

# Conservation of Southeast Asian Birds: The Role of Bird Markets and Avian Flu

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## Abstract

The extensive captive-wild-bird trade has aided the decline in many wild bird species in Indonesia. Indeed, many species that we found to be rare in the field were quite common in the Jakarta bird market in 1996. The number of birds for sale in the market, however, dropped dramatically in mid 2005, when the presence of avian flu in Jakarta kept prospective bird buyers away. Before the avian flu precipitated the decline we did a rapid survey the afternoon of 22 November, 1996, of the largest bird market in Southeast Asia, Pramuka Pasar Burung (Pramuka Street Bird Market) in Jakarta, Indonesia. Throughout the entire market somewhere between 80,000 and 150,000 individual birds of roughly 150 different species were for sale. Most were more than likely captured on Java or other islands within 1500 km of Jakarta. But a significant number were either bred in captivity or imported, in several cases illegally. We found many species for sale that were and still are listed as rare or endangered. The value of the birds in the market on that one afternoon was somewhere between US\$800,000 and US\$1,500,000. Now that the concern of bird flu has severely dropped the number of buyers frequenting any bird market, this previously lucrative trade has been greatly curtailed. With significantly fewer birds being captured in the wild, perhaps this is a unique opportunity to change the social acceptance of the captive-bird trade from one of benefiting a person's life to that of being a foolish endeavour that could not only deplete a national treasure by, but could prove to be fatal.

## INTRODUCTION

The diversity of biota in Southeast Asia is extraordinarily high. Unfortunately, the rapid conversion of natural habitats by human beings has influenced both the presences and density of many species. As a

consequence, much of the biodiversity of tropical Asia is quickly becoming confined to rapidly shrinking remnants of habitat. This includes primary lowland tropical forest, which now rarely occurs in truly large undisturbed expanses.

Java currently possesses one of the highest human population densities on our planet, roughly 1000 people for each square kilometer. Jakarta, the capital of Indonesia, is one of the world's largest cities, with 8.8+ million people in the city itself and over 17 million when the surrounding suburbs are included (Dimitrov 2006). The 126,700 m<sup>2</sup> island currently supports around 127 million people. A government-encouraged relocation programme, focusing primarily on moving people off Java to other areas within Indonesia, has contributed to the escalation of habitat destruction throughout the island nation.

Human beings have been present on Java for more than one million years and over several millennia Javanese have converted ancient-forest lands for their use. Approximately 80% of the original forest cover was lost 2000 years ago, and for the last 700 years less than 10% has remained (Whitten *et al.* 1996). Fortunately, a large proportion of this remaining area is now designated as reserves. Unfortunately, most of these reserves are small, confined to mountainous terrain, under constant human pressure, and sadly receive little or none of the needed protection. Without enforcement diversity and density of forest-dwelling birds have been declining (Bishop, *unpublished*). Outside of Java's reserves the countryside looks, at least at first glance, botanically rich and luxuriant. On closer inspection, however, the large number of exotic plant species is obvious, and the almost complete absence of birds in these areas is disconcertingly noticeable.

The dearth of birds is certainly due to a number of factors, including habitat destruction (e.g., rattan poaching in the reserves), overuse of pesticides, over-hunting primarily for food, and capture for the wild-bird trade. Each of these factors are more or less important depending on the location, but we suspect that until the 2005 report of

avian flu, the impact of the wild-bird trade on local avifaunas was larger than officials and policy makers purport it to be. Indeed, so large to preclude enforcement of laws.

The demand for caged birds plummeted—down 60 to 80%—when, in September, 2005, the first death of a Jakarta woman due to avian flu was reported (Salazberg *et al.* 2006). Since that time there have been a total of 37 deaths in Jakarta due to the bird flu. This total results put Indonesia second in the list of countries with the highest number of avian-flu-caused deaths. The first being Vietnam, with 42 deaths. In May, 2006, the number of deaths in Indonesia averaged 1 every 2 ½ days (Mason, 2006).

An owner of a stall in the bird market, Titi Havati, reportedly told the Jakarta Post, “*Before the bird flu scare, I exported live birds to Hong Kong, Taiwan and China. But now, I have been reduced to selling birdseed.*” (Anonymous, 2006). Officials have started to respond to citizens’ worries about having the market near a residential area. Plans are being investigated to move the market beyond the outskirts of greater Jakarta. Such a move will further decrease the number of customers frequenting the market. This could precipitate a restructuring of the bird market, resulting in only a very small number of sellers remaining in this business. With such a small market, perhaps the number of infractions will be small enough to allow officials to have the time needed to deter people illegally capturing and selling wild-caught birds.

While parrots are perhaps the most notorious wild-bird export from Indonesia, the domestic trade of all birds before 2005 was enormous. Indeed, the internal trade in Java probably overshadowed that of other Southeast Asian countries, but there are few studies of the species and numbers of species traded domestically in Indonesian markets (TRAFFIC SE Asia 1993, Nash 1993). In an effort to help quantify the domestic wild-bird trade we somewhat surreptitiously gathered data by doing a rapid census on Friday, November 22, 1996, at the Pramuka Pasar Burung (Pramuka Street Bird Market), the largest of the three large bird markets in Jakarta. This provided us with information to compare with observations made in the field the previous three weeks. Additionally, the senior author has more than 25 years of field experience in the region.

## Methods

The Pramuka Pasar Burung was the largest bird market not only in Indonesia but also in all of Southeast Asia (Nash 1993). This market, which was sponsored and opened by the Indonesian government in 1975 (Nash 1993), occupied two adjoining buildings, the older one storey building was built in 1975, and the other has four stories and was built in the late 1980s (Nash, date unknown). A third smaller building also used by wild-bird merchants was next door (building date unknown).

On November 22, 1996, four of us divided into two

pairs and systematically as possible walked up and down the rows of stalls. One couple quickly paced off the various isles to get a rough estimate of the overall size of the market. The other couple checked the cages of a considerable fraction of the stalls, identified species and estimated the number of each species within each stall. One person of this latter pair recorded data on a Dictaphone while the other indicated additional cages and species in the stall not yet recorded, and photographed individual birds not immediately identifiable to species. The entire survey conducted by both couples working very rapidly took approximately two hours. Our survey technique was rapid by design, in part owing to the behaviour of several vendors, some of whom became very suspicious and those who became hostile forced our fast pace. The results, although clearly only giving a rough estimate of the species diversity and number of individual birds held in the market, presents a rough ‘snapshot’ of the wild-bird trade in Java in the late 1990s and an indication of the scale of the domestic trade at that time.

## Results

On that single afternoon our measurements estimated a total of around 3200 m<sup>2</sup> of floor space in the one storey building with about 125 stalls open for business. The first floor of the 4-storey adjoining building measured approximately 1640 m<sup>2</sup> but only had roughly 40 stalls open throughout all 4 floors, and the neighboring building with about 600 m<sup>2</sup> of space had 17 stalls operating that day. Therefore, we estimate a total of about 190 stalls occupied during our visit. Nash (1993) reported that the one-storey building was built to house 124 stalls and the first floor of the 4-storey building provided 1700 m<sup>2</sup> of space, resulting in the room for a total of 200 stalls throughout all four floors. Only around 20% of the 200 stalls were occupied the day of our survey. We found stalls in the third neighboring building, the presence of which Nash did not report. Indeed, this was the building that we found most of the species that were illegal to sell, including mammals of many kinds.

We estimated that, rather than selling birds, around 3% of the stalls sold mammals, cages or bird food, which included many different type of seeds and insects. Taking that into account, we estimate that close to 175 stalls were selling birds.

The number of birds per stall ranged typically from 250 to 900 with an average of around 650. This number was driven by the fact that most stalls that day exhibited a large numbers of less-expensive birds, such as Oriental White-eyes or Peking Robins. These species were in several cages about 40x90x60 cm, each of which often held around 50 individuals. Surprisingly, we also saw large cages with fairly expensive birds in them, such as a large cage of *Fire-tufted Barbets* with over 65 individuals stuffed in a cage that should have only held two to four. This cage of birds was of concern to us not

only because of its large numbers in a small cage, but because the cage was sitting in the open sun, which was obviously stressing the birds held within.

Usually, the more highly valued birds, like *Hill Mynas* or *Straw-headed Bulbuls*, were kept one per small cage that were roughly 20x20x30 cm and were usually hanging from the ceiling of a stall, not sitting in the direct sunlight. Our findings for that single afternoon in November suggest that around 115,000 individual birds, give or take 35,000, were for sale in the Pramuka Bird Market.

The individual birds in the market represented approximately 150 different species (Appendix A lists 147 identified species and 7 additional species only identified to genus). Certainly, not all of the birds in the market were captured from the wild, but we estimate that only about 5% of the species in the market were captively bred (e.g., *Budgerigars*). Of the 44 non-passerine species we recorded, 28 were native to islands within around 1500 km of Jakarta. The remaining 16 species were imports from New Guinea (4 species), Africa (3 species), S & SE Asia (3 species), Australia (2 species), Molucca Islands (2 species), and other areas (2 species) (see Andrew 1992).

Of special note were two species we recorded, Javanese *Hawk-Eagle* and *Seram Cockatoo*, both of which were categorized as threatened by Collar and co-authors (1995) in the most complete compilation in the mid 1990s of threatened birds of the world. Both species were and still are prohibited from trade by CITES as Schedule 1 species. The *Javanese Hawk-eagle*, the majestic bird on the Indonesian national crest, is now severely endangered with an estimated global wild population in the late 1980s of about 50 - 60 pairs (Meyburg et al. 1989). The poor individual for sale at the bird market, which represented around 0.5% of the entire world's population, was so emaciated that there was little similarity between it and the robust and proud hawk-eagle on the national seal. Tragically this withered individual was being sold "for a specially low price" of only US\$200, which we were told was a significant discount undoubtedly due to its incipient death.

Sixteen of the non-passerine species probably came from Java itself, and this total includes a number of species that could fairly frequently be seen in suitable habitat in West Java until about the mid 1990s, but have disappeared since. For example, in the early 1990s *Black-shouldered Kite* and *Zebra Dove* were regularly seen in the open countryside and parks around Jakarta and Bogor in West Java (KDB pers obs). Their absence since then is most simply explained by trapping for the wild-bird trade.

Of the 110 passerine species we identified, 81 were most likely captured within 1500 km of Jakarta. All but a few of the remaining 29 species are presumed to have been imported from Africa (9 species), southern and SE Asia (12 species) northern Asia (3), India (2 species) and other areas (3 species). The exceptions were birds often bred in

captivity, such as the *Zebra (Peaceful) Dove* and *Blue-capped Cordonbleu*. Thus, not only did Indonesia's domestic bird trade affect its own birds but also had an impact on the populations of birds in surrounding areas. Fortunately, this behaviour of capturing wild birds has slowed significantly, due to customer concerns of contracting bird flu. Therefore, among the horrible consequences of the avian flu there may be a small positive benefit of the flu reaching Jakarta.

Of special note among the Indonesian species at the market was the presence of two Javan endemics-of-concern: *White-breasted* and *White-bibbed babblers*. The former was considered globally threatened (Collar et al. 1995), and the latter had a restricted range. Capture for the wild-bird trade certainly contributed to the population decline of both these species.

The situation of the *Straw-headed Bulbul* is quite instructive about the impact of capturing wild birds. This bulbul is one of the finest of all songsters, which made it a much-sought-after species by customers. This was because that species would often win singing contests held frequently throughout Jakarta. The numbers of this exquisite musician declined so radically in Indonesia, which contains the majority of its range, that birds were illegally imported from peninsular Malaysia via a "laundering" scheme in Singapore (Nash 1993). Our field observations in Sabah, Borneo, from 3-13 November, and reported observations during previous years by KDB, confirm the rarity of the *Straw-headed Bulbul* within extensive areas of seemingly suitable habitat.

Two other birds of note that were well represented in the market, with many hundreds of individual of each species, were the *Tawny-breasted* and *Pin-tailed parrotfinches*. As with the *Straw-headed Bulbul*, these two parrotfinches were present in the market in high numbers. This was unsettling as both species were rarely encountered in the wild and, despite their relative wide distribution, these species were (and still are) considered to be rare, local and declining. Bird trapping was almost certainly a major factor causing the decline in the populations of both species.

## Discussion

The keeping of birds in cages has a history lost in time, and in Javanese tradition it was thought desirable for every man to have five things: a wife (*wanita*), a job (*narpadha*), a house (*wisma*), a horse or carriage (*turangga*), and a bird (*kukila*). The possession of the *Peaceful (Zebra) Dove* in particular was believed to bring good luck to its owner (Brotoisworo & Iskander 1984). The modern inhabitants of Java have been called 'inveterate aviculturalists' (Morrison 1980). This Javanese tradition of keeping caged wild-caught birds was seen as very rewarding for the owner. This quite popular pastime spread beyond the Javanese to and throughout Indonesia. As such, the hobby of keeping wild-caught birds was adopted widely. The birds were kept

for the social status they brought (especially true for rare and protected species), their song, their beauty, and as pets for children.

While walking down most streets in Indonesia, birdcages could be seen outside shops and houses. The cages frequently were suspended on a pole above the roofs where the owners believed the birds would appreciate the view and breeze. In these lofty locations, however, the birds were subjected to full sunlight for much, if not all, of the day, which undoubtedly was quite stressful to the birds.

Fairly frequently, owners of caged birds would release bird they had kept for a while, because this action was often seen as magnanimous. In virtually every case, however, the released bird had little chance of survival owing to two factors. 1. While kept in captivity, flight muscles of birds become weak with disuse and probably also from lack of correct nutrients. From information on reintroductions of birds, we know that individuals must be kept in a large aviary for a time before released in order to strengthen their flight muscles. 2. The releases were frequently done within the city limits or in other habitat that was inappropriate for the bird. Deep forest species do not know how to navigate through a city back to the forest where they can survive.

A previous Indonesian President's wife, Mrs. Suharto, who established a huge aviary seemingly with the goal of possessing one individual of every bird species found in Indonesia, undoubtedly bolstered the prestige obtained by maintaining many wild-caught birds. This created an enhanced demand for caged birds for a very large number of people, especially those of the higher socio-economic classes, seeking to emulate her. While the proportion of wealthy people in Indonesia was relatively small, in a nation of some 200 million people, the absolute number was quite large. Even those in the lower socio-economic classes followed the tradition of keeping birds, which they frequently entered in competitive bird-song contests. The birds they keep were either captured directly from the wild, or less expensive species purchased at the bird markets. Because of large number of people in this socio-economic class, numerically they were important customers at the markets.

Another one-day survey of the Pramuka Bird Market was done on 12 September, 1992, by officials from TRAFFIC Southeast Asia. Their counts were quite a bit lower than ours. They counted roughly 20,500 individuals, representing 77 non-CITES species for sale from stalls holding an average of only 80 individuals (Nash 1993). The difference in these numbers compared to those we found (115,000, 150, and 650, respectively) was probably due to a large fraction of the total number of individual birds we saw being crammed into a few large cages with 50 or so birds per cage in most stalls. The time of year may have contributed to the larger number of individuals

we saw in November, 1996, compared to those seen in September, 1992.

We also expect that the species available in the market reflected seasonal changes in number of individuals and species. For example, some of the cuckoos such as *Chestnut-winged Cuckoo* are only known as migrants to Indonesia, and therefore would be available for capture in November, at the time of our rapid survey, and not during the other rapid census. If the concerns of contracting avian flu can be eliminated, then a study of seasonal changes in the Indonesian wild-bird trade would be useful, but difficult given the generally uncooperative nature that Nash (1993) and we (1996) encountered once the merchants realized we were observers and not customers.

Wild-caught birds could be obtained in almost every city and town in Indonesia. Most of the larger towns had at least one formal bird market; while the smaller towns would either have at least one stalls selling birds in the main market. Even in the few towns where no bird market or market stalls exists, often bird sellers carry cages of birds door-to-door in search of customers. Wild caught birds were in great demand and provided a lucrative income for many.

With more than one million birds sold annually in the markets of Java and Bali alone (Whitten *et al.* 1996) the trade was clearly enormous and lucrative. This was emphasized by our observations in just a couple of hours at the Pramuka Bird Market. Prices quoted for birds available on the afternoon of our survey ranged from as low as US \$2.00 to as high as US \$400.00 for a *Hill Myna* in excellent condition. Costs of other select species included: *Seram Cockatoo* for US \$360, *Hill Myna* for US \$300, *Javan Hawk-Eagle* (in very poor condition and near death) and *Rufescent Imperial Pigeon* each for US \$200, and *White-rumped Shama* for US \$120. If we assume a conservative average of US \$10.00 per bird, then the total for the birds we saw in just one afternoon was approximately US \$800,000 to US\$1,500,000. The price demanded in other countries for those exported rare, protected and threatened species such as the *Seram Cockatoo*, brought prices considerably higher, perhaps as high as US \$20,000 - 30,000, in Europe, Japan or the USA.

The diversity of taxa in the market indicated the persistence of bird-trappers in obtaining new species, particularly given the differing ranges and relative obscurity of some of the species present in the market. For example, the *Rufescent Imperial Pigeon* is a rarely encountered species of New Guinea's mountains (KDB pers obs), but its presence in the market suggested the increasingly easy access to the forests of Irian Jaya, especially the mountains. The presence of the *Diamond Dove*, endemic to Australia, was of special interest because, unless bred in captivity, which was unlikely, this species must have been exported illegally from Australia even though that nation had very strict export laws applying to all wild-caught birds. Another point of note was the cage

of more than 20 Pink-necked Green Pigeon, a species capable of surviving in the fragmented woodlots of lowland and coastal Java but almost extirpated in these areas. Again, trapping such as this undoubtedly contributed significantly toward this loss of this species in these areas.

Local informants told us that the Pramuka Bird Market was only "the tip of the iceberg." There were several other bird markets that operate similarly, seven days a week, year round (see Nash 1993). We were also told that the best specimens never reached the public market, but were sold privately. Many of these species were endangered and therefore illegal to trade. Indeed, most, if not all, of the individuals of endangered species we saw in the market, such as the *Javan Hawk-Eagle*, were in poor condition with feathers disheveled, missing and broken, and heads and wings drooping.

Our market census while providing a valuable snapshot of the indigenous bird trade in Indonesia, and especially Java, provided an insight into the numbers and species diversity of the domestic and international bird trade. The presence on just one afternoon of 40 species from northern Asia, Philippines, Australia and Africa (Appendix A) suggested, however, the Indonesian bird trade represented not only a considerable drain on its own bird populations but also on those of south and Southeast Asia and, to a lesser degree, to those of Africa and Australia. Furthermore, our results are similar to those of Round (1990), who surveyed the Bangkok Weekend Market, noting 68,654 individuals of 225 native bird species, and 3,132 individuals of 51 species of exotic birds.

Nash (1993), summarizing the results of his 1991-1993 survey of the wild-bird trade in Indonesia observed that "Overall, it may be said that the Indonesian bird trade has had a serious and perhaps devastating impact on certain species (such as the *Straw-headed Bulbul*), a moderate impact on certain species (for example *Tawny-breasted Parrotfinches*, and *Java Sparrows* and *Hill Mynas*), which may eventually threaten populations, a lesser impact on many species which are still common (for instance most *munias*) and a totally unknown but possibly significant impact on lesser-known forest species (such as *Orange-headed Thrush*, *Fire-tufted Barbet*, *Sumatran White-crested Laughingthrush* [*Garrulax leucolophus bicolor*], *Black-naped Oriole*, *leafbirds* and the *Orange-spotted Bulbul*)."

If anything, we believe that Nash was understating the enormity of Indonesia's domestic bird trade and its probable horrendous impact on the bird populations especially of Java, Bali and much of Sumatra. For example, when KDB first visited Java in 1981, local ornithologists cautioned him not to expect to see many birds in the open countryside or mosaic of secondary woodlands and farmland. Notwithstanding, birds such as *Javan Kingfisher*, *Sooty-headed Bulbul*, *Long-tailed Shrike*, and some *munias* could be regularly observed when traveling by road

through West Java even along Indonesia's first motorway the Jagorawi. In 1996, after an absence of four years, KDB returned to West Java and this time during travels through the countryside he could not but help notice the almost complete absence of birds.

Even within the relatively protected Bogor Botanical Gardens the once common *Sooty-headed Bulbul* had become hard to find. Impressions of a recent crash in West Javan bird populations were further endorsed by a visit to a small hill-forest reserve above Carita. There, despite an intensive search, notably few bulbuls were encountered until about midday when three trappers were met along the trail unconcernedly walking into the reserve with their traps and *Black-crested Bulbuls* attached as captive lures.

Now, due to the avian flu, most people feel apprehensive about being around any type of birds, which has drastically decreased the highly destructive demand for wild-caught birds. Currently this flu virus is spread only among birds or to humans handling dead and infected birds. There is much fear, however, about the virus possibly mutating in a manner that allows passage directly from birds to humans and among humans. This fear may indeed help protect many wild bird species throughout Indonesia and other countries.

During this time when Javanese are avoiding birds, hopefully the previously socially encouraged behaviours of trapping, selling, buying, keeping and irresponsibly releasing wild-caught birds can become socially unacceptable. This could change the desire to seeing birds in cages to seeing them flying free in their natural habitat. Such a change could be difficult, but certainly it is a great opportunity for us to help conserve the diversity of birds frequently appearing in the wild-bird trade. Additionally, to help keep the native birds flying free, a strong captive breeding programme could be developed. This might be as successful with some species as it has been for the highly prized *Zebra (Peaceful) Dove*, and perhaps provide needed income to those who previously caught and/or sold wild birds.

Changing the socially accepted behaviour of having wild-caught caged birds to keeping only hand-raised birds may not be hopelessly difficult. As noted earlier, Mrs. Suharto alone apparently increased significantly the desire by Indonesians to possess caged wild birds. This suggests that a significant but opposite gesture by another prominent public figure or by a potentially fatal disease could engender a social value for conservation and preservation of birds in the wild. Hence, taking advantage of this opportunity to help stop the trading in wild-caught birds could, at the very least, help conserve what is left of the Indonesian avifauna.

#### Literature Cited

Anonymous. (2005) "Jakarta confirms bird flu deaths", BBC News, <http://news.bbc.co.uk/1/hi/world/asia-pacific/4698863.stm>

- Anonymous, (February 26, 2006). "Bird flu and bird markets: Jakarta, Indonesia". <http://www.planetmole.org/06-02/bird-flu-and-bird-markets-jakarta-indonesia.html>
- Andrew, P. (1992) *The birds of Indonesia. A checklist (Peters' sequence). Kukila Checklist no. 1. Jakarta. Indonesian Ornithological Society.*
- Brotoisworo, E. and J. Iskander. (1984). *Problems of bird protection in Indonesia: a case study on Java. 10<sup>th</sup> Asian Continental Conference, Sri Lanka.*
- Collar, N. J., Crosby, M. J., and A. J. Stattersfield. (1995). *Birds to Watch 2. The World List of Threatened Birds. Cambridge. Birdlife International.*
- Dimitrov, Dimitar L. (4 June 2006), "Jakarta". <http://www.bookrags.com/history/worldhistory/jakarta-ema-03.html>
- Mason, M. ( May 31,2006). *Bird flu explodes in Indonesia, one death every 2 ½ days in May.*  
[http://bodyandhealth.canada.com/channel\\_health\\_news\\_details.asp](http://bodyandhealth.canada.com/channel_health_news_details.asp)
- Meyburg, B. U., van Balen, S., Thiollay, J.-M. and R. D. Chancellor. (1989). "Observations on the Javan Hawk Eagle *Spizaetus bartelsi*", Pp. 279-299 in B.-U. Meyburg and R. D. Chancellor, eds. "Raptors in the Modern World. Berlin and Paris " " World Working Group on Birds of Prey and Owls. "
- Morrison, A.(1980). *A note on Javanese aviculture. Avicul. Mag. 86: 108-110.*
- Nash, S. V. (1993). *Going for a song: the trade in SE Asian non-CITES birds. Cambridge. Traffic.*
- Nash, S. V. Date unknown. *Pramuka - The Animal Market from Hell.* <http://www.ippl.org/ippl-alert-pramuka.html.bak>.
- Round, P. D. (1990). *Bangkok bird club survey of the bird and mammal trade in the Bangkok weekend market. Nat. Hist. Bull. Siam Soc. 38: 1-43.*
- Salzberg, S, Ghedin E. and Spiro D.( 2005). *Shared data are key to beating threat from flu. Nature 440:605.*
- TRAFFIC Southeast Asia. (1993). *Wildlife trade between the southern Lao PDR provinces of Champasak, Sekong and Attapeu and Thailand, Cambodia and Viet Nam. TRAFFIC Southeast Asia Field Report No. 3.*
- Whitten, T., Soeriaatmadja, R. E., & S. A. Afiff. (1996). *The Ecology of Java and Bali. Singapore. Periplus Editions.*

## Appendix A

### Non-passerines

1. Black-shouldered Kite	<i>Elanus caeruleus</i>	Ba,Bo,J,Sl,Sm,NG
2. Javan Hawk-Eagle	<i>Spizaetus bartelsi</i>	<b>Endemic to J</b>
3. Brown Quail	<i>Coturnix ypsilophora</i>	LS,NG,AU
4. Green Junglefowl	<i>Gallus varius</i>	Endemic to J,Ba,LS
5. Masked Lapwing	<i>Vanellus miles</i>	LS,NG,AU
6. Northern Lapwing	<i>Vanellus vanellus</i>	Winters in SE Asia
7. Common Wood-Pigeon	<i>Columba palumbus</i>	Palaearctic
8. Ashy Wood-Pigeon	<i>Columba pulchricollis</i>	India, n. SE Asia
9. Spotted Dove	<i>Streptopelia chinensis</i>	GS
10. Eurasian Collared Dove	<i>Streptopelia decaocto</i>	S. Asia to w. Europe
11. White-faced Cuckoo-Dove	<i>Turacoena manadensis</i>	Endemic to SI
12. Namaqua Dove	<i>Oena capensis</i>	Africa
13. Emerald Dove	<i>Chalcophaps indica</i>	Ba,Bo,J,Sl,Sm,NG,AU
14. Diamond Dove	<i>Geopelia cuneata</i>	Endemic to AU
15. Zebra Dove	<i>Geopelia striata</i>	Ba,Bo(intro.),J,Sl,Sm
16. Bar-shouldered Dove	<i>Geopelia humeralis</i>	NG,AU
17. Pink-necked Pigeon	<i>Treron vernans</i>	Ba,Bo,J,Sl,Sm,LS
18. Rufescent Imperial Pigeon	<i>Ducula chalconota</i>	Endemic to NG
19. Pinon Imperial Pigeon	<i>Ducula pinon</i>	Endemic to NG
20. Moluccan King-Parrot	<i>Alisterus amboinensis</i>	SI,M,NG
21. Budgerigar	<i>Melopsittacus undulatus</i>	Endemic to AU
22. African Grey Parrot	<i>Psittacus erithacus</i>	Africa
23. Red-headed Lovebird	<i>Agapornis pullarius</i>	Africa

24. Large Sulawesi Hanging-Parrot	<i>Loriculus stigmatus</i>	Endemic to SI
25. Seram (Salmon-crested) Cockatoo	<i>Cacatua moluccensis</i>	<b>Endemic to Seram, Haruku and Ambon</b>
26. Black Lory	<i>Chalcopsitta atra</i>	Endemic to NG
27. Red Lory	<i>Eos bornea</i>	Endemic to M
28. Yellow-and-green Lorikeet	<i>Trichoglossus flavoviridis</i>	Endemic to SI
29. Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	LS,M,NG
30. Chestnut-winged Cuckoo	<i>Clamator coromandus</i>	Winters in Bo,J,SI,Sm
31. Large Hawk-Cuckoo	<i>Cuculus sparveroides</i>	Bo,Sm,winters in Ba,J,SI
32. Pallid Cuckoo	<i>Cuculus pallidus</i>	AU,winters in LS,NG
33. Banded Bay Cuckoo	<i>Cacomantis sonneratii</i>	Bo,J,Sm
34. Rusty-breasted Cuckoo	<i>Cacomantis sepulchralis</i>	Ba,Bo,J,SI,Sm,LS,M
35. Red-billed Malkoha	<i>Phaenicophaeus javanicus</i>	Bo,J,Sm
36. Chestnut-breasted Malkoha	<i>Phaenicophaeus curvirostris</i>	Ba,Bo,J,Sm
37. Wreathed Hornbill	<i>Aceros undulatus</i>	Ba,Bo,J,Sm
38. Fire-tufted Barbet	<i>Psilipogon pyrolophus</i>	Sm
39. Orange-fronted Barbet	<i>Megalaima armillaris</i>	Endemic to J,Ba
40. Laced Woodpecker	<i>Picus vittatus</i>	Ba,J,Sm
41. Greater Flameback	<i>Chrysocolaptes lucidus</i>	Ba,Bo,J,Sm

Identified only to genus, but different species than above:

42. small kestrel	<i>Falco</i> spp.
43. lorikeet	<i>Trichoglossus</i> spp.
44. Amazon parrot	<i>Amazona</i> spp.

**Passerines**

1. Hooded Pitta	<i>Pitta sordida</i>	Bo,J,SI,Sm,GS,NG
2. Banded Pitta	<i>Pitta guajana</i>	Ba,Bo,J
3. Mongolian Lark	<i>Melanocorypha mongolica</i>	N Asia
4. Australasian Bushlark	<i>Mirafra javanica</i>	Ba,Bo,J,SI,NG,AU
5. Straw-headed Bulbul	<i>Pycnonotus zeylanicus</i>	Bo,J,Sm
6. Black-headed Bulbul	<i>Pycnonotus atriceps</i>	Ba,Bo,J,Sm
7. Black-crested Bulbul	<i>Pycnonotus melanicterus dispar</i>	Ba,J,Sm
8. Scaly-breasted Bulbul	<i>Pycnonotus squamatus</i>	Bo,J,Sm
9. Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	Bo,J,SI,Sm
10. Orange-spotted Bulbul	<i>Pycnonotus bimaculatus</i>	Endemic to Ba,J,Sm
11. Yellow-vented Bulbul	<i>Pycnonotus goiavier</i>	Ba,Bo,J,SI,Sm
12. Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	<b>Sm(intro)<sup>+</sup>,S &amp; SE Asia</b>
13. Light-vented Bulbul	<i>Pycnonotus sinensis</i>	S Asia
14. Sunda Streaked Bulbul	<i>Hypsipetes virescens</i>	Endemic to J, Sm
15. Pied Triller	<i>Lalage nigra</i>	GS
16. Fiery Minivet	<i>Pericrocotus igneu</i>	Bo,Sm
17. Common Iora	<i>Aegithina tiphia</i>	Ba,Bo,J,Sm
18. Greater Leafbird	<i>Chloropsis sonnerati</i>	Ba,Bo,J,Sm
19. Blue-winged Leafbird	<i>Chloropsis cochinchinensis</i>	Bo,J,Sm
20. Golden-fronted Leafbird	<i>Chloropsis aurifrons</i>	Sm
21. Orange-bellied Leafbird	<i>Chloropsis hardwickii</i>	S & SE Asia
22. Blue-masked Leafbird	<i>Chloropsis venusta</i>	Endemic to Sm

23. Tiger Shrike	<i>Lanius tigrinus</i>	Winters in Ba,Bo,J,Sm
24. Long-tailed Shrike	<i>Lanus schach</i>	Ba,Bo,J,Sm
25. White-browed Shortwing	<i>Brachypteryx montana</i>	Bo,J,Sm,LS
26. Siberian Blue Robin	<i>Luscinia cyane</i>	Winters in Bo,Sm
27. Magpie Robin	<i>Copsychus saularis</i>	Ba,Bo,J,Sm,LS
28. White-rumped Shama	<i>Copsychus malabaricus</i>	Bo,J,Sm
29. Pied Bushchat	<i>Saxicola caprata</i>	Ba,Bo,J,SI,LS
30. Chestnut-capped Thrush	<i>Zoothera interpres</i>	Bo,J,Sm,LS
31. Orange-headed Thrush	<i>Zoothera citrina</i>	Ba,Bo,J,Sm
32. Scaly Thrush Eurasia,	<i>Zoothera dauma</i>	Ba,J,Sm,LS,NG,AU
33. Eye-browed Thrush	<i>Turdus obscurus</i>	Winters in Ba,Bo,J,Sm
34. Chestnut-backed Scimitar-Babbler	<i>Pomatorhinus montanus</i>	Bo,J,Sm
35. White-breasted Babbler	<i>Stachyris grammiceps</i>	Endemic to J
36. White-bibbed Babbler	<i>Stachyris thoracica</i>	Endemic to J
37. White-crested Laughingthrush	<i>Garrulax leucolophus</i>	Sm, S & SE Asia
38. Black-throated Laughingthrush	<i>Garrulax chinensis</i>	S & SE Asia
39. Rufous-vented Laughingthrush	<i>Garrulax delesserti</i>	India
40. Black Laughingthrush	<i>Garrulax lugubris calvus</i>	Bo,Sm
41. Sunda Laughingthrush	<i>Garrulax palliabes</i>	Endemic to Bo,Sm
42. Chestnut-capped Laughingthrush	<i>Garrulax mitratus</i>	Bo,Sm,S & SE Asia
43. Hwamei	<i>Garrulax canorus</i>	S & SE Asia
44. Rufous-breasted Laughingthrush	<i>Garrulax cachinnans</i>	India
45. Chestnut-crowned Laughingthrush	<i>Garrulax erythrocephalus</i>	S & SE Asia
46. Silver-eared Mesia	<i>Leiothrix argentauris</i>	Sm,S & SE Asia
47. Red-billed Leiothrix	<i>Leiothrix lutea</i>	S Asia
48. Golden-headed Cisticola	<i>Cisticola exilis</i>	Ba,Bo,J,SI,Sm,LS,AU
49. Bar-winged Prinia	<i>Prinia familiaris</i>	Endemic to Ba,J,Sm
50. Common Tailorbird	<i>Orthotomus sutorius</i>	J,S & SE Asia
51. Ashy Tailorbird	<i>Orthotomus ruficeps</i>	Bo,J,Sm
52. Sulphur-breasted Leaf Warbler	<i>Phylloscopus ricketti</i>	S & SE Asia
53. Mountain Leaf Warbler	<i>Phylloscopus trivirgatus</i>	Ba,Bo,J,Sm
54. Sunda Warbler	<i>Seicercus grammiceps</i>	Endemic to Ba,J,Sm
55. Indigo Flycatcher	<i>Eumyias indigo</i>	Bo,J,Sm
56. Blue-fronted Flycatcher	<i>Cyornis hoevelli</i>	Endemic to SI
57. Hill Blue-Flycatcher	<i>Cyornis banyumas</i>	Bo,J, S & SE Asia
58. White-throated Fantail	<i>Rhipidura albicollis</i>	Bo,Sm,S & SE Asia
59. Orange-bellied Flowerpecker	<i>Dicaeum trignostigma</i>	GS
60. Ruby-cheeked Sunbird	<i>Anthreptes singalensis</i>	Bo,J,Sm
61. Crimson Sunbird	<i>Aethopyga siparaja</i>	Bo,J,Sm,S & SE Asia
62. Oriental White-eye	<i>Zosterops palpebrosus</i>	Ba,Bo,J,Sm,LS
63. Streak-headed Dark-Eye	<i>Lophozosterops squamiceps</i>	Endemic to SI
64. Asian Golden Weaver	<i>Ploceus hypoxanthus</i>	J,Sm
65. Red Avadavat	<i>Amandava amandava</i>	Ba,Bo(intro),J,Sm <sup>+</sup>
66. Zebra Finch	<i>Taeniopygia guttata</i>	LS,AU
67. Tawny-breasted Parrotfinch	<i>Erythrura hyperythra</i>	Bo,J,S & SE Asia
68. Pin-tailed Parrotfinch	<i>Erythrura prasina</i>	Bo,J,Sm
69. Black-faced Munia	<i>Lonchura molucca</i>	SI,M,LS
70. Scaly-breasted Munia	<i>Lonchura punctulata</i>	Ba,Bo(intro.),J,SI,Sm
71. White-bellied Munia	<i>Lonchura leucogastra</i>	Bo,Sm,S & SE Asia



72. Blue-capped Cordonbleu	<i>Uraeginthus cyanocephalus</i>	Africa
73. Black-faced Waxbill	<i>Estrilda nigriloris</i>	Africa
74. Locustfinch	<i>Ortygospiza locustella</i>	Africa
75. Green-backed Twinspot	<i>Mandingoa nitidula</i>	Africa
76. Pink-throated Twinspot	<i>Hypargos margaritatus</i>	Africa
77. Asian Glossy Starling	<i>Aplonis panayensis</i>	SI,GS
78. Red-billed Starling	<i>Sturnus sericeus</i>	S Asia, China
79. Chestnut-cheeked Starling	<i>Sturnus philippensis</i>	Winters in Bo
80. White-shouldered Starling	<i>Sturnus sinensis</i>	Winters in Bo
81. Asian Pied Starling	<i>Sturnus contra</i>	Ba,Bo(intro.),J,Sm
82. Black-collared Starling	<i>Sturnus nigricollis</i>	S & SE Asia
83. Common Myna	<i>Acridotheres tristis</i>	S Asia & GS(intro.)
84. Jungle Myna	<i>Acridotheres fuscus</i>	S & SE Asia
85. Javan Myna	<i>Acridotheres javanicus</i>	Ba,J,Sm(intro.),SI
86. Crested Myna	<i>Acridotheres cristatellus</i>	Bo(intro.),S & SE Asia
87. Golden Myna	<i>Mino anais</i>	NG
88. Coledo	<i>Sarcops calvus</i>	Philippines
89. Hill Myna	<i>Gracula religiosa</i>	Ba,Bo,J,Sm
90. Superb Starling	<i>Lamprotonis superbus</i>	Africa
91. Black-naped Oriole	<i>Oriolus chinensis</i>	Ba,Bo,J,Sm,SI
92. Asian Fairy-Bluebird	<i>Irena puella</i>	Bo,J,Sm
93. Black Drongo	<i>Dicrurus macrocercus</i>	Ba,J,Sm
94. Spangled Drongo	<i>Dicrurus bracteatus</i>	SI,LS,NG,AU
95. Green Magpie <i>Cissa chinensis</i>		<b>Bo,Sm,S &amp; SE Asia</b>
96. Bornean Treepie	<i>Dendrocitta cinerascens</i>	Endemic to Bo
97. Racket-tailed Treepie	<i>Crypsirina temia</i>	Ba, <b>Bo</b> <sup>+</sup> ,J, <b>Sm</b> ,SE Asia
98. White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	SI,GS,NG,AU
99. Pied Currawongs	<i>Strepera graculina</i>	Endemic to AU
100. Bearded Reedling	<i>Panurus biarmicus</i>	Palaearctic
101. Great Tit	<i>Parus major</i>	Ba,Bo,J,Sm
102. Bohemian Waxwing	<i>Bombycilla garrulus</i>	Eurasia
103. Pin-tailed Whydah	<i>Vidua macroura</i>	Africa
104. Australasian Pipit	<i>Anthus novaeseelandiae</i>	Ba,Bo,J,SI,Sm
105. Yellow-fronted Canary	<i>Serinus mozambicus</i>	Africa
106. Yellow-breasted Greenfinch	<i>Carduelis spinoides</i>	S Asia

Identified only to genus, but different species than above:

107. laughingthrush	<i>Garrulax</i> spp
108. white-eye	<i>Zosterops</i> spp
109. starling	<i>Sturnus</i> spp
110. bishop bird	<i>Euplectes</i> spp

**Note:** <sup>+</sup>—Extirpated; **bold**—rare, threatened, or vulnerable; Ba—Bali; Bo—Borneo; J—Java; Sm—Sumatra; SI—Sulawesie; LS—Lesser Sundas; GS—Greater Sundas; NG—New Guinea; AU—Australia.