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SONGSTERS OF SINGAPORE

An Overview of the Bird Species in Singapore
Pet Shops

James A. Eaton, Boyd T. C. Leupen and Kanitha Krishnasamy





TRAFFIC REPORT

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Front cover photograph: Montane White-eye *Zosterops poliogastrus*, native to East Africa
Credit: James A. Eaton

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*James A. Eaton, Boyd T. C. Leupen and
Kanitha Krishnasamy*



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Montane White-eye *Zosterops poliogastrus*, native to East Africa



Singapore bird shop scene

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ABBREVIATIONS AND ACRONYMS

AVA	Agri-food and Veterinary Authority, Singapore
CITES.....	Convention on International Trade in Endangered Species of Wild Fauna and Flora
ESA.....	Endangered Species (Import and Export) Act 2006
IUCN.....	International Union for Conservation of Nature
SGD	Singapore Dollars
USD	United States Dollars



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Oriental Magpie-robin *Copsychus saularis adamsi*, restricted to the Malaysian state of Sabah, Borneo

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EXECUTIVE SUMMARY

Singapore has a long history of involvement in the bird trade. Recent analysis of the trade in CITES Appendix I and II-listed birds from over 30 countries between 2005 and 2014, highlights that Singapore issued commercial import- and export permits for a total of 225 561 and 136 912 birds respectively. This involved 212 species, of which 30 were classified by the IUCN as Vulnerable, Endangered or Critically Endangered. Another study on the import and export of CITES-listed birds from the Solomon Islands in 2011 found Singapore to be the importer of 72% of the 68 000 wild-caught and reportedly captive-bred birds from the Solomon Islands, with the vast majority of these birds subsequently being re-exported. In both studies, attention was drawn to the illegal sourcing of birds, and Singapore's role in moving these birds into the legal global market.

To understand further the bird trade industry in Singapore, TRAFFIC undertook a rapid assessment of the open bird trade in Singapore's pet shops. Surveys of 39 pet shops, listed by AVA as licensed to sell birds, were conducted over four days in November and December 2015. A full inventory of the species and volumes in trade was documented, excluding domesticated species. This report provides a snapshot of the current composition and availability of openly traded birds in Singapore's AVA-licensed bird selling pet shops.

Of the 39 shops visited, 28 were found to be selling birds. A total of 14 085 birds were observed, comprising 109 species. Seven of all species, accounting for a total of 42 individuals, are currently listed in – or have recently been approved for uplisting to – CITES Appendix I. Whether these birds were captive-bred or wild-caught could not be established. The most heavily traded CITES Appendix I-listed bird was the Yellow-shouldered Amazon *Amazona barbadensis* with at least 16 recorded individuals. Overall, 41 CITES Appendix II species were recorded, totalling 350 individuals. A majority of the species, 97% (n=60) found in trade are currently not listed in CITES. Of the total number of species in trade, 70% involved seven species that were flagged as immediate concern at the first Asian Songbird Crisis Summit in 2015

From the IUCN Red List of Threatened Species, only one Critically Endangered species was observed; Yellow-crested Cockatoo *Cacatua sulphurea* (two individuals). Two Endangered species were encountered, namely Lilac-crowned Amazon *Amazona finschi* (n=3) and Sun Parakeet *Aratinga solstitialis* (n=16), although two further species, Grey Parrot *Psittacus erithacus* (n=15) and Straw-headed Bulbul *Pycnonotus zeylanicus* (n=1), were subsequently (December 2016) uplisted to this category (from Vulnerable). Eight Vulnerable species (excluding Grey Parrot and Straw-headed Bulbul, but including the December 2016 uplisted Greater Green Leafbird *Chloropsis sonnerati* and Javan White-eye *Zosterops flavus*) were found, totalling 66 individuals. Sixty-seven percent (9452 individuals of seven species) of the total number of encountered birds were flagged as species of immediate concern at the first Asian Songbird Crisis Summit, held in Singapore in 2015.

About 70% of these involved seven species that were flagged as immediate concern at the 1st Asian Songbird Crisis Summit two years ago. The most commonly encountered species in trade, accounting for a remarkable 46% of the total seen, was the Oriental White-eye *Zosterops palpebrosus* (n=6473). Three other species exceeded the 1000-mark of number of birds on sale: Red-whiskered Bulbul *Pycnonotus jocosus* (n=2811), Zebra Dove *Geopelia striata* (n=1227) and the Red Avadavat *Amandava amandava* (n=1030). Of these, only Zebra Dove is native to Singapore.

Significantly, 73% of all species (n=80) and 80% of all individuals (n=11 222) observed in trade were not native to Singapore. Of these non-native species, 35% occur on the Indian Subcontinent and in Southeast Asia, while another 31% originate from Central/South America. Recent bird surveys in

other Southeast Asian countries found fewer birds for sale from Central/South America, making Singapore's involvement in the trade in such species unique in the region. This is in contrast to other prominent bird markets in the region, including Jakarta, Malang, Surabaya and Yogyakarta in Indonesia, as well as Bangkok in Thailand that was dominated by species native to the country or elsewhere in Southeast Asia.

The high number of birds recorded in trade over a four-day survey in a small city nation like Singapore confirms the popularity of the bird trade in this country. However, a considerable lack of access to trade records (beyond CITES import- and export records) and other regulatory information concerning the harvesting, breeding, and trading of animals in Singapore has rendered a comprehensive assessment of the state of the bird trade impossible. Consequently, it has not been possible to draw any conclusions regarding the sustainability of the industry. Access to such information would aid research, enable the determination of legal and illegal trade levels and provide clarity into the sustainability of the bird trade. In November 2016, Singapore's Agri-Food and Veterinary Authority (AVA), the country's CITES Management Authority, found that 14 of 27 pet bird shops surveyed by the Animal Concerns Research and Education Society (ACRES) did not comply with the government's licensing conditions on welfare.

All information gathered from the survey has been shared with AVA for their continued law enforcement monitoring purposes. In light of this study's findings, TRAFFIC makes of the following recommendations to aid in a better understanding of Singapore's role in the global bird trade:

RECOMMENDATIONS

Regulation and Enforcement

At present, it is not possible to determine if the bird trade in Singapore is occurring illegally, and if so, to what extent. This can only be done if the following information is made available:

- The quantity of CITES species and individuals registered for import and export, and disclosure of any quotas set by the Government for trade.
- Captive breeding activities within Singapore, including information on registered breeders and the volumes of species meant for domestic and/or international trade.
- Processes and protocols in place to regulate non-CITES, non-protected species that are being imported and exported from Singapore.

The Animal Welfare and Control Division of AVA, which issues licenses to pet shops, should conduct regular inspections to ensure that shops have the correct permits for all imported and captive-bred species, and when applicable, CITES-permits for CITES-listed species. In order for consumers to make wise purchasing decisions, AVA should introduce a regulatory requirement (including penalties for ITS violation) for shop owners to provide information on the name of the bird, its CITES status (if it involves a CITES-listed species), and its source (wild-caught/captive bred). This would allow consumers to make a conscious decision on whether to buy sustainably sourced pets or not.

Awareness and Reporting Crime

Members of the public who suspect that any illegal activity is occurring are encouraged to report suspected crime directly to AVA, or through TRAFFIC's Wildlife Witness App, which can be downloaded from the App Store or Google Play for free.



Pet Shop Monitoring

Regular monitoring of the bird trade in Singapore by the AVA with the support of local NGOs and conservation partners will be important to enable law enforcement support and the discovery of emerging trends and issues. Such monitoring should include the bird trade which occurs in pet shops, and parts of which may contravene licences and captive breeding quotas. Additionally, international trade data should be assessed. Also, monitoring of indicator species (including the species suggested in this report) that face high conservation threats from the bird trade will enable the assessment of their (over-)exploitation. Studying turnover rates to extrapolate the estimated number of birds sold per year, and determining the conservation implications of these findings, is of high importance. Consistent monitoring has also been identified as a need at the Asian Songbird Summit 2015 to support the regulation of bird trade.

Controlling Invasive Species

Several non-native species have been introduced into the Singaporean landscape as a result of the bird trade, with escapees of some species having established feral populations. These populations may have detrimental impacts on native bird populations and may require costly control measures. TRAFFIC recommends research into which native Singaporean species are threatened by these invaders and to what extent.

Managing Merit Release

Species used for merit release need to be controlled and tested, with regular monitoring of pet shops to confirm that only native species (including correct subspecies) are used for such purpose, until this practice comes to an end. Ending merit release can be achieved by further promoting 'Operation No Release'; an initiative by the Singapore National Parks Board, Public Utilities Board and AVA, and supported by local conservation organisations, to raise public awareness about the detrimental effects of animal release on natural areas. In line with this campaign, the Government has highlighted the detrimental ecological impacts of these practices on the natural environment, and has warned that first offenders may be prosecuted under the Singapore Parks and Trees Act and be fined up to SGD50 000 (USD36 789), jailed up to six months, or both.

INTRODUCTION

The unregulated and excessive exploitation of wildlife and their parts poses a serious threat to global biodiversity and has proven to be a particularly serious problem in the Southeast Asian region. Here, inadequate monitoring efforts, insufficient enforcement, corruption and complacency within governments, as well as a general lack of awareness and concern for conservation amongst the public, has allowed the illegal trade in wildlife to flourish (Nijman, 2010). Among the most frequently traded animals in Southeast Asia are birds. Popular for their singing qualities and colourful plumage, birds are predominantly sold as pets, and for traditional purposes (for example, bird derivatives are sometimes used as headgear in traditional dancing). Observations from market surveys and from seizures of birds in Indonesia, Malaysia and Thailand provide a first indication of the worrying extent to which birds are currently being traded in some parts of the region (Shepherd *et al.*, 2013; Chng *et al.*, 2015; Shepherd *et al.*, 2015, Chng and Eaton, 2016). These studies serve as an alert to the potentially dire consequences this trade may have for wild populations. To illustrate, Shepherd *et al.* (2013) highlight that the heavily traded Straw-headed Bulbul *Pycnonotus zeylanicus* has seen tragic reductions in its population sizes throughout the region, with the species now considered extinct in Thailand and on the Indonesian islands of Java and Sumatra and recently (December 2016) uplisted to International Union for Conservation of Nature (IUCN) Red List of Threatened Species. At the first ever Asian Songbird Crisis Summit held in Singapore in October 2015, experts have called on Asian governments to take immediate steps to curtail the unsustainable trade that is decimating wild bird populations in the region (TRAFFIC, 2015).

The bird trade in Southeast Asia has long been recognised as a major conservation concern (Basuni, 1989; Nash, 1993; Bennet *et al.*, 1996; Shepherd, Waltert, 2005; 2007; Shepherd, 2010; Shepherd *et al.*, 2013; Eaton *et al.*, 2015). A study on the trade of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I and II-listed birds from over 30 countries between 2005 and 2014 highlights that Singapore issued commercial import- and export permits for a total of 225 561 and 136 912 birds respectively (Poole and Shepherd, 2016). Another study on the import and export of CITES-listed birds from the Solomon Islands in 2011 emphasized that 72% of the 68 000 wild-caught and reportedly captive-bred birds from the Solomon Islands were imported by Singapore, with the country then re-exporting a vast majority of these birds (Shepherd *et al.*, 2012). Claims of captive breeding, particularly those involving species that are extremely difficult to breed in captivity, have raised questions about the legality of wildlife trade throughout the entire region, including Singapore (Shepherd *et al.*, 2012). Additionally, the online bird trade in Singapore appears to be extensive, with a recent Animal Concerns Research and Education Society (ACRES) study finding 655 online bird advertisements between June and August 2016. Of these advertisements, 273 concerned CITES Appendix I or II-listed species (18 and 255 advertisements respectively) (ACRES, 2016). The Agri-food and Veterinary Authority (AVA) and ACRES are currently engaged in further investigation of these advertisements.

While studies have highlighted Singapore's role as an important transport hub and an end-use market for selected wildlife commodities, much of the country's bird trade remains to be extensively documented. Historically, only two comprehensive bird shop studies in Singapore have been published – the first was conducted between January 1992 and May 1993 and the second between August 2005 and January 2006 (Nash, 1994; Lee, 2006); both studies found considerable numbers of birds for sale (the results from these studies are described in further detail in the sections that follow). With this in mind, TRAFFIC undertook the current study to explore the nature and scale of today's open bird trade occurring in Singapore's pet shops.

SINGAPORE'S WILDLIFE LEGISLATION

International trade – The Endangered Species (Import and Export) Act 2006

Singapore became a signatory to the CITES in November 1986. The AVA, a statutory board of the Ministry of National Development, is the lead agency governing the protection of wildlife in Singapore. It functions as both the national CITES Management Authority and the national CITES Scientific Authority and is responsible for the country's implementation and enforcement of the Convention (CITES, 2015). The *Endangered Species (Import and Export) Act 2006* (ESA) was first enacted in 1989 to give legal effect to the implementation and enforcement of CITES. The three schedules to the Act list the endangered species. Under the Act, a permit is required to import, export, and re-export a scheduled species and/or any of its parts and derivatives (Lye, 1999; AVA, 2015). Furthermore, the Act renders the possession or sale of specimens that were acquired without the appropriate permits illegal. In an effort to strengthen CITES implementation in the country, the ESA underwent several revisions between 2000 and 2013. The most notable revision came into effect on 1 March 2006, when penalties for unauthorized import, export and re-export of CITES-listed species were increased ten-fold (Singapore Attorney-General's Chambers, 2013). Fines for any illegal trade or possession constitute SGD50 000 (USD36 789) per species (but are not to exceed in the aggregate SGD500 000 (USD367 893) or imprisonment for a term not exceeding two years.

Domestic trade – Animals and Birds (Amendment) Act 2014

The protection of animals at a national level is governed by the *Animals and Birds (Amendment) Act 2014*. Among other things, it regulates the keeping, breeding and feeding of animals and birds through a rigid license and permit system. Licenses or permits also stipulate the location at which a bird or animal must be kept. Anyone found guilty of violating this law is liable to a fine of up to SGD5000 (USD3679) or to imprisonment of up to six months, or both. Additionally, the AVA has the authority to suspend or revoke a license or permit if: 1.) the licence or permit has been obtained by fraud or misrepresentation; 2.) the license or permit holder violates: any provision of the Act, any conditions of the license or permit, or any direction given by the Director-General of AVA or an authorised officer under the Act; 3.) it is in the public interest to suspend or revoke the licence or permit.

The operations of pet stores are further governed by the *Pet Shop License Conditions (4) Display and Sale of Birds*. Some of these regulations require pet shop owners to stock-track all birds (both CITES and non-CITES-listed individuals).

Wild Animals and Birds Act 2000

Not to be confused with the above, Singapore's wild bird populations are also protected under the Wild Animals and Birds Act 2000. This law prohibits the capture, keeping and/or killing of wild birds without a license. It also forbids netting. Violation of this law may result in fines of up to SGD1000 (USD736). Under this law, only six bird species are exempted from licensing requirements: the House Crow *Corvus splendens*, Feral Pigeon *Columba livia*, Purple-backed Starling *Agropsar sturninus*, Philippine Glossy Starling *Aplonis panayensis*, Common Myna *Acridotheres tristis* and White-vented Myna *Acridotheres javanicus*.

METHODS

Field surveys were carried out on 4-5 November 2015 and 6-7 December 2015. During these surveys, 39 pet shops were visited, each one time. The selection of shops surveyed was based upon AVA's list of Pet Shop Grading (a system the AVA introduced in 2007 to raise the standard of animal welfare and professionalism in the pet retail industry). This list contains 41 shops that are licensed to sell birds. Two of these shops were not visited due to time constraints and locality.

A full inventory was carried out in each shop, with individuals of each species counted and where possible recorded to a subspecies level. Each surveyed shop has been provided with an identification number, allowing for analysis between shops and comparison with earlier surveys, while retaining the shops' anonymity. Domesticated species (Budgerigars *Melopsittacus undulatus*, Cockatiels *Nymphicus hollandicus*, lovebirds *Agapornis* spp., canaries *Crithagra* spp. and *Serinus* spp. and mutant plumaged parrots Psittaciformes spp.) were excluded from the inventory. Price data were obtained by asking dealers and/or observing openly advertised prices. These data were largely obtained opportunistically, and only in those cases in which it was possible to engage with dealers. Most pet shops in Singapore are open to the public every day and birds for sale are usually openly displayed. Therefore, no covert investigation or research methods were employed. Observers only counted the birds that were on open display.

Taxonomy and vernacular names used follow Gill and Donsker (2014). Birds were defined to the species level for the analyses in this study, except for analyses on origins for which the subspecies level was used. Individuals that could not be identified to a species level were omitted from analysis. Mentioned prices are based on a conversion rate of SGD 1.36 = USD 1 (<http://www.oanda.com/currency/converter/>, viewed 7 July 2016). Price data were collected in SGD and are presented here in both SGD and USD.

RESULTS

Of the 39 pet shops visited, 36 shops were open for business during the time of the survey. However, at one of the closed shops, birds (including White-rumped Shama *Copsychus malabaricus*, Red-whiskered Bulbul *Pycnonotus jocosus* and Oriental White-eye *Zosterops palpebrosus*) could clearly be heard calling inside, proving that live birds were present, and most likely available for sale. In 28 of the 36 open shops, birds were openly for sale.

In these 28 stores, a total of 14 085 birds of 109 species was recorded (a full inventory of species observed in trade is provided in Annex 1). This works out to an average of 503 birds per shop. A little over half (n=60) of the species found in shops are not listed in any of the CITES appendices. Of those species that are listed in CITES, seven are currently listed in – or have recently been approved for uplisting to – CITES Appendix I, and 41 are listed in CITES Appendix II. Table 1 provides a summary of CITES-listed species recorded during this survey (a full list of CITES-listed species encountered during the survey is provided in Annex 2).

Table 1: Summary of CITES-listed species

CITES Appendix	No of species	No of Individuals
I	7	42
II	41	350
III	1	4
NC	60	13 689
Total	109	14 085

Seventy-eight percent (n=85) of the recorded species are currently classified as Least Concern on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species¹, comprising 99% of all individuals (n=13 951). Only one Critically Endangered species was observed; Yellow-crested Cockatoo *Cacatua sulphurea*. An additional 11 Near Threatened species, eight Vulnerable species, and four Endangered species were recorded (Table 2).

Table 2: IUCN-Listed species

Species Name	Scientific Name	Number of Individuals	Number of Shops	CITES app.
CR		2	2	
Yellow-crested Cockatoo	<i>Cacatua sulphurea</i>	2	2	I
EN		35	11	
Grey Parrot	<i>Psittacus erithacus</i>	15	8	I
Lilac-crowned Amazon	<i>Amazona finschi</i>	3	2	I
Straw-headed Bulbul	<i>Pycnonotus zeylanicus</i>	1	1	II
Sun Parakeet	<i>Aratinga solstitialis</i>	16	4	II
VU		66	6	
Blue-eyed Cockatoo	<i>Cacatua ophthalmica</i>	1	1	II
Greater Green Leafbird	<i>Chloropsis sonnerati</i>	7	4	NC
Java Sparrow	<i>Lonchura oryzivora</i>	34	2	II
Javan White-eye	<i>Zosterops flavus</i>	1	1	NC
Reeves's Pheasant	<i>Syrmaticus reevesii</i>	2	1	NC
Salmon-crested Cockatoo	<i>Cacatua moluccensis</i>	1	1	I
Yellow-naped Amazon	<i>Amazona auropalliata</i>	4	1	I
Yellow-shouldered Amazon	<i>Amazona barbadensis</i>	16	2	I
NT		31	7	
Alexandrine Parakeet	<i>Psittacula eupatria</i>	1	1	II
Blue-masked Leafbird	<i>Chloropsis venusta</i>	1	1	NC
Blue-naped Parrot	<i>Tanygnathus lucionensis</i>	1	1	II
Blue-rumped Parrot	<i>Psittinus cyanurus</i>	17	2	II
Festive Amazon	<i>Amazona festiva bodini</i>	1	1	II
Green Broadbill	<i>Calyptomena viridis</i>	2	1	NC
Lesser Green Leafbird	<i>Chloropsis cyanopogon</i>	2	2	NC
Lord Derby's Parakeet	<i>Psittacula derbiana</i>	1	1	II
Red-breasted Parakeet	<i>Psittacula alexandri</i>	2	1	II
Southern Mealy Amazon	<i>Amazona farinose</i>	2	1	II
Yellow-faced Amazon	<i>Alipiopsitta xanthops</i>	1	1	II
LC		13 951	28	
Total		14 085	28	

CR: Critically Endangered; EN: Endangered; VU: Vulnerable; LC: Least Concern / NC: Non-CITES

¹ The IUCN Red List of Threatened Species™ is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species.

Species Composition

The top 10 recorded species account for 94% (n=13 294) of the total individuals observed in trade (Table 3). Note that six of the top 10 most heavily traded species are not native to Singapore – this accounts for 80% (n=10 719) of the top ten individual totals. The Oriental White-eye makes up a remarkable 46% of the total of observed specimens and is the most frequently recorded bird of this survey (see ‘Species of Concern’ under ‘Discussion’).

Table 3: Top 10 most frequently encountered birds

Species	Scientific Name	CITES App.	Native to Singapore	Number of Individuals
Oriental White-eye	<i>Zosterops palpebrosus</i>	NC	no	6473
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	NC	no	2811
Zebra Dove	<i>Geopelia striata</i>	NC	yes	1227
Red Avadavat	<i>Amandava amandava</i>	NC	no	1030
Scaly-breasted Munia	<i>Lonchura punctulata</i>	NC	yes	699
White-headed Munia	<i>Lonchura maja</i>	NC	yes	494
Bronze Mannikin	<i>Lonchura cucullata</i>	NC	no	220
White-rumped Shama	<i>Copsychus malabaricus</i>	NC	yes	155
Monk Parakeet	<i>Myiopsitta monachus</i>	II	no	96
Rose-ringed Parakeet	<i>Psittacula krameri</i>	NC	no	89
Total				13 294

NC: Non-CITES

Origin and Source

Of all of the encountered species, 27% (n=29) were found to be native to Singapore, representing less than half of the total volume of birds found in trade. Importantly, 73% of all species (n=80) and 80% of all individuals in trade (n=11 222) observed in trade were not native to Singapore (Figure 1 and 2).

Figure 1: Native and non-native species in trade

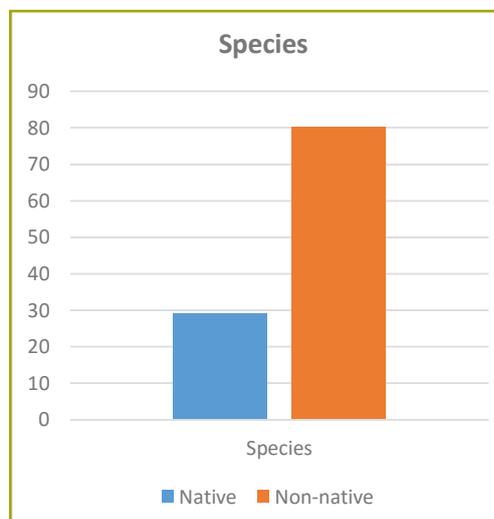
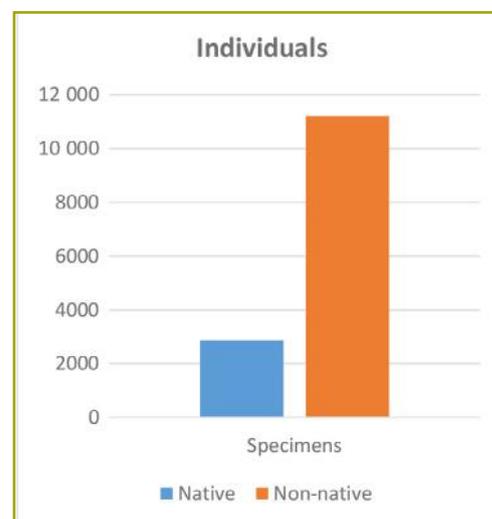


Figure 2: Native and non-native individuals in trade



DISCUSSION

CITES and International Bird Trade Involving Singapore

As noted, Singapore has a long history of trading in birds. A study carried out by TRAFFIC reported that in 1988 an estimated 700 000 birds were exported (Nash, 1993). Between 2000 and 2010, it was found by TRAFFIC that Singapore had reported the import of close to 50 000 birds from the Solomon Islands, which constituted 72% of all imports during this period (Shepherd *et al.*, 2012). A more recent study by the Wildlife Conservation Society (WCS) and TRAFFIC on the trade in CITES-listed birds in Singapore found that the country imported and exported birds from and to at least 35 and 37 countries respectively over a ten-year period, confirming its role as a trade hub in the global aviculture industry (Poole and Shepherd, 2016). The online bird trade, including the trade in CITES Appendix I and II-listed species, also appears to be extensive in Singapore (ACRES, 2016).

Singapore's bird trade history extends to the trade in various species of Psittaciformes (parrots) from across the globe. Between 2005 and 2014, 212 CITES Appendix I and II-listed bird species were imported into Singapore for commercial purposes (Poole and Shepherd, 2016). Of particular concern was the trade in Grey Parrots *Psittacus erithacus*, with Singapore accounting for almost 10% of the world's CITES-reported trade. More than 90% of these birds were declared as wild-caught and originated from the Democratic Republic of Congo (DRC). In March 2016, the CITES Secretariat suspended the trade in Grey Parrots from the DRC owing to a long-standing concern regarding trade threats to the species (CITES, 2016), meaning countries are requested to inform enforcement- and customs authorities in order to avoid the inadvertent acceptance of specimens from the DRC. This four-day survey recorded 15 individual Grey Parrots from eight shops. One shop advertised the sale of this bird for SGD1900 (USD1398). Grey Parrots were voted to be uplisted to CITES Appendix I during the CITES Conference of the Parties in September – October 2016.

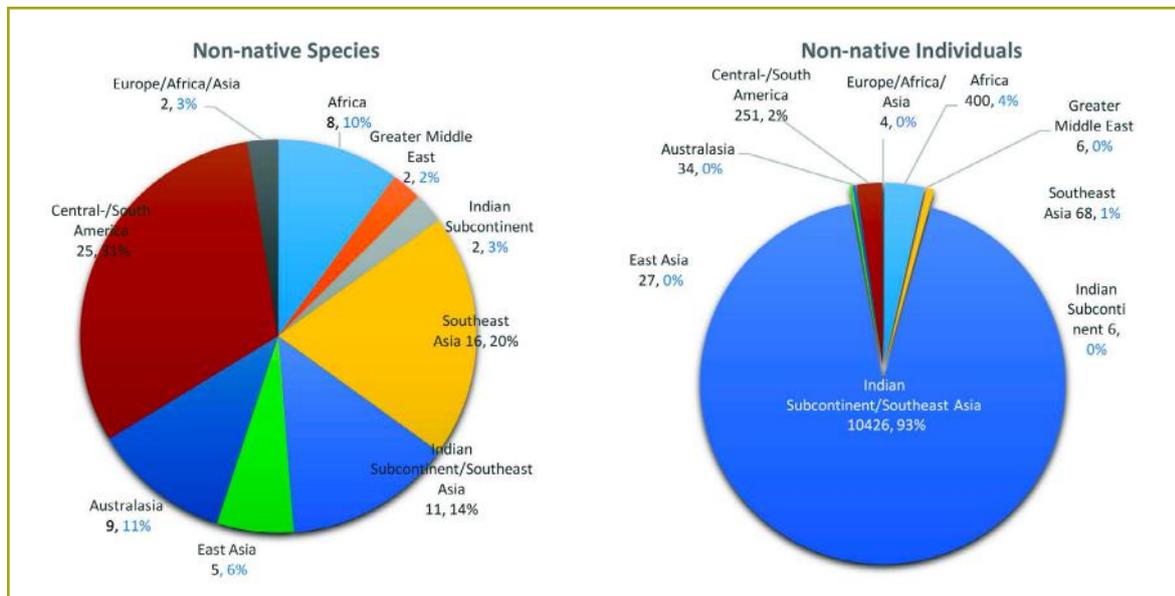
Figure 3: A Grey Parrot *Psittacus erithacus* observed in trade in Singapore in November 2015



The fact that the majority (73%) of the bird species found on sale were non-native, confirms Singapore’s role as a transit hub in the international bird trade. Of all non-native species, 35% (n=28) occur on the Indian Subcontinent and in Southeast Asia. No less than 31% (n=25) originate from Central/South America (Figure 4). While a vast majority (84%) of the Central/South American species recorded are currently listed in Appendix II of CITES, three species; Yellow-naped Amazon *Amazona auropalliata*, Yellow-shouldered Amazon *Amazona barbadensis* and Lilac-crowned Amazon *Amazona finschi*, are listed in Appendix I. All three species are widely collected for the pet trade, and especially for the Yellow-naped Amazon and Lilac-crowned Amazon, poaching for the pet trade remains a serious threat to its survival (BirdLife, 2016). A total of 23 birds from the three species were seen during this survey.

Both the Central American Lilac-crowned Amazon and the South American Sun Parakeet *Aratinga solstitialis* are considered Endangered by IUCN (Table 2). The number of bird species from the Central-/South American region documented in trade is remarkable because recent bird surveys in other Southeast Asian countries found very few birds of Central-/South American origin (Shepherd *et al.*, 2004; Chng *et al.*, 2015; Harris *et al.*, 2015; Chng and Eaton, 2016).

Figure 4: Origins of non-native species and individuals



While it is interesting to note the large number of non-native species for sale in Singapore, it must also be noted that the native species found on sale during this study were all protected under Singapore’s *Wild Animals and Birds Act 2000*. Capturing, keeping or killing these birds is prohibited.

Unfortunately, details on what species pet stores were licensed to sell (this includes details on imports and exports of CITES-listed species and quarantine regulation checks) could not be determined in the current study, as this information was unavailable from the AVA. It also remains unclear how many of the Appendix I-listed birds were captive-bred, and if any of the encountered specimens had been in circulation since before CITES was implemented in Singapore (which could be the case for some long-living species, such as Psittaciformes). The lack of transparent data impedes any effort in determining whether (and to what extent) the trade is legal. We should consider the possibility that the encountered birds that belonged to species that are not exclusively native to Singapore, were not caught in Singapore but in any of their other range countries, and were subsequently imported into Singapore. More detailed import and export analysis for CITES-listed species involving Singapore is currently not possible as the CITES trade database lacks 2015 import and export data.

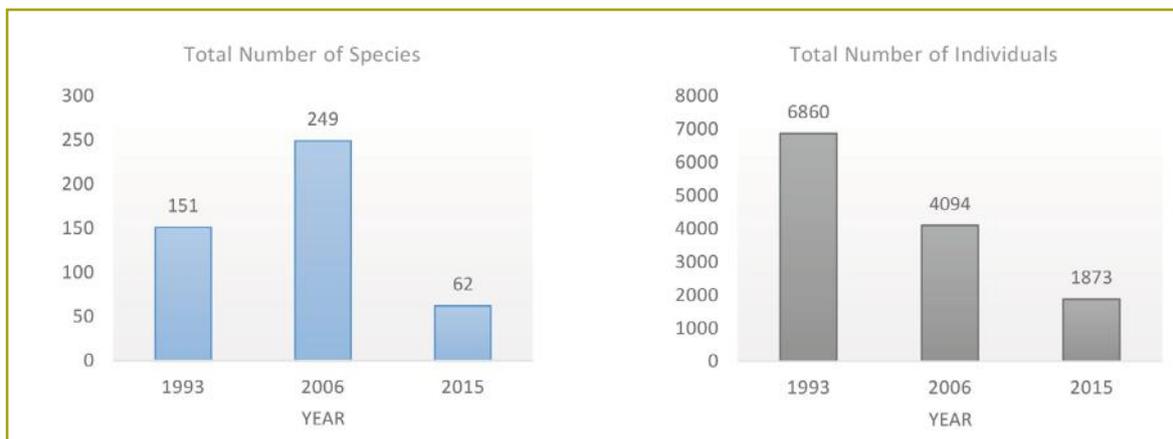
Surveys Compared

There are two known previous studies concerning the Singaporean bird shop trade. The first one was conducted between January 1992 and May 1993 and entailed 252 visits, carried out in 43 retail shops and two exporter premises (Nash, 1994). Nash found a total of 247 non-CITES species, with an average of 414 individuals per shop (Nash, 1994). The second study was conducted between August 2005 and January 2006 by Lee. During this study, 38 pet shops were visited (out of 67 AVA-certified stores), and 134 species were identified, totalling 13 968 individuals (an additional 226 birds of 28 species remained unidentified) (Lee, 2006).

Several shops that were visited for the current study were absent from the previous surveys. It is difficult to determine whether these shops were missed on the previous surveys, or simply did not exist at the time those surveys were conducted. Additionally, some businesses may have undergone a name change. In this assessment, shops that were not surveyed during the first two surveys are treated as new businesses. Two shops not present in previous studies (shop number 42 and number 48) remarkably had the largest numbers of individual birds on sale (6481 and 1085 birds respectively) (numbered shops are listed in Annex 3). Furthermore, twelve shops that used to sell large quantities of (individual) birds, now sold considerably less (shop number 2, 4, 6, 21, 26, 27, 30, 33, 38, 64, 66 and 71). Finally, five shops were found to have more individuals on sale than during previous survey(s) (number 43, 49, 51, 59 and 73). However, in these shops, the range of species on sale was found to be significantly smaller than before. This could be due to reductions in availability or demand for certain species, or because these shops changed their sales strategies, focussing on larger numbers of birds from a narrower selection of species. A detailed comparison on the diversity of species offered and number of individuals for sale is provided in Annex 3 and 4.

Ten shops were surveyed in all three studies and therefore lend themselves to comparison. However, it must be kept in mind that the previous studies were conducted over a considerable period of time, while the current study's survey was carried out in a total of four days. Nevertheless, the 1993 study bases itself on average numbers of birds sold in each shop, and in the 2006 study, shops were only visited once. Comparison between the two studies and the current study is therefore possible. The results of the respective studies suggest that the assortment of species for sale in the ten shops increased sharply between 1993 and 2006, and then decreased between 2006 and 2015. When it comes to the number of individuals for sale, a different trend can be observed. Over the years, the quantities of birds on offer seem to have decreased in almost all of the ten shops. In 2006 then, the number of species had remarkably increased, while the number of individuals had dropped. Currently, both the number of species and the number of individuals have decreased (in both cases by more than half) compared to the previous surveys (Figure 5).

Figure 5: Total number of species and individuals observed in 1993, 2006 and 2015 in ten shops



A comparison between the 1993 survey and the current study's survey for the 10 most commonly traded non-CITES species shows some commonalities in the species composition. Six of the species were recorded in both surveys (Table 4), with two African species surprisingly in the 2015 survey, while Pin-tailed Parrotfinch *Erythrura prasina* availability had declined markedly in other regional bird markets, compared to past years (van Balen, pers comm., Chng *et al.*, 2015, Chng and Eaton, 2016) (Table 4).

This survey also reinforces that Singapore's bird market has been active for more than two decades. Indeed, the volume of birds observed over a four day period is comparable to the volume of birds recorded in TRAFFIC's past surveys in Java, Indonesia, where between 19 000 and 22 000 birds were recorded over a three-day period (Chng *et al.*, 2015; Chng *et al.*, 2016b). Further, a majority of the birds recorded here were native to Indonesia, in contrast to the non-native species that dominated the Singapore bird market.

Table 4. Nash 1993 and current study's top 10 most frequently encountered birds compared

Ranking	Species	Scientific Name	2015 Number	1993 Number	Difference
1	Oriental White-eye	<i>Zosterops palpebrosus</i>	6473	10 800	-40%
2	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	2811	12 050	-77%
3	Zebra Dove	<i>Geopelia striata</i>	1227	28 950	-96%
4	Red Avadavat	<i>Amandava amandava</i>	1030	not recorded	N/A
5	Scaly-breasted Munia	<i>Lonchura punctulata</i>	699	23 350	-97%
6	White-headed Munia	<i>Lonchura maja</i>	494	12 550	-96%
7	Bronze Mannikin	<i>Lonchura cucullata</i>	220	not recorded	N/A
8	White-rumped Shama	<i>Copsychus malabaricus</i>	155	3200	-95%
9	Monk Parakeet	<i>Myiopsitta monachus</i>	96	not recorded	N/A
10	Rose-ringed Parakeet	<i>Psittacula krameri</i>	89	not recorded	N/A

Species of Concern

A selection of priority species in the Greater Sunda region was identified at the first Asian Song Bird Crisis Summit in 2015 – these species are considered to be most at risk from trade and have the highest conservation priority. Those priority species that were found during this study are listed below.

Straw-headed Bulbul *Pycnonotus zeylanicus*

The current study found just a single bird in the pet shops. None were encountered during the 2006 survey by Lee. Personal ad-hoc observations have occurred on two separate occasions in February 2015, with a total of three individuals being found on display in shop number 21 and two in shop number 31 (Chng, pers. obs., 2015).

The species was recently (December 2016) uplisted from Vulnerable to Endangered on the IUCN Red List. The species has been extirpated from much of its range; Myanmar, Thailand and Java, and no records of its presence on Sumatra have been published since 2009. It is now only found in Malaysia, Singapore and remote areas of Kalimantan (Bergin *et al.*, in prep). Generally, the population in Singapore is considered stable. However, the Singapore Annual Bird Census 2016 suggests a near 50% drop in numbers (from 60 in 2015 to 34 in 2016) (Singapore Bird Group, 2016) and further, more thorough research into this is needed. The quality of the Straw-headed Bulbul's

songs makes it a prized species and forms the main reason behind the extensive trapping of the species for both the domestic and the international cage-bird trade (BirdLife, 2016). Information from Singaporean bird dealers and bird enthusiasts in the past highlight that occasionally this species is smuggled into the country from Malaysia, claiming a preference for birds from there that are thought to be larger, with louder singing capabilities (Shepherd *et al.*, 2013).

Asian Pied Starling *Gracupica contra jalla*

The current study found a single individual of the race *jalla*; the first account of this species in trade in Singapore (Luis Neves *in litt*). Classified as Least Concern on the IUCN Red List. Although a widespread species, with a range extending from Pakistan to Indonesia, the subspecies *jalla*, endemic to Indonesia (Java and Bali), is now feared extinct in the wild (Eaton *et al.*, 2015). This taxon is of particular concern due to its distinctive plumage, and could be split as a separate species in the future (Eaton *et al.*, 2015).

Common Hill Myna *Gracula religiosa*

The current survey found only four individuals for sale in two shops, all appeared to be of the widespread subspecies *religiosa*. It is classified as Least Concern on the IUCN Red List. This is a widespread species, found throughout Southeast Asia, though some taxa of Common Hill Myna are nearing extinction in the wild (Eaton *et al.*, 2015). The Common Hill Myna is one of the most popular avian pets in Asia. From 1994–2003, over 170 000 wild-caught individuals were exported from range states (Birdlife, 2016). From 2000–2010, 2900 Common Hill Mynas reported as originating from the Solomon Islands (where they do not naturally occur) were imported by Singapore and Malaysia. In Singapore, this species was popular in the bird trade, with an estimated 4700 wild-caught birds observed in trade between January 1992 and May 1993 (Nash, 1993).

White-rumped Shama *Copsychus malabaricus*

A total of 141 individuals were recorded in 12 shops, all of which appeared to be the expected taxon *tricolor* from Peninsular Malaysia to Java. The species is classified as Least Concern on the IUCN Red List. The White-rumped Shama is a widespread species. It is found (Kalimantan, Sumatra and Java), with several Indonesian subspecies already in severe decline and possibly even extinct due to capture for the bird trade (Eaton *et al.*, 2015). In four shops, nestlings were observed, in dimly lit areas at the back of the shops, indicating some form of captive breeding or removal of chicks from the wild is taking place. Sixty-nine individuals were recorded by Lee (2006).

In addition, seven White-crowned Shama *Copsychus stricklandii* (a taxon often subsumed within White-crowned Shama and endemic to the East Malaysian state of Sabah and adjacent Kalimantan in Indonesia) were found in two shops.

Greater Green Leafbird *Chloropsis sonnerati*

Only seven individuals were recorded in four shops on this survey, and only two were recorded by Lee (Lee, 2006), indicating that the trade in this species is not as pronounced as it is in Indonesia. Nash's 1993 survey found a minimum of 400 individuals on trade in seven localities (Nash, 1993). The species is found throughout the lowland forests of the Greater Sundas, although it was recently (December 2016) reclassified as Vulnerable on the IUCN Red List, with trapping for the songbird trade, particularly in Indonesia, and habitat destruction noted as the major threats (BirdLife International, 2012; Chng *et al.*, 2015; Chng and Eaton, 2016; Eaton *et al.*, in prep.) The Greater Green Leafbird was considered a species of high concern at the Asian Songbird Crisis Summit following anecdotal evidence of large numbers being imported from Malaysia to both Sumatra and Kalimantan (Adhiasto and Miller, pers. comm.).

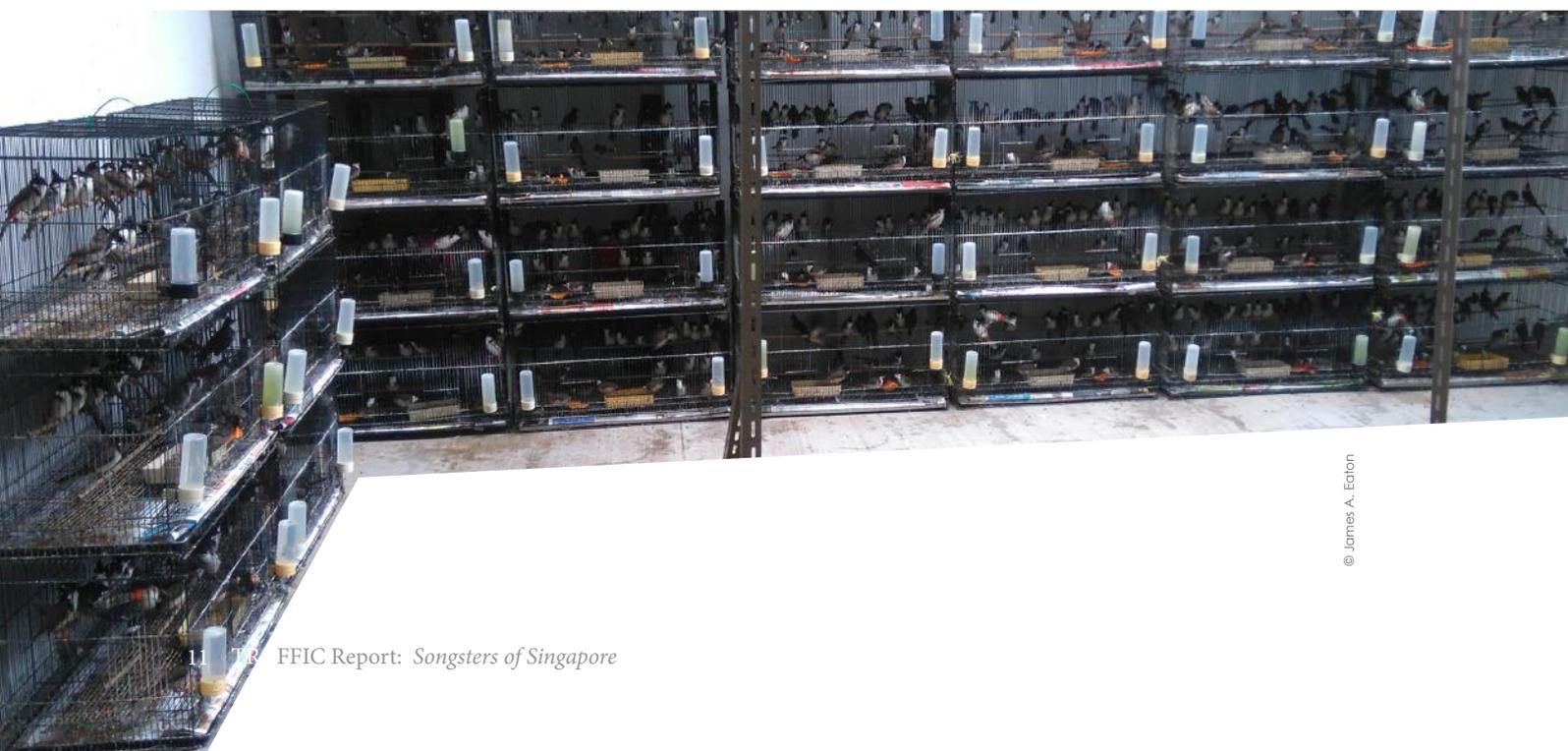
Oriental White-eye *Zosterops palpebrosus*

The Oriental White-eye was the most encountered species in trade, with almost 6500 recorded individuals. This compares to the 4884 individuals recorded in 2006 by Lee, who also found it to be the most abundant species in trade at the time. With massive numbers elsewhere in trade (Chng *et al.*, 2015; Chng and Eaton, 2016b), the species requires closer monitoring due to potential taxonomic rearrangements and implications, as identification to subspecies level is very difficult due to poorly understood plumage differences. While this species is currently regarded by the IUCN as Least Concern and is not listed in CITES, the staggering number encountered during this relatively small-scale survey is reason for concern. There are no records of extensive captive breeding programs for this species in Singapore, or anywhere else in the world, suggesting that the individuals on sale were extracted from the wild. Several shops advertised the species as originating from Malaysia. In fact, the species was previously native to Singapore but has been considered extinct in the country since THE 1970s and is now seen as a non-native resident (Jeyarajasingam, 2012, Birdlife International 2012). It appears to have been replaced by Japanese White-eye *Zosterops japonicus*, derived from escapees in many areas (Jeyarajasingam, 2012; BirdLife International, 2012). The price of the species was widely advertised and varied between SGD80 (USD59) and SGD200 (USD147), with one shop advertising birds from Malaysia at SGD120 (USD88), while birds not marked with an origin cost SGD150 (USD110). Another shop selling the species at SGD120 also had birds advertised as 'new' at SGD200. White-eyes are commonly used in singing contests (Chng *et al.*, 2015).

Red-whiskered Bulbul *Pycnonotus jocosus*

The Red-whiskered Bulbul is the second most numerous species encountered in this study, with 2811 recorded individuals. This species was also among the most numerous in Nash's (12 050) and Lee's (1907) studies. It is classified as Least Concern on the IUCN Red List. The species range stretches from southernmost Thailand to China and India, though it has now been extirpated from much of Thailand due to capture for the bird trade (Techachoochert and Round, 2013). In Thailand, there are over 100 Red-whiskered Bulbul clubs dedicated to the keeping of the species, with over 50 000 members at one club – the captive population of the species in Thailand is likely to number in the millions (Techachoochert and Round, 2013). There are also Red-whiskered Bulbul-dedicated clubs in Malaysia, who regularly meet up for singing contests (Eaton, pers. obs., 2015). The status of this species as a songbird in Singapore is highly revered. It was depicted on the SGD5 notes between

Figure 6: Over 1000 Red-whiskered Bubluls *Pycnonotus jocosus* were observed in one shop



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1976 and 1984, despite not even being native to the country. However, the bird is now a non-native resident throughout the country, not helped by continued introductions, such as part of the 1002 individuals confiscated from an unlicensed pet shop, being donated to Jurong Bird Park by the AVA, whom, along with government agencies agreed to release them (and Oriental White-eyes and Zebra Dove) into the Singapore countryside (Wildlife Reserves Singapore Year Book, 2009/2010).

Captive Breeding

A number of nestlings and fledglings were observed for sale. Most of these were Psittacines, which were likely to have been captive-bred or ranched. Young White-rumped Shama were found in four shops, generally at the back of the shops, in dim-lit, paper or cloth-covered cages. Whether or not these birds were captive-bred or harvested from the wild could not be confirmed. TRAFFIC was also not able to obtain any information regarding the captive breeding of birds in Singapore to enable analysis with results from this study. However, this issue is worthy of further investigation, considering the recent accounts of wildlife laundering practices. As illustrated in a recent report on the export of birds from the Solomon Islands (Shepherd *et al.*, 2013), traffickers may exploit legal trade channels to launder illegal wildlife products. Only by comparing annual captive breeding quota with the actual amount of birds on offer, can such practices be detected. Captive-bred individuals can usually be identified by the closed rings around their legs. In this survey, however, no more than four species were recorded to have such rings, namely Zebra Dove (380 individuals in two shops), Asian Pied Starling (one individual), Red-fan Parrot *Derophtus accipitrinus* (one individual) and Grey Parrot (three individuals in two shops). Questions about captive breeding practices (in Singapore and in range countries) relating to the latter species have been raised in a recent study (Poole and Shepherd, 2016).

Songbird Contests

Compared to other countries in the region, Singapore's bird keeping culture has only recently developed. Bird keeping started to become popular after World War II, and around 1956 the Singapore Cage Bird Society was formed by families of British Armed Forces (Yim, 2008). The regular species on show then were Budgerigars, canary species, Java Sparrow *Lonchura oryzivora*, Oriental Magpie Robin *Copsychus saularis* and Zebra Dove, followed by several parrot species (Yim, 2008).

Figure 7: Buyers waiting for the perfect song to seduce them into making a purchase



Songbird contests in Singapore started in 1964, a year after the *Kelab Burung Singapura* was formed, and bird fighting was outlawed. Instead, people started to gamble and place bets on the loudness, and variety of the songs, and stamina and posture of birds (Yim, 2008). This went from strength to strength with a greater number of species and competitions being held across the country (Yim, 2008). Today, the competitions still thrive in areas such as Ang Mo Kio Town Garden, where the Kebun Bahru Bird Singing Club holds regular songbird contests, accommodating more than 1000 cages (<http://kebunbarubirdsingingclub.weebly.com/index.html>).

The current study found older Singaporean men of Chinese ethnicity, aged (estimated) between 50-75 years old to be the predominant visitors to these shops. Often, rows of chairs or stools were placed in front of cages, where these men sat patiently observing songbirds with the intention of picking out the best singer. During the course of this survey, at least two posters in different locations were observed advertising a songbird singing contest and prices to enter the competition. They specifically targeted five species:

- White-rumped Shama at SGD20 (USD15) per individual
- Oriental Magpie Robin at SGD20 (USD15) per individual
- Chinese Hwamei *Garrulax canorus* at SGD20 (USD15) per individual
- Red-whiskered Bulbul at SGD12 (USD9) per individual
- White-eyes and at SGD12 (USD9) per individual

Events like this emphasize and popularize the entertainment value of certain species and are likely to increase the demand for these species. Indeed, as shown above, Oriental White-eye and Red-whiskered Bulbul were the most encountered species in trade.

Merit Release

Large numbers of birds, primarily munias *Lonchura* spp., weavers *Ploceus* spp. and Barn Swallows *Hirundo rustica*, are released in East and Southeast Asia for the purpose of merit release - in Buddhism, liberating animals from captivity is thought to be an important way to earn spiritual merit (Gilbert et al., 2012). In Hong Kong, this occurrence has resulted in 15% of the breeding avifauna being non-indigenous; these invasive populations are likely to have a negative impact on the native bird populations (Leven and Corlett, 2004). Furthermore, tests on birds trapped for merit release conducted in Phnom Penh detected 43/415 (10%) birds carrying influenza A virus, 1/97 (1%) carrying *Chlamydothyla psittaci*, and 4/97 (4%) carrying *Mycobacterium genavense*, posing a risk to both public health and wild bird populations (Gilbert et al., 2012).

During the current study's survey, munia species were advertised for 'merit' release in two shops. Three non-native munia species, totalling 286 individuals, were recorded. Twenty-four species which although were originally introduced in the country, have established a regular population that may or may not be self-sustaining (Lim, 2009).

Figure 8:
Typical songbird contest advertisement





Figure 9: A Zebra Dove *Geopelia striata* song contest in Singapore

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CONCLUSION AND RECOMMENDATIONS

This report has provided a snapshot of the current composition and availability of birds being openly traded in Singapore's AVA-licensed bird-selling pet shops. Request for information on trade records and other regulatory information concerning the harvesting, breeding, and trading of animals in Singapore was not made available. This has rendered a comprehensive assessment of the state of the bird trade in Singapore impossible. Consequently, it has not been possible to draw any conclusions regarding the sustainability of the industry. In light of this, and of this study's findings, TRAFFIC makes a number of recommendations below, primarily targeted at the regulatory bodies in Singapore, to aid in a better understanding of Singapore's bird trade.

Regulation and Enforcement

At present, it is not possible to determine if the bird trade in Singapore is occurring illegally, and if so, to what extent. This can only be done if the following information is made available:

- The quantity of CITES species and individuals registered for import and export, and disclosure of any quotas set by the Government for trade.
- Captive breeding activities within Singapore, including information on registered breeders and the volumes of species meant for domestic and/or international trade.
- Processes and protocols in place to regulate non-CITES, non-protected species that are being imported and exported from Singapore.

The Animal Welfare and Control Division of AVA, which issues licenses to pet shops, should conduct regular inspections to ensure that shops have the correct permits for all imported and captive-bred species, and when applicable, CITES-permits for CITES-listed species. In order for consumers to make wise purchasing decisions, AVA should introduce a regulatory requirement (including penalties for ITS violation) for shop owners to provide information on the name of the bird, its CITES status (if it involves a CITES-listed species), and its source (wild-caught/captive bred). This would allow consumers to make a conscious decision on whether to buy sustainably sourced pets or not.

Awareness and Reporting Crime

Members of the public who suspect that any illegal activity is occurring are encouraged to report suspected crime directly to AVA, or through TRAFFIC's Wildlife Witness App, which can be downloaded from the App Store or Google Play for free.



Pet Shop Monitoring

Regular monitoring of the bird trade in Singapore by the AVA with the support of local NGOs and conservation partners will be important to enable law enforcement support and the discovery of emerging trends and issues. Such monitoring should include the bird trade which occurs in pet shops, and parts of which may contravene licences and captive breeding quotas. Additionally, international trade data should be assessed. Also, monitoring of indicator species (including the species suggested in this report) that face high conservation threats from the bird trade will enable the assessment of their (over-)exploitation. Studying turnover rates to extrapolate the estimated number of birds sold per year, and determining the conservation implications of these findings, is of high importance. Consistent monitoring has also been identified as a need at the Asian Songbird Summit 2015 to support the regulation of bird trade.

Controlling Invasive Species

Several non-native species have been introduced into the Singaporean landscape as a result of the bird trade, with escapees of some species having established feral populations. These populations may have detrimental impacts on native bird populations and may require costly control measures. TRAFFIC recommends research into which native Singaporean species are threatened by these invaders and to what extent.

Managing Merit Release

Species used for merit release need to be controlled and tested, with regular monitoring of pet shops to confirm that only native species (including correct subspecies) are used for such purpose, until this practice comes to an end. Ending merit release can be achieved by further promoting 'Operation No Release'; an initiative by the Singapore National Parks Board, Public Utilities Board and AVA, and supported by local conservation organisations, to raise public awareness about the detrimental effects of animal release on natural areas. In line with this campaign, the Government has highlighted the detrimental ecological impacts of these practices on the natural environment, and has warned that first offenders may be prosecuted under the Singapore Parks and Trees Act and be fined up to SGD50 000 (USD36 789), jailed up to six months, or both.

Figure 10: A Chinese Hwamei *Garrulax canorus* in a Singapore pet store



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ANNEX 1: Total species and individuals offered for sale in Singapore's pet stores in 2015

Common Name	Scientific Name	IUCN Status	CITES Appendix	Total Number of Individuals in Trade
Oriental White-eye	<i>Zosterops palpebrosus</i>	LC	NC	6473
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	LC	NC	2811
Zebra Dove	<i>Geopelia striata</i>	LC	NC	1227
Red Avadavat	<i>Amandava amandava</i>	LC	NC	1030
Scaly-breasted Munia	<i>Lonchura punctulata</i>	LC	NC	699
White-headed Munia	<i>Lonchura maja</i>	LC	NC	494
Bronze Mannikin	<i>Lonchura cucullata</i>	LC	NC	220
White-rumped Shama	<i>Copsychus malabaricus</i>	LC	NC	155
Monk Parakeet	<i>Myiopsitta monachus</i>	LC	II	96
Rose-ringed Parakeet	<i>Psittacula krameri</i>	LC	NC	89
Spotted Dove	<i>Spilopelia chinensis tigrina</i>	LC	NC	72
Magpie Mannikin	<i>Lonchura fringilloides</i>	LC	NC	60
Montane White-eye	<i>Zosterops poliogastrus</i>	LC	NC	44
Black-headed Munia	<i>Lonchura atricapilla</i>	LC	NC	40
Eurasian Tree Sparrow	<i>Passer montanus</i>	LC	NC	40
Pin-tailed Whydah	<i>Vidua macroura</i>	LC	NC	39
Java Sparrow	<i>Lonchura oryzivora</i>	VU	II	34
Yellow-vented Bulbul	<i>Pycnonotus goiavier</i>	LC	NC	26
Oriental Magpie Robin	<i>Copsychus saularis musicus</i>	LC	NC	24
Black-headed Parrot	<i>Pionites melanocephalus</i>	LC	II	21
Blue-headed Parrot	<i>Pionus menstruus</i>	LC	II	21
Chinese Hwamei	<i>Garrulax canorus</i>	LC	II	21
Japanese White-eye	<i>Zosterops japonicus</i>	LC	NC	21
Green-cheeked Parakeet	<i>Pyrrhura molinae</i>	LC	II	19
Blue-rumped Parrot	<i>Psittinus cyanurus</i>	NT	II	17
Sun Parakeet	<i>Aratinga solstitialis</i>	EN	II	16
Yellow-shouldered Amazon	<i>Amazona barbadensis</i>	VU	I	16
Yellow-throated Greenbul	<i>Chlorocichla flavicollis</i>	LC	NC	16
Grey Parrot	<i>Psittacus erithacus</i>	EN	I	15
Blue-and-yellow Macaw	<i>Ara ararauna</i>	LC	II	11
Eclectus Parrot	<i>Eclectus roratus roratus</i>	LC	II	10
Blue-crowned Hanging Parrot	<i>Loriculus galgulus</i>	LC	II	7
Greater Green Leafbird	<i>Chloropsis sonnerati</i>	VU	NC	7
Oriental Skylark	<i>Alauda gulgula</i>	LC	NC	7
Red-and-green Macaw	<i>Ara chloropterus</i>	LC	II	7
White-crowned Shama	<i>Copsychus stricklandii stricklandii</i>	LC	NC	7
Yellow-crowned Amazon	<i>Amazona ochrocephala</i>	LC	II	7
Blue-winged Leafbird	<i>Chloropsis cochinchinensis</i>	LC	NC	6

Common Name	Scientific name	IUCN Status	CITES Appendix	Total Number of Individuals in Trade
Coconut Lorikeet	<i>Trichoglossus haematodus</i>	LC	II	6
Javan Munia	<i>Lonchura leucogastroides</i>	LC	NC	6
Orange-headed Thrush	<i>Geokichla citrina</i>	LC	NC	6
Chestnut-fronted Macaw	<i>Ara severus</i>	LC	II	5
Galah	<i>Eolophus roseicapilla</i>	LC	II	5
Long-tailed Paradise-whydah	<i>Vidua paradisaea</i>	LC	NC	5
Red-billed Leiothrix	<i>Leiothrix lutea</i>	LC	II	5
White-bellied Parrot	<i>Pionites leucogaster xanthomerius</i>	LC	II	5
Common Hill Myna	<i>Gracula religiosa</i>	LC	NC	4
Kalij Pheasant	<i>Lophura leucomelanos</i>	LC	III	4
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	LC	II	4
Turquoise-fronted Amazon	<i>Amazona aestiva</i>	LC	II	4
Yellow-naped Amazon	<i>Amazona auropalliata</i>	VU	I	4
Zebra Finch	<i>Taeniopygia guttata castanotis</i>	LC	NC	4
Bimaculated Lark	<i>Melanocorypha bimaculata</i>	LC	NC	3
Black-throated Laughingthrush	<i>Garrulax chinensis</i>	LC	NC	3
Bluethroat	<i>Luscinia svecica</i>	LC	NC	3
Crested Lark	<i>Galerida cristata</i>	LC	NC	3
Golden-fronted Leafbird	<i>Chloropsis aurifrons</i>	LC	NC	3
Lady Amherst's Pheasant	<i>Chrysolophus amherstiae</i>	LC	NC	3
Lilac-crowned Amazon	<i>Amazona finschi</i>	EN	I	3
Pied Bushchat	<i>Saxicola caprata</i>	LC	NC	3
Siberian Rubythroat	<i>Calliope calliope</i>	LC	NC	3
Spot-throated Babbler	<i>Pellorneum albiventre</i>	LC	NC	3
Baya Weaver	<i>Ploceus philippinus</i>	LC	NC	2
Blue Rock Thrush	<i>Monticola solitarius</i>	LC	NC	2
Bronze-winged Parrot	<i>Pionus chalcopterus</i>	LC	II	2
Eastern Rosella	<i>Platycercus eximius</i>	LC	II	2
Golden Pheasant	<i>Chrysolophus pictus</i>	LC	NC	2
Green Broadbill	<i>Calyptomena viridis</i>	NT	NC	2
Lesser Green Leafbird	<i>Chloropsis cyanopogon</i>	NT	NC	2
Marigold Lorikeet	<i>Trichoglossus capistratus capistratus</i>	LC	II	2
Red-bellied Macaw	<i>Orthopsittaca manilatus</i>	LC	II	2
Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	II	2
Red-fan Parrot	<i>Deroptyus accipitrinus</i>	LC	II	2
Red-shouldered Macaw	<i>Diopsittaca nobilis</i>	LC	II	2
Reeves's Pheasant	<i>Syrnaticus reevesii</i>	VU	NC	2
Southern Mealy Amazon	<i>Amazona farinosa</i>	NT	II	2
White-crested Laughingthrush	<i>Garrulax leucolophus diardi</i>	LC	NC	2
Yellow-crested Cockatoo	<i>Cacatua sulphurea</i>	CR	I	2
Alexandrine Parakeet	<i>Psittacula eupatria</i>	NT	II	1

Common Name	Scientific Name	IUCN Status	CITES Appendix	Total Number of Individuals in Trade
Asian Pied Starling	<i>Gracupica contra jalla</i>	LC	NC	1
Barred Warbler	<i>Sylvia nisoria</i>	LC	NC	1
Black-naped Oriole	<i>Oriolus chinensis</i>	LC	NC	1
Blue Whistling Thrush	<i>Myophonus caeruleus</i>	LC	NC	1
Blue-eyed Cockatoo	<i>Cacatua ophthalmica</i>	VU	II	1
Blue-masked Leafbird	<i>Chloropsis venusta</i>	NT	NC	1
Blue-naped Parrot	<i>Tanygnathus lucionensis</i>	NT	II	1
Chinese Blackbird	<i>Turdus mandarinus</i>	LC	NC	1
Crimson Sunbird	<i>Aethopyga siparaja</i>	LC	NC	1
Dusky Parrot	<i>Pionus fuscus</i>	LC	II	1
Festive Amazon	<i>Amazona festiva bodini</i>	NT	II	1
Finsch's Parakeet	<i>Psittacara finschi</i>	LC	II	1
Javan White-eye	<i>Zosterops flavus</i>	VU	NC	1
Lord Derby's Parakeet	<i>Psittacula derbiana</i>	NT	II	1
Major Mitchell's Cockatoo	<i>Cacatua leadbeateri</i>	LC	II	1
Mongolian Lark	<i>Melanocorypha mongolica</i>	LC	NC	1
Orange-bellied Leafbird	<i>Chloropsis hardwickii</i>	LC	NC	1
Palm Cockatoo	<i>Probosciger aterrimus</i>	LC	I	1
Red-crested Turaco	<i>Tauraco erythrolophus</i>	LC	II	1
Rosy Starling	<i>Pastor roseus</i>	LC	NC	1
Salmon-crested Cockatoo	<i>Cacatua moluccensis</i>	VU	I	1
Siberian Blue Robin	<i>Larvivora cyane</i>	LC	NC	1
Siberian Thrush	<i>Geokichla sibirica</i>	LC	NC	1
Straw-headed Bulbul	<i>Pycnonotus zeylanicus</i>	EN	II	1
Sumatran Leafbird	<i>Chloropsis media</i>	LC	NC	1
Thick-billed Heleia	<i>Heleia crassirostris</i>	LC	NC	1
White-capped Parrot	<i>Pionus seniloides</i>	LC	II	1
White-crowned Parrot	<i>Pionus senilis</i>	LC	II	1
Yellow-faced Amazon	<i>Alipiopsitta xanthops</i>	NT	II	1
Zappey's Flycatcher	<i>Cyanoptila cumatilis</i>	LC	NC	1

Figure 11: Zebra Doves *Geopelia striata* were among the most commonly encountered birds in pet stores in Singapore



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ANNEX 2: CITES-listed species offered for sale in Singapore's pet stores in 2015

CITES I	CITES II	CITES III
Grey Parrot	Alexandrine Parakeet	Kalij Pheasant
Lilac-crowned Amazon	Black-headed Parrot	
Palm Cockatoo	Blue-and-yellow Macaw	
Salmon-crested Cockatoo	Blue-crowned Hanging Parrot	
Yellow-crested Cockatoo	Blue-eyed Cockatoo	
Yellow-naped Amazon	Blue-headed Parrot	
Yellow-shouldered Amazon	Blue-naped Parrot	
	Blue-rumped Parrot	
	Bronze-winged Parrot	
	Chestnut-fronted Macaw	
	Chinese Hwamei	
	Coconut Lorikeet	
	Dusky Parrot	
	Eastern Rosella	
	Eclectus Parrot	
	Festive Amazon	
	Finsch's Parakeet	
	Galah	
	Green-cheeked Parakeet	
	Java Sparrow	
	Lord Derby's Parakeet	
	Major Mitchell's Cockatoo	
	Marigold Lorikeet	
	Monk Parakeet	
	Red-and-green Macaw	
	Red-bellied Macaw	
	Red-billed Leiothrix	
	Red-breasted Parakeet	
	Red-crested Turaco	
	Red-fan Parrot	
	Red-shouldered Macaw	
	Southern Mealy Amazon	
	Straw-headed Bulbul	
	Sulphur-crested Cockatoo	
	Sun Parakeet	
	Turquoise-fronted Amazon	
	White-bellied Parrot	
	White-capped Parrot	
	White-crowned Parrot	
	Yellow-crowned Amazon	
	Yellow-faced Amazon	
Total: 7	Total: 41	Total: 1

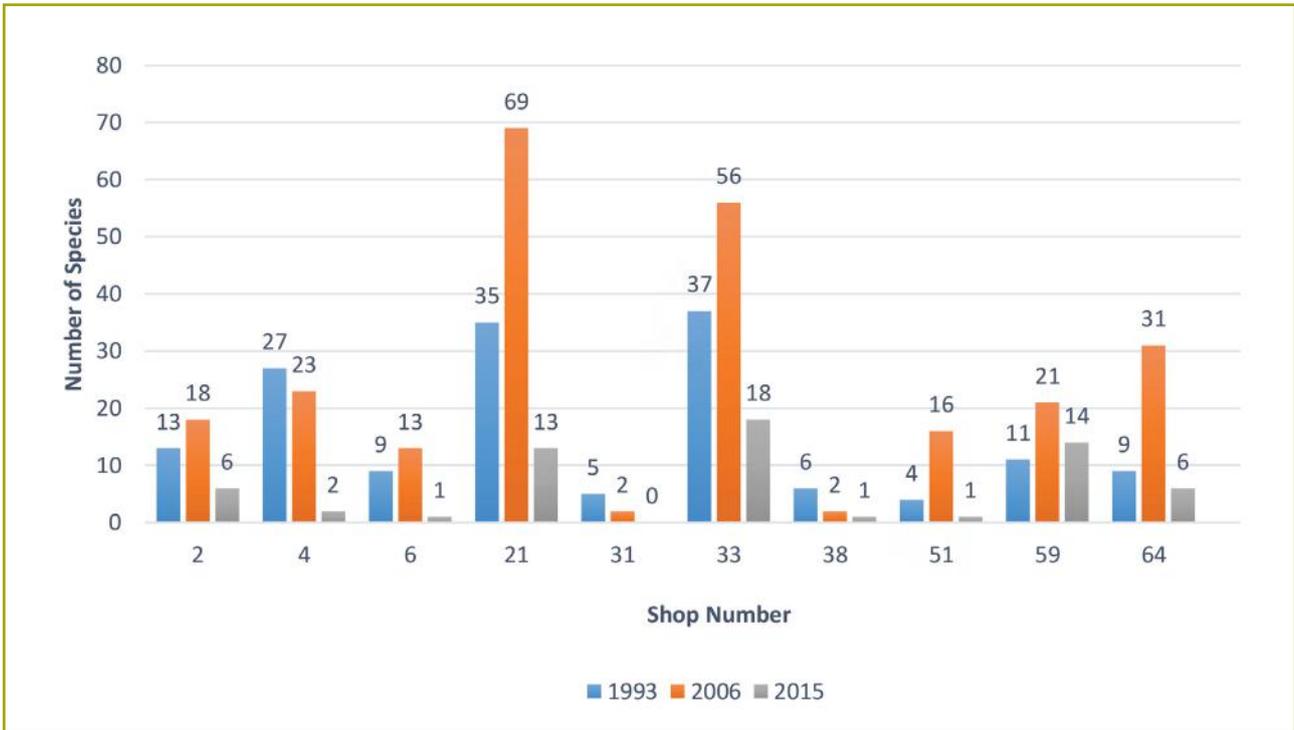
ANNEX 3: Comparison of Singapore bird trade surveys in 1993, 2006 and 2015

Shop Number	Nash (1993)		Lee (2006)		2015 Survey	
	No of Species	No of Individuals	No of Species	No of Individuals	No of Species	No of Individuals
1			10	125	-	-
2	-	-	18	666	6	43
3	13	500	-	-	no birds on sale	
4	3	60	23	859	2	26
5	27	1300	-	-	5	11
6	4	12	13	418	1	5
7	9	600	13	139	-	-
8	-	-	15	672	-	-
9	15	1400	-	-	no birds on sale	
10	-	-	-	-	Closed during survey	
11	-	-	-	-	-	-
12	14	370	30	1076	-	-
13	-	-	-	-	2	6
14	-	-	-	-	3	23
15	-	-	-	-	Closed during survey	
16	-	-	5	201	-	-
17	-	-	-	-	-	-
18	5	75	-	-	-	-
19	3	200	-	-	1	2
20	-	-	-	-	-	-
21	7	170	69	833	13	289
22	35	1200	9	169	-	-
23	11	200	-	-	-	-
24	7	200	9	378	-	-
25	4	140	33	401	-	-
26	-	-	6	121	6	55
27	-	-	13	387	9	51
28	-	-	14	322	closed	
29	10	350	-	-	-	-
30	3	70	6	210	3	43
31	-	-	2	71	no birds	
32	5	200	-	-	-	-
33	5	90	56	457	18	275
34	37	1000	-	-	1	1
35	-	-	-	-	no birds	
36	-	-	-	-	-	-
37	8	90	4	593	-	-
38	-	-	2	6	1	3
39	6	160	-	-	-	-

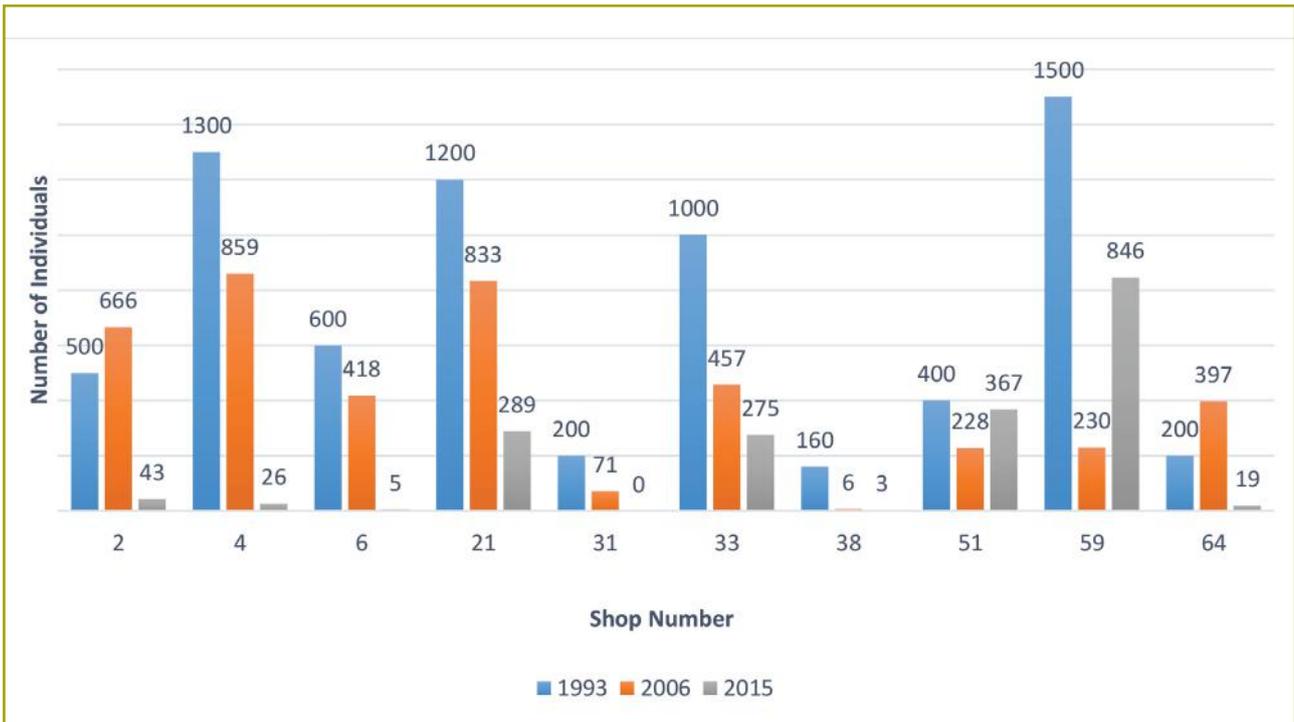
Shop Number	Nash (1993)		Lee (2006)		2015 Survey	
	No of Species	No of Individuals	No of Species	No of Individuals	No of Species	No of Individuals
40	14	700	-	-	-	-
41	6	200	-	-	-	-
42	10	400	-	-	4	6481
43	-	-	7	420	4	1424
44	-	-	9	286	-	-
45	8	500	-	-	-	-
46	9	500	-	-	1	700
47	-	-	4	295	-	-
48	-	-	-	-	6	1085
49	-	-	2	123	1	297
50	-	-	4	11	-	-
51	5	100	16	228	1	367
52	4	400	-	-	-	-
53	11	600	-	-	-	-
54	4	-	-	-	-	-
55	1	5	8	96	-	-
56	-	-	-	-	-	-
57	5	500	-	-	3	72
58	-	-	-	-	-	-
59	15	1100	21	230	14	846
60	11	1500	31	251	-	-
61	-	-	-	-	-	-
62	5	350	-	-	no birds	
63	-	-	-	-	no birds	
64	-	-	31	397	6	19
65	9	200	-	-	-	-
66	2	-	14	1275	3	490
67	-	-	-	-	no birds	
68	-	-	-	-	1	11
69	-	-	-	-	-	-
70	3	5	14	260	-	-
71	10	400	39	788	4	164
72	-	-	5	33	-	-
73	-	-	26	500	8	1126
74	-	-	-	-	-	-
75	12	300	-	-	2	170
76	-	-	-	-	-	-
77	12	350	-	-	-	-
78	1	-	-	-	no birds	
79	-	-	7	436	-	-
80	7	500	10	101	-	-
81	-	-	29	360	-	-

Green text denotes shops surveyed during all three periods

ANNEX 4: Species observed in trade, per shop, in 1993, 2006, 2015



ANNEX 5: Number of individual birds observed, per shop, in 1993, 2006, 2015



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.

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