

## COUNTRY SPECIAL: TIMOR-LESTE

# Birds, birding and conservation in Timor-Leste

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## Introduction

The eastern half of Timor island, at the south-eastern limit of the Oriental region, has not featured on birders' itineraries for many years, if ever. After decades more or less out-of-bounds, it has opened up again as a newly independent country, Timor-Leste (East Timor), actively encouraging tourism and having declared its first national park. Recent surveys have revealed natural riches far greater than most could have expected or indeed hoped for. This article introduces Timor-Leste today, summarises the results of those surveys, and, we hope, provides a strong case for visitors to go to see this friendly, beautiful and bird-rich country for themselves.

## Geography

### *Timor and the Lesser Sundas*

Timor island is the largest of the Lesser Sunda islands, an archipelago of hundreds of oceanic islands spanning about 1,700 km between the Sunda shelf (of the Eurasian continental plate) to the west and the Sahul shelf (of the Indo-Australian plate) to the east at 8–10°S 119–123°E (Fig. 1). The Sahul shelf connects Australia, Papua and the Aru islands. The Sunda shelf unites Sumatra, Java, Borneo and Bali with continental Malaysia and Thailand. The Lesser Sundas are divided between two groups or arcs: the Inner Banda Arc islands include the mostly volcanic islands of Lombok, Sumbawa and Flores, through to Alor, Wetar and the Banda Islands, and the Outer Arc islands include Timor, Roti and Semau through to Tanimbar. Sumba is considered a continental fragment.

### *Timor and associated islands*

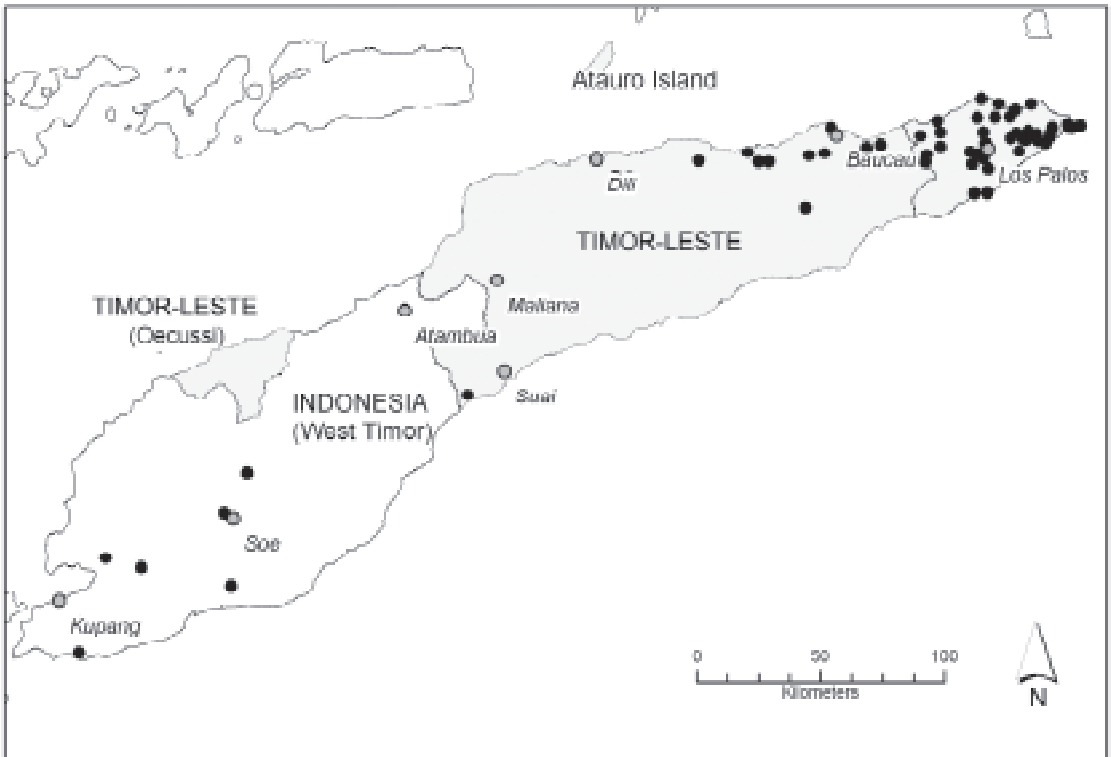
Timor island is 474 km long and up to 95 km wide (c. 30,700 km<sup>2</sup>). It comprises parts of the nation of Timor-Leste (main block is 260 km long and up to 80 km wide; 14,874 km<sup>2</sup>) including the Oecussi enclave plus the islands of Jaco and Atauro, and part of the Indonesian province of East Nusa Tenggara; the Indonesian part is commonly referred to as West Timor (15,850 km<sup>2</sup>). The arc-shaped Timor island is aligned east-west and is broadest towards the centre and west. The distance from Timor to Australia is 450 km. The main islands neighbouring Timor are: Semau (261 km<sup>2</sup>, 2.7 km from Timor), Roti (1,263 km<sup>2</sup>, 12 km from Timor), Atauro (148 km<sup>2</sup>, 24 km from Timor), Jaco (12 km<sup>2</sup>, 0.7 km from Timor), Wetar (2,684 km<sup>2</sup>, 49 km from Timor) and Alor (2,125 km<sup>2</sup>, 40 km from Timor). Timor, Semau and Jaco would frequently have been connected over the last 250,000 years, but Roti, Atauro, Wetar and Alor would have remained isolated by about 10, 20, 35 and 35 km (respectively).

### *Origins and geology of Timor and associated islands*

It is generally accepted that all the major continental islands of South-East Asia, including Timor, were part of the Gondwana supercontinent. The origin of Timor and the other Outer Banda Arc islands is complex and controversial, but it is agreed to have been formed by continent-continent collision. The Australian continental shelf is moving north. Timor probably emerged after the low-density continental margin of Australia began sinking (i.e. was subducted) below the Eurasian Plate about 4 million years ago. Timor is composed mostly of sedimentary

Figure 1. Map showing some of the main islands of the Lesser Sundas region.





**Figure 2.** Map of Timor island, showing international frontiers, and distribution of systematic bird sampling (solid circles) in Timor-Leste (highlighting the intensity of effort in Lautem district) and West Timor. Main towns are marked with open circles.

rocks (limestone, clays, shales and gravels) with some igneous rocks and crystalline schists (Glover 1986). The island was uplifted rapidly about 2 million years ago and has risen about 700 m during the past 200,000 years. Of the two other islands that are part of the state of Timor-Leste (see below), Jaco—off the eastern tip of Timor—is low coralline limestone, while Atauro, 3–3.5 million years old, is part of the Inner Volcanic Arc, and consists of highly eroded volcanic remnants of marine origin.

### Climate

Timor has a highly seasonal dry tropical (monsoonal) climate that is geographically variable depending on elevation and aspect. North coast towns such as Manatuto and Vermasse with mean annual rainfall of 600 mm/yr (over a 4–6 month wet season) are among the driest in South-East Asia. There are two wet-season peaks along the south coast, and in the mountains, with a total of 7–9 months of rain (1,500–4,000 mm/year). The dry season (July to October) has little rain and low humidity. This is generally the best time for field visits. Lowland and coastal towns such as Dili are typically hot during the day (31–33°C) and warm at night (20–25°C), but daytime temperatures decrease by about 4–5°C with each 1,000 m of elevation.

### Timor-Leste

Timor-Leste (in full, the Democratic Republic of Timor-Leste) is the official name of the country that now occupies the former Portuguese Timor; the name, perhaps unfamiliar to many, results simply from the adoption of Portuguese as the official language, *Leste* meaning East. While it remains commonly known as East Timor (and was referred to in BirdLife International [2001] as Timor Loro Sae), the country, which includes the eastern part of Timor island, Oecussi enclave and offshore islands Atauro and Jaco is hereafter referred to as Timor-Leste, and occasionally as “the East”. The remainder of Timor is referred to as West Timor, or the “the West”.

### History and people

#### Early colonisation and languages

Archeological evidence shows that Timor was first inhabited by prehistoric hunter-gatherers about 30,000–40,000 years ago (O'Connor *et al.* 2002), who lived in rock shelters with a diet including Pleistocene fauna (giant rats, birds and reptiles). Evidence from agriculture suggests that about 3,000 years ago Austronesian seafarers arrived on the island. About 40 languages now occur on Timor, and—with the exception of very

recent additions—these belong to either the Austronesian language family or the trans-New Guinea phylum.

### *The Dutch and Portuguese on Timor*

In 1566, the Portuguese established colonies in East Timor, mainly for Sandalwood *Santalum album* (source of an aromatic oil). They fought regularly with local tribes and the Dutch (based in Kupang, West Timor); these conflicts resulted in Portuguese retention of the Oecussi enclave on the north coast of (then) Dutch western Timor, as well as Atauro island, and hence their inclusion to this day in the modern state of Timor-Leste rather than Indonesia; the borders of Timor-Leste are exactly those of the former Portuguese Timor (Fig. 2). In the late nineteenth century, Timor was visited by the great naturalist-explorer Alfred Russel Wallace, who conducted his pioneering research into evolution in this part of Asia in the nineteenth century; he noted that the Timorese "...fight continually amongst themselves, and take every opportunity of kidnapping unprotected people of other tribes for slaves" (Wallace 1869). Relations among the local polities changed continually, with regular seasonal raiding into territories, ritual headhunting, and migration of clans in search of land and water (Fox 2003). The Portuguese mounted about 60 expeditions between 1847 and 1913 to control the Timorese, but the island was never colonised like other parts of the East Indies—the Portuguese simply claimed to have pacified their territory by 1912 and the Dutch (West Timor) by 1915. In 1860, the Portuguese Governor of Timor, Affonso de Castro, described the situation: "Our empire on this island is nothing but a fiction" (Fox 2003). Following Portuguese withdrawal in 1975, eastern Timor was occupied by Indonesia until 1999, when a United Nations Transitional Administration in East Timor (UNTAET) was set up. The country gained independence in 2002.

### *Main historical land uses*

During the past few millennia the dominant land uses on Timor have been agriculture (shifting or swidden agriculture), use of timber and non-timber forest products for house construction, grazing by goats, sheep, cattle, buffalo and horses, and more recently, agricultural crops such as rice, coffee, vegetables, particularly maize, fruit and agroforestry. The populous north coast of Timor-Leste is dry, but many rivers bring regular water for agriculture (Fox 2003). The rugged topography of the mountains has hindered the build-up of large populations, with communities generally living in small and scattered villages. As the Sandalwood trade dwindled in the nineteenth century, coffee was

introduced and planted widely in the upland areas throughout Timor.

In the 1960s the Portuguese initiated agricultural programmes on the south coast to entice a population shift, which was continued from 1977 by the Indonesian government which controlled Timor-Leste from 1975 to 1979, after Portuguese rule ceased. Fighting between the Indonesian military and Falantil (the armed wing of the independence movement) reinforced this movement from mountains to coast in 1975–1980 (Fox 2003). Since Timor-Leste's independence in 2002, the slow pace of economic development and lack of jobs saw major population shifts towards the towns of Dili and Baucau, with a major exodus from Dili during 2006–2007 because of communal and political conflict. Timor-Leste has a population of some 1.01 million people (2005; Ministry of Planning and Finance: [www.dne.mopf.gov.tp](http://www.dne.mopf.gov.tp); a density of 68 per km<sup>2</sup>): population densities are lower than West Timor (1.59 million people at an average population density of 97 per km<sup>2</sup>) and far lower than in much of neighbouring Indonesia.

### **Birds of Timor, and specifically of Timor-Leste**

#### *Species and status*

At least 262 bird species are known from Timor; 169 are considered resident, 76 regular migrants and 17 vagrants (Trainor *et al.* 2007b). Of the 49 birds added to the island list since the publication of *The birds of Wallacea* (White & Bruce 1986), just one was a native passerine bird (Pale-headed Munia *Lonchura pallida*). Two introduced birds (Sooty-headed Bulbul *Pycnonotus aurigaster* and Eurasian House Sparrow *Passer domesticus*) have become well established on Timor since 1997–1999; but almost all of the additions have been seabirds and waterbirds. Several species reported without detail and so needing confirmation include Schrenk's Bittern *Ixobrychus eurhythmus*, Baillon's Crake *Porzana pusilla*, Dunlin *Calidris alpina*, Eastern Grass Owl *Tyto longimembris* and Slender-billed Crow *Corvus enca*. Finally Sunda Cuckoo *Cuculus lepidus* has been split from the migrant Oriental Cuckoo *C. saturatus* whereas the two species are lumped in the field guide.

#### *Endemism*

Timor island lies in a biogeographic region known as Wallacea, named after Wallace in honour of his unique travels and studies among the thousands of oceanic islands in the seas between the Eurasian and Australasian continental plates. These islands have been colonised by animals and plants from both Asia and Australasia, but through long isolation have developed exceptionally high levels of endemism.

Timor and its associated islands of Wetar, Sawu, Roti and Semau have been defined by BirdLife International as the “Timor and Wetar Endemic Bird Area” (EBA) (Stattersfield *et al.* 1998) on the basis of an analysis of the distributions of restricted-range bird species, defined as those

with a total range size of less than 50,000 km<sup>2</sup>. Among the 126 resident land birds, Stattersfield *et al.* (1998) listed 35 restricted-range species as occurring in the Timor and Wetar EBA; 31 are found on Timor island (all of which have been recorded in Timor-Leste: see Table 1), including

**Table 1.** Threatened and restricted-range species recorded in Timor-Leste.

English name	Scientific name	IUCN <sup>1</sup>	EBA <sup>2</sup>	Altitude (m) <sup>3</sup>	Habitat
Christmas Island Frigatebird	<i>Fregata andrewsi</i>	CR		Sea-level	Marine
Beach Thick-knee	<i>Esacus giganteus</i>	NT		Lowlands	Beaches
Malaysian Plover	<i>Charadrius peronii</i>	NT		Lowlands	Beaches
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT		Lowlands	Wetlands
Black-tailed Godwit	<i>Limosa limosa</i>	NT		Lowlands	Wetlands
Dusky Cuckoo Dove	<i>Macropygia magna</i>		RR	0–800	Evergreen forest; Tropical dry forest
Slaty Cuckoo Dove	<i>Turacoena modesta</i>	NT	RR	0–1,300	Evergreen forest; Tropical dry forest
Wetar Ground Dove	<i>Gallinolumba hoedtii</i>	EN	RR	0–800	Evergreen forest; Tropical dry forest
Timor Green Pigeon	<i>Treron psittaceus</i>	EN	RR	0–600	Evergreen forest; Tropical dry forest
Pink-headed Imperial Pigeon	<i>Ducula rosacea</i>	NT	RR	0–1,000	Forest, coastal scrub
Timor Imperial Pigeon	<i>Ducula cineracea</i>	EN	RR	400–2,200	Tropical montane forest; plantation
Yellow-crested Cockatoo	<i>Cacatua sulphurea</i>	CR		0–1,000	Tropical dry forest, woodland, plantations
Olive-headed Lorikeet	<i>Trichoglossus euteles</i>		RR	0–2,300	Forest, woodland, agricultural land
Iris Lorikeet	<i>Psitteuteles iris</i>	NT	RR	0–1,500	Closed forest, woodland, plantations
Olive-shouldered Parrot	<i>Aprosmictus jonquillaceus</i>	NT	RR	0–2,600	Tropical dry forest, savanna, plantations
Timor Coucal	<i>Centropus mui</i>	ne	RR	0–500	Tropical forests (edges), woodland
Cinnamon-banded Kingfisher	<i>Todiramphus australasia</i>	NT	RR	0–1,500	Evergreen forest, tropical dry forest
Streaky-breasted Honeyeater	<i>Meliphaga reticulata</i>		RR	0–1,200	Tropical dry forest, villages
Plain Friarbird	<i>Philemon inornatus</i>		RR	0–2,200	Tropical dry forest
Yellow-eared Honeyeater	<i>Lichmera flavicans</i>		RR	0–2,000	Evergreen forest; Tropical dry forest, <i>Eucalyptus</i> woodland
Red-rumped Myzomela	<i>Myzomela vulnerata</i>		RR	0–1,200	Tropical dry forest; village
Plain Gerygone	<i>Gerygone inornata</i>		RR	0–1,500	Tropical dry forest, scrub; village
Fawn-breasted Whistler	<i>Pachycephala orpheus</i>		RR	0–1,500	Tropical dry forest
Timor Figbird	<i>Sphecotheres viridis</i>		RR	0–1,000	Tropical dry forest, scrub
Olive-brown Oriole	<i>Oriolus melanotis</i>		RR	0–1,600	Tropical dry forest
Buff-banded Grassbird	<i>Buettikoferella bivittata</i>		RR	0–700	Tropical dry forest
Timor Stubtail	<i>Urosphena subulata</i>		RR	0–1,900	Tropical dry forest, scrub
Timor Bush Warbler	<i>Bradypterus timorensis</i>	NT	RR	c.1800	Montane forest; ?montane scrub
Timor Leaf Warbler	<i>Phylloscopus presbytes</i>		RR	0–2,300	All forest types
Spot-breasted White-eye	<i>Heleia muelleri</i>	NT	RR	0–1,460	Evergreen forest; Tropical dry forest
Chestnut-backed Thrush	<i>Zoothera dohertyi</i>	NT	RR	600–2,300	Hill and montane forest
Orange-banded Thrush	<i>Zoothera peronii</i>	NT	RR	0–1,600	Closed canopy forest, plantations
White-bellied Bushchat	<i>Saxicola gutturalis</i>	NT	RR	0–1,200	Tropical dry forest, woodland
Black-banded Flycatcher	<i>Ficedula timorensis</i>	NT	RR	0–1,200	Evergreen forest, tropical dry forest
Timor Blue Flycatcher	<i>Cyornis hyacinthinus</i>		RR	0–2,000	Tropical dry forest, plantations
Red-chested Flowerpecker	<i>Dicaeum maugei</i>		RR	0–1,200	Open forest; villages
Flame-breasted Sunbird	<i>Nectarinia solaris</i>		RR	0–1,000	Tropical dry forest, scrub; villages
Tricoloured Parrotfinch	<i>Erythrura tricolor</i>		RR	0–1,200	Tropical dry forest, thickets
Timor Sparrow	<i>Padda fuscata</i>	NT	RR	0–1,250	Woodland, grassland, agricultural land

Notes

<sup>1</sup>IUCN Red List category

<sup>2</sup>EBA: species marked RR are “restricted-range” species found only in the Timor and Wetar Endemic Bird Area

<sup>3</sup>Some elevation limits RR changed with respect to Trainor *et al.* (2007b), based on more recent work



STEFAN BEHRENS

**Plate 1.** Yellow-crested Cockatoo *Cacatua sulphurea*, Komodo Island, Lesser Sundas, September 1998.



JAMES EATON

**Plate 2.** Olive-shouldered Parrot *Aprosmictus jonquillaceus*, Bipolo, West Timor, May 2005.

**Plate 3.** Yellow-eared Honeyeater *Lichmera flavicans*, Mt Mutis, West Timor, August 2004.



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20 of the species confined to the EBA (the other three are endemic to Wetar Island). Eight are endemic to Timor, 23 to the Timor and Wetar Endemic Bird Area (Timor, Wetar, Sawu, Roti and Semau), 32 to the Lesser Sundas and 41 to Wallacea.

### **Affinities**

Timor's resident land bird fauna is most similar to the neighbouring islands of Wetar, Roti and Alor, with high levels of similarity to other large islands (Flores, Sumba, Sumbawa and Lombok). About 31% of Timor's birds are "Australian" and more than half are derived from Asia. Previous authors have suggested that 49–63% of Timor's birds are "Australian" (Mayr 1944, Noske 1997, Clode & O'Brien 2001) but these were either based on an outdated phylogeny or on a small sample of Wallace's bird specimens. A large proportion of Timor's birds are dependent on tropical forests or savannas, but there are very few grassland, mangrove and open-country species (Noske 1997).

### **East and West Timor**

Since all major habitats exist on both sides of the border, all birds listed for Timor island could be expected to occur in Timor-Leste (and vice versa), but this may not be true. Two resident West Timor landbirds remain unknown from the East: Elegant Pitta *Pitta elegans* and Timor Bush Warbler *Bradypterus timorensis*; the pitta appears genuinely absent from the East, but can be locally abundant in the West (Trainor 2005), while the "lost" warbler (see below) may yet be rediscovered either side. Two species known only from the East are Orange-footed Megapode *Megapodius reinwardt* (present on Atauro and Jaco islands as a breeding resident, and a visitor to the extreme eastern tip of the eastern mainland) and Pheasant (Timor) Coucal *Centropus (mul) phasianinus*, which is apparently restricted to Lautem district in the extreme east.

Turning to abundance, Dusky Cuckoo Dove *Macropygia magna*, Slaty Cuckoo Dove *Turacoena modesta*, Yellow-crested Cockatoo *Cacatua sulphurea*, Marigold Lorikeet *Trichoglossus capistratus*, Olive-shouldered Parrot *Aprosmictus jonquillaceus*, Cinnamon-banded Kingfisher *Todiramphus australasia*, Yellow-eared Honeyeater *Lichmera flavicans*, Chestnut-backed Thrush *Zoothera dohertyi* and Orange-banded Thrush *Z. peronii* all appear much commoner in the East, whereas only Buff-banded Grassbird *Buettikofarella bivittata* is commoner (and much more widespread) in the West. Among various reasons that could be proposed, it seems clear that the greatly reduced hunting pressures in the East are of particular benefit to forest pigeons, parrots, and probably thrushes.

### Montane and lowland Timor

Timor island has extensive land above 1,000 m but little intact montane forest. While attention is normally focused on threatened and endemic species, the remaining landbirds hold much interest, particularly in relation to these montane forests. Several of the restricted-range species are strictly montane, especially Timor Imperial Pigeon *Ducula cineracea*, Timor Bush Warbler and Chestnut-backed Thrush *Zoothera dohertyi* (Table 1), but so also are some non-endemics: Yellow-breasted Warbler *Seicercus montis* (1,100–2,300 m +), Pygmy Wren Babbler *Pnoepyga pusilla* (1,100–2,000 m +), Mountain White-eye *Zosterops montanus* (500–2,600 m), Island Thrush *Turdus poliocephalus* (1,100–2,600 m), Lesser Shortwing *Brachypteryx leucophrys* (1,100–2,100 m +), Snowy-browed Flycatcher *Ficedula hyperythra* (1,100–2,200 m +) and Blood-breasted Flowerpecker *Dicaeum sanguinolentum* (920–1,200 m +). Many of these are Asian montane species. Others are unexpectedly found in lowlands, when elsewhere in Asia they are typically montane birds: Sunda Bush Warbler *Cettia vulcania* and Little Pied Flycatcher *Ficedula westermanni* (Noske 1997). Relatives of the Timor Stubtail *Urosphena subulata* and Timor Blue Flycatcher *Cyornis hyacinthinus* are montane, but both occur widely on Timor (Noske 1997). On Flores the Timor Leaf Warbler *Phylloscopus presbytes* is found only in the mountains, but on Timor it occurs from the lowlands to the mountains.

### Taxonomy

Naming conventions here follow BirdLife International (2008) with the following exceptions: the distinctive *capistratus* race of Rainbow Lorikeet *Trichoglossus haematodus* is recognised as a full species, Marigold Lorikeet *T. capistratus*, and the distinctive Timor race of Pheasant Coucal is recognised as a full species, Timor Coucal *Centropus mui*.

The recently published *Systematics and taxonomy of Australian birds* (Christidis & Boles 2008) briefly mentions some (Australian) birds occurring in the Timor region that need further taxonomic study. These include: Barred Dove *Geopelia maugeus*, Emerald Dove *Chalcophaps indica*, Rainbow Lorikeet *Trichoglossus* spp., Little Bronze Cuckoo complex *Chrysococcyx* spp., Brush Cuckoo complex *Cacomantis* spp., Southern Boobook *Ninox* spp., White-shouldered Triller *Lalage* spp., fantails *Rhipidura* spp., and Zebra Finch *Taeniopygia* spp. Christidis & Boles (2008) have also split a number of Australian forms of wide-ranging taxa, and for some of these it is not clear whether the Australian or Asian/European form occurs on Timor (e.g. Osprey *Pandion*



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Plate 4. Timor Blue Flycatcher *Cyornis hyacinthinus*, Tahura Forest Park, Amarasi, West Timor, August 2004.



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Plate 5. Male Snowy-browed Flycatcher *Ficedula hyperythra*, mountains of Timor-Leste, April 2008.

Plate 6. Chestnut-backed Thrush *Zoothera dohertii*, April 2008.



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*haliaetus*, Great Egret *Casmerodius albus*, Barn Owl *Tyto alba* and Clamorous Reed Warbler *Acrocephalus stentoreus*) and whether these splits will find general international support. The Australian Darter *Anhinga novaehollandiae* is present and not the Oriental Darter *A. melanogaster*. Among taxonomic uncertainties concerning Asian species (Collar 2003, Rheindt & Hutchinson 2007) some of the most interesting of these on Timor are montane birds (or typically montane birds, as above).

### Habitats and their characteristic birds

Timor is hilly or mountainous, with little flat land. A central mountain chain forms the island's spine, with many peaks above 2,000 m, Mount Tatamailau (or Ramelau) in Timor-Leste being the highest at 2,963 m; Gunung Mutis at 2,400 m is the highest peak in West Timor. Rivers are short and broad, and flow towards the north or south coasts, rapidly but for short periods. A narrow plain (3–10 km wide) along much of the south coast is characterised by seasonally inundated swamp forest, swamps and tall grasslands. Hills dominate much of the north coastal region with little coastal plain development. In Timor-Leste there are three major plateaus around Maliana, Baucau and Lospalos.

Much of Timor supports woody vegetation, mainly in the form of woodlands and savannas, but primary closed-canopy forest is locally distributed. In the 1860s, Wallace (1869) noted that "there is one important exception in the island of Timor ..., in which there is absolutely no forest such as exists in the other islands". Mayr (1944) conveyed observations by Stein in 1931: "...much was expected from the previously unexplored high mountains of eastern Timor, but the result was disappointing. Villages occur up to an altitude of 2,300 metres, and the forests have, therefore, entirely disappeared from the mountains....".

### Tropical forests (closed-canopy forests)

Despite many threats, a wide range of tropical forests persists in Timor-Leste, mostly as small patches including montane forest (above about 1,000 m), tall evergreen forest (trees growing to 40 m), semi-deciduous, tropical dry forest, and thorn forest (trees to 10–20 m with many deciduous species). Evergreen swamp forests occur on the south coast, with unique inland patches around Lake Iralalaro. The largest block of tropical forest on Timor island occurs in the Lore, Muapitine, Mehara and Tutuala village areas of Lautem district, in the recently declared Nino Konis Santana National Park. These forests are particularly rich in fleshy fruits and host many frugivorous birds. Most of the globally threatened and restricted-range

birds rely on this habitat, although there are varying patterns of habitat use. The Cinnamon-banded Kingfisher and Black-banded Flycatcher *Ficedula timorensis* prefer evergreen forests, whereas Timor Figbird *Sphecotheres viridis*, White-bellied Bushchat *Saxicola gutturalis* and Flame-breasted Sunbird *Nectarinia solaris* prefer tropical dry forests.

### Woodland and savanna

Woodlands and savannas are extensive along the north coast including *Eucalyptus alba* woodland, palm and acacia savanna, and *E. urophylla* open forest in the hills. Much of this vegetation was presumably formed by the historical conversion of tropical forest to agriculture, but some occurs naturally in areas of low rainfall and on ridges and particular geologies. There are few specialised birds, but the White-bellied Bushchat and Timor Sparrow *Padda fuscata* are often abundant. Nectarivores such as Iris Lorikeet *Psitteuteles iris* and Olive-headed Lorikeet *Trichoglossus euteles* are seasonally abundant when eucalypts flower. Australasian Lark *Mirafra javanica* and Helmeted Friarbird *Philemon buceroides* are common birds of lowland savannas. The Yellow-eared Honeyeater *Lichmera flavicans* is a dominant bird above about 500 m.

### Coffee plantations

Coffee plantations shaded by the overstorey tree Sengon *Paraserianthes falcataria* are widespread above 600 m in Bobonaro, Ermera, Liquica and Same districts. These plantations are poorer in birds than natural tropical forests, but a wide range of forest birds are present including Yellow-crested Cockatoo, Iris Lorikeet, Olive-shouldered Parrot *Aprosmictus jonquillaceus*, Orange-banded Thrush and Timor Blue Flycatcher *Cyornis hyacinthinus*.

### Agricultural land

Swidden agriculture with small-scale grain and vegetable crops is the main form of agriculture in Timor-Leste. Open-country species such as Barred Dove, Large-billed Crow *Corvus macrorhynchos*, White-shouldered Triller *Lalage sueurii* and Pied Bushchat *Saxicola caprata* are often common in this habitat. Resident Greater Painted-snipe *Rostratula benghalensis* and many migrant waders and other waterbirds use different stages of irrigated ricefields (e.g. at Lacro, Secal, Laleia and Laivai rivers); Timor Sparrow is frequently common in these same river valleys.

### Grassland

Grasslands are extensive on degraded lands and on plateaus near Lospalos and Maliana. Quail *Coturnix* spp., Tawny Grassbird *Megalurus timoriensis*,

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**Plate 7.** Important areas of montane forest survive in a few places in Timor-Leste, including Mount Mundo Perdido.

**Plate 8.** Montane forest also survives as small patches on Mount Legumau.

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**Plate 9.** *Eucalyptus alba* savanna woodland is widespread in dry areas of Timor-Leste, including Atauro island (shown here).



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**Plate 10.** Dry deciduous forest is found in drier areas with strong dry seasons, seen here on limestone hills at Tilomar .

**Plate 11.** Timor-Leste has some of the most important freshwater wetlands in the Lesser Sunda region; Lake Modo Mahut has some of the most intact wetland ecosystems.

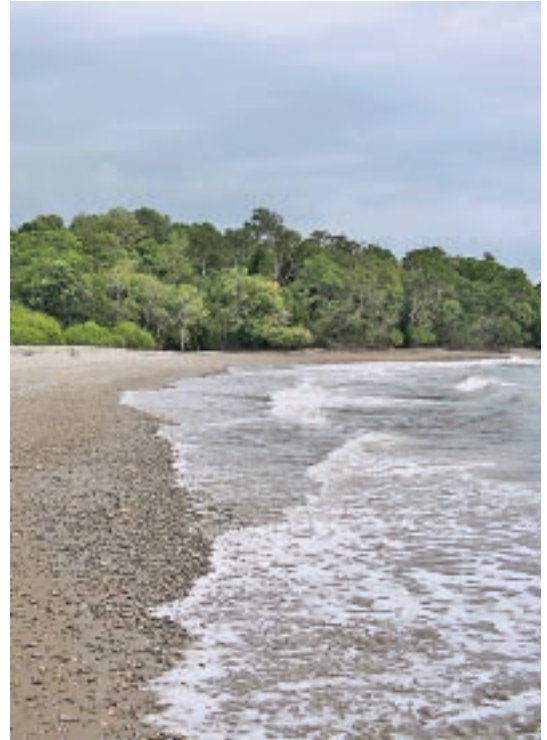
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COLIN TRAINOR



**Plate 12.** The Irasequiro River flows out of Lake Iralalalo; this is a unique region of grassland and wetland largely surrounded by forest.



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**Plate 13.** Near Lore, the coastal forest extends up to the mountains in the Mount Paitchau and Lake Iralalalo range. This area and the Lore region are part of the magnificent Nino Konis Santana National Park.

**Plate 14.** Coastal evergreen forest and dry forest extends down to the undisturbed beach in the Vero River area in the extreme south-east of Timor-Leste.

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cisticolas *Cisticola* spp., Australasian Lark, migrant Yellow Wagtail *Motacilla flava*, Australasian Pipit *Anthus richardi* and estrildid finches are often common in this habitat. Along the rainshadow regions of the north coast, grazed short-grass habitat provides feeding opportunities for migrant Oriental Plover *Charadrius veredus*, Australian Pratincole *Stiltia isabella* and Oriental Pratincole *Glareola maldivarum*. Taller *Imperata* grasslands along the south coast provide extensive but poorly surveyed habitat for rails Rallidae, (presumed) Swinhoe's Snipe *Gallinago megala* and quail.

### Wetland

Wetlands are extremely limited in Timor-Leste, but there is a wide variety of types including freshwater lakes, saline lakes, rivers, swamps and marshes, wet grasslands, river estuaries, intertidal sand- and mudflats, sandy and rocky beaches, mangrove and exposed coral reefs (Trainor 2005). Lake Iralaloro (55 waterbird species) and Lake Modo Mahut are internationally significant wetland complexes. Mangrove is extensive in the Hera-Metinaro area, 12–35 km east of Dili, but is poor in birds. Near-threatened species using wetlands in Timor-Leste include Asian Dowitcher *Limnodromus semipalmatus* and Black-tailed Godwit *Limosa limosa*, as well as terns, pelican, cormorants, ducks and rails.

### Coastlines, especially beach

Timor-Leste is fringed by beaches and rocky coastline, with occasional estuaries and coastal lagoons. Much of the original littoral vegetation has been converted through agriculture, but beach forest and coastal strand habitats are still present in parts of Lautem district. Near-threatened beach-dwellers such as Malaysian Plover *Charadrius peronii*, Great-billed Heron *Ardea sumatrana* and Beach Thick-knee *Esacus giganteus* occur in small numbers along the coast, together with migrant shorebirds, herons, terns and other seabirds.

### Villages

Village land offers simplified habitat with coconut palms, medium-sized fruit trees and numerous flowering plants. These are often poor in species, but include nectarivores such as Streaky-breasted Honeyeater *Meliphaga reticulata*, Brown Honeyeater *Lichmera indistincta* and Red-rumped Myzomela *Myzomela vulnerata*; and small insectivores such as Ashy-bellied White-eye *Zosterops citrinella* and Pied Bushchat.

### Ocean/pelagic

Open ocean surrounds Timor-Leste, providing habitat for many seabirds including boobies Sulidae;

petrels and shearwaters Procellariidae, storm-petrels Hydrobatidae, frigatebirds Fregatidae and terns Sternidae. The migrant Red-necked Phalarope *Phalaropus lobatus* appears to winter in significant numbers in waters between Dili and Atauro Island, and perhaps elsewhere around Timor-Leste. The status of all seabirds is poorly known in the region, and would make an interesting study.

### History of ornithological exploration

Up to 1980, 24 ornithological surveys or reports are listed for Timor (White & Bruce 1986), beginning with William Dampier in 1699. Major collections and surveys include those of Muller (1828–1829), A. R. Wallace (1856–1861), D. S. Hoedt (1863–1866), H. O. Forbes (1882), C. B. Haniel (1911) (Hellmayr 1914), G. H. W. Stein (1931–1932) (Mayr 1944), and McKean and Mason (1973–1974). Georg Stein spent almost five months in West and East Timor, collecting 1,300 specimens during visits to Lelogama, Mount Mutis (West Timor), and Mount Ramelan (Ramelau) in East Timor. The Portuguese literature is patchy. Sousa (1883) and Themido (1938) briefly listed specimens collected by F. B. de Carvalho and R. das Dores. Bacelar (1958) provided a useful list of collections made by F. B. de Carvalho, and Mesquitela (1989) produced a summary of collections including those noted by Themido, Bacelar and Stein and Mayr. McKean *et al.* (1975) collected 97 species (281 specimens) in East Timor, which were deposited at the Australian National Wildlife Collection in Canberra. They described a new race of Pheasant Coucal (Mason *et al.* 1984) and published their new Timor records (McKean *et al.* 1975), some of which were not quite new (Mees 1976). Recent studies by Richard Noske (Noske 1994, 1996, 1997, Noske & Saleh 1996) and visiting birdwatchers (most notably Andrew 1986) added many new birds to the list. Contemporary observations in Timor-Leste by CRT and others have added a further 20 birds to the list for Timor, almost all being migrant waders, seabirds or rails (Mauro 2003, Trainor 2004, 2005, Trainor & Soares 2004, Trainor & Leitão 2007, Trainor *et al.* 2007b). Extensive tropical forests in Lautem district have been the prime target of recent fieldwork (Fig. 2).

### Mammals, reptiles, frogs and freshwater fish of Timor

The non-bird land fauna of Timor is poorly known; recent surveys have revealed new species of bats, frogs, geckos and skinks. The mammal, frog and reptile faunas are dominated by Asian families and species. At least 52 mammals occur on Timor with about one-third introduced. Remarkably, only two native terrestrial mammals have been recorded—

Timor Shrew *Crocidura tenuis* and Timor Rat *Rattus timoriensis*—with the remaining native mammals being bats (at least 33 species). There are at least six introduced rats and mice and several introduced shrews. Timor once had a rich native rat fauna including giant rats, but these may have become extinct after the introduction of mammals associated with human settlement during the last 1,000–7,000 years (Glover 1986), including: Common Spotted Cuscus *Phalanger orientalis* (the only Australo-Papuan marsupial on Timor), Long-tailed Macaque *Macaca fascicularis* (the only primate), Common Palm Civet *Paradoxurus hermaphroditus*, Eurasian Wild Pig *Sus scrofa*, Rusa Deer *Cervus timorensis*, rats and mice.

There are moderate to high levels of endemism especially for frogs (about 50% Timor-endemic), skinks (25%) and geckos (25%). There are about 15–20 frog species and 40 or more reptiles including six geckos, two monitor lizards, about 10 skinks, at least one blind snake, three pythons, one viper, about eight colubrid snakes, one file snake, at least four primitive sea snakes, the Estuarine Crocodile *Crocodylus porosus*, one recently discovered *Chelodina* freshwater turtle (Kuchling *et al.* 2007) and four sea turtles. Oceanic islands such as Timor are generally poor in freshwater fish, and those species present are typically derived from marine ancestors. At least 50 freshwater and estuarine fish have been recorded. Two endemics occur on Timor: the Rice-fish *Oryzias timorensis* and a newly described hardyhead fish *Craterocephalus laisapi* from Lospalos, representing a genus known otherwise only from Australia and southern New Guinea (Larson *et al.* 2005). As for birds (above), a few differences have been found between Timor-Leste and West Timor: the single native rat is known only from the West, and the endemic turtle and hardyhead fish from the East.

### Threatened birds

Four globally threatened and 14 near threatened birds occur in Timor-Leste (Table 1); in addition, the critically endangered Christmas Frigatebird *Fregata andrewsi* has been recorded apparently as a vagrant (BirdLife International 2008). Leaving the latter aside, all the threatened birds depend on tropical forest habitat for their survival, and the remaining forests of Timor-Leste and neighbouring Indonesia (perhaps especially Wetar) are critical for these species. Hunting is a particular threat in addition to habitat loss—three of the four threatened birds are fruit-eating pigeons, large-bodied species much sought after by hunters. Threat status has not been evaluated by BirdLife International for two species recognised here, Marigold Lorikeet and Timor Coucal, because they



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**Plate 15.** Slaty Cuckoo Dove *Turacoena modesta*, Tahura Forest Park, Amarasi, West Timor, August 2004.

are not recognised as species by BirdLife; we provide a tentative category for each.

### Slaty Cuckoo Dove *Turacoena modesta* (Near Threatened)

The Slaty Cuckoo Dove is generally uncommon in a wide range of tropical forests including open *Eucalyptus* forest along watercourses. Occasionally in tropical evergreen forest it can be a dominant pigeon, with many individuals calling throughout the day, with its characteristic and far-reaching descending *hoo-wook* call. Known only from Timor, Roti, Jaco, Atauro and Wetar islands.

### Wetar Ground Dove *Gallicolumba hoedtii* (Endangered)

The Wetar Ground Dove is one of the rarest pigeons in the world (Timor and Wetar) and may have specialised habitat requirements. In Timor-Leste, it was found in 2005 in spring forest at Foho Lulik, on the south coast near the Indonesian border (Lambert *et al.* 2006). No other regular sites are known anywhere, but traders in Dili indicated that captured birds were obtained from the Natarbora area, which includes a wild area of swamp forests, secondary forests and wetlands in the Sungai Clere

region of Manufahi (Same) and Manatuto districts. Birds seen appeared to have a strong association with the spring habitat, but more survey work is needed on the broad coastal plain on Timor-Leste's south coast. It is believed to be absent from Nino Konis Santana National Park in the far east.

**Timor Green Pigeon *Treron psittaceus*  
(Endangered)**

Local villagers suggest that pigeon hunting for Portuguese-era and local celebrations, and by the Indonesian military, has devastated populations of the Timor Green Pigeon. The bird is regarded as "deaf": when one member of a flock is shot, other birds sit in the trees until they too are shot, with the result that a large proportion of a flock might be killed in a short period. They are generally highly local, but in the Vero river valley of Nino Konis Santana National Park, flocks of 30–50 birds are occasionally observed. Flocks presumably move over a large area to obtain *Ficus* fruit. Timor Green Pigeon is relatively common in the Lore coastal evergreen forest. One huge flock of 130 birds was observed feeding in a village fruit tree at Wairoke (Wairoce). As a result of its naive behaviour, the Timor Green Pigeon is likely to remain threatened unless air-rifles are effectively banned. This pigeon occurs only on Timor and Roti, and perhaps Atauro based on information from local villagers.

**Pink-headed Imperial Pigeon *Ducula rosacea*  
(Near Threatened)**

Generally the most common forest pigeon in Timor-Leste, often replaced above about 1,200 m by Timor Imperial Pigeon. Typically observed in small flocks of fewer than 10 birds, but up to 100 birds have been seen in the Lore area feeding on *Canarium* trees. A prime target for local hunters.

**Timor Imperial Pigeon *Ducula cineracea*  
(Endangered)**

This large montane pigeon is restricted to Timor and Wetar. It is locally abundant in tropical evergreen forest above 1,200 m, and is regularly found in scattered *Ficus* trees amongst coffee plantations near Dili (Railako). More surveys of mountain areas are needed to understand its status better, but it does appear to be commoner in Timor-Leste than in West Timor (see above), where recently it has only been recorded from the Gunung Mutis area.

**Yellow-crested Cockatoo *Cacatua sulphurea*  
(Critically Endangered)**

The Yellow-crested Cockatoo *Cacatua sulphurea* occurred widely in Wallacea until intensive trade began in the late 1970s. Worldwide fewer than

5,000 birds are thought to remain in the wild, with perhaps up to 500 in Timor-Leste. This is certainly the best population after Sumba island (with its distinctive race *citrinocristata*) and Komodo island. Generally highly local, with populations of 20–40 birds at several sites including Lake Modu Mahut (Mauro 2003), Lore IBA and Mount Cabaque. This bird is frequently seen in small groups throughout much of Nino Konis Santana National Park, where a total of 100 birds may persist. Poorly surveyed areas around Ermera and Railako, dominated by coffee plantation and *Eucalyptus* forest, are said by local people to hold a few hundred birds; this remains unconfirmed although birds are certainly present. Low-level trapping of young birds continues, but at much lower rates than during the Indonesian period. Apart from being a valuable commodity, the Yellow-crested Cockatoo is said to be a pest of corn crops. Population levels may now be increasing.

**Marigold Lorikeet *Trichoglossus capistratus*  
(perhaps Near Threatened)**

The Marigold Lorikeet occurs on Timor, Wetar, Roti, Atauro and Sumba, and is part of the Rainbow Lorikeet *T. haematodus* complex. In Timor-Leste, this lorikeet is dominant in lowland tropical forest, while Iris Lorikeet and Olive-headed Lorikeet *T. euteles* replace it in *Eucalyptus*-dominated savannas and woodlands. All three species may co-occur in tropical montane forest at 1,000–1,500 m. Trade appears to be at a low level, although Marigold Lorikeet is a common cagebird in Dili.

**Iris Lorikeet *Psitteuteles iris* (Near Threatened)**

This and the Olive-headed Lorikeet *Trichoglossus euteles* are among the most localised and unpredictable of the restricted-range birds. It appears to be entirely absent from Nino Konis Santana National Park, but can be locally abundant in coffee plantations and *Eucalyptus* open forest (at 500–1,200 m) south of Dili (Aileu, Railako and Gleno).

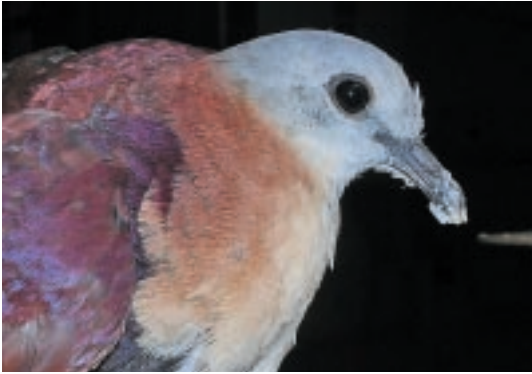
**Olive-shouldered Parrot *Aprosmictus jonquillaceus*  
(Near Threatened)**

This parrot occurs over a wide range of mostly lowland habitats, and appears to be commonest in *Eucalyptus* woodlands and open forests such as south of Dili. Small numbers are captured and traded locally. Observed in small family parties of 3–7 birds.

**Timor Coucal *Centropus mui* (perhaps Vulnerable)**

This species was described by Mason *et al.* (1984) following collection of a bird at Lake Iralalano. Recent observations have found that it is absent

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**Plate 16.** Wetar Ground Dove *Gallucolumba hoedtii*, Dili, Timor-Leste, September 2004.

ANDY RHODES



**Plate 17.** Pink-headed Imperial Pigeon *Ducula rosacea*, Bipolo, West Timor, July 2006.

**Plate 18.** Yellow-crested Cockatoo *Cacatua sulphurea*, Komodo island, Lesser Sundas, September 1998.

STEFAN BEHRENS



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**Plate 19.** Iris Lorikeet *Trichoglossus iris*, Mt Mutis, West Timor, August 2004.

**Plate 20.** Olive-shouldered Parrot *Aprosmictus jonquillaceus*, Buat, West Timor, September 2004.



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**Plate 21.** Cinnamon-banded Kingfisher *Todiramphus australasia*, Bipolo, West Timor, July 2006.



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**Plate 22.** Spot-breasted White-eye *Heleia muelleri*, Timor, June 1993.

**Plate 23.** Orange-banded Thrush *Zoothera peronii*, Bipolo, West Timor, August 2007.



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from the interior of evergreen and tropical dry forest, but is often common at forest edges, particularly in association with swampy grasslands, marshes and shrubs. It is widespread in Lautem district, but to date there have been no confirmed sightings elsewhere. It is more vocal and easier to observe in the wet season.

**Cinnamon-banded Kingfisher *Todiramphus australasia* (Near Threatened)**

This is a generally common bird of tropical evergreen forest, including secondary forest, in pairs and small groups, but generally absent from tropical dry forest. Kingfishers often call briefly at dawn and dusk and are therefore easy to overlook, but at some sites it calls throughout the day, and may be among the most frequently recorded birds.

**Timor Bush Warbler *Bradypterus timorensis* (Near Threatened)**

There are no Timor-Leste records; the last confirmed record was in 1931, at c.1,800 m on Gunung Mutis in West Timor (Mayr 1944, Dickinson *et al.* 2000). Timor-Leste has more extensive montane habitat than the West, and extensive intact montane thickets on steep and inaccessible slopes. These (e.g. Mount Matebian and Mount Cablaque) should be targeted to search for this bird.

**Spot-breasted White-eye *Heleia muelleri* (Near Threatened)**

The staccato rattle of groups of 3–4 Spot-breasted White-eyes is a feature of the tropical evergreen forests of Timor-Leste, but they are generally absent from tropical dry forest. They are inconspicuous unless calling, and so are likely to be unrecorded. They occur widely in Timor-Leste, and are under no threat of extinction so long as tropical evergreen forests survive.

**Chestnut-backed Thrush *Zoothera dohertyi* (Near Threatened)**

An elusive but common bird in montane forest generally above about 1,100 m, where it occasionally co-occurs with Orange-banded Thrush. There is no trade in this bird in Timor-Leste. During 1998–2001 (and 2004–2005), hundreds to thousands of Chestnut-backed Thrush and Orange-sided Thrush were trapped in the West and sold at markets in Kupang (CRT unpubl. obs) (and also Mataram, Lombok), but there is no more recent information. Small numbers of Chestnut-backed Thrush were sold as far afield as Medan, north Sumatra in 1999–2001 (Shepherd 2005), but most of the surviving birds probably reach markets on Java.

**Orange-banded Thrush *Zoothera peronii*  
(Near Threatened)**

This thrush occurs in a wide variety of forest types, including secondary forests and occasionally regenerating swidden fields. There is currently no capture for trade in Timor-Leste (although it was captured in the Indonesian period) and it continues to be one of the most frequently heard forest birds.

**White-bellied Bushchat *Saxicola gutturalis*  
(Near Threatened)**

This bird is entirely absent from tropical evergreen forest in Timor-Leste, but is one of the commonest birds of tropical dry forest and savannas, which are extensive (especially savannas) along the north coast. Concerns that it might be threatened arose largely because its preferred habitat was rarely visited by ornithologists.

**Black-banded Flycatcher *Ficedula timorensis*  
(Near Threatened)**

This stunning bird is never abundant but pairs are regularly heard, but less regularly seen, in a wide range of tropical forests, secondary forests, and even teak plantations in tropical forest mosaics.

**Timor Sparrow *Padda fuscata* (Near Threatened)**

Specific surveys for Timor Sparrow have never been undertaken, but recent observations have found substantial populations in dry degraded savanna-woodland landscapes (especially river valleys associated with irrigated ricefields) along the north coast of Timor-Leste, where flocks of 30–50 birds are readily observed. Seasonally, local people report that flocks can comprise thousands of birds about ricefields. In contrast to neighbouring West Timor, there is no trade in Timor-Leste.

**Migrants**

Timor is used by small numbers of up to 30 shorebird species during the Palearctic winter, and small numbers of shorebirds use Timor-Leste for staging (feeding and resting) while *en route* to and from feeding grounds in Australia. Some key sites for migrants are listed in the “Where to watch” section below. Most notable among the brief shorebird transients is Oriental Pratincole, one flock of which at Lake Iralalaro consisted of 3,000 birds (Trainor 2005). The Oriental Plover is another spectacular passage migrant: it spends days or weeks in Timor-Leste in flocks of up to 70 birds.



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**Plate 24.** White-bellied Bushchat *Saxicola gutturalis*, female, Timor, June 1993.

**Plate 25.** White-bellied Bushchat *Saxicola gutturalis*, male, Timor, June 1993.



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**Plate 26.** Black-banded Flycatcher *Ficedula timorensis*, Timor, June 1993.

**Plate 27.** Timor Sparrow *Padda fuscata*, Bipolo, West Timor, August 2007.



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Little is known of migration or migrant ecology in the region, and very few landbird migrants arrive on Timor; these include Oriental Honey-buzzard *Pernis ptilorhyncus*, Chinese Goshawk *Accipiter soloensis*, Japanese Goshawk *A. gularis*, Oriental Cuckoo *Cuculus saturatus*, Arctic Warbler *Phylloscopus borealis* and Yellow Wagtail *Motacilla flava*. Several *Locustella* warblers may be regular migrants but are probably overlooked. Large numbers of migrant accipiters pass over Java and Bali to enter west Nusa Tenggara, and presumably visit Timor each year. A few Australian birds migrate to Timor-Leste, including thousands of Australian Pratincole, Black-faced Cuckooshrike *Coracina novaehollandiae* and several cuckoo species during May to December. These migrations are not always annual: Australian Pratincole and Black-faced Cuckooshrike appear to be absent in some years. The Channel-billed Cuckoo *Scythrops novaehollandiae* visits Timor regularly from September to January each year. Possibly it breeds in Timor-Leste, but this remains unconfirmed. The Magpie-lark *Grallina cyanoleuca* was considered an East Timor resident (McKean *et al.* 1975) but only a single bird has been seen since the 1970s.

### Conservation in Timor-Leste

Despite the pressures for rapid economic development, the government and people of Timor-Leste have shown an exceptional (and exemplary) commitment to maintaining their natural and cultural riches. Protection of the environment, preservation of natural resources and safeguarding of sustainable livelihoods are guaranteed under the Constitution, and backed by strong regulations—such as a total ban on commercial logging since the year 2000. This has been very much needed, as the country has opened up to the possibility of large-scale exploitation by external investors. In 2000, a consortium attempted to build a casino complex in the biologically richest part of the island, on Jaco island in the extreme east. A protected area law was quickly developed and passed by UNTAET, covering eight sites that had been identified under Indonesian authority, plus another seven. This served its purpose well. However, with independence in 2002, the Timorese government is now taking the opportunity to develop permanent protected areas and a comprehensive package of policy and legislation to support it; the area proposed for the casino has instead been included in the area declared as the country's first national park (see below).

Many communities have traditionally subsisted through slash-and-burn agriculture. This is not sustainable at current rates of land clearance and population densities, and the need to develop more appropriate livelihoods is recognised by all. To

safeguard the fragmented and fragile network of sites of conservation importance in Timor-Leste, there is strong consensus in Timor and beyond that a protected area network, carefully established so as to bring benefits to local communities, is an essential component of the management of the country's resources. The needs are large and complex, and a continuing lack of human resources and capacity is a problem in one of Asia's poorest countries, but fortunately Timor-Leste is beginning to receive the help it needs.

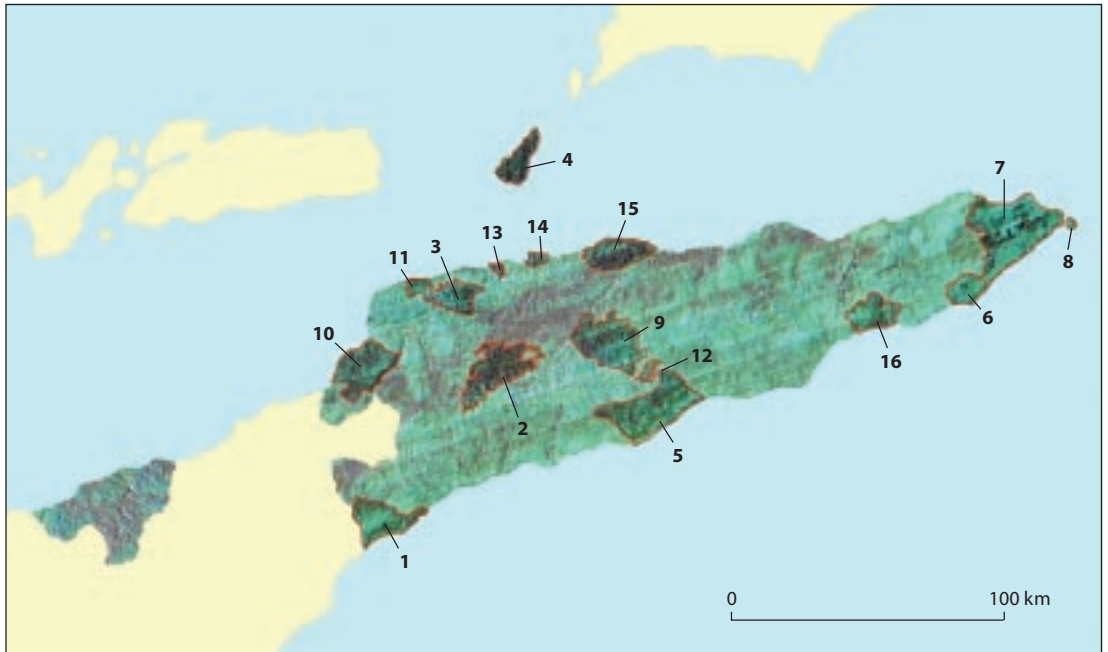
At the end of 2007, BirdLife International published *Important Bird Areas of Timor-Leste*, which identifies 16 of the most extensive and least-disturbed forests and wetlands on Timor island. The IBA research represented joint work by BirdLife and Timor-Leste's Ministry of Agriculture and Fisheries (MAF) since 2002, and the Minister of Agriculture has welcomed it as providing important baseline information for the creation of a protected areas network. The World Bank recently financed the production of the field guide to *The birds of Timor-Leste* (Trainor *et al.* 2007b) in Portuguese, Indonesian and English, based on the existing *Guide to the birds of Wallacea* (Coates & Bishop 1997), and published by BirdLife International and Dove Publications (and shortly available to purchase from Dove Publications). Studies of other fauna and flora are also underway, to ensure that the conservation and protected areas system truly represents and conserves the unique biodiversity of Timor-Leste.



### Important Bird Areas

Sixteen IBAs have been identified in Timor-Leste: 14 on the mainland and two on offshore islands (Table 2). They have a total area of 1,852 km<sup>2</sup>, just under 12.5% of the land area of Timor-Leste. Five possible additional IBAs have been identified, where insufficient biological information is currently available to confirm whether they qualify under the IBA criteria. Further ornithological surveys are required to help develop the IBA network, and to improve understanding of the status of the threatened and restricted-range birds.

All 16 IBAs support populations of some of the restricted-range birds of the Timor and Wetar EBA, and 10 of them are known to support populations of globally threatened bird species. Of the threatened species, Yellow-crested Cockatoo is known from eight of the IBAs, Timor Green Pigeon



**Figure 3.** Location of Important Bird Areas (numbered as in Table 2) in Timor-Leste. Base map taken from Trainor *et al.* (2007).

**Table 2.** Designated and candidate Important Bird Areas in Timor-Leste. The areas of candidate IBAs are not defined (ND below), pending further study.

Site name (and number: Fig. 3)	Area (km <sup>2</sup> )	Altitude (m)	Description/habitats
<i>Confirmed IBAs</i>			
1. Tilomar	227	0–1,000	Tropical dry forest; evergreen forest
2. Tata Mailau	303.7	600–2,972	<i>Eucalyptus</i> woodland; montane shrubland
3. Fatumasin	136.2	800–1,369	Tropical dry forest
4. Atauro Island-Manucoco	141.2	0–995	Montane forest; <i>Eucalyptus</i> woodland; tropical dry forest
5. Sungai Clere	422.6	0–100	Evergreen swamp forest; swamps; wet grassland
6. Lore	109	0–500	Evergreen coastal forest; coastal strand; tropical dry forest
7. Mount Paitchau and Lake Iralalaro	557.9	0–960	Evergreen and dry forests; lake and seasonally inundated sedge and grasslands
8. Jaco Island	11	0–100	Tropical dry forest
9. Mount Diatuto	344.5	600–1,770	<i>Eucalyptus</i> forest; montane forest
10. Be Malae – Atabae	278.5	0–100	Tropical dry forest; woodland; beach and shallow saline lake
11. Maubara	52.9	0–500	Shallow saline lake; tropical dry forest
12. Mount Mak Fahik & Mount Sarim	29.6	400–1,000	<i>Eucalyptus</i> forest; montane forest
13. Tasitolu	15.4	0–403	Shallow saline lake; open woodland
14. Areia Branca beach and hinterland	29.9	0–500	Beaches and mangrove; <i>Eucalyptus</i> woodland
15. Mount Curi	200.8	0–1,320	<i>Eucalyptus</i> forest & woodland; montane forest
16. Irabere estuary & Iliomar forest	165.5	0–500	Tropical dry forest; coastal mosaic at estuary
<i>Candidate IBAs</i>			
17. Saboria mountain (above 2,000 m)	ND		? <i>Eucalyptus</i> woodland; montane shrubland
18. Talobu/Laumeta mountain (above 2,000 m)	ND		? <i>Eucalyptus</i> woodland; montane shrubland
19. Mount Mundo Perdido	ND		Montane forest; <i>Eucalyptus</i> forest; grassland
20. Mount Matebian (above 2,000 m)	ND		<i>Eucalyptus</i> forest; Montane forest; montane shrubland
21. Mount Cablaque	ND		<i>Eucalyptus</i> forest; Montane forest; montane shrubland

from six, Timor Imperial Pigeon from two, and Wetar Ground Dove from a single IBA. The IBA network covers all major terrestrial habitats found in Timor-Leste, including extensive areas of lowland monsoon forest, tall evergreen forest and montane forest. Several IBAs retain small areas of coastal forest and strand vegetation. There are nationally important wetlands in eight IBAs, including freshwater and saline lakes, intertidal mudflats, swamps, mangroves, rivers and streams. Other habitats present in the IBAs are savanna woodland, shrubland, grassland and agricultural land.

**Nino Konis Santana National Park**

The history of protected area establishment in Timor-Leste is brief, but priority sites have been identified and the first park was declared in 2007. In 1967 two forest reserves were established by the Portuguese colonial government: at Tilomar (Suai district) and Lore (Lospalos), with the aim of protecting Sandalwood (FAO/UNDP 1982). In 1982, eight East Timor sites (with nine in West Timor), including Tilomar and Lore, were identified as key representative natural areas as part of the Indonesian-wide *National Conservation Plan*; two (Lore-Iralalaro and Gunung Tatamailau) were listed among the nine major areas of conservation interest

for the entire Nusa Tenggara region (FAO/UNDP 1982).

The Lore-Monte Paitchau-Iralalaro area was again identified during the period of Indonesian administration as one of the highest site priorities in the Indonesian *Biodiversity Action Plan* including freshwater lakes, swamps and tropical forest (National Development Planning Agency 1993). The 15 sites included under the UNTAET protected area law passed in 2000 (see above) included all the previously identified sites, covering at least 1,868 km<sup>2</sup>, or about 13% of the nation’s land area, but boundaries were not defined and the sites are not recognised in land-use planning (Trainor *et al.* 2007a).

Therefore, at the beginning of 2007 no protected areas with clear boundaries had been formally declared in Timor-Leste. Sixteen conservation areas have been declared in West Timor covering 1,533 km<sup>2</sup> (Departemen Kehutanan 2007) or 9.6% of the land, although boundaries have not been established and there is little to no management. Therefore the need for protected area establishment to safeguard the birds and other biodiversity of Timor was urgent.

As the map of IBAs (Fig. 3) shows, and as every site-prioritisation exercise carried out has also

**Figure 4.** Map of the terrestrial part of Nino Konis Santana National Park, and names of villages in Lautem district. Based on Government of Timor-Leste (2007). The park also extends into the marine zone on all coasts.



found, there is a concentration of rich sites for wildlife in the extreme east of Timor-Leste. In 2007, the government declared this area as Nino Konis Santana National Park, covering 123,600 hectares (Fig. 4), and linking three IBAs: Lore, Mount Paitchau and Lake Iralalalo, and Jaco Island. This is the country's first national park, and is a wonderful place to visit even while the park infrastructure is non-existent. Visitors can find an unbroken succession of habitat from coastal to small areas of montane forest; such a continuum rare now anywhere in the world. Several forest types are present, together with the impressive and wildlife-rich Lake Iralalalo, the largest in the Lesser Sundas. Even the beaches are so undisturbed as to hold Great-billed Heron, Malaysian Plover and Beach Thick-Knee. The park boundary extends into the marine area, which holds magnificent coral reefs characteristic of the "Coral Triangle".

#### Where-to-watch sites

Some key sites (with districts in brackets) for watching birds, and the typical birds observed at the sites, are listed below. Those that are also IBAs are mapped on Fig. 3; others are easily found on freely available maps of Timor-Leste. Roadside *Eucalyptus* woodland, secondary forests and ricefields often allow satisfying observations. All IBAs offer excellent birdwatching opportunities, and the directory of IBAs (Trainor *et al.* 2007a) includes suggestions on access to all sites. The distribution of the major forest types and their dominant food resources is a major influence on the broad distribution of fruit-eating pigeons and other frugivores, and nectarivorous lorikeets. The most extensive areas of fruit-rich primary and secondary tropical forests, covering about 1,000 km<sup>2</sup>, occur in Lautem district. Flower-rich *Eucalyptus* forests and savannas are mostly found in the western districts of Manatuto, Dili, Aileu, Same, Bobonaro and Ermera.

**Dili (Dili):** Pied Bushchat, introduced Sooty-headed Bulbul *Pycnonotus aurigaster* and Eurasian Tree Sparrow *Passer montanus*, Ashy-bellied White-eye, Red-rumped Myzomela, Red-chested Flowerpecker *Dicaeum maugei* and Zebra Finch *Taeniopygia guttata* are some of the common birds found in Dili.

**Tasitolu IBA (Dili):** The lakes, mudflat and surrounding woodland host a large number of waterbirds (60 species) and savanna birds (60 species), including migrant waders at appropriate seasons (notably Oriental Plover), breeding Red-capped Plover *Charadrius ruficapillus* and Timor Sparrow. Tasitolu together with Lake Laga and other north-coast

sites are important stopover sites for migrant birds.

**Comoro (Dili):** The gravel-bed estuary hosts small numbers of migrant waders and Malaysian Plover (3–4 pairs are resident) and inshore waters periodically host seabirds including Red-necked Phalarope *Phalaropus lobatus*, frigatebirds and terns.

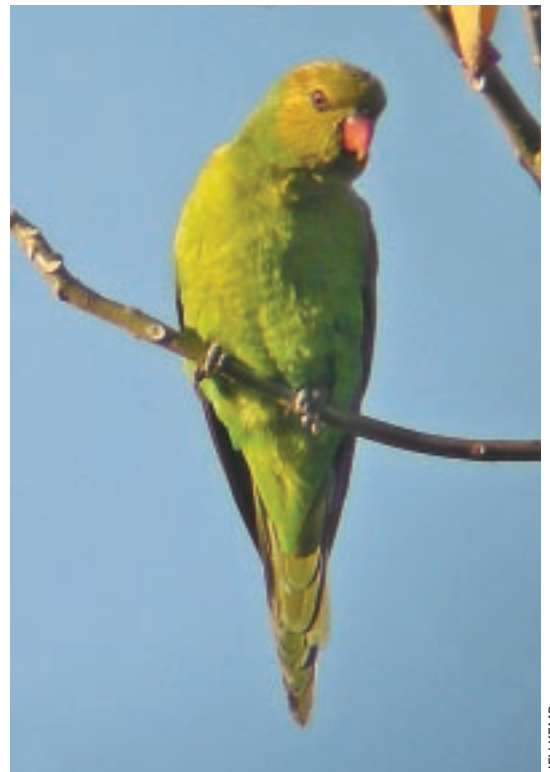
**Areia Branca beach and hinterland IBA (Cristo Rei) (Dili):** The savannas east of Cape Fatucama are rich in open-country birds including Barred Dove, Australasian Lark, Streaky-breasted Honeyeater and Brown Honeyeater. Shorebirds, including Malaysian Plover, are present on the beaches.

**Offshore waters of Atauro and Oecussi:** Pelagic seabirds and cetaceans (dolphins and whales) are frequent between Dili and Atauro Island or Oecussi; regular ferries serve these routes.

**Hera-Metinaro (Dili):** Mangrove-backed mudflats host migrant waders, including occasional Asian Dowitcher and Far Eastern Curlew *Numenius madagascariensis*.

**Atauro Island–Manucocco IBA (Dili):** This steep and patchily forested mountain on Atauro Island hosts Banded Fruit Dove *Ptilinopus cinctus*, Olive-headed Lorikeet, Orange-

**Plate 28.** Olive-headed Lorikeet *Trichoglossus euteles*, Bipolo, West Timor, August 2004.



banded Thrush, Sunda Thrush *Zoothera andromedae* and a small range of typical forest birds.

**Tibar (Liquica):** Mangroves and mudflat host a range of waders such as Common Redshank *Tringa totanus*, Terek Sandpiper *Xenus cinereus* and Grey-tailed Tattler *Heteroscelus brevipes*.

**Maubara IBA (Liquica):** Provides habitat for several waterbirds and small numbers of migrants. Slaty Cuckoo Dove is regularly seen around the lake. Forest south of the lake has not yet been investigated.

**Dare to Aileu (Aileu):** Secondary forest, *Eucalyptus urophylla* woodland and coffee plantations at 400–1,200 m along the road to Aileu host Iris Lorikeet, Olive-shouldered Parrot and Wallacean Drongo *Dicrurus densus*.

**Railako (Ermera):** Coffee plantation and secondary forest hosts many forest and woodland birds including Timor Imperial Pigeon, Yellow-crested Cockatoo, Iris Lorikeet and Timor Blue Flycatcher.

**Manatuto fishponds (Manatuto):** Regularly hosts small numbers of migrant waders and other waterbirds.

**Lake Laga or Fatuk Masin (Baucau):** This shallow saline lake hosts migrant waders and open woodland birds, most notably staging Oriental Plover in October–November

**Lake Eraulu (Ermera):** This montane marsh hosts Australian Pelican *Pelecanus conspicillatus*, Wandering Whistling-duck *Dendrocygna arcuata*, Common Coot *Fulica atra*, Swinhoe's Snipe and Australasian Grebe *Tachybaptus novaehollandiae*.

**Nitibe (Oecussi):** Extensive tropical dry forest on steep slopes and patches of montane forest were recently surveyed by the Department of National Parks and Protected Areas. They had a sight record of Wetar Ground Dove, and observations of small numbers of Yellow-crested Cockatoo, together with a rich forest bird fauna.

**Malahara (Lautem):** Part of the Mount Paitchau and Lake Iralalero IBA, and of Nino Konis Santana National Park. Extensive tropical evergreen forest hosts most of Timor's lowland forest birds including Timor Green Pigeon, Yellow-crested Cockatoo, Cinnamon-banded Kingfisher, Spot-breasted White-eye and Black-banded Flycatcher.

**Tutuala and Jaco Island (Lautem):** Part of the Mount Paitchau and Lake Iralalero IBA, and of Nino Konis Santana National Park. Dry forests host Slaty Cuckoo Dove and White-bellied Bushchat, and a wide range of lowland birds. Coastal habitats are also rich

in coastal birds and sometimes seabirds. Swifts and swiftlets nest along coastal cliffs.

**Lake Iralalero (Lautem):** Part of the Mount Paitchau and Lake Iralalero IBA, and of Nino Konis Santana National Park. Typically hosts a wide variety of waterbirds including cormorants, darter, egrets, night herons, ducks, jacana, and rails. Long-toed Stint *Calidris subminuta* and Wood Sandpiper *Tringa glareola* and several other migrant waders winter at the lake. Staging Oriental Pratincole are present in October–December each year.

**Lore IBA (Lautem):** Evergreen coastal forest and coast, part of Nino Konis Santana National Park; hosts most lowland birds including Timor Green Pigeon and Yellow-crested Cockatoo, while intact coastal habitats host Great-billed Heron, Beach Thick-knee and Malaysian Plover.

### Birding etiquette: where to stay, tips and hints

Timor-Leste can be reached by air from Darwin, Australia (Airnorth [www.airnorth.com.au](http://www.airnorth.com.au)), and Denpasar (Bali), Indonesia ([www.merpati.co.id](http://www.merpati.co.id)). It is also possible to travel overland (8–10 hrs) on minibuses between Dili and Kupang, West Timor, for about \$20 each way. General tourist information can be found in the East Timor Lonely Planet guide (Wheeler 2004), and on websites such as Discover Dili <http://www.discoverdili.com> and the Timor-Leste Government Tourist Office <http://www.turismotimorleste.com>. Tourism is in its infancy in Timor-Leste, but there are travel operators ([www.timormegatours.com](http://www.timormegatours.com)) and vehicle hire. Information on hotel accommodation can be found in the Lonely Planet guide or those websites. It is best to plan your trip and travel arrangements before arriving in Timor-Leste. The main languages used are Indonesian and the indigenous Tetum (Portuguese, one of the official languages, is not widely spoken in rural areas), and for travel outside Dili you will almost certainly need a translator-guide if you can't speak one of these languages.

As in most of Asia, local knowledge and permissions (formal or informal) are important. Visitors intending to go to rural areas that see few visitors are advised to meet Timorese government workers in the Ministry of Agriculture and Fisheries, in particular the National Directorate of Forestry, which contains the Department of National Parks and Protected Areas (essential if visiting protected areas or forests), and/or the Tourism Department, and discuss planned activities. Government staff may be able to give phone contacts of key local people (such as village chiefs) and suggestions on logistics/safety for your trip. For more formal activities such as bird tour groups or research, permission would be needed at higher level in the

relevant government ministries, and contacts made more formally at district or sub-district and village levels.

Local contacts in rural areas are very important; this is true in any region with little history of accommodating visitors from abroad, and is perhaps made more so in Timor-Leste by the occasionally volatile political situation. All land falls within villages, and local communities will generally want to know who is visiting their lands, and for what purpose. As in much of neighbouring Indonesia, it is expected that visitors as a minimum will meet with the village head, but this may be unnecessary if your guide or local contact originates from that village, or is well known to the village. Disputes are usually caused by unclear financial arrangements (payment to local guides for example), and perhaps by trespass (according to local villagers). These are best avoided by being respectful, having reliable local contacts, employing a translator-guide if needed (to ensure that communications are clear), and being willing to meet and spend some time with local villagers. Remember that there may be special places or certain times, such as during traditional ceremonies, when local communities may not wish to receive visitors. It is also often customary that visitors are accompanied by a local counterpart who may act as a guide. Daily payments for local guides may be about \$5 per person (plus food and drinks). If they apply a combination of common sense, courtesy and attention to travel advice, visiting birders are most unlikely to encounter any problems.

Knowledge of the birds of Timor-Leste is still in its infancy, and every visiting birder is likely to add new information. Who will rediscover the Timor Bush Warbler, recently split as an endemic species but unrecorded since 1931, when it was captured at about 1,800 m in West Timor? It would be very much appreciated if visitors could send their records to the first author or to BirdLife International, which will ensure that the government can use them to inform its protected areas programme.

### Acknowledgements

This article draws on fieldwork carried out by Colin R. Trainor, Fernando Santana and colleagues, and on the programme of the Government to Timor-Leste to establish a new system of protected areas. This programme has been carried out with the support of BirdLife International, and, through BirdLife, the Keidanren Nature Conservation Fund, Darwin Initiative (UK Government Department for Environment, Food and Rural Affairs) and Vogelbescherming Nederland (BirdLife Netherlands). Colin Trainor was supported for much of the fieldwork by a Postgraduate Research

Scholarship from Charles Darwin University (CDU), with additional financial support from the Cooperative Research Centre for Tropical Savannas at CDU, and from the UK Parrot Society. Work in Timor-Leste would have been impossible without the assistance and approval of the Ministry of Agriculture and Fisheries, in particular the Department of National Parks and Protected Areas, in the National Directorate of Forestry: Manuel da Silva, Manuel Mendes, Adelino Rogario and Cathy Molnar (Protected Area Network Advisor); also the National Directorate for Environmental Services and the Lautem District Administration. In the field, work by all the authors was assisted by many people, particularly Alcantra F. Xavier, João dos Santos, Lourenço dos Santos, Filomeno Soares Ferreira, Constantino Hornay and Flaminio Xavier. Frank Lambert, Pedro Leitão and Iwein Mauro collected new information on the birds of Timor and some of their information is summarised here. Thanks to Kyle Armstrong and Jane Edwards for preparing some maps. IBA mapping (including Fig. 3) was assisted by the Agriculture and Landuse Geographical Information System, and Rudyanto. We gratefully acknowledge the photographers whose work is included in this article.

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**Plate 29.** Southern Boobook *Ninox novaeseelandiae fusca*, Cristo Rei, Timor-Leste, April 2008.



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**Plate 32.** Timor Figbird *Sphecotheres viridis*, Bipolo, West Timor, September 2006.

JAMES EATON



**Plate 30.** Fawn-breasted Whistler *Pachycephala orpheus*, Camplong, West Timor, May 2005.

**Plate 31.** Golden Whistler *Pachycephala pectoralis*, male, Timor mountains, April 2008.



ANDY RHODES

**Plate 33.** Olive-brown Oriole *Oriolus melanotis*, male, Camplong, West Timor, July 2006.

**Plate 34.** Rufous Fantail *Rhipidura rufifrons*, Timor, April 2008.

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**Plate 35.** Buff-banded Grassbird *Buettikoferella bivittata*, Timor, June 1993.



**Plate 36.** Buff-banded Grassbird *Buettikoferella bivittata*, Timor, June 1993.

## Timor island bird checklist

Key to habitat use, abundance, conservation status and distribution

### Habitat use

- TF = tropical forest  
 WL = woodland  
 PL = plantation  
 AG = agricultural land  
 GR = grassland  
 WE = wetland  
 VI = village  
 BE = beach/coastal  
 OC = ocean/pelagic

### Abundance

- aw** = common austral winter migrant  
**cr** = common resident  
**cw** = common winter visitor  
**cwp** = common winter visitor and passage migrant  
**lav** = locally common austral visitor  
**lci** = locally common introduced  
**lcp** = locally common passage migrant  
**lcr** = locally common resident  
**naw** = not common austral migrant  
**np** = not common passage migrant  
**nr** = not common resident  
**nv** = not common visitor  
**nw** = not common winter visitor  
**nwp** = not common winter visitor and passage migrant  
**v** = vagrant

### Conservation status

- CR** = Critically Endangered  
**EN** = Endangered  
**VU** = Vulnerable  
**NT** = Near Threatened  
**rr** = restricted-range (and regional endemic)

### Distribution

- > = also occurs west or north of Wallacea  
 (Insular and continental South-East Asia)  
 < = also occurs east or south of Wallacea  
 (New Guinea and Australia)  
 E = endemic

Note: of the resident landbirds only Elegant Pitta *Pitta elegans* and Timor Bush Warbler *Bradypterus timorensis* have not yet been recorded in Timor-Leste

English name	Scientific	Habitat	Abundance	Status	Distrib
Orange-footed Megapode	<i>Megapodius reinwardt</i>	TF, WL	lcr		>
Brown Quail	<i>Coturnix ypsilophora</i>	WL, GR, AG	cr		>
Blue-breasted Quail	<i>Coturnix chinensis</i>	GR, AG	lcr		<>
Red Junglefowl	<i>Gallus gallus</i>	TF, WL, PL	cr		<
Wandering Whistling-duck	<i>Dendrocygna arcuata</i>	WE	cr		<>
Radjah Shelduck	<i>Tadorna radjah</i>	WE	v		>
Green Pygmy-goose	<i>Nettapus pulchellus</i>	WE	lav		>
Pacific Black Duck	<i>Anas superciliosa</i>	WE, BE	cr		>
Sunda Teal	<i>Anas gibberifrons</i>	WE, BE	cr		<
Garganey	<i>Anas querquedula</i>	WE	v		<
Hardhead	<i>Aythya australis</i>	WE	lav		>
Cape Petrel	<i>Daption capense</i>	OC	v		<>
Streaked Shearwater	<i>Calonectris leucomelas</i>	OC	nv		<>

RICHARD NOSKE



**Plate 37.** Timor Stubtail *Urosphena subulata*, Timor, June 1993.



**Plate 38.** Timor Blue Flycatcher *Cyornis hyacinthinus*, male, Timor mountains, April 2008.

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English name	Scientific	Habitat	Abundance	Status	Distrib
Wedge-tailed Shearwater	<i>Puffinus pacificus</i>	OC	nv		<>
Bulwer's Petrel	<i>Bulweria bulwerii</i>	OC	nv		<>
White-faced Storm-petrel	<i>Pelagodroma marina</i>	OC	v		<>
Matsudaira's Storm-petrel	<i>Oceanodroma matsudairae</i>	OC	nv		>
Little Grebe	<i>Tachybaptus ruficollis</i>	WE	cr		<>
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	WE	nr		<>
Great-billed Heron	<i>Ardea sumatrana</i>	BE	nr		<>
Australian Sacred Ibis	<i>Threskiornis molucca</i>	WE	v		>
Glossy Ibis	<i>Plegadis falcinellus</i>	WE	nv		<>
Royal Spoonbill	<i>Platalea regia</i>	WE, BE	lav		>
Yellow Bittern	<i>Ixobrychus sinensis</i>	WE	lcr		<>
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	WE, AG	lcr		<
Black Bittern	<i>Ixobrychus flavicollis</i>	WE	nr		<>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	WE	lcr		<
Rufous Night Heron	<i>Nycticorax caledonicus</i>	WE	lcr		<>
Striated Heron	<i>Butorides striata</i>	WE, BE	lcr		<>
Cattle Egret	<i>Bubulcus ibis</i>	WE, AG	cr		<>
Purple Heron	<i>Ardea purpurea</i>	BE, WE	nr		<
Pied Heron	<i>Ardea picata</i>	WE, AG	nv		>
Great Egret	<i>Casmerodius albus</i>	WE, BE	lcr		<>
Intermediate Egret	<i>Mesophox intermedia</i>	WE	nr		<>
White-faced Heron	<i>Egretta novaehollandiae</i>	WE, AG	cr		>
Little Egret	<i>Egretta garzetta</i>	WE	cr		<>
Pacific Reef Egret	<i>Egretta sacra</i>	BE	cr		<>
White-tailed Tropicbird	<i>Phaethon lepturus</i>	OC	v		<>
Greater Frigatebird	<i>Fregata minor</i>	OC, BE	nv		<>
Lesser Frigatebird	<i>Fregata ariel</i>	OC, BE	nv		<>
Christmas Island Frigatebird	<i>Fregata andrewsi</i>	BE, OC	v	CR	<
Australian Pelican	<i>Pelecanus conspicillatus</i>	WE, BE	lav		>
Masked Booby	<i>Sula dactylatra</i>	OC	lcr		<>
Red-footed Booby	<i>Sula sula</i>	OC	cr		<>
Brown Booby	<i>Sula leucogaster</i>	OC	cr		<>
Little Pied Cormorant	<i>Phalacrocorax melanoleucus</i>	WE, BE	lcr		>
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	WE, BE	lcr		>
Australian Darter	<i>Anhinga novaehollandiae</i>	WE, BE	nr	NT	>
Spotted Kestrel	<i>Falco moluccensis</i>	WL, PL, GR, AG	cr		<
Eurasian Hobby	<i>Falco subbuteo</i>	WL	v		<
Australian Hobby	<i>Falco longipennis</i>	WL, AG	nr		>
Peregrine Falcon	<i>Falco peregrinus</i>	WL	nr		<>

English name	Scientific	Habitat	Abundance	Status	Distrib
Osprey	<i>Pandion haliaetus</i>	BE	nr		<>
Pacific Baza	<i>Aviceda subcristata</i>	TF, WL, AG	nr		>
Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i>	TF, WL	nw		<
Black-winged Kite	<i>Elanus caeruleus</i>	GR, AG	nr		<
Black Kite	<i>Milvus migrans</i>	WL, GR, AG, VI	lcr		<>
Brahminy Kite	<i>Haliaeetus indus</i>	WL, WE, AG	cr		<>
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	BE	lcr		<>
Short-toed Snake Eagle	<i>Circaetus gallicus</i>	TF, WL, AG	nr		<
Spotted Harrier	<i>Circus assimilis</i>	GR	v		>
Chinese Goshawk	<i>Accipiter soloensis</i>	TF, WL	nw		<
Brown Goshawk	<i>Accipiter fasciatus</i>	TF, WL, PL	cr		>
Japanese Sparrowhawk	<i>Accipiter gularis</i>	TF, WL	nw		<
Grey-faced Buzzard	<i>Butastur indicus</i>	TF, WL	nw		<
Bonelli's Eagle	<i>Hieraetus fasciatus</i>	TF, WL	nr		<
Buff-banded Rail	<i>Gallirallus philippensis</i>	WE, GR	cr		<>
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	WE, GR	lcr		<
Ruddy-breasted Crane	<i>Porzana fusca</i>	WE	nr		<
Spotless Crane	<i>Porzana tabuensis</i>	WE	nr		>
White-browed Crane	<i>Porzana cinerea</i>	WE, GR	lcr		<
Purple Swampphen	<i>Porphyrio porphyrio</i>	WE	lcr		<>
Dusky Moorhen	<i>Gallinula tenebrosa</i>	WE	lcr		<>
Common Coot	<i>Fulica atra</i>	WE	lav		<>
Red-backed Buttonquail	<i>Turnix maculosus</i>	GR, AG	lcr		<>
Beach Thick-knee	<i>Esacus giganteus</i>	BE	nr	NT	<>
Black-winged Stilt	<i>Himantopus himantopus</i>	WE, AG	lcr		<>
Masked lapwing	<i>Vanellus miles</i>	WE, AG	nv		>
Pacific Golden Plover	<i>Pluvialis fulva</i>	WE,GR, AG	cwp		<>
Grey Plover	<i>Pluvialis squatarola</i>	WE,GR, AG	cwp		<>
Little Ringed Plover	<i>Charadrius dubius</i>	WE	nw		<>
Kentish Plover	<i>Charadrius alexandrinus</i>	WE	nw		<
Red-capped Plover	<i>Charadrius ruficapillus</i>	WE, BE	lcr		>
Malaysian Plover	<i>Charadrius peronii</i>	BE	nr	NT	<
Lesser Sand Plover	<i>Charadrius mongolus</i>	WE, BE	cwp		<>
Greater Sand Plover	<i>Charadrius leschenaultii</i>	WE, BE	cwp		<>
Oriental Plover	<i>Charadrius veredus</i>	WE,GR, AG	lcp		<>
Greater Painted-snipe	<i>Rostratula benghalensis</i>	WE, AG	nr		<
Comb-crested Jacana	<i>Irediparra gallinacea</i>	WE	lcr		<>
Swinhoe's Snipe	<i>Gallinago megala</i>	WE, GR	cw		<>
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	WE, BE	nw	NT	<>
Black-tailed Godwit	<i>Limosa limosa</i>	WE, BE	nwp	NT	<>
Bar-tailed Godwit	<i>Limosa lapponica</i>	WE, BE	nwp		<>
Little Curlew	<i>Numenius minutus</i>	WE	np		<>
Whimbrel	<i>Numenius phaeopus</i>	WE, BE	cwp		<>
Eurasian Curlew	<i>Numenius arquata</i>	WE	v		<
Far Eastern Curlew	<i>Numenius madagascariensis</i>	WE, BE	nwp		<>
Spotted Redshank	<i>Tringa erythropus</i>	WE	v		<
Common Redshank	<i>Tringa totanus</i>	WE, BE, AG	cw		<>
Marsh Sandpiper	<i>Tringa stagnatilis</i>	WE	cw		<>
Common Greenshank	<i>Tringa nebularia</i>	WE, BE	cwp		<>
Wood Sandpiper	<i>Tringa glareola</i>	WE, BE, AG	cw		<>
Terek Sandpiper	<i>Xenus cinereus</i>	WE, BE	nwp		<>
Common Sandpiper	<i>Actitis hypoleucos</i>	WE, BE	cw		<>
Grey-tailed Tattler	<i>Heteroscelus brevipes</i>	WE, BE	cw		<>
Ruddy Turnstone	<i>Arenaria interpres</i>	WE, BE	lcp		<>
Great Knot	<i>Calidris tenuirostris</i>	WE, BE	nwp		<>

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Red Knot	<i>Calidris canutus</i>	WE	v		<>
Sanderling	<i>Calidris alba</i>	WE, BE	nw		<>
Red-necked Stint	<i>Calidris ruficollis</i>	WE	cw		<>
Long-toed Stint	<i>Calidris subminuta</i>	WE, AG	nw		<>
Pectoral Sandpiper	<i>Calidris melanotos</i>	WE	v		<
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	WE, BE, AG	cw		<>
Curlew Sandpiper	<i>Calidris ferruginea</i>	WE	np		<>
Broad-billed Sandpiper	<i>Limicola falcinellus</i>	WE	nw		<>
Ruff	<i>Philomachus pugnax</i>	WE	nw		<>
Red-necked Phalarope	<i>Phalaropus lobatus</i>	OC	cw		<>
Australian Pratincole	<i>Stiltia isabella</i>	WE,GR	aw		>
Oriental Pratincole	<i>Glareola maldivarum</i>	WE,GR	lcp		<>
Gull-billed Tern	<i>Sterna nilotica</i>	WE,BE	nv		<>
Caspian Tern	<i>Sterna caspia</i>	BE	naw		<>
Lesser Crested Tern	<i>Sterna bengalensis</i>	OC, BE	nv		<>
Great Crested Tern	<i>Sterna bergii</i>	WE, BE, OC	cr		<>
Black-naped Tern	<i>Sterna sumatrana</i>	OC	lcr		<>
Common Tern	<i>Sterna hirundo</i>	WE,BE	nw		<>
Little Tern	<i>Sterna albifrons</i>	WE,BE	lcr		<>
Bridled Tern	<i>Sterna anaethetus</i>	OC	nv		<>
Whiskered Tern	<i>Chlidonias hybrida</i>	WE, BE	cr		<>
White-winged Tern	<i>Chlidonias leucopterus</i>	WE,BE	nw		<>
Brown Noddy	<i>Anous stolidus</i>	BE, OC	nr		<>
Arctic Jaeger	<i>Stercorarius parasiticus</i>	BE, OC	v		<>
Rock Pigeon	<i>Columba livia</i>	VI	cr		<>
White-throated Pigeon	<i>Columba vitiensis</i>	TF, WL	lcr		<>
Island Collared Dove	<i>Streptopelia bitorquata</i>	WL	nr		<
Spotted Dove	<i>Stigmatopelia chinensis</i>	WL, AG	cr		<
Dusky Cuckoo Dove	<i>Macropygia magna</i>	TF, WL	cr	rr	E
Little Cuckoo Dove	<i>Macropygia ruficeps</i>	TF, WL	nr		<
Slaty Cuckoo Dove	<i>Turacoena modesta</i>	TF, WL	nr	NT,rr	E
Emerald Dove	<i>Chalcophaps indica</i>	TF, WL, PL, AG	cr		<>
Barred Dove	<i>Geopelia maugeus</i>	WL, PL, AG	cr		E
Wetar Ground Dove	<i>Gallicolumba hoedtii</i>	TF	nr	EN,rr	E
Timor Green Pigeon	<i>Treron psittaceus</i>	TF, WL	nr	EN,rr	E
Banded Fruit Dove	<i>Ptilinopus cinctus</i>	TF, WL, PL, AG	cr		E
Rose-crowned Fruit Dove	<i>Ptilinopus regina</i>	TF, WL, AG	cr		>
Pink-headed Imperial Pigeon	<i>Ducula rosacea</i>	TF, WL, PL	cr	NT,rr	E
Timor Imperial Pigeon	<i>Ducula cineracea</i>	TF, PL	nr	EN,rr	E
Pied Imperial Pigeon	<i>Ducula bicolor</i>	TF	v		>
Yellow-crested Cockatoo	<i>Cacatua sulphurea</i>	TF, WL, PL	nr	CR	E
Blue-streaked Lory	<i>Eos reticulata</i>	TF	v		>
Marigold Lorikeet	<i>Trichoglossus capistratus</i>	TF, WL, PL, BE	lcr		>
Olive-headed Lorikeet	<i>Trichoglossus euteles</i>	TF, WL, PL	lcr		E
Iris Lorikeet	<i>Psittuteuteles iris</i>	TF, WL, PL	lcr	NT,rr	E
Red-cheeked Parrot	<i>Geoffroyus geoffroyi</i>	TF, WL, PL	cr		>
Great-billed Parrot	<i>Tanygnathus megalorhynchus</i>	TF, WL	nr		<
Olive-shouldered Parrot	<i>Aprosmictus jonquillaceus</i>	TF, WL, PL	cr	NT,rr	E
Oriental Cuckoo	<i>Cuculus saturatus</i>	WL, PL	lcr		<>
Sunda Cuckoo	<i>Cuculus lepidus</i>	TF	cr		<
Pallid Cuckoo	<i>Cuculus pallidus</i>	WL	naw		>
Brush Cuckoo	<i>Cacomantis variolosus</i>	WL, PL	cr		>
Gould's Bronze Cuckoo	<i>Chrysococcyx russatus</i>	TF, WL, PL, AG	cr		<>
Shining Bronze Cuckoo	<i>Chrysococcyx lucidus</i>	WL	naw		>
Horsfield's Bronze Cuckoo	<i>Chrysococcyx basalis</i>	WL	naw		<>

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Australian Koel	<i>Eudynamis cyanocephalus</i>	TF, WL, PL	cr		>
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	WL	naw		>
Lesser Coucal	<i>Centropus bengalensis</i>	WL, GR, AG	cr		<
Timor Coucal	<i>Centropus mui</i>	TF, WL, AG	lcr		>
Barn Owl	<i>Tyto alba</i>	WL, AG, VI	nr		<>
Southern Boobook	<i>Ninox novaeseelandiae</i>	TF, WL, PL, AG	cr		>
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	TF, WL	lcr		<>
Savanna Nightjar	<i>Caprimulgus affinis</i>	WL, AG, VI	cr		<
Glossy Swiftlet	<i>Collocalia esculenta</i>	WL, GR, AG	cr		<>
Edible-nest Swiftlet	<i>Collocalia fuciphaga</i>	WL, GR, PL, AG	lcr		<
White-throated Needletail	<i>Hirundapus caudacutus</i>	GR, BE	np		<>
Fork-tailed Swift	<i>Apus pacificus</i>	GR, AG, BE	lcp		<>
Little Swift	<i>Apus affinis</i>	GR, BE	nr		<>
Asian Dollarbird	<i>Eurystomus orientalis</i>	WL, PL, AG	nv?		<>
Collared Kingfisher	<i>Todiramphus chloris</i>	WL, PL, BE	cr		<>
Cinnamon-banded Kingfisher	<i>Todiramphus australasia</i>	TF, WL, PL	lcr	NT,rr	E
Sacred Kingfisher	<i>Todiramphus sanctus</i>	WL, BE	aw		>
Common Kingfisher	<i>Alcedo atthis</i>	WE, BE	cr		<>
Blue-tailed Bee-eater	<i>Merops philippinus</i>	GR	nr		<>
Rainbow Bee-eater	<i>Merops ornatus</i>	WL, PL, AG	cr		>
Elegant Pitta	<i>Pitta elegans</i>	TF	nr?		E
Streaky-breasted Honeyeater	<i>Meliphaga reticulata</i>	TF, WL, VI	cr	rr	E
Plain Friarbird	<i>Philemon inornatus</i>	TF, WL, PL	cr	rr	E
Helmeted Friarbird	<i>Philemon buceroides</i>	TF, WL, PL	cr		>
Brown Honeyeater	<i>Lichmera indistincta</i>	WL, PL, AG, VI	cr		>
Yellow-eared Honeyeater	<i>Lichmera flavicans</i>	TF, WL, PL	lcr	rr	E
Red-rumped Myzomela	<i>Myzomela vulnerata</i>	TF, WL, VI, PL	cr	rr	E
Plain Gerygone	<i>Gerygone inornata</i>	TF, WL, PL, AG	cr	rr	E
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	WL, AG	cr		<>
Black-faced Woodswallow	<i>Artamus cinereus</i>	WL, AG	cr		>
Wallacean Cuckooshrike	<i>Coracina personata</i>	TF, WL, PL	cr		E
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>	WL, AG	aw		>
Slender-billed Cicadabird	<i>Coracina tenuirostris</i>	TF	nr		>
White-shouldered Triller	<i>Lalage sueurii</i>	WL, PL, AG	WL, PL, AG		E
Fawn-breasted Whistler	<i>Pachycephala orpheus</i>	TF, WL, PL, AG	cr	rr	E
Golden Whistler	<i>Pachycephala pectoralis</i>	TF, WL, PL	cr		>
Long-tailed Shrike	<i>Lanius schach</i>	WL, AG	cr		<
Timor Figbird	<i>Sphecotheres viridis</i>	TF, WL, PL, AG	cr	rr	E
Olive-brown Oriole	<i>Oriolus melanotis</i>	TF, WL, PL, AG	cr	rr	E
Wallacean Drongo	<i>Dicrurus densus</i>	TF, WL, PL	cr		E
Northern Fantail	<i>Rhipidura rufiventris</i>	TF, WL, PL, AG	cr		>
Rufous Fantail	<i>Rhipidura rufifrons</i>	TF, WL, PL, AG	cr		>
Island Monarch	<i>Monarcha cinerascens</i>	WL, WE	nr		>
Spectacled Monarch	<i>Monarcha trivirgatus</i>	TF, WL, PL	cr		>
Magpie-lark	<i>Grallina cyanoleuca</i>	WL	v		>
Broad-billed Flycatcher	<i>Myiagra ruficollis</i>	TF, WL, AG	cr		>
Large-billed Crow	<i>Corvus macrorhynchos</i>	WL, PL, AG	cr		<
Barn Swallow	<i>Hirundo rustica</i>	WE, GR, AG, VI	cwp		<>
Pacific Swallow	<i>Hirundo tahitica</i>	GR, AG, VI	cr		<>
Striated Swallow	<i>Hirundo striolata</i>	WL, GR, VI	nr		<
Tree Martin	<i>Hirundo nigricans</i>	WL, GR, AG, VI	lcr/lav		>
Fairy Martin	<i>Hirundo ariel</i>	WI, WE	naw		>
Australasian Lark	<i>Mirafra javanica</i>	GR, AG	lcr		>
Zitting Cisticola	<i>Cisticola juncidis</i>	WL, GR, AG	cr		<>
Golden-headed Cisticola	<i>Cisticola exilis</i>	WL, GR, AG	cr		<>

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Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	WL, VI	lci		<
Tawny Grassbird	<i>Megalurus timoriensis</i>	WL, GR, WE, AG	cr		<>
Buff-banded Grassbird	<i>Buettikoferella bivittata</i>	TF, WL	lcr	rr	E
Timor Stubtail	<i>Urosphena subulata</i>	TF, WL, PL	cr	rr	E
Sunda Bush Warbler	<i>Cettia vulcania</i>	TF, WL, PL	cr		<
Timor Bush Warbler	<i>Bradypterus timorensis</i>	TF, WL	nr	NE,rr	E
Oriental Reed Warbler	<i>Acrocephalus orientalis</i>	WE	nw		<
Clamorous Reed Warbler	<i>Acrocephalus stentoreus</i>	WE	lcr		<>
Arctic Warbler	<i>Phylloscopus borealis</i>	TF, WL	nw		<
Timor Leaf Warbler	<i>Phylloscopus presbytes</i>	TF, WL, PL	cr	rr	E
Yellow-breasted Warbler	<i>Seicercus montis</i>	TF	lcr		<
Pygmy Wren Babbler	<i>Pnoepyga pusilla</i>	TF	lcr		<
Mountain White-eye	<i>Zosterops montanus</i>	TF, WL	lcr		<
Ashy-bellied White-eye	<i>Zosterops citrinella</i>	TF, WL, PL, VI	cr		>
Spot-breasted White-eye	<i>Heleia muelleri</i>	TF, WL	lcr	NT,rr	E
Short-tailed Starling	<i>Aplonis minor</i>	TF, WL, PL	lcr		<
Pale-bellied Myna	<i>Acridotheres cinereus</i>	WL, VI	lci		<
Chestnut-backed Thrush	<i>Zoothera dohertyi</i>	TF	lcr	NT,rr	E
Orange-banded Thrush	<i>Zoothera peronii</i>	TF, WL, PL	cr	NT,rr	E
Sunda Thrush	<i>Zoothera andromedae</i>	TF	nr		<
Island Thrush	<i>Turdus poliocephalus</i>	TF, WL	lcr		<>
Lesser Shortwing	<i>Brachypteryx leucophrys</i>	TF	lcr		<
Pied Bushchat	<i>Saxicola caprata</i>	WL, AG, VI	cr		<>
White-bellied Bushchat	<i>Saxicola gutturalis</i>	TF, WL	lcr	NT,rr	E
Snowy-browed Flycatcher	<i>Ficedula hyperythra</i>	TF	nr		<
Little Pied Flycatcher	<i>Ficedula westermanni</i>	TF, WL, PL	cr		<
Black-banded Flycatcher	<i>Ficedula timorensis</i>	TF, WL	lcr	NT,rr	E
Timor Blue Flycatcher	<i>Cyornis hyacinthinus</i>	TF, WL, PL	cr	rr	E
Thick-billed Flowerpecker	<i>Dicaeum agile</i>	TF, WL, PL	nr		<
Red-chested Flowerpecker	<i>Dicaeum mauei</i>	TF, WL, PL, VI	cr	rr	E
Blood-breasted Flowerpecker	<i>Dicaeum sanguinolentum</i>	TF, WL	lcr		E
Flame-breasted Sunbird	<i>Nectarinia solaris</i>	TF, WL, PL, VI	cr	rr	E
Eurasian Tree Sparrow	<i>Passer montanus</i>	AG, VI	lci		<>
Red Avadavat	<i>Amandava amandava</i>	WL, GR, AG	cr		<
Zebra Finch	<i>Taeniopygia guttata</i>	WL, GR, AG, VI	cr		>
Tricoloured Parrotfinch	<i>Erythrura tricolor</i>	TF, WL	cr	rr	E
Black-faced Munia	<i>Lonchura molucca</i>	WL, GR, AG, VI	cr		E
Scaly-breasted Munia	<i>Lonchura punctulata</i>	WL, GR, AG, VI	cr		<
Five-coloured Munia	<i>Lonchura quincolor</i>	WL, GR, AG, VI	lcr		E
Pale-headed Munia	<i>Lonchura pallida</i>	GR, AG, VI	cr		E
Timor Sparrow	<i>Padda fuscata</i>	WL, GR, AG, VI	lcr	NT,rr	E
Yellow Wagtail	<i>Motacilla flava</i>	GR, AG	cw		<>
Grey Wagtail	<i>Motacilla cinerea</i>	GR, AG	cw		<>
Australasian Pipit	<i>Anthus novaeseelandiae</i>	GR, AG	cr		<>
Pechora Pipit	<i>Anthus gustavi</i>	WL, GR	nw		<