

*Short notes and reviews***Trade in non-native, CITES-listed, wildlife in Asia, as exemplified by the trade in freshwater turtles and tortoises (Chelonidae) in Thailand**Vincent Nijman¹, Chris R. Shepherd^{1,2}¹ Zoological Museum, University of Amsterdam, PO Box 94766 1090 GT Amsterdam, The Netherlands. Email: nijman@science.uva.nl; ² TRAFFIC Southeast Asia, Unit 9-3A, Jalan SS23/11, Taman SEA, Petaling Jaya, Selangor, Malaysia

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Abstract

In 1973 the Convention in International Trade in Endangered Species of Wild Fauna and Flora (CITES) was called to life as to regulate the international wildlife trade, and to prevent species becoming (economically and biologically) extinct. The trade in freshwater turtles and tortoises in Asia is so huge that it threatens the survival of many species. In 2006 and 2007, during three surveys at Chatuchak market in Bangkok, Thailand, we recorded a significant trade in non-native CITES-listed freshwater turtles and tortoises to be used as pets. We documented a total of 688 individuals of 19 species from different regions of the world, many of which are globally threatened with extinction. Most commonly recorded were three species of tortoise from Madagascar and Africa, i.e. Radiated Tortoise *Geochelone radiata*, Spurred Tortoise *G. sulcata* and Leopard Tortoise *G. pardalis*. Five species were listed on CITES Appendix I, precluding all international trade, and an additional six Appendix II or III-listed species that can be traded albeit regulated, were not registered as being imported into Thailand in the last six year. CITES I-listed species were not more expensive than CITES II or III listed species, nor was there a relationship between retail price and numbers of turtles observed. The large number and availability of illegally sourced animals indicates a blatant disregard for law and authority by traders both from Thailand and from exporting countries. We conclude that the trade in these species, in such significant volumes, is of serious conservation concern, and in order for CITES to be more effective it is imperative that Parties recognize the scale of the international trade in freshwater turtles and tortoises and respond accordingly.

Introduction

Wildlife trade is an issue at the very heart of the relationship between biodiversity conservation and sustainable development (Oldfield, 2003). Directly and indirectly, increasing demand and consumption are

depleting the Earth's living natural resources at an alarming rate, even though it is well documented that these resources form the biological foundation upon which human society depends (Broad *et al.*, 2003). In order to regulate the international wildlife trade, and to prevent species becoming (economically and biologically) extinct, in 1973, the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) was called to life. Once CITES laws are passed in a contracting Party, the police, customs inspectors, wildlife officials, and other government officers are empowered to enforce the CITES regulations.

A significant part of the wildlife trade deals with tropical species, nowhere more so than in the international pet trade. Although to the naive outsider it may appear that most of the trade in tropical pets is to meet the international demand, with buyers mostly in the developed countries and the suppliers mostly operating from the developing countries. However, increasingly it is becoming clear that a large proportion of the trade is to meet domestic demand in tropical countries (Duarte-Quiroga and Estrada, 2003; Shepherd *et al.*, 2004; Nijman, 2006). Furthermore, as apparently there are a large number of affluent buyers in developing countries, and controls can be lax in certain countries, there is a market for exotic pets (i.e. those species not indigenous to the country itself) within the developing world.

Freshwater turtles and tortoises are traded worldwide (e.g. Georges *et al.*, 2006; O'Brien *et al.*, 2003; Vargas-Ramirez *et al.*, 2007) and in Asia to the point where it has been termed a crisis (van Dijk *et al.*, 2000). They are traded for their meat, to be used as ingredients in traditional medicines and, increasingly so as pets (Shepherd, unpubl. data). Much of the trade

is carried out in an illegal and unsustainable manner (Shepherd *et al.*, 2004; Warchol, 2004), resulting in many species becoming endangered (Compton, 2000; Shepherd and Ibarrondo, 2005). Numerous species of freshwater turtles and tortoises are traded as pets in major cities in East and Southeast Asia. The supply and demand of freshwater turtles and tortoises appears to be increasing throughout South-east Asia with an increase in species diversity on offer and an increase in the number of retail outlets specializing in these species (Shepherd *et al.*, 2004).

Here we report on the trade in non-native (exotic) freshwater turtles and tortoises in Thailand, as observed during three periods in 2006 and 2007 at the Chatuchak or Weekend market in Bangkok. Chatuchak (sometimes transliterated as Jatujak) is one of the main hubs for trade in freshwater turtles and tortoises for pets in South-east Asia (van Dijk & Palasuwan, 2000), and is the main hub for the domestic pet trade in Thailand. We found exotic species to make up the bulk of the trade in tortoises and freshwater turtles, with species having been imported from all parts of the world. For a significant proportion of these species international trade regulations are in place, precluding or restricting commercial trade. Here we report our findings and discuss the implications for global freshwater turtles and tortoises conservation and the threat unregulated trade in Thailand poses to these species.

Methods

Data acquisition

Observations were made in January and August 2006 and April 2007. Retail outlets that specialized in selling reptiles (14 shops in 2006 and 15 in 2007 at the time of the survey) were visited three times, and all species observed, quantities and other relevant information were recorded. We restrict ourselves to those species that do not occur naturally in Thailand and that are listed on one of the three Appendices of CITES. Thailand became a Party to CITES in 1983; no commercial trade is allowed in Appendix I species, whereas Appendix II and Appendix III species can be traded albeit regulated. When retail prices were displayed these were recorded, or when not, these were requested from the dealers. Additionally, we contacted a number of dealers included in the survey by phone as to get quotes of selected species. Prices were quoted in US Dollar and Thai Bath; the latter are here converted at

the exchange rate at the time of the survey. All species were openly displayed for sale and there was no need to resort to undercover techniques to obtain the data; no animals were purchased.

Data on the numbers of CITES-listed turtles and tortoises imported in Thailand were retrieved from the UNEP-WCMC database (2007) for the period 2000–2005 (2006 was not yet available). This database holds all information on the international trade of CITES-listed species as reported by CITES Parties. We focus on the import data as reported by the Thai CITES Management Authority.

Analysis

We use simple linear regressions to test for relationships between number of individuals observed at Chatuchak during the three surveys, between number of individuals observed and numbers reportedly imported into Thailand, and for relationships between requested prices (in USD) and frequencies of occurrence of certain species. Where necessary, data were $\log(x+1)$ transformed as to approach a normal distribution more closely, and significance is accepted when $P < 0.05$ in a two-tailed test.

Results

Numbers and species composition

In all we recorded 29 species of freshwater turtles and tortoises. Excluding two species that are captive-bred in large numbers (i.e. Red-eared Slider *Trachemys scripta elegans* and Chinese Softshell Turtle *Pelodiscus sinensis*), it appears that exotic CITES listed species were observed more often in large numbers (>30 individuals) than indigenous or non-CITES-listed species (Fisher's Exact probability test, $P=0.057$). Exotic, CITES-listed species were nearly seven times as commonly observed than indigenous or non-CITES-listed species (688 v 98 individuals). The 688 individuals represented 19 species; five are listed in CITES Appendix I, 11 in CITES Appendix II and four in Appendix III. Of these species 11 species are considered globally threatened with extinction, with nine listed as Vulnerable and two as Endangered. There were statistically significant relations (with high coefficients of determinations) between the number of individuals of any given species recorded at a survey and the numbers of the same species recorded during a previous

Table 1. Species of exotic CITES-listed freshwater turtles and tortoises observed at Chatuchak animal market, Bangkok, Thailand, 2006-2007, with first quotes in USD (small refers to individuals that are relatively small whereas large refers to those that are larger) and the average number of individuals reportedly imported into the country in the period 2000-2005.

Species name	CITES Appendix	Total observed	Price (USD)			Average annual import (2000-2005)
			Small	Medium	Large	
Radiated Tortoise <i>Geochelone radiata</i> *	I	269	57-86	72-230		0
Spurred Tortoise <i>Geochelone sulcata</i>	II	123	86-158	143-244	516-1291	117
Leopard Tortoise <i>Geochelone pardalis</i>	II	119	57-86	57-143		462
Indian Star Tortoise <i>Geochelone elegans</i>	II	68	14-57	14-115		313
Red-footed Tortoise <i>Geochelone carbonaria</i>	II	31	86	24-143		11
Pancake Tortoise <i>Malacochersus tornieri</i>	II	30	72			72
Mississippi Map Turtle <i>Graptemys kohnii</i>	III	8				0
Pig-nosed Turtle <i>Carettochelys insculpta</i>	II	7			72	0
Alligator Snapping Turtle <i>Macrolemys temminckii</i>	III	7		143		0
Spotted Pond Turtle <i>Geoclemys hamiltonii</i>	I	6	138			0
Burmese Eyed-turtle <i>Morenia ocellata</i>	I	4				0
Spider Tortoise <i>Pyxis arachnoides</i>	I	4	287			42
Giant Aldabra Tortoise <i>Geochelone gigantea</i>	II	3		2009		24
Hermann's Tortoise <i>Testudo hermanni</i>	II	3		143		78
Indian Roofed Turtle <i>Kachuga tecta</i>	I	2	17-43			0
Chinese Stripe-necked Turtle <i>Ocadia sinensis</i>	III	2	43			0
Indian Tent Turtle <i>Kachuga tentoria</i>	II	1				0
Black-breasted Leaf Turtle <i>Geoemyda spengleri</i>	III	1		43		0

* a medium Radiated Tortoise having unusual yellow coloration demanded a much higher price of 2009 USD

survey ($F_{1,16} = 27.3$, $P = 0.0001$, $R^2_{adj} = 61\%$ and $F_{1,25} = 13.0$, $P = 0.002$, $R^2_{adj} = 41\%$, for August vs January and April vs August respectively), suggesting a consistent availability of species. However, although there were eight exotic, CITES-listed species of freshwater turtle or tortoise recorded during all three surveys, an equal number was recorded during one survey only.

The most abundant species was the Radiated Tortoise *Geochelone radiata*, a CITES Appendix I-listed species endemic to Madagascar, with a total of 269 specimens observed (Table 1). Next most abundant observations were for the Spurred Tortoise *G. sulcata* and the Leopard Tortoise *G. pardalis*, both CITES II-listed species, native to Africa, with a total of 123 and 119 specimens observed, respectively. As such some two-thirds of the pet turtles originate from Africa (including Madagascar) and only approximately 10 percent from East, Southeast and South Asia.

Monetary value and legality of the trade

Prices range from a low 14 USD for a small- to medium-sized Indian Star Tortoise *Geochelone elegans* to a high of 2000 USD for a medium-sized Giant Aldabra Tortoise *G. gigantea* or an unusually colored Radiated

Tortoise, also demanding a high of USD 2000. Prices of four CITES I-listed species were not significantly different from that of 5 CITES II-listed species (median price for a small-sized individual, USD 112 v USD 86, respectively). The price of a CITES-listed freshwater turtle or tortoise for sale at Chatuchak holds no relationship with the numbers observed ($F_{1,8} = 0.04$, $P = 0.85$ and $F_{1,7} = 1.1$, $P = 0.33$ for small and medium-sized individuals, respectively). The total monetary value of these turtles and tortoises observed amount to an absolute minimum of approximately USD 45,000 (based on minimum prices requested for small individuals) to approximately USD 100,000 (based on the average prices of medium sized individuals).

There was no relationship between the number of tortoises and freshwater turtles reportedly imported into Thailand and the number recorded at Chatuchak ($F_{1,6} = 1.0$, $P = 0.35$, $R^2_{adj} = 0.4\%$). Only one of the five Appendix I-listed species has been reported as being imported into Thailand post 2000. This species, Spider Tortoise *Pyxis arachnoides*, was included on Appendix I in January 2005, and all 260 individuals were imported prior to the Appendix I-listing entering into effect. Only eight of the exotic species of freshwater turtle and tortoise observed at Chatuchak market ap-

pear in the UNEP-WCMC database as having been imported into Thailand between 2000–2005 (Table 1): for one species, Red-footed Tortoise *Geochelone carbonaria*, the number of individuals observed during our survey is three times the annual average imported into Thailand, suggesting either very low turn-over or additional (illegal) imports. Two Appendix II-listed species and all four Appendix III-listed species have not been (legally) imported into the country.

Apart from the Appendix I-listed species, several Appendix II-listed species, such as the Pig-nosed Turtle *Carettochlys insculpta*, Indian Tent Turtle *Kachuga tentoria*, and Indian Star Tortoise are totally protected in their range States and cannot be exported. Since they were not recorded as being imported by Thailand, they too must have been smuggled into the country. In concordance with this, retailers openly acknowledged that many of these species have been illegally obtained and offered advice on techniques to smuggle protected species out of the country.

Discussion

Results of this study show that there is a significant market for exotic freshwater turtles and tortoises for pets in Thailand, many of which are globally threatened. Expensive species were as commonly offered for sale as less expensive ones and the composition of the species observed differed between surveys suggesting an erratic supply, or may be indicative of the capriciousness of the Asian turtle trade (with continuously changing favorite species). Despite this market changing in what species are on offer, it was also clear that during every survey a significant number of even the rarer species were for sale. Illegally imported species were readily available. Although prices were not available for all species, there was no relationship between the asking price and the numbers observed; some of the more commonly observed species demanded high prices, and indeed the total value of the freshwater turtle and tortoise trade in Chatuchak is significant.

The large number and available of illegally sourced species in the markets highlights the lack of vigilance and enforcement effort on the part of the relevant authorities. Furthermore, the number of Red-footed Tortoises recorded as being imported into Thailand was far smaller than the numbers observed, further illustrating a lack of effective regulation. A similar picture, with more CITES-listed species being traded in greater

numbers than permitted was observed by Sze and Dudgeon (2006) and Goh and O’Riordan (2007) in Hong Kong and Singapore, respectively.

Many of the buyers at Chatuchak are Thai, although a significant number are purchased by retail dealers from neighbouring countries. Prices were frequently quoted in foreign currency (mainly US Dollar), suggesting the traders at Chatuchak are indeed catering for the international market. There is a documented trade in rare tortoise species from Bangkok to Malaysia and Indonesia (Shepherd and Nijman, in press) and further illustrated through seizures of Madagascar tortoise species in Bangkok *en route* to Malaysia (TRAFFIC, unpublished). This information is indicative of a burgeoning trend within South-east Asian countries for keeping of endangered and exotic species of high economic value.

Of particular concern was the number of CITES I-listed species observed in trade. Surprisingly, as a group, these were not more expensive than CITES II-listed species (although CITES-listed species may be more expensive than non-CITES species, see e.g. Courchamp *et al.*, 2006). The presence of these species, especially those in relatively large numbers, such as the Radiated Tortoise, indicates a blatant disregard for law and authority, both on the part of the traders in Thailand and the exporting countries, such as, in the case of the Radiated Tortoise, Madagascar (see Walker *et al.* 2004 for an example of illegal trade of tortoises from Madagascar to Indonesia). The trade in these species, in such significant volumes, is of serious conservation concern. In order for CITES to be an effective conservation tool, it is imperative that Parties recognize the scale of the international trade in freshwater turtles and tortoises, and respond accordingly. Enforcement effort, especially at points of entry into Thailand, should be enhanced if this problem is to be adequately addressed.

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