

SUNDALAND FORESTS



THE Sundaland (or Sundaic) region includes the moist tropical lowland and montane forests of the Thai-Malay peninsula and the Greater Sunda islands. It supports 47 threatened bird species, 38 of which breed nowhere else. Twenty-eight threatened species are particularly associated with Sundaland’s (once) extensive lowland forests (Table 2); 22 of these are endemic to the region, including four unique to the Thai-Malay peninsula (including Gurney’s Pitta), one known only from Sumatra (Rueck’s Blue-flycatcher), five confined to Borneo and one small island specialist (Silvery Wood-pigeon). Nineteen (mainly montane) threatened species are found in the region’s three Endemic Bird Areas, including one confined to the Bornean mountains, six to the Sumatra mountains, two to the Peninsular Malaysia mountains, and seven to the Java and Bali forests. This region also supports a remarkable total of 106 Near Threatened species, including 79 lowland specialists.

- **Key habitats** Lowland evergreen and semi-evergreen rain forest, peat swamp forest, heath forest, moist deciduous forest, lower montane and upper montane rain forest, savanna and cultivated areas.
- **Altitude** 0–3,350 m.
- **Countries and territories** Myanmar; Thailand; Malaysia (Peninsular, Sabah, Sarawak); Singapore; Brunei; Indonesia (Sumatra, Kalimantan, Java and Bali).

Threatened species

	CR	EN	VU	Total
	5	4	29	38
	1	1	3	5
	—	—	4	4
Total	6	5	36	47

Key: = breeds only in this forest region.
 = also breeds in other region(s).
 = non-breeding visitor from another region.

The Sundaland forests region corresponds closely to Conservation International’s Sundaland Hotspot (see pp.20–21).

Khao Nor Chuchi is now the only significant area of level lowland forest remaining in peninsular Thailand, and it is under constant pressure from encroachment. PHOTO: P. ROUND/BIRDLIFE



OUTSTANDING IBAs FOR THREATENED BIRDS (see Table 1)

Twenty-eight IBAs have been selected, which together support populations of all threatened forest birds of the Sundaland forests, apart perhaps from the poorly known Silvery Wood-pigeon, Black-browed Babbler and Rueck's Blue-flycatcher. Several of these sites are unique, as they support the only (or by far the largest) known populations of one or more threatened species; for example Bali Barat National Park in Indonesia holds the only known population of Bali Starling. However, many other significant areas of forest with populations of threatened birds survive in this huge region, which need to be protected

through the habitat management approaches detailed below under *Forest loss and degradation*.

CURRENT STATUS OF HABITATS AND THREATENED SPECIES

The Sundaland region was originally almost entirely forested, with what are widely acknowledged to be amongst the most biologically diverse tropical forests on earth. However, they are being cleared or degraded at an alarming rate, and lowland forests, the richest habitat of all, are under serious threat of almost complete clearance. The main causes of this deforestation are clear-felling and logging (both legal and illegal) for timber and pulp fibre, conversion to



plantations (e.g. rubber, oil palm, and for pulp and paper) and conversion for agriculture. They are transforming once-continuous forests into a scattered archipelago of relatively small blocks; the vulnerability of true primary forest species is thereby greatly increased, since they have reduced or are entirely denied opportunities for dispersal to other areas, and their populations are exposed to heightened risks from fires, climate change, edge effects and inbreeding.

In Tenasserim, southern Myanmar, extensive lowland forests remain in Tanintharyi division, but in accessible level lowland areas near to main roads they are rapidly being cleared for oil palm plantations. In peninsular Thailand, lowland forests were still extensive at the start of the twentieth century, but almost entirely cleared by the 1980s;

forest below 100 m covered only 20–50 km² in 1987, and most of this was cleared soon after. Pressure on habitat in Peninsular Malaysia is slightly less intense: total forest cover declined from 90% at the beginning of the twentieth century to 43% by 1990, but level lowland forest will soon be restricted to a few patches inside protected areas. In Sabah and Sarawak, forest cover was estimated at 39% and 64% respectively in 1990, but declined greatly in the following decade. There has been little forest loss in the small Sultanate of Brunei, which retains c.81% forest cover, of which c.59% is primary. Over the period 1985 to 1997, about 90,000 km² of forest was cleared in Kalimantan, a decrease in forest cover from 75% to 59%, and about 67,000 km² of forest was cleared in Sumatra, a decrease in

Table 1. Outstanding Important Bird Areas in the Sundaland forests

IBA name	Status	Territory	Threatened species and habitats
1 Southern Tanintharyi Division	—	Myanmar	Extensive lowland forests with Gurney's Pitta and Plain-pouched Hornbill
2 Huai Kha Khaeng WS ^{F04,F06}	PA ^{WH}	Thailand	Large reserve with populations of White-fronted Scops-owl and Plain-pouched Hornbill
3 Kaeng Krachan NP	PA	Thailand	Large reserve with populations of White-fronted Scops-owl and Plain-pouched Hornbill
4 Khao Nor Chuchi	(PA)	Thailand	Only known site for Gurney's Pitta
5 Belum	—	Peninsular Malaysia	Extensive lowland forests with several threatened birds, notably very large numbers of Plain-pouched Hornbill
6 Taman Negara NP	PA	Peninsular Malaysia	Large reserve with populations of almost all threatened lowland and montane forest birds of Peninsular Malaysia
7 Cameron Highlands WR	PA	Peninsular Malaysia	Montane forests with populations of Mountain Peacock-pheasant and Malayan Whistling-thrush
8 Endau-Rompin SP	PA	Peninsular Malaysia	Extensive lowland forests with populations of several threatened birds
9 Gunung Leuser NP	PA ^{BR}	Sumatra	Very large reserve with populations of most threatened lowland and montane forest birds of Sumatra, notably Aceh Pheasant
10 Bukit Tigapuluh-Teso Nilo complex	(PA)	Sumatra	Extensive lowland forests with populations of several threatened birds
11 Berbak NP ^{W20}	PA ^R	Sumatra	Extensive swamp forests supporting several threatened birds; a key site for White-winged Duck
12 Kerinci Seblat NP	PA	Sumatra	Very large reserve with populations of most threatened lowland and montane forest birds of Sumatra, notably Salvadori's Pheasant
13 Bukit Barisan Selatan NP	PA	Sumatra	Large reserve with several threatened lowland and montane forest birds, notably the only recent records of Sumatran Ground-cuckoo
14 Danau Sentarum NP ^{W20}	PA ^R	Kalimantan	Large reserve with populations of several threatened lowland forest birds
15 Gunung Palung NP	PA	Kalimantan	Large reserve with populations of several threatened lowland forest birds, notably Bornean Peacock-pheasant
16 Tanjung Puting NP	PA ^{BR}	Kalimantan	Large reserve with populations of several threatened lowland forest birds
17 Barito Ulu	—	Kalimantan	Extensive lowland forests with populations of several threatened birds
18 Upper Mahakam River	—	Kalimantan	Extensive lowland forests, appears to be the Bornean stronghold of White-shouldered Ibis
19 Kayan Mentarang NP	PA	Kalimantan	Very large reserve with extensive lowland and montane forests and populations of several threatened birds
20 Ulu Temburong NP	PA	Brunei	Large reserve with several threatened lowland and montane forest birds, including Storm's Stork and Mountain Serpent-eagle
21 Kinabalu NP	PA ^{WH}	Sabah	Large reserve with extensive montane forests and populations of several threatened birds, notably Mountain Serpent-eagle
22 Lower Kinabatangan WS	PA	Sabah	Large reserve with several threatened lowland forest birds, notably a large population of Storm's Stork
23 Tabin WS	PA	Sabah	Large reserve with populations of several threatened lowland forest birds
24 Danum Valley CA	PA	Sabah	Large reserve with populations of several threatened lowland forest birds
25 Gunung Mulu NP	PA ^{WH}	Sarawak	Large reserve with populations of several threatened lowland and montane forest birds
26 Gunung Halimun NP	PA	Java	Large reserve with populations of several threatened forest birds, including all those confined to western Java
27 Gunung Gede-Pangrango NP	PA ^{BR}	Java	Large reserve with populations of several threatened forest birds, including all those confined to western Java
28 Gunung Raung	—	Java	Extensive montane forests with populations of several threatened birds, notably White-faced Hill-partridge
29 Bali Barat NP	PA	Bali	Only site for Bali Starling

Several of the forest birds of this region occur in two IBAs listed in region W20 (Sembilang and Way Kambas NP).

Note that more IBAs in this region will be included in the *Important Bird Areas in Asia*, due to be published in early 2004.

Key IBA name: CA = Conservation Area; NP = National Park; SP = State Park; WR = Wildlife Reserve; WS = Wildlife Sanctuary.

Status: PA = IBA is a protected area; (PA) = IBA partially protected; — = unprotected; BR = IBA is wholly or partially a Biosphere Reserve (see pp.34–35); R = IBA is wholly or partially a Ramsar Site (see pp.31–32); WH = IBA is wholly or partially a World Heritage Site (see p.34); F04/F06 = supports threatened forest birds of regions F04/F06; W20 = supports threatened waterbirds of region W20.

Table 2. Threatened birds of the Sundaland forests.

Species	Distribution and habitat		
SUNDALAND LOWLANDS			
Storm's Stork <i>Ciconia stormi</i>	☉	EN	PSB: forest in the level lowlands and on lower hill slopes, particularly swamp forest
White-shouldered Ibis <i>Pseudibis davisoni</i>	☉	CR	B: forested rivers in a restricted area of lowland Borneo
White-winged Duck <i>Cairina scutulata</i>	☉	EN	PSJ: wetlands in lowland forest, extinct on Java and near extinction on the Thai–Malay peninsula
Wallace's Hawk-eagle <i>Spizaetus nanus</i>	☉	VU	PSB: forest in the level lowlands and on lower hill slopes
Black Partridge <i>Melanoperdix nigra</i>	☉	VU	PSB: forest in the level lowlands and on lower hill slopes
Crestless Fireback <i>Lophura erythrophthalma</i>	☉	VU	PSB: forest in the level lowlands and on lower hill slopes
Wattled Pheasant <i>Lobiphasis bulweri</i>	☉	VU	B: forest on hill slopes at low and mid-elevations
Malaysian Peacock-pheasant <i>Polyplectron malacense</i>	☉	VU	P: forest in the level lowlands
Bornean Peacock-pheasant <i>Polyplectron schleiermacheri</i>	☉	EN	B: lowland forest below c.1,000 m, apparently favouring forest on black alluvial soils
Masked Finfoot <i>Heliopais personata</i>	☉	VU	PSJ: wetlands in lowland forest, including mangroves; may breed locally in the region
Silvery Wood-pigeon <i>Columba argentina</i>	☉	CR	I: mangroves, woodland and coconut groves on small islands; no confirmed records since 1931
Large Green-pigeon <i>Treron capellei</i>	☉	VU	PSB): forest in the level lowlands and on lower hill slopes
Grey Imperial-pigeon <i>Ducula pickeringii</i>	☉	VU	I: forest and cultivation on small islands off northern Borneo
Short-toed Coucal <i>Centropus rectunguis</i>	☉	VU	PSB: forest in the level lowlands and on lower hill slopes
White-fronted Scops-owl <i>Otus sagittatus</i>	☉	VU	P: forest in the level lowlands and on lower hill slopes
Sunda Nightjar <i>Caprimulgus concretus</i>	☉	VU	SB: lowland forest usually below 500 m, often near water
Blue-banded Kingfisher <i>Alcedo euryzona</i>	☉	VU	PSB): streams in lowland forest, mainly below 850 m (but up to 1,400 m on Borneo)
Plain-pouched Hornbill <i>Aceros subruficollis</i>	☉	VU	P: lowland forest below c.1,000 m
Gurney's Pitta <i>Pitta gurneyi</i>	☉	CR	P: forest in the level lowlands, known from a handful of sites in southern Myanmar and Thailand
Blue-headed Pitta <i>Pitta baudii</i>	☉	VU	B: lowland forest below c.500 m
Fairy Pitta <i>Pitta nympha</i>	☉	VU	B: recorded in forest below 1,070 m
Straw-headed Bulbul <i>Pycnonotus zeylanicus</i>	☉	VU	PSB): secondary forest and scrub, often near rivers, usually below 1,000 m
Hook-billed Bulbul <i>Setornis criniger</i>	☉	VU	SB: peat swamp and heath forest, mainly in the lowlands
Black-browed Babbler <i>Malacocincla perspicillata</i>	☉	VU	B: known by a single specimen collected in the 1840s, apparently in lowland forest
Bornean Wren-babbler <i>Ptilocichla leucogrammica</i>	☉	VU	B: lowland forest below c.600 m
Brown-chested Jungle-flycatcher <i>Rhinomyias brunneata</i>	☉	VU	PB: non-breeding birds are apparently confined to mature forest in the level lowlands
Rueck's Blue-flycatcher <i>Cyornis ruckii</i>	☉	CR	S: known by two specimens collected in the lowlands of northern Sumatra in 1917–1918
Large-billed Blue-flycatcher <i>Cyornis caerulatus</i>	☉	VU	SB: lowland forest below c.500 m

☉ = breeds only in this forest region; ☉ = also breeds in other region(s); ☉ = non-breeding visitor from another region

Distribution: P = Thai–Malay peninsula (and northward along the Thailand–Myanmar border); S = Sumatra; B = Borneo; J = Java; I = small islands.

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Gurney's Pitta was rediscovered in southern Myanmar in 2003, after a gap of almost 90 years.



White-winged Duck inhabits forested wetlands in lowland Sumatra, but its habitat there is being rapidly lost and fragmented.



Javan Hawk-eagle, Indonesia's national bird, is confined to the pockets of forest that remain on Java.

PHOTO: BAS VAN BALEN



forest cover from 49% to 35%. It is mainly the lowland forests which have been converted and degraded, and without immediate and fundamental changes in policies and management (including improved law enforcement), the World Bank has predicted that virtually all lowland forest will have been cleared in Sumatra by the year 2005 and in Kalimantan by 2010. Much of Java was deforested centuries ago, and by the 1980s only 2,590 km² of lowland forest and 2,640 km² of montane forest remained there, all in isolated fragments of varying size.

CONSERVATION ISSUES AND STRATEGIC SOLUTIONS (summarised in Table 3)

Forest loss and degradation

■ FORESTRY AND ILLEGAL LOGGING

Forest ecosystems have been under intense pressure from commercial harvest by legal and illegal enterprises for several decades. Massive areas of natural habitat have been and continue to be selectively logged or clear-felled. The forests in the level lowlands have been most seriously affected, as the topography favours accessibility, and timber extraction is most profitable there. However, forest in the 1,000–2,000 m altitudinal zone is coming under increasing pressure from logging as timber resources are exhausted in the lowlands. Peat swamp forest is also increasingly targeted for extraction: large-scale exploitation of coastal forests in south Sumatra began in the mid-1970s and between 1982 and 1995 two-thirds of the remaining primary swamp forest was logged; on Borneo only scattered remnants of virgin peat swamp forest remain, most of which are scheduled to

Table 2 ... continued. Threatened birds of the Sundaland forests.

Species		Distribution and habitat
BORNEAN MOUNTAINS (EBA 157)		
Mountain Serpent-eagle <i>Spilornis kinabaluensis</i>	☉ VU	Montane forest above 800 m in northern and central Borneo
SUMATRA MOUNTAINS (EBA 158)		
Aceh Pheasant <i>Lophura hoogerwerfi</i>	☉ VU	Montane forest at c.1,200–2,000 m
Salvadori's Pheasant <i>Lophura inornata</i>	☉ VU	Montane forest at c.800–2,200 m
Sumatran Ground-cuckoo <i>Carpococcyx viridis</i>	☉ CR	Hill and lower montane forest at c.300–1,400 m
Schneider's Pitta <i>Pitta schneideri</i>	☉ VU	Montane forest at c.900–2,400 m
Graceful Pitta <i>Pitta venusta</i>	☉ VU	Hill and lower montane forest at c.400–1,400 m
Sumatran Cochoa <i>Cochoa beccarii</i>	☉ VU	Montane forest at c.800–2,400 m
PENINSULAR MALAYSIA MOUNTAINS (EBA 158)		
Mountain Peacock-pheasant <i>Polyplectron inopinatum</i>	☉ VU	Montane forest at c.820–1,800 m
Crested Argus <i>Rheinardia ocellata</i>	☉ VU	Occupies the transition between hill and lower montane forest at c.650–1,150 m
Malayan Whistling-thrush <i>Myophonus robinsoni</i>	☉ VU	Montane forest at c.750–1,750 m
Rufous-headed Robin <i>Luscinia ruficeps</i>	☉ VU	Single record of a presumed migrant mist-netted in ericaceous scrub at 2,030 m
JAVA AND BALI FORESTS (EBA 160)		
Javan Hawk-eagle <i>Spizaetus bartelsi</i>	☉ EN	Lowland and montane forest up to 2,500 m on Java, with an optimum altitude of c.500–1,000 m
White-faced Hill-partridge <i>Arborophila orientalis</i>	☉ VU	Known from montane forest at a handful of localities in East Java
Green Peafowl <i>Pavo muticus</i>	☉ VU	Semi-deciduous forest and partially open habitats on Java, both in the lowlands and mountains
Javan Scops-owl <i>Otus angelinae</i>	☉ VU	Montane forest on Java at c.900–2,500 m
Javan Cochoa <i>Cochoa azurea</i>	☉ VU	Montane forests in West and Central Java at c.900–3,000 m
Java Sparrow <i>Padda oryzivora</i>	☉ VU	Woodland, savanna and cultivated areas on Java and Bali, mainly in the lowlands
Black-winged Starling <i>Sturnus melanopterus</i>	☉ EN	Savanna, forest and cultivated areas on Java and Bali, mainly in the lowlands
Bali Starling <i>Leucopsar rothschildi</i>	☉ CR	Confined to a small area of open woodland and savanna in the lowlands of western Bali

☉ = breeds only in this forest region; ☉ = also breeds in other region(s); ☉ = non-breeding visitor from another region

Table 3. Conservation issues and strategic solutions for birds of the Sundaland forests.

Conservation issues	Strategic solutions
Forest loss and degradation	
<ul style="list-style-type: none"> ■ FORESTRY AND ILLEGAL LOGGING ■ PULP AND PAPER INDUSTRY ■ CONVERSION TO PLANTATIONS (ESPECIALLY OIL PALM) ■ CONVERSION TO AGRICULTURE ■ FOREST FIRES ■ DEVELOPMENT (URBAN, INDUSTRIAL, ETC.) ■ MINING ■ TRANSMIGRATION 	<ul style="list-style-type: none"> ➤ Advance sustainable forest management and certification, including improved implementation of existing logging policies and regulations that are beneficial to forest biodiversity ➤ Encourage timber traders, retailers and users to take greater corporate responsibility for natural forest management and conservation ➤ Protect natural forests in active or logged concessions from conversion to other land-uses ➤ Secure substantial long-term funding to provide incentives for government and civil society to protect and restore natural forests ➤ Increase inter-governmental cooperation and action to stop illegal logging ➤ Develop a public register of Indonesian government regulations and decisions relating to forest and land-use ➤ Support national and local environmental NGOs in promoting regional concern about forest conservation ➤ Reject new proposals to clear natural forests for pulp fibre, and only establish new plantations on land that is already cleared or degraded ➤ Encourage plantation companies to take corporate responsibility for forest conservation, by developing 'best practice' in the establishment and management of industrial timber, oil palm and other plantation crops ➤ Conduct environmental audits of the pulp and paper sector, to ensure against illegal or unsustainable practices ➤ Promote increased corporate responsibility amongst investors, traders, and corporate users of pulp and paper, oil palm and coffee, to help prevent these sectors impacting further on natural forests ➤ Establish a permanent forest fire monitoring and prevention network, and manage and protect commercial forests to prevent the outbreak and spread of fires ➤ Enforce the ASEAN no burning policy in the plantation sector ➤ Assess the environmental impact of road building, mining, and new transmigration schemes in forested areas, and minimise development near sites of high biodiversity value
Protected areas coverage and management	
<ul style="list-style-type: none"> ■ GAPS IN PROTECTED AREAS SYSTEM ■ WEAKNESSES IN RESERVE MANAGEMENT 	<ul style="list-style-type: none"> ➤ Improve protected areas systems to fill gaps in coverage of threatened bird species and their habitats ➤ Rapidly advance the protection of the largest remaining blocks of lowland forest in Sumatra and Kalimantan, and southern Myanmar ➤ Strengthen reserve management (particularly in Sumatra and Kalimantan) through improved funding, infrastructure and staff training
Exploitation of birds	
<ul style="list-style-type: none"> ■ HUNTING AND TRAPPING ■ WILD BIRD TRADE 	<ul style="list-style-type: none"> ➤ Improve enforcement of existing hunting laws, including by increased patrolling of protected areas ➤ Control the wild bird trade in Indonesia by strengthening law enforcement and awareness campaigns
Gaps in knowledge	
<ul style="list-style-type: none"> ■ OUTDATED INFORMATION ON FOREST COVER ■ INADEQUATE DATA ON THREATENED BIRDS 	<ul style="list-style-type: none"> ➤ Locate remaining primary lowland forest patches in Sumatra and Kalimantan, and assess their long-term conservation prospects ➤ Survey poorly known threatened species, notably Silvery Wood-pigeon, Black-browed Babbler and Rueck's Blue-flycatcher, and Gurney's Pitta in southern Myanmar

The World Bank has predicted that virtually all lowland forest will have been cleared in Sumatra by the year 2005 and in Kalimantan by 2010.



PHOTO: MARCO LAMBERTINI/BIRDLIFE

Illegal logging is a major problem, including inside protected areas, and needs to be addressed through increased international cooperation and action.



PHOTO: JEREMY HOLDEN

be cleared or converted to other land-uses. Recent political and economic upheavals in Indonesia have resulted in an escalation of illegal logging and land conversion, with deliberate targeting of all remaining stands of valuable timber, including those inside protected areas. For example, industrial-scale logging is currently taking place within the boundaries of Gunung Leuser National Park, Sumatra, and Tanjung Puting National Park, Kalimantan, with regional authorities and outside agencies unable to prevent it.

The most extensive remaining forests are in Sumatra and Kalimantan, but are being very rapidly exploited, with logging concessions covering 67,000 km² in Sumatra and 118,000 km² in Kalimantan. Concessions are currently managed unsustainably, and increasingly subject to illegal logging, either through over-cutting (by the concessionaires) or by third parties. Over-capacity in the timber industry as a whole is fuelling massive illegal logging both inside and outside concessions. Once logged, there is considerable pressure to convert forestland to other uses (e.g. plantations). This pressure is expected to become progressively stronger, especially given the over-capacity in the pulp industry and oil palm expansion plans.

It is vital that sustainable forest management is rapidly achieved throughout the region, supported by the development of credible national and international forest certification schemes. Many existing policies and regulations relating to logging would benefit threatened birds and other biodiversity, and should be fully implemented, including: reduced-impact logging; logging restrictions on slopes, along watercourses and adjacent to protected areas; and preservation of representative pieces of primary habitat. Timber traders, retailers and users must take greater corporate responsibility for natural forest management and conservation. The area of natural forest within logging concessions, particularly in the lowlands, far exceeds that covered by protected areas; conservation efforts should focus on natural areas that have been logged or are scheduled for logging, particularly as many concessions are coming to the end of their cutting plans and are likely to come under considerable pressure from conversion proposals. The funding for these projects needs to be sourced from the global community, through initiatives such as carbon offset agreements and 'ecological taxes' on commodities such as paper and palm oil, with the aim of providing long-term incentives to governments and civil society in the region to protect and restore natural forests; however, a major challenge is to find ways to pay for forest conservation without fuelling corruption. The problem of illegal logging needs to be addressed through increased international inter-governmental cooperation and action. Conservation in Indonesia would benefit from complete transparency of the Ministry of Forestry's regulations and decisions, particularly those relating to concessions and land-use status (and proposed changes in land-use), through the development of an on-line, publicly accessible register. The capacity of national and local environmental NGOs in Indonesia needs strengthening, so that they can promote awareness about forest conservation and help monitor and protect key forest areas. Local NGOs should be supported by the conservation community when they challenge in court illegal activities and proposals by local government to release natural forest areas for other forms of land use.

■ PULP AND PAPER INDUSTRY

The Indonesian pulp and paper industry has expanded rapidly since the late 1980s, and the country is now one of

The pulp and paper industry is putting huge pressure on Sundaland's forests, and must take greater corporate responsibility for forest conservation.



PHOTO: MARCO LAMBERTINI/BIRDLIFE

the world's top 10 producers; the Indonesian Ministry of Industry and Trade recently proposed to make pulp and paper one of four key 'engines of macro economic recovery', and similar expansion is planned in East Malaysia. The corresponding increase in demand for wood fibre is causing large-scale forest clearance and degradation, particularly in Sumatra, through clear-felling of forest for pulp wood and for the establishment of pulp wood plantations. There are six large pulp mills in Sumatra and one in East Kalimantan, and three new mills are being considered, in Sabah, Sarawak and South Kalimantan (with associated industrial timber plantations, e.g. of 3,000 km² in place of logging concessions in Sabah). The pressure that the industry is placing on the forests of this region is set to increase substantially over the next 10 years as the new mills come online, and as capacity expansions are carried out at existing mills.

In line with a moratorium declared by the Government of Indonesia, all plans to clear new areas of natural forest (even degraded secondary forest) for pulp-fibre or to establish new timber plantations should be rejected. Any expansion of plantations in Sumatra and Kalimantan should be on already cleared and degraded land which now lacks significant forest cover. The plantation industry should take greater corporate responsibility for forest conservation, and, with advice from the conservation community, it should develop 'best practice' in the

establishment and management of plantations, including: a commitment not to clear natural forest for plantations; protection and management of natural forest patches within existing concessions; adherence to ASEAN's policy not to use fire to clear land; and prohibition of hunting within concessions. Plantations adjacent to protected areas or other important areas of natural forest should assist with and respect boundary demarcation, and could also assist in providing a buffer in any strategy to protect these areas. To ensure the sustainability of the pulp and paper industry in Indonesia, environmental audits should be conducted to fully assess the financial and environmental risks involved with the pulp and paper sector, and to ensure against illegal or unsustainable practices. In particular, investors, traders and buyers should agree a strategy with the pulp and paper companies to end the current use by mills of timber from natural forests, involving reduced processing capacity and using only sustainably harvested pulpwood from independently certified plantations.

■ CONVERSION TO PLANTATIONS (ESPECIALLY OIL PALM)

Extensive areas of natural forest are being cleared and replaced with plantations of cash-crops, principally oil palm, but also rubber, coffee and fruit. Palm oil is Indonesia's most important agricultural commodity in terms of foreign exchange, and between 1984 and 1997 an estimated 17,000 km² of forest on Sumatra was replaced by oil palm estates, with a further 21,000 km² cleared (mainly for oil palm) but not planted; the corresponding figures for Kalimantan are lower, but are expected to increase. Large areas of forest in Peninsular Malaysia have been cleared for oil palm and rubber plantations, and the area of oil palm is now rapidly expanding in East Malaysia (Sabah and Sarawak); for example, the Sarawak State Government plans to plant 15,000 km² of oil palm. The accessible lowland forests in southern Myanmar are also being rapidly cleared for oil palm plantations. Indonesia's oil palm sector is dominated by corporate groups that are also active in the timber and pulp industry; when concessions have been selectively logged, these groups apply (usually successfully)

Palm oil is Indonesia's most important agricultural commodity in terms of foreign exchange, and large areas of forest in Sumatra and Kalimantan have been converted to plantations.



PHOTO: MARCO LAMBERTINI/BIRDLIFE

for the land-use to be changed to conversion forest, for plantation development, with the residual timber being used as pulp-fibre. Palm oil is used primarily for food stuffs (e.g. cooking oil, ice cream), as well as soaps, lubricants and cosmetics; it is exported throughout the world and many European and US multinationals are major users.

The oil palm industry should take greater corporate responsibility for forest conservation, and, with advice from the conservation community, should develop 'best practice' in the establishment and management of plantations, with any expansion restricted to cleared and degraded land which lacks significant forest cover. It is in the vegetable oil industry's self-interest to develop long term strategies towards ecologically and socially sustainable land use and production methods, given that consumers will expect the industry to take care of these issues. Manufacturers should identify the suppliers of the oil that they use, and their plantations, and ensure that their consumption is not leading to the clearance of natural tropical forests.

■ CONVERSION TO AGRICULTURE

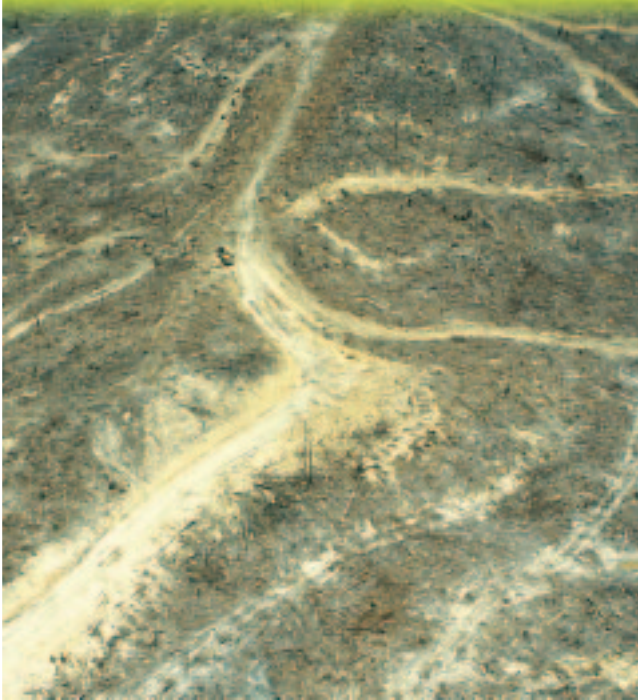
In some areas, the forests were long ago cleared for cultivation, notably on Java, where the rich volcanic soils support intensive agriculture and a large human population. Small-scale investors and small-holders continue to have a significant involvement in deforestation, particularly in Sumatra and Kalimantan, although the proportion of forest land they clear is very hard to determine; they have often been marginalised by concessions or plantations, or are sponsored or spontaneous inter-provincial transmigrants. Typically they clear and manage small plots for a variety of tree crops (rubber, coffee, cocoa, cinnamon, etc.) or subsistence crops. Often land is cleared, with backing from local investors, for land speculation and land claim purposes. The clearance of large areas of forest at higher altitudes is of particular concern, e.g. for cinnamon in Kerinci Seblat National Park and for coffee in Bukit Barisan Selatan National Park. Fire is used to clear or prepare land for cultivation, adding to the risk of forest fires. Encroachment into forest needs to be prevented in protected areas and at other key sites for biodiversity. Improved agricultural efficiency and techniques should be used to retain soil fertility and reduce the need to clear more forest, with cleared land rehabilitated so it can be used for cultivation.

■ FOREST FIRES

The Sundaland region is affected by the El Niño–Southern Oscillation (ENSO) cycle, which causes periodic droughts and renders the region's logged-over areas intensely vulnerable to fire, especially in the lowlands. Many swamp forests grow on a peat soil that easily burns when dry and they are then much more vulnerable to severe fire damage. Drought conditions in 1997 and 1998 led to very extensive fires, which were estimated to have damaged 3,000 km² of lowland forest and 3,000 km² of swamp forest in Sumatra, and 23,000 km² of lowland forest and 7,500 km² of swamp forest in Kalimantan. Nearly all burning was related to human activities, particularly commercial land clearance for oil palm and timber estates (estimated by some to account for 80% of fires in Sumatra and Kalimantan). Future ENSO events could lead to a resurgence of forest burning for plantation development; a permanent forest fire monitoring and prevention network is needed, to help with efforts to reduce the incidence and impact of forest fires. The ASEAN no-burning policy should be enforced, with appropriate penalties for plantation companies which transgress

Fires are used to clear forest for agriculture and plantations, but often burn out of control during the periodic droughts associated with the El Niño–Southern Oscillation cycle.

PHOTO: MARCO LAMBERTINI/BIRDLIFE



(although it may be necessary to allow some strictly controlled burning within existing plantations to prevent the build-up of combustible materials). Commercial forests should be managed to protect against the outbreak and spread of fires, and laws that protect forests from arson should be strongly enforced.

■ DEVELOPMENT (URBAN, INDUSTRIAL, ETC.)

Some important forest areas have been affected or are threatened by development. The Chew Larn dam in Thailand, for example, submerged the country's only Storm's Stork locality. In Peninsular Malaysia, the proposed Highland Resorts Road (now apparently on hold) would damage the montane habitats of Mountain Peacock-pheasant and Malayan Whistling-thrush, by causing large-scale deforestation and erosion, development (urban and tourism), encroachment for highland agriculture (e.g. vegetables), and increased incursion by loggers and hunters. Kerinci Seblat and Gunung Leuser National Parks on Sumatra and Kayan Mentarang National Park in Kalimantan are threatened by road development projects, which would facilitate access to forest areas. Environmental impact assessments should be conducted for projects that could damage forested areas, with appropriate mitigation plans. New developments should be avoided near protected areas and other sites of high biodiversity value. Plans for the Highland Resort Road in Malaysia should be dropped.

■ MINING

In Kalimantan, large mining operations have caused considerable damage to forests, pollution and the disruption of local communities. Under Indonesian law, new mining projects are subject to environmental impact assessments; these should fully take into account the potential damage to forest biodiversity, with mitigation for any negative effects. No further open-cast coal mining should be allowed in forest areas.

■ TRANSMIGRATION

It has long been policy in Indonesia to re-settle people mainly from Java to develop the country's less populated regions, with Kalimantan a major destination. The 'Million hectare peat swamp project', which aimed to clear large areas of swamp forest in Central Kalimantan for rice cultivation, has recently been cancelled, but only after huge areas of forests had been clear-felled or drained. The environmental impact of any new resettlement schemes needs to be carefully assessed, following the existing legal process (the AMDAL regulations); in general, they should be sited away from protected areas and other key forest sites.

Protected areas coverage and management

■ GAPS IN PROTECTED AREAS SYSTEM

There are extensive networks of protected areas in most parts of this region, but there are some important gaps in coverage of threatened birds and their habitats. Although forest designated for conservation covers c.48,000 km² in Sumatra and c.44,000 km² in Kalimantan, the most extensive and impressive national parks are in hill and montane (rather than lowland) areas, and only one has been fully gazetted; measures are urgently needed to advance the protection of the largest remaining blocks of lowland forest. The following sites and habitats need official protection or alternative measures to ensure that their habitat and biodiversity are conserved, recognising that reserves (together with any adjacent forested areas) need to be large enough to support functional forest ecosystems and bird communities: (1) all forest inhabited by Gurney's Pitta at Khao Nor Chuchi in Thailand, and at selected sites in southern Tanintharyi Division, southern Myanmar; (2) a large protected area in the Main Range in Peninsular Malaysia, for Mountain Peacock-pheasant and Malayan Whistling-thrush; (3) enlargement of Gunung Leuser National Park, Sumatra, to cover all areas of high biodiversity value, especially in the lowlands; (4) management of the Teso Nilo forests (including Bukit Tigapuluh National Park, Kerumutan, Bukit Rimbang and Bukit Baling), Sumatra, for elephant and tiger; (5) a protected area for Silvery Wood-pigeon, once surveys have located a suitable site; (6) inclusion of lowland logging concessions into the Kerinci Seblat National Park, Sumatra, especially the Sipurak Hook area; (7) a major protected area in the Sebuku Sembakung region of East Kalimantan (which is adjacent to extensive areas of managed natural forest in Sabah).

■ WEAKNESSES IN RESERVE MANAGEMENT

Some protected areas in this region are well planned and managed, but most lack the financial, technical and management capacity required for their protection. Given the rapid rate of deforestation in this part of Indonesia, there is an urgent need to preserve the integrity of the existing protected areas systems, and especially to prevent illegal logging and land clearance in lowland areas within reserves. National and international efforts are needed to support and monitor government efforts to secure these areas; this should develop and advance a reform agenda for protected areas as an integral part of the emerging National Forest Programme. Funding is needed to strengthen patrolling and enforcement, to finance participatory boundary demarcation in critical areas, and to promote protected areas at local government level and among the Indonesian public. The donor community should place primary importance on preserving the integrity of the protected areas system in its lending and grant-making programmes.

In parts of the region, e.g. Sarawak, there is a trend towards privatised reserve management, with the aim of generating revenue to cover management costs; at protected areas with high landscape and wilderness value it may be possible to raise sufficient income from tourism, but reserves with lower tourism potential could be starved of resources. In Indonesia, recent autonomy legislation to decentralise power from national to local governments is causing problems in some protected areas, e.g. at Kayan Mentarang National Park in Kalimantan the local government has approved the construction of a new road, apparently without reference to central government; it is vital that this new local legislation (and its implementation) is harmonised with existing national laws (and the mechanisms used to enforce them), to prevent conflicts of this type. Many reserves in the region lack adequate management plans, and these should be prepared, fully taking into account all relevant national and local legislation and the needs of local communities. Other measures for site conservation could include local land-use planning backed by local government legislation and the establishment of site conservation partnerships with local stakeholders.

Exploitation of birds

■ HUNTING AND TRAPPING

Hunting is a problem, especially of larger birds such as pheasants, storks, raptors, pigeons and hornbills. Many people carry firearms and shoot opportunistically in forest areas. Snaring of terrestrial birds (particularly pheasants and partridges) to supply food to villages and logging camps is very common and must pose a serious threat to some species. Existing hunting laws need to be more strictly enforced, particularly in protected areas, through increased patrolling and removal of snares. In logged forest restrictions on hunting and trapping will have long-term economic benefits through the pollination, seed dispersal and other ecological services provided by wildlife, many of which speed the recovery of degraded habitat.

■ WILD BIRD TRADE

Cage birds play an important role in Indonesian culture, and the wild bird trade is a serious problem, particularly on Java and Bali where Javan Hawk-eagle, Black-winged Starling and, especially, Bali Starling are severely threatened largely because of this pressure. The widespread decline in the Straw-headed Bulbul, a popular song bird that once occurred throughout this region, has been one of the most dramatic of any species in Asia. Improved roads, including the opening up of forest by logging concessions and plantations, have greatly increased access for hunters and trappers. Designing conservation strategies to counter the threat of trade is especially difficult. In the case of Bali Starling and Javan Hawk-eagle (Indonesia's 'national bird'), raising awareness through the national media runs the risk of increasing demand. The financial value of these birds means that people will go to great lengths to capture them, and attempts to control trade may be undermined by corruption. However, efforts to control the trade must be continued, by strengthening law enforcement and awareness campaigns.

Gaps in knowledge

■ OUTDATED INFORMATION ON FOREST COVER

Given the rapid rate of deforestation, forest-cover maps are now outdated. A thorough assessment (using satellite images, aerial surveys and ground surveys) is urgently needed to

locate all significant remaining patches of non-swampy primary forest in the lowlands of Sumatra and Kalimantan; the prospects for their long-term conservation should be assessed, and they should become the focus of national forest monitoring initiatives. The potential impacts of the pulp and paper and the oil palm industries on natural forests need to be fully taken into account in this assessment.

■ INADEQUATE DATA ON THREATENED BIRDS

Ornithological coverage of this region is very incomplete; a few areas have been reasonably well studied (e.g. Peninsular Malaysia), but large parts of Sumatra and Kalimantan, for example, have never been surveyed. Research is therefore needed to assess the distribution, population and habitat needs of many Sundaland species, with a particular focus on protected areas and other key sites for biodiversity, especially the remaining patches of primary lowland forest. Three species have not been recorded in recent decades, and need to be searched for: Silvery Wood-pigeon (offshore islands), Black-browed Babbler (lowland Borneo) and Rueck's Blue-flycatcher (lowland Sumatra). Gurney's Pitta was known from a single site in peninsular Thailand until surveys in 2003 located it in southern Myanmar, where research should be continued to identify the largest remaining areas of suitable lowland forest habitat and to develop an appropriate conservation strategy. Sumatran Ground-cuckoo was rediscovered in Bukit Barisan Selatan National Park in 1997, but needs further study. Other poorly known species which require surveys include: White-faced Hill-partridge (East Java), Bornean Peacock-pheasant (lowland Borneo), Mountain Serpent-eagle (Bornean mountains), White-fronted Scops-owl (Thailand and Peninsular Malaysia) and Javan Scops-owl (Javan mountains). The taxonomic position of Aceh Pheasant, which may be conspecific with Salvadori's Pheasant, should be assessed.

Straw-headed Bulbul is a popular cagebird because of its beautiful song, but excessive capture for trade has caused a dramatic decline in its range.



PHOTO: CHRISTIAN ARTUSO