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IN THE MARKET FOR EXTINCTION

An inventory of Jakarta's bird markets

*Serene C.L. Chng, James A. Eaton, Kanitha Krishnasamy, Chris R. Shepherd
and Vincent Nijman*





TRAFFIC REPORT

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Front cover photograph: Rows of cages at Pramuka market.
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Rows of cages at Pramuka market.

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A White-rumped Shama, one of the popular songbirds for sale in the markets

TABLE OF CONTENTS

Acknowledgements	iii
Executive Summary	iv
Recommendations	v
Introduction	1
Methods	4
Results	5
Discussions and Observations	10
Conclusion	19
Recommendations	20
References	21
Appendices	23

ABBREVIATIONS AND ACRONYMS

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
IDR	Indonesian Rupiah
IUCN	International Union for Conservation of Nature
LIPI	Lembaga Ilmu Pengetahuan Indonesia (Indonesian Institute of Sciences: Indonesia's CITES Scientific Authority)
PHKA	Perlindungan Hutan dan Konservasi Alam (Directorate General of Forest Protection and Nature Conservation: Indonesia's CITES Management Authority)
USD	US Dollar

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EXECUTIVE SUMMARY

With the second highest number of threatened bird species in the world (131) and the highest number in Asia, Indonesia is a global conservation priority. Unfortunately, many of these species are threatened by illegal and unsustainable wildlife trade. Illegal harvest and trade in birds is widespread in Indonesia, with lax enforcement enabling markets to persist, some of them huge in size and scale, whose traders openly sell protected and illegally-sourced birds, with little or no fear of legal actions being taken against them.

This paper illustrates the large scale of the trade, with 19 036 birds of 206 species being counted during the survey carried out over a three day period in the three largest bird markets in Jakarta. Of these, 18 641 birds (98% of total volume of birds) of 184 species were native to Indonesia and harvested outside of the national harvest quota system or in direct violation of the *Conservation Act (No. 5) of 1990* that protects selected species. Of the native species observed, 3884 birds (20% of total volume of birds) of 51 species are endemic to Indonesia and eight species are assessed as threatened on the IUCN Red List. The high levels of trade would likely lead to a reassessment of the threat status of a number of species, although there is a paucity of information on the status of most species in the wild in Indonesia.

While it is recognized that a number of Indonesian species are being bred in captivity for local sale, it is unclear where these operations are obtaining parent stock and if they are effectively reducing or instead leading to an increase in illegal and unsustainable capture from the wild. Commercial captive breeding of native species is not currently proposed as a solution to the bird conservation crisis, at least until effective regulation of such operations can be demonstrated.

While long-term conservation strategies, such as reduction of demand for wild birds in Indonesia, are essential to complement effective enforcement, ensuring that illegally acquired and legally protected species are not captured and traded remains an urgent priority. The laws for native species generally afford good protection, but monitoring and enforcement in the markets is lacking.

As long as these markets exist in their present form illegal trade will continue, undermining bird conservation in Indonesia and further threatening the country's avifauna with extinction. Corruption further undermines effective enforcement and needs to be eliminated. We urge the new Indonesian government, which is starting to make significant steps forward in conservation, to take pride in their rich and unique wildlife and send a strong message nationally and internationally by taking decisive action against these illegal markets. To aid the conservation of bird species in Indonesia, the following recommendations are made.

RECOMMENDATIONS

Legislation

For native species, the protected species list in the *Act of the Republic of Indonesia No.5 of 1990 concerning Conservation of Living Resources and their Ecosystems*, widely known as the *Conservation Act (No. 5) of 1990* needs reviewing and updating urgently, to reflect recent changes in species of conservation concern, as well as recent taxonomic changes linked to range and therefore potentially resulting in conservation concerns. The Government of Indonesia is encouraged to assess the species that may be in decline due to trade and provide enhanced legal protection for those deemed to be threatened. In some cases, where former subspecies have newly been recognized as distinct species, listing the whole genus would ensure better legislative protection and also provide protection in the future if any new splits occur.

If quotas for certain species are needed, research should be carried out first to determine what off-take would be sustainable, and mechanisms put in place to ensure quotas are not flouted and species without quotas are not traded.

The Indonesian government is urged to review and update its national legislation to provide sufficient protection to non-native species traded within the country.

Enforcement and Regulation

The Government of Indonesia is encouraged to take action against individuals found in violation of the law through increased monitoring of the markets along with conservation partners. Due to the extreme numbers of birds in trade, a staggered approach may prove most effective, focusing first on species legally protected by law and prosecuting violators. A second phase involving the issuance of warnings to dealers trading in species not protected by law but that have a zero harvest quota should be considered, followed-up by prosecuting offenders who ignore initial warnings.

Proper licensing systems of traders should be examined and considered. Ultimately, if the bird markets continue to allow the illegal trade in species, especially in large volumes, they should be closed down, thereby eliminating opportunities for continuous illegal capture of birds and facilitating persistent and possibly increasing demand.

Work in conjunction with the government should be carried out for a clearer understanding of species currently being permitted to be bred in captivity. Combined with information from continuous market monitoring and examination of systems regulating the acquisition of stock, these data can support the effort to determine the impact on species in the wild.

Monitoring

TRAFFIC, along with locally-based NGOs and conservation partners and law enforcement agencies to continue to monitor the wildlife markets and strengthen co-ordination with law enforcement agencies in order to provide support to law enforcement and identify any emerging issues.

Regular market monitoring of indicator species, based on findings from this study on species facing high conservation threats, is recommended to calculate turnover rates in the market and therefore extrapolate the number of birds sold per year to enable determination on the extent of threat for these species and enable the establishment of conservation measures.

Awareness-raising

The deeply-embedded culture of bird-keeping will require more than just enforcement and regulation to comprehensively eliminate the threat it poses to wild bird populations in Indonesia. A key element that would improve the conservation status of Indonesian birds is consumer education and in the long-term, consumer behaviour change.

INTRODUCTION

Southeast Asia is the epicentre of wildlife trade (Nijman, 2010), with Indonesia widely recognized as a country with extremely high levels of illegal and unsustainable wildlife trade (Shepherd, 2006; Stengel *et al.*, 2011; Nijman *et al.*, 2012; Nellemann *et al.*, 2014). Indonesia's live bird trade is remarkable because of the vast scale and tremendous volumes involved, and due to the immense threat the trade poses to the conservation of an ever-growing list of species (Nash, 1993; Shepherd, 2006; Metz, 2007; Shepherd, 2010). The situation is particularly dire owing to the high diversity and levels of endemism across the Indonesian archipelago (BirdLife International, 2001; Jetz *et al.*, 2014). Indonesia currently has more species of birds assessed as threatened with extinction than any other country in Asia, and is second only to Brazil, globally, with 131 threatened bird species (Brazil has 164) (IUCN Red List, 2014). While Indonesian bird species are in demand globally, the domestic demand is greater. Due to the strong Javanese culture of bird-keeping (Soehartono and Mardiasuti, 2002; Jepson and Ladle, 2005), this demand is especially noticeable on the island of Java. The domestic bird trade is not able to meet the demand for some species of birds and therefore Indonesia has a history as a significant importer of birds from other parts of the world (Soehartono and Mardiasuti, 2002; Shepherd *et al.*, 2004).

Lax enforcement and corruption are at the root of the illegal wildlife trade in Indonesia (Lee *et al.*, 2005). While Indonesia has adequate national legislation to regulate trade in native species, lack of enforcement of this legislation has allowed for some of the largest open wildlife markets in Asia, if not the world, to flourish. Many of the species openly displayed for sale on a daily basis have been illegally harvested and/or are totally protected by law.

Three major wildlife markets – Barito, Jatinegara and Pramuka – located in the nation's capital, Jakarta, are considered to be among the largest, if not the largest, in Southeast Asia (Shepherd, 2012; UNODC, 2013). Trade, legal or otherwise, takes place openly in all three of these markets (Saraswati, 2002; Shepherd, 2012). Barito comprises a row of approximately 30 specialized bird and pet shops situated on one side of the road (Jalan Barito), in central Jakarta. Additionally, a small number of mobile sellers bring their cages daily to Barito. Jatinegara comprises a series of approximately 40 permanent bird shops along both sides of a side street (Jalan Kemuning); in addition vendors display portable bird kiosks adjacent and in front of the permanent shops as well as on the curb of Jalan Matramanan Raya. Pramuka, in operation since 1976 (Basuni and Setiyani, 1989), comprises a permanent four-storey building with over a hundred shops occupied almost exclusively by bird traders and traders in avicultural supplies such as bird food and cages, as well as some other permanent bird and avicultural shops in buildings surrounding the market.

Few surveys have been carried out in the past in these markets. In 1987, a comprehensive survey of Pramuka was done (Basuni and Setiyani, 1989) and from 1991 to 1993, TRAFFIC surveyed numerous bird markets across Southeast Asia including Barito and Pramuka markets, focusing on non-CITES listed birds (Nash, 1993). More recently, surveys of these three markets have focused on particular groups of species such as laughingthrushes (*Garrulax* spp.) (Shepherd, 2007; Shepherd, 2010), parrots, raptors and protected birds (Profauna, 2009), owls (Shepherd, 2012; Nijman and Nekaris, unpubl. data) and mynas (Shepherd *et al.*, 2015). However, there is a paucity of information on the current scale of trade in these markets, the species present and their related volumes, and the legal status of these species in trade. Obtaining such current baseline data would enable a meaningful evaluation of conservation efforts and impacts, emerging trends and species of conservation concern, and hence highlight the need for this comprehensive inventory of the three major markets.

This report provides insight into the current status of the bird trade in Jakarta, highlights levels of illegal trade and trade in threatened species and makes recommendations to counter this problem

and thus reduce the conservation threats facing bird species in Indonesia. This study is significant and timely, following the recent 2014 IUCN Red List review of bird species by BirdLife International revealing that “more than a tenth of bird species have been flying under the conservation radar” following new taxonomic revisions resulting in many species not being recognized as threatened until now. Southeast Asia and Java in particular were highlighted as areas of concern (Fowle, 2014).

Such comprehensive surveys are essential not only to provide baseline data for long-term monitoring and evaluation, but also to guide further conservation efforts, inform national and international policy interventions and provide current data for advocacy and awareness-raising actions.

Legislation review

Indonesia and CITES

Indonesia has been a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1979, making it one of the first countries in Southeast Asia to commit to implementing and enforcing this Convention. The CITES Management Authority in Indonesia is the Ministry of Forestry’s Department of Forest Protection and Nature Conservation (PHKA), while the Scientific Authority is the Indonesian Institute of Sciences (LIPI). In 2004, Indonesia was ranked as having Category 1 CITES-implementing legislation under the CITES National Legislation Project (CITES Resolution Conf. 8.4 (Rev. CoP15)), which infers that Indonesia’s national laws allow for adequate and efficient implementation and enforcement of CITES. However, Indonesia’s legislation does not provide for effective implementation of the Convention as authorities cannot effectively take action on the trade of non-native birds within the country, including the trade in species governed by CITES – this is detailed below.

Indonesian wildlife laws covering import/export, domestic trade, collection from the wild, breeding

Indonesia has several CITES-implementing legislations, and the key ones concerning wildlife trade are described here. Indonesia’s national wildlife legislation, relating to the protection and regulated harvest and trade of native species, is adequate, although the list of protected species should be reviewed and updated. *The Act of the Republic of Indonesia No.5 of 1990 concerning Conservation of Living Resources and their Ecosystems*, widely known as *the Conservation Act (No. 5) of 1990* is the principal legislation regulating wildlife trade in Indonesia. This list has not been updated since it was first gazetted, and therefore newly-recognized species or species that have since become of conservation concern are not on the list. Chapter V Article 21 states that protected species are not allowed to be captured, kept, destroyed, transported within or out of Indonesia, or traded. Violation of this can result in imprisonment for a maximum of five years or a fine of up to IDR100 million (USD8584). Protected species are listed under the Government Regulation No. 7, 1999, “Concerning the Preservation of Flora and Fauna”.

This legislation, however, is not adequate for the protection of species not native to Indonesia. In reality, Indonesia’s law does not allow for the effective implementation or enforcement of CITES. This is due to the omission of CITES-listed non-native species from the protected species list, which means that these are not protected from trade and possession within the country. Due to this, once any CITES-prohibited specimens are smuggled into the country, authorities are not mandated to take enforcement action, and traders are virtually free to possess and sell these animals at will.

The Government Regulation No. 8, 1999, “Concerning the utilization of wild plants and animal species”, Chapter V states that only unprotected wildlife can be traded, traders must submit trade

records annually and all trade of plants and animals must be accompanied by legal documents. There is a quota system in place for the collection and trade of unprotected animals; quotas are set yearly by LIPI. Captive-bred animals are also subject to regulations under article 10, which defines that only second and subsequent generations of captive-bred protected animals may be traded. Harvest and export quotas are set annually for native species, except for protected species or species listed under CITES Appendix I, which are prohibited from being harvested at all (BirdLife International, 2001).

However, since 2002, no harvest or export quota has been allocated for birds, other than the capture of small quantities of a few select species for use as breeding stock for commercial breeding operations (Shepherd, 2006; Profauna, 2008), thereby making any capture or trade of any wild birds in Indonesia illegal, regardless of whether the species is listed as protected or not.

METHODS

Surveys were carried out by six people on 21st-23rd July 2014 in the three largest bird markets in Jakarta, the capital city of Indonesia – Pramuka, Jatinegara and Barito. Two of the authors have made regular visits to all three markets in the past, and are familiar with their layout, characteristics, and the trade dynamics within and between the markets. In each market, a full inventory was carried out, with individuals of every species counted and where possible recorded to a subspecies level.

Price data for select species were obtained by interviewing dealers or observing prices openly advertised. The first given price was recorded, without any bargaining. Priority species for which price information was collected included those known to be of conservation concern and/or known to be important species in trade such as laughingthrushes *Garrulax* spp, Bali Myna *Leucopsar rothschildi*, Black-winged Myna *Acridotheres melanopterus*, Hill Myna *Gracula religiosa*, Straw-headed Bulbul *Pycnonotus zeylanicus* and Tanimbar Cockatoo *Cacatua goffiniana*. Price information for other species was obtained where the opportunity to do so arose in conversation with traders. Prices for all species were not asked so as not to arouse the suspicion of traders. As points of comparison, additional prices for a number of species traded in Pramuka were obtained from a website that gives updates of asking prices of birds in this market; prices used from this site are from 2014 (ID Bagus, 2014).

All three markets are open daily to the public, with the birds openly displayed for sale, and therefore no covert investigation or research methods were employed. Observers only counted all birds openly displayed. As traders are fully aware that at least part of their trade is illegal, photographs are not allowed to be taken in the markets and no attempts to do so were made during this survey.

Taxonomy and vernacular names follows Gill and Donsker (2014). Birds are defined to species level for the analyses in this study, except for analyses on origins for which the subspecies level is used. Individuals that could not be identified to species level were omitted from the analyses.

Prices were based on a conversion rate of IDR11 650 = USD1. Price data were collected in IDR and presented here in USD.

RESULTS

Species composition and volume

During the survey carried out in 2014, a total of 19 036 birds of 206 species were recorded from the three markets (Appendix 1). Pramuka had by far the largest volume of birds (Table 1). Despite having over 10 times as many birds as Barito and Jatinegara, the number of species present at Pramuka was under twice that of Jatinegara and thrice that of Barito.

Table 1 Number of birds present in each of the three markets

	Number of shops	Number of birds	Number of species	Mean number of birds per shop	Range of birds per shop
Pramuka	87	16 160	180	186	2 - 1177
Jatinegara	29	1 399	106	44	4 – 187
Barito	23	1 477	65	64	1 - 431

The top 10 most numerous birds observed were all species native to Indonesia, all of them also native to Java. None of these are protected under Indonesian law, and all are currently assessed as being Least Concern on the IUCN Red List (Table 2).

Table 2 The ten most numerous bird species observed in Jakarta's bird markets

Common and Scientific Name	Distribution in Indonesia ¹	Individuals	Number of shops
Oriental White-eye <i>Zosterops palpebrosus</i>	Greater Sundas	2339	37
Javan Myna <i>Acridotheres javanicus</i>	Java, Bali, Sumatra	2054	43
Zebra Dove <i>Geopelia striata</i>	Java, Sumatra, Bali	1859	30
Greater Green Leafbird <i>Chloropsis sonnerati sonnerati/zosterops</i>	Greater Sundas	1248	72
Yellow-vented Bulbul <i>Pycnonotus goiavier analis</i>	Greater Sundas	1061	43
Australasian Bushlark <i>Mirafra javanica</i>	Java, Lesser Sundas	1052	20
Asian Pied Starling <i>Gracupica contra floweri/jalla</i>	Java, Sumatra	782	58
Scaly-breasted Munia <i>Lonchura punctulata</i>	Greater and Lesser Sundas	614	6
Oriental Magpie Robin <i>Copsychus saularis muticus/pluto</i>	Greater Sundas	583	59
Sooty-headed Bulbul <i>Pycnonotus aurigaster</i>	Java and Bali	476	32

The families with the highest volume and number of species observed were Sturnidae (3465 individuals, 18 species), Zosteropidae (2886 individuals, six species), Columbidae (2349 individuals, nine species) and Pycnonotidae (2252 individuals, 16 species) (Appendix 2).

¹Lesser Sundas stretch from Lombok to Wetar, Timor and the Banda Sea islands and include Timor Leste. Maluku includes Halmahera and Morotai (north Maluku), Obi, Seram, Buru, Ambon (central Maluku), Tanimbar and Kai (south Maluku). Greater Sundas encompasses Sumatra, Java, Bali and Borneo, which also includes East Malaysia and Brunei Darussalam.

Origin and source

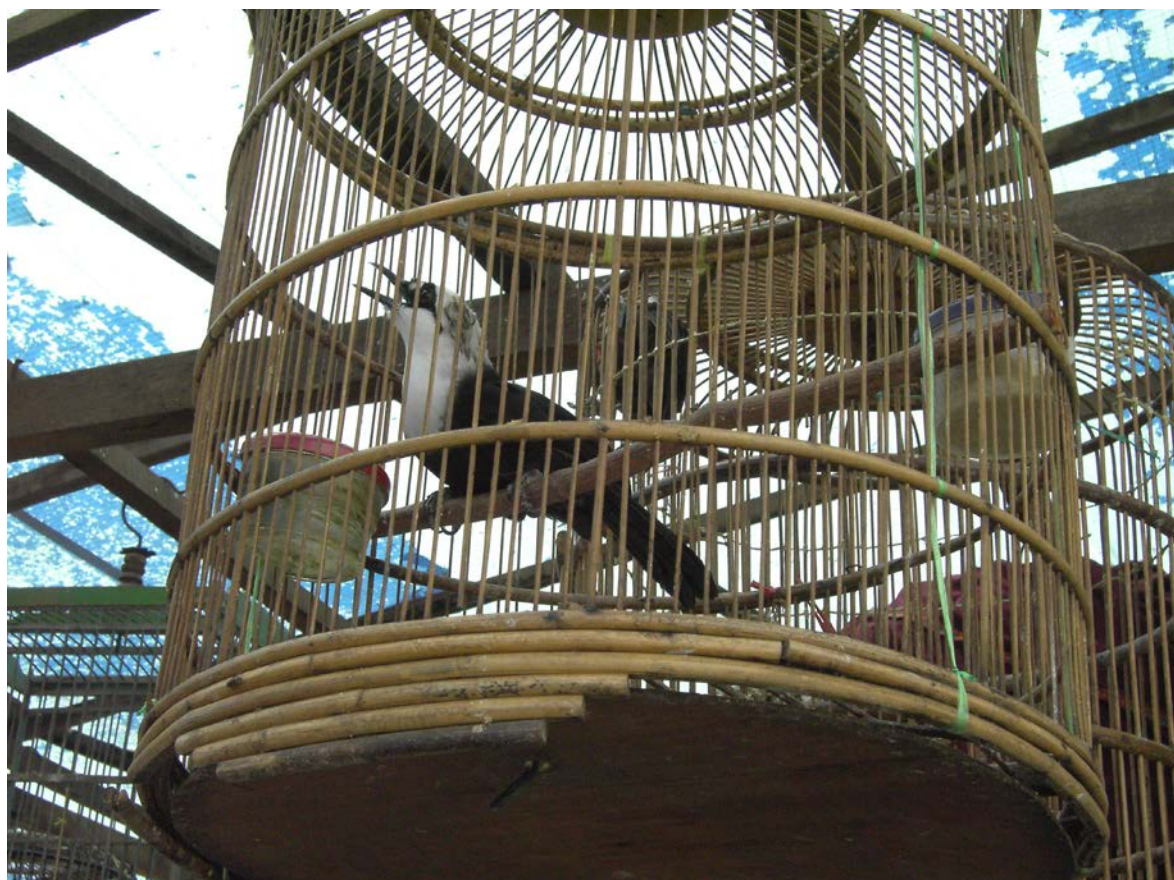
Indonesian species

The vast majority of birds observed in the markets originated from Indonesia, with a total of 18 641 birds (98% of total volume of birds) of 184 species observed, of which 3884 birds (20% of total volume of birds) of 51 species are endemic to Indonesia (Appendix 3).

Of the 184 species native to Indonesia, 22 (20% by volume - 773 out of 3884 birds) are listed as being Protected by national law Government Regulation No. 7, 1999. Eight of the native species are assessed as globally threatened on the IUCN Red List. Two were assessed as Critically Endangered (16 Bali Myna and 14 Black-winged Myna), one as Endangered (three Rufous-fronted Laughingthrush *Garrulax rufifrons*) and five as Vulnerable (345 Java Sparrow *Padda oryzivora*, 76 Sumatran Laughingthrush *Garrulax bicolor*, 22 Chattering Lory *Lorius garrulus*, nine Straw-headed Bulbul *Pycnonotus zeylanicus* and one Javan Coucal *Centropus nigrorufus*) (IUCN Red List, 2014).

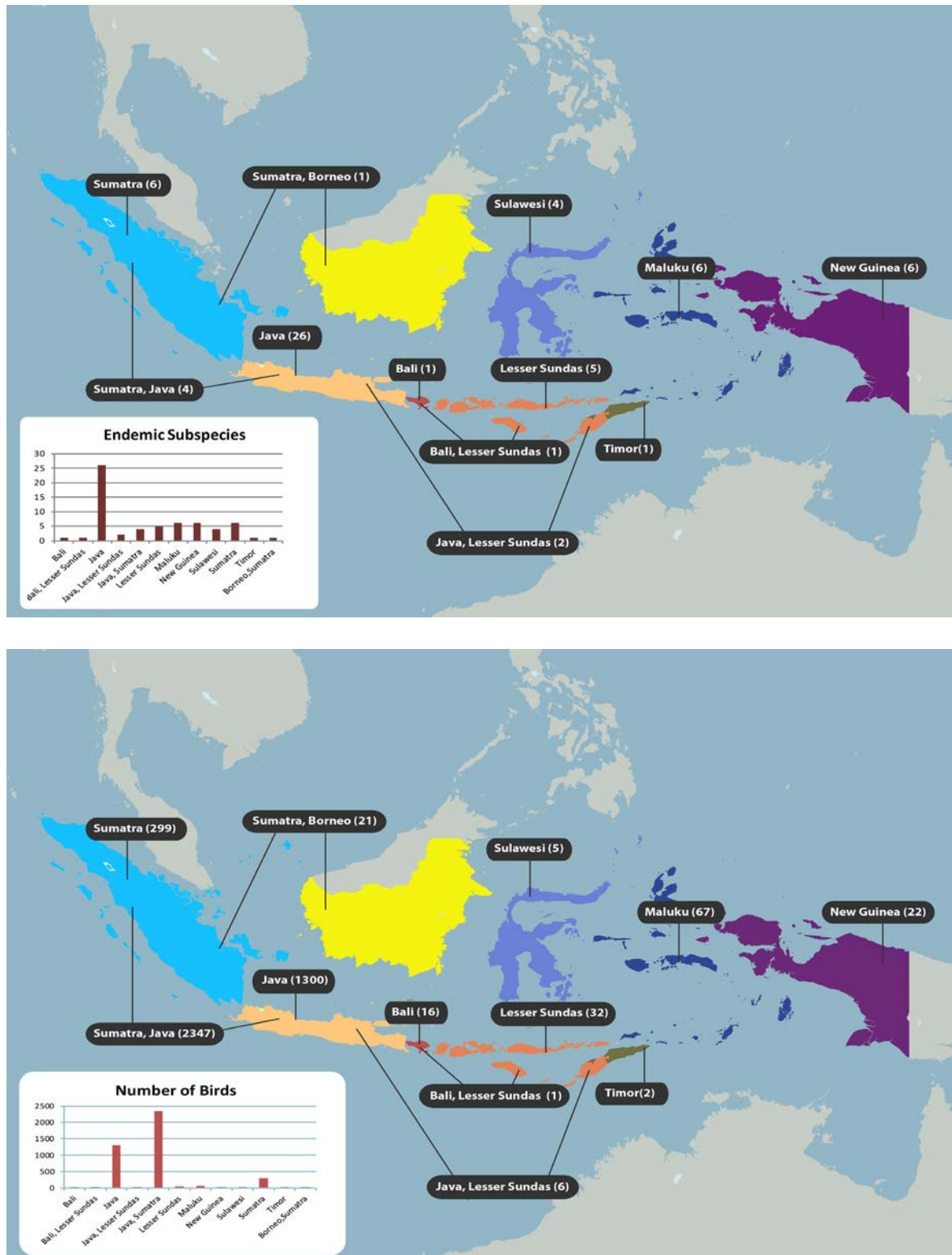
Over 90% of the species observed were native to Java and Sumatra, with significant overlaps with species occurring between the two islands. A total of 17 328 individuals from 124 species were native to Java, and out of this, 1300 birds of 26 species are found only on Java.

From these native Indonesian species, a total of 4096 birds of 57 species and subspecies were endemic to Greater Sundas, Lesser Sundas, Sulawesi and Maluku (Figure 1). A further 22 individuals of six species and subspecies recorded were endemic to the island of New Guinea (consisting of Papua New Guinea and Papua province of Indonesia).



A Sumatran Laughingthrush, one of the species seen for sale in the markets

Figure 1: Maps showing number of endemic subspecies (top) and number of birds endemic to locations in Indonesia observed during market surveys in Jakarta



The vast majority of the native birds observed were thought to be wild-caught. This deduction was based on the authors' knowledge that these species were not being bred commercially, the condition of the birds, the fear reaction of birds to humans approaching, and also by interviewing sellers who often identified the trade route that the species had been taken on from where they had been

sourced. The likely exception was the Javan subspecies *Gracupica contra jalla* of Asian Pied Starling; given the paucity of records and numbers of this race observed in the past 20 years in the wild, most of these birds seen are likely to be captive-bred. This was further supported by the fact that many of the birds of this species were newly fledged juveniles.

Other species that were likely sourced from the wild as well as being captive-bred include Java Sparrow, Zebra Dove *Geopelia striata*, Orange-headed Thrush *Geokichla citrina* (Jepson, 2008), Long-tailed Shrike *Lanius schach* and Javan Myna *Acridotheres javanicus*. The authors made this deduction due to the sheer numbers present in the market that generally do not reflect the numbers seen in the wild (Eaton, J. A. pers. obs.), and the number of young birds present.

Non-native species

Relatively few birds not native to Indonesia were observed during this study. A total of 395 birds (2% of total number observed) of 22 species were non-native (Table 3). Most of these originated from Central and East Asia, namely Mongolia and China.

Table 3 Range of non-native species observed during survey and CITES status

CITES Appendix/Range country	Number of individuals	Number of species
South America	2	2
Appendix I	2	2
Africa	3	2
Central and East Asia	210	2
South America	1	1
Appendix II	214	5
Africa	8	1
Australia	1	1
Central and East Asia	118	6
Indochina	16	2
South Asia	39	5
Not CITES-listed	179	15
Total	395	22

Interestingly, the vast majority of the non-native species were passerines of relatively low monetary value, and of low conservation threat status. Of the 22 non-native species observed, only two are listed as threatened by the IUCN Red List (Vulnerable; total of two individuals), and only seven are listed in the Appendices of CITES (216 individuals) (Table 3) (IUCN Red List, 2014). This may be due to difficulties in importing these birds, or the preferential demand for native songbirds, many of which are not threatened or protected.

Of the non-native birds recorded, Hwamei *Garrulax canorus*, Red-billed Leiothrix *Leiothrix lutea*, Knysna Turaco *Tauraco corythaix*, Blue-and-gold Macaw *Ara ararauna* and African Grey Parrot *Psittacus erithacus* are listed in CITES Appendix II, which means that any international trade requires permits. Scarlet Macaw *Ara macao* and Military Macaw *Ara militaris* are listed in CITES Appendix I, which means that international commercial trade in wild-caught animals is prohibited.

According to Indonesia's reported CITES trade data from 2004 to 2014, only African Grey Parrot, Blue-and-gold Macaw, Military Macaw and Scarlet Macaw were reported, which means that the Hwamei, Red-billed Leiothrix and Knysna Turaco recorded during the survey are likely to have been illegally brought into Indonesia without permits.

Prices

Price information from all three markets was obtained for 65 species, many opportunistically in conversation with traders. For Pramuka alone, price data were obtained for 64 species, which extrapolated to 14 368 out of the 16 160 individual birds (89%). Asking prices ranged from USD0.43 for a Scaly-breasted Munia *Lonchura punctulata* to USD4292 for a Scarlet Macaw (Appendix 4). Based on these figures, the value of just these 65 species of birds counted in the three markets over the three days is USD510 000. In Pramuka market, ten species alone represented a combined worth of approximately USD335 000 (Table 4).

Table 4 : The ten species that represented the largest potential value in Pramuka in July 2014, with a combined worth of approximately USD 335 000.

Species	Individuals	Price per bird (USD)	Value per species (USD)
Australasian Bushlark	1051	60.09	63 150.21
Asian Pied Starling	743	65.8	48 891.31
White-rumped Shama	229	210.3	48 158.80
Greater Green Leafbird	1099	43.63	47 950.36
Zebra Dove	1693	20.03	33 903.60
Javan Myna	1957	14.38	28 137.12
Hill Myna	79	300.43	23 733.91
Hwamei	98	171.67	16 824.03
Yellow-vented Bulbul	877	16.31	14 303.00
Oriental White-eye	2255	4.43	9987.81
Total	10081		33 5040.15

DISCUSSIONS AND OBSERVATIONS

Species

That almost 20 000 birds were recorded in only these three markets over three days gives a glimpse into the overwhelming scale of the bird trade in Java. It should be noted that as a one-time survey the results represent birds offered for sale in these markets only at a particular point in time, and turnover rates were therefore unable to be estimated. Judging from the fresh green pigmentation of most of the leafbirds offered for sale, for example, these individuals at least are likely to have been caught recently.

Compared to previous surveys of these markets (Basuni and Setiyani, 1989; Nash, 1993), there were fewer stalls in Pramuka and Barito markets in this survey and a similar volume of birds but a much higher number of species. Basuni and Setiyani (1989) counted at least 150 000 birds of 65 species in Pramuka market in December 1987, with at least 150 stalls. The 1993 TRAFFIC study recorded an average of 65 non-CITES species from approximately 80 stalls at Barito, and an average of 88 non-CITES species from approximately 254 stalls at Pramuka (Nash, 1993).

Of the top 20 most abundant birds, Greater Green Leafbird *Chloropsis sonnerati*, Javan Myna, the Javan subspecies *jalla* of Asian Pied Starling, Oriental Magpie Robin *Copsychus saularis* (especially *C. m. amoenus* and *C. m. musicus*) and Java Sparrow are considered by the authors to be threatened with extinction in Indonesia due to the bird trade. Although Javan Myna is a common invasive species in other countries, it is rare in its native range due to trapping for the bird trade, with only a handful of birds observed in the wild on any one occasion (Eaton, J. A. pers. obs.). Likewise, Oriental Magpie Robins are one of the most abundant birds in other parts of their range such as Malaysia, but on Java wild birds are rarely seen (Eaton, J. A. pers. obs.). These birds could have come from a mix of either local trapping, imports from elsewhere in Indonesia or the region but there was no evidence that these were being captive-bred, as birds sold were adult birds without closed rings. The Java Sparrows in these markets may be partially sourced from captive-breeding operations, but numbers coming from the wild are unknown and wild populations are considered by conservationists to be threatened in Indonesia by trade.

Ruby-throated Bulbul *Pycnonotus dispar* (24th most abundant in the survey), Sumatran Laughingthrush (36th) and Silver-eared Mesia *Leiothrix argentea* (42nd) were also found in considerable volumes in the three markets and are of particular concern too. This is especially so considering they are now locally extinct from many areas within their native range in Sumatra and restricted to the more remote areas (Eaton, J. A. pers. obs.). Like Java, levels of bird trade in Sumatra were also recorded to be high (Shepherd, 2006).

Prices collected in this study are comparable to those found listed online for the same time period (ID Bagus, 2013). Comparing price data for birds over three surveys carried out in these markets in 1987, 2009 and 2014, the value of birds has generally increased, some quite drastically (Table 5). For instance, the average asking price for Black-winged Mynas in this survey was USD270. In 1987, they were being sold at Pramuka market for IDR20 000 (then USD 12.50) (Basuni and Setiyani, 1989), and in 2009 for IDR150 000 (then USD14.92) to IDR 350 000 (then USD34.82) in other markets across Java (ProFauna, 2009). This could be an indication of the increasing rarity of sought-after species (Shepherd *et al.*, 2015). Furthermore, statistical analyses by Harris *et al.* (2015) that compared historical and contemporary data for bird markets in Medan showed clear increases in price as trade quantities decrease for species that are undergoing severe population declines.

Table 5 A sample of prices over time. Prices are listed in USD at the time of the survey, and where ranges are provided the mid-point estimate is used.

	1987 (Basuni and Setiyani)	2009 (ProFauna)	2014 (this study)
Black-winged Myna	USD 12.50	USD 25	USD 270
Tanimbar Cockatoo	NA	USD 100	USD 215
Banded Pitta*	NA	USD 7	USD 43
Rainbow Lorikeet	USD 22	USD 27.50	USD 17
Greater Green Leafbird	USD 14	NA	USD 44
Straw-headed Bulbul	USD 18	NA	USD 547
Sumatran Laughingthrush*		USD 5	USD 90
		(Shepherd, 2007)	

*Both species have recently been split, which means that individuals recorded in earlier surveys may now belong to separate species. It should also be noted that all banded pitta recorded in 2014 were Javan Banded Pitta.

In one instance at Pramuka market, the crown of a Yellow-vented Bulbul *Pycnonotus goiavier* was dyed orange and the bird offered as a Straw-headed Bulbul for USD172 – the average asking price for this species was USD547, the third-highest behind Scarlet Macaw and Bali Myna. This was the only example of a species being passed off as another. In Jatinegara, some Collared Scops Owl *Otus lettia* chicks and Scaly-breasted Munias were dyed bright colours, presumably to make them more attractive to buyers. Domestic chicken chicks, treeshrews *Tupaia* spp. and Sugar Gliders *Petaurus breviceps* for sale at Jatinegara were also commonly bleached or dyed various colours.



Chestnut-capped Laughingthrush for sale

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Origin, sources and trade routes

Of all birds counted, 98% were native to Indonesia, which suggests that the bulk of trade in the Jakarta markets is sourced from within the country. This is despite the zero harvest quotas imposed on native bird species, with the exception of the capture of certain non-protected species for breeding purposes. Ninety-one percent of all birds include Java in their range, which means that it is possible that they are sourced from within Java itself.

Traders were observed at one stall in Pramuka to be packing hundreds of adult Javan Mynas into crates, which were to be transported to other locations in Indonesia for sale. This suggests that the Jakarta markets also function as distribution centres, where traders buy birds from hunters and collectors and then distribute them to other cities. This also suggests that these birds were not captive-bred, as breeders are likely to distribute the birds themselves.

There are relatively low numbers of Lesser Sunda and Moluccan species in the Jakarta markets despite them being known to be in trade, which suggests that they could be on a different trading route. Previous research, seizures at the Tanjung Perak, Surabaya, and anecdotal information indicates that this could be via East Java, or the Philippines (ProFauna, 2008; Hernawan, 2015). Bornean and Moluccan birds are said to go to Surabaya and Malang in East Java rather than Jakarta (Ceisar and Politarius pers. comm.).

With non-Indonesian species, the traders were largely correct when asked about the origin of Bimaculated Lark *Melanocorypha bimaculata* and Brahminy Starling *Sturnia pagodarum* (Pakistan), and Mongolian Lark *Melanocorypha mongolica* (Mongolia). Only occasionally were they incorrect with certain species, such as the Rufous-fronted Laughingthrush which is endemic to Java, but we were told that it originated from China.

This practice of providing incorrect information may reflect a low level of knowledge of the species being sold, suggesting that the species was obtained through a distributor who provided inaccurate information, or could be deliberate to mislead the buyer to obtain a better price. Nash (1993) noted this from surveys more than two decades ago, and this similarity with what we have observed suggests that some aspects of the trade remain unchanged.

Bird-keeping motivations

The social aspects of bird-keeping in Indonesia, in particular Java, are key to this trade. There is a Javanese saying that “a man is considered to be a real man if he already has a house, a wife, a horse, a keris (dagger) and a bird” (Byard-Jones, 2005) – this encapsulates the cultural desirability of bird-keeping.

Furthermore, the prevalence of well-promoted singing competitions continues to raise the demand for certain species. A significant proportion of birds recorded are of species known to be sought after for their singing ability. There are bird singing competitions across Java, and known competition species include Zebra Dove, White-rumped Shama, Oriental White-eye, Hwamei, Oriental Magpie Robin, Straw-headed Bulbul (Box 1) and a number of species from the Sturnidae family (Nash, 1993; Shepherd *et al.*, 2004; Jepson, 2008; Jepson, 2010; Jepson *et al.*, 2011).

Box 1 - The Straw-headed Bulbul – an example of a species being decimated by demand in Indonesia for songbirds

The plight of the Straw-headed Bulbul definitively illustrates the unsustainable demand for songbirds in Indonesia. Native to western Indonesia, the Straw-headed Bulbul is extirpated from Java (van Balen, 1999) and probably near extirpation in Kalimantan and Sumatra (BirdLife, 2012). Outside of Indonesia, the Straw-headed Bulbul is extinct in Thailand (BirdLife, 2012), and its status in Myanmar and Brunei is unknown (Shepherd *et al.*, 2013). The species is also found in Malaysia and Singapore where populations, especially in Malaysia, are under threat (Shepherd *et al.*, 2013). The Straw-headed Bulbul is relentlessly trapped for its melodious song, prized by bird collectors and hobbyists.

Despite the obvious impact of over-harvesting and the near complete extirpation in Indonesia, the species is smuggled into Indonesia from neighbouring Malaysia, and perhaps from elsewhere in its range. Nash (1993) stated that the conservation of the Straw-headed Bulbul was of immediate concern as capture for trade had already largely extirpated the species from Indonesia, yet little has been done since this alarm was first raised.

CITES trade data from 2008 to 2014 did not show any imports of Straw-headed Bulbuls, which suggests that birds are locally caught or smuggled illegally into the country. This has been further corroborated by traders in Jakarta who have stated the birds are smuggled into the country (Shepherd *et al.*, 2013). A small number of these birds are apparently being bred in captivity in Indonesia for trade (Shepherd *et al.*, 2013), though this is clearly not bringing about any significant reductions in poaching of wild birds. Virtually unknown to conservationists, this species is on the verge of extinction and unless actions are taken immediately to reduce the poaching and the trade, at national and international levels, this species may be lost forever.

To the researchers posing as potential buyers, traders also pointed out birds with visually attractive plumage, such as pittas (Shepherd *et al.*, in press). A trader divulged that some species such as Black-naped Orioles *Oriolus chinensis* and crows were kept as good luck charms to ward off bad luck and evil spirits. Some species are also victims of current fads – the popularity for owls as pets surged after the first Harry Potter movie (Shepherd, 2010). And then there are birds whose rarity immediately makes them coveted as a status symbol (Shepherd *et al.*, 2004; Collar *et al.*, 2012; Croes, 2012), such as the Bali Myna.

Clearly, bird trade and bird-keeping in Indonesia has had a long, social and cultural history. A Java-focused study found that birds were the most popular pets in Indonesian households, with some 1.3 million households keeping birds; a bird in a cage in traditional Javanese culture symbolizes the importance of a hobby in a balanced life (symbolic species are doves, for example), which also supports our findings with the abundance (Jepson and Ladle, 2005). The deeply-embedded culture of bird-keeping will require more than just enforcement and regulation to comprehensively eliminate the threat it poses to wild bird populations in Indonesia. A key element that would improve the conservation status of Indonesian birds is consumer education and in the long-term, consumer behaviour change.

Captive breeding – solution or loophole?

Commercial captive breeding of birds, or market-driven conservation approaches, has been proposed as a conservation solution to reduce and, potentially eliminate the demand for songbirds from the wild in Indonesia (Jepson and Ladle, 2005; Jepson *et al.*, 2011). Some species of birds observed during this study are reportedly captive bred for the commercial bird trade, including “Javan” Asian Pied Starlings as mentioned above, and Java Sparrows. Certification schemes in the local cultural contexts have indeed been proposed, and if implemented effectively could be a conservation solution (Jepson *et al.*, 2008).

However, it is still unclear whether these operations are as yet effectively reducing illegal and unsustainable capture from the wild. In many of these cases the parent stock may have been sourced from wild-caught birds (Jepson *et al.*, 2008), and breeders may not be registered with the government authorities. Furthermore, depending on market demand the monetary costs of producing captive-bred birds may outweigh that of trapping wild birds (Jepson *et al.*, 2011), further justifying the continued trapping of wild birds to source the songbird trade.

Importantly, corruption and weak enforcement, and a lack of effective monitoring and regulation of commercial wildlife breeding operations in Indonesia has been shown to lead to the laundering of a wide range of wild-caught species entering the global market falsely declared as captive-bred (Nijman *et al.*, 2012; Nijman and Shepherd, in press). Commercial captive breeding of birds has also in many cases provided a means to launder otherwise protected species into the domestic and international market (Croes, 2012; Shepherd *et al.*, 2012). As such, we believe that commercial breeding of native species can only be a solution to the bird conservation crisis if effective regulation of such operations to disallow for laundering of wild birds can be demonstrated.

Conservation implications

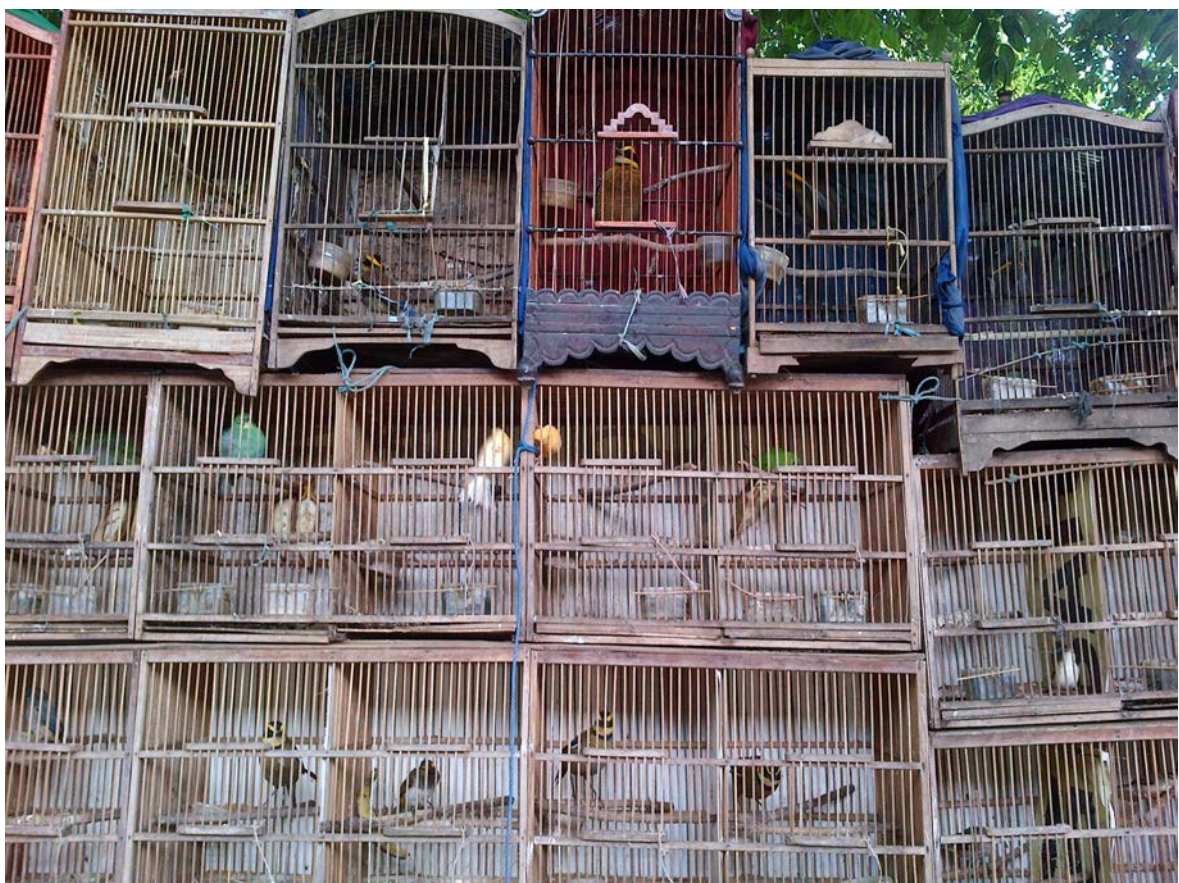
With such massive volumes being recorded at just these three markets in Jakarta in three days, the impact of hunting and trade on wild populations must be immense. This study did not take into account turnover, but observations of the poor conditions the birds are kept in suggest that mortality rates are high. Shepherd *et al.* (2004) found some species of birds, such as munias, suffered a 50% mortality rate in the first 24 hours after capture. Approximately 30% of Scaly-breasted Munias observed being spray-painted in a cage were dead or on the brink of death minutes after being spray-painted (Chng, S. and Eaton, J. A. pers. obs.).

Many of the species present in this survey were grassland and open country birds (mainly Javan birds) and sub-montane forest species (mainly Sumatran birds). The markets were previously dominated by lowland forest species (C. R. Shepherd *pers. obs.*), and it is possible that this shift reflects the reduced availability of lowland forest birds as well as diminished intact lowland habitat due to habitat conversion and degradation (Waltert *et al.*, 2005; Margona *et al.*, 2014).

There are a number of issues with these unregulated wildlife markets openly engaging in illegal wildlife trade. Corruption and a lack of political will undermine any legislative wildlife protection and enforcement efforts. First and most importantly, harvest and subsequent trade of large quantities of native birds continues. The Indonesian authorities established a zero quota for native birds, which realistically is not being enforced for a multitude of reasons, including the bird-keeping culture. Traders continue operating illegally without being punished. The message being sent is that both Indonesia’s national laws and natural heritage are not valued, by traders, law enforcers as well as the consumers who buy and fuel the trade. Furthermore, the availability of birds in these markets also makes it easy for buyers simply to walk in and buy anything, legal or otherwise. These markets are not just a conservation threat to birds; at least 146 mammals were seen in the markets in the three days, including to Critically Endangered Javan Slow Loris (Box 2).

Although Indonesian legislation generally affords good protection for native species, monitoring and enforcement in the markets is inadequate; strict enforcement for some key species is crucial in ensuring wild populations don't plummet. Where international trade and regulations are concerned, ending trade for many of these species goes beyond the spirit and reach of CITES, especially since a vast majority of them are native birds.

Currently, the quota and permits system for harvesting and trading native species within Indonesia is comprehensive on paper, but in reality the implementation and enforcement of this system leaves much to be desired, based on this and other wildlife trade assessments in Indonesia. It needs to be demonstrated that this system can be effectively implemented and regulated and not misused as a mechanism to launder wild-caught birds as captive-bred. Following that, one potential solution is the setting of realistic, science-based harvest quotas for selected species in close consultation with NGOs and researchers. Research needs to be carried out first, and mechanisms need to be in place to ensure quotas are not flouted, and species without quotas are not traded. This could be trialed for a set period of time to test the feasibility and effectiveness of such a compliance measure, accompanied by monitoring of wild populations to ensure that off-take is sustainable. This would enable a balance between the cultural significance of bird-keeping in Indonesia and the conservation of threatened bird populations. Traders and bird-keeping hobbyists need to understand that compliance is in their best interests in the long term.



Rows of cages at a stall just outside Pramuka market.

Box 2 - Mammals at the Jakarta pasar burung (bird markets)

During the surveys, live mammals observed for sale at the markets were also counted, with estimates made for species present in large quantities. No mammals were seen at Pramuka market.

Common Name	Scientific Name	IUCN	Jatinegara	Barito
Asian Small-clawed Otter	<i>Aonyx cinereus</i>	VU	1	2
Small-toothed Palm Civet	<i>Arctogalidia trivirgata</i>	LC		2
Plantain Squirrel	<i>Callosciurus notatus</i>	LC		3
Short-tailed Mongoose	<i>Herpestes brachyurus</i>	LC		1
Long-tailed Macaque	<i>Macaca fascicularis</i>	LC	18	11
Southern Pig-tailed Macaque	<i>M. nemestrina</i>	VU	3	
Javan Ferret Badger	<i>Melogale orientalis</i>	DD		1
Sunda Slow Loris	<i>Nycticebus coucang</i>	VU		1
Javan Slow Loris	<i>Nycticebus javanicus</i>	CR	2	
Common Palm Civet	<i>Paradoxurus hermaphroditus</i>	LC	30	7
Sugar Glider*	<i>Petaurus breviceps</i>	LC	100+	100+
Leopard Cat	<i>Prionailurus bengalensis</i>	LC	4	
Large Flying Fox	<i>Pteropus vampyrus</i>	NT	15	3
Javan Lutung	<i>Trachypithecus auratus</i>	VU	1	
Common Treeshrew	<i>Tupaia glis</i>	LC		24
Fruit Bat spp	<i>Cynopterus sp</i>			10
Flying Fox spp	<i>Pteropus sp</i>			1
Tree Shrew spp*	<i>Tupaia sp</i>		100+	100+
Flying Squirrel spp			2	
Hedgehog spp				4

*Estimates of numbers were made for these species

The observers were told that the flying foxes and fruit bats were for consumption as traditional medicine, while the other animals were being sold as pets, most of them in the same shops that sold birds. Most of the macaques were juveniles, and some of the tree shrews had been bleached to give them an 'albinistic' appearance.

From the list above, only the Sunda Slow Loris is listed as Protected under Indonesian law. Javan Slow Loris was considered a subspecies of Sunda Slow Loris until its split to a full species in 2008; this is not reflected in the list of Indonesian protected species from 1999.



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Javan Banded Pitta in a cage outside Pramuka market.



© James Eaton/Birdour Asia

A Black-winged Myna, one of the most expensive birds for sale, is under pressure by the cage bird trade

Future work and indicator species

It is not feasible to carry out full inventories like this one on a regular basis without arousing the suspicion of traders because of the huge effort required to visit each shop and identify and count each bird. However, regular monitoring over a long period of time is crucial to uncovering market dynamics such as turnover rates and shifts in the species composition, and represents a cost-effective way to monitor the conservation status of species of concern (Harris *et al.*, 2015).

Continued monitoring of bird markets will provide significant and important information on the scale and extent of the bird trade in Indonesia over time. This can be used to address issues relating to the regulation of bird trade in Indonesia, and ultimately, towards finding a solution to ensure a decline in open availability and trade in protected species and those not permitted for trade by the Indonesian government. Such monitoring will show how our efforts in highlighting key species correlate to demand, availability and price, and guide and prioritize management or regulation protocols to conserve species of concern. As such, the selection of appropriate indicator species will enable long-term, regular and rapid monitoring to take place in these three markets.

All globally threatened Indonesian endemics should be monitored. Additionally, other indicator species should provide information on abundances and price changes over time, reflecting enforcement effort, sources and other conservation threats such as habitat loss. The latter group could be divided into species traded specifically as songbirds, and those traded for other purposes. For enforcement purposes, monitoring key species that are protected by law in Indonesia (i.e. should not be in trade at all) and non-quota (also should not be in trade, but generally seen as a lower priority than protected species) is important.

The following are examples of species that could be selected as indicator species:

1. Black-winged Myna – An easily identifiable, high value species; Javan and Bali endemic with identifiable subspecies to indicate the origin further; Critically Endangered, protected in Indonesia. This species is also currently being commercially captive-bred, so monitoring should also take into account captive-bred individuals (with closed leg rings) and identify potential risks of cross-breeding between subspecies and laundering of wild-caught individuals as captive-bred.
2. Straw-headed Bulbul – An easily identifiable, high value species; CITES Appendix II; becoming increasingly rare in trade and the wild.
3. Chattering Lory – An easily identifiable, high value species; Maluku endemic with identifiable sub-populations to indicate the origin further; CITES Appendix II.
4. Tanimbar Cockatoo/Corella – An easily identifiable, high value species; Tanimbar endemic; CITES Appendix I, protected in Indonesia. However, in these three markets the species was only seen in two shops. The lack of Moluccan species in Jakarta presumably means they are on a different trading route. Anecdotal information suggests the trade in species from this region may be out of eastern Indonesia, or via the Philippines; more investigation into this is needed.
5. Sumatran Laughingthrush (VU) and Rufous-fronted Laughingthrush (EN) – Threatened species, endemic to Indonesia.

In addition, more work in other parts of Indonesia is required to understand fully the dynamics of the caged bird trade in Indonesia, especially in East Java where eastern Indonesian species are likely to be traded, and ports in eastern Indonesia.

CONCLUSION

This paper illustrates a large scale bird trade, with 19 036 birds of 206 species available for sale during the survey carried out over a three day period in the three largest bird markets in Jakarta. Of these, 18 641 birds (98% of total volume of birds) of 184 species were native to Indonesia and harvested outside of the national harvest quota system or in direct violation of the *Conservation Act (No. 5) of 1990* that protects selected species. Of the native species observed, 3884 birds (20% of total volume of birds) of 51 species are endemic to Indonesia and eight species are assessed as threatened on the IUCN Red List. The high levels of trade would likely lead to a reassessment of the threat status of a number of species, although there is a paucity of information on the status of most species in the wild in Indonesia.

While it is recognized that a number of Indonesian species are being bred in captivity for local sale, it is unclear where these operations are obtaining parent stock and if they are effectively reducing or instead leading to an increase in illegal and unsustainable capture from the wild. Commercial captive breeding of native species is not currently proposed as a solution to the bird conservation crisis, at least until existing systems are better understood and administered, and effective regulation of such operations can be demonstrated.

The laws for native species generally afford good protection, but monitoring and enforcement in the markets is lacking, an area that requires immediate priority. While long-term conservation strategies, such as reduction of demand for wild birds in Indonesia, are essential to complement effective enforcement, ensuring that illegally acquired and legally protected species are not captured and traded remains an urgent priority.

As long as these markets exist in their present form illegal trade will continue, undermining bird conservation in Indonesia and further threatening Indonesia's avifauna with extinction. Corruption further undermines effective enforcement and needs to be eliminated. We urge the new Indonesian government, which is starting to make significant steps forward in conservation, to take pride in their rich and unique wildlife and send a strong message nationally and internationally by taking decisive action against these illegal markets. To aid the conservation of bird species in Indonesia, the following recommendations are made.

RECOMMENDATIONS

Legislation

For native species, the protected species list in the *Act of the Republic of Indonesia No.5 of 1990 concerning Conservation of Living Resources and their Ecosystems*, widely known as the *Conservation Act (No. 5) of 1990* needs reviewing and updating urgently, to reflect recent changes in species of conservation concern, as well as recent taxonomic changes linked to range and therefore potentially resulting in conservation concerns. The Government of Indonesia is encouraged to assess the species that may be in decline due to trade and provide enhanced legal protection for those deemed to be threatened. In some cases, where former subspecies have newly been recognized as distinct species, listing the whole genus would ensure better legislative protection and also provide protection in the future if any new splits occur.

If quotas for certain species are needed, research should be carried out first to determine what off-take would be sustainable, and mechanisms put in place to ensure quotas are not flouted and species without quotas are not traded.

The Indonesian government is urged to review and update its national legislation to provide sufficient protection to non-native species traded within the country.

Enforcement and Regulation

The Government of Indonesia is encouraged to take action against individuals found in violation of the law through increased monitoring of the markets along with conservation partners. Due to the extreme numbers of birds in trade, a staggered approach may prove most effective, focusing first on species legally protected by law and prosecuting violators. A second phase involving the issuance of warnings to dealers trading in species not protected by law but that have a zero harvest quota should be considered, followed-up by prosecuting offenders who ignore initial warnings.

Proper licensing systems of traders should be examined and considered. Ultimately, if the bird markets continue to allow the illegal trade in species, especially in large volumes, they should be closed down, thereby eliminating opportunities for continuous illegal capture of birds and facilitating persistent and possibly increasing demand.

Work in conjunction with the government should be carried out for a clearer understanding of species currently being permitted to be bred in captivity. Combined with information from continuous market monitoring and examination of systems regulating the acquisition of stock, these data can support the effort to determine the impact on species in the wild.

Monitoring

TRAFFIC, along with locally-based NGOs and conservation partners and law enforcement agencies to continue to monitor the wildlife markets and strengthen co-ordination with law enforcement agencies in order to provide support to law enforcement and identify any emerging issues.

Regular market monitoring of indicator species, based on findings from this study on species facing high conservation threats, is recommended to calculate turnover rates in the market and therefore extrapolate the number of birds sold per year to enable determination on the extent of threat for these species and enable the establishment of conservation measures.

Awareness-raising

The deeply-embedded culture of bird-keeping will require more than just enforcement and regulation to comprehensively eliminate the threat it poses to wild bird populations in Indonesia. A key element that would improve the conservation status of Indonesian birds is consumer education and in the long-term, consumer behaviour change.

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Appendix

Appendix 1: Total number of birds seen in the three Jakarta markets, in decreasing order of abundance

Scientific Name	Common Name	IUCN Red List	Protected in Indonesia	Individuals	Number of shops
<i>Zosterops palpebrosus melanurus/buxtoni</i>	Oriental White-eye	LC	0	2393	37
<i>Acridotheres javanicus</i>	Javan Myna	LC	0	2054	43
<i>Geopelia striata</i>	Zebra Dove	LC	0	1859	30
<i>Chloropsis sonnerati sonnerati/zosterops</i>	Greater Green Leafbird	LC	0	1248	72
<i>Pycnonotus goiavier analis</i>	Yellow-vented Bulbul	LC	0	1061	43
<i>Mirafra javanica</i>	Australasian Bushlark	LC	0	1052	20
<i>Gracupica contra floweri/jalla</i>	Asian Pied Starling	LC	0	782	58
<i>Lonchura punctulata</i>	Scaly-breasted Munia	LC	0	614	6
<i>Copsychus saularis muticus/pluto</i>	Oriental Magpie Robin	LC	0	583	59
<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	LC	0	476	32
<i>Streptopelia chinensis tigrina</i>	Spotted Dove	LC	0	468	16
<i>Lophozosterops javanicus</i>	Javan Grey-throated White-eye (Javan Dark-eye)	LC	1	428	13
<i>Acridotheres tristis</i>	Common Myna	LC	0	390	34
<i>Erythrura prasina</i>	Pin-tailed Parrotfinch	LC	0	350	7
<i>Padda oryzivora</i>	Java Sparrow	VU	0	345	8
<i>Parus cinereus</i>	Cinereous Tit	LC	0	266	26
<i>Copsychus malabaricus tricolor</i>	White-rumped Shama	LC	0	256	44
<i>Lanius schach bentet</i>	Long-tailed Shrike	LC	0	256	36
<i>Alophoixus bres bres/tephrogenys</i>	Grey-cheeked Bulbul	LC	0	212	38
<i>Garrulax palliatus palliatus</i>	Sunda Laughingthrush	LC	0	180	19
<i>Pycnonotus bimaculatus bimaculatus/tenggerensis</i>	Orange-spotted Bulbul	LC	0	159	33
<i>Pericrocotus cinnamomeus saturatus</i>	Small Minivet	LC	0	156	14
<i>Prinia familiaris</i>	Bar-winged Prinia	LC	0	144	19
<i>Pycnonotus dispar</i>	Ruby-throated Bulbul	LC	0	132	26
<i>Gracula religiosa religiosa</i>	Hill Myna	LC	1	128	35
<i>Aegithina tiphia scapularis</i>	Common Iora	LC	0	126	21
<i>Orthotomus sepium</i>	Olive-backed Tailorbird	LC	0	125	12
<i>Leiothrix lutea</i>	Red-billed Leiothrix	LC	NA	112	3
<i>Loriculus galgulus</i>	Blue-crowned Hanging-parrot	LC	0	109	7
<i>Garrulax mitratus</i>	Chestnut-capped Laughingthrush	LC	0	103	21
<i>Otus bakkamoena lempiji</i>	Collared Scops-Owl	LC	0	101	9
<i>Garrulax canorus</i>	Hwamei	LC	NA	98	3
<i>Mixornis bornensis javanicus</i>	Bold-striped Tit-babbler	LC	0	95	6
<i>Cyornis rufigastra rufigastra/rhizophorae</i>	Mangrove Blue Flycatcher	LC	0	81	6
<i>Melanocorypha maxima</i>	Tibetan Lark	LC	NA	78	5
<i>Garrulax bicolor</i>	Sumatran Laughingthrush	VU	0	76	12

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<i>Alophoixus bres bres/tephrogenys</i>	Grey-cheeked Bulbul	LC	0	212	38
<i>Garrulax palliatus palliatus</i>	Sunda Laughingthrush	LC	0	180	19
<i>Pycnonotus bimaculatus bimaculatus/tenggerensis</i>	Orange-spotted Bulbul	LC	0	159	33
<i>Pericrocotus cinnamomeus saturatus</i>	Small Minivet	LC	0	156	14
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<i>Garrulax mitratus</i>	Chestnut-capped Laughingthrush	LC	0	103	21
<i>Otus bakkamoena lempiji</i>	Collared Scops-Owl	LC	0	101	9

Appendix 2: The number of birds and species seen in the markets grouped according to families.

Family	Number of birds	Number of species
Accipitridae	4	1
Aegithinidae	126	1
Alaudidae	1162	5
Alcedinidae	6	2
Artamidae	1	1
Campephagidae	180	4
Chloropseidae	1337	5
Cisticolidae	381	7
Columbidae	2349	9
Coraciidae	5	1
Corvidae	91	5
Cuculidae	6	3
Dicaeidae	14	3
Dicruridae	8	3
Estrildidae	1384	9
Eurylaimidae	1	1
Irenidae	44	1
Laniidae	256	1
Leiothrichidae	678	12
Loriidae	120	10
Megalaimidae	4	4
Meliphagidae	3	2
Monarchidae	20	1
Muscicapidae	962	11
Musophagidae	2	1
Nectariniidae	112	5
Oriolidae	61	2
Pachycephalidae	3	2
Paridae	266	1
Passeridae	8	1
Phasianidae	3	3
Picidae	48	3
Pittidae	65	2
Ploceidae	75	3
Psittacidae	121	8
Pycnonotidae	2252	16
Rallidae	1	1
Rhipiduridae	15	3
Sittidae	20	2
Strigidae	107	3
Sturnidae	3465	18
Sylviidae	27	2
Timaliidae	266	11
Turdidae	82	9
Turnicidae	5	1
Tytonidae	4	1
Zosteropidae	2886	6
Total	19036	206

Appendix 3: Distribution of endemic species and subspecies

Distribution of endemic species	Sum of Individuals	Number of species/subspecies
Borneo, Sumatra	21	1
Endemic+Borneo	21	1
New Guinea	22	6
Endemic+Papua New Guinea	22	6
Bali, Lesser Sundas	1	1
Java, Lesser Sundas	5	1
Lesser Sundas	3	1
Timor	2	1
Endemic+Timor-Leste	11	4
Bali	16	1
Java	1297	25
Java (east)	3	1
Java, Lesser Sundas	1	1
Java, Sumatra	2347	4
Lesser Sundas	29	4
Maluku	67	6
Sulawesi	5	4
Sumatra	299	6
Endemic	4064	52

Appendix 4: Average asking prices of species obtained from traders

Common Name	Individuals	Price (IDR 1000)	Price (USD)
Scarlet Macaw	1	50000	4291.85
Bali Myna	16	6833	586.52
Straw-headed Bulbul	9	6375	547.21
African Grey Parrot	1	5000	429.18
Hill Myna	128	3500	300.43
Black-throated Laughingthrush	20	3500	300.43
Black-winged Myna	14	3140	269.53
Large-billed Crow	32	3000	257.51
White-crested Laughingthrush	4	2500	214.59
Tanimbar Cockatoo	3	2500	214.59
White-rumped Shama	256	2450	210.3
Hwamei	98	2000	171.67
Black-naped Oriole	59	1416	121.55
Hooded Pitta	2	1200	103
Rufous-fronted Laughingthrush	3	1150	98.71
Sumatran Laughingthrush	76	1050	90.13
Bare-throated Whistler	2	900	77.25
Orange-headed Thrush	24	850	72.96
Asian Pied Starling	782	766.6	65.8
Australasian Bushlark	1052	700	60.09
Tibetan Lark	78	700	60.09
Common Green Magpie	26	700	60.09
Chestnut-backed Thrush	24	600	51.5
Sunda Laughingthrush	180	550	47.21
Asian Fairy Bluebird	44	550	47.21
Greater Green Leafbird	1248	508.3	43.63
Javan Banded Pitta	63	500	42.92
Scarlet Minivet	13	450	38.63
Chestnut-capped Laughingthrush	103	400	34.33
Common Flameback	32	400	34.33
Lesser Green Leafbird	25	400	34.33
Sumatran Leafbird	14	400	34.33
Chestnut-backed Scimitar Babbler	12	400	34.33
Indigo Flycatcher	5	400	34.33
Pied Fantail	13	387.5	33.26
Long-tailed Shrike	256	350	30.04
Grey-cheeked Bulbul	212	350	30.04
Piping Crow	1	300	25.75
Black-and-Red Broadbill	1	300	25.75
Cinereous Tit	266	262.5	22.53
Blue-crowned Hanging-parrot	109	250	21.46
Streaked Bulbul	24	250	21.46
Black Laughingthrush	15	250	21.46
Orange-spotted Bulbul	159	240	20.6
Zebra Dove	1859	233.3	20.03
Collared Scops-Owl	101	225	19.31
Rainbow Lorikeet	26	200	17.17
Island Thrush	1	200	17.17
Yellow-vented Bulbul	1061	190	16.31

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Black-naped Oriole	59	1416	121.55
Hooded Pitta	2	1200	103
Rufous-fronted Laughingthrush	3	1150	98.71

TRAFFIC, the wildlife trade monitoring network, is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

For further information contact:

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