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MARCH 2018

SLOW AND STEADY:

The Global Footprint of Jakarta's Tortoise and Freshwater Turtle Trade

John Morgan





TRAFFIC REPORT

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Front cover photograph: Indian Star Tortoise
Geochelone elegans

Credit: © Chris R. Shepherd

SLOW AND STEADY: The Global Footprint of Jakarta's Tortoise and Freshwater Turtle Trade

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Indian Star Tortoise *Geochelone elegans*

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Radiated Tortoise *Astrochelys radiata*, endemic tortoise from Madagascar



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ACRONYMS AND ABBREVIATIONS

BKSDA	<i>Balai Konservasi Sumber Daya Alam</i> (Natural Resources Conservation Agency of Indonesia)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. (Article II, paragraph 1 of the Convention) Appendix II includes species not necessarily threatened with extinction, whose trade must be controlled in order to avoid utilization incompatible with their survival. (Article II, paragraph 2 of the Convention) Appendix III includes species whose exports are regulated in at least one country, which has asked other CITES Parties for assistance in controlling the trade. (Article II, paragraph 3 of the Convention). A species does not have to be protected nationally for a country to put it in Appendix III
IDR	Indonesian Rupiah
IUCN	International Union for Conservation of Nature
IUCN SSC Red List Status; abbreviations used in Appendix 1	
	Critically Endangered (CR) Near Threatened (NT)
	Endangered (EN) Least Concern (LC)
	Vulnerable (VU) Not Evaluated (NE)
KLHK GAKKUM	<i>Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia Penegakan Hukum</i> (Law Enforcement Division of the Ministry of Environment and Forestry)
KSDAE	<i>Konservasi Sumber Daya Alam dan Ekosistem</i> (Conservation of Natural Resources and Ecosystem) which was previously known as PHKA: <i>Perlindungan Hutan dan Konservasi Alam</i> (Forest Protection and Nature Conservation)
LIPI	<i>Lembaga Ilmu Pengetahuan Indonesia</i> (Indonesian Institute of Sciences: Indonesia's Scientific Authority and Scientific Authority for CITES in Indonesia)
NGO	Non-governmental organization
UNEP-WCMC	United Nations Environment World Conservation Monitoring Centre
USD	United States Dollar

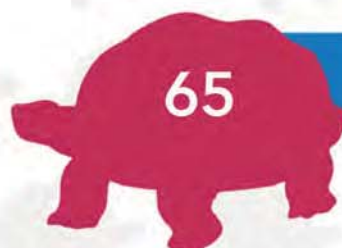
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TRADE IN TORTOISES AND FRESHWATER TURTLES IN JAKARTA



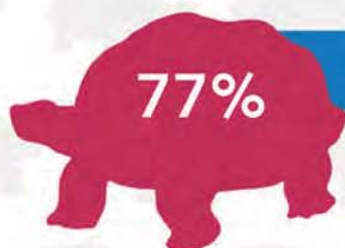
individuals observed on sale



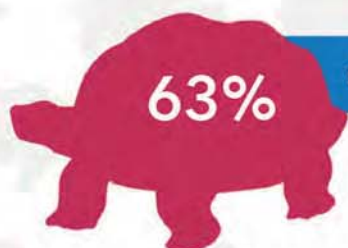
species



Indian Star Tortoise recorded the most



species were non-native



species internationally regulated by CITES



Appendix I



Appendix II



Appendix III



species categorized in IUCN Red List as threatened with extinction

EXECUTIVE SUMMARY

TRAFFIC has been monitoring the trade in tortoises and freshwater turtles in Jakarta's markets, exotic pet shops and at wild animal exhibitions (expos) for more than a decade. The two resulting TRAFFIC reports in 2007 and 2011 revealed that trade in Jakarta was widespread and that a large proportion consisted of illegal trade. Subsequently, TRAFFIC carried out additional surveys of tortoises and freshwater turtles in Jakarta in 2015. This four-month study, aimed to document the trade in Jakarta's markets and pet shops to re-assess the situation in terms of illegal and unsustainable trade. These data were compared to previous TRAFFIC surveys to assess fluctuations and trends over the past decade.

During weekly visits to seven locations (comprising three pet stores, two animal markets and two tropical fish markets), and single visits to three reptile expos, all known to be dealing in reptiles, a total of 4985 individuals of 65 different species of tortoise and freshwater turtles were recorded. As time spent in the shops was limited to avoid arousing suspicion, the identification of individual tortoise and freshwater turtle specimens over the survey period was not possible, and therefore the total number of individuals on sale could potentially be an overestimate. Nevertheless, numbers of individuals provided for any given week and the total number of species identified are accurate. Numbers of tortoises and freshwater turtles observed per week ranged from 92 to 983, with a mean of 383 individuals. Only 15 of the species observed were native to Indonesia, of which three were nationally protected. Non-native species made up 77% of individuals on sale, with species originating from Africa (6 species), Asia (14), Europe (4), Madagascar (3), North America (16) and South America (7).

Almost half (32 of 65) of the species observed on sale were categorized in the International Union for Conservation of Nature (IUCN) Red List as being threatened with extinction. Nine species recorded (one of which was native) are currently listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I, where commercial international trade is prohibited, meaning at least eight of these species were likely to have been illegally imported. A further 27 species were listed in Appendix II and five in Appendix III. With 41 CITES-listed species observed during the surveys, 10 of which were native species and therefore may not appear in the United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade database because records there are restricted to international trade transactions, and ten of which do appear in the database, 21 species (involving 1758 animals) still remain unaccounted for, suggesting they were brought into the country through illegal means. However, as the UNEP-WCMC database requires a minimum of two years to be updated it is possible that the records are still incomplete.

A retrospective analysis of discrepancies between CITES trade records and trade observations from the two previous TRAFFIC surveys in 2004 and 2010, reveal that at least 15 of these CITES-listed non-native species, involving a minimum of 727 animals, are suspected to have been imported illegally.

The findings from the 2015 survey show that more species were found on sale than in the previous two TRAFFIC surveys, as well as more non-native, CITES-listed and threatened species. Numbers of native Indonesian species, both protected and non-protected, have stayed fairly constant since the 2010 survey (14 in 2010 and 15 in 2015). While this does not directly indicate larger volumes of species are being traded compared to previous years, the fact that more species were on display reveals either a change in preference among buyers for more novel species or better trade connections between Indonesian traders and a wider variety of suppliers worldwide. Clearly, efforts to curb the unsustainable and at times illegal trade in tortoises and freshwater turtles are either insufficient or ineffective.

The high number of non-native species offered for sale is facilitated by a long-standing legislative problem in Indonesia, namely, Indonesian law does not regulate domestic trade in any non-native

species, including those listed by CITES, once they have crossed the Custom's boundary into Indonesian territory. This legal loophole hampers any law enforcement to counter illegal trade in these non-native species. Furthermore, existing laws covering native protected species are seldom enforced effectively, and traders are rarely prosecuted to the full extent possible under the law: thus illegal trade continues largely uninhibited given the lack of regulation and deterrence. The conservation of many tortoise and freshwater turtle species recorded in these surveys depends in part on the effectiveness of Indonesia's approach to tackling trafficking and market availability; this applies equally to native and non-native species. TRAFFIC recommends the following actions:

Law enforcement

Indonesian authorities (including Conservation of Natural Resources and Ecosystem (KSDAE) and Natural Resources Conservation Agency of Indonesia (BKSDA)) are urged to conduct checks on these open markets to enforce the existing wildlife laws and take action against traders selling protected species and individuals trading without the appropriate licences and/or quarantine certificates (if the animals are non-native). Indonesian traders operating in Jakarta continue to trade nationally protected species with minimal fear of the law. A deterrent can only be created if all occurrences of illegal trade are swiftly and effectively acted upon by relevant Indonesian enforcement agencies.

The Indonesian authorities, specifically the police, the Government Law Enforcement Division (KLHK GAKKUM) and the Courts are urged to arrest and prosecute any trader found to be trading in protected species to the full extent of the law, in addition to the confiscation of the animals. For example, the seizure and subsequent prosecution of traders selling protected species at Jatinegara Bird Market in Jakarta in early 2016 resulted in numerous protected species once regularly observed on display disappearing from the market completely and highlights the positive deterrent effect of prosecution in mitigating illegal trade. Continually disrupting illegally operating traders will increase the likelihood that the penalties incurred when trading in illegal species will eventually outweigh the potential gains.

Customs (*Bea dan Cukai*) and quarantine (*Badan Karantina Pertanian*) authorities are urged to increase vigilance at international entry points to Indonesia, in particular at the major international airports for example Soekarno-Hatta, Jakarta and Juanda, Surabaya in Java and Kualanamu, Medan in Sumatra. High numbers of non-native CITES appendix-listed species on sale in markets do not tally with import records in the UNEP-WCMC CITES trade database, which highlights the current lack of effectiveness at preventing these animals from entering the country illegally.

Indonesian authorities should increase communication and co-operation with countries known to be source locations or transit points for smuggled animals entering the Indonesian market, such as Madagascar, the USA, Thailand, Malaysia and People's Republic of China to disrupt international trade chains and focus law enforcement efforts on key traders and species of concern. The most recently established CITES Tortoises and Freshwater Turtles Task Force established under Decision 16.119 at the CITES CoP 17 in 2016 could facilitate communication and collaboration between Indonesia and the other countries to help develop effective and long-term solutions to the current crisis.

Legislation

The existing law relating to wildlife protection (Conservation Act No. 5, 1990) and the protected species list (Regulation No. 7, 1999) are currently undergoing review by the Indonesian government. **It is recommended that the revised legislations cover newly-recognized native species and also species that have become of conservation concern in recent years but are not yet listed as protected.**

Species for consideration should be ones that are currently classified as Critically Endangered or Endangered by the IUCN Red List, but are still not protected under Indonesian law such as the Sulawesi Forest Turtle *Leucocephalon yuwonoi* (CR), Spiny Turtle *Heosemys spinosa* (EN), Forsten's Tortoise *Indotestudo forstenii* (EN), and Asian Giant Tortoise *Manouria emys* (EN).

Additionally, Indonesian wildlife law (Act No.5, 1990) needs to be amended to include regulation of trade, possession or legal acquisition requirements for CITES-listed, non-native species. This will empower Indonesian law enforcement officials to act on illegal trade in non-native CITES-listed species.

Monitoring

We recommend the continued strategic monitoring of the markets, pet shops and expos in Jakarta and across the country by the Indonesian Government, non-governmental organizations (NGOs) and researchers to document and assess the extent of any illegal trade. Collection of systematic data on trade fluctuations, trends and prices can help to identify new species that are becoming threatened by trade and are in need of additional conservation efforts. The importance of local and international NGOs and researchers in the monitoring and reporting of illegal trade in Indonesia cannot be overestimated; however, it is essential that the Indonesian Government allocates the necessary resources to wildlife trade-related monitoring and compliance issues to help complement the existing efforts by NGOs.

INTRODUCTION

Background

Indonesia is a well-known hub for wildlife trade (Nijman *et al.*, 2012; Shepherd, 2012; Chng *et al.*, 2015; Chng and Eaton, 2016). Large volumes of wild animals and plants, including marine species are traded in Indonesia on a daily basis both legally and otherwise (Shepherd and Ibarrodo, 2005; Nijman and Shepherd, 2007; Nijman and Shepherd, 2009; Schoppe, 2009; Stengel *et al.*, 2011; Nijman *et al.*, 2012; Burgess and Lilley, 2014). More than half of the world's 320 tortoise and freshwater turtle species are currently considered to be threatened by extinction (Cheung and Dudgeon, 2006; van Dijk *et al.*, 2014). A variety of tortoise and freshwater turtle species have been regularly observed on sale, legally and illegally, in and around Jakarta's markets, exotic pet shops and at wild animal exhibitions (expos) (Shepherd and Nijman, 2007; Stengel *et al.*, 2011). Surveys reveal that while native tortoise and freshwater turtles are still observed on sale in Jakarta, non-native species appear to be increasing in demand with higher volumes and numbers of species reported in trade (Stengel *et al.*, 2011).

TRAFFIC has been monitoring the trade in tortoises and freshwater turtles in Indonesia for more than a decade and presents the results from the 2015 surveys in this report.

Previous research

Eleven years have passed since TRAFFIC published *An overview of the regulation of the freshwater turtle and tortoise pet trade in Jakarta, Indonesia* (Shepherd and Nijman, 2007), and seven years since the follow-up report, *The trade in tortoises and freshwater turtles in Jakarta, Indonesia revisited* (Stengel *et al.*, 2011). The aim of these reports was to document the scale of the trade in Jakarta and to describe any illegal aspects of the trade. The reports were also intended to establish baseline data from which trends in species composition, values, origins and more could be monitored.

The first report from 2007 (based on data collected in 2004), confirmed that trade in Jakarta was widespread and that a large proportion consisted of illegal trade. During these surveys, a total of 48 species were recorded. Of these, 22 Indonesian species were observed, six of which were nationally protected. The remaining 26 species were non-native to Indonesia. A total of 18 species recorded were listed in one of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) appendices (Shepherd and Nijman, 2007).

The second report from 2011 (based on data collected in 2010) documented a similar level of trade in the numbers of species found on display (49), but described an increased number of non-native (35) and CITES-listed species on sale (33). It was suggested that the higher numbers of non-native species in 2010 could be due to declines in wild populations of native species, better law enforcement in Indonesia in relation to nationally protected native species or increased demand for non-native species (Stengel *et al.*, 2011).

Legislation review

Indonesia's principal wildlife legislation, known as the *Act of the Republic of Indonesia No.5 of 1990 concerning Conservation of Living Resources and their Ecosystems* is considered to be fairly comprehensive, albeit outdated. This piece of legislation is a framework law that is associated with other government regulations and ministerial decrees. Chapter V, Article 21 stipulates that those who unlawfully capture, keep, destroy, transport within or out of Indonesia, or trade protected species, without proper licences obtained from the Ministry of Forestry's Department of Conservation of Natural Resources and Ecosystem (*Konservasi Sumber Daya Alam dan Ekosistem*) (KSDAE), could be subject to imprisonment for a maximum of five years or a fine of up to IDR100 million (USD8584). Furthermore, the transporting of any species (protected or otherwise) within Indonesia requires

documents issued by the Natural Resources Conservation Agency of Indonesia (*Balai Konservasi Sumber Daya Alam*) (BKSDA) at the provincial level (Article 42, Chapter X of the *Regulations of the Government of the Republic of Indonesia Number 8, 1999*).

On the current protected species list “Concerning the Preservation of Flora and Fauna” (*Government Regulation No. 7, 1999*), only five species of tortoises and freshwater turtles are featured (Appendix 1). For these protected species and those listed in Appendix I of CITES, any harvest from the wild is forbidden. For other non-protected species (24 in total) (van Dijk *et al.*, 2014), harvesting is allowed for trade, but following the national harvest and export quota system (*Regulation No. 8, 1999 on the Exploitation of Wild Flora and Fauna*), around 10% is allocated for domestic use, and the remaining 90% is for export (based on 2016 quotas) (KSDAE, 2015). The national quotas are divided up among provinces and districts and are reviewed annually. In accordance with the Decree 447, the breeding of tortoises and freshwater turtles in captivity for commercial purposes in Indonesia requires a licence to do so from KSDAE (the CITES Management Authority). With regards to the utilization of wild plants and animal species in Indonesia (*Regulation No. 8, 1999 and Ministerial Decree No.P.19/Ministry of Forestry-II/2005*), only the second generation (F2) of protected reptiles from captive breeding operations can legally be traded, and not wild-caught broodstock (F0) or first-generation specimens (F1).

One shortcoming with this national legislation is that the list of species covered by it has not been updated since it was first passed. Consequently, any newly-recognized species and/or species that have become of conservation concern over the last 18 years are yet to be included in the list (see *Government Regulation No. 7, 1999, “Concerning the Preservation of Flora and Fauna”*). These existing laws, however, are currently undergoing a review by the Indonesian Government and the Indonesian Institute of Science (*Lembaga Ilmu Pengetahuan Indonesia, LIPI*). It is expected that an updated version of the law will offer protection to a larger number of known threatened species.

A further major issue with the existing national legislation is the lack of protection or regulation for non-native species, which does not complement or comply with the corresponding obligations under CITES, despite Indonesia being a Party to CITES since 1978. Customs officials at international ports of entry have the authority to seize CITES-listed species lacking the correct documents. The lack of coverage for non-native, CITES-listed species under Indonesian laws, however, means that if a CITES-listed species is successfully smuggled through Customs, there is little more that can be done. The authorities are not required to act or enforce, so traders that possess and sell these animals can do so without fear of prosecution.

Since the last TRAFFIC report on Jakarta’s tortoise and freshwater turtle trade in August 2011 (Stengel *et al.*, 2011), numerous commendable law enforcement operations have occurred particularly at ports of entry and exit. Significant seizures of tortoises and freshwater turtles at Soekarno-Hatta Airport in Jakarta include 464 tortoises including approximately 100 Egyptian Tortoises *Testudo kleinmanni* in November 2011 (TRAFFIC, 2011); 61 Indian Star Tortoises *Geochelone elegans* and African Spurred Tortoises *Geochelone sulcata* in November 2011 (TRAFFIC, 2011) and 10 Radiated Tortoises *Astrochelys radiata* in November 2015 (Tristiawati, 2015). In comparison to seizures at airports and ports only one other record of confiscated chelonians were found within Indonesia: 29 Indian Star Tortoises *Geochelone elegans* seized from three different pet shops in North Sumatra in 2006 (CITES, 2006).

Consequently, TRAFFIC carried out surveys of tortoises and freshwater turtles in Jakarta in 2015. This four-month study, carried out on a weekly basis, aimed to document the trade in Jakarta’s markets and pet shops to assess the current situation in terms of illegal and unsustainable trade. These data were compared to previous TRAFFIC surveys in 2004 and 2010 to assess fluctuations and trends over the

past decade (Shepherd and Nijman, 2007; Stengel *et al.*, 2011). The resulting analysis has been used to make further recommendations to the Indonesian Government towards more effective mitigation of illegal trade.





METHODS

Systematic observations of the pet trade in tortoises and freshwater turtles were carried out in Jakarta between August and December 2015. Weekly visits were made to three pet stores, two animal markets and two tropical fish markets known to be dealing in reptiles. Visits occurred on weekends as these were the busiest days in the markets and shops. Single visits were also made to three reptile expos that took place in the Jakarta area during this period. Reptile expos are trade shows that are typically held in busy communal areas such as shopping centres where predominantly local traders and enthusiasts can set up small temporary stalls to exhibit and sell their livestock to the general public. Reptile expos in Jakarta are often accompanied by rare or “dangerous” animal displays and reptile competitions to help draw in potential buyers.

During each visit, species and volumes of trade were recorded for every outlet. Only animals on display were recorded. On the rare occasions when an animal could not be identified during a survey, additional visits were carried out the following day and photographs of that individual were obtained for further identification. Owing to the frequent and repetitive nature of the surveys, it was inevitable that certain individual specimens were counted more than once. As time spent in the shops was limited to avoid arousing suspicion, the identification of individual tortoise and freshwater turtle specimens over the survey period was not possible, and therefore the total number of individuals on sale could potentially be an overestimate. Nevertheless, numbers of individuals provided on any given day or the total number of species identified are accurate.

Throughout the duration of the surveys, informal discussions regarding species origins, prices, methods and routes of import and legality were carried out with the traders where possible. Prices of species were obtained in Indonesian Rupiah (IDR) and subsequently converted to US Dollar (USD) using the exchange rate on 1 December 2015 (USD1 = IDR13 643 from <https://www.oanda.com/currency/converter/>). The first asking price was used in the analysis. In the cases where more than one price for an individual species was obtained, the maximum and minimum prices were reported. For example, when possible, prices for individual species were obtained by both non-Indonesian and Indonesian researchers on separate occasions in order to determine if there was any bias towards foreigners—i.e. higher prices. No animals were purchased during the duration of the study.

Data collected during the surveys were compiled into a dataset along with each species' IUCN Red List status, CITES appendix listing, origin and protected status within Indonesia. The non-native and invasive species Red-eared Slider *Trachemys scripta elegans* was removed from the analysis because it is known to be captive bred in large numbers and therefore not relevant to this report. The United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC) CITES trade database records were analysed in order to assess the legality of the trade for CITES-listed species observed during the survey period. All import records of non-native CITES-listed species imported into Indonesia from 2010 to 2015 were obtained.

CITES Parties are required to submit annual reports regarding trade in CITES-listed specimens to the CITES Secretariat by 31st October the following year (UNEP-WCMC, 2013). In reality, not all Parties submit these reports on time. For example, since 2010, the Indonesian CITES authorities have submitted these reports an average of 97 days late (CITES, 2017). Furthermore, depending on the type of data submitted, they may then need to be inputted manually into the database. Owing to these various reporting issues, complete trade statistics are normally only available two years earlier than the current year (UNEP-WCMC, 2013). As the trade statistics from the database were retrieved in March 2017, however there is a possibility that the data for 2015 were still incomplete.

To better understand trade observations from TRAFFIC's previous market monitoring in 2004 and 2010, a retrospective analysis of the UNEP-WCMC database was carried out too, as the database would now be up-to-date for those periods. For the survey in 2004 the UNEP-WCMC database records for the period 2000–2004 were retrieved and for the 2010 survey records from 2005–2010 were analysed. As large inconsistencies were found between the numbers reported by countries exporting to Indonesia and the numbers reported to have been imported by Indonesia, the reported import figures were used for the analysis as it is possible export permits were issued in the exporting countries, but the export did not take place. Nomenclature of species follows the Species+ database (<https://www.speciesplus.net>) for CITES-listed species, and *Turtles of the world: annotated checklist of taxonomy, synonymy, distribution with maps, and conservation status* (van Dijk *et al.*, 2014) for species not included in the Species+ database.

RESULTS

Overview

During the 13 visits, 65 different species of tortoises and freshwater turtles were recorded comprising a total of 4985 individuals (see Appendix 4). Only 15 of the species observed were native to Indonesia, one of which, Forsten's Tortoise *Indotestudo forstenii*, is endemic to Indonesia. Three of the native species recorded on sale are designated as Protected under Indonesian national law, which means harvest and trade in wild-caught specimens is prohibited: Southern River Terrapin *Batagur affinis*, New Guinea Snapping Turtle *Eseya novaeguineae* and Malayan Giant Turtle *Orlitia borneensis*. The other species originated from Africa (6), Asia (14), Europe (4), Madagascar (3), North America (16) and South America (7). In absolute numbers, non-native species made up 77% of those on sale (3711/4985).

The five most commonly observed species on sale were Indian Star Tortoise *Geochelone elegans*, Southeast Asian Box Turtle *Cuora amboinensis*, African Spurred Tortoise *Centrochelys sulcata*, Leopard Tortoise *Stigmochelys pardalis* and Radiated Tortoise *Astrochelys radiata* (Table 1). Of these, only the Southeast Asian Box Turtle is native to Indonesia.

Species	Total Number	Median per week with range	IUCN Red List Status	CITES Appendix
Indian Star Tortoise	937	74 (1–238)	VU	II
Southeast Asian Box Turtle	837	65 (25–111)	VU	II
African Spurred Tortoise	767	65 (5–168)	VU	II
Leopard Tortoise	495	43 (2–68)	LC	II
Radiated Tortoise	486	30 (11–103)	CR	I

Just under half (32 of 65) of the species observed on sale were categorized on the IUCN Red List as being threatened by extinction. Seven of these Red Listed species were considered Critically Endangered, eight as Endangered and 16 as Vulnerable. The rest of the species observed were classified as Near Threatened (9), Least Concern (18) and six had not yet been evaluated. Of the top five most commonly observed species on sale, four were classified as threatened (Table 1).

Forty-one (63%) of the 65 species observed on sale were listed in the CITES appendices: nine (14%) were in Appendix I, 27 (42%) in Appendix II and five (8%) in Appendix III. According to the UNEP-WCMC CITES trade database records, no CITES Appendix I-listed species have been imported into Indonesia for commercial purposes since 2010 and only 11 CITES Appendix II- and Appendix III-listed species have been reported (see Appendix 2). With 41 CITES-listed species observed during the surveys, 10 of which were native species and therefore may not appear in the UNEP-WCMC database because records there are restricted to international trade transactions, and ten of which do appear in the database, 21 species still remain unaccounted for, suggesting they were brought into the country through illegal means. However, as the UNEP-WCMC database requires a minimum of two years to be updated it is possible that the records are still incomplete.

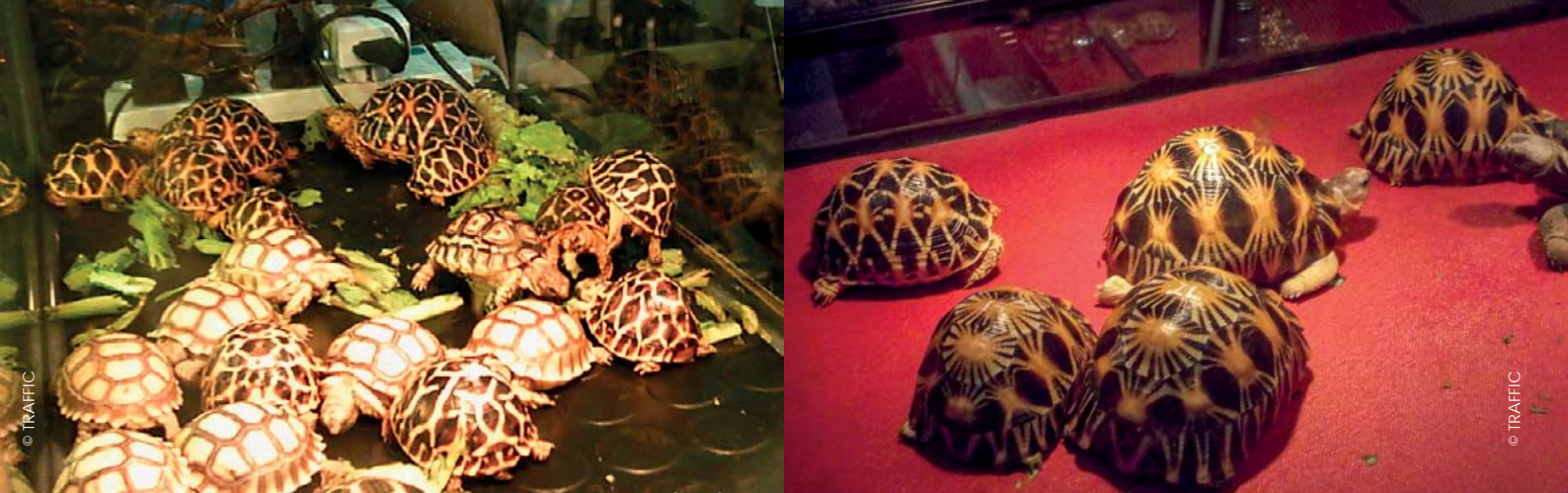


Photo 1: (Left) Indian Star Tortoises *Geochelone elegans*, African Spurred *Centrochelys sulcata* and Leopard Tortoises *Stigmochelys pardalis* on display at a reptile expo in Jakarta in 2015. (Right) Radiated Tortoises *Astrochelys radiata* and Indian Star Tortoises *Geochelone elegans* with painted on prices

Retrospective analysis of UNEP-WCMC CITES trade database

Of the species listed in the CITES database during the period 2000 to 2004, a total of 265 individual animals were not accounted for that were observed in trade during surveys in 2004. Similarly, 104 individuals were not accounted for in the database (during the period 2005 to 2010) that were observed during the 2010 surveys (see Appendix 3). Furthermore, additional non-native CITES-listed species were observed in trade during the two previous surveys but were completely absent from the UNEP-WCMC database: in 2004, 14 CITES-listed species comprising 273 individuals, and in 2010, 20 CITES-listed species consisting of 285 individuals were not accounted for indicating they entered the country illegally (Table 2).

Table 2: Numbers of CITES-listed species and individuals observed in Jakarta during surveys in 2004 and 2010 that were not accounted for in the UNEP-WCMC CITES trade database.

Listing	Species	Individuals
2004 Survey		
CITES I	5	109
CITES II	7	58
CITES III	2	106
Total	14	273
2010 Survey		
CITES I	8	141
CITES II	8	43
CITES III	4	101
Total	20	285

Weekly fluctuations

Weekly numbers of observed tortoises and freshwater turtles ranged from 92 individuals in week 9 to 983 in week 13 (Figure 1 and Figure 2). The median number of individuals per week was 379 and the mean number of species was 31. A reliable estimation of actual stock and stock turnover was not possible because the store owners would frequently rotate their display animals from their stock meaning that the actual number of individuals being bought or sold was difficult to verify. Some locations were visited less frequently because the stalls or stores were closed at the time of the visit, or because the TRAFFIC researchers did not feel comfortable to enter. Sometimes traders can become hostile if they feel that customers are not genuine buyers (time wasters) or are people attempting to survey their stock for protected species. Recent high-profile confiscations of turtles in Indonesia and the accompanying media coverage have potentially made traders more cautious of their illegal activities.

Reptile expos were included in the analysis of weekly data and featured in weeks 2, 4 and 13. During the weeks of the larger expos (weeks 4 and 13), regular monitoring of the markets and pet stores continued, however, a number of pet shops and market stalls were found to be closed for those weeks as the owners had moved their stock to display at a temporary stall at the expo. The expos typically consisted of local pet shop owners, some online retailers and a few unknown traders. The reptile expo in week 13 was the largest of the expos visited, and not surprisingly, this week also featured the highest number of different species on sale in one single survey (see Retail Outlets) (Figure 1). Apart from the Leopard Tortoise (which had highest numbers recorded in week 6 with 68 individuals) the other four most commonly recorded species were also in highest abundance in week 13 with 282 Indian Star Tortoises, 111 Southeast Asian Box Turtles, 168 African Spurred Tortoises, 51 Leopard Tortoises and 103 Radiated Tortoises. The low numbers witnessed on weeks 3 and 9 were in part because of the closure of one of the larger markets owing to a flood and road construction respectively (Figure 1 and Figure 2).



Figure 1. Weekly totals of all individuals observed, including the top five most abundant species on sale in Jakarta markets in 2015 including reptile expos that featured in weeks 2, 4 and 13.

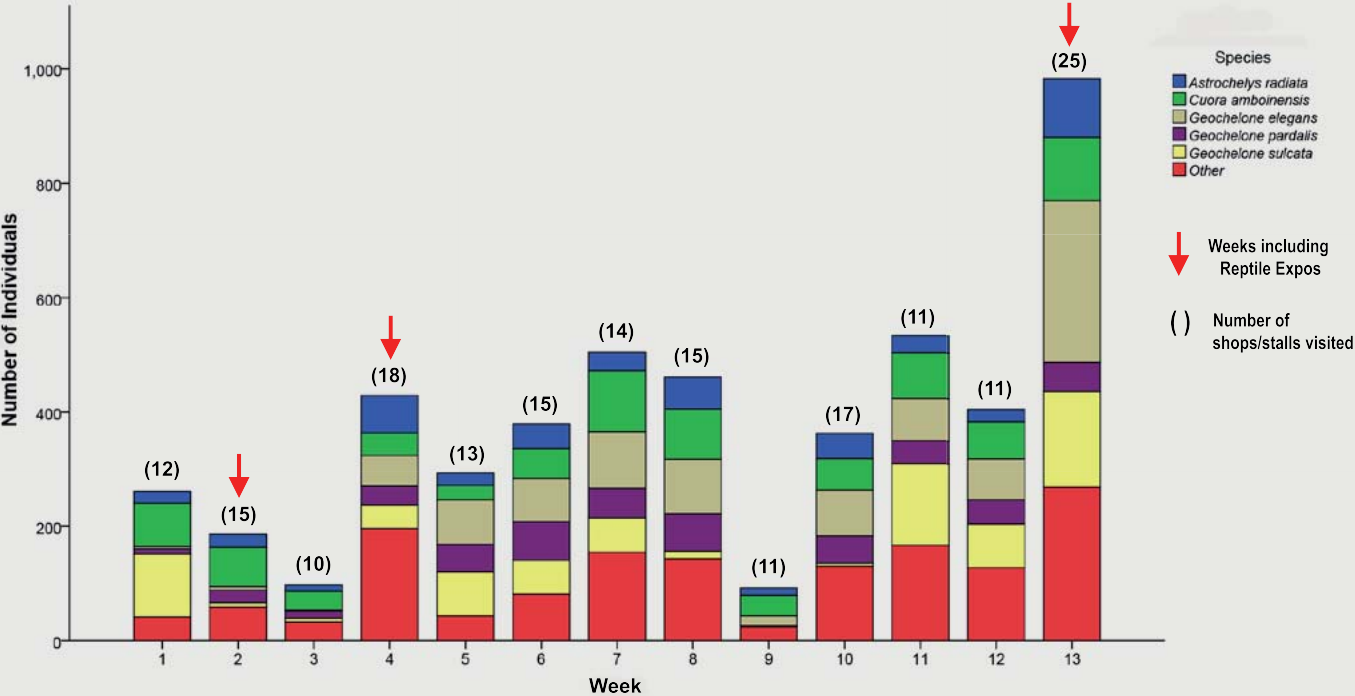
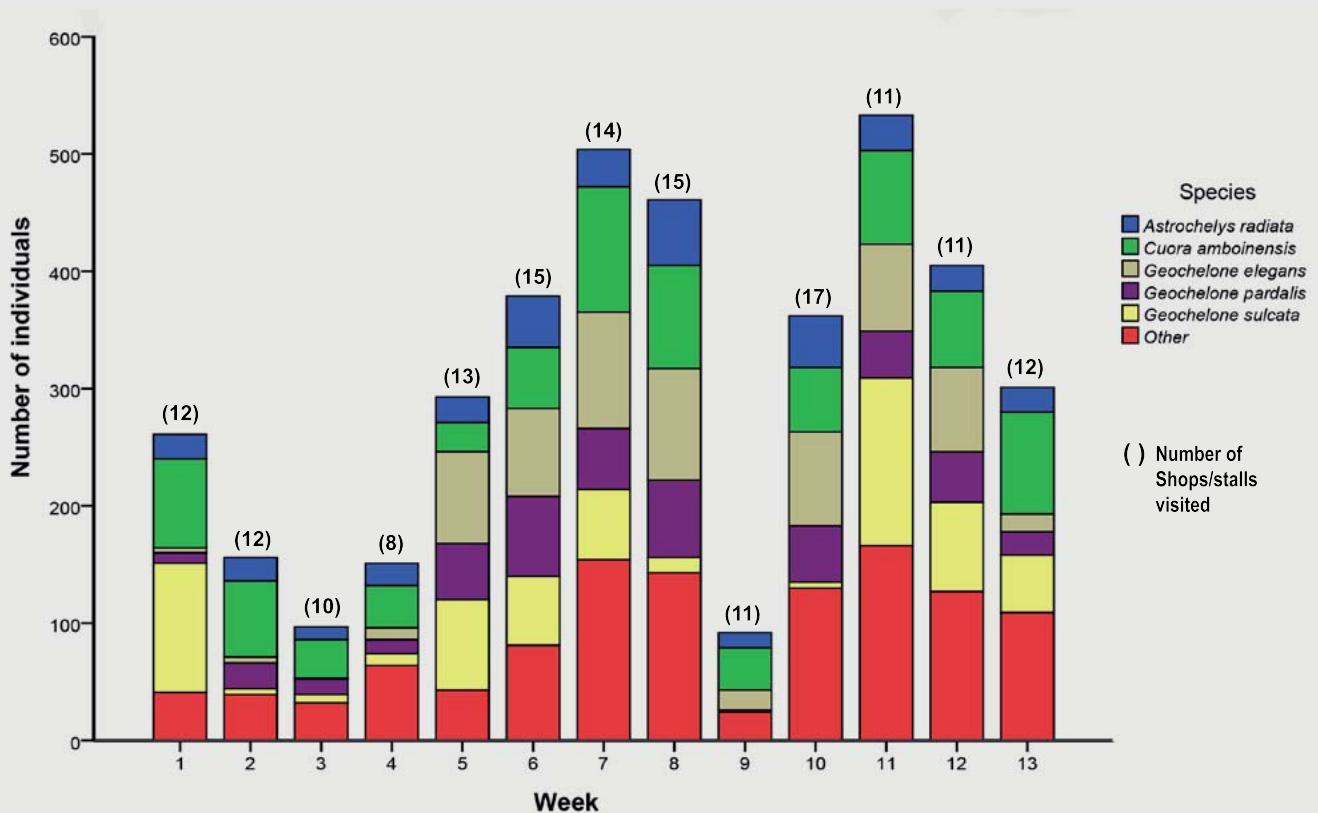


Figure 2. Weekly totals of all individuals observed, including the top five most abundant species on sale in Jakarta markets in 2015 excluding the reptile expos.



Retail outlets

The tropical fish market on Jl. Gunung Sahari had the largest cumulative total over the survey period of individual tortoises and freshwater turtles on display (1533) and the highest number of different species (53) compared to the other outlets and expos (Table 3 and Figure 3). This market has around 40 permanent stalls, 10 of which specialize in tortoises and freshwater turtles and had the largest variety of exotic species originating from every continent across the world. The pet shop on Jl. Kartini in comparison had the second highest volume (1438), but the number of species was much lower (8). Here, large numbers of a few select species could be observed in the shop one week, but then quickly disappeared within the following few weeks; these had been presumably bought in bulk. In one open discussion with the owner, she confirmed she was also distributing to other traders in Jakarta and around the country.

Table 3: Overview of tortoise and freshwater turtle species observed on sale in Jakarta at various locations from August–December 2015 (absolute numbers).

Location	Number of visit	Total species	Total individuals	Mean number per week	Conservation status (% of total individuals)						CITES (% of total individuals)				Native to Indonesia (%)
					CR	EN	VU	NT	LC	NE	I	II	III	NL	
Market															
Barito	10	5	235	24		10	80	10				100			98
Jatinegara	13	17	652	50		6	85	9	1			90	1	9	85
Jl Gunung Sahari	13	53	1533	118	19	4	40	9	21	9	22	55	6	17	22
Jl Sumenep	8	8	63	8		25	44	5	25			70		30	92
Pet Shop															
Jl Kartini	10	8	1438	144	6		71		22	1	6	93	1		1
Mangga Dua	8	2	53	7		100						100			0
Jl Hayam Wuruk	2	3	21	11		38	33			29		100			38
Expo															
ICE	1	8	30		10	7	43	17		23	10	90			20
MOI	1	22	278		21		54	3	9	13	23	70	3	4	6
Mangga Dua	1	33	682		13	1	69	4	11	2	15	77	2	7	7
TOTALS		64	4985	383	7	9	62	6	9	8	8	85	1	7	74

Figure 3: Breakdown of the cumulative number of individuals and species at the different retail outlets (markets, pet shops and expos) in Jakarta in 2015.

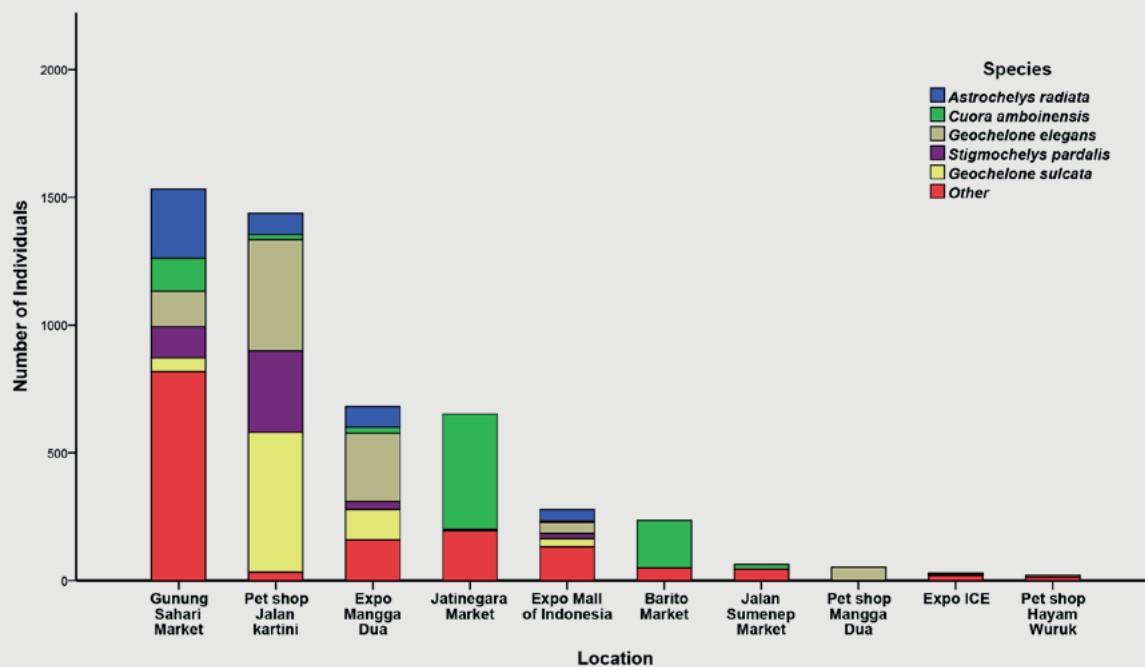




Photo 3: (Top) Jatinegara Bird Market.
(Bottom) Reptile Expo at Mall of Indonesia.





Photo 3: (Bottom)
Radiated *Astrochelys radiata*
and African Spurred
Centrochelys sulcata
Tortoises on sale at an Expo
in Mangga Dua Square.

(Left) Radiated Tortoises
Astrochelys radiata and
Indian Star Tortoises *Geochelone elegans*
at an Expo in
the Mall of Indonesia. Signs
prohibiting the taking of
photos are visible.





The largest expo was at Mangga Dua Mall called “Reptiles United: Unity in Diversity”, which took place from 25 November to 6 December 2015. Of the 24 stalls selling reptiles, 14 of them were either dedicated to or at least selling a proportion of tortoises and freshwater turtles. A total of 682 individuals were recorded at Mangga Dua Mall Expo, representing 33 different species (Figure 3). A wide variety of species, including threatened, CITES-listed, and even nationally protected species were openly on display to the general public at these expos. The only precaution taken by traders was the placement of signs forbidding the taking of photos of their exhibits (Photo 3).

Prices

Prices given did not differ between Indonesian and non-Indonesian researchers, suggesting that the prices were fixed. Prices of individual tortoises and freshwater turtles varied greatly depending on size and also on appearance. For example, individuals deemed to have highly domed carapaces (particularly for the genus *Testudo*), strong distinctive colours and no defects were more expensive. Ploughshare Tortoises *Astrochelys yniphora* were the most expensive species observed on sale in Jakarta ranging from USD7143–28 571 for an individual. The native Southeast Asian Box Turtle was the cheapest with prices ranging from USD2–30.

Non-native species were overall significantly more expensive than native species for both minimum and maximum prices obtained (Table 4). There were no significant differences in prices between threatened species (IUCN Red List categories CR, EN and VU) when compared with non-threatened (IUCN Red List categories NT, LC and NE). When comparing all categories of CITES-listed species (CITES Appendix I and CITES Appendix II + III) against non-listed species there were also no significant differences in prices obtained. However, prices were significantly higher for CITES Appendix I-listed species when compared to non-listed species (for both minimum and maximum prices given). The prices provided for CITES Appendix I-listed species were higher than those of CITES Appendix II- III-listed species (although only minimum prices were significantly higher) (Table 4).

Table 4. Mean minimum and maximum requested prices (n = 56 species) for the different categories of tortoise and freshwater turtle observed in markets and pet stores during the surveys in 2015.

Category	Minimum price (USD)	Maximum Price (USD)
Native (n=14)	80	83
Non-native (n=42)	406	1535
Critically Endangered (n=5)	1624	7183
Endangered (n=8)	274	276
Vulnerable (n = 14)	307	1138
Non-threatened (n = 22)*	118	383
Not Evaluated (n = 7)	126	1269
CITES I (n = 8)	1236	5510
CITES II and III (n = 22)	235	837
Not Listed (n = 26)	137	133

*Non-Threatened = Near Threatened + Least Concern.



Photo 4: (Top) Galapagos Tortoise *Chelonoidis niger* (VU) on sale at the Mall of Indonesia Reptile Expo in September 2015. (Bottom) Egyptian *Testudo kleinmanni* (CR) and Radiated Tortoises *Astrochelys radiata* (CR) at the Mangga Dua Square Expo in December 2015. All species are CITES Appendix I-Listed (TRAFFIC, 2015).



One trader in Jakarta said he had previously travelled a few times to Bangkok in order to buy unspecified species of tortoises and freshwater turtles to smuggle back to Indonesia. This trader said that prices were much cheaper in Thailand, so he could make a good profit by selling the animals in Indonesia. Prices of some tortoises and freshwater turtles obtained from Chatuchak Market in Bangkok by TRAFFIC researchers during surveys in 2016 (unpublished) corroborate the trader's claims of lower prices for some species, but not for all.

During other open discussions with traders, three different owners of pet shops said that their animals were almost always imported, as opposed to being captive bred in Indonesia. One dealer said that some of his non-native tortoises and freshwater turtles are purchased from dealers abroad (for example North America) and sent by air via Singapore to China and finally into Indonesia. He claimed that airport staff members are paid off to let the shipments go through unchecked. He did not know why the shipment was sent to China first, but he mentioned that (the higher transport costs) is probably why prices are generally higher in Indonesia than other Asian countries.



DISCUSSION

Numbers, IUCN Red List status and CITES-related implications

This report is the third in a series. The initial report by Shepherd and Nijman (2007), based on survey data from 2004, was the first to quantify the levels of illegal trade in tortoises and freshwater turtles in Jakarta and the implications for the conservation of these species both in Indonesia and globally. The second report by Stengel *et al.* (2011), based on survey data from 2010, revealed that despite some efforts to control the trade, the volume of trade and the number of different species on sale had in fact risen since 2004. The findings from this current report do not suggest that any change in this trend has occurred. During the present surveys, more species were found on sale than in the previous two surveys, as well as more non-native, CITES-listed, nationally protected and threatened species (IUCN Red List categories: Critically Endangered, Endangered and Vulnerable) (Figures 4 and 5). Whilst this does not directly indicate larger volumes of species are being traded compared to previous years, the fact that more species were on display reveals either a change in preference among buyers for more novel species or better trade connections between Indonesian traders and a wider variety of suppliers worldwide. Clearly, efforts to curb the unsustainable and at times illegal trade in tortoises and freshwater turtles are either insufficient or ineffective.

Figure 4. Comparison of the overall numbers of species, native and non-native, protected and threatened species observed on sale in 2004, 2010 and 2015.

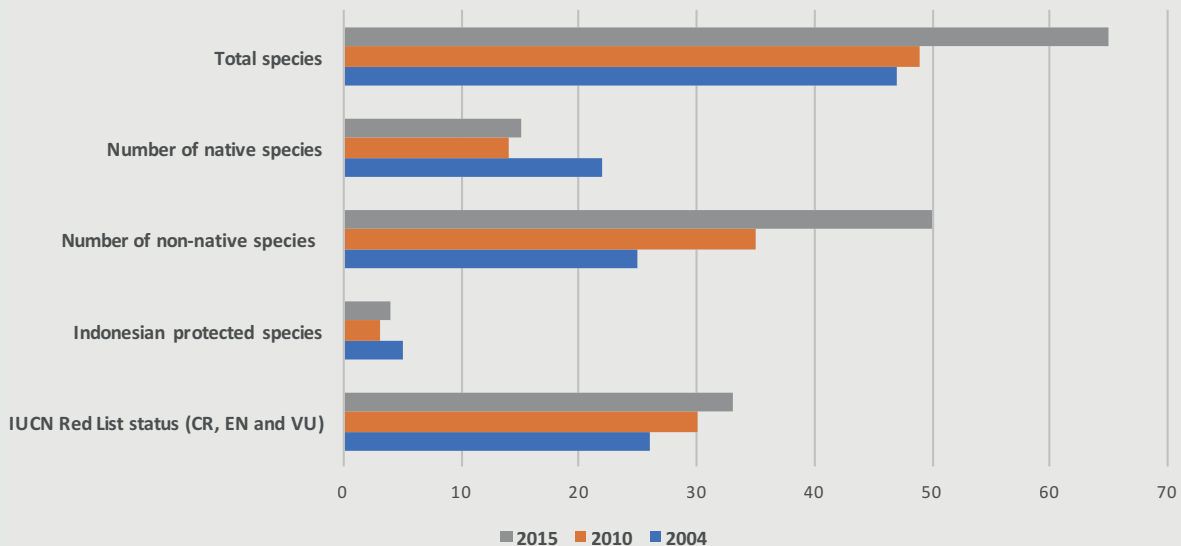
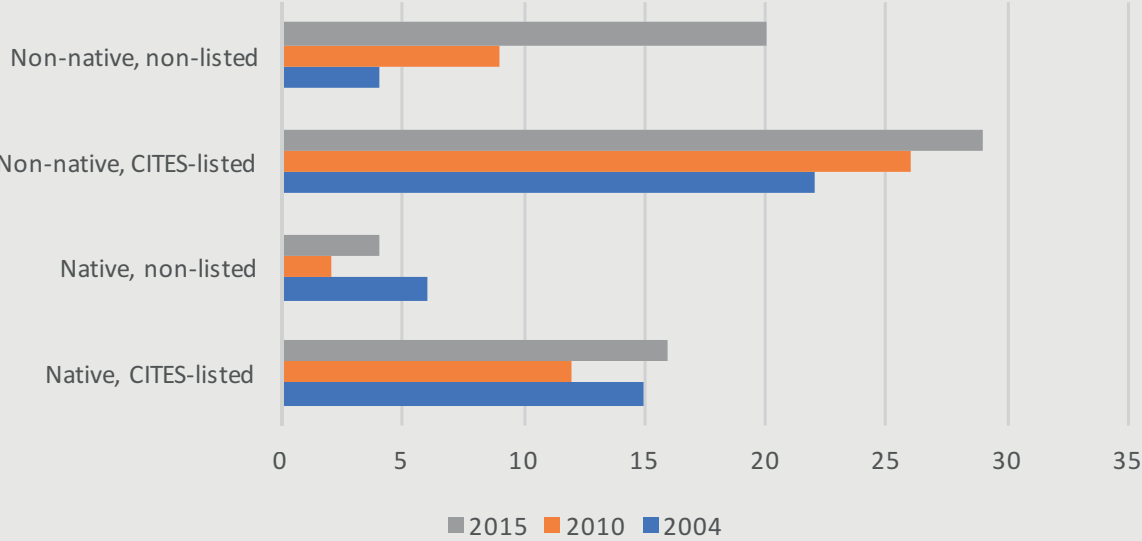
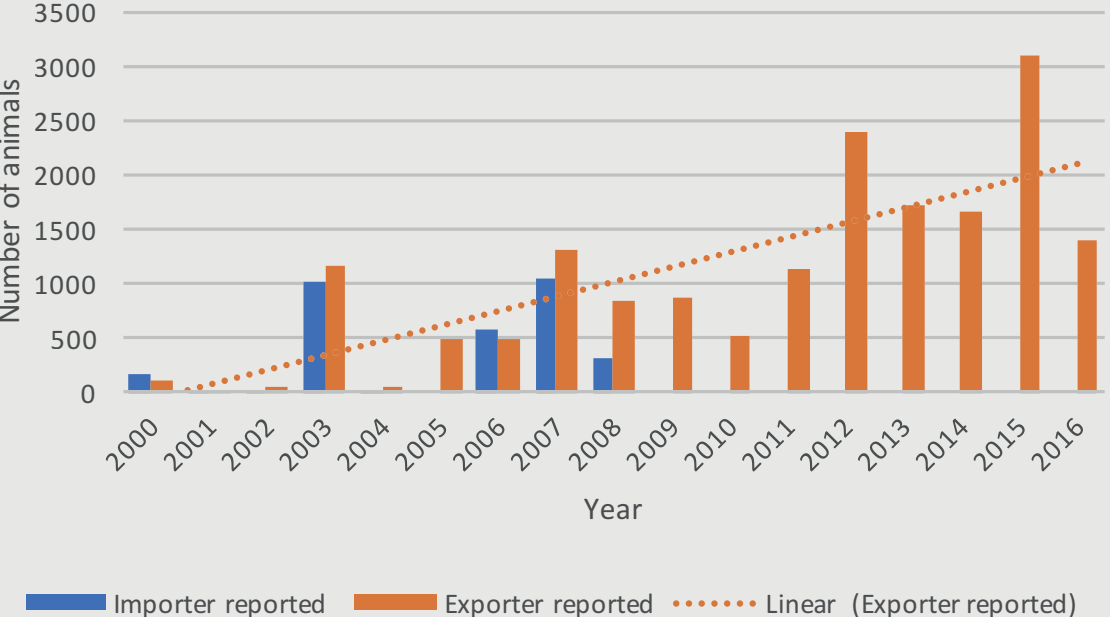


Figure 5. Comparison of the number of native, non-native and CITES-listed species observed on sale in Jakarta in 2004, 2010 and 2015.



The overall increase in species observed for sale is likely to have been influenced by the greater number of surveys carried out in 2015: a total of 13 separate regular surveys over a four-month period compared to the two in 2010 and seven in 2004 (over a three-month period). However, if increased survey effort alone was the main reason for higher numbers of species recorded, this would have resulted in a rise in both non-native and native species. In fact, an overall decrease in native species since 2004 has been observed (Figure 4). Furthermore, the weekly totals (Figures 1 and 2) revealed that four out of the top five most abundant species observed were non-native and comprised a significant proportion of the total, while in 2004 there was only one non-native species in the top five most abundant species observed, and three in 2010. Since 2000, exporter-reported imports of CITES-listed Testudines into Indonesia have also gradually increased according to the the UNEP-WCMC database, which further corroborates these findings (Figure 6).

Figure 6: Indonesian imports of tortoise and freshwater turtles since 2000 reported in the UNEP-WCMC CITES trade database.

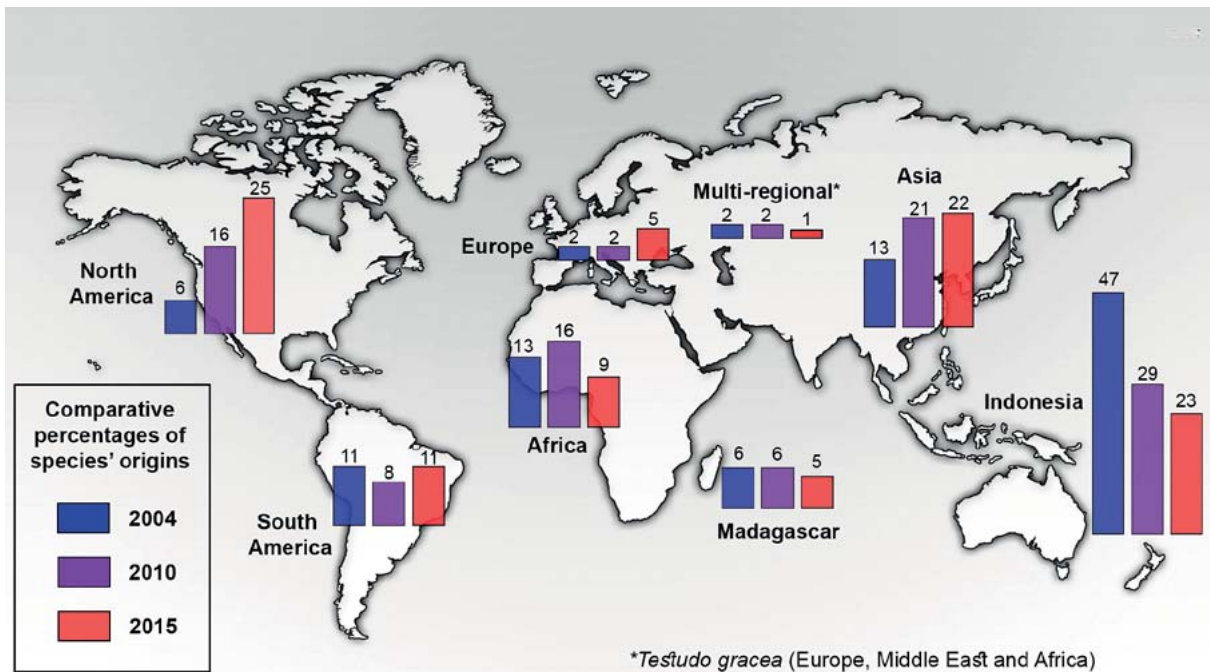


The fact that these species are being observed on sale in such high numbers on a weekly basis indicates a continued high demand among consumers and/or increased connections with international suppliers amongst Indonesian traders. Furthermore, the overall increase in threatened and non-native CITES-listed species is another cause for conservation concern. As has now been proved in the retrospective analysis of the UNEP-WCMC CITES trade database, large numbers of non-native, CITES-listed species entered Indonesia illegally over the last decade for sale in the markets and pet shops. Numbers of species observed in this current survey cannot yet be confirmed to be illegally imported as the UNEP-WCMC CITES trade database is incomplete, however there is no evidence to suggest that the trend would have changed.

Non-native species

Following on from the 2004 and 2010 reports, the number of species from Asia (excluding Indonesia) and North America has increased in 2015 (Figure 7).

Figure 7: Comparative percentages of tortoise and freshwater turtle species' origins observed for sale in Jakarta in 2004, 2010 and 2014. While numbers of native species have stayed constant, the increase in species from other regions such as North American has skewed the proportions in other regions.



The most commonly observed species on sale during the surveys was the Indian Star Tortoise with 937 individuals recorded (mean number per week=72) (Table 1). This species has a star-like pattern on its carapace that makes it highly desirable to reptile collectors around the world, particularly in Asia (Das, 1991; Chng, 2014). This species is listed as Vulnerable in the IUCN Red List and although it is listed in CITES Appendix II, it is protected by domestic legislation prohibiting collection and trade in all its range States of India, Pakistan and Sri Lanka. From 2005 to 2015, no import records for Indian Star Tortoises into Indonesia for commercial purposes are recorded in the UNEP-WCMC CITES trade database. In fact, the only record of this species being imported into Indonesia during this time was in 2010 when 13 individuals were brought in for the purported purpose of zoo animals. Many of the individuals observed on sale in Jakarta were either hatchlings or juveniles, and so could only have entered the country within the last few years. With no recent import records and no records of legal exports from any of the range countries or specimens reportedly bred in captivity in other countries available, it is safe to assume that high levels of illegal importation into Indonesia was still occurring as recently as 2015.

Photo 5: Indian Star Tortoises *Geochelone elegans* on sale at a Reptile Expo in Jakarta in 2015. This was the most commonly observed species over the survey period.



From 2010 to 2015 more than 34 080 live Indian Star Tortoises were seized globally in 118 separate cases (CITES Secretariat, 2016). Between 2008–2013, the Indian Star Tortoise was the most frequently seized tortoise species attempting to be smuggled into Thailand with nearly 6000 individuals confiscated in 15 separate cases (Chng, 2014), and was the most commonly observed chelonian species in over a decade of surveys in Bangkok’s Chatuchak Market (Nijman and Shepherd, 2015). Other studies have also documented extensive illegal trade in Indian Star Tortoises from India into Thailand and other Southeast Asian countries (D’Cruze *et al.*, 2015; Vyas, 2015).

Another of the five most frequently observed species on sale was the Radiated Tortoise *Astrochelys radiata*, a Critically Endangered, CITES Appendix I-listed species endemic to Madagascar (Table 1). Akin to the Indian Star Tortoise from Asia, import records for the Radiated Tortoise were also absent from the UNEP-WCMC CITES trade database between 2000–2015 (Appendices 2 and 3). Despite being fully protected nationally under Malagasy law (Ordinance No. 60-126 of 3 October 1960), the Radiated Tortoise is still being heavily poached for both its meat (adults) and for the illegal pet trade (juveniles) which is crippling wild populations (Hudson and Horne, 2010; Castellano *et al.*, 2013; Morgan *et al.*, in prep.). Like the Indian Star Tortoise, juveniles have been exported in large numbers to Bangkok, Thailand and China, from where they are then distributed to markets across Asia, including Indonesia (Nijman and Shepherd, 2007; Hudson and Horne, 2010; CITES Secretariat, 2016).

Compared to the two previous TRAFFIC reports, an increase of species from North America was observed in the present study (Figure 7). Nine of the 16 North American species observed were from the Family Kinosternidae (Photo 6 and 7). Thirteen of the 16 were not listed in the CITES appendices, two were listed in Appendix III and one was listed in Appendix II. The increased numbers of North American species observed could be due to Indonesian traders moving towards non-regulated species that are easier and safer to acquire with the increasing diversification and globalization of suppliers' networks. However, with continued depletion of wild populations of freshwater turtles in Asia due to over-harvesting, it is also possible that North American species are being increasingly targeted to fill the demand (Ceballos and Fitzgerald, 2004; Gong et al., 2009) and may explain the higher proportions seen during the present study. Furthermore, as very few of the North American species observed in trade in Jakarta were listed in the CITES appendices, the importing of these species into Indonesia and across borders provides a legal alternative with less business risk, to smuggling CITES-listed species.



Photo 6: Mexican Giant Musk Turtles *Staurotypus triporcatus* from North and Central America on sale in Jakarta.

As previously indicated by Stengel *et al.* (2011), the high numbers of non-native species on sale in Jakarta markets are likely to be a combination of the increasing demand amongst Indonesian reptile enthusiasts for more unusual and exotic species, and potentially combined with decreasing populations of native Indonesian species that are becoming rarer and more difficult to collect and/or trade. Based on the findings from this present study, as the numbers of native Indonesian species have stayed fairly constant since the 2010 TRAFFIC survey (Figure 4), it would appear that the increase in non-native species is not due to the difficulty of obtaining certain native species.



Photo 7: An Alligator Snapping Turtle *Macrochelys temminckii* from North America on sale at a Reptile Expo in Jakarta in 2015. A higher number of North American species were found on sale in 2015 compared to the previous two surveys.

Prices

Overall, the prices of species observed for sale during the 2015 surveys were significantly higher than in 2004 for both mean minimum and maximum prices obtained (Table 3). General inflation in Indonesia will of course be an influencing factor (34% from 2004 to 2016) (Anon, 2016), but even when considering a 34% inflation rate (over 12 years), the majority of price increases still exceeds this figure, often significantly (Table 4).

Table 4. Comparison of the maximum and minimum prices of species in 2004 and 2015.

Category	Minimum Price (USD)		Difference	% Increase	Maximum Price (USD)		Difference	% Increase
	2004	2005			2004	2015		
Native	26	80	54	208	39	83	44	113
Non-native	147	406	259	176	182	1535	1353	743
Critically Endangered	83	1624	1541	1856	92	7183	7091	7708
Endangered	14	274	260	1858	68	276	208	305
Vulnerable	107	307	200	186	146	1138	992	679
Non-threatened*	88	118	30	34	113	383	270	239
CITES I	169	1236	1067	631	267	5510	5243	1964
CITES II and III	107	235	128	119	126	837	711	564
Not listed	48	137	89	185	72	133	61	85

*Non-threatened = Near Threatened + Least Concern.

Note: Individual price data were not available from the 2010 surveys

Despite the significant price increases that occurred from 2004 to 2015, many of the trends from the 2004 dataset were still visible in this current study. Non-native species were significantly higher in price than native species. For minimum prices, CITES Appendix I-listed species were significantly more expensive than both non-listed species and CITES Appendix II and III-listed species, (maximum prices were approaching statistical significance). In both surveys, no significant differences were found between threatened compared to non-threatened species.

Legislation and enforcement

The large numbers of tortoises and freshwater turtles on display in the Jakarta markets that were either native to and protected in Indonesia, or non-native CITES Appendix I-listed indicates illegal trade and the illegal importation of species respectively. As it is possible that the CITES trade database records for that period are still incomplete—there can be a delay in record reporting of no less than two years—assumptions of illegal trade of non-native CITES Appendix II species cannot yet be made. In the retrospective analysis of the two previous TRAFFIC reports (2004 and 2010), however, the database records are now complete, and therefore the unrecorded import of large numbers of non-native CITES listed species into Indonesia can be confirmed to be illegal for both the survey periods (Table 2 and Appendix 3).

In Jakarta, traders are able to operate freely and openly, regularly breaking the law by selling nationally protected species, with little or no concern for any intervention from the authorities, evidenced by the volume of these species recorded in the markets. This is not a new issue, and not one restricted to tortoises and freshwater turtles; TRAFFIC, along with numerous other organizations including Jakarta Animal Aid Network (JAAN), Profana, Turtle Conservancy, Yayasan IAR Indonesia (YIARI), the Wildlife Conservation Society (WCS) and CITES (evident in the decisions they have made), have now highlighted this problem repeatedly over the course of more than a decade and made recommendations

on how to mitigate the illegal trade (Shepherd *et al.*, 2004; Nijman and Shepherd, 2007; Shepherd, 2010; Stengel *et al.*, 2011; ProFauna, 2012; Chng *et al.*, 2015; WCS, 2015).

In terms of Indonesian legislation, the species coverage in the laws pertaining to wildlife are outdated (and in fact are currently undergoing evaluation to be renewed), but nevertheless do provide protection for a few native species; a number of which were observed on display in this current survey. However, these laws are seldom enforced, and traders are rarely prosecuted to the full extent of the law, which therefore fails to create any kind of deterrent (Nijman, 2009; Shepherd, 2010; Chng *et al.*, 2015). The lack of law enforcement is obvious at outlets that display protected species on a daily basis. Throughout the duration of the 2015 surveys, only one trader was seen to be cautious with one of the protected species he was selling by strategically placing a nationally-protected Southern River Terrapin *Batagur affinis* on the top shelf in his shop which was slightly obscured from view. He stated he kept it there because it was illegal to sell it. In contrast, the other two protected species in Indonesia, the New Guinea Snapping Turtle and the Malaysian Giant Turtle were commonly seen openly on display.

When law enforcement occurs, it can have extremely positive impacts on suppressing the illegal trade. One example, which was facilitated by some local NGOs working with the government, resulted in a small yet significant seizure of protected species that occurred in early 2016 at the notorious Jatinegara bird market. Indonesian authorities raided the market in January and seized 17 Green Sea Turtles *Chelonia mydas*, two slow lorises *Nycticebus* sp. and a Leopard Cat *Prionailurus bengalensis*. In addition, four traders were arrested, two of whom received 6 and 12 months imprisonment together with fines (PN Jakarta Timur, 2016). The traders' stalls that were regularly selling reptiles have subsequently closed, and the protected mammals that were once regularly observed have not been seen again. Following the seizures at Jatinegara, another large bird market known as Pramuka has subsequently added signs in the vicinity of the market prohibiting the trading of species protected by the Indonesian government (Photo 8).

For non-native CITES-listed species that are being illegally imported, improved policing at the ports of entry should help to suppress illegal trade. Again, what is now evident from the two previous surveys (2004 and 2010), and this study also, is that effective law enforcement at airports and other borders that prevent non-native species that are subjected to international regulation, is lacking. With a higher number of non-native, CITES-listed species on sale in 2015 than were found in the previous surveys, the situation could be worsening. If the CITES-listed specimens are not stopped at the borders, once they have entered the country, there is little the Indonesian authorities can do, as they are not protected by the law. This effectively means that these specimens, including those in Appendix I for which international commercial trade is prohibited, can be bought and sold within the country, without the authorities even required to request to see legal CITES documents from traders. This is a consequence of non-native species not being covered under current national legislation. Numerous CITES Appendix I-listed non-native species such as Ploughshare and Radiated Tortoises were often in full view of the public and were regularly placed on display outside shops by the road side.



Photo 8. Sign prohibiting the sale of protected animals at Pramuka bird market in Jakarta.

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CONCLUSION

Fifteen of the 65 species observed during this survey were native to Indonesia, of which three were nationally protected. The national legislation regarding the capture, trade or possession of native species is relatively comprehensive, thus, the open trade in protected species observed during this survey suggests either insufficient or ineffective law enforcement. Furthermore, when seizures and arrests do occur, the penalties rarely fit the crime committed. This combination of inadequacies fails to create any deterrent for illegal traders involved in a lucrative and relatively risk-free business.

Non-native species made up 77% of individuals on sale. For non-native species, key national legislation does not offer any protection, which essentially creates a loophole in the legal system that allows even CITES Appendix I-listed, non-native species to be kept, bought or sold legally within Indonesia. Enforcement of CITES legislation at international ports of entry should provide the first level of protection against illegal imports; however, the results from this survey suggest that this is currently not effective. Whether corruption, lack of training or awareness, the absence of adequate facilities

to house and care for confiscated specimens, or simply negligence on the part of exporting countries and the Indonesian authorities are the reason for the lax enforcement needs to be investigated further and swiftly resolved. As a signatory to CITES, Indonesia has a responsibility to enforce CITES requirements when necessary. If CITES-listed species are not provided protection within the country under the existing laws, the laws need to be updated. Given the continued observation of illegal trade in tortoises and freshwater turtles in Jakarta over the 12 years since the first survey in 2004, legislative revisions must be expedited to ensure that illegal practices within the country do not continue to flourish under the disguise of legislative loopholes.

As the numbers of native Indonesian species have stayed fairly constant since the 2010 TRAFFIC survey, the main drivers for the increase in non-native species could potentially be the demand-driven trade for more exotic species amongst Indonesian consumers, or the supply-driven trade, whereby Indonesian importers are widening their network of trade contacts worldwide—or a combination of the two. Further social science research is required to gain a better insight into the main drivers and motivations behind the trade.

The illegal buying, selling and possession of nationally protected species or the illegal import of CITES-listed species are not new issues in Indonesia and TRAFFIC and other NGOs have highlighted this for over a decade now. What becomes apparent is that if the Indonesian government does not begin to consider the illegal trade of tortoises and freshwater turtles a priority issue and take the necessary steps to regulate it, many currently threatened species will be pushed closer to extinction.

RECOMMENDATIONS

Law enforcement

Indonesian authorities (including Conservation of Natural Resources and Ecosystem (KSDAE) and Natural Resources Conservation Agency of Indonesia (BKSDA)) are urged to conduct checks on these open markets to enforce the existing wildlife laws and take action against traders selling protected species and individuals trading without the appropriate licences and/or quarantine certificates (if the animals are non-native). Indonesian traders operating in Jakarta continue to trade nationally protected species with minimal fear of the law. A deterrent can only be created if all occurrences of illegal trade are swiftly and effectively acted upon by relevant Indonesian enforcement agencies.

The Indonesian authorities, specifically the police, the Government Law Enforcement Division (KLHK GAKKUM) and the Courts are urged to arrest and prosecute any trader found to be trading in protected species to the full extent of the law, in addition to the confiscation of the animals. For example, the seizure and subsequent prosecution of traders selling protected species at Jatinegara Bird Market in Jakarta in early 2016 resulted in numerous protected species once regularly observed on display disappearing from the market completely and highlights the positive deterrent effect of prosecution in mitigating illegal trade. Continually disrupting illegally operating traders will increase the likelihood that the penalties incurred when trading in illegal species will eventually outweigh the potential gains.

Customs (*Bea dan Cukai*) and quarantine (*Badan Karantina Pertanian*) authorities are urged to increase vigilance at international entry points to Indonesia, in particular at the major international airports for example Soekarno-Hatta, Jakarta and Juanda, Surabaya in Java and Kualanamu, Medan in Sumatra. High numbers of non-native CITES appendix-listed species on sale in markets do not tally with import records in the UNEP-WCMC CITES trade database, which highlights the current lack of effectiveness at preventing these animals from entering the country illegally.

Indonesian authorities should increase communication and co-operation with countries known to be source locations or transit points for smuggled animals entering the Indonesian market, such as Madagascar, the USA, Thailand, Malaysia and People's Republic of China to disrupt international trade chains and focus law enforcement efforts on key traders and species of concern. The most recently established CITES Tortoises and Freshwater Turtles Task Force established under Decision 16.119 at the CITES CoP 17 in 2016 could facilitate communication and collaboration between Indonesia and the other countries to help develop effective and long-term solutions to the current crisis.

Legislation

The existing law relating to wildlife protection (Conservation Act No. 5, 1990) and the protected species list (Regulation No. 7, 1999) are currently undergoing review by the Indonesian government. **It is recommended that the revised legislations cover newly-recognized native species and also species that have become of conservation concern in recent years but are not yet listed as protected.** Species for consideration should be ones that are currently classified as Critically Endangered or Endangered by the IUCN Red List, but are still not protected under Indonesian law such as the Sulawesi Forest Turtle *Leucocephalon yuwonoi* (CR), Spiny Turtle *Heosemys spinosa* (EN), Forsten's Tortoise *Indotestudo forstenii* (EN), and Asian Giant Tortoise *Manouria emys* (EN).

Additionally, Indonesian wildlife law (Act No.5, 1990) needs to be amended to include regulation of trade, possession or legal acquisition requirements for CITES-listed, non-native species. This will empower Indonesian law enforcement officials to act on illegal trade in non-native CITES-listed species.

Monitoring

We recommend the continued strategic monitoring of the markets, pet shops and expos in Jakarta and across the country by the Indonesian Government, non-governmental organizations (NGOs) and researchers to document and assess the extent of any illegal trade. Collection of systematic data on trade fluctuations, trends and prices can help to identify new species that are becoming threatened by trade and are in need of additional conservation efforts. The importance of local and international NGOs and researchers in the monitoring and reporting of illegal trade in Indonesia cannot be overestimated; however, it is essential that the Indonesian Government allocates the necessary resources to wildlife trade-related monitoring and compliance issues to help complement the existing efforts by NGOs.

APPENDICES

Appendix 1: List of protected reptiles in Indonesia (Regulation No. 7, 1999)

Species	Common name
<i>Batagur baska</i>	Northern River Terrapin
<i>Caretta caretta</i>	Loggerhead Turtle
<i>Carettochelys insculpta</i>	Pig-nosed Turtle
<i>Chelodina novaeguineae</i>	New Guinea Snake-necked Turtle
<i>Chelonia mydas</i>	Green Turtle
<i>Chitra indica</i>	Indian Narrow-headed Softshell Turtle
<i>Chlamydosaurus kingii</i>	Frilled Lizard
<i>Crocodylus novaeguineae</i>	New Guinea Crocodile
<i>Crocodylus porosus</i>	Salt-water Crocodile
<i>Crocodylus siamensis</i>	Siamese Crocodile
<i>Dermochelys coriacea</i>	Leatherback Sea Turtle
<i>Elseya novaeguineae</i>	New Guinea Snapping Turtle
<i>Eretmochelys imbricata</i>	Hawksbill Turtle
<i>Hydrosaurus amboinensis</i>	Sailfin Lizard
<i>Hypsilurus dilophus</i>	Crowned Forest Dragon
<i>Lanthanotus borneensis</i>	Borneo Earless Monitor
<i>Lepidochelys olivacea</i>	Olive Ridley Sea Turtle
<i>Morelia viridis</i>	Green Tree Python
<i>Natator depressus</i>	Flatback Sea Turtle
<i>Orlitia borneensis</i>	Malaysian Giant Turtle
<i>Python bivittatus</i>	Burmese Python
<i>Python timoriensis</i>	Timor Python
<i>Tiliqua gigas</i>	Blue-tongued Skink
<i>Tomistoma schlegelii</i>	False Gharial
<i>Varanus gouldii</i>	Gould's Monitor
<i>Varanus indicus</i>	Mangrove Monitor
<i>Varanus komodoensis</i>	Komodo Dragon
<i>Varanus nebulosus</i>	Clouded Monitor
<i>Varanus prasinus</i>	Emerald Monitor
<i>Varanus timorensis</i>	Spotted Tree Monitor
<i>Varanus togianus</i>	Togian Water Monitor

Appendix 2: Tortoise and freshwater turtle species observed in trade in 2015 for which CITES importer-reported records for Indonesia exist in the UNEP-WCMC CITES trade database since 2010.

Species	CITES Appendix	2010	2011	2012	2013	2014	2015	TOTAL
<i>Aldabrachelys gigantea</i>	II	31	106	39	90			266
<i>Chelonoidis carbonaria</i>	II		10	508	251	37	280	1086
<i>Chelonoidis denticulata</i>	II		38	59	12	30	28	167
<i>Centrochelys sulcata</i>	II	414	428	1164	913	1431	756	5106
<i>Graptemys pseudogeographica</i>	III		222					222
<i>Kinixys spekii</i>	II						100	100
<i>Malacochersus tornieri</i>	II		30	10	20			60
<i>Pelomedusa subrufa</i>	III	30						30
<i>Stigmochelys pardalis</i>	II		249	370	100		300	1019
<i>Testudo hermanni</i>	II				20		1	21
<i>Testudo marginata</i>	II		25					25

Appendix 3: Retrospective analysis of the tortoise and freshwater turtle species that were observed in trade in 2004 and 2010 for which CITES importer-reported records for Indonesia exist in the UNEP-WCMC CITES database.

Species	CITES	Observed in trade (Ob)	Reported Import (RI)	Number Unaccounted for (RI - Ob)
Period 2000–2004		2004		(RI - Ob)
<i>Aldabrachelys gigantea</i>	II	0	22	
<i>Centrochelys sulcata</i>	II	8	0	-8
<i>Chelonoidis carbonarius</i>	II	5	10	
<i>Chelonoidis denticulatus</i>	II	3	50	
<i>Geochelone elegans</i>	II	238	50	-188
<i>Kinixys belliana</i>	II	4	150	
<i>Kinixys erosa</i>	II	0	0	
<i>Kinixys homeana</i>	II	0	0	
<i>Manouria emys</i>	II	71	3	-68
<i>Pelomedusa subrufa</i>	III	0	100	
<i>Pelusios gabonensis</i>	III	2	100	
<i>Podocnemis unifilis</i>	III	1	0	-1
<i>Pyxis arachnoides</i>	II	7	80	
<i>Stigmochelys pardalis</i>	II	4	130	
<i>Testudo graeca</i>	II	34	500	
TOTAL		377	1195	-265
Period 2005–2010		2010		
<i>Aldabrachelys gigantea</i>	II	10	3	-7
<i>Centrochelys sulcata</i>	II	118	568	
<i>Chelonoidis carbonarius</i>	II	46	58	
<i>Chelonoidis denticulatus</i>	II	0	34	
<i>Geochelone elegans</i>	II	97	0	-97
<i>Geochelone platynota</i>	II	0	0	
<i>Kinixys belliana</i>	II	0	0	
<i>Kinixys erosa</i>	II	0	0	
<i>Kinixys homeana</i>	II	0	0	
<i>Kinixys spekii</i>	II	0	0	
<i>Stigmochelys pardalis</i>	II	36	130	
<i>Testudo graeca</i>	II	6	125	
<i>Testudo horsfieldii</i>	II	0	0	

Appendix 4: Species recorded during the 2004, 2010 and 2015 surveys.

Species name	Common name	2004	2010	2015	IUCN	CITES	Native
<i>Acanthochelys spixii</i>	Black Spine-necked Swamp Turtle			1	NT	NL	No
<i>Aldabrachelys gigantea</i>	Giant Aldabra Tortoise		10	218	VU	II	No
<i>Amyda cartilaginea</i>	Southeast Asian Softshell Turtle	10	1	3	VU	II	Yes
<i>Apalone ferox</i>	Florida Softshell Turtle		1		LC	NL	No
<i>Astrochelys radiata</i>	Radiated Tortoise	22	125	486	CR	I	No
<i>Astrochelys yniphora</i>	Ploughshare Tortoise	2	6	15	CR	I	No
<i>Batagur affinis</i> *	Southern River Terrapin	1	4	2	CR	I	Yes
<i>Batagur borneoensis</i>	Painted Terrapin	6		1	CR	II	Yes
<i>Carettochelys insculpta</i> *	Pig-nosed Turtle	69	2		VU	II	Yes
<i>Centrochelys sulcata</i>	African Spurred Tortoise	8	118	767	VU	II	No
<i>Chelodina parkeri</i>	Parkers Snake-necked Turtle	20			VU	NL	Yes
<i>Chelodina reimanni</i>	Reimann's Snake-necked Turtle			7	NT	NL	Yes
<i>Chelodina rugosa</i>	Siebenrocks Snake-necked Turtle	444		43	NE	NL	Yes
<i>Chelonoidis carbonaria</i>	Red-footed Tortoise	18	46	157	NE	II	No
<i>Chelonoidis denticulata</i>	Yellow-footed Tortoise	5		9	VU	II	No
<i>Chelonoidis niger</i>	Galapagos Tortoise			1	EN	I	No
<i>Chelus fimbriatus</i>	Mata Mata Turtle	20	20	10	NE	NL	No
<i>Chelydra serpentina</i>	Common Snapping Turtle	35	5	30	LC	NL	No
<i>Chitra chitra</i> *	Southeast Asian Narrow-headed Softshell Turtle	1			CR	I	Yes
<i>Chrysemys picta</i>	Western Painted Turtle		2	2	LC	NL	No
<i>Clemmys guttata</i>	Spotted Turtle		10		EN	II	No
<i>Cuora amboinensis</i>	Southeast Asian Box Turtle	395	125	837	VU	II	Yes
<i>Cuora galbinifrons</i>	Indochinese Box Turtle		1		CR	II	No
<i>Cuora trifasciata</i>	Chinese Three-striped Box Turtle			1	CR	II	No
<i>Cyclemys sp.</i>	Asian Leaf Turtle	241	19	113	NT	II	Yes
<i>Dogania subplanta</i>	Malayan Softshell Turtle	2			LC	NL	Yes
<i>Elseya novaeguineae</i> *	New Guinea Snapping Turtle	39	1	83	LC	NL	Yes
<i>Elseya schultzei</i>	Schultz's Snapping Turtle	58			NE	NL	Yes
<i>Emydura subglobosa</i>	Red-bellied Short-necked Turtle	10	14	76	LC	NL	Yes
<i>Emys orbicularis</i>	European Pond Turtle			4	NT	NL	No
<i>Geochelone elegans</i>	Indian Star Tortoise	238	97	937	VU	II	No
<i>Geoclemys hamiltonii</i>	Black Spotted Pond Turtle	15	1	50	VU	I	No
<i>Graptemys pseudogeographica</i>	Mississippi Map Turtle	97	65	7	LC	III	No
<i>Hardella thurjii</i>	Crowned River Turtle		1		VU	II	No
<i>Heosemys grandis</i>	Giant Asian Pond Turtle	9		30	VU	II	No
<i>Heosemys spinosa</i>	Spiny Turtle	63	21	27	EN	II	Yes
<i>Hieremys annandalii</i>	Temple Turtle			21	EN	II	No
<i>Indotestudo forstenii</i>	Sulawesi Tortoise	70		21	EN	II	Yes
<i>Kinixys belliana</i>	Bell's Hingeback Tortoise	4			NE	II	No
<i>Kinosternon baurii</i>	Stripe-necked Mud Turtle			3	LC	NL	No
<i>Kinosternon flavescens</i>	Yellow Mud Turtle			2	LC	NL	No
<i>Kinosternon integrum</i>	Mexican Mud Turtle			2	LC	NL	No
<i>Kinosternon leucostomum</i>	White-lipped Mud Turtle			2	VU	NL	No
<i>Kinosternon scorpioides</i>	Scorpion Mud Turtle			24	NT	NL	No
<i>Leucocephalon yuwonoi</i>	Sulawesi Forest Turtle	35	4		CR	II	Yes
<i>Lissemys punctata</i>	Indian Flapshell Turtle			3	LC	II	No
<i>Macrochelys temminckii</i>	Alligator Snapping Turtle	9	17	97	VU	III	No
<i>Malaclemys terrapin</i>	Diamondback Terrapin		4	11	NT	II	No
<i>Malacochersus tornieri</i>	Pancake Tortoise	34	12	10	VU	II	No
<i>Malayemys subtrijuga</i>	Malayan Snail-eating Turtle	26	20	9	VU	II	Yes

<i>Manouria emys</i>	Asian Giant Tortoise	71	6	20	EN	II	Yes
<i>Mauremys japonica</i>	Japanese Pond Turtle	2			NT	II	No
<i>Mauremys reevesii</i>	Chinese Pond Turtle	18	1	1	EN	III	Yes
<i>Mauremys sinensis</i>	Chinese Striped-necked Turtle		16	25	EN	III	No
<i>Melanochelys tricarinata</i>	Tricarinate Hill Turtle			3	VU	I	No
<i>Melanochelys trijuga</i>	Indian Black Turtle			1	NT	II	No
<i>Nilssononia gangetica</i>	Indian Softshell Turtle		2		VU	I	No
<i>Nilssononia hurum</i>	Indian Peacock Softshell		1		VU	I	No
<i>Notochelys platynota</i>	Malayan Flat Shell Turtle	110			VU	II	Yes
<i>Orlitia borneensis*</i>	Malaysian Giant Turtle	61	15	29	EN	II	Yes
<i>Pangshura tecta</i>	Indian Roofed Turtle	63		14	LC	I	No
<i>Pangshura tentoria</i>	Indian Tent Turtle		2		LC	I	No
<i>Pelochelys cantorii</i>	Asian Giant Softshell Turtle	2	6		EN	II	No
<i>Pelodiscus sinensis</i>	Chinese Softshell Turtle			61	VU	NL	No
<i>Pelomedusa subrufa</i>	African Helmeted Turtle		5	9	NE	NL	No
<i>Pelusios gabonensis</i>	Central African Mud Turtle		5		NE	NL	No
<i>Pelusios subniger</i>	East African Black Mud Turtle	2	13		LC	NL	No
<i>Phrynops geoffroanus</i>	Geoffroy's Side-necked Turtle	3			NE	NL	No
<i>Phrynops hilarii</i>	Hilaires Side-necked Turtle		2		NE	NL	No
<i>Podocnemis unifilis</i>	Yellow-spotted River Turtle	1	1		VU	II	No
<i>Pseudemys nelsoni</i>	Florida Red-bellied Cooter			10	LC	NL	No
<i>Pseudemys rubriventris</i>	Northern Red-bellied Turtle			2	NT	NL	No
<i>Pyxis arachnoides</i>	Spider Tortoise	7	2	2	CR	I	No
<i>Rhinoclemmys punctularia</i>	Spot-legged Wood Turtle			4	NE	NL	No
<i>Sacalia quadriocellata</i>	Four-Eyed Turtle		3	1	EN	III	No
<i>Siebenrockiella crassicollis</i>	Black Marsh Turtle	164	40	6	VU	II	Yes
<i>Staurotypus triporcatus</i>	Mexican Giant Musk Turtle			2	NT	NL	No
<i>Sternotherus carinatus</i>	Razorback Musk Turtle		21	4	LC	NL	No
<i>Sternotherus minor</i>	Loggerhead Musk Turtle			13	LC	NL	No
<i>Sternotherus odoratus</i>	Common Musk Turtle			4	LC	NL	No
<i>Stigmochelys pardalis</i>	Leopard Tortoise	4	36	495	LC	II	No
<i>Testudo graeca</i>	Spur-thighed Tortoise	5	6	19	VU	II	No
<i>Testudo hermanni</i>	Hermann's Tortoise	3		91	NT	II	No
<i>Testudo horsfieldii</i>	Russian Tortoise			27	VU	II	No
<i>Testudo kleinmanni</i>	Egyptian Tortoise	7	2	11	CR	I	No
<i>Testudo marginata</i>	Marginated Tortoise		8	8	LC	II	No
<i>Trachemys dorbigni</i>	D'Orbigny's Slider			2	NE	NL	No

* Species protected under Indonesian law.

** The Galapagos Tortoise *Chelonoidis niger* is part of a species complex. Whilst CITES recognises different subspecies of a single species, IUCN recognises numerous distinct species of *Chelonoidis*. As the exact species/sub-species was not identifiable from photos alone, the lowest Red List status for all possible *Chelonoidis* spp. was used (VU).

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