

## The birds of Sumbawa, Moyo and Sangeang Islands, Nusa Tenggara, Indonesia

R.E. Johnstone<sup>1</sup>, P. Jepson<sup>2</sup>, S.H.M. Butchart<sup>3</sup>, J.C. Lowen<sup>4</sup> and D. Prawiradilaga<sup>5</sup>

<sup>1</sup>Western Australian Museum, Francis Street, Perth, Western Australia 6000, Australia

<sup>2</sup>BirdLife International, Bogor, Indonesia

<sup>3</sup>Department of Zoology, University of Cambridge, CB2 3EJ, UK

<sup>4</sup>Emmanuel College, Cambridge, CB2 3AP, UK

<sup>5</sup>Museum Zoologicum Bogoriense, Bogor, Indonesia

**Abstract** – This paper is based mainly on data gathered during a vertebrate survey of Sumbawa, Moyo and Sangeang Islands by a joint Western Australian Museum–Museum Zoologicum Bogoriense expedition in May and October–November 1988, a Cambridge student expedition to Sumbawa Island in July–August 1993; and a visit by P. Jepson and S. Schmitt to Sumbawa in September 1993.

A total of 172 species of bird were recorded and 362 specimens were collected which include the first major collections from Moyo and Sangeang Islands and represent important new collections for Sumbawa Island. The local distribution, abundance and habitat preferences found for each species are described. Many specimens and observations represent new island and/or archipelago records.

### INTRODUCTION

The islands of Sumbawa, Moyo and Sangeang lie in the inner Banda arc of the Indonesian archipelago between longitude 116°45' and 119°15' east and latitude 8°0' and 9°15' south. They are situated between Lombok in the west and Komodo and Flores in the east in the Indonesian province of Nusa Tenggara Barat (Figure 1). The Flores Sea is to the north and the Indian Ocean to the south. The major aim of this work was to document the distribution and status of the avifauna of Sumbawa, Moyo and Sangeang Islands and to collect series of certain species for taxonomic, morphological and genetic studies. The islands were visited by the joint Western Australian Museum–Museum Zoologicum Bogoriense group between 6–28 May and 18 October to 15 November 1988. Additional information was collated from the Cambridge Flores–Sumbawa expedition carried out between 28 July and 19 August 1993 by Butchart *et al.* (1993), from P. Jepson and S. Schmitt's visit to Sumbawa from 10–23 September 1993 from B.R. Lees' visits to Moyo from 1992 to 1995; and from the Museum Zoologicum Bogoriense collection.

Pulau Sumbawa is an irregular shaped volcanic island 270 km long on its east-west axis and 90 km wide and covering about 14,750 km<sup>2</sup>. Large bays (Teluk) in the central and eastern part of the island namely Teluk Saleh, Teluk Dompou, Teluk Bima and Teluk Waworada give the island its irregular shape. Teluk Saleh is the largest and divides the

island almost in half. Sumbawa contains several extinct volcanoes, the largest Gunung Tambora rising to 2821 m. The massive eruption of Tambora in 1815 produced 80 cubic kilometres of airborne ash which cooled the world enough to produce the year without a summer in 1816 (FAO 1981).

Collections and observations were made at fourteen main sites on Sumbawa namely: Desa Belo 8°52'00"S, 116°50'00"E, Desa Meraran 8°41'30"S, 116°51'00"E, Batu Hijau 9°00'S, 116°55'E, R.F2 (a meteorological station) 8°55'S, 117°00'E, Desa Merente 8°33'10"S, 117°01'15"E, Gunung Olet Sangenges 8°35'S, 117°07'E, Babar 8°55'S, 117°05'E, Batu Dulang 8°35'00"S, 117°17'20"E, Batu Tering 8°48'00"S, 117°22'00"E, around Sumbawa Besar 8°30'00"S 117°26'00"E, Teluk Santong 8°43'40"S, 117°53'30"E, Desa Daha (near Huu) 8°45'00"S, 118°26'00"E, Desa Waworada 8°42'30"S, 118°47'30"E, Desa Sangeang 8°18'00"S, 118°56'00"E and Sape 8°34'00"S, 119°00'00"E (Figure 2).

In the annotated list we summarise for each species its relative abundance (whether it is very common, common, moderately common, uncommon, scarce or rare), whether it feeds alone or in groups, status (whether it is a vagrant, visitor or resident), habitat preferences and breeding season.

Eight major habitat types were recognised on Sumbawa.

1. **Marine.** Includes coastal seas, straits between islands and gulfs.

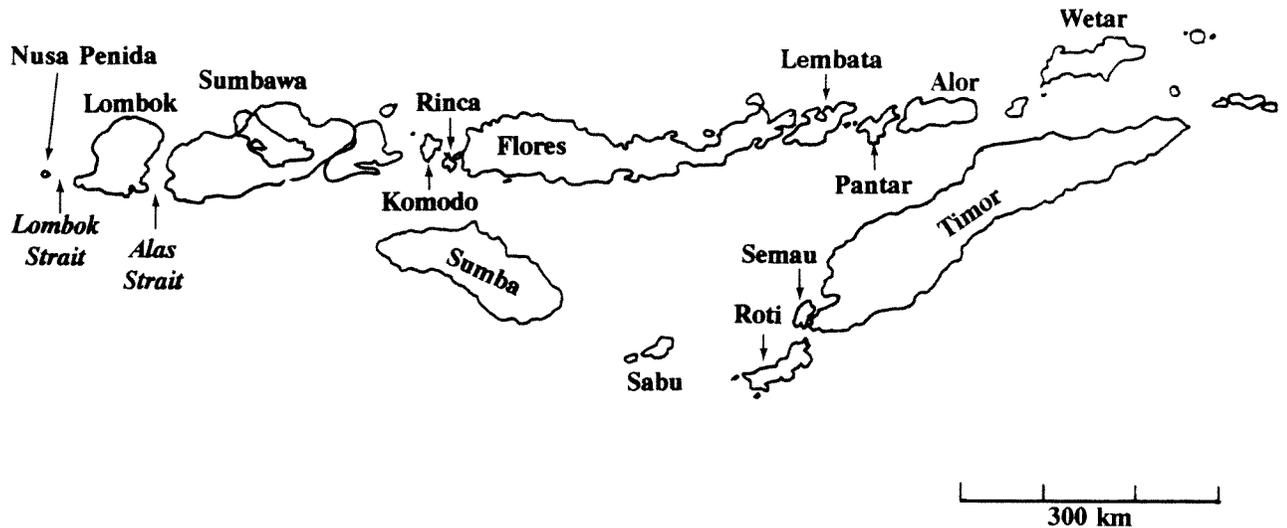


Figure 1 Map of Nusa Tenggara showing position of Sumbawa Island.

2. **Mangal.** Small stands of mangal occur in many of the embayments. They consist mainly of *Rhizophora*, *Sonneratia* and *Bruguiera* in the seaward zone and *Avicennia*, *Lumnitzera* and *Excoecaria* to landward (Figure 3).
3. **Cultivated areas.** These include rice fields, coconut, cashew and banana plantations, village gardens with kapok, maize and other vegetables and in the highlands coffee plantations (Figure 4).
4. **Semi-evergreen rainforest, moist deciduous monsoon forest and gallery forest.** This forest is usually tall (canopy >30 m), is complex in structure and no doubt originally extended

over much of the volcanic-alluvial plain. Trees include, *Ficus*, *Terminalia*, *Alstonia*, *Celtis*, *Serianthes*, *Diospyros*, *Eugenia*, *Grewia*, *Schefflera*, *Myristica*, *Albizzia*, *Mimusops*, *Garuga*, *Nauclea*, *Erythrina* and *Tamarindus*. Vines, rattans and palms are abundant and the understorey consists mostly of small trees, shrubs, bamboo, herbs, ferns and in some places *Lantana* (Figure 5).

Most of the lowland rainforest has been disturbed and cleared by shifting cultivation then allowed to regenerate. Historically it has also been locally devastated by volcanic eruptions and lava flows.

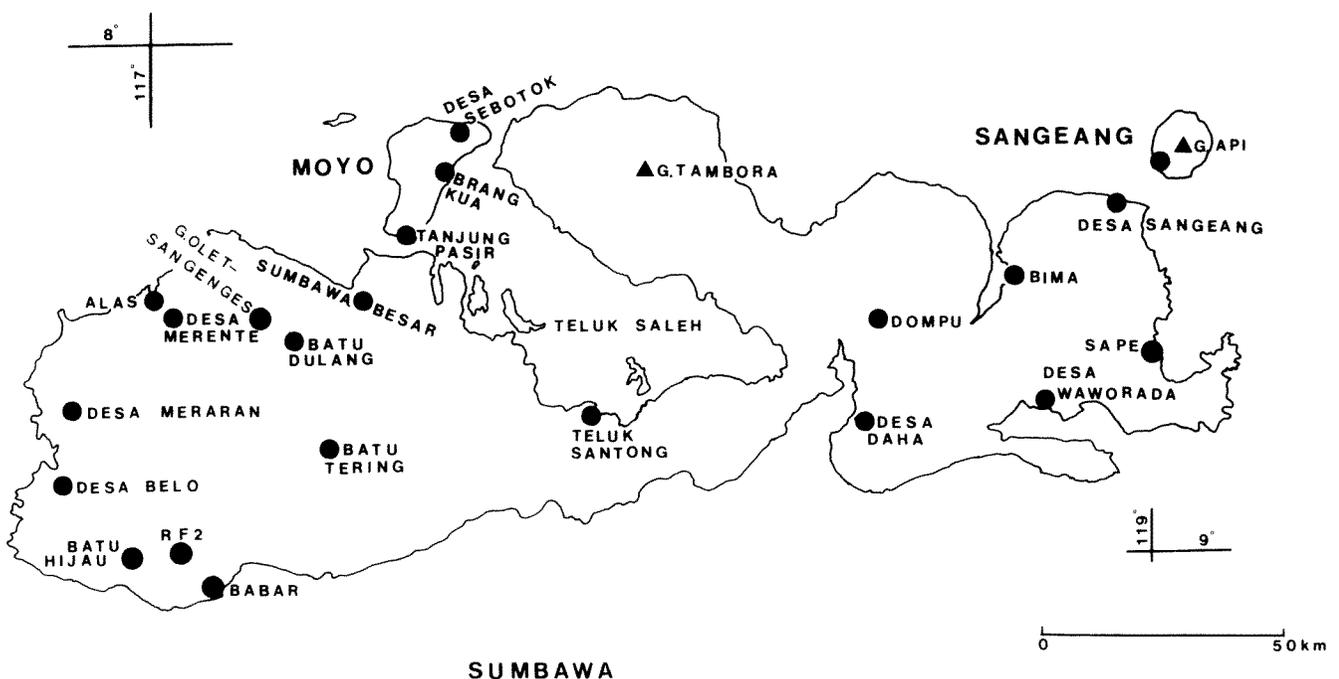


Figure 2 Map of Sumbawa, Moyu and Sangeang Islands showing main study sites.



Figure 3 Mangal at Teluk Santong.

5. **Grassland.** Areas of rank grassland "alang alang", *Imperata cylindrica*, often with scattered trees and shrubs occur throughout the island (Figure 6).



Figure 4 Cultivated areas at Desa Daha, photographed by R. How.

6. **Woodland.** Open woodlands occur in drier parts of the island especially coastal flats on the eastern end. Trees include *Zizyphus*, *Acacia* and *Tamarindus* (Figure 7).
7. **Meraran wetland.** This is a large freshwater lake of about 860 ha with associated small swamps. The lake was largely carpeted with water hyacinth and water lilies and the swamps edged with stands of bulrush *Typha* and reeds *Pragmites* (Figure 8).
8. **Montane forest.** At about 700 m in altitude the lowland forest grades into montane rainforest. This change is well marked structurally and floristically and takes place through a broad ecotone of about 200–300 m in altitude. Structurally, the forest becomes lower (averaging about 20 m), the leaves smaller, and the tree trunks thinner stemmed and more heavily mossed. Many trees and shrubs occur that are not found at lower altitudes and epiphytes and ferns are abundant. At Batu Dulang this forest extended upwards to about 1200 m. On the higher peaks of Gunung Tambora above 1400 m the forest is largely dominated by *Casuarina junghuniana* with an understorey of herbaceous plants and ferns. Lower slopes of Tambora were once also clothed with pure stands of *Duabanga moluccana* highly prized for its timber, but most of this appears to have been cleared (Figure 9).

Pulau Moyo is an uplifted limestone island about 27 km long, 8–20 km wide, about 335 km<sup>2</sup> and with a maximum height of 200 m. It is situated 1.5 km off the northwest coast of Sumbawa near Sumbawa Besar at the mouth of Teluk Saleh. Three sites were visited on Moyo by the WAM–MZYB expedition namely: Desa Sebotok 8°09'30"S, 117°37'15"E on



Figure 5 Semi-evergreen rainforest at Daha.



Figure 6 Grassland on eastern Sumbawa with Pulau Sangeang in background, photographed by R. How.



Figure 7 Open woodland near Sumbawa Besar.



Figure 8 Meraran wetland.



Figure 9 Montane forest at Merente.



Figure 10 Grassland at Tanjung Pasir.



Figure 11 Southern side of Pulau Sangeang, photographed by R. How.

northern end (between 6–9 November); Brang Kua 8°09'30"S, 117°36'45"E on eastern side (between 9–11 November); and Tanjung Pasir 8°23'15"S, 117°31'30"E on southern end (between 11–14 November). B.R. Lees visited areas on the west side of the island including the vicinity of Amanawana Bay 8°16'S, 117°30'E and Labuan Aji (Labuhanhaji) 8°13'5", 117°30'E.

Most of the southern half of the island consists of a rather extensive plateau undulating between 85 and 160 m. The northern half descends more gently to the sea, is more forested than the south, contains a more extensive drainage system, and has more land suitable for agriculture.

The major habitat types on Moyo Island are as follows:

1. **Mangal.** Many bays around the island contain small stands of mangroves. They consist mostly of a pioneer or seaward zone of *Sonneratia* and a landward zone of *Rhizophora* and *Bruguiera*.
2. **Semi-evergreen rainforest and moist deciduous monsoon forest.** This forest occurs over most of the northern half of the island on the central and southern slopes of the plateau and along southern creeks. The canopy has an average height of 20–25 m. Dominant trees include *Calophyllum*, *Cripteronis*, *Eugenia*, *Schoutenia*, *Grewia*, *Schleichera*, and *Protium*. Scattered trees of *Podocarpus* and *Dipterocarpus* occur mainly in the north.
3. **Grasslands.** Most of the central and southern part of the island consists of grassy plains with

emergent prickly trees and shrubs. (Figure 10).

4. **Cultivated areas and secondary regrowth.** This includes areas cleared for agriculture and depauperate scrubs with *Alstonia*, *Tamarindus* and *Lantana*.

Presumably the vegetation on Moyo would have been devastated by the eruption of Tambora in 1815.

Pulau Sangeang is a roughly circular volcanic island 15 km wide, 150 km<sup>2</sup> and with a central active volcano Gunung Api rising to 1949 m. It is situated 8 km off the northeast coast of Sumbawa and was visited between 21–23 October 1988 on the southwestern side at 8°13'30"S, 119°00'20"E. Gunung Api last erupted in 1986.

The narrow coastal fringe is vegetated mostly with low open woodland with a ground cover of rank grasses. Small thickets dominated mainly by *Ficus* spp. occur in some gullies but much of the vegetation has been disturbed by recent lava flows. Many derelict village gardens were overrun with castor oil plant. Large areas of 'alang alang' occur on the lower slopes of Gunung Api and patches of vine forest occur higher up and in deeper gullies. (Figure 11).

#### CLIMATE

Sumbawa, Moyo and Sangeang Islands have a tropical monsoon type climate, characterised by moderate stable temperatures and high relative humidity. The wet season (northwest monsoon)

begins in November, peaks in December–January and may continue until March. From May to September the winds are predominantly from the southeast (east monsoon) and are relatively dry. April and October are transitional. Mean daily temperatures range from 22–32° C, and average humidity is 85%. Mean annual rainfall ranges from 1000 mm in lowlands to 3000 mm in highlands. The eastern part of Sumbawa is considerably drier than the west.

### ORNITHOLOGICAL HISTORY

Previous collections and additional data are available from:

1. J. Wivan van Lansberge 1880–1883, Governor General: Flores, Sumbawa, Alor and Timor (Junge 1954);
2. F. Guillemard, 1885, report on the collections of birds made during the voyage of the yacht 'Marchesa' (Bruce 1987);
3. W. Doherty 1887–1898, collector for Lord Rothschild on Sulawesi, Talaud 1887, 1891, 1896, Lombok, Sumbawa, Satonda, Bacan, Halmahera, Buru, Tanimbar, Obi and Kai (his hunters only) 1897–1898 (Junge 1954, Murphy 1932, Rothschild 1983);
4. J. Elbert 1909–1910, Sunda Expedition to Lombok, Sumbawa, Flores, Wetar, Muna, SE Sulawesi (Elbert 1911, Rensch 1926 and 1931, van Bemmelen and Voous 1951, Junge 1954 and Jany 1955);
5. B. Rensch's observations and collections from Lombok, Sumbawa and Flores (Rensch 1930, 1931);
6. G.A. Lincoln and others 1973, surveys of Lombok, Sumbawa and Komodo (Lincoln 1974, 1975);
7. FAO/UNDP Bogor 1981, survey Pulau Moyo and the Sanggar Peninsula (Gunung Tabor), a plan for conservation in northern Sumbawa;
8. The Birds of Wallacea (White and Bruce 1986);
9. D. Gibbs (1990) Wallacea, unpublished site guide for birdwatchers;
10. V. Mason (1990) Bali Bird Club Newsletter, No 1. unpublished;
11. K.D. Bishop (1992) New and interesting records of birds in Wallacea;
12. B.R. Lees' observations on Moyo from 1992–1995;
13. S.H.M. Butchart *et al.* 1993, Preliminary report of the Cambridge Flores/Sumbawa conservation project (unpublished report);
14. Collections in Museum Zoologicum Bogoriense (MZB).

### ANNOTATED SPECIES LIST

Classification and nomenclature follows Andrew (1992) and White and Bruce (1986).

#### Hydrobatidae

*Oceanites oceanicus* Wilson's Storm-petrel

Sumbawa I. – One offshore an hour east of Sape on 20 August 1993. First recorded for Sumbawa by Bishop (1992).

#### Fregatidae

*Fregata ariel* Lesser Frigatebird

Sumbawa I. – Five between Sape and Komodo I. on 21 August 1993 also one probably this species offshore near Sumbawa Besar on 10 August 1993. Recorded by Gibbs (1990) between Sape and Komodo in December 1989 and Mason (1990) at Badas.

Moyo I. – Two just offshore between Sebotok and Brang Kua on 9 November 1988. These are the first records for the Sumbawa region.

#### Phalacrocoracidae

*Phalacrocorax melanoleucos* Little Pied Cormorant

Sumbawa I. – Flocks of 10 and 4 at a freshwater lake, Meraran on 13 May 1988, also one 5 km east of Alas on 9 August and another on 19 August 1993. The first records for Sumbawa.

*Anhinga m. melanogaster* Darter

Sumbawa I. – One calling from a freshwater lake at Meraran on 13 May 1988. Also one from Sumbawa Besar in MZB collection.

#### Sulidae

*Sula leucogaster* Brown Booby

Sumbawa I. – One just off Alas on 29 May 1988. The first record for Sumbawa.

#### Pelecanidae

*Pelecanus conspicillatus* Australian Pelican

Sumbawa I. – Uncommon vagrant from Australia. A flock of 300 recorded in western Sumbawa during May–December of 1978 (Somadikarta and Holmes 1979 and Escott and Holmes 1980).

#### Ardeidae

*Ardea cinerea jouyi* Grey Heron

Sumbawa I. – Two huge herons with white underparts, a black line through the eye and black flight feathers, were observed at a freshwater lake at Meraran on 13 May 1988. Rensch (1931) lists an immature female collected on Sumbawa in May.

*Ardea sumatrana* Great-billed Heron

Moyo I. – Single birds on coastal reefs at Tanjung Pasir on 13 and 14 November 1988, and two regularly observed in Amanwana Bay between 1992 and 1995. The first records for the Sumbawa region.

*Ardea purpurea* Purple Heron

Sumbawa I. – Two at a freshwater lake at Meraran on 13 May 1988 and two at Lake Taliwang, east of Maluku on 9 August 1993.

*Ardea novaehollandiae* White-faced Heron

Sumbawa I. – Moderately common, in ones, twos and small groups (up to 8) occasionally larger aggregations (up to 50). Recorded at Meraran, Lake Taliwang, Babar, Selah Legium, Belo, Dompou and Dahu. Rice fields, freshwater lakes and creeks.

Moyo I. – One on coast at Brang Kua on 10 November 1988.

*Egretta alba* Great Egret

Sumbawa I. – One at a swamp near Empang on 20 May and three on a mudflat near Bima on 19 October 1988. The first records for Sumbawa.

*Egretta garzetta* Little Egret

Sumbawa I. – Seven on mudflats at Sape on 21 August 1993. The first record for Sumbawa.

*Egretta sacra* Reef Egret

Sumbawa I. – Three near Maluku on 9 August and one at Sape on 21 August 1993. All grey phase.

Moyo I. – One on SW coast and two on reefs at Tanjung Pasir in November 1988. Also groups of four to five at Amanwana Bay from 1992–1995. Both white phase and dark phase birds recorded.

*Bubulcus ibis* Cattle Egret

Sumbawa I. – Locally common but generally uncommon. One in rice field at Batu Tering on 8 May 1988 and at least 1000 at Lake Taliwang on 9 August 1993.

*Ardeola speciosa* Javan Pond Heron

Sumbawa I. – Common in lowland wetlands. Small groups and loose flocks (up to 300). Recorded at Meraran, Lake Taliwang, Belo, Dompou, Waworada, Dahu, Sape and Sumbawa Besar. Rice fields, swamps, lakes, along rivers and mudflats.

Moyo I. – Moderately common. Small groups (up to 8). Recorded at Sebotok and Brang Kua. Mainly rice fields and mangal.

*Butorides striatus* Striated Heron

Sumbawa I. – Moderately common in mangal at Teluk Santong in May and in dense creekside vegetation at Dahu in October 1988, also in lowland riverine forest at Selah Legium in August 1993.

Moyo I. – Common to moderately common. Recorded at Sebotok, Brang Kua and Tanjung Pasir. Mangal, tidal flats and beaches. Nest with 2 eggs (one chipping) 9 m up in a *Sonneratia alba* on seaward edge of mangal at Sebotok on 7 November 1988.

*Ixobrychus sinensis* Yellow Bittern

Sumbawa I. – Moderately common at a large freshwater lake at Meraran in May 1988. Mainly in Typha, lilies and water hyacinth. Nest with one nestling found in Typha on 13 May. This is the first record for

Sumbawa and the first breeding record for Nusa Tenggara. Previously thought to be only a migrant to Wallacea, however, small breeding populations have been found in areas with a large influx of migrants e.g. Sri Lanka, the Philippines and Java (Hancock and Elliott 1978).

## Ciconiidae

*Ciconia e. episcopus* Woolly-necked Stork

Sumbawa I. – Moderately common in ones, twos and groups (up to 30). Recorded at Belo, Sekongkang (8°59'S, 116°45'E), Selah Legium and near Sumbawa Besar. Mainly ricefields. Two specimens from Dompou in MZB collection.

Moyo I. – Scarce. Two at Brang Kua on 11 November, two on a reef flat at Tanjung Pasir on 14 November 1988 and two observed regularly between Labuan Aji and waterfalls from 1992–1995.

*Leptoptilos javanicus* Lesser Adjutant

Moyo I. – Two at Brang Kua on 10 November 1988. The first record east of Bali.

## Accipitridae

*Pandion haliaetus* Osprey

Moyo I. – Scarce. Only recorded at Amanwana Bay and Tanjung Pasir.

*Pernis ptilorhyncus* Oriental Honey-buzzard

Sumbawa I. Scarce. One at Babar, Selah Legium on 8 August and a pair at Gunung Olet Sangenges on 16 August 1993. These are the first records for Sumbawa and the birds probably belong to one of the Sundaic races *P. p. torquatus* or *P. p. ptilorhyncus*.

*Elanus caeruleus* Black-winged Kite

Sumbawa I. – Scarce. Recorded by Gibbs (1990) at Taliwang in December 1989 and one near Lake Taliwang on 9 August 1993. The first records for Sumbawa.

*Milvus migrans affinis* Black Kite

Sumbawa I. – Three edge of lake at Meraran on 22 May and one over roads and fires on 13 May 1988. The first records for Sumbawa.

*Haliastur indus intermedius* Brahminy Kite

Sumbawa I. – Common. Ones, twos and groups (up to 24). Recorded at Alas, Meraran, Selah Legium, Maluku, Taliwang, Sumbawa Besar, Teluk Santong, Dahu and near Dompou. Mainly coasts, swamps, riverine vegetation and moist deciduous monsoon forest. Also attracted to fires. Recorded up to 1200 m at Gunung Olet Sangenges. A male from Dompou in MZB collection.

Moyo I. – One in mangal and coconut plantation at Sebotok, two observations of single birds at Tanjung Pasir and two at Amanwana.

*Haliaeetus leucogaster* White-bellied Sea Eagle

Sumbawa I. – Uncommon. One near Alas on 7 May; one near Sumbawa Besar on 23 May 1988; one at Maluku on 9 August 1993; four east of Sape on 21 August 1993;

and one inland at 1250 m at Gunung Olet Sangenges on 18 August 1993. Also one on islet between Sumbawa and Lombok on 29 May 1988.

Moyo I. – One at Tanjung Pasir on 12 November 1988 and a pair breeding each year at Amanwana from 1992–1995.

*Circaetus gallicus* Short-toed Eagle

Sumbawa I. – One record of two birds at Babar, Selah Legium on 5 August 1993.

*Accipiter fasciatus wallacii* Brown Goshawk

Sumbawa I. – Uncommon to moderately common. Ones and twos recorded at Belo, Babar (Selah Legium), Gunung Olet Sangenges, Dahu and Sumbawa Besar. Rainforest and riverine forest. A female from Sumbawa Besar in MZB collection.

Moyo I. – Two in rainforest at Brang Kua on 10 November and a pair building a nest 13 m up in *Erythrina* in vine forest at Tanjung Pasir in November 1988. Also recorded at Amanwana. The stomach of a male collected at Brang Kua contained a lizard *Sphenomorphus*.

Sangeang I. – One hunting over prickly *Acacia-Zizyphus* scrub on 21 October 1988.

*Accipiter novaehollandiae sylvestris* Grey Goshawk

Sumbawa I. – Uncommon. Recorded during July–August 1993 at all three sites in Selah Legium complex and at Gunung Olet Sangenges up to 900 m. Mainly in rainforest but also moist deciduous monsoon forest. Two specimens from Sumbawa Besar in MZB collection.

Moyo I. – One in coconut palms at Sebotok on 7 November 1988. Also observed in several locations around the island by B. Lees between 1992 and 1995.

*Accipiter gularis* Japanese Sparrow-hawk

Sumbawa I. – One at Batu Hijau on 27 July and two on 28 July 1993. This is a common Palaearctic winter visitor to South-East Asia but there are few records for the Lesser Sundas and these are the first for Sumbawa.

*Hieraaetus fasciatus* Bonelli's Eagle

Sumbawa I. – Rare. Two just east of Maluku on 9 August 1993.

*Hieraaetus kienerii* Rufous-bellied Eagle

Sumbawa I. – Rare. Three records at Batu Hijau and one at Gunung Olet Sangenges in July–August 1993. The first records for Sumbawa and this species is listed by White and Bruce (1986) as scarce and local in Wallacea.

*Spizaetus cirrhatus floris* Changeable Hawk-eagle

Sumbawa I. – Rare. One at Gunung Olet Sangenges on 15 August 1993 and a male from Batu Dulang in MZB collection. This subspecies is restricted to Flores, Sumbawa and Paloe, and is isolated from the nearest breeding birds in South-East Asia.

**Falconidae**

*Falco moluccensis microbialia* Spotted Kestrel

Sumbawa I. – Moderately common. Ones and twos.

Recorded at Meraran, Belo, Babar, Selah Legium, Maluku, Batu Tering, the footslopes of Gunung Olet Sangenges, Sumbawa Besar, Dompou, Waworada and Batu Dulang. Forests, woodlands, near large bat caves, lowland open country and around villages. Pair entering a hollow 25 m up in huge tree in rainforest at Batu Dulang (alt. 800 m) on 4 November 1988.

A male from Dompou in MZB collection.

Moyo I. – Scarce, Ones and twos at Amanwana, Labuan Aji, Sebotok, Brang Kua and Tanjung Pasir. Coconut plantations, rice fields and over burnt areas.

*Falco cenchroides* Australian Kestrel

Sumbawa I. – One at Sekongkong, western Sumbawa (8°59'S, 116°45'E) on 1 August 1993. The first record for Sumbawa.

*Falco longipennis* Australian Hobby

Sumbawa I. – Scarce or uncommon. Six sightings, mostly of single birds at Selah Legium, Batu Tering, near Dompou and at Batu Dulang. Over villages and rice fields.

Moyo I. – Two observations of a single bird hunting over low prickly *Zizyphus* and coastal cliffs at Tanjung Pasir.

**Anatidae**

*Dendrocygna javanica* Lesser Whistling Duck

Sumbawa I. – Ten trapped by a fisherman on freshwater lake at Meraran on 12 May 1988.

*Anas gibberifrons* Grey Teal

Moyo I. – Several observations of two birds on brackish coastal pools at Tanjung Pasir.

**Megapodiidae**

*Megapodius r. reinwardt* Orange-footed Scrubfowl

Sumbawa I. – Scarce or rare. Only recorded at Belo and at Batu Hijau and RF2, Selah Legium. Ones and twos in lowland rainforest and prickly vine forest.

Moyo I. – Moderately common. Recorded at Brang Kua and Tanjung Pasir. Rainforest, creekside forest and prickly coastal scrub. Birds were active on mounds in November.

Sangeang I. – Scratchings probably made by this species were found along a creek with dense vine forest.

**Phasianidae**

*Gallus varius* Green Junglefowl

Sumbawa I. – Moderately common to very common and widespread. Recorded at Merante, three sites in Selah Legium, Gunung Olet Sangenges, Belo, Batu Tering, Desa Sangeang, Waworada, Dahu, near Dompou, Batu Dulang and near Sumbawa Besar. Sea level to 1500 m. Mossy forest, rainforest, vine forest, bamboo thickets and open woodland. More often heard than seen. A downy chick collected at Waworada on 27 October 1988.

Moyo I. – Locally moderately common but generally scarce. Calling at Brang Kua and Tanjung Pasir in 1988, also recorded in a number of localities by B. Lees between 1992 and 1995.

Sangeang I. – Scarce. Thickets and scrubs.

### Turnicidae

*Turnix maculosa floresiana* Red-backed Button-quail

Sumbawa I. – Scarce. Seven at Desa Sangeang on 20 October 1988. A male from Sumbawa Besar in MZB collection.

Sangeang I. – A small quail probably this species was flushed from a grassy flat with prickly *Acacia* on 21 October.

*Turnix suscitator powelli* Barred Button-quail

Sumbawa I. – A female from Sumbawa Besar in MZB collection.

Moyo I. – One probably this species flushed from strand zone on beach at Sebotok on 8 November and another from grassland at Brang Kua on 10 November 1988.

Sangeang I. – An adult and chick trapped in grassland.

### Rallidae

*Rallina fasciata* Red-legged Crake

Sumbawa I. – Two edge of freshwater lake at Meraran on 13 May 1988, one in wet grass on the edge of a flooded rice field at Belo on 17 May 1988 and one mist-netted in lower montane forest at c. 550 m at Gunung Olet Sangenges on 16 August 1993. The first records for Sumbawa.

*Porzana cinerea* White-browed Crake

Sumbawa I. – Ones and twos at Meraran in May 1988. Freshwater lake with lilies, bulrushes and water hyacinth.

*Amaurornis phoenicurus leucomelanus* White-breasted Waterhen

Sumbawa I. – Uncommon to moderately common. Recorded Meraran, Lake Taliwang, Belo, Babar, Selah Legium, Gunung Olet Sangenges, Waworada and near Domp. Rice fields, swamps, edges of rivers and creeks.

*Porphyrio porphyrio* Purple Swamphen

Sumbawa I. – Two at edge of a freshwater lake at Meraran on 12 and 13 May 1988. Both had greenish-grey backs. The first record for Sumbawa.

*Gallinula tenebrosa* Dusky Moorhen

Sumbawa I. – One, probably this species observed on a freshwater lake at Meraran on 13 May 1988.

*Gallinula chloropus* Common Moorhen

Sumbawa I. – Two on freshwater lake at Meraran on 12 and 13 May 1988. Both were adults with black upperparts, white flanks and red base to bill. White and Bruce (1986) list a juvenile collected in May.

### Jacaniidae

*Irediparra gallinacea* Comb-crested Jacana

Sumbawa I. – Up to six at freshwater lake, Meraran in May 1988. Feeding among lilies and water hyacinth.

### Charadriidae

*Pluvialis squatarola* Grey Plover

Sumbawa I. – One on coastal flats near Bima on 19 October 1988 and one adult on mudflats at Sape on 21 August 1933. First records for Sumbawa.

Moyo I. – Ones, twos and once a loose group of 8 at Tanjung Pasir in November 1988.

*Pluvialis fulva* Pacific Golden Plover

Moyo I. – Two on tidal flats at Desa Sebotok on 6 November 1988.

*Charadrius peronii* Malaysian Plover

Sumbawa I. – Uncommon along the northern coast. Six on a muddy beach near Maluk on 9 August 1993, three near Sumbawa Besar on 11 August and two on mudflats at Sape on 21 August 1993; also two birds probably *C. peronii* observed twice at edge of mangal, Teluk Santong in May 1988.

*Charadrius leschenaultii* Greater Sand-plover

Sumbawa I. – Scarce or uncommon. One 5 km east of Alas on 9 August 1993, four probably this species near same place on 11 August, and at least six on mudflats at Sape on 21 August 1993. Also recorded by Gibbs (1990) at Taliwang in December 1989. The first records for Sumbawa.

Moyo I. – Two possibly *C. leschenaultii* on mud flats at Desa Sebotok on 6 November 1988.

### Scolopacidae

*Numenius phaeopus* Whimbrel

Sumbawa I. – One on mudflats near Bima on 19 October 1988, and one on a beach 5 km east of Sumbawa Besar on 10 August 1993. A passage migrant and winter visitor to Wallacea.

Moyo I. – Moderately common in November 1988. Mudflats, exposed reefs and beaches.

*Numenius madagascariensis* Far-Eastern Curlew

Sumbawa I. – Two 5 km east of Alas on 9 August 1993. The first records for Sumbawa.

*Limosa lapponica* Bar-tailed Godwit

Sumbawa I. – Three on mudflats near Alas on 28 May, and one on a beach near Waworada on 27 October 1988. The first records for Sumbawa. A passage migrant and winter visitor to Wallacea.

Moyo I. – One on a tidal flat at Sebotok on 6 November 1988.

*Tringa totanus* Common Redshank

Sumba Is. – three on mudflats at Sape on 21 August, 1993.

Moyo I. – Two on beach at Tanjung Pasir on 12 November 1988. The first records for the Sumbawa region.

*Xenus cinereus* Terek Sandpiper

Sumbawa I. – Two on mudflats at Sape on 21 August 1993. The first record for Sumbawa.

*Heteroscelus brevipes* Grey-tailed Tattler

Sumbawa I. – Moderately common. Recorded at Teluk Santong, near Alas, Empang and near Bima. Coastal mudflats. A passage migrant and winter visitor. The first records for Sumbawa.

Moyo I. – Moderately common. Tidal flats and beaches.

*Tringa hypoleucos* Common Sandpiper

Sumbawa I. – Moderately common. Regularly observed on beaches, mudflats and rocky shores along the northern coast.

Moyo I. – Moderately common in November 1988. Recorded at Sebotok, Brang Kua and Tanjung Pasir. Beaches, mudflats and mangal.

Sangeang I. – One on coastal rocks and one on a beach.

**Recurvirostridae***Himantopus leucocephalus* White-headed Stilt

Sumbawa I. – Two in rice fields near Sumbawa Besar on 8 May 1988.

**Phalaropodidae***Phalaropus lobatus* Red-necked Phalarope

Sumbawa I. – Forty-nine offshore east of Sape on 21 August 1993. A passage migrant and winter visitor to Wallacea.

Moyo I. – Four feeding on calm sea in strait between Tanjung Pasir (Moyo I.) and Sumbawa I. on 14 November 1988.

**Burhinidae***Esacus magnirostris* Beach Stone Curlew

Moyo I. – One on reef at Tanjung Pasir on 14 November 1988, also recorded in ones and twos at Amanwana Bay and along the east coast by B. Lees between 1992 and 1995.

**Laridae***Sterna anaethetus* Bridled Tern

Sumbawa I. – A total of 149 birds offshore east of Sape on 21 August 1993.

*Sterna albifrons sinensis* Little Tern

Sumbawa I. – Flocks of 100, 50, 20, 10, 30 and 100 were recorded flying north between Lombok and Sumbawa on 18 October 1988. This region is part of the migration flyway between South East Asia and its winter quarters in northern Australia. Small numbers also breed in the eastern Lesser Sundas.

*Sterna bergii* Great Crested Tern

Sumbawa I. – Scarce. Two in the port of Alas in May 1988, 6 at sea between Sumbawa and Lombok in October 1988 and twenty offshore east of Sape on 21 August 1993. Also reported by Mason (1989).

Moyo I. – Scarce. Four feeding along shoreline near Tanjung Pasir on 13 November 1988 and one at sea between Moyo and Sumbawa Is on 14 November 1988. These are the first records for the Sumbawa region.

*Sterna bengalensis* Lesser Crested Tern

Sumbawa I. – One just east of Sape on 21 August 1993. The first record for Sumbawa.

*Cygis alba* White Tern

Sumbawa I. Two offshore east of Sape on 21 August 1993. The first record for Sumbawa and for Wallacea (White and Bruce 1986).

**Columbidae***Treron floris* Flores Green Pigeon

Sumbawa I. – One in lowland semi-evergreen forest at 550 m at Batu Hijau, Selah Legium on 30 July 1993.

*Treron vernans* Pink-necked Green Pigeon

Sumbawa I. – Two in low prickly scrub on a dry hill at Desa Sangeang on 20 October 1988; moderately common in rainforest at Waworada, small flocks flying high and fast over forest. Breeding March–May (White and Bruce 1986).

Moyo I. – Two feeding on fruits of *Eugenia cummini* and another two in *Ficus* and *Terminalia* at Sebotok in November 1988.

Sangeang I. Moderately common. Ones, twos and small flocks (up to 50). Prickly *Zizyphus* and *Acacia* also creekside vegetation with fruiting trees especially *Ficus*.

Previously recorded only from Lombok I. and Sumbawa I.

*Ptilinopus cinctus albocinctus* Black-backed Fruit Dove

Sumbawa I. – Locally moderately common to common but generally scarce. Recorded in montane forest at 1150 m at Batu Dulang in November 1988, at two sites in lowland semi-evergreen rainforest at Selah Legium in August 1993 and at Gunung Olet Sangenges in August 1993. At the latter common in lower montane forest from 800 m to 1000 m and abundant in montane forest from 1000 to 1500 m. Mainly pairs and small groups. Call a loud 'how-wow' or 'coo-woop'.

*Ptilinopus melanospila* Black-naped Fruit Dove

Sumbawa I. – Uncommon. Two in canopy of rainforest at Waworada in October 1988, also recorded at Gunung Olet Sangenges and at three sites at Selah Legium during July–August 1993. Mainly moist deciduous monsoon forest, semi-evergreen forest, lowland forest and lower montane forest, from 50 m to 700 m.

Moyo I. – Two in a coastal thicket with *Tamarindus*, *Sesbania* and *Eugenia*.

Sangeang I. – Two feeding in canopy of huge *Ficus* on 23 October 1988.

*Ducula aenea polia* Green Imperial Pigeon

Sumbawa I. – Uncommon to very common, in pairs and small groups. Recorded at Sumbawa Besar,

Merente, Belo, Gunung Olet Sangenges, three sites in Selah Legium and Dahu. Recorded up to 850 m. Most common in lowland semi-evergreen rainforest, less frequent in moist deciduous monsoon forest below 100 m and in lower montane forest above 600 m.

Moyo I. – Common. Ones, twos and flocks (up to 50). Recorded at Amanwana, Sebotok and Brang Kua. Rainforest especially areas with fruiting trees including *Eugenia cummini* and *Ficus*. Also observed flying between Tanjung Pasir and Sumbawa I.

*Ducula lacernulata* Dark-backed Imperial Pigeon

Sumbawa I. – Common above 850 m in montane forest at Gunung Olet Sangenges during August 1993. Recorded up to 1700 m. Mostly in upper montane ridge-top forest. A pair carrying nesting material at 1460 m on 15 August. The first records for Sumbawa.

*Ducula bicolor* Pied Imperial Pigeon

Moyo I. – Rare. Several flocks observed by R. Lees at Labuan Aji between 1992 and 1995.

*Columba vitiensis* Metallic Pigeon

Sumbawa I. – Scarce or rare. Five records of single birds during August 1993. Recorded in lowland semi-evergreen forest at Batu Hijau, in moist deciduous monsoon forest at Babar and in upper montane forest at 1250 m at Gunung Olet Sangenges. Presumably rare, but widespread and inhabiting a variety of forest types.

*Macropygia emiliana* Ruddy Cuckoo-dove

Sumbawa I. – Status uncertain. Rare in lowland semi-evergreen forest at the two sites at Selah Legium and in lower montane forest below 1000 m at Gunung Olet Sangenges; but common in upper montane forest (up to 1600 m) at Gunung Olet Sangenges.

Sangeang I. – Four in a *Ficus* thicket along a gully on 23 October.

*Macropygia ruficeps orientalis* Little Cuckoo Dove

Sumbawa I. – One probably this species in mossy rainforest at 1150 m near Batu Dulang in November 1988. Breeding recorded in May (White and Bruce 1986). A male from Batu Dulang in MZB collection.

Moyo I. – One in vine forest at Tanjung Pasir on 14 November 1988.

*Streptopelia bitorquata* Island Collared Dove

Sumbawa I. – Common in mangal at Teluk Santong. Listed as breeding in April–May (White and Bruce 1986).

Moyo I. – Scarce. Only recorded at Desa Sebotok. Mangal.

Sangeang I. – Three on beach on 22 October 1988.

*Streptopelia chinensis tigrina* Spotted Dove

Sumbawa I. – Common and widespread. Recorded at Alas, near Sumbawa Besar, Merente, Belo, Gunung Olet Sangenges, Maluku, Babar, Teluk Santong, Batu Tering, Sangeang and Dahu. Mainly in and around cultivation but also open coastal woodland, open *Acacia* scrub and riverine vegetation. From sea level to c. 800 m. Listed as breeding from March to May (White and Bruce 1986).

Moyo I. – Moderately common. Recorded at Labuan Aji, Desa Sebotok, Brang Kua and Tanjung Pasir. Creekside vegetation, edges of rainforest, burnt areas and prickly coastal scrub.

Sangeang I. – Common. Groups of up to 100 drinking from seepages on beaches. Also open forest and woodland.

*Geopelia striata maugei* Timor Zebra Dove

Sumbawa I. – Common. Recorded at Belo, Babar, Teluk Santong, Waworada, Maluku, Sura I., and Dahu. Edges of forest and mangal, along creeks also rice fields, gardens, scrub and road verges below 100 m. Breeding April–July (White and Bruce 1986).

Moyo I. – Moderately common. Recorded at Labuan Aji, Sebotok and Brang Kua. Edges of mangal, gardens and open woodland.

Sangeang I. – Common. Ones, twos and groups of up to 50 drinking at fresh water seepages on beach. Also coastal scrubs and woodlands.

*Chalcophaps indica indica* Green-winged Pigeon

Sumbawa I. – Scarce or uncommon. Recorded at Batu Tering at three sites at Selah Legium and at Gunung Olet Sangenges. Creekside forest, bamboo thickets, lowland semi-evergreen and moist deciduous monsoon forest, and lower montane forest (up to 850 m). Rare in upper montane forest.

Moyo I. – Scarce. Only recorded at Sebotok. Coastal vine thickets and mangal.

Sangeang I. – One in creekside forest.

*Caloenas nicobarica* Nicobar Pigeon

Sumbawa I. – Scarce. One flushed from edge of open forest at Belo on 17 May 1988 and three records of possibly the same individual in semi-evergreen lower montane forest at 450 m at Batu Hijau, Selah Legium in August 1993. Also a female from Taliwang in MZB collection.

Moyo I. – Scarce. Several flocks of 8–10 observed by B. Lees in dense forest near waterfalls between 1992 and 1995.

## Psittacidae

*Trichoglossus haematodus forsteni* Rainbow Lorikeet

Sumbawa I. – Uncommon to moderately common in small flocks (up to 8). Recorded at Alas, Sumbawa Besar, Merente, Belo, RF2, Babar, Waworada and Batu Dulang. Coastal lowlands, moist deciduous monsoon forest and rainforest to 1150 m. Nomad attracted to flowering trees.

*Cacatua sulphurea parvula* Yellow-crested Cockatoo

Sumbawa I. – Rare. One in semi-evergreen rainforest at Merente on 11 May 1988; a pair in tall riverine forest dominated by the tree *Duabanga moluccensis* at RF2, Selah Legium on 5 August 1993 and one at same place the following day. This parrot appears to be close to extinction on Sumbawa.

Moyo I. – Moderately common. Small groups (up to 5) recorded at Brang Kua and Tanjung Pasir. Rainforest and gardens.

*Geoffroyus geoffroyi floresianus* Red-cheeked Parrot

Sumbawa I. – Locally common, e.g. at Gunung Olet Sangenges, at three sites at Selah Legium and at Waworada and Dahu, elsewhere scarce. Lowland semi-evergreen and moist deciduous monsoon forest below 550 m (uncommon above 550 m to 700 m), also woodland and sometimes village gardens.

#### Cuculidae

*Cuculus saturatus* Oriental Cuckoo

Sumbawa I. – Rare. One in bamboo thicket near Dompou on 1 November 1988; listed as rare in moist deciduous monsoon and lowland semi-evergreen forest at RF2 and Babar, Selah Legium in August 1993; and rare in lowland semi-evergreen and montane forest (up to 1400 m) at Gunung Olet Sangenges in August 1993. Both migrant *C. s. saturatus* and resident *C. s. lepidus* are recorded for this island.

Moyo I. – One in prickly scrub at Tanjung Pasir on 11 November 1988.

*Cuculus sepulcralis* Rusty-breasted Cuckoo

Sumbawa I. – Recorded as rare in lowland semi-evergreen forest below 550 m, but common in montane forest up to 1500 m at Gunung Olet Sangenges in August 1993.

Sangeang I. – One in creekside forest on 23 October 1988.

*Chrysococcyx lucidus* Shining Bronze-cuckoo

Sumbawa I. – Rare. Only recorded at three sites at Selah Legium and at Gunung Olet Sangenges in August 1993. Moist deciduous monsoon forest and lowland semi-evergreen forest below 550 m.

*Eudynamys scolopacea* Asian Koel

Sumbawa I. – Scarce. Single birds at Waworada in October 1988 and in scrub at Babar, Selah Legium in August 1993.

Moyo I. – Moderately common. Ones and twos. Recorded at Sebotok, Brang Kua and Tanjung Pasir. Mangal, forest with fruiting trees and open prickly *Zizyphus*.

*Centropus bengalensis javanensis* Lesser Coucal

Sumbawa I. – Locally moderately common. Recorded at Batu Tering, Meraran, Belo, two sites at Selah Legium, Batu Hijau, Babar, Sangeang, Waworada, Dahu, Batu Dulang and Dompou. Tall grass, gardens, *Lantana* thickets, lowland semi-evergreen forest, scrub and edges of rainforest. From coasts to 1150 m.

Moyo I. – Uncommon. Ones and twos at Labuan Aji, Brang Kua and Tanjung Pasir. Hedge rows, *Lantana* and prickly *Zizyphus*.

#### Tytonidae

*Tyto alba* Barn Owl

Sumbawa I. – One entangled in string in a coconut palm at Sumbawa Besar in November 1988.

One specimen (spirit), length 33 cm, weight 294 g.

Moyo I. – One at Tanjung Pasir in 1992, also heard at Amanwana between 1992 and 1995.

#### Strigidae

*Otus magicus albiventris* Moluccan Scops Owl

Sumbawa I. – One collected from open forest at Waworada and two netted in gardens with coconut palms, bamboo and kapok at Dahu in October 1988.

*Otus silvicola* Wallace's Scops Owl

Sumbawa I. – Status uncertain. A total of seven birds heard calling in lowland semi-evergreen rainforest at 500–550 m at Batu Hijau, Selah Legium and at 450 m at Gunung Olet Sangenges, and one in upper montane forest at 1350 m at the latter site. Also a male from Dompou in MZB collection.

#### Caprimulgidae

*Caprimulgus macrurus* Large-tailed Nightjar

Sumbawa I. – Four edge of forest at Batu Tering in May 1988, one calling from a clearing in rainforest at Batu Dulang (1150 m) in November 1988 and two sightings of single birds in a forest clearing at Batu Hijau, Selah Legium in July and August 1993.

*Caprimulgus affinus* Savanna Nightjar

Sumbawa I. – Uncommon. Recorded at Waworada and near Dompou. Grassland on stony hills, open woodland, bare flats and edges of roads.

Moyo I. – One in open prickly woodland near Tanjung Pasir on 12 November 1988.

Sangeang I. – One on open grassy flat on 22 October 1988. Call 'skeetch' or 'tweetch'.

#### Apodidae

*Aerodramus fuciphagus* Edible-nest Swiftlet

Sumbawa I. – Locally common but generally uncommon. Five collected from an old Japanese tunnel at 800 m near Batu Dulang in November 1988. Common at three sites at Selah Legium and at Gunung Olet Sangenges (mainly below 1000 m). About 50,000 at Lake Taliwang on 9 August 1993.

*Collocalia esculenta* Glossy Swiftlet

Sumbawa I. – Common to very common. From sea level to 1250 m. Recorded at Alas, Merente, Belo, Selah Legium, Maluku, Gunung Olet Sangenges, Sumbawa Besar, Batu Tering, Dahu and Batu Dulang. Breeding at Belo in May 1988.

Sangeang I. – Common. Seven collected from a small cave.

*Hirundapus caudacutus* White-throated Needletail

Moyo I. – Two dashing low over the coast during a thunderstorm at Tanjung Pasir on 13 November 1988. The first record for the Sumbawa region.

*Cypsiurus balasiensis* Asian Palm Swift

Sumbawa I. – Four, probably this species, were flushed from the dead skirt of a coconut palm at

Sumbawa Besar on 5 November 1988. White and Bruce (1986) list unconfirmed reports from Komodo, Rinca and Flores I.

Moyo I. – Two flushed twice from frons of a coconut palm at Sebotok on 8 November 1988.

#### Alcedinidae

*Alcedo atthis floresiana* Common Kingfisher

Sumbawa I. – Uncommon. Recorded in riverine forest at RF2 and Babar, Selah Legium in August 1993. Also a male from Sumbawa Besar in MZB collection.

*Alcedo meninting* Blue-eared Kingfisher

Sumbawa I. – One collected at Batu Tering on 26 May 1988. The first record for Sumbawa.

*Alcedo coerulescens* Small Blue Kingfisher

Sumbawa I. – Locally moderately common e.g. in mangal at Teluk Santong, elsewhere scarce. Also recorded at Meraran at edge of swamp and at Empang.

*Ceyx erithacus* Oriental Dwarf Kingfisher

Sumbawa I. – Uncommon in riverine forest at three sites at Selah Legium (up to 550 m), and a single record at 650 m at Gunung Olet Sangenges in August 1993.

*Halcyon capensis floresiana* Stork-billed Kingfisher

Sumbawa I. – Scarce or rare. One in mangal at Teluk Santong on 23 May 1988, also recorded in riverine forest at three sites at Selah Legium and at Gunung Olet Sangenges in August 1993. Most records below 550 m one at 870 m.

*Halcyon sancta* Sacred Kingfisher

Sumbawa I. – Common. Ones and twos. Recorded at Sumbawa Besar, Meraran, Belo, Teluk Santong, Batu Tering and Dahu in 1988 and along the coast between Maluku and Sumbawa Besar and at Sape in August 1993. Mangal, village gardens, open woodland and edges of forest. Mainly a winter visitor from Australia.

Moyo I. – Scarce. One in mangal at Sebotok on 7 November 1988, also recorded at Tanjung Pasir and Amanwana between 1992 and 1995.

Sangeang I. – Scarce. Single birds in prickly *Zizyphus* scrub on 21 and 22 October 1988.

*Halcyon chloris chloris* Collared Kingfisher

Sumbawa I. – Common. Ones and twos. Recorded at Teluk Santong, Bima, Sangeang and Waworada in May 1988 and along the coast from Maluku to Sape in August 1993. Mainly mangal and village gardens. Observed feeding on fiddler crabs at Teluk Santong.

Moyo I. – Uncommon. Ones and twos. Recorded at Sebotok and Tanjung Pasir. Mangal and coastal scrub also groves of *Tamarindus*.

Sangeang I. – Uncommon. Ones and twos in open woodland near coast.

*Caridonax fulgidus* White-rumped Kingfisher

Sumbawa I. – Uncommon but locally moderately common. A female collected from rainforest at Batu Dulang on 3 November 1988, also recorded from 50–

1460 m at Gunung Olet Sangenges and at three sites at Selah Legium in August 1993. Most frequent in primary semi-evergreen forest (particularly in lower montane forest at Gunung Olet Sangenges), but also recorded in moist deciduous monsoon forest and forest edges. A female from Bau Dulang in MZB collection.

#### Meropidae

*Merops ornatus* Rainbow Bee-eater

Sumbawa I. – Common in pairs and flocks (up to 300). Recorded at Alas Batu Tering, Merente, near Taliwang, Belo, Batu Hijau, Maluku, Gunung Olet Sangenges, near Sumbawa Besar, Batu Dulang, Teluk Santong, Sangeang, Waworada and near Sape. Probably mostly winter visitors from Australia, records in May, July–August and October–November. A flock of 100 flying north over Merente on 11 May 1988 and a flock of 300 roosting in mangal at Teluk Santong on 21 May 1988. Some breeding may also occur in the region. A freshly dug but empty nest burrow was found on an open grassy flat at Sangeang on 20 October 1988. Breeding occurs in north Western Australia in October–February.

Moyo I. – Common along edge of mangal at Sebotok, also recorded at Tanjung Pasir.

Sangeang I. – Scarce. Two on 22 October and 4 on 23 October 1988.

*Merops philippinus* Blue-tailed Bee-eater

Sumbawa I. – Scarce. Recorded at Alas and Meraran in 1988, and two 5 km east of Sumbawa Besar on 10 August 1993.

Moyo I. – Scarce. Migratory flocks observed by R. Lees at Labuan Aji, mainly August–October.

#### Coraciidae

*Eurystomus orientalis* Common Dollarbird

Sumbawa I. – Status uncertain. Two in riverine forest at Dahu on 31 October 1988, one near Dompou in November 1988 also recorded in open areas with scattered trees at three sites at Selah Legium in July–August 1993.

Moyo I. – A female collected from tall *Sonneratia* mangal at Sebotok on 7 November 1988. Listed by R. Lees as often seen on west side of island.

#### Picidae

*Dendrocopos moluccensis* Brown-capped Woodpecker

Sumbawa I. – Locally moderately common but generally scarce. Recorded at Batu Dulang in November 1988 and at three sites at Selah Legium and at Gunung Olet Sangenges in July–August 1993. Mainly semi-evergreen forest also lower montane forest up to 850 m, scarce or rare in lowland moist deciduous monsoon and upper montane forest.

Sangeang I. – One in open woodland on 23 October 1988.

#### Pittidae

*Pitta elegans concinna* Elegant Pitta

Sumbawa I. – Locally moderately common to

common. Recorded at Merente, near Alas, Belo, Batu Dulang, at three sites at Selah Legium and at Gunung Olet Sangenges. Recorded from 30–1350 m. Common in logged forest, frequent in primary semi-evergreen and moist deciduous monsoon forest, uncommon in upper montane forest. Three mist-netted birds had brood patches on 2, 13 and 14 August.

#### Alaudidae

*Mirafra javanica* Singing Bushlark

Sumbawa I. – Scarce. One on a bare rice field at Belo on 15 and 16 May and one on a grassy flat with prickly Acacia at Sangeang on 20 October 1988.

#### Hirundinidae

*Hirundo rustica gutturalis* Barn Swallow

Sumbawa I. – A flock of 25 circling Bima on 19 October 1988, common in small flocks in Teluk Sumbawa on 6 November 1988 and one at Babar, Selah Legium on 8 August 1993. These are the first records for Sumbawa.

Moyo I. – Moderately common in small flocks in and around Sebotok in November.

Sangeang I. – Two over village on 22 October.

*Hirundo tahitica javanica* Pacific Swallow

Sumbawa I. – Scarce. Ones and twos noted at Belo, Teluk Santong and Dompou in May and October 1988, and at Batu Hijau, Selah Legium, Maluku and 5 km east of Sumbawa Besar in August 1993.

*Hirundo striolata* Striated Swallow

Sumbawa I. – Only one record of four birds near Lake Taliwang on 9 August 1993.

#### Motacillidae

*Anthus novaeseelandiae* Richard's Pipit

Sumbawa I. – Locally moderately common in ones, twos and small groups (up to 6). Recorded at Teluk Santong and Sangeang. Coastal grassy flats.

#### Campephagidae

*Coracina personata floris* Wallacean Cuckoo Shrike

Sumbawa I. – Uncommon. Ones and twos. Recorded at Merente, near Alas, Belo, Batu Tering, Batu Hijau, Gunung Olet Sangenges and Batu Dulang. Mainly open woodland also lowland semi-evergreen rainforest.

*Coracina dohertyi* Sumba Cicadabird

Sumbawa I. – Status uncertain. Two at 250 m at RF2, Selah Legium on 5 August 1993, and frequent at 800–930 m at Gunung Olet Sangenges on 15–18 August 1993. All were in semi-evergreen rainforest. The first records for Sumbawa.

*Lalage sueurii sueurii* White-winged Triller

Sumbawa I. – Moderately common. Mainly in ones and twos. Recorded at Alas, Belo, Maluku Sumbawa Besar, 5 km east of Sumbawa Besar, Batu Tering, Teluk

Santong, Waworada and Sangeang. Mangal, coastal scrub, woodlands and cultivated areas.

Moyo I. – One in mangal at Sebotok on 7 November.

Sangeang I. – Pair in open woodland on 21 October and one on 22 October 1988.

*Pericrocotus lansbergei* Little Minivet

Sumbawa I. – Locally moderately common but generally uncommon. Recorded at Gunung Olet Sangenges, at three sites at Selah Legium and 5 km east of Sumbawa Besar. Mainly open parkland with some large trees and sparse understorey, also semi-evergreen forest, moist deciduous monsoon forest and riverine forest. Recorded up to 1150 m but most frequent below 500 m. Three males from Batu Dulang in MZB collection.

#### Laniidae

*Lanius cristatus* Brown Shrike

Moyo I. – A male collected from open woodland at Sebotok on 8 November 1988. Presumably a vagrant from northern Asia. The first record for the Sumbawa region.

*Lanius schach bentet* Long-tailed Shrike

Sumbawa I. – Moderately common. Recorded at Sumbawa Besar, Empang, Teluk Santong, Waworada and Sangeang. Also along northern coast from Maluku, through Taliwang and Sumbawa Besar to Sape. Open woodland and cultivated areas.

*Saxicola caprata fruticola* Pied Bushchat

Sumbawa I. – Locally moderately common in ones and twos. Recorded at Sumbawa Besar, Meraran, Belo, Babar, northern and western coasts from Maluku to Sape, Dompou, Waworada and Wawo. Mainly open coastal habitats, cultivated areas and edges of wetlands.

Moyo I. – Scarce. Recorded at Labuan Aji, Sebotok and Tanjung Pasir. Open woodland and prickly coastal scrub.

Sangeang I. – Scarce. Open scrub and village gardens.

#### Turdidae

*Zoothera interpres* Chestnut-capped Thrush

Sumbawa I. – Scarce or uncommon. Only recorded at Gunung Olet Sangenges and a single record from Batu Hijau, Selah Legium. Mainly lowland semi-evergreen forest and lower montane forest from 450 m to 850 m. Birds were in full song in July–August 1993 and a juvenile seen on 14 August. Apparently replaced by *Z. dohertyi* at higher altitude.

*Zoothera dohertyi* Chestnut-backed Thrush

Sumbawa I. – Locally moderately common but generally rare. Rare at Batu Hijau, Selah Legium and below 500 m at Gunung Olet Sangenges, but common above this altitude at the latter site. Mainly closed-canopy semi-evergreen forest with fruiting trees between 750 and 950 m. Rarely in degraded forest. Birds were singing in July–August. A female from Batu Dulang in MZB collection.

*Zoothera andromedae* Sunda Thrush

Sumbawa I. – One at 450 m in closed semi-evergreen forest at Batu Hijau, Selah Legium and four (including two mist-netted) at 550–850 m at Gunung Olet Sangenges in August 1993. These are the first records for Sumbawa.

**Sylviidae***Tesia everetti sumbawana* Russet-capped Tesia

Sumbawa I. – Locally common. Only recorded at Batu Dulang, Gunung Olet Sangenges and at Batu Hijau and RF2, Selah Legium. Recorded from 200 m to 1700 m though slightly less common at higher altitudes. Favours the dense undergrowth of rainforest, bamboo thickets and dense riverine forest. Individuals were observed carrying nesting material at Batu Hijau on 29 July 1993.

*Acrocephalus stentoreus* Clamorous Reed Warbler

Sumbawa I. – Only recorded at Meraran wetlands where it was moderately common in Typha and lilies. An adult male collected on the 14 May had a weight of 21 g, total length 119 mm and wing 77 mm. It has a heavier bill and is paler and more streaked on the throat and breast than Western Australian populations.

*Phylloscopus borealis* Arctic Warbler

Sumbawa I. – Two males in MZB collection.

*Phylloscopus trivirgatus trivirgatus* Mountain Leaf-Warbler

Sumbawa I. – Three feeding in canopy of rainforest at Batu Dulang 1150 m on 3 November 1988.

*Seicercus montis* Yellow-breasted Warbler

Sumbawa I. – One feeding in canopy of rainforest at Batu Dulang 1150 m on 4 November. First record for Sumbawa.

*Cisticola juncidis* Zitting Cisticola

Sumbawa I. – Two adults and 3 fledged chicks in tall grass at Teluk Santong on 23 May 1988 and one in grassland at Sumbawa Besar on 10 August 1993. Also a specimen in MZB collection from Wawo.

Moyo I. – Moderately common in tall grass and coastal scrub at Tanjung Pasir.

Sangeang I. – Several in spinifex, grass and low shrubs near beach.

**Muscicapidae***Rhinomyias oscillans* Russet-backed Rhinomyias

Sumbawa I. – Rare. Only recorded at Batu Hijau, Selah Legium between 27 July and 8 August 1993 in primary semi-evergreen forest from 500–650 m. Juveniles observed on 28 July and 2 August indicating breeding. Birds were not distinguishable from those on Flores and are presumably of the same race *R. o. oscillans*. The first records for Sumbawa.

*Ficedula hyperythra vulcani* Snowy-browed Flycatcher

Sumbawa I. – One in rainforest at Batu Dulang, 1150 m, on 4 November 1988.

*Ficedula dumetoria dumetoria* Rufous-chested Flycatcher

Sumbawa I. – Rare or uncommon. Recorded at Batu Hijau, Selah Legium, and at Gunung Olet Sangenges. Also a male from Batu Dulang in MZB collection. Mainly closed-canopy semi-evergreen forest above 400 m.

**Monarchidae***Terpsiphone paradisi floris* Asian Paradise Flycatcher

Sumbawa I. – A male from Dompu in MZB collection.

*Hypothymis azurea prophata* Black-naped Monarch

Sumbawa I. – Moderately common throughout the island. Rainforest including moist deciduous monsoon forest, riverine forest, woodland, mangal, bamboo thickets and cultivated areas, below 1000 m. Forages mainly in lower levels of vegetation. Breeding – pair building a nest 6 m up in a bamboo thicket at Batu Tering on 26 May and a pair building 1.5 m up on a hanging vine at Dahu on 30 October.

Moyo I. – Moderately common. Recorded at Sebotok and Tanjung Pasir. Mangal, vine forest and woodland.

Sangeang I. – A female collected from a coastal *Ficus* thicket on 22 October.

**Rhipiduridae***Rhipidura diluta sumbawensis* Brown-capped Fantail

Sumbawa I. – Locally moderately common e.g. at Waworada, Batu Dulang, Selah Legium and Gunung Olet Sangenges (up to 1700 m). Recorded in all forest types, including heavily degraded habitat. Most frequent in forest with an extensive understorey, along streams and in small clearings with dead vegetation lying on the ground.

Sangeang I. – One in a *Ficus* thicket near coast on 22 October.

**Pachycephalidae***Pachycephala pectoralis fulvotincta* Common Golden Whistler

Sumbawa I. – Common to moderately common. Recorded at Merente, Belo, Selah Legium, Gunung Olet Sangenges, Batu Tering, Batu Dulang, Waworada, Dahu and Dompu. All forest habitats from 20–850 m including rainforest, bamboo thickets and cultivated areas.

Sangeang I. – Scarce. Pair in open scrub along a creek on 22 October.

*Pachycephala nudigula ilsa* Bare-throated Whistler

Sumbawa I. – Common in semi-evergreen forest at Batu Hijau and RF2, Selah Legium, and at Gunung Olet Sangenges during July–August 1993. Recorded from 200–1700 m. Mainly montane and riverine forest. Tolerant of habitat degradation only where the forest retained a closed canopy. This subspecies is endemic to Sumbawa.

**Paridae***Parus major cinereus* Great Tit

Sumbawa I. – Scarce. Ones and twos. Recorded at

Gunung Olet Sangenges, Batu Tering, Batu Dulang, Waworada and Sangeang. Mainly open woodland, village gardens, also semi-evergreen rainforest, moist deciduous monsoon forest and scrub with scattered trees.

### Dicaeidae

#### *Dicaeum annae* Golden-rumped Flowerpecker

Sumbawa I. – Locally moderately common but generally scarce or uncommon. Recorded at three sites at Selah Legium, also at Gunung Olet Sangenges, Merente, near Alas and at Batu Dulang. Mainly closed canopy semi-evergreen rainforest also cultivated areas with patches of rainforest. Recorded from 40 m to 1530 m, most frequent below 1000 m. Three birds with brood patches were mist-netted in early August, indicating breeding.

#### *Dicaeum agile* Thick-billed Flowerpecker

Sumbawa I. – Uncommon. Recorded at Batu Hijau, Selah Legium, at Gunung Olet Sangenges and at Babar in July–August 1993. Noted from 50–700 m and most records were from moist deciduous monsoon forest and scrub with scattered trees. The first records for Sumbawa.

#### *Dicaeum igniferum* Black-fronted Flowerpecker

Sumbawa I. – Common to moderately common. Recorded at Merente, three sites at Selah Legium, Gunung Olet Sangenges, near Alas, Batu Tering, Batu Dulang and Teluk Santong. Noted from 50–1730 m but rare in upper montane forest. Rainforest, degraded forest, monsoon forest, cultivated areas and woodland. Breeding noted in July–August 1993.

Moyo I. – Uncommon. Ones and twos recorded at Sebotok and Tanjung Pasir. Mangal, rainforest and open coastal scrub.

### Nectariniidae

#### *Anthreptes malacensis convergens* Brown-throated Sunbird

Sumbawa I. – Moderately common. Recorded at Merente, Batu Hijau, Babar, Gunung Olet Sangenges, near Alas, Meraran, Teluk Santong, Batu Tering, Dahu and Dompou. Mainly riverine forest, cultivated areas and scrub, less frequent in semi-evergreen forest. Noted from 20–1000 m.

Moyo I. – Uncommon. Two at Sebotok on 7 November.

#### *Nectarinia jugularis ornata* Olive-backed Sunbird

Sumbawa I. – Common. Recorded at Sumbawa Besar, Merente, Batu Hijau, Babar, footslopes of Gunung Olet Sangenges, near Alas, Belo, Batu Dulang, Batu Tering, Teluk Santong, Sangeang, Waworada and Dahu. Mainly cultivated areas, edges of rainforest, logged forest, riverine forest and open woodland.

Moyo I. – Scarce. Ones and twos at Amanwana, Sebotok and Tanjung Pasir. Cultivated areas and creekside forest. Also attracted to flowering *Erythrina*.

Sangeang I. – Scarce. Open woodland.

#### *Nectarinia solaris* Flame-breasted Sunbird

Sumbawa I. – Scarce. Recorded near Sumbawa Besar, Merente, three sites at Selah Legium, Gunung Olet Sangenges, near Alas and at Dahu. Mainly cultivated areas, riverine forest and degraded forest. Attracted to flowering *Kurrajong* and *Erythrina*. Juveniles observed in July–August.

### Zosteropidae

#### *Zosterops palpebrosus unicus* Oriental White-eye

Sumbawa I. – Very common to moderately common in small flocks (up to 20) at Batu Dulang and Gunung Olet Sangenges. Lower and upper montane semi-evergreen forest from 850–1730 m.

#### *Zosterops montanus* Mountain White-eye

Sumbawa I. – Six recorded at 1500–1700 m in semi-evergreen montane forest at Gunung Olet Sangenges on 16 August 1993.

#### *Zosterops wallacei* Yellow-spectacled White-eye

Sumbawa I. – Locally moderately common. Recorded at Merente, three sites at Selah Legium, Gunung Olet Sangenges, Batu Tering, Batu Dulang, Dompou and Wawo. From 20–800 m in cultivated areas, bamboo thickets, scrub, forest-edge and heavily degraded forest. Tolerant of very dry habitat.

Moyo I. – Uncommon. Recorded at Sebotok and Tanjung Pasir. Vine forest and woodland.

#### *Zosterops chloris intermedius* Lemon-bellied White-eye

Sumbawa I. – Common in small flocks (up to 5). Recorded at Batu Tering, Batu Dulang, Teluk Santong, Sangeang, Waworada and Bima. Cultivated areas, mangal and open woodland.

Moyo I. – Common at Sebotok and Tanjung Pasir. Cultivated areas, coastal thickets and vine forest.

Sangeang I. – Common. Mainly small flocks. Open coastal woodland especially thickets of *Ficus*.

#### *Lophozosterops supercilialis hartertianus* Yellow-browed Darkeye

Sumbawa I. – Common in upper montane semi-evergreen forest between 1400 and 1700 m at Gunung Olet Sangenges in August 1993. Also a female from Batu Dulang in MZB collection. Presumably common in remaining montane forests on Sumbawa.

#### *Lophozosterops dohertyi dohertyi* Crested Darkeye

Sumbawa I. – Locally common but generally scarce. Recorded at Batu Dulang, Batu Hijau, Gunung Olet Sangenges and RF2 (Selah Legium). Common at sites with closed-canopy semi-evergreen rainforest between 300 and 1400 m. Only found in degraded forest where a closed canopy and extensive understorey remained. Appears to be replaced by the congeneric Yellow-browed Darkeye above 1200 m. Breeding recorded in July–August 1993.

#### *Heleia crassirostris* Thick-billed Darkeye

Sumbawa I. – Locally moderately common. Recorded at three sites at Selah Legium and at Gunung Olet

Sangenges in July–August 1993. Noted from 100–1200 m. Most frequent in primary semi-evergreen rainforest and moist deciduous monsoon forest. Also in degraded forest-edge habitat and dry forest. Five mist-netted birds had brood patches and one bird was observed carrying nesting material in early August.

#### Estrildidae

*Taeniopygia guttata guttata* Zebra Finch

Sumbawa I. – Moderately common in small flocks (up to 10). Recorded at Sumbawa Besar, Belo, Batu Tering, Teluk Santong and Sangeang. Cultivated areas, open woodland and thickets of prickly Acacia.

*Erythrura hyperythra intermedia* Tawny-breasted Parrot-Finch

Sumbawa I. – Status uncertain. Three males from Sumbawa in MZB collection.

*Lonchura molucca* Black-faced Munia

Sumbawa I. – Common. Mainly in small flocks (up to 20) occasionally larger flocks up to 200. Recorded at Sumbawa Besar, Merente, Meraran, Belo, Maluku, Alas, footslope of Gunung Olet Sangenges, Batu Tering, Batu Dulang, Teluk Santong, Waworada and Dahu. Cultivated areas especially rice fields, edges of wetlands, edges of forest and lowland scrub. Breeding recorded in May.

Moyo I. – Uncommon to moderately common in small flocks (up to 8). Recorded at Sebotok and Brang Kua. Coastal thickets and edges of forest.

*Lonchura punctulata nisoria* Scaly-breasted Munia

Sumbawa I. – Common. Mainly small flocks (up to 30). Recorded at Sumbawa Besar, Belo, Teluk Santong, Waworada and Dahu. Mainly in and around rice fields.

*Lonchura pallida* Pale-headed Munia

Sumbawa I. – Uncommon. Mainly small flocks (up to 20). Recorded near Sumbawa Besar, Meraran, Maluku and Teluk Santong. Cultivated areas except at Meraran they were mostly in *Typha*, *Pragmites* and lilies.

*Padda oryzivora* Java Sparrow

Sumbawa I. – Uncommon. Flock of six on road near Sumbawa Besar on 8 May; four bathing in creek at Batu Tering on 26 May; and several in gardens at Batu Tering on 27 May 1988.

#### Meliphagidae

*Philemon buceroides neglectus* Helmeted Friarbird

Sumbawa I. – Common. Recorded at Merente, three sites at Selah Legium, Gunung Olet Sangenges, near Alas, Belo, Batu Tering, Batu Dulang, Dahu and Waworada. Rare above 1000 m. Rainforest, vine forest and cultivated areas.

Moyo I. – Common. Recorded at Sebotok, Brang Kua and Tanjung Pasir. Mangal, open woodland, rainforest and vine forest. Attracted to flowering *Sesbania*.

Sangeang I. – Common. Open woodland and creekside vegetation. Attracted to fruiting *Ficus*.

*Lichmera lombokia* Scaly-crowned Honeyeater

Sumbawa I. – Only recorded at Gunung Olet Sangenges in August 1993. Common in upper montane semi-evergreen forest from 1000–1700 m and uncommon in lower montane forest (800–1000 m).

*Lichmera indistincta limbata* Brown Honeyeater

Sumbawa I. – Common. Recorded at Sumbawa Besar, Alas, Meraran, Batu Tering, Batu Dulang and Teluk Santong. Mangal and cultivated areas.

Sangeang I. – Common. Open woodland, vine scrub along creeks and cultivated areas.

#### Passeridae

*Passer montanus* Eurasian Tree Sparrow

Sumbawa I. – Moderately common to common. Recorded at Sumbawa Besar, Meraran, Belo, Maluku, Batu Tering, Bima and Sangeang. Town gardens cultivated areas and edges of swamps. Not listed by White and Bruce (1986) for Sumbawa and thought to be a recent introduction.

Sangeang I. – Uncommon. Recorded in open woodland near villages.

#### Sturnidae

*Aplonis minor* Short-tailed Starling

Sumbawa I. – Rare. Recorded between 200 m and 1600 m at Batu Hijau and at Gunung Olet Sangenges in July–August 1993.

*Gracula religiosa venerata* Hill Myna

Sumbawa I. – Uncommon. Two in a bamboo thicket edge of rainforest at Batu Dulang on 5 November 1988, also recorded at Batu Hijau, Selah Legium in semi-evergreen rainforest (450–650 m) in July–August 1993.

Moyo I. – Moderately common at Brang Kua and Tanjung Pasir. Attracted to fruiting trees especially *Ficus*.

#### Oriolidae

*Oriolus chinensis broderipii* Black-naped Oriole

Sumbawa I. – Common to moderately common in ones and twos. Recorded at Meraran, Belo, Batu Hijau, Babar, Gunung Olet Sangenges, Batu Tering, Batu Dulang and Dahu. Mainly lowland semi-evergreen and moist deciduous monsoon forest, riverine forest, woodland and bamboo thickets. Attracted to fruiting trees especially *Ficus* and *Eugenia* spp.

Moyo I. – Moderately common in ones and twos. Recorded at Sebotok, Brang Kua and Tanjung Pasir. Rainforest, woodland and mangal. Attracted to fruiting *Ficus* and *Eugenia*.

Sangeang I. – Moderately common in ones and twos. Vine forest.

#### Dicruridae

*Dicrurus densus bimaensis* Wallacean Drongo

Sumbawa I. – Moderately common throughout the island. Mainly in ones and twos and occasionally in small groups (up to 6). All lowland forests including

rainforest, riverine forest, vine thickets and cultivated areas. Rare in upper montane forest (up to 1430 m). Attracted to fruiting trees especially *Ficus* and *Terminalia*. Breeding; a nest with hatchlings at Dahu on 31 October.

Moyo I. – Moderately common in ones, twos and small groups (up to 8). Recorded at Amanwana, Labuan Aji, Sebotok, Brang Kua and Tanjung Pasir. Rainforest, coconut groves and low open woodland. Breeding; pair building a nest in huge leafless tree at Brang Kua on 10 November.

Sangeang I. – One in open woodland and three in a *Ficus* in October.

#### Artamidae

*Artamus leucorhynchus albiventer* White-breasted Woodswallow

Sumbawa I. – Moderately common in small groups (up to 20). Recorded at Sumbawa Besar, Belo, Lake Taliwang, Batu Dulang, Teluk Santong, Waworada, Dompu and Dahu. Mangal, edges of wetlands, open woodland and cultivated areas especially coconut groves.

Moyo I. – Moderately common at Sebotok and Brang Kua in small groups (up to 8). Mangal and cultivated areas.

#### Corvidae

*Corvus macrorhynchos macrorhynchos* Large-billed Crow.

Sumbawa I. – Uncommon or scarce. Ones and twos. Recorded at Teluk Santong, Empang, Sumbawa Besar and Babar. Mainly open woodland, coconut plantations, scrub and riverine forest.

Moyo I. – Scarce. Only recorded in coconut plantations at Sebotok.

### DISCUSSION

A total of 162 (103 non-passerine and 59 passerine) were recorded on Sumbawa Island, 70 species (52 non-passerine and 18 passerine) on Moyo Island and 33 species (20 non-passerine and 13 passerine) on Sangeang Island. Of these 37 species are new records for the Sumbawa region namely: Lesser Frigatebird *Fregata ariel*, Little Pied Cormorant *Phalacrocorax melanoleucos*, Brown Booby *Sula leucogaster*, Little Egret *Egretta garzetta*, Striated Heron *Butorides striatus*, Yellow Bittern *Ixobrychus sinensis*, Lesser Adjutant *Leptoptilos javanicus*, Oriental Honey-buzzard *Pernis ptilorhynchus*, Black-winged Kite *Elanus caeruleus*, Black Kite *Milvus migrans*, Japanese Sparrowhawk *Accipiter gularis*, Rufous-bellied Eagle *Hieraaetus kienerii*, Australian Kestrel *Falco cenchroides*, Grey Teal *Anas gibberifrons*, Red-legged Rail *Rallina fasciata*, Purple Swampphen *Porphyrio porphyrio*, Grey Plover *Pluvialis squatarola*, Great Sand Plover *Charadrius leschenaultii*, Far-Eastern Curlew *Numenius madagascariensis*, Bar-tailed Godwit

*Limosa lapponica*, Common Redshank *Tringa totanus*, Terek Sandpiper *Xenus cinereus*, Grey-tailed Tattler *Heteroscelus brevipes*, Beach Thick-knee *Esacus magnirostris*, Little Tern *Sterna albifrons*, Great Crested Tern *Sterna bergii*, Lesser Crested Tern *Sterna bengalensis*, White Tern *Cygis alba*, Dark-backed Imperial Pigeon *Ducula lacermulata*, White-throated Needletail *hirundapus caudacutus*, Asian Palm-swift *Cypsiurus balasiensis*, Sumba Cicadabird *Coracina dohertyi*, Sunda Thrush *Zoothera andromedae*, Yellow-breasted Warbler *Seicercus montis*, Russet-backed Rhinomyias *Rhinomyias oscillans*, Thick-billed Flowerpecker *Dicaeum agile* and Tree Sparrow *Passer montanus*.

A further 7 species are listed for Sumbawa by White and Bruce (1986) namely: Greater Painted Snipe *Rostratula benghalensis*, Common Greenshank *Tringa nebularia*, Lesser Shortwing *Brachypteryx leucophrys*, Little Pied Flycatcher *Ficedula westernmanii*, Island Monarch *Monarcha cinerascens*, Grey Wagtail *Motacilla cinerea* and Five-coloured Munia *Lonchura quincticolor*.

Of these the Greater Painted Snipe is scarce and local in the Lesser Sundas; Common Greenshank and Grey Wagtail are both winter visitors from the Palearctic; Lesser Shortwing and Little Pied Flycatcher are largely confined to montane forest over 1000 m, appear to be very local in distribution and possibly confined to vicinity of Gunggung Tambora; and the Island Monarch and Five-coloured Munia also appear to be fairly localised in their distribution.

Combining all records gives a total of 179 species for Sumbawa and its satellite islands. For its size and position Sumbawa has a relatively impoverished fauna when compared with Lombok 4,700 km<sup>2</sup> with about 150 species and Flores 17,000 km<sup>2</sup> with about 215 species. Few additional passerine species could be expected for Sumbawa, however more work along the coast would no doubt add many visiting waders to the list. Additional wetland birds could also be expected during visits after good seasons.

The avifauna of Sumbawa, Moyo and Sangeang Islands is typical of the western Lesser Sunda Islands having much in common with Lombok Island to the west and Flores to the east. The depauperate fauna of Sumbawa when compared to the similar sized Flores Island is no doubt partly due to the comparatively arid conditions that prevail over most of the island, especially the eastern half, and the lack of variety of habitats in general. Sumbawa does however support a number of species with high conservation importance including many listed as threatened or near threatened in Collar *et al.* (1994) namely: Flores Green Pigeon, Nicobar Pigeon, Yellow-crested Cockatoo, Wallace's Scops Owl, Sumba Cicadabird, Russet-backed Rhinomyias and

Crested Darkeye. The Flores Green Pigeon and Nicobar Pigeon favour small islands. Both are very localised in distribution and are the target of trappers. The Yellow-crested Cockatoo is now very rare on Sumbawa and moderately common on Moyo Island. On Sumbawa it has declined greatly through habitat destruction and persecution for the cage bird trade. Wallace's Scops Owl is restricted to Sumbawa and Flores and appears to be rare on both islands. The Sumba Cicadabird was previously only known from Sumba and Flores, and the Sumbawa birds may represent an undescribed subspecies Butchart *et al.* (1993). The Russet-backed Rhinomyias was also only previously known from Flores and Sumba and records from Sumbawa are an important extension of range. The Crested Darkeye is restricted to Sumbawa and Flores and like the Russet-backed Rhinomyias occurs mainly in mid-level semi-evergreen rainforest. Mid-level forest is being destroyed at an alarming rate on both Flores and Sumbawa and both species do not appear to tolerate degraded forest.

Overall Sumbawa shares eight endemic species with Flores namely: Wallace's Scops Owl, Little Minnivet, Russet-capped Tesia, Bare-throated Whistler, Golden-rumped Flowerpecker, Yellow-browed Darkeye, Thick-billed Darkeye and Crested Darkeye. Sumbawa also contains six endemic subspecies namely: *Trichoglossus haematodus forsteni*, *Tesia everetti sumbawana*, *Rhipidura diluta sumbawensis*, *Pachycephala nudigula ilsa*, *Lophozosterops superciliaris hartertianus* and *Lophozosterops dohertyi dohertyi*.

Mayr (1944) and White and Bruce (1986) showed that from Bali east through the Lesser Sunda Islands to Alor there is a progressive decrease in birds of Asian affinities and an increase in species with Australian affinities. Sumbawa lies in this transitional zone between the Oriental and Australasian faunas. Although primarily Oriental the avifauna of Sumbawa contains a small Austro-Papuan element including the Grey Teal, Red-cheeked Parrot, Rainbow Lorikeet, Rainbow Bee-eater, Brown Honeyeater and Zebra Finch.

The migrant species visiting Sumbawa, Moyo and Sangeang can be divided into three main groups:

1. Non-breeding winter visitors from the Palaearctic e.g. Grey Plover *Pluvialis squatarola*, Red-necked Phalarope *Phalaropus lobatus*, Common Sandpiper *Tringa hypoleucos*, Spine-tailed Swift *Hirundapus caudacutus* and Barn Swallow *Hirundo rustica*;
2. Passage migrants including many waders e.g. Grey-tailed Tattler *Tringa brevipes* and Bar-tailed Godwit *Limosa lapponica*;
3. Winter visitors from Australia including

Australian Pelican *Pelecanus conspicillatus* and Rainbow Bee-eater *Merops ornatus*;

4. South-east Asian migrants including the Lesser Adjutant *Leptoptilos javanicus* and Brown Shrike *Lanius cristatus*.

The faunas of Moyo and Sangeang Islands are of interest because they would have been derived almost wholly from Sumbawa Island, and in both cases would have a history of extinction and acquisition caused by catastrophic volcanic eruptions. The massive eruption of Gunung Tambora in 1815 would almost certainly have devastated all the vegetation on Moyo Island, and the eruption of Gunung Api on Sangeang Island in 1986 appears to have destroyed or burnt most of the vegetation there. A total of 70 species were recorded on Moyo Island, comprising 52 species of non-passerine and 18 species of passerine, and 33 species on Sangeang comprising 19 non-passerine and 14 passerine species. Two additional species the Brahminy Kite *Haliastur indus* and the Great Tit *Parus major* are listed for Sangeang by Bruce (1987) from a brief visit of the yacht 'Marchesa' (Guillemard 1885).

On Moyo Island as on many other Lesser Sunda Islands non-passerine species outnumber passerines by a ratio of about 2:1. An examination of the species lists for these islands immediately shows which species are successful colonists. Many species of bird are reluctant crossers of even the narrowest stretches of water, whereas others regularly cross water gaps of many kilometres (Diamond 1974). Discounting the migrant species on both islands, the lists comprise entirely of lowland species that have colonised not only these islands but many others in the Lesser Sundas. One interesting omission from Moyo Island is the Golden Whistler. This species is widespread and moderately common on Sumbawa Island and has successfully colonised hundreds of other oceanic islands.

#### ACKNOWLEDGEMENTS

We thank Mr N. Kolichis whose grants to the Western Australian Museum defrayed the costs of R.E. Johnstone's two field expeditions to Sumbawa. We are also grateful to B.R. Lees for bird observations from Moyo Island.

We gratefully acknowledge the support given to us by our Institutions, the Western Australian Museum (WAM), Perth, and the Museum Zoologicum Bogoriense (MZB), Bogor. We also thank the past and present Directors Dr S. Kadarsan and Dr Soetikno Wirioatmodjo respectively, of Puslitbang Biologi, Lembaga Ilmu Pengetahuan Indonesia and Dr D.J. Kitchener of the Western Australian Museum for facilitating this collaborative project.

SHMB and JCL gratefully acknowledge their co-expedition members for support and advice: Tom Brooks, Charles Davies, Gunawan Dharmaputra, Alo Sahu, and particularly Guy Dutson. The Cambridge Flores/Sumbawa Conservation Project 1993 would like to thank the Earl of Cranbrook, Rudyanto, Priyo Budy Asmoro, Bas van Balen, Roger Barnes, Yusup Cahyadin, Cambridge University Explorers' and Travellers' Club, Dr David Chivers, Peter Colston, Rob Clay, Mike Crosby, Carl Downing, Jonathan Eames, Tom Evans, Dave Gandy, Rob Giles, Derek Holmes, Agil al Idrus, Carol Inskipp, Dr Martin Jones, Ben King, Dr Frank Lambert, Durwyn Liley, Richard Lindsay, Anda Lisa, Dr Kathy MacKinnon, Dr Kathryn Monk, Dr Jim Paine, Dewi Praistuti, Wahyu Raharjaningtrah, Richard Ranft, Irinus Ros, Paul Salaman, Nat Seddon, Jeni Shannaz, Dr Marcel Silvius, Steve Smith, Tony Stones, Sujatnika, Rob Timmins, Joe Tobias and Nigel Winsler.

The expedition was generously supported by: Bird Exploration Fund, BirdLife International/FFPS BP Conservation Expedition Competition, British Ornithologists' Union, A.S. Butler Charitable Trust, Cambridge Expeditions Fund, Chadwyck-Healey Ltd., Clare College, Emmanuel College, The Explorers' Club Youth Activity Fund, Fitzwilliam College, Russell and Mary Foreman 1980 Charitable Trust, Royal Geographical Society, Royal Society of St George, Gilchrist Educational Trust, J.R. Greenwood, Lindeth Charitable Trust, J.F. & E.A. Measures Charity, Newby Trust Ltd., Oriental Bird Club, PT Newmont Nusa Tenggara, The People's Trust for endangered Species, Peter Natham Charitable Trust, Shell International Petroleum Co. Ltd., L.E. Simmons (Chesterton Travel Group), SmithKline Beecham, Wexas International, Glaxo Group Research Ltd., Wildwings, Carl Zeiss Ltd and the sponsors of the National Student Bird Race.

#### REFERENCES

- Andrew, P. (1992). *The Birds of Indonesia: a Checklist (Peter's sequence)*. Jakarta: Indonesian Ornithological Society.
- Bishop, K.D. (1992). New and interesting records of birds in Wallacea. *Kukila* 6: 8-34.
- Bruce, M.D. (1987). Additions to the birds of Wallacea 1. Bird records from smaller islands in the Lesser Sundas. *Kukila* 3: 38-43.
- Butchart, S.H.M. (ed.), Brooks, T.M., Davies, C.W.N., Dharmaputra, G., Dutson, G.C.L., Lower, J.C. and Sagu, A. (1993). *Preliminary Report of the Cambridge Flores/Sumbawa Conservation Project 1993*. Unpublished report.
- Collar, N.J., Crosby, M.J. and Stattersfield, A.J. (1994). *Birds to watch 2: the World List of Threatened Birds*. Cambridge, U.K., BirdLife International.
- Diamond, J.M. (1974). Colonisation of exploded volcanic islands by birds: the supertramp strategy. *Science* 184: 803-806.
- Elbert, J. (1911). *Die Sunda-Expedition des Vereins für Geographie und Statistik zu Frankfurt am Main*. Vol. 1: 143-232.
- Escott, C.J. and Holmes, D.A. (1980). The avifauna of Sulawesi, Indonesia: faunistic notes and additions. *Bulletin of the British Ornithologists' Club* 100: 189-194.
- FAO (1981). Pulau Moyo and Sanggar Peninsula (Gunung Tambora): a plan for conservation: northern Sumbawa. UNDP/FAO FO/INS/78/061 *Field Report* 23: VII + 37 PP.
- FAO (1982). *National Conservation Plan for Indonesia* Vol. IV Nusa Tenggara. Field Report of UNDP/FAO National Parks Development Project UNDP/FAO FO/INS/78/061. Bogor: Food and Agriculture Organisation.
- Jany, E. (1954). Nachricht über eine Sammelreise nach den Inseln Batjan und Obi. *Journal für Ornithologie* 95: 429.
- Junge, G.C.A. (1954). Ornithologisch onderzoek in de Indische archipel. *Ardea* 41: 301-336.
- Lincoln, G.A. (1975). Bird counts either side of Wallace's line. *Journal of Zoology, London* 177: 349-361.
- Mayr, E. (1944). The birds of Timor and Sumba. *Bulletin of the American Museum of Natural History* 83: 123-194.
- Murphy, R.C. (1932). Moving a museum. *Natural History* 32: 497-511.
- Rensch, B. (1930). *Eine Biologische Reise nach den Kleinen Sunda-Inseln*. Berlin: Borntraeger. xii + 236 pp.
- Rensch, B. (1931). Die Vogelwelt von Lombok, Sumbawa und Flores. *Mitteilungen aus dem Zoologischen Museum in Berlin* 17: 451-637.
- Rothschild, M. (1983). *Dear Lord Rothschild: Birds, Butterflies and History*. London: Hutchinson.
- Somadikarta, S. and Holmes, D.A. (1979). An influx of Australian Pelicans *Pelecanus conspicillatus* in Indonesia. *Bulletin of the British Ornithologists' Club* 99: 154.
- van Bemmelen, A.C.V. and Voous, K.H. (1958). On the birds of the islands of Muna and Buton, S.E. Celebes. *Treubia* 21: 27-104.
- White, C.M.N. and Bruce, M.D. (1986). *The Birds of Wallacea (Sulawesi, the Moluccas and Lesser Sunda Islands, Indonesia)*. An Annotated Checklist. B.O.U. Checklist No. 7.