart Chape.

## PRESSURE THREATENED BIRDS

While in broad terms we believe we know the reasons why each of our special birds are so rare and threatened, this is not based on scientific research.

Several of our rare birds are close to extinction and we believe that the Red-throated Lorikeet is probably gone from Viti Levu now, but hopefully still survives on Taveuni. The opening up of the highlands of Viti Levu in the early 1980s to build the Monasavu Dam and the subsequent increase and spread of predatory black rats is the likely cause of the loss of this small parrot.

### HOW MUCH LONGER CAN THE FIJI PETREL SURVIVE?

Less than 50 Fiji Petrel, Kacaunigau (CR) are believed to survive. They nest in burrows in the forested highlands of Gau but spend the rest of their lives on the high seas as a truly pelagic seabird. Feral cats, rats and feral pigs predate adults as they return to their nests. Unless this is stopped and the nesting burrows are protected, the Fiji Petrel will become extinct. NatureFiji-MareqetiViti is working with three communities on Gau to protect the nesting burrows of the Collared Petrel – developing expertise for when nests of the Fiji Petrel are discovered.



Forests of Gau Island © Eleazar O'Connor.

In the case of the Fiji Petrel, it is feral cats in conjunction with feral pigs and rats that have all but predated this species to extinction.

Fiji is home to a very distinctive race of the Peregrine Falcon, a species that elsewhere in the world has become an icon of conservation success. Unfortunately this is not the case in Fiji (White *et al.* 2000).

The Peregrine Falcon, Ganivatu (AR) is a species of widespread cultural interest in Fiji, but only about 20 pairs are believed to survive.



Unlike populations elsewhere in the world that have recovered well from the pesticide-induced population crashes of the 1950-70s, Fiji's Ganivatu appears headed for local extinction. While the reasons are not known, in-breeding may be a factor.

Our colonial nesting seabirds have come under a new threat in the last 20 years with the rapid spread of outboard engines enabling landowners to quickly and easily travel to remote nesting colonies. Over-harvesting and frequent disturbance cannot be indefinitely sustained by these seabirds.

### THE LAST OF FIJI'S SOOTY TERNS

The Sooty Tern spends most of its life well out at sea. It comes to land only to nest in large colonies that are very vulnerable to disturbance and predation. With a large colony in Ono-i-lau being lost in the last 20 years, only three colonies remain in Fiji. These are on Ha'atana (Rotuma) and Nukucikobia and Naevo in the Lau Group. As with many of our colonially nesting seabirds, traditional restrictions on harvesting of nesting birds have been lost or are weakly followed, and motorised boats have allowed easy access to remote nesting colonies. As a group, our colonially nesting seabirds are highly threatened and need special awareness and protection.

Opposite: Fiji Petrel *Pseudobulweria macgillivrayi* spends most of its life on the high seas Tubenoses Project & Extreme Gadfly Petrel Expeditions © Hadoram Shirihai.

## RESPONSE THREATENED BIRDS



Over the years, our knowledge of our globally threatened birds has improved, thanks to worldwide interest, visiting ornithologists and the catalytic endeavours of international organisations such as BirdLife International.

NatureFiji-MareqetViti has initiated some in-depth work on Fiji's most highly threatened birds including the Fiji Petrel, the Collared Petrel and the Red-throated Lorikeet.

'Re-discovered' on Viti Levu in 2003 after nearly 80 years since the last confirmed record, the Long-legged Thicketbird has demonstrated the critical importance of basic field research. Largely through the efforts of Fiji's leading field ornithologist Vili Masibalavu, the Long-legged Thicketbird has been found to be much more widespread than originally realised. Although extremely difficult to see, once its habitat

preferences were known and its song recorded, its presence is now easily confirmed by its response to any playback of its call.

Over the past five years the University of the South Pacific has co-ordinated an important biodiversity survey of the little-known Lau archipelago. Undertaken by three expeditions, this survey has provided new information and an important baseline on seabird nesting colonies, including new nesting sites for nationally threatened species such as the Sooty Tern, Crested Tern, Bridled Terns, both species of Frigatebird and the Masked Booby. What remains to be developed in both cases is a professional conservation management capability to protect these species in the field.

**Above: Long-legged Thicketbird *Trichocichla rufa*** © Timoci Gaunavinaka/BirdLife International. **Right: Egg-nest of the White Tern *Gygis alba*** © Steve Cranwell.



## STATE PROTECTED AREAS

Fiji has a rudimentary system of Protected Areas and none has been established specifically to conserve any of Fiji's special birds, although an innovative lease for Namenalala Island specifies protection for the large Red-footed Booby colony and all the forest habitat surrounding it.



Red-footed Booby *Sula sula* © Stuart Chape.

### NAMENALALA ISLAND RESERVE

Namenalala was uninhabited until it was leased for a small, low-impact eco-resort in 1983. The resort continues today, and is bound by lease conditions to restrict resort development to less than 4 ha of the island while providing active protection to the remaining 35 ha of the island comprising undisturbed dry forest. One of Fiji's largest colonies of Red-footed Booby is found there. It might be classified as the best managed reserve in Fiji today.

### IMPORTANT BIRD AREAS

BirdLife International has developed a set of global criteria for identifying Important Bird Areas (IBA) – areas of particular importance to birds but often extremely important for other biodiversity too. The IBA Programme is global in scale and, to date, over 10,000 sites have been identified worldwide, using standard, internationally recognised criteria for selection.

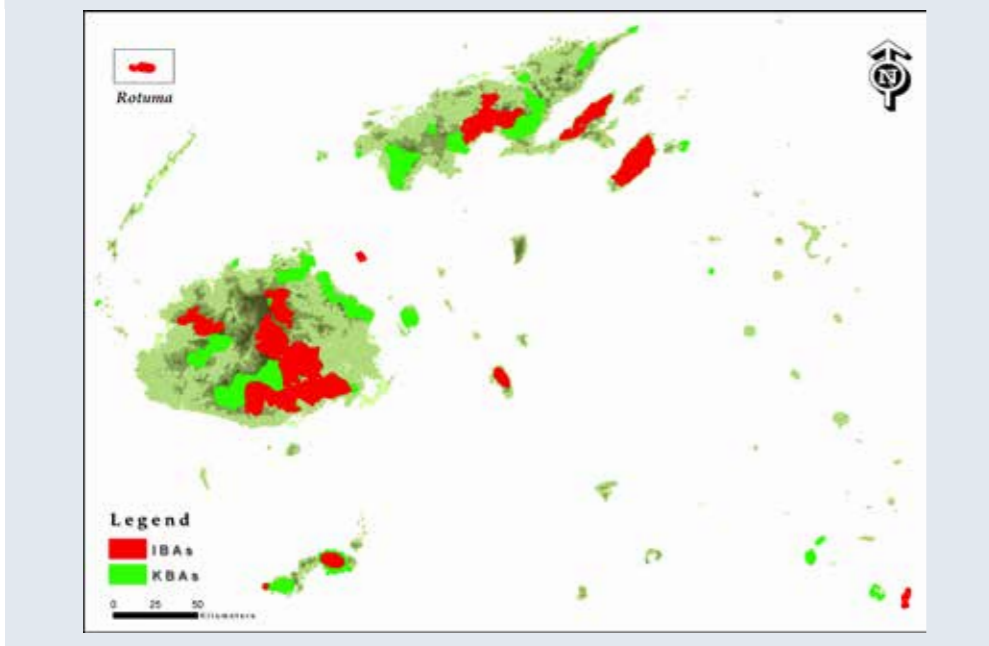


During 2003-2006, the BirdLife Fiji Programme identified 14 IBAs in Fiji – 13 terrestrial and one marine site. The majority are forest sites where large numbers of Fiji's endemic birds are located or where particular rare species are found. Most of Fiji's IBAs are also Key Biodiversity Areas and are therefore important for Fiji's wider biodiversity needs.

The IBA programme is now being extended to marine IBAs that start to capture important pelagic areas in Fiji's waters.

## STATE PROTECTED AREAS

FIGURE 5: FIJI'S IBAs AND KBAs



The IBAs cover about 17% of Fiji's land area and about 40% of the country's remaining forest. These are mostly in the largest areas of natural forest on the main islands (Viti Levu, Vanua Levu, Taveuni, Kadavu and Gau) plus two small islands which each support a specific threatened bird (Rotuma, Ogea), and Vatuiira, which supports an important seabird nesting colony.

Although designation as an IBA provides no official protected status, it highlights the area as particularly important to birds and encourages opportunities for conservation.

In addition to IBAs, Fiji has identified Key Biodiversity Areas that are also places of international importance for the conservation of biodiversity identified nationally using simple, standard criteria, based on their importance in maintaining species populations.

As the building-blocks for designing the ecosystem approach and maintaining effective ecological networks, KBAs and IBAs are the starting-point for conservation planning at the landscape level.

Right: Early morning forest, Viti Levu © Jörg Kretzschmar.

## PRESSURE PROTECTED AREAS



Korobasabasaga Range, Viti Levu, recently excised from the Sovi Basin Conservation Area for mining purposes © Dick Watling.

Because of the nature of communal land ownership in Fiji, there will always be challenges in achieving a representative system of protected areas, as most landowners will understandably require the greatest immediate monetary return for any land use they choose for their property. So it must be recognised that the potential for

'traditional' national parks and protected areas in Fiji is extremely limited.

Even when this is possible, protection cannot be guaranteed, as the establishment of the Sovi Basin Conservation Area has shown.

### SOVI BASIN UNDER THREAT

The Sovi Basin Conservation Area is generally regarded as Fiji's most important biodiversity conservation area and the last wilderness area on Viti Levu. It was first formally recommended as a Protected Area in 1988 and is now listed on the World Heritage Tentative List. As a result of over 25 years of commitment by many stakeholders, active work, research, surveys and consultation with the landowning communities of the Sovi Basin Conservation

Area, 99% of its landowners signed a consent to lease their land to the National Trust of Fiji for the purpose of conservation. The area was formally leased to the National Trust of Fiji in early 2011. However, the intervention of the Namosi Joint Venture Mining Project resulted in the environmentally fragile and important Wainavadu catchment of the Sovi Basin Conservation Area being excised as a waste dump for the mine, even before an Environmental Impact Assessment was considered.

## RESPONSE PROTECTED AREAS

### PROTECTION OF KEY SITES

Fiji has a well developed system of Key Biodiversity Areas (including Important Bird Areas) identified and some of these are prioritised for formal protection in the National Biodiversity Strategy and Action Plan.

On Taveuni, Fiji's conservation stronghold, NatureFiji-MareqetiViti is working with the landowners, Forests Department and the Provincial Office to develop the existing Forest Reserve – a site with great potential for World Heritage status – into the Taveuni National Park. The intention is to facilitate greater potential benefits to the landowners and provide tourism to Taveuni with a significant additional attraction.

Closer to Suva and on a smaller scale, a proposal to establish the Wainikavika National Park has been submitted to Government to extend the Garrick Memorial Reserve to include a scenic reservoir and its forest surround as a recreation site for Suva's growing population.

As noted above, the potential for 'traditional protected areas' in Fiji is limited because of the prevailing tenure and landowners' justifiable aspirations. As such, the future for the protection of Fiji's quite extensive forest resources lies in fostering stewardship of the forest by landowners without alienating the land.

Much more work needs to be done to identify innovative methods of rewarding landowners for positive forest custodianship instead of subsidising or encouraging forest conversion.

Payments for ecosystem services, REDD + arrangements and Permanent Forest Estates are all being looked at by various agencies, conservation organisations and landowner groups to develop progressive modes of forest protection and/or sustainable management. The foundation lies in better sustainable land-use planning. Community-based land use and management plans have great potential to assist landowners to identify and implement the most productive use for their lands.

### COMMUNITY-BASED PROTECTED AREAS

Following identification of IBAs, BirdLife International and its partners have initiated work with landowner and other communities at some of the IBAs with the intention of focusing on:

- Conservation action on the ground
- Advocacy for action by other stakeholders
- Monitoring conservation status change – birds and habitat
- Revision of institutional and supporting frameworks if necessary
- Sustainable finance to support these activities

NatureFiji-MareqetiViti has initiated work with several landowners to begin conserving sites for threatened species. These include the Collared Petrel in Gau, the Fiji Mastiff Bat at its only known roosting cave at Nakanacagi on Vanua Levu, and the Fiji Sago Palm at Culanuku, Serua.

**Right: Qarani community members installing an artificial nest box for Collared Petrel © Eleazar O'Connor.**



### SISI INITIATIVE

The Sisi Initiative is a BirdLife Fiji project named after the Silktail *Lamprolia victoriae*, which is found only on Taveuni and on the Natewa Tunuloa Peninsula on Fiji's second-largest island of Vanua Levu.

The Natewa Peninsula is one of Fiji's 14 Important Bird Areas. However, the bird's old-growth rainforest habitat is being encroached upon by forces such as illegal logging, forest fires, overgrazing, agricultural expansion and the spread of invasive species.

In response to these threats, the Sisi group has been working with communities to wisely use and manage their natural resources in order to conserve the endemic bird, while at the same time improving their own way of life.

Actively managing more than 6000 hectares (almost 15,000 acres) of forest, six villages are turning to income-generating activities that are compatible with conservation, including beekeeping, jewelry manufacture and ecotourism.

### COLLARED PETREL COLONY, SAVALEVU, GAU



Collared Petrel *Pterodroma brevipes* © Mark Fraser.

The first-ever nesting colony of the Collared Petrel was found at Savalevu, in the forest above Navukailagi, Gau, by landowners and NatureFiji-MareqetiViti's Fiji Petrel Project. The colony comprises more than 25 nesting burrows but is suffering from severe feral cat predation. The landowners have announced to the Gau Island Council that they wish to protect the area and the Fiji Petrel Project is now working with the landowners to control rats and feral cats. Consultations will be undertaken for the preparation of a management plan and an appropriate form of protection.

## STATE THE IMPORTANCE OF FOREST



Over 99% of Fiji's endemic biodiversity is found in the nation's native forests. This is because originally Fiji was all but completely forested, so its native landbirds and biodiversity evolved as forest species.

Any conversion of forest in Fiji may easily result in the world extinction of a plant or animal species, so it represents the greatest threat to birds and Fiji's terrestrial biodiversity.

Birds demonstrate this dependence on forest very well. There are 35 native landbird species (excluding ground and waterbirds) on Viti Levu and only two of these are not found in forest. Although they all fly well, only 17 of them might be seen in open, agricultural habitats and only 12 in suburban gardens.

Forest varies with rainfall from semi-deciduous dry forest in lowland rain-shadows, to wet rainforest at higher altitudes facing the prevailing southeasterly winds. Lowland rainforest extends up to about 600-800m where it grades into

montane rainforest, and cloud forest on the most exposed ridges and peaks. Little dry forest remains as it is much easier to clear, is more susceptible to fire and drier areas are preferred for habitation. Many coasts have a very narrow band of littoral forest, with extensive stands of mangroves in some leeward and estuarine areas. Most of Fiji's forest birds are found in all forest types, but some are restricted to wetter forest, which is also much richer in plant diversity.

Relatively large areas of forest are required if we are to ensure the survival of our endemic forest biodiversity. This is readily understood in the aftermath of a major cyclone such as TC Evan in December 2012, where extensive forest areas can be badly damaged. Birds are more fortunate than other groups and if they are able to survive the carnage, they can fly and some will find refuge in less damaged forest some distance away. As the forest recovers, so they can migrate back into the recuperating area.

For trees and other plants, this process of recolonisation of cyclone-ravaged tracts takes much longer.

At stake however, is the need to have extensive areas of forest, some of which can remain undamaged during even the most damaging cyclone.

Above: *Kauvula Endospermum macrophyllum* © Jörg Kretzschmar. Right: Mt Tomaniivi cloud forest © Stuart Chape.



## PRESSURE THE IMPORTANCE OF FOREST

Just over 50% of Fiji's land area, formerly covered by forest, has been converted to grassland or agricultural crops. The rate of forest loss has declined in recent years, although a recent comparison indicates that there continues to be an increase in the extent of Open Forest at the expense of Closed forest (Figure 6).

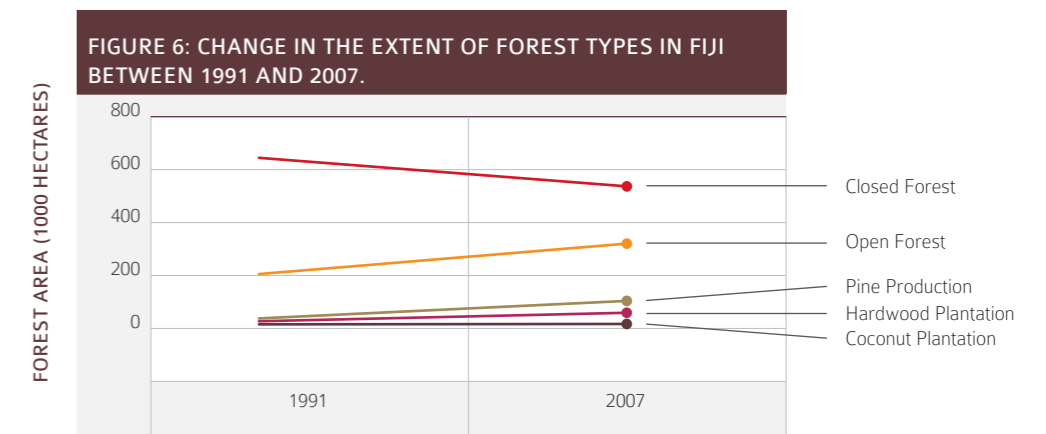
This recorded decline in the extent of closed forest represents a reduction of 7000ha per year.

The loss of forest is ongoing and the conversion of 45,000 ha of mahogany plantation (1970-80s) from high quality native forest was a devastating blow to Fiji's endemic birds and other forest biodiversity, especially when there existed a large area of degraded forest where the plantations could and should have been located.

Fire remains the most serious ultimate cause of forest loss and the prevalent attitude to wildfire in Fiji is casual.

Adoption of a positive stewardship attitude to our forest resources is a national priority and a major element of this will need to be the control of wildfire.

The influence of forest quality on birds is poorly known. Ornithologist Mere Valu studied forest birds near Suva. She focused on a subset of forest birds that are all able to persist in the face of disruption, and found that the identified changes in behaviour confirm that logging can have subtle effects on forest birds' ecology and behaviour, and that these changes can be measured even eight years after logging has ceased. Although the interim implications of the change in behaviour observed between the two habitat types remain unknown, the observations highlight the importance of maintaining Fiji's undisturbed tracts of forest for the future integrity of tropical ecosystems. (Tabudravu 2009)



Data from FRA 2010 – Country Report, Fiji

## RESPONSE THE IMPORTANCE OF FOREST



Maintaining Fiji's forest cover is the key to protecting all of its endemic birds as well as its other terrestrial biodiversity. As such, the priority land areas currently identified for protection in the National Biodiversity Strategy and Action Plan are all forest areas. However, conservation of viable and healthy populations of birds requires more than the establishment of a few statutory Protected Areas that cover only a small portion of the landscape; it needs conservation in the 'working' landscape. A new Forest Policy for Fiji was adopted in 2007 after extensive nationwide consultation. One of its key provisions intended to safeguard the forest sector is the need to establish a national Permanent Forest Estate.

The key objective of the Permanent Forest Estate is to replace the *ad hoc* logging of recent years and the incremental loss of productive forest through unplanned and unsustainable agriculture, with an area that will enable sustainable forest management and conserve all the attributes of Fiji's significant forest resources.

The Forests Department, with assistance from NatureFiji-MareqetiViti, is undertaking an awareness campaign of the Permanent Forest Estate provision amongst forest landowners and registering those who indicate their interest.

**Above: Deforested, fire-climax grassland hills in west Viti Levu © Stuart Chape. Right: Habitats of endemic birds like the Many-coloured Fruit Dove are threatened by unsustainable logging © Jörg Kretzschmar.**



### FOREST CONSERVATION: THE WAY FORWARD

Traditionally and to a large extent currently, landowners had few if any options for benefiting financially from protecting their forests. Government and the private sector generally encouraged landowners to log their forests without ensuring sustainability, or convert to mahogany, cocoa or coconut plantations, or fell their forest for agricultural crops. Conservation of forests has been regarded as a beneficial land use, but the benefits accrue largely to the public in free ecosystem services without any monetary benefits accruing to the landowners.

The future for forest protection in Fiji lies in rectifying these anomalies. Forest custodianship or conservation needs to be a recognised land use and the landowners should benefit financially as a result. Innovation is required in enabling forest owners to benefit from wise stewardship of their forests rather than expecting this to happen only through *ad hoc* logging or a variety of conversion options.

Forest harvesting needs to be undertaken on a sustainable basis. Forest conversion schemes should be prohibited and plantations established in open or degraded forest areas. Ecosystem services need to be fully costed and paid for. National biodiversity conservation needs should be recognised as a land use and the forest owners should be advantaged accordingly.

## STATE SEABIRDS AND SHOREBIRDS



Nesting colony of Sooty Tern *Sterna fuscata* © Steve Cranwell.

Migrant shorebirds and voyaging seabirds are a distinctive and culturally important component of the Fijian avifauna. In September each year, the Bar-tailed Godwits arrive at Suva Point. As far as we know, they fly direct from Alaska to Suva, a non-stop journey of eight to nine days. Some fly direct from Alaska to New Zealand, an 11-day non-stop flight. The migrations that our Dilio (Pacific Golden Plover), Bar-tailed Godwits and other shorebirds undertake twice a year are marvels of the natural world.

Similarly, when a young Kacaunigau (Fiji Petrel) leaves its burrow somewhere in the forest near Delaco on Gau, there will be no parents watching over it. Instinct dictates it flies out to the sea and then, we believe, due south to cooler temperate waters. It will not return to Gau or visit any other

land for three to four years, and when it does so, it will likely return direct to its nesting burrow. This is yet another marvel of nature.

Prior to human settlement, all the islands of Fiji are believed to have supported very high densities of nesting seabirds that functioned as major ecosystem drivers by transporting nutrients from the ocean to land and by cultivating soil with their burrowing.

Following human settlements, seabirds have provided benefits such as food, feathers and nutrients for farming (seabird guano). Some of our seabirds were key to the navigating prowess of the Pacific's first voyagers, while today seafarers still use seabirds for locating schools of fish.



Seabirds evolved in Oceania in the absence of mammalian predators and as a result are extremely vulnerable when they become established. They are especially vulnerable to the presence of humans. The numbers and distribution of breeding seabirds in Oceania today is a vestige of what it was prior to the coming of man.

In Fiji, seabirds are believed to be declining. What we are sure of is that there is an almost universal lack of information to reliably assess their condition. At present we know little more than which species still breed in Fiji and where the main breeding colonies are, although we know these are confined to remote, relatively undisturbed sites. We have no information on how they are faring.



Above: White-faced Storm Petrel © Jörg Kretzschmar.  
Left: Red-footed Booby *Sula sula* © Jörg Kretzschmar.



## PRESSURE SEABIRDS AND SHOREBIRDS

Fiji's seabirds suffer from unsustainable harvesting by man, predation by rats – augmented by feral cats and pigs at certain sites – and loss of breeding habitat to developments like tourism. Some important seabird nesting sites are vulnerable to sea-level rise and climate change.

Our colonial nesting seabirds have come under increased threat in the last 20 years with the rapid spread of outboard engines enabling landowners to quickly and easily travel to remote nesting colonies. Over-harvesting and frequent disturbance cannot be sustained indefinitely by these seabirds.

Poor planning and environmental control has led to some significant seabird nesting sites being leased to tourism operators without any provision for the nesting birds. Prominent amongst these are Wailagilala (Fiji's only true atoll), which has one of Fiji's largest colonies of Brown Noddy and several other seabirds; Nanuku (Ringgold Isles); Vunavadra (Mamanuca Group – South Sea Island), which had a large Black-necked Tern colony and was a Black Noddy roosting site; and Matamanoa (Mamanuca Group), which supported a Wedge-tailed Shearwater colony.

The coastal habitats of shorebirds are threatened in many parts of the Pacific. Even in Fiji, important coastal flats are being or have been considered for development. The mudflats of the Suva Peninsula – a listed Site of National Significance – support over a thousand migratory shorebirds each year, yet these are now threatened with development. At Saweni on Viti

Levu's west coast, another listed Site of National Significance for coastal habitat of shorebirds has been leased by Government for conversion and development.



### RATS AND SEABIRDS

Invasive rats are among the largest contributors to seabird extinction and endangerment worldwide. In the Pacific, the first voyagers brought with them the Pacific rat *Rattus exulans*, which has become a serious predator of some of the smaller seabirds. It was the later introduction of the Ship rat *R. rattus* and the Norway rat *R. norvegicus* by Europeans that greatly increased the severity of rat predation on seabirds.

Above: Predation of seabirds by rats is a serious problem in Fiji and the islands of the tropical Pacific © Steve Cranwell. Right: Mottled Petrel *Pterodroma inexpectata* pass through Fiji waters in large numbers on their southerly migration each October © Jörg Kretzschmar.



Potentially 320,000 seabirds are killed annually as bycatch in the world's longline fisheries (Andersen *et al.* 2011). Fiji has become a regional hub for longline fishing vessels in the Southwest Pacific, yet we have little information and have developed no effective form of control or mitigation.

An additional new threat now being actively discussed in the region is deep-sea mining for minerals. What effect this will have on marine ecosystems and seabirds is largely conjecture at this stage. However, Fiji's under-resourced environmental administration has already demonstrated that it is unable to appropriately regulate mining on land; mining at sea will be just an added dimension of difficulty.

### SUVA FORESHORE UNDER THREAT

Fiji's seminal 'State of the Environment Report' (1993) identified the mudflats of the Suva Peninsula as an important migratory shorebird habitat. As a result, it was approved and listed as a 'Site of National Significance'.

Recently, the Government has called for 'Expressions of Interest' from developers for conversion of the foreshore, initially for the mudflats and more recently for the last remaining significant areas of mangrove.

## RESPONSE SEABIRDS AND SHOREBIRDS

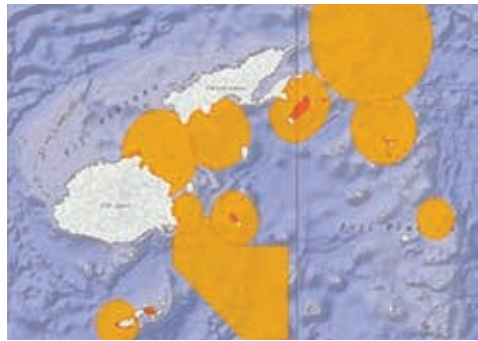


Figure 7: Fiji's preliminary set of Marine Important Bird Areas (Source: BirdLife 2012).

While our seabirds remain very poorly known by comparison with our landbirds, information has improved greatly in the last 10 years as a result of surveys of the Lau Group and identification of Marine Important Bird Areas.

Until recently, the breeding seabirds of the entire Lau Group were virtually unknown. Three surveys co-ordinated by the University of the South Pacific of North, Central and Southern Lau have provided an important baseline on seabird nesting colonies, including new nesting sites for nationally threatened species such as the Sooty Tern, Crested Tern, Bridled Terns, both species of Frigatebird and the Masked Booby.

BirdLife International has applied its global Important Bird Area criteria to seabird population estimates, especially of globally threatened species, to confirm the most important sites in the tropical Pacific for seabirds, now known as Marine Important Bird Areas. These are identified on the basis of breeding, feeding or

areas important for migration or congregation. Twelve such sites have been identified on a preliminary list for Fiji (see Figure 7).

Better knowledge of the distribution of seabird nesting sites and marine IBAs has provided an initial focus for conservation action on the ground. Conservation organisations have initiated work with communities associated with seabird nesting sites, notably BirdLife in Kadavu and Vatu I Ra and NatureFiji-MareqetiViti on Gau with the threatened Fiji Petrel and Collared Petrel.

Most significantly, BirdLife International has undertaken the eradication of rats from 11 islands with important seabird nesting colonies. On several of these islands, nesting habitat has improved, numbers of nesting birds have increased and new species nesting on the island have been identified.

### THE ENIGMATIC FIJI PETREL

No more than 20 pairs of the Fiji Petrel are believed to survive. Eleazar O'Connor and Posa Qalo are Fiji Petrel Project Officers for NatureFiji-MareqetiViti in charge of two New Zealand-trained detector dogs. In their first year on the island they have found more than 50 petrel nests. All those nests whose occupants have been identified are Collared Petrels, but nearly 20 nests remain to be identified.

Right: Masked Booby *Sula dactylatra* © Steve Cranwell.



### RAT ERADICATION FROM SEABIRD NESTING ISLANDS

Rats have reached about 80% of the world's islands and are among the most successful invasive mammals. In Fiji, there are three species: the Pacific rat *Rattus exulans*, Brown rat *Rattus norvegicus*, and Ship rat *Rattus rattus*. The Ship rat is an agile climber and a serious predator of nesting birds.



© Steve Cranwell.

Successful Fiji rat eradication campaigns coordinated by BirdLife Fiji Programme have re-created nearly 300 ha of predator-free habitat on 11 islands. Now permanently cleared of introduced rats, these islands are being used for restoration of colonial nesting seabirds and recovery of threatened species such as invertebrates, lizards, forest birds, and some species of plants. By applying lessons learned from these campaigns, the cost-effectiveness of eradication campaigns has greatly improved.

## STATE INTRODUCED PREDATORS



### EVOLVING WITHOUT PREDATORS

Introduced predators are one of the major contributors of species extinctions on islands. They also pose a threat to economic development, human health and food security. Since 1800, 90% of all bird extinctions have occurred on islands and more than half of these extinctions have been caused by introduced predators.

The Pacific has experienced one of the world's most disastrous examples of the chance introduction of an alien predator. Guam is currently struggling to control the 3 million Brown tree snakes (*Boiga irregularis*) that have caused species extinctions and continue to cause power outages, as well as health and infrastructure problems.

Fiji's birds evolved in the islands without any mammalian predators, so it's not surprising that when introduced, these have had a devastating impact. Today, few of us wonder why the Jungle Fowl (Toaniveikau), the Banded Rail (Bici), and the Purple Swampphen (Teri) are not found on Viti Levu or Vanua Levu – 'it's just how it is'. But it's

not how it was: their absence today is due to the introduction of the mongoose<sup>1</sup>, which represent just the most obvious impact. The mongoose is responsible for the absence of several other birds as well as even more extensive impacts to Fiji's reptiles and native frog. Fortunately, there are a few forest and hence biodiversity-rich islands such as Taveuni, Kadavu, Gau, Ovalau and Koro, that retain sizeable areas of biodiversity-rich forest and crucially are without the mongoose. Preventing mongooses from spreading to these islands is of the highest priority.

### RECOGNISING THE CULPRITS: RESEARCH REQUIRED

Currently, while there is general interest in alien invasives, little research has been done to determine the significance of the various introduced predators in respect of our birds and other biodiversity. There is a pressing need for research to provide data and evidence on exactly what is happening in Fiji and not to rely on experiences elsewhere. Much of the current 'invasives' concern is based on perception rather than evidence.

Conspicuous species such as Myna birds and Bulbuls are often blamed, while inconspicuous species like rats and feral cats are overlooked or their role downplayed. The mongoose is diurnal and everyone knows of it, even if they are not aware of what it is responsible for. Few of us are aware of the devastating impact of unseen predators on our forest birds. The most serious



### MUCH-MALIGNED MYNAS

Myna birds and Bulbuls are conspicuous, introduced birds frequently blamed for 'chasing the native birds into the bush'. Certainly they are both aggressive birds, and Mynas are proven egg thieves – but they are not forest-adapted species, so it is incorrect to blame them for the scarcity of native birds in our gardens and farmland. Our native birds are primarily forest-evolved birds and are

of these is the arboreal Ship rat, which has penetrated all forest types. Many of our forest birds would be found at much higher densities in the absence of the Ship rat, and these rats are likely responsible for the threatened status of some of our forest birds such as the Red-throated Lorikeet, the Long-legged Thick-knee and the Pink-billed Parrotfinch.

Studies in the United States have shown that the combined forces of 'outdoor' and feral cats may be responsible for tens of millions of bird fatalities each year. In Fiji too, feral cats are another unseen but highly destructive predator of birds and may well be primarily responsible for the extreme rarity of the Fiji Petrel, as the NatureFiji-MareqetiViti-led Fiji Petrel Project has found cat predation of nesting Collared Petrels to be high on the island of Gau where the Fiji Petrel also nests.

Left: Red-vented Bulbul *Pycnonotus cafer* © Mark Fraser.

not adapted to using open, cleared habitats. On the other hand, Mynas and Bulbuls are adapted to open, disturbed habitats and do not go far into the forest. So there is little or no displacement, just adaptation to different habitats. Fortunately there are some exceptions – the Kula (Collared Lory) is a conspicuous one, as it is at home from mountain forest through gardens to city centres and out to the mangroves.

### THE BIG BAD FIVE

**Rats:** 'Unseen' voracious predators, most seriously the arboreal Ship rat *Rattus rattus*;

**Feral cats:** Serious predators of birds;

**Mongoose:** Two introduced species in Fiji – responsible for the loss of many ground-nesting birds as well as lizards and frogs on islands where they occur;

**Feral pigs:** Serious predators of ground-nesting birds;

**Goats:** On small islands, unmanaged goats can devastate nesting habitat for both seabirds and landbirds.

<sup>1</sup> We learned only in 2009 that there are two species of introduced mongoose in Fiji, *Herpestes javanicus* and *H. fuscus*. Fiji has the dubious distinction of being the only country in the world (as far as we know), with two introduced species of mongoose.

## PRESSURE INTRODUCED PREDATORS

While we know that rats, mongooses and feral cats are serious predators of our birds, the severity and extent of their impact remains to be clarified. It is likely to vary between bird species. It is quite likely that the impact of the introduction of the Ship rat less than 200 years ago is still

being felt and the decline of the Red-throated Lorikeet in the last 30 years could be attributed to Ship rats. Whatever, the predatory pressure remains and we urgently need to know the extent of it in respect of our threatened birds.



Red-throated Lorikeet *Chamosyna amabilis* © W.A. Beckon.



Setting a cat trap © Eleazar O'Connor.

### DOES THE RED-THROATED LORIKEET STILL SURVIVE?

There has been no confirmed sighting of Kulawai, the Red-throated Lorikeet, since 1993, despite over 2100 hours of searching by local and overseas ornithologists. It is now considered lost from Viti Levu and our hopes for its continued survival rest on a possible population on Taveuni. Disturbance and increased predation by rats following the opening of the Viti Levu highlands for the construction of the Monasavu Dam is believed to be the reason for its apparent local extinction on Viti Levu.

### COLLARED PETREL KILLED BY FERAL CAT

The first-ever nesting colony of the Collared Petrel was found by the Fiji Petrel Project at Savalevu, Gau in May 2012. Feral cats had killed at least seven Collared Petrels at the twenty-nest colony by the time some of the chicks had departed in August of that year.



The world is becoming a smaller and more accessible place, and with a constant increase in international shipping and air transport, the chances of the accidental introduction of additional serious predators or competitors of our birds is very real. Recently an air link was opened between Guam and Fiji, providing a ready conduit for entry of the Brown Tree Snake. Fortunately, for the time being at least, the air link has been suspended.

The issue for small island national governments such as Fiji's is not just to be able to detect invasive species arriving in the country but to be able to quickly recognise the significance of a situation and mount an effective response as promptly as possible. The recent arrival of the American (Green) Iguana *Iguana iguana* to Fiji has illustrated the difficulties of mounting a national-level commitment with appropriate funding and the necessary 5-10 year eradication time-frame.

### PREVENTING THE ESTABLISHMENT OF THE AMERICAN (GREEN) IGUANA IN FIJI AND THE PACIFIC



A very successful invasive pest that is spreading fast through the Caribbean and on mainland USA, the American Iguana's arrival in Fiji represents the first established population in the Pacific and is a potential bridgehead to the world's most isolated

island ecosystems. NatureFiji-MareqetiViti, working with the Biosecurity Authority of Fiji, has undertaken an extensive awareness programme and training among the communities on Qamea and surrounding islands to encourage their support for this iguana's eradication.

However, the newly-established Biosecurity Authority of Fiji has not yet been able to acquire sufficient resources to have any chance of eradicating the iguana. Qamea, where the iguana is established, neighbours Taveuni, Fiji's conservation stronghold, and the iguana's spread to that island would be a biodiversity conservation disaster.

Left: Collared Petrel killed by a cat © Eleazar O'Connor. Above: American Iguana *Iguana iguana* © Rick van Veen.

## RESPONSE INTRODUCED PREDATORS

In order to confront the problem of invasive pests, the Government has recently established the independent Biosecurity Authority of Fiji to address such issues in an independent and professional manner. Vigilance at our borders is essential; this is not mere rhetoric, as we know full well with the arrival of the American (Green) Iguana to Fiji.

While rats and feral cats are usually nocturnal and unseen, few people apart from scientists appear to be aware of how serious these predators are, which is a problem when encouraging support for their control. However, over the past few years, with the support of landowners, a successful start has been made with removing rats from islands that have important seabird nesting colonies. More of a challenge will be the establishment of rat and cat-free protected areas of native forest to benefit some of our threatened endemic forest birds.

Ensuring that the mongoose does not spread further than its current distribution of 11 islands in Fiji, and preventing the entry of extremely serious invasive species such as the Brown Tree Snake, are vital to minimising the chances of any further invasive predators that could threaten Fiji's birds and biodiversity.

With the Biosecurity Authority of Fiji, NatureFiji-MareqetiViti is currently implementing a capacity-building project to prevent the spread of invasive alien species, focusing on Mongooses, the Brown Tree Snake and the American Iguana. Actions have included the production of risk

assessments for the introduction and spread of the Brown Tree Snake and the Mongoose in Fiji and incursion response plans for the establishment of American Iguanas on Taveuni and beyond.

These risk assessments and associated 'response plans' will enable government, private sectors and communities to prevent and respond to an incursion in an effective and efficient manner.



Above: Nukupureti and Nukubasaga, two seabird breeding islands in the Ringgolds Group, from which rats have been removed © Steve Cranwell.



### ERADICATION OF INTRODUCED INVASIVES ON SMALL ISLANDS

To date, successful Fiji rat eradication campaigns co-ordinated by BirdLife Fiji Programme have re-created nearly 300 ha of predator-free habitat on 11 islands. The island of Monuriki supports a large colony of Wedge-tailed Shearwaters.



With the support of the landowners, rats and goats were eradicated from the island in 2011.

Left: Rats and goats have been removed from Monuriki Island © Stuart Chape. Top: Feral goats on Monuriki Island before their removal © Steve Cranwell. Lower: Polynesian rat eating Sooty Tern egg © Steve Cranwell.

## STATE LAWS, RESTRICTIONS AND SUSTAINABLE NATURAL RESOURCE USE

Fiji's birds have received remarkable legislative protection for nearly 100 years. Fiji's Birds and Game Act 1923 afforded full protection for all of the country's native birds while specifying which species were not protected (certain introduced birds and certain pigeons during the annual one-month shooting season).

Such national inclusive lists of protected species were a rarity until well into the last quarter of the 20th century. Until then, and for many countries still today, only named birds were protected, all others being unprotected. An inclusive list, such as Fiji has had since 1923, is more comprehensive, easier to administer, and offers better protection for all birds within a country's borders.

Sustainable natural resource use is the key to long-term national and landowner prosperity, as well as bird and other biodiversity protection. In general, what is good for people is good for birds. Sustainable resource use, clean air and clean water lead to a healthy environment for birds and people.

In recognition of this, sustainable natural resource use is incorporated as a key component of Fiji's Environmental Management Act which came into force in 2007.

Another important cornerstone of Fiji's biodiversity conservation legislation is the Endangered and Protected Species Act (2003 and currently being amended), which provides administrative legislation for Fiji's participation in CITES as well as protection for birds and other biodiversity.

The National Biodiversity Strategy and Action Plan is a responsive, regularly updated plan that identifies priorities and responsibilities. The Department of the Environment is responsible for maintaining the plan with assistance from other relevant government departments and agencies, together with the various conservation organisations operating in Fiji.



Fiji is a signatory and has set up an active administration for implementing CITES – the Convention on International Trade in Endangered Species.

### ENVIRONMENTAL MANAGEMENT ACT 2005 (EXTRACT)

The purposes of this Act are:

- To apply the principles of sustainable use and development of natural resources; and
- (a) the preservation of the coastal environment, margins of wetlands, lakes and rivers;
  - (b) the protection of outstanding natural landscapes and natural features;
  - (c) the protection of areas of significant indigenous vegetation and significant habitat of indigenous fauna;
  - (d) the relationship of indigenous Fijians with their ancestral lands, waters, sites, sacred areas and other treasures; or
  - (e) the protection of human life and health.

Left: *Tagimoucia Medinella waterhousii*, the legendary forest blossom from Taveuni © Jörg Kretzschmar.

# PRESSURE LAWS, RESTRICTIONS AND SUSTAINABLE NATURAL RESOURCE USE

## ERODING NATURAL RESOURCES

Unsustainable resource use is still conspicuously practised in many sectors, none more so than in our rivers and streams with rock and gravel extraction, water abstraction and the blocking of migratory fish routes. Unsustainable resource use is also conspicuous in sloping-land agriculture, forest and mangrove conversion, plantation management, foreshore modification and mining. Wildfire continues to play a major

role in the conversion of forest to degraded forest and grassland.

Birds are most severely impacted by the conversion of native forests, but our migrant shorebirds have limited feeding habitat and key sites such as the Suva Peninsula mudflats are threatened by Government-encouraged or approved development.

## COMMONPLACE UNSUSTAINABLE RESOURCE USE



Gravel and river rock extraction © Dick Watling.



Unsustainable agriculture practices: ginger growing in the Waibau area, Viti Levu © John Morrison.



Unsustainable logging practices threaten Fiji's entire ecosystem © David Olson/Wildlife Conservation Society.



Forest destruction by wildfire © Dick Watling.



## HARVESTING AND 'SHOOTING'

Traditionally, Fijians and other Pacific Islanders have harvested eggs or nestlings from colonially nesting seabirds. This harvesting is likely to have resulted in the loss of certain birds that no longer nest in Fiji and the current rarity of some others. Over time, traditional controls were developed and would likely have assisted in a sustainable harvesting regime.

Today, colonially nesting seabirds are the most threatened group of our birds, primarily because traditional controls have been lost or are weakly followed. Further, the widespread acquisition

of boats with outboard engines has meant that isolated islets where the seabirds breed are much more easily accessed.

With only one exception (the Fiji Petrel Kacau-nigau), these threatened seabirds are found elsewhere in the Pacific or even in other oceans; as such their Fijian populations are not of major global interest and therefore their conservation attracts little attention. This is unfortunate because many of these birds are of great national interest and we should be identifying our national conservation priorities rather than blindly following global priorities.

## PITY THE POOR PIGEONS

"The Minister of Agriculture may, each year, allow a shooting season of one month for the Fiji Wood Pigeon and the Chili Pigeon under the Birds and Game Protection Act 1923." Unfortunately for all our pigeons, no Fijian or scientific names are used in the Act and neither of these pigeon names are in use in any authoritative book on Fijian birds or pigeons of the world.

Treaties and conventions to which Government is a signatory, require it to ensure that any 'wildlife management' such as pigeon shooting, be undertaken on a sustainable basis.

To enable this requires clear identification of the birds concerned, research into pigeon ecology and population dynamics, and a regular monitoring system. All of this, together with the costs of shotgun control by the police, should be paid for by those who indulge in the archaic Pigeon Shooting Season, and not the ordinary taxpayer.

In recent years, Government has moved to replace or update much of Fiji's archaic legislation. Fiji's Pigeons are eagerly awaiting their turn.

Left: Fair game in the pigeon shooting season? A Fiji Wood Pigeon? A Chili Pigeon? Neither; this is a Pacific Pigeon *Ducula pacifica* – so is it protected? © Paddy Ryan

## CLIMATE CHANGE

There is much speculation on all aspects relating to climate change and its likely impacts on island people, their environments and biodiversity. As yet there has been no serious attempt to study climate change impacts on birds or biodiversity in Fiji. Elsewhere in the world however, bird studies are showing demonstrable impacts of climate

change. These include measurable effects on bird populations through mortality during severe weather events, changing sea temperatures, mis-timed insect emergence, decoupling of the breeding seasons of birds from those of their prey, and collapsing food-webs.



### CLIMATE CHANGE VULNERABLE: LOW-LYING SEABIRD NESTING COLONIES

Several of Fiji's most important colonial seabird nesting colonies such as Nukucikobia, Naevo and Ha'atana, are on isolated low-lying islets that are no more than 3m above mean sea level. These may suffer increased inundation from storms affecting the nesting

birds, which may lead to their abandonment. Nukucikobia, N. Lau group, has at least seven species of nesting seabird including very rare nesters in Fiji, the Sooty Tern and the Masked Booby. Nukucikobia is also an important turtle-nesting site.

Above: Nukucikobia sand cay © Dick Watling. Right: Sooty Shearwater *Puffinus griseus* © Jörg Kretzschmar.



Climate Change Vulnerable Low Altitude Cloud Forest on Gau Island, Home of the Fiji Petrel © Eleazar O'Connor.

### CLIMATE CHANGE VULNERABLE: LOW ALTITUDE CLOUD FOREST ON GAU ISLAND – HOME OF THE FIJI PETREL

The Fiji Petrel nests only in the upland forests of Gau and scientists believe that it has a remnant distribution in the cool cloud forest on the highest forested ridges of an island that has some of the lowest altitude cloud forest found anywhere in the world (Watling & Gillison 1995). As such, it may be uniquely susceptible to climate change.

Climate change will likely impact birds and biodiversity by amplifying pressure of existing threats in indefinable ways. The problem with current approaches is they tend to ignore current threats and focus on ill-defined climate change issues *per se*. The pragmatic approach is to improve our capacity to address existing threats such as those identified in this document, and to improve our state of knowledge of all birds, especially our threatened and endemic species – those for which we alone are fully responsible.

The small populations of some island birds, especially those restricted to a single island (of which we have seven in Fiji), make them particularly vulnerable to severe weather events or to marked changes in rainfall amount and distribution – two of the more widely predicted impacts of climate change.

While the people of Fiji are unlikely to have any measurable effect on climate change, their response to the problem may have significant impacts on birds and biodiversity. Increased frequency of deliberately-lit wildfires could have a devastating effect on Fiji's remaining forest and its endemic birds and biodiversity. Ill-considered foreshore development – including increasing numbers of badly-designed and constructed seawalls – could damage shorebird foraging areas.

Climate change is the subject of great bilateral and multilateral donor interest but Fiji's birds and biodiversity, despite being of great value by international standards and a good indicator for biodiversity in general, have yet to be the subject of any resilience or adaptive strategy studies.



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## About NatureFiji-MareqetiViti

NatureFiji-MareqetiViti is the membership-based working arm of the Fiji Nature Conservation Trust, registered under the Charitable Trust Act (Cap 67) in June 2007. Registered Charitable Trust #817.

### **What We Do**

The mission statement of the Fiji Nature Conservation Trust is: *“to enhance biodiversity and habitat conservation, endangered species protection and sustainable use of natural resources of the Fiji Islands for the benefit of communities and the Fijian people”.*

Since our establishment in 2007, we have launched or are currently undertaking over 30 projects. These include internationally groundbreaking work such as those projects focusing on globally endangered species – the Fiji Petrel, the Fiji Flying Fox, the Fiji Sago Palm, the Lau Skink and the Yaqaga Crested Iguana. Other projects are even more challenging such as our current

search for the Red-throated Lorikeet, which we fear may already be extinct, there being no confirmed sighting since 1993.

### **Become a Member**

By joining NatureFiji-MareqetiViti, you will become a member of Fiji’s leading local conservation organisation. As a non-profit and non-government organisation, NatureFiji-MareqetiViti depends on membership subscriptions, donations and bequests. It is your support and generosity that will enable NatureFiji-MareqetiViti to work actively for the conservation of Fiji’s unique natural heritage.

### **For further information, contact us:**

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Photographs, from top left: Male Orange Dove *Ptilinopus victor* © Paddy Ryan; Kavula *Endospermum macrophyllum* © Jörg Kretzschmar; Golden Dove *Ptilinopus luteovirens* © Baravi Thaman.



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