

## Diurnal Raptors on the Island of Sumba, Indonesia, in June/July and December/January 2001–2002

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### Summary

During three visits to Sumba, Indonesia, in 2001 and 2002, we noted sightings and behaviour of the 12 species of diurnal raptor known for the island. Brahminy Kites *Haliastur indus* and Moluccan Kestrels *Falco moluccensis* were the most numerous raptors on the coast and inland. Kestrels showed pre-breeding behaviour during June–July (dry season) and mating during December–January, the beginning of the wet season. An unidentified harrier *Circus* sp. not previously recorded for the island was seen twice. It was tentatively identified as either Eastern Marsh *C. spilonotus* or Swamp Harrier *C. approximans*. Other raptors were difficult to identify and there may be species of *Accipiter* or raptors in general yet to be identified. The large numbers of pigeons and parrots on Sumba seemed to constitute an unused prey base, perhaps used by Bonelli's Eagle *Aquila fasciata*, or a yet to be discovered eagle, accipiter, or owl species.

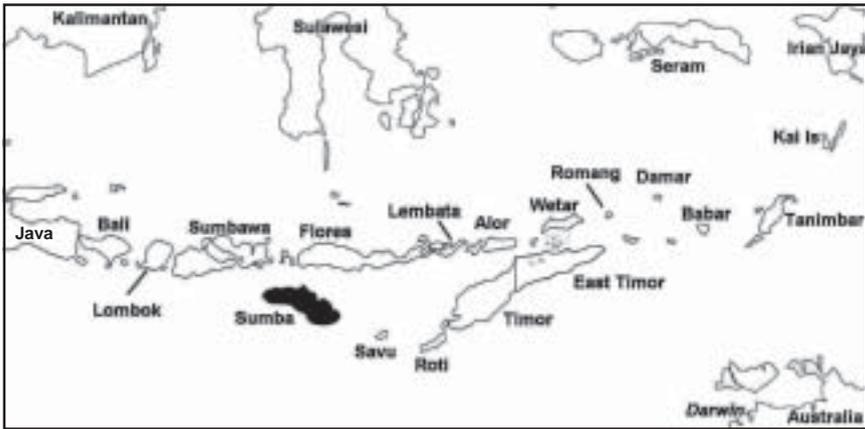
### Introduction

The island of Sumba, 210 km long with a surface area of ~ 12 000 km<sup>2</sup>, lies at 10°S and 120°E in the Lesser Sunda chain south of Flores and Sumbawa in south-eastern Indonesia (Figure 1). At 1225 m, the highest point is Gunung (Mount) Wangameti; the island experiences a winter dry season around May to November, and a summer wet season around December to April. The annual rainfall is between 500 mm on the southern coast and 2000 mm on the inland hills. Closed-canopy forest, mostly deciduous with some evergreen, now covers < 11% of the island and is confined to small and fragmented pockets since the clearing and repeated burning of vegetation for grazing and cultivation (Jones *et al.* 1995). The population is ~ 350 000 people, and Waingapu on the north-eastern coast, with a population of ~ 25 000, is the administrative centre and main entry point to the island. A central plateau of limestone with marls and calcareous sandstones is cut in places by gorges. Freshwater lakes, dependent on water input in the wet season, form in scoops in the land in the higher limestone/sandstone terrain and in lower-elevation floodplains (Monk *et al.* 1997).

Little is known about the avifauna of Sumba and there have been no surveys concentrating on the diurnal raptors. Linsley *et al.* (1999), Coates & Bishop (1997) and Ferguson-Lees & Christie (2001) document a total of 12 diurnal raptors from Sumba (Table 1). Here we describe the first survey of diurnal raptors on Sumba, conducted in association with a more intensive survey of Sumba's *Ninox* owl species.

### Methods

During three trips to Sumba, in July 2001, December 2001 to January 2002 and June–July 2002, we concentrated on finding and photographing the Sumba Hawk-Owl *Ninox rudolfi* and the newly described Little Sumba Hawk-Owl *N. sumbaensis*, mostly at two



**Figure 1. Map of Eastern Indonesia showing location of Sumba.**

**Table 1**

**Species of diurnal birds of prey recorded on Sumba and some other main islands in Wallacea, after Coates & Bishop (1997), Linsley *et al.* (1999) and Ferguson-Lees & Christie (2001). \* indicates presence**

<i>Species</i>	<i>Sumba</i>	<i>Flores</i>	<i>Timor</i>	<i>Sumbawa</i>
Osprey <i>Pandion haliaetus</i>	*	*	*	
Black-winged Kite <i>Elanus caeruleus</i>	*	*	*	*
Pacific Baza <i>Aviceda subcristata</i>	*	*	*	*
<sup>a</sup> Oriental Honey-Buzzard <i>Pernis ptilorhyncus</i>		*	*	*
Black Kite <i>Milvus migrans</i>	*		*	*
Brahminy Kite <i>Haliastur indus</i>	*	*	*	*
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>	*	*	*	*
Short-toed Eagle <i>Circaetus gallicus</i>	*	*	*	*
Spotted Harrier <i>Circus assimilis</i>	*		*	
<sup>a</sup> Chinese Goshawk <i>Accipiter soloensis</i>		*		
Brown Goshawk <i>Accipiter fasciatus</i>	*	*	*	*
Varied Goshawk <i>Accipiter novaehollandiae</i>		*		*
Japanese Sparrowhawk <i>Accipiter gularis</i>		*	*	
Besra Sparrowhawk <i>Accipiter virgatus</i>		*		
Bonelli's Eagle <i>Aquila fasciata</i>		*	*	*
<sup>a</sup> Rufous-bellied Eagle <i>Hieraaetus kienerii</i>		*		*
Changeable Hawk-Eagle <i>Spizaetus cirrhatus</i>		*		*
Moluccan Kestrel <i>Falco moluccensis</i>	*	*	*	*
<sup>a</sup> Nankeen Kestrel <i>Falco cenchroides</i>		*		*
<sup>a</sup> Northern Hobby <i>Falco subbuteo</i>			*	
Australian Hobby <i>Falco longipennis</i>	*	*	*	*
Peregrine Falcon <i>Falco peregrinus</i>	*	*	*	*

<sup>a</sup>Recorded by Coates & Bishop (1977) but not Ferguson-Lees & Christie (2001)

locations. One was near Lewa, 49 km west of the main town of Waingapu, on an elevated limestone plateau (~700 m) with small freshwater lakes and dominated by forest fragments, corn and rice growing, and cattle grazing, and another 42 km east of Waingapu near Melolo along a coastal environment dominated by grazing, rice farming and coastal fishing and mangroves (see Olsen *et al.* 2002). On trips to these locations we left Waingapu around late morning or midday, and returned after dark. We noted the date, location, and behaviour of any diurnal raptors seen. From an apparently road-killed Moluccan Kestrel *Falco moluccensis* we took six measurements with a steel ruler, callipers, and a 300-g Pesola spring balance: wing (unflattened from end of longest primary to carpal joint); tail (tip to root of longest feather); culmen minus cere (dorsally from edge of cere to tip); mid toe without talon (from web between mid toe and inner toe); tarsus (from pad of foot to end of tarsus with tarsal joint bent); and weight (to nearest gram).

### Systematic list

#### Osprey *Pandion haliaetus*

19 July 2001, midday: one flying along Melolo River near Melolo.

20 Dec. 2001, mid afternoon: one flying along the sea near Waingapu.

Not as common as Brahminy Kites *Haliastur indus*; we saw none inland.

#### Black-winged Kite *Elanus caeruleus*

14 July 2001, Lewa rice field: midday, one hovering above rice field; at dusk one flying/hunting over rice field.

15 July 2001, mid afternoon: two sitting in dead tree 15 km east of Melolo.

2 Jan. 2002, late afternoon: one flying high over open grassland 28 km west of Waingapu.

Measurements in Ferguson-Lees & Christie (2001) show Indonesian *E.c. hypoleucos* to be a large subspecies. Local people told us that these kites were reasonably common. We left a disposable camera with a guide who took photographs of a Black-winged Kite that he found sick or injured along the road near Waingapu (Plate 32). We were not present to view or measure this specimen.

#### Pacific Baza *Aviceda subcristata*

13 July 2001, late afternoon: at rice field near Lewa one chasing off some crows *Corvus* sp., as if the Baza was nesting nearby.

1 July 2002, late afternoon: near Km 40 on Waingapu–Lewa road a group of four flying, diving and calling to one another, apparently a family group.

If the first observation was of a nesting bird, and the second of a family group, these Bazas may breed on Sumba during the dry season (May–November).

#### Black Kite *Milvus migrans*

13 July 2001, early afternoon: four catching locusts over rice field near Lewa.

14 July 2001, midday: one seen at small village outside Lewa; another at rice field outside Lewa; 4–5 at rice fields western side of Lewa (same place as 13 July); late afternoon, fight between a Black Kite and a Brahminy Kite; six or seven Black Kites circling over rice field west of Lewa; near dusk about 25 Black Kites near Lewa circling together on a thermal above a hill.

Many Black Kites seemed to be drawn to locust plagues on the elevated highlands, where locals grow corn and rice, and to the rich grazing land there. The clearing of the natural forest cover has probably led to an increase in the



**Black-winged Kite** *Elanus caeruleus hypoleucos* found sick or injured near Waingapu, Sumba, Indonesia

Plate 32

Photo: c/o Jerry Olsen & Susan Trost

number of Black Kites on Sumba, where they are now able to take advantage of increases in their preferred prey of rodents and large insects in these grazing areas.

### **Brahminy Kite** *Haliastur indus*

We saw adults and juveniles on 22 occasions, in wet and dry seasons and in all areas visited: coastal, upland, grazing, cropland, and urban. Most observations were of soaring birds. Some typical observations include:

14 July 2001, 6 km east of Lewa, late afternoon: aerial fight between Brahminy Kite and Black Kite; before dusk two adults fighting aerially.

20 Dec. 2001, mid afternoon: on road near Lewa, juvenile soaring, then caught a small bird in the air.

23 Dec. 2001, late afternoon: near radar station above Waingapu, adult and immature soaring with Moluccan Kestrel.

30 Dec. 2001: see White-bellied Sea-Eagle, below.

Brahminy Kites were often observed hunting away from the sea. They, and Moluccan Kestrels, were the most common raptors. They were usually seen in open areas, but also hunting in and over forest, as they do in the Solomon Islands (Olsen 1997). In central Sumba, Brahminy Kites appeared to hunt for birds, insects, mammals, reptiles and carrion, and so fill a generalist niche, similar to that filled by the Common Buzzard *Buteo buteo* in the Northern Hemisphere and the Brown Falcon *Falco berigora* in Australia.

### **White-bellied Sea-Eagle** *Haliaeetus leucogaster*

10 July 2001, late morning: one flying near mangroves near the sea at Waingapu airport.

30 Dec. 2001, late morning, hills west of Waingapu: immature flying, attacked by three Brahminy Kites.

In contrast with Australia, we saw no White-bellied Sea-Eagles inland. Locals told us that Sea-Eagles nest in mangrove swamps on the coast, but not on inland lakes.



**Captive Short-toed Eagle *Circaetus gallicus* in Dili, Timor-Leste**

### **Short-toed Eagle** *Circaetus gallicus*

13 July 2001, early afternoon: one hovering over rice field close to Lewa.

18 July 2001, early afternoon: dry forest around limestone canyon 18 km south of Waingapu, a flying Short-toed Eagle being chased/attacked by Spotted Harrier and Moluccan Kestrel simultaneously.

24 Dec. 2001, late afternoon: one soaring along Waingapu–Lewa road.

These white-breasted eagles are larger than Spotted Harriers. We identified them by their distinct markings, brown droplets and speckling on white underparts, and, at a distance, by their slow hovering. Short-toed Eagles were the only large eagles that hovered like a kestrel or Black-winged Kite, then stooped and parachuted vertically onto ground prey. On the island of Timor JO saw a Short-toed Eagle fly across open ocean towards the smaller island of Atauro, 30 km north, giving the impression that these eagles can easily travel between islands. JO photographed one specimen kept as a pet in the town of Dili (Plate 33).

### **Spotted Harrier** *Circus assimilis*

Because we saw Spotted Harriers on seven occasions, in wet and dry seasons, in coastal and elevated inland environments, all in adult plumage, we assumed that these were breeding residents. All were observed coursing over open grassland or rice fields. Two interesting observations were:

18 July 2001: one chased a Short-toed Eagle (see above), and one swooped into a farmer's yard, apparently after poultry.

### **Harrier** *Circus* sp.

13 July 2001, early afternoon, near Lewa rice field: two dark harriers (Eastern Marsh or Swamp Harriers?) aerially fighting, as if in a border dispute.

29 Dec. 2001, Waingapu–Melolo road, late afternoon: two large dark harriers coursing over dry grassland.

These large, chocolate-brown harriers appeared black from a distance and were larger than Spotted Harriers. As they were too wary to be approached, we could see no plumage detail and cannot say whether they were Eastern Marsh Harriers *C. spilonotus* or Swamp Harriers *C. approximans*, or another species.

### **Brown Goshawk** *Accipiter fasciatus* and unidentified accipiters

14 July 2001, late morning, 8 km east of Waingapu: one flying goshawk, unidentified species.

20 Dec. 2001, late afternoon, Waingapu–Lewa road near Mengattiti: immature goshawk, probably Brown Goshawk (dark barring).

20 Dec. 2001, late afternoon, Km 49 Waingapu–Lewa road: a perched Brown Goshawk 400 m south, edge of clearing in centre of forest (videotaped).

23 Dec. 2001, near sunset, Waingapu–Lewa road: flying goshawk, unidentified species.

1 July 2002, at dusk, Km 49 on the Waingapu–Lewa road: 400 m south in centre of forest, for ~ 15 minutes accipiter flying from tree to tree and uttering food-begging call, as fledged accipiters do, or as female accipiters do during pre-breeding and breeding season. Small passerines flitting through undergrowth and alarm-calling appeared frightened. The hawk was the size of a female Collared Sparrowhawk *A. cirrhocephalus*, but the call was indistinguishable from male Brown Goshawk (audio-recorded).

Accipiters are difficult to distinguish, especially in the field; some that we saw were about the size of male Brown Goshawks, and others smaller than the Brown Goshawks with which we are familiar near Canberra, ACT. These may have been other accipiter species.

### **Moluccan Kestrel** *Falco moluccensis*

We saw Moluccan Kestrels on 30 occasions, perched, flying or hovering at all times of the day, and once after dark. We saw them in all environments (coastal, elevated plateau, farmland, grazing, and forest) on all trips to Lewa and Melolo. We did not see them in towns and suspect that locals shoot them with air rifles or slingshots if they nest or roost there. Men and boys commonly used air rifles and slingshots to kill birds and bats: we saw Brahminy Kites, Moluccan Kestrels, Barn Owls *Tyto alba*, pigeons, parrots, and fruit bats that had been killed thus.

13 July 2001, midday, on Waingapu–Lewa road on first plateau 18 km from Waingapu: three Kestrels flying.

17 July 2001, mid afternoon, 14 km east of Waingapu–Melolo road: two perched, apparently a pair.

18 July 2001, late afternoon: Melolo road 10 km from Waingapu, one hovering over field; one perched on low tree 10 m from road; 18 km south of Waingapu, two perched close to dry forested canyon area; late afternoon, two perched in tree in same wooded limestone canyon, female food-begging and being fed by male.

19 July 2001, late morning: along the Melolo River one flying; two perched along Waingapu–Melolo road.

17 Dec. 2001, near sunset: two perched by the road in the National Park near Lewa; two mating at top of tree where male Kestrel had been calling.

23 Dec. 2001, late afternoon, road to Lewa: one flying, moulting on wing visible.

29 Dec. 2001, late afternoon: two perched beside road to Melolo.

30 Dec. 2001, 2116 h, i.e. at night, Wanga near Melolo: one called when Sumba Hawk-Owl flew close to its roost or nest.

2 Jan. 2002, late afternoon, 13 km west of Waingapu: three large raptors and Kestrel fighting.

25 June 2002, near sunset, 27 km east of Waingapu on Melolo road: pair sitting in a tree.

These kestrels hovered, and hunted from telephone poles or trees in the manner of other kestrels. We observed courting behaviour during the dry season (June–July) and pairs roosting together and mating at the beginning of the wet season (December–January), so they almost certainly breed during the dry and maybe during the wet season as well. One appeared to nest in the crown of a palm tree in December; we were told of another nest in the high thatched, peaked roof of a traditional house. We could not distinguish the vocalisations of these kestrels from those of the Nankeen Kestrel *Falco cenchroides* and thus consider that they may form, with the Common Kestrel *F. tinnunculus* of Eurasia and Nankeen Kestrel of Australasia, a superspecies.

On 30 December we measured an adult male Moluccan Kestrel *F.m. microbialia*, apparently road-killed that afternoon (Plate 34). The measurements (mm) were: wing 220.0, tail 161.0, culmen 15.5, mid toe 24.4, tarsus 44.0; weight 162.0 g. The weight appears to be the first published for this species (see Ferguson-Lees & Christie 2001), and similar to the weight of male Nankeen Kestrels near Canberra (Marchant & Higgins 1993; J. Olsen unpubl. data). However, there is little overlap in wing-length for Moluccan and Nankeen Kestrels (males: 205–233 mm vs



**Road-killed Moluccan Kestrel** *Falco moluccensis microbalia* found near Waingapu, Sumba, Indonesia

Plate 34

Photo: Jerry Olsen & Susan Trost

231–260 mm: see Ferguson-Lees & Christie 2001), and this difference is evident in the field. The shorter-winged Moluccan Kestrel may be less migratory, or hunt different prey in different habitat from that of the Nankeen Kestrel.

**Australian Hobby** *Falco longipennis*

14 July 2001, near sunset over rice field west of Lewa: one Hobby catching insects, noticeably long wings, wintering from Australia?

18 July 2001, late afternoon: two circling and flying high.

22 July 2002, early afternoon: adult flying about 5 m above the ground over trees and buildings near the bridge in central Waingapu, apparently hunting.

We saw these birds only during austral winter and could not distinguish them, even at close range, from *F.l. longipennis* with which we are familiar in Canberra, so these may have been migrant *F.l. longipennis* and not the smaller *F.l. hanieli* said to be resident on nearby Flores, Wetar and Timor (Coates & Bishop 1997).

**Peregrine Falcon** *Falco peregrinus*

14 July 2001, near sunset over rice field near Lewa: adult flying and catching insects during a locust plague.

As this bird was dark and had shorter wings than lighter-coloured, longer-winged, migratory *F.p. calidus*, we assumed that it was non-migratory *F.p. ernesti*, said to be resident in the Lesser Sundas (see Ferguson-Lees & Christie 2001).

## Discussion

This was the first survey of diurnal raptors on Sumba, albeit only incidental to a search for the two *Ninox* owls there. We saw all the diurnal raptors listed for Sumba by Coates & Bishop (1997), Linsley *et al.* (1999) and Ferguson-Lees & Christie (2001), and one unidentified harrier species that is not. Since 2002, Bonelli's Eagle *Aquila fasciata* has been seen on the island (C. Trainor pers comm.). The elevated area around Lewa was particularly rich in raptor species and numbers, and, given that a new species of owl has recently been found there (Olsen *et al.* 2002), it is possible that a more thorough survey will reveal new species of diurnal, and perhaps also nocturnal, raptors. Local people consistently mentioned a large black eagle on the island, and pointed to the plate of the Black Eagle *Ictinaetus malayensis* in Coates & Bishop (1997). They claimed that it was a visitor during the wet season, i.e. during the Northern Hemisphere winter. We saw the Black Eagle on nearby Bali.

Certain other species have been recorded for Sumbawa, Flores and Timor but not Sumba (Table 1). Some of these may eventually be recorded for Sumba. In forests and woodland on Sumba there appeared to be an unused prey base: several species of medium-sized parrots and pigeons in large numbers (see Coates & Bishop 1997). Except for Brown Goshawks and Peregrine Falcons (and now, Bonelli's Eagle), we saw no raptors of a suitable size and genus that might prey on these pigeons and parrots, and it is possible that an eagle currently not known for the island, such as the Changeable Hawk-Eagle *Spizaetus cirrhatus*, or an undiscovered accipiter or large owl indeed preys on these pigeons and parrots. New surveys of the island will help settle these questions.

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## References

- Coates, B.J. & Bishop, K.D. (1997), *A Guide to the Birds of Wallacea (Sulawesi, The Moluccas and Lesser Sunda Islands, Indonesia)*, Dove Publications, Brisbane.
- Ferguson-Lees, J. & Christie, D.A. (2001), *Raptors of the World*, Christopher Helm, London.
- Jones, M.J., Linsley, M.D. & Marsden, S.J. (1995), 'Population sizes, status and habitat associations of the restricted-range bird species of Sumba, Indonesia', *Bird Conservation International* **5**, 21–52.
- Linsley, M.D., Jones, M.J. & Marsden, S.J. (1999), 'A review of the Sumba avifauna', *Kukila* **10**, 60–90.
- Marchant, S. & Higgins, P.J. (Eds) (1993), *Handbook of Australian, New Zealand and Antarctic Birds*, vol. 2, Oxford University Press, Melbourne.
- Monk, K.A., de Fretes, Y. & Reksodiharjo-Lilley, G. (1997), *The Ecology of Nusa Tenggara and Maluku*, Periplus Editions, Hong Kong.
- Olsen, J. (1997), 'Notes on Sanford's Sea-Eagle *Haliaeetus sanfordi* and other raptors in the Solomon Islands', *Australian Bird Watcher* **17**, 81–86.
- Olsen, J., Wink, M., Sauer-Gürth, H. & Trost, S. (2002), 'A new *Ninox* owl from Sumba, Indonesia', *Emu* **102**, 223–231.