

Review

Shades of grey: the legal trade in CITES-listed birds in Singapore, notably the globally threatened African grey parrot *Psittacus erithacus*

COLIN M. POOLE and CHRIS R. SHEPHERD

Abstract There are few published studies quantifying the volume of wildlife being traded through Singapore. We report on Singapore's involvement in the trade of avifauna listed on CITES based on government-reported data to CITES, with particular emphasis on Singapore's role in the trade of the globally threatened African grey parrot *Psittacus erithacus*. During 2005–2014 Singapore reported commercial import permits for 225,561 birds, from 35 countries, listed on CITES Appendices I and II, and the export of 136,912 similarly listed birds to 37 countries, highlighting the country's role as a major international transshipment hub for the global aviculture industry. Major exporters to Singapore included the Solomon Islands, the Netherlands, Taiwan, the Democratic Republic of the Congo, and South Africa. Major importers from Singapore included Taiwan, the United Arab Emirates and Japan. Singapore imported significant quantities of CITES-listed birds from African countries, including the Central African Republic, the Democratic Republic of the Congo, Guinea and South Africa, a number of which have a history of abuse of CITES export permits, discrepancies in reported trade data, or an acknowledged lack of wildlife law enforcement capacity. Significant discrepancies were detected between import and export figures of CITES-listed avifauna reported by Singapore and its trading partners. Based on these findings we present three recommendations to improve the regulation and monitoring of the trade in CITES-listed bird species in Singapore.

Keywords African grey parrot, avian conservation, bird trade, CITES, *Psittacus erithacus*, Singapore, wildlife trade

Introduction

The global wildlife trade is a multibillion dollar industry (Engler & Parry-Jones, 2007; Roe, 2008; Wyler & Sheikh, 2013), with millions of animals and their derivatives traded each year to meet consumer demand (TRAFFIC,

2015). This is particularly so for pet birds in South-east Asia (Lin, 2005), where a study of five cities in Indonesia estimated that as many as 2.6 million birds were kept, and concluded that the scale of bird-keeping warranted conservation intervention (Jepson & Ladle, 2005). Studies have highlighted the importance of improving monitoring at various trade hubs worldwide, not only from a conservation perspective but also in controlling the potential spread of infectious diseases that could affect the health of people or domestic animals (Daszak et al., 2000; Karesh et al., 2007; Nijman, 2010; Rosen & Smith, 2010; Travis et al., 2011). Much of the trade in wildlife is thought to pass through such hubs and these provide the greatest opportunity to maximize the effects of regulatory efforts. The South-east Asian city-state of Singapore is believed to be a trade hub (Sodhi et al., 2004; Lee, 2006) but little has been published that quantifies the extent of the global wildlife trade moving through the country.

Singapore became a signatory to CITES in November 1986, and the Agri-Food and Veterinary Authority, a statutory board of the Ministry of National Development, is both the Management and Scientific Authority responsible for the implementation and enforcement of CITES in Singapore (CITES, 2015a). The Endangered Species (Import and Export) Act (Chapter 92A) was enacted in 1989 to give legal effect to the implementation and enforcement of CITES in Singapore, and the three schedules to the Act list the threatened species. Under the Act a permit is required to import, export or re-export a scheduled species and/or any of its parts or derivatives (Lye, 1999; AVA, 2015).

An investigation of the role of the Solomon Islands in the global bird trade reported that Singapore had played a major role in the movement of significant numbers of wild-caught, CITES-listed birds (Shepherd et al., 2012). The birds, predominantly parrots and cockatoos, had been falsely declared as being captive-bred in the Solomon Islands despite the country lacking any avian breeding facilities. The report highlighted Singapore's role in the transport of large volumes of CITES-listed birds to importers elsewhere, with 12 of the 14 species imported to Singapore from the Solomon Islands subsequently re-exported to other nations (Shepherd et al., 2012).

The two main aims of this study were (1) to quantify Singapore's legal trade of CITES Appendix I and II listed

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Received 25 September 2013. Revision requested 22 November 2013.

Accepted 22 February 2016. First published online 13 April 2016.

birds during recent years, with emphasis on volumes, sources and destinations of birds moving in and out of the country, and (2) to document Singapore's role in the trade of the African grey parrot *Psittacus erithacus*, a globally threatened species that is heavily traded through Singapore. The African grey parrot is endemic to the forests of West and Central Africa, and its gentle nature and ability to mimic human speech make it one of the most popular avian pets. This has made the parrot a prime target for poachers (BirdLife International, 2015). The species is categorized as Vulnerable on the IUCN Red List and is listed on CITES Appendix II (Birdlife International, 2015). It is reportedly one of the most popular species within the Singaporean aviculture scene, with a retailer reporting to a journalist that 'demand is good but supply is low' (Chan, 2012). The parrot's distinctive appearance, popularity among bird owners and global conservation status make it an ideal candidate to raise awareness of the global bird trade and conservation.

Methods

We focus on the legal commercial trade in live CITES Appendix I and II listed bird species to and from Singapore during 2005–2014 (data from 2014 comprised a single entry at the time of analysis). Relevant data were retrieved from the CITES trade database (CITES, 2015b), which contains records of the import, export and re-export of CITES-listed species as reported to the CITES Secretariat by CITES Parties. Such reporting is mandatory under the Convention, highlighted in CITES Article VII, which requires each Party to maintain trade records for all CITES-listed species (CITES, 1979).

According to Article VIII of CITES, Parties are required to submit data annually to the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) based on actual trade or the number of permits issued (CITES, 1979). This is clarified in the Notification to the Parties No. 2011/019, Guidelines for the Preparation and Submission of CITES Annual Reports (February 2011), which states: 'As far as possible, data in the report should record the actual trade that took place; i.e. the quantity of specimens that entered or left the country. If it is not possible to report the actual exports and re-exports, data on such trade should come from each permit and certificate issued...The report should state clearly whether the data used for the records of imports and exports/re-exports are based on permits/certificates issued or on actual trade' (CITES, 2011).

The Agri-Food and Veterinary Authority has stated that information provided by Singapore to UNEP-WCMC relating to the bird trade is based on the number of permits issued (Lee, 2006; Shepherd et al., 2012). As this is not stated clearly in the CITES database it is possible that actual figures

may not match the quantities recorded in the database, as a result of permits being issued and then not being used by the trader. Many CITES Parties fail to monitor and report international wildlife trade systematically (Phelps et al., 2010), which raises concerns about potentially significant under-reporting in the CITES database.

Data obtained from the database were analysed with special attention to import and export data and the provenance of traded specimens. All commercial trade in CITES-listed birds involved live individuals, and each entry in the database contained the following data: species; year of import/export (2005–2014); import and export quantity (reported in individuals); export purpose (in this case for commercial trade); and export source (whether the bird was wild-caught or captive-bred).

Results

Species traded

A total of 212 CITES Appendix I and II listed bird species were reported as having been imported into Singapore for commercial purposes during 2005–2014. Of these, 29 species are categorized as Vulnerable, Endangered or Critically Endangered on the IUCN Red List (Table 1). During the same period Singapore reported exporting 195 CITES Appendix I and II listed bird species for commercial purposes, of which 24 are categorized as Vulnerable, Endangered or Critically Endangered (Table 1).

Parrots were the most commonly traded species during this period, occupying all top 10 positions in the import data, with half of these species originating in Africa (Table 2). Based on CITES data the African grey parrot was the most intensively traded species, with more than twice the number of specimens reported imported into Singapore compared to any other species.

Similarly, parrots also dominated the re-export data. With the exception of the common hill myna *Gracula religiosa*, nine of the top 10 most commonly reported exported species from Singapore were parrots (Table 3). However, unlike the imports, more than half of these species originated in the Asia–Pacific region. Once again, however, the African grey parrot was the most intensively traded species, with more than three times the number of specimens reported exported from Singapore compared to any other species.

Origin and volume

Singapore imported 225,561 birds from 35 exporting countries during 2005–2014. It reported exports of 136,912 birds to 37 countries in the same time period. Eight of the 35 countries/territories accounted for 74% of overall import volume during 2005–2014. The top eight exporters were the

TABLE 1 Bird species categorized as Vulnerable, Endangered or Critically Endangered on the IUCN Red List (BirdLife International, 2015) that were imported to or re-exported from Singapore during 2005–2014.

Species imported into Singapore (No.)	Species re-exported from Singapore (No.)
Critically Endangered	
Bali myna <i>Leucopsar rothschildi</i> (4)	Yellow-crested cockatoo <i>Cacatua sulphurea</i> (72)
Swift parrot <i>Lathamus discolor</i> (551)	Swift parrot <i>Lathamus discolor</i> (72)
Endangered	
Sun conure <i>Aratinga solstitialis</i> (10,686)	Sun conure <i>Aratinga solstitialis</i> (6,751)
Grey crowned crane <i>Balearica regulorum</i> (8)	Grey crowned crane <i>Balearica regulorum</i> (6)
White cockatoo <i>Cacatua alba</i> (381)	White cockatoo <i>Cacatua alba</i> (1,072)
White-bellied parrot <i>Pionites leucogaster</i> (1,724)	White-bellied parrot <i>Pionites leucogaster</i> (648)
Green peafowl <i>Pavo muticus</i> (4)	Green peafowl <i>Pavo muticus</i> (10)
Egyptian vulture <i>Neophron percnopterus</i> (2)	Purple-naped lory <i>Lorius domicella</i> (6)
Visayan hornbill <i>Penelopides panini</i> (4)	Saker falcon <i>Falco cherrug</i> (1)
Yellow cardinal <i>Gubernatrix cristata</i> (30)	
Green racket-tail <i>Prioniturus luconensis</i> (24)	
Lilac-crowned amazon <i>Amazona finschi</i> (1)	
Vulnerable	
Golden conure <i>Guaruba guarouba</i> (27)	Golden conure <i>Guaruba guarouba</i> (12)
Yellow-billed amazon <i>Amazona collaria</i> (4)	Yellow-billed amazon <i>Amazona collaria</i> (4)
Blue-eyed cockatoo <i>Cacatua ophthalmica</i> (106)	Blue-eyed cockatoo <i>Cacatua ophthalmica</i> (30)
Java sparrow <i>Lonchura oryzivora</i> (3,802)	Java sparrow <i>Lonchura oryzivora</i> (1,200)
African grey parrot <i>Psittacus erithacus</i> (41,737)	African grey parrot <i>Psittacus erithacus</i> (31,529)
Pesquet's parrot <i>Psittichas fulgidus</i> (48)	Pesquet's parrot <i>Psittichas fulgidus</i> (48)
Crimson-bellied parakeet <i>Pyrrhura perlata</i> (479)	Crimson-bellied parakeet <i>Pyrrhura perlata</i> (348)
Chattering lory <i>Lorius garrulus</i> (588)	Chattering lory <i>Lorius garrulus</i> (1,868)
Channel-billed toucan <i>Ramphastos vitellinus</i> (16)	Channel-billed toucan <i>Ramphastos vitellinus</i> (6)
White-throated toucan <i>Ramphastos tucanus</i> (30)	White-throated toucan <i>Ramphastos tucanus</i> (2)
Yellow-naped amazon <i>Amazona auropalliata</i> (27)	Moluccan cockatoo <i>Cacatua moluccensis</i> (376)
Hispaniolan amazon <i>Amazona ventralis</i> (1)	Western crowned pigeon <i>Goura cristata</i> (80)
Blue bird-of-paradise <i>Paradisaea rudolphi</i> (10)	Southern crowned pigeon <i>Goura scheepmakeri</i> (14)
Secretarybird <i>Sagittarius serpentarius</i> (8)	Malayan peacock-pheasant <i>Polyplectron malacense</i> (23)
Shoebill <i>Balaeniceps rex</i> (10)	Salmon-crested cockatoo <i>Cacatua moluccensis</i> (81)
Wattled crane <i>Bugeranus carunculatus</i> (4)	
Hyacinth macaw <i>Anodorhynchus hyacinthinus</i> (1)	

Netherlands (15%), South Africa (14%), the Solomon Islands (12%), the Democratic Republic of the Congo (10%), Taiwan (7%), Guinea (6%), the Central African Republic (5%) and Guyana (5%). Three of the 37 countries/territories accounted for 84% of total export volume during 2005–2014. The most significant importer of birds from Singapore was Taiwan, accounting for 66% of total re-export volume, followed by the United Arab Emirates (11%) and Japan (7%).

Trade in African grey parrots via Singapore

Imports to Singapore A total of 41,737 African grey parrots were reported as imports into Singapore during 2005–2014: 21,407 individuals declared as captive-bred and 20,330 declared as wild-caught. This represented 9.2% of CITES-reported African grey parrot exports globally during the same period. A total of 40,610 parrots, accounting for 97% of all African grey parrots reported to have entered Singapore, originated in eight

African countries, namely, Congo, the Democratic Republic of the Congo, the Central African Republic, Guinea, Ivory Coast, Cameroon, Liberia and South Africa. A review of the origin of the declared captive-bred birds indicated that all major exporters to Singapore (trade volumes of >1,000 birds) were countries in Central and West Africa, with the Central African Republic being the main supplier of African grey parrots declared as captive-bred, exporting a total of 9,010 birds to Singapore during 2005–2014. Singapore was one of only two importers of this species from the Central African Republic during the study period, the other being the United Arab Emirates, which reported importing 650 birds in 2005. The majority (90.2%) of African grey parrots declared as wild-caught originated from the Democratic Republic of the Congo, which reportedly exported 18,344 wild-caught individuals to Singapore during the study period. In contrast to the Central African Republic the Democratic Republic of the Congo exported declared wild-caught African grey parrots to multiple countries (86,744 individuals to 29

TABLE 2 The 10 most commonly reported CITES-listed bird species imported into Singapore during 2005–2014, with their natural range, IUCN threat category, and quantity imported.

Species	Natural range	IUCN threat category	Quantity imported* (% total import volume)
African grey parrot	Africa	Vulnerable	41,737 (18.5)
Monk parakeet <i>Myiopsitta monachus</i>	South America	Least Concern	20,569 (9.1)
Sun conure	South America	Endangered	10,686 (4.7)
Senegal parrot <i>Poicephalus senegalus</i>	Africa	Least Concern	9,747 (4.3)
Fischer's lovebird <i>Agapornis fischeri</i>	Africa	Near Threatened	8,524 (3.8)
Masked lovebird <i>Agapornis personatus</i>	Africa	Least Concern	8,220 (3.6)
Yellow-bibbed lory <i>Lorius chlorocercus</i>	Solomon Islands	Least Concern	7,986 (3.5)
Ducorps' cockatoo <i>Cacatua ducorpsii</i>	Solomon Islands	Least Concern	6,334 (2.8)
Eclactus parrot <i>Eclactus roratus</i>	Solomon Islands; Indonesia	Least Concern	5,260 (2.3)
Jardine's parrot <i>Poicephalus gulielmi</i>	Africa	Least Concern	5,064 (2.2)

*Includes birds declared as captive-bred as well as wild-caught

TABLE 3 Top 10 bird species most commonly exported from Singapore during 2005–2014, as reported in the CITES trade database.

Species	Natural range	IUCN threat category	Quantity exported* (% total export volume)
African grey parrot	Africa	Vulnerable	31,529 (23.0)
Monk parakeet	South America	Least Concern	10,163 (7.4)
Sun conure	South America	Endangered	6,751 (4.9)
Senegal parrot	Africa	Least Concern	5,389 (3.9)
Common hill myna <i>Gracula religiosa</i>	South-east Asia	Least Concern	5,270 (3.8)
Eclactus parrot	Solomon Islands; Indonesia	Least Concern	4,140 (3.0)
Red lory <i>Eos rubra</i>	Indonesia	Least Concern	3,786 (2.8)
Yellow-bibbed lory	Solomon Islands	Least Concern	3,714 (2.7)
Red-rumped parrot <i>Psephotus haematonotus</i>	Australia	Least Concern	3,282 (2.4)
Ducorps' cockatoo <i>Cacatua ducorpsii</i>	Solomon Islands	Least Concern	3,036 (2.2)

*Includes birds declared as captive-bred as well as wild-caught

countries during the study period). Singapore, however, was the second largest importer, accounting for 21% of all exports. During 2005–2014 the total number of declared captive-bred African grey parrots reportedly imported into Singapore declined from 5,971 in 2005 to 35 in 2013. In contrast, the number declared as wild-caught increased from 830 in 2005 to 3,560 in 2006 before undergoing a gradual decline to 1,400 by 2010, but subsequently more than doubled to 3,600 in 2012 before declining to 1,300 in 2014 (Fig. 1).

Exports from Singapore During 2005–2014 Singapore reported exporting 31,529 African grey parrots, of which 20,785 were declared as captive-bred and 9,912 as wild-caught; a further 832 had no source information recorded. Parrots were exported to 14 countries/territories, notably Taiwan (23,161 individuals), the United Arab Emirates (4,800) and Japan (1,374). Import data for Taiwan indicate that Singapore was the main supplier of this species to Taiwan, with 99% of all African grey parrots entering Taiwan exported from Singapore.

Discussion

We provide the first quantitative measure, based on Government data reported to CITES, of Singapore's involvement in the global commercial trade of CITES Appendix I and II listed avifauna. During 2005–2014 the country reported importing > 220,000 individuals of CITES Appendix I and II listed birds for commercial purposes. Trade included 212 CITES-listed species, comprising 14.8% of Appendix I and II listed bird species (CITES, 2013). This trend is mirrored in Singapore's involvement in the global trade of African grey parrots, accounting for c. 9% of global reported re-exports during the study period. Singapore's role as a trans-shipment hub is also evident, with imports from and re-exports to > 30 nations, and with a particularly important role in the transport of avifauna from Europe and Africa to East Asia and the Middle East.

However, this is undoubtedly a significant underestimate of the true volumes of avian trade, as the analysis was restricted to reported legal trade in CITES Appendix I and II listed avifauna. It did not quantify Appendix III or

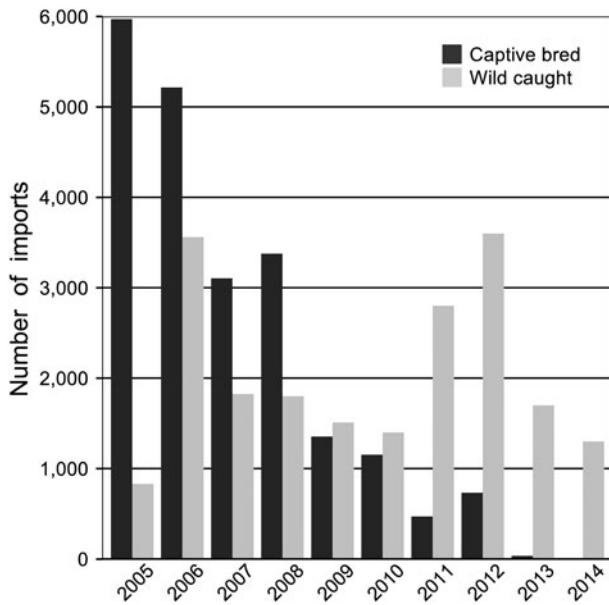


FIG. 1 Reported imports of declared wild-caught and captive-bred African grey parrots *Psittacus erithacus* into Singapore between 2005 and 2014 (CITES, 2015b).

non-CITES listed birds, the latter of which historically accounted for 90% or more of the bird trade in Singapore (Nash, 1993), nor did it assess trade involving birds in transit between third party countries, which might only pass through Singaporean ports but never legally enter the country or require Singapore to issue a CITES permit. Furthermore, no aspect of potential illegal trade was considered.

A 2006 CITES Significant Trade Review of African grey parrots highlighted that trade originating in three of the top eight exporters of CITES-listed birds to Singapore (Guinea, the Democratic Republic of the Congo, and the Central African Republic) was of possible or urgent concern because of unsustainable export levels (CITES, 2006). The review noted these countries had low capacities for enforcement of wildlife-related regulations, and lacked information confirming the presence of captive-breeding facilities in these countries. Of particular concern is the trade originating in the Democratic Republic of the Congo, which has a history of abuse of export permits; for example, in September 2010 the authorities there seized 523 African grey parrots bound for Singapore with forged CITES documentation that named a Singaporean company as the importer (Eckles, 2010). Notably, although 523 birds were seized, the accompanying CITES documentation was only for 300 (Heath, 2010). The Democratic Republic of the Congo also has a record of routinely exceeding quota levels (CITES, 2006). Our findings suggests that, in the case of African grey parrots, this continues; during 2005–2014 the country exceeded its legal export quota for wild-caught African grey parrots for 7 of the 10 years (Table 4). Similar dynamics have been

highlighted concerning the role of the Solomon Islands in the global bird trade, including exports to Singapore (Shepherd et al., 2012).

It is the responsibility of the CITES Management Authority in the recipient country to be satisfied that specimens are imported into that country in accordance with the provisions of CITES (CITES, 1979). In lieu of these findings where data are deficient, Singapore should exercise caution when importing and re-exporting CITES-listed birds from such countries as the Central African Republic and the Democratic Republic of the Congo.

A number of discrepancies were recorded between reported import and export figures of CITES Appendix I and II listed birds in Singapore. During 2005–2014 a minimum of 85,649 birds were unaccounted for (i.e. not re-exported) after arrival in Singapore. Birds that are not re-exported are presumed to have entered the domestic market but the scale of the discrepancy suggests this is unlikely. To illustrate the magnitude of this finding, in 2014 the total number of resident households was 1.2 million (Singapore Department of Statistics, 2015). Were the discrepancy representative of the local bird market, a mean of 7.1 out of every 100 households in Singapore would have owned a CITES Appendix I or II listed bird in 2014, which seems unlikely. It is plausible that these birds could be housed in local captive-breeding facilities but information is not available to ascertain if these facilities are capable of housing such large numbers of birds. Another possible contributing factor to the discrepancies between the CITES import and re-export data is that the Agri-Food and Veterinary Authority has stated previously that information provided by Singapore to UNEP-WCMC relating to the bird trade is based on the number of permits issued rather than the actual import or export taking place (Lee, 2006; Shepherd et al., 2012). However, it is unlikely that this discrepancy could account for > 80,000 birds over a 7-year period. Further investigation is required to ascertain the causes of such discrepancies within the data, as an inability to monitor the movement of such species fundamentally undermines CITES and facilitates potential loopholes for illegal trade.

There were also inconsistencies recorded between countries in the reporting of trade volumes, particularly involving countries importing birds from Singapore. This is not the first time such discrepancies have been highlighted. In 2004 CITES bird import data reported by Singapore did not tally with export records from two of its regional trading partners, Indonesia and Malaysia, with significant discrepancies associated with the former (Lee, 2006). These observations are of even greater concern when the trade history between Singapore and its major trading partner Taiwan is taken into account. Taiwan is not a party to CITES and therefore is not obliged to report its trade data. The onus is therefore on exporters such as Singapore to accurately

TABLE 4 Total quantities of declared wild-caught African grey parrots reported exported from the Democratic Republic of the Congo during 2005–2014, with CITES export quotas, and any discrepancy, for the same period (CITES, 2015b).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Exports	14,965	10,177	4,975	8,570	12,108	7,700	3,660	12,620	6,969	5,000	86,744
Export quotas	10,000	10,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
Discrepancy	+4,965	+177	−25	+3,570	+7,108	+2,700	−1,340	+7,620	+1,969	0	+26,744

report trade volumes and sources of the birds being traded. The discrepancies in trade volumes and the unexplained reduction in the number of African grey parrots declared as wild-caught individuals during re-export is particularly troubling and suggests major failings in the reporting or recording of trade in CITES-listed species, with countries showing significant variability in their ability and commitment to monitor and report trade. Similar discrepancies have been documented for other taxa and in other parts of the world (e.g. Blundell & Rodan, 2003; Blundell & Mascia, 2005; Phelps et al., 2010) and this highlights potentially systemic problems with the CITES monitoring and reporting framework as a whole.

Singapore is well positioned to serve as a global leader, employing best practices in the regulation, compliance and monitoring of the international trade in wildlife. This is particularly important, not only in terms of its obligations to the CITES convention, but also in relation to the potentially serious economic and human health impacts that could arise from zoonotic diseases, such as highly pathogenic avian influenza viruses (H5N1 or more recently H7N9), being brought into the country inadvertently through an inadequately regulated wildlife trade. Such risk has been highlighted globally (Daszak et al., 2000; Karesh et al., 2007; Travis et al., 2011), and directly demonstrated recently in the Singaporean context by the discovery of the chytrid fungus disease in the country's global amphibian trade (Gilbert et al., 2013), as well as Singapore's prominent role in the global salamander trade, which could result in the spread of a fungal pathogen to North America's salamander population (Yap et al., 2015).

We make the following recommendations specifically relating to the implementation of CITES in Singapore: (1) Singapore, fulfilling its obligations to internationally agreed CITES guidelines, should take steps to provide CITES with more complete and accurate information. This includes clearly reporting the actual trade that took place (i.e. the quantity of specimens that entered or left the country, and not simply the number of permits issued). (2) The Singaporean CITES Management and Scientific Authorities should exercise greater caution in ascertaining that specimens are imported and re-exported in accordance with the provisions of the CITES convention. This includes ensuring that numbers are within permitted quotas, the legitimacy of individuals declared as captive-bred, and the origin and legality of non-native stock, particularly concerning

imports of African grey parrots from the Democratic Republic of the Congo and the Central African Republic. (3) Singapore should adopt a policy of greater transparency concerning its role in the regulation and monitoring of wildlife trade, particularly of CITES-listed species, declaring, in addition to import, export and re-export data, stocks of CITES-listed species held by registered breeding and exporting facilities and data concerning seizures of illegal wildlife within its borders.

Acknowledgements

We thank Jacob Phelps and two anonymous reviewers for extensive constructive comments. CRS thanks WWF–Singapore for generously funding a portion of this research.

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