# **Threatened Birds of Asia:**

## The BirdLife International Red Data Book

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#### SUMBA HORNBILL

### Aceros everetti

Critical  $\square$  — Endangered  $\square$  —

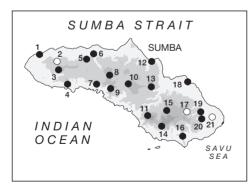
Vulnerable ■ B1+2b,c,d,e; C1; C2b



This species qualifies as Vulnerable as it is a single-island endemic with a small population, which is estimated to have declined at more than 10% in three generations owing to rapid forest loss. Moreover, the area of available habitat is small and continues to be reduced and suffer severe fragmentation.

**DISTRIBUTION** The Sumba Hornbill (see Remarks 1) is endemic to the island of Sumba, Nusa Tenggara, Indonesia. In the following account, older and the most recent records are mixed, and in some cases old and new place names may appear as different sites when in fact they refer to the same forest area. O'Brien *et al.* (1998a) reported finding the species at 19 of the island's 33 forest blocks, including 15 of 17 blocks greater than 10 km² and four of 16 smaller than 10 km²; these sites, documented here by M. F. Kinnaird and T. G. O'Brien (*in litt.* 2000), represent the most up-to-date range for the species, but this is not to say that it will not be found, at least on occasion, in the other forest blocks. Records thus include:

■ INDONESIA Sumba Rokoraka, September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Waimangura at the source of the Wai Kamburu, Waidjewa, 440 m, August 1948 (Bühler and Sutter 1951); Yawila, September 1992 (M. J. Jones et al. 1995, Marsden and Jones 1997), September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Poronumbu (Pornumbu, Porunumbu), September 1992 (M. J. Jones et al. 1995, Marsden and Jones 1997), September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Loko Sobak, September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Manupeu, including Waimanu, August 1991 (Riffel and Bekti 1991), August 1992 (M. J. Jones et al. 1995, Marsden and Jones 1997), September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); "RTK44", September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); "RTK44", September–December 1995 (M. F. Kinnaird and





The distribution of Sumba Hornbill Aceros everetti: (1) Rokoraka; (2) Waimangura; (3) Yawila; (4) Lamboya; (5) Poronumbu; (6) Loko Sobak; (7) Manupeu; (8) RTK44; (9) Langgaliru; (10) Lewapaku; (11) Tabundung; (12) Mondu; (13) Praipaha Mandas; (14) Gunung Wanggameti; (15) Kapohak Penang; (16) Pangaduharhar; (17) Mao Marru; (18) Palakahembi; (19) Luku Melolo; (20) Lulundilu; (21) Mangili.

○ Historical (pre-1950) ○ Fairly recent (1950–1979) ● Recent (1980–present) □ Undated

T. G. O'Brien in litt. 2000); Langgaliru (500 m), May 1932 (Mayr 1944) and August 1992 (M. J. Jones et al. 1995; see Remarks 2), September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Lewapaku (Lewa), January 1990 (Gibbs 1990), December 1991 (M. J. Jones et al. 1995), November 1998 (R. Drijvers in litt. 1999), this site also being known as Wondut, October 1992 (N. Bostock in litt. 1999); Tabundung ("Tagulodon"), 1979 or soon after (MacKinnon et al. 1982), October 1989 (M. J. Jones et al. 1995); Mondu, August 1991 (Riffel and Bekti 1991); Praipaha Mandas, September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Gunung Wanggameti, 1979 or soon after (MacKinnon et al. 1982), September 1992 (M. J. Jones et al. 1995, Marsden and Jones 1997), September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000), this site including "Tanjung Ngunju" (Nggongi), 1979 or soon after (MacKinnon et al. 1982), September/October 1989 (M. J. Jones et al. 1995); Kapohak Penang, September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Pangaduhahar, September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Mao Marru, May 1925 (Rensch 1931b), June 1932 (Mayr 1944); Palakahembi (Laikayambi), September–December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Luku Melolo (also known as Praimbanan), July/August 1992 (M. J. Jones et al. 1995), September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000), with 40+ males there, November 1998 (R. Drijvers in litt. 1999), this site clearly being the source of "Melolo", June 1932 (Mayr 1944); Lulundilu, September-December 1995 (M. F. Kinnaird and T. G. O'Brien in litt. 2000); Mangili ("Monjeli"), the type locality, autumn 1896 (Hartert 1898e, Greenway 1978).

**POPULATION** This species was characterised as scarce at Wanggameti and not uncommon at Tanjung Ngunju in 1979 or soon after (MacKinnon et al. 1982), while Zieren et al. (1990), in reporting several pairs in undisturbed forest at unspecified sites in February 1990, concluded it was not common. Fieldwork in 1989 led to an estimated population of 9.037 (range 3.067– 15,007) (Jones and Marsden undated), but when this work was combined with results from 1992 (still qualified by the authors as incomplete), a density of 5.7±1.6 birds per km<sup>2</sup> was revealed, and on the basis of there being 1,080 km<sup>2</sup> of closed-canopy forest a population of 6,156±1,728, rounded to a likely true figure of 6,500, was tentatively estimated; the effective breeding population was thought, however, likely to be much lower owing to delayed maturation (M. J. Jones et al. 1995; see also Marsden 1999b). In fact a recalculation using new evidence derived a density of 2.28 hornbills per km<sup>2</sup>, and by multiplying this against the total forested area for Sumba a population of 3,926±471 birds has been estimated (O'Brien et al. 1998a; see Remarks 3). In the early 1990s the species was most frequently recorded at Manupeu and Langgaliru, both sites being characterised by lowland primary and/or old secondary evergreen forest (M. J. Jones et al. 1995)—and both sites now incorporated into the Manupeu-Tanahdaru National Park (see Measures Taken); further data on habitat preference is given in the next section.

ECOLOGY Habitat Birds are usually found in little-disturbed forest, but occasionally at forest edge and in isolated trees or groves in parkland far from closed forest; however, the species shows a strong association with evergreen forest that has large trees and a dense canopy at low altitudes (M. J. Jones et al. 1995; also Riffel and Bekti 1991, Marsden 1999b). Thus the statement that it is dependent on "primary deciduous forest" (Kemp 1995) is somewhat mistaken (see Breeding below). The cardinal factor in its presence is size and quality of forest: it is absent from or rare in forests under 10 km², and its abundance decreases with increasing human disturbance as indicated by tree-cutting levels (O'Brien et al. 1998a). The species thus prefers large areas of undisturbed primary forest, i.e. characterised by tall canopy, large-boled trees and high stem density; but this is not to say that small forest patches are of no value to the species (O'Brien et al. 1998a). An upper altitudinal limit of "950+ m"

has been indicated (Coates and Bishop 1997). A pair used a giant *Stercula* as a regular resting site (Bühler and Sutter 1951).

Food Given the general association of hornbills and figs it is very likely that figs are a key item of the Sumba species's diet, as implied by Riffel and Bekti (1991) in their observation of two pairs feeding in a fruiting fig, and by White and Bruce (1986) in their mention of "fig trees... of great size" in the interior of the island. Certain fruiting trees are "defended" by pairs of hornbills during the breeding season (Juhaeni 1993). It has been noted that trees of the families Meliaceae, Burseraceae and Myristicaceae have few seed dispersers other than hornbills, and that 13 species from these families occur on Sumba, so it may be expected that the Sumba Hornbill commonly forages on their fruits (O'Brien et al. 1998a). Apart from figs, among the known foods are lalang Aglaia, lepale Aglaia, uluketaka A. ensideroxylon and kihu Dyxoxylum caulostachyum (Meliaceae), kehi and kisi (both Canarium, one C. asperum) (Burseraceae), laru Myristica littoralis (Myristicaceae), kondorawa Decaspermum fruticosum (Myrtaceae), kotera Tetrameles nudiflora (Datiscaceae), mangga Mangifera and ijiwatu Spondias pinnata (Anacardiaceae), kaduru Palaquium (Sapotaceae), kawarak Ouercus piriformis (Fagaceae) and lapana Parinaria corymbosa (Urticaceae), with "kirumbobok", "babi", "najawatu", "kaladagangga", "talici", "mandawacu", "palololuang", "kayure" and "borukaloku" still to be identified (A. Sitompul per M. F. Kinnaird in litt, 2000). Moreover, parts of insects and pieces of bone have been found in faeces (A. Sitompul per M. F. Kinnaird in litt. 2000).

Breeding The species reportedly moults in the rainy season, December-March (Kemp 1995), and Holmes (1993a) speculated that his seeing only males in December indicated that females were then incubating (see also Remarks 4). Certainly it seems that the birds are nesting at this time: four nests were found, July-September, with reports of chicks in September, suggesting that the breeding season runs from June to January (O'Brien et al. 1998a), although there may be some differences between the west and east ends of the island (S. Survadi per M. F. Kinnaird in litt. 1999). Two birds from six collected in May/June were immature (Mayr 1944) and the gonads of this series were small (AMNH label data). In 1989 and 1992 a total of 10 nests was located, all but two in living deciduous trees with an average 1 m diameter at breast height (i.e. as with the Yellow-crested Cockatoo Cacatua sulphurea on the island the birds select deciduous trees within evergreen forest for nest-sites) (M. J. Jones et al. 1995); one of these was in a cavity created by the strangling of a host tree by the fig Ficus benjamina, but most nests were in Tetrameles nudiflora (Marsden and Jones 1997). In 24 nests located in 1996 Tetrameles again proved to be important, but eight other tree species were used, and competition for sites appeared to be high; often the nest tree is also occupied by a nesting pair of Yellow-crested Cockatoos Cacatua sulphurea (S. Suryadi per M. F. Kinnaird in litt. 1999).

THREATS Forest destruction has clearly affected Sumba for centuries, and the extent of recent losses is not clear. White and Bruce (1986) have an inconclusive comment based on seeming discrepancies in collectors' accounts of forest on the island, which at least allowed the interpretation that much "heavy woodland" might have been lost between the 1890s and the 1920s. Thus at the end of the nineteenth century, although the central plateau was already then "everywhere the richest possible meadow-land", the forests still lay "in great masses... are wholly trackless, and serve as the boundaries of hostile tribes" (Doherty 1891). Unpublished data suggest that 60% of the island's forest cover has been lost between 1927 and around 1990 (M. J. Jones et al. 1995, O'Brien et al. 1998a). Certainly MacKinnon et al. (1982) were able to show noticeable shrinkage of cover at Tanjung Ngunju between 1972/1973 and their work at the end of the same decade (see Measures Proposed for this area). Habitat loss within the small range of this species was posing a distinct threat around 1990 (Riffel and Bekti 1991, M. J. Jones et al. 1995). At this stage the island's forests were

fragmented into 34 blocks ranging in size from 0.16 to 425 km² in size, and covering around 15.5% of the land area (O'Brien *et al.* 1998a; see Remarks 5). Exploitation for agriculture and wood, causing its fragmentation, is exacerbated by the island's extremely dry climate and the uncontrolled burning of grassland to encourage new growth for cattle (Juhaeni 1993); this greatly inhibits regeneration, which is difficult enough on the coralline limestone substrate (K. D. Bishop *in litt.* 2000). Moreover, small-scale logging and various activities in land adjacent to forest have added pressures, and the current expansion of urban areas will lead to greater exploitation of forests irrespective of local needs or interests (Umbu Datta 1993). At Lewa, the "bird tour" forest 50 km south of Waingapu, a pair cling on, but there used to be more before the area was degraded since around 1990 (B. F. King verbally 1998, K. D. Bishop *in litt.* 2000).

The exploitation of birds for food has also been claimed as a severe problem, although local people reported only occasional success at trapping or shooting them (Riffel and Bekti 1991). By contrast, fieldwork in 1989 and 1992 revealed little evidence of large-scale trapping activity (young were reported occasionally taken for food), and at one site (Yawila) local people considered it unlucky to catch and kill the species (M. J. Jones *et al.* 1995); moreover, the meat is distasteful and the birds' economic value low (Juhaeni 1993). However, trapping and hunting do occur on a small (local) scale, both for food and as pets, e.g. near Katikuai (Linsley *et al.* 1998, S. Suryadi *per* M. F. Kinnaird *in litt.* 1999). In the 1980s birds were being trapped at fruiting figs and touted as pets outside tourist hotels (Collar and Andrew 1988). "A small trade in hornbills was... reported by local residents" in February 1990 (Zieren *et al.* 1990), but no further information was provided on the nature of this activity (including, in particular, whether it was international or to satisfy demand within Indonesia). In 1999, demand from a German-based zoo, for five pairs, led to local efforts to capture birds (R. F. A. Grimmett *in litt.* 2001), and a bird was being offered for sale at Luku Melolo in March 1999 (I. Mauro *in litt.* 1999).

The Sumba Hornbill is one of (now) three threatened members of the suite of seven bird species that are entirely restricted to the "Sumba Endemic Bird Area", threats and conservation measures in which are profiled by Sujatnika *et al.* (1995) and Stattersfield *et al.* (1998).

MEASURES TAKEN This species has been protected under Indonesian law since 1931 (Inskipp 1986) and was included in the list of protected species in 1999. Langgaliru was in 1992 the site of Sumba's only protected area (M. J. Jones *et al.* 1995), but in 1998 this area was incorporated into one of two new national parks on the island, one Manupeu-Tanahdaru (with Langgaliru) and the other Laiwangi-Wanggameti, these two embracing the two largest blocks of forest on the island and having a combined surface area of 1,350 km² (PKA/BirdLife International 1998; see Remarks 6). This came in fulfilment of work identifying and recommending these areas for protection, and in addition to these conservation areas a substantial proportion of the remaining forest on the island is designated as protection forest (Jepson *et al.* 1996). Since 1997, BirdLife and WWF, together with local NGOs, have been working with government agencies and local communities to define boundaries and zoning for the national park areas, and support forest protection efforts by local groups (R. F. A. Grimmett *in litt.* 2001).

The species is listed on Appendix II of CITES, not Appendix I (*contra* Juhaeni 1993). The Sumba Hornbill has been designated as the official faunal mascot of the West Sumba Regency, thereby raising awareness of the species in the west of the island (R. F. A. Grimmett *in litt*. 2001).

**MEASURES PROPOSED** Apart from recommending park or sanctuary status for the Wanggameti/Tabundung area (then outlined as 426 km<sup>2</sup>) and Langgaliru/Manupeu area (then outlined as 156 plus 128 km<sup>2</sup>), Jepson *et al.* (1996) urged strict nature reserve status for

forests at Yawila (30 km²) and Puronumbu (25 km²) in the west of the island and for Luku Melolo (77 km²) in the east, wildlife sanctuary for Lulundilu just south of Luku Melolo, and grand forest park status for Tanjung Ngunju (19 km²). These areas are now identified as Important Bird Areas (Rudyanto verbally 2000), and will be addressed through the Sumba Forest Conservation Strategy currently being drafted by the provincial authorities and BirdLife International Indonesia Programme (Sujatnika verbally 2000).

Research into the breeding and feeding ecology of this species is essential in order to understand more clearly the options for its effective management and conservation (M. J. Jones *et al.* 1995). However, the discovery of the importance of *Tetrameles* trees to the species has made it possible to recommend that as many of these trees as possible should be included in future in conservation areas (they are much used by other species, including Yellow-crested Cockatoo, and are so smooth-barked that they are difficult to climb; yet they only make up around 8% of tree species in sampled plots) (Marsden and Jones 1997). It is also important to emphasise that the Sumba Hornbill is likely to prove responsible for the dispersal of the seeds of a significant proportion of economically important and ecologically dominant trees on the island, so that for the long-term viability of the remaining forests (and the economic services they provide) the preservation of the hornbill is almost certainly essential (O'Brien *et al.* 1998a).

REMARKS (1) This is a "dwarf island form" of hornbill belonging to the species group that includes Wreathed Hornbill Aceros undulatus and Papuan Hornbill A. plicatus (White and Bruce 1986). (2) This is apparently the site called Nerip in Marsden and Jones (1997). (3) O'Brien et al. (1998a) derived their population figure by adding all forest patch areas, even though they determined that forest patches under 10 km<sup>2</sup> are little used by the species. If only those forest patches larger than 10 km<sup>2</sup> are summed (they detailed 17), the available forest area reduces to 1,662 km<sup>2</sup>, yielding a population of 3,789 birds (which is, however, within their original confidence intervals). (4) It has been stated that outside the breeding season birds form groups which appear to be family parties of up to 5-6, combining at roosts to form flocks of up to 70 birds, and that when established pairs isolate themselves a few months before breeding, the immature birds remain in small flocks (Juhaeni 1993); however, there is no evidence to support this. (5) O'Brien et al. (1998a) gave 11% as forested area and indicated Sumba's land area as 11,150 km<sup>2</sup>, which implies 1,226 km<sup>2</sup> of forested land, but the sizes of the 33 forest patches in their appendix totals 1,732 km<sup>2</sup>, which is 15.5% of the land area. (6) PKA/BirdLife International (1998) accidentally used the name "Langgaliru-Wanggameti" for Laiwangi-Wanggameti (Langgaliru is part of the Manupeu-Tanahdaru park), and used the spellings Laiwanggi and Tanadaru.