

CROSSING INTERNATIONAL BORDERS: THE TRADE OF SLOW LORISES *Nycticebus* spp. AS PETS IN JAPAN

Louisa Musing^{1*}, Kirie Suzuki², and K.A.I. Nekaris³

^{1,3}Nocturnal Primate Research Group, Department of Social Sciences, Faculty of Humanities and Social Sciences, Gibbs Building, Gipsy Lane, Oxford, OX3 0BP. ¹E-mail: louisa.musing@gmail.com, ³E-mail: anekaris@brookes.ac.uk

²Japan Wildlife Conservation Society, 102 MoutAPT.1-11-19, Sakai Musashino-shi, Tokyo, Japan 180-0022. E-mail: suzukikirie@jwcs.org

*Corresponding author

ABSTRACT

Japan's involvement in the wildlife trade is widely recognised. We investigated the extent and legitimacy of trade of slow lorises, *Nycticebus* spp., as pets in Japan. We collected data from online videos, pet shops, and selected informants between May and July 2014 in Japan, and supplemented these with data from CITES Trade Database and confiscation records. We recorded 114 slow lorises in 93 Japanese online videos, and across 20 pet shops we recorded the sale of 74 individuals of six threatened species, including 12 Critically Endangered *N. javanicus* and two hybrids, each costing USD 3,290-8,650, with animals displayed with falsified CITES permits. From 1985 to 2013, CITES data specify that Japan imported more slow lorises than any other country ($n=633$), and 400 individuals were confiscated entering Japan, between 2000 and 2013. Penalties imposed on law breakers are weak and our investigations highlight inadequacies in Japan's enforcement of national law and CITES regulation. To combat the illegal trade and demand for wildlife as pets, we emphasise the need for: stronger penalties, improved legislative regulation, provision of educational materials and training programs to border control staff and the public. Finally, we strongly urge the continued monitoring of the slow loris trade in Japan.

Keywords: Asia, exotic pets, illegal wildlife trade, legislation, primates

INTRODUCTION

Numerous internationally protected and rare species are threatened by global wildlife trade (Warchol, 2004; Bush et al., 2014). Species are traded through various markets, established international routes, and more recently via the Internet, where trading systems are notoriously difficult to regulate (Broad et al., 2003; Blundell & Mascia, 2005; Alacs & Georges, 2008). Southeast Asia, a mega-biodiverse region, has been identified as a 'wildlife trade hotspot' predominantly supplying demand from the United States, the European Union and Japan (Nijman, 2010; Rosen & Smith, 2010; Baker et al., 2013). Japan is notably involved in the legal and illegal importation, use and consumption of wildlife, including vascular and medicinal plants (Iwatsuki, 2008; Ishihara et al., 2010), bear gallbladders (Mano & Ishii, 2008), timber wood for products such as chopsticks (Barden et al., 2000; Tian & Yin, 2006), whale meat (Danaher, 1997), and animals for the exotic pet trade (Walker et al., 2004; Ishihara et al., 2010). These activities regularly include species listed on the Convention on International Trade in Endangered

Species of Wild Fauna and Flora (CITES) (Takahashi, 2009; Ishihara et al., 2010) and they continue to elicit international criticism regarding law enforcement, wildlife management and protection (Hirata, 2005; Takahashi, 2009).

Of the forms of wildlife trade, the commercial pet trade prevails as a driving force behind the loss of biodiversity (Shepherd et al., 2004; Fernandes-Ferreira et al., 2012) and involves thousands, sometimes millions, of individual reptiles, amphibians, birds and mammals (Gilardi, 2006; Linder et al., 2013). More than half of the world's primate taxa are listed as threatened with extinction on the IUCN Red List (IUCN, 2014), yet despite all primate species being listed under CITES Appendix I (banning all commercial trade), or Appendix II (regulating trade to avoid detriment to species survival in the wild) (CITES, 2014), their trade is by no means declining (Nijman et al., 2011).

A commonly protected and threatened group of primates available in the pet trade are slow lorises,

Nycticebus spp., a small, nocturnal, arboreal-living primate taxon endemic to South, “East” (Southern Yunnan), and Southeast Asia (Shepherd, 2010; Nekaris & Bearder, 2011). Frequently traded for use in traditional medicines (Starr et al., 2010) and the photo prop trade (Osterberg & Nekaris, 2015), their prevalence and demand as pets, particularly in non-range countries, has been fuelled by their popularity on Internet videos, of which a large number originate from Japan (Nekaris et al., 2013a). Since 2007, *Nycticebus* spp. have been listed on CITES Appendix I but individuals are still regularly smuggled. Between 2007 and 2013, a total of 99 live individuals, likely destined for the pet trade in Eastern Europe, Russia, the Middle East, China, and Japan, were officially confiscated (Nekaris et al., 2013a; TRAFFIC, 2013). Of these 99 individuals, 73 were destined for or seized in Japan (TRAFFIC, 2013) and this report remains one of the few to quantify slow loris trade in Japan (see Black, 2007; McGreal, 2007a, 2007b; Sakamoto, 2007).

We set out to examine the nature of and extent to which slow lorises are legitimately or illegally traded as pets in Japan, with the aim of providing an insight and analysis as to the magnitude of their exploitation. We also used online videos, which offer a unique opportunity to analyse aspects of the pet trade (Nekaris et al., 2013a), from Web 2.0 sites where videos are uploaded and can be viewed worldwide for gaining further insight into the demand of pet slow lorises in Japan. More specifically, we examine the following questions. How common is the slow loris pet trade in Japan and what species are kept as pets? What form does this trade most often take (pet shops, Internet) and what evidence is there that it is legal? How can slow lorises serve as an example for illegal wildlife trade in Japan?

METHODS

We conducted research for a two-month period in Japan and the UK between May and July 2014, and used databases available from the UK from January to July 2014. We investigated both online and in-store pet shops.

Online videos

To locate online videos of pet slow lorises in Japan, we used purposive sampling (Bernard, 2006) to consult three popular Web 2.0 sites: the Japanese version of YouTube, Niconico, and MSN. We entered the search terms ‘pet slow loris’ and ‘slow loris’ into each Web 2.0 site with English and with Japanese characters

(Katakana) and only selected those videos with their upload location as Japan. To avoid duplication, only the first available video from each individual user was utilised. Individuals were deemed pet slow lorises if they were observed in a typical pet environment (i.e. in a human household, on household furniture, in a cage etc.) or if a term relating to pet was used in the description. We excluded any individual observed in alternative situations (i.e. sanctuary, zoo, private exhibit). For each video we recorded: number of slow lorises, species of slow loris and its age group.

In-store and online pet shop investigations

Using a purposive sampling method (Bernard, 2006; Newing et al., 2011), we investigated five in-store pet shops in Tokyo, and 18 online pet shops across Japan, which were advertising the sale of slow lorises. We collected information on: species, age group (recorded as infant, juvenile or adult, following Rode-Margono et al., 2014), sex, availability of CITES permit (and its information, i.e. trade date), source (i.e. captive bred), and sale price. We followed the taxonomy of Nekaris (2014) recognising eight Slow Loris species, one of which is Critically Endangered (*N. javanicus* É. Geoffroy, 1812), and also included the putative new taxon *N. coucang hilleri* (Nekaris & Jaffe, 2007). When identifying individuals, we used the identification key by Nekaris et al. (2015) and an associated photo ID collection that includes known hybrids from captivity. In some parts of their range, where one allopatric species meets another, hybrid species of slow loris are possible but no research is currently available. Consequently, those animals that had all the features of known hybrids from captive facilities are considered here as hybrids. Informal interviews (Bernard, 2006; Newing et al., 2011) were additionally conducted with all five in-store pet shop dealers, hereafter known as informants, regarding slow loris demand and source.

CITES trade data

For an overview of the international trade of *Nycticebus* spp. into Japan, we obtained data from the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade Database. This database holds records of imports, exports and re-exports of CITES-listed species for member countries. Japan officially became a Party to CITES in 1980; import data are not available until 1985, therefore we collected data between 1985 and 2013 (inclusive), the latter being the last year of obtainable data. As the UNEP-WCMC CITES Trade Database only recognises three species of slow lorises: *N. bengalensis* (Lacépède, 1800), *N.*

coucang (comprising *N. coucang* [Boddaert, 1785], *N. javanicus*, *N. menagensis* [Trouessart, 1893]), and *N. pygmaeus* (Bonhote, 1907), frequency of distinct species could not be determined. We downloaded data on the imports of all *Nycticebus* spp. into Japan for analysis focusing upon live trade (instead of trade in animal parts or specimens [i.e. skulls, bodies, hair etc.]), importer-reported quantities instead of exporter-reported quantities (as this reflects the numbers in the country of import), exporter and purpose.

Confiscation records and illegal activity

To gain insight into the illegal trade of *Nycticebus* spp. in Japan, we obtained data from three separate sources. Confiscation data of slow lorises between 2000 and 2013 (the latter being the latest year of available data) were acquired from Japan's Ministry of Economy, Trade and Industry (METI) database consisting of seizure records from Japanese airport and marine border controls, while records regarding prosecutions and seizures from international border controls were collected from TRAFFIC, the wildlife trade monitoring network's bulletin. (TRAFFIC, 2013). Though records and computerised databases provide valuable information (Flowerdew, 2005), inaccuracy and missing values are known disadvantages of secondary data (Silver et al., 2013). While TRAFFIC records provide listings of species-specific names, this is rare in the METI database and slow lorises are commonly recorded as *Nycticebus* spp. or 'monkey' due to identification problems and inadequate species knowledge at confiscation. To avoid data limitation we cross-checked information from each source to prevent duplication and confirmed two listings of slow lorises as 'monkey' in METI records. For each confiscation incident bound for or found in Japan, we recorded available information on species, age group, exporting country, the number of slow lorises traded, and purpose. In the METI records, the only details available between 2000 and 2002 were the number of slow lorises confiscated and frequency of seizures. We therefore separated this analysis into: the total number of individuals confiscated between 2000 and 2013 (i.e. Fig. 2), and those confiscated between 2003 and 2013 where we could determine the exporting country. Furthermore, to review the extent of the illegal activity since the transfer of *Nycticebus* spp. to CITES Appendix I in 2007, we also examined information from TRAFFIC (2013), Japan Wildlife Conservation Society (JWCS), reports, and media articles regarding the arrests of slow loris pet dealers and owners.

RESULTS

Online videos

We observed 114 individuals in 93 online videos with the earliest uploaded in May 2007, and the latest in July 2014. Of these, *N. bengalensis*, *N. coucang*, and *N. pygmaeus* made up 89.5% of individuals observed (Table 1). Seven individual *N. javanicus* and three hybrids also appeared in the videos. We observed individuals across all age groups: 63.2% adults, 22.8% juveniles, and 14% infants.

In-store and online pet shop investigations

We discovered 74 slow lorises of six threatened species, including 12 Critically Endangered *N. javanicus*, for sale, in 20 pet shops; two in-store pet shops and 18 online pet shops (Table 1). The two in-store pet shops were displaying a total of 18 individuals priced between ~USD 4,330 and USD 8,650 per individual. The majority of these 18 individuals were adults (83%), with 17% juveniles and no infants. All 18 individuals were displayed with CITES permits stating those specific slow lorises had been imported prior to 13 September 2007 (Fig. 1), however the presence of these documents with juvenile slow lorises clearly shows they are false. No import permit contained information on their origin. We witnessed the actual purchase of one adult *N. javanicus* individual for ~USD 4,330.

All five informants expressed the desirability of *Nycticebus* spp. as pets in Japan, describing them as 'rare', 'popular' and 'valuable'. Two informants revealed that although slow lorises were typically acquired from private breeders, it was possible to obtain wild individuals. One informant implied that two individuals currently for sale were wild-caught; one (hybrid species identified by the authors) from Thailand, and another (*N. coucang hilleri*) from Sumatra. Another emphasised the popularity of pet slow lorises explaining he had sold one *N. pygmaeus* in December 2013 for ~USD 6,920, and the shop was currently awaiting two new juveniles due to arrive at the end of 2014.

Online pet shop investigations revealed the sale of 56 individuals priced between ~USD 3,290 and ~USD 8,220 per individual. Of these, only 33 were said to be captive bred, 12 were recorded as having been imported before June 2007, despite one being a juvenile, and 11 had either no visible CITES permit or no mention of one on the website.

Of all 74 individuals, the most common species for sale was *N. pygmaeus* (39.2%). Individuals from all three age groups were observed: 60.7% adults, 23.2%

Table 1. Frequencies and percentages of *Nycticebus* spp. and hybrids.

Species (subspecies)	In-store and online pet shops				Online videos	
	In-store pet shops (2)	Online pet shops (18)	Total pet shops (20)	Total percentage (%)	Frequency	Percentage (%)
<i>N. bancanus</i>	0	0	0	0	0	0
<i>N. borneanus</i>	0	0	0	0	0	0
<i>N. bengalensis</i>	1	12	13	17.6	28	24.6
<i>N. coucang</i>						
(<i>N. c. hilleri</i>)	4 (1)	8 (3)	12 (4)	16.2 (5.4)	41 (1)	36 (0.9)
<i>N. javanicus</i>	5	7	12	16.2	7	6.1
<i>N. kayan</i>	0	0	0	0	1	0.9
<i>N. menagensis</i>	0	2	2	2.7	0	0
<i>N. pygmaeus</i>	6	23	29	39.2	33	28.9
Hybrid	1	1	2	2.7	3	2.6
Total frequency	18	56	74	100	114	100

Note: (1) recorded in two in-store pet shops in Tokyo and 18 online pet shops across Japan; and (2) observed in 93 Japanese online videos from three Web 2.0 sites, during investigations between 8 May and 1 July 2014.

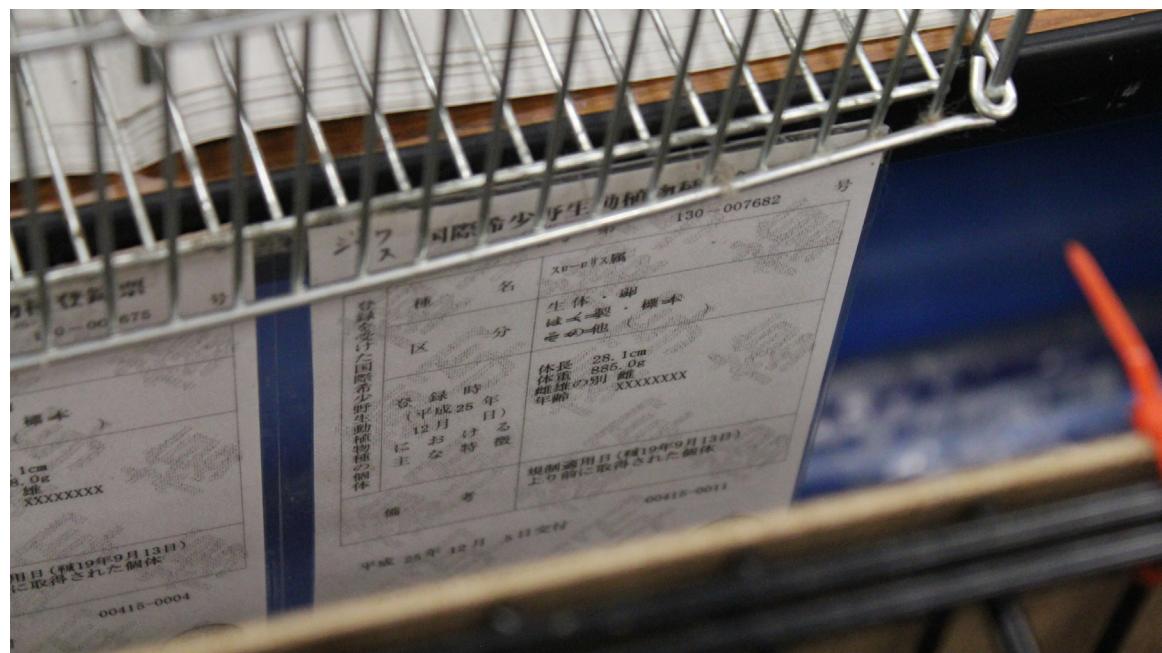


Fig. 1. Photograph of CITES permit stating that the specific slow loris was imported into Japan prior to 13 September 2007 as recorded during the in-store pet shop investigations in Tokyo, Japan between 8 May and 1 July 2014. The slow loris in question was too young to have been imported at this time, showing the falsification of the document. Photograph source: principal investigator.

juveniles, and 16.1% infants. With a considerable number of juvenile and infant slow lorises for sale, it is important to highlight that any slow lorises bred from adults that had been illegally acquired are also illegal.

CITES trade data

CITES records indicate that between 1985 and 2013 there were 633 imports of live *Nycticebus* spp. into Japan, with Malaysia the most frequent exporter, followed by China and Singapore. The only other exporting country was Thailand. All imports were for commercial purposes and the last import was recorded in 1999.

Confiscation records and illegal activity

Between 2000 and 2013, 42 incidences involving 400 individuals listed as *Nycticebus* spp. on METI records were confiscated at Japanese borders (Fig. 2). When analysing the data with available information on exporting country (between 2003 and 2013), 309 individuals listed as *Nycticebus* spp. in 28 incidences were confiscated at Japanese borders between 2003 and 2013 (Table 2). If individuals listed as 'monkey' are included in the data (a total of two listings, both in 2007), a total of 30 incidences involving 350 individuals occurred between 2003 and 2013. Regardless of whether individuals listed as 'monkey' are incorporated into these results, Thailand and Indonesia were the most significant exporting countries between 2003 and 2013 (Table 2).

Examination of reports from TRAFFIC (2013) and JWCS revealed that between late 2006 and 2008 seven further attempts were made to smuggle 42 individuals illegally from Thailand into Japan. Furthermore, information from reports and media articles revealed that between 2008 and 2014, nine separate arrests of slow loris dealers or pet owners were made, involving 26 slow lorises. Three of these arrests were due to illegal sales, and the further six were due to failure to produce a valid CITES permit.

DISCUSSION

Based on our investigations the incidence of sale of slow lorises as pets in Japan was high and covered six threatened species, most notably 12 Critically Endangered *N. javanicus*. While some individuals may legitimately derive from legal sources, evidence of falsified CITES permits and 400 confiscated individuals at Japanese borders between 2000 and 2013 highlight the extent of the illegal activity. Trade links between slow loris range countries and Japan are strong and provide appropriate opportunities to accommodate

their increasing demand as pets. Although Japanese national laws are in place in accordance with international regulation to deter this commercial trade, enforcement of CITES regulation is weak, penalties are lenient, and Japan has trouble safeguarding these threatened species.

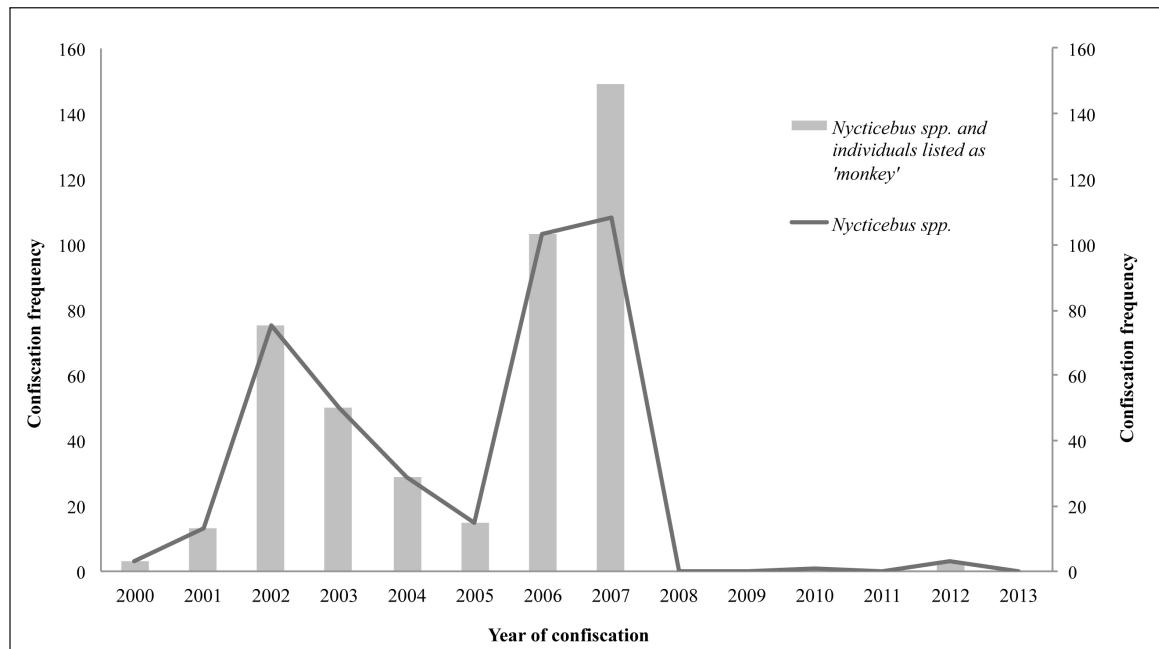
CITES data reveal that Japan's imports of live slow lorises are the highest amongst any CITES Party (Svensson & Friant, 2014), with the last recorded import occurring in 1999. Between 1985 and 1999, the national legislation in China, Singapore and Thailand did not fully protect or prohibit slow lorises from being traded and therefore the export of these individuals to Japan were legal at the time (Nekaris & Starr, 2015). Malaysia officially protected slow lorises under the Protection of Wild Life Act 1972, however the Minister is able to grant special permits to those with a valid application when satisfying certain conditions. There are two possible explanations for the recorded exports from Malaysia: either they were granted by special permit, or CITES permits were misused. As Malaysia is widely recognised as a major exporter of live animals and is frequently found to be illegally trading internationally protected wildlife (Nijman, 2010; Rosen & Smith, 2010), the latter is a legitimate possibility but has not been confirmed.

According to the five informants, slow loris species are typically sourced from private captive breeders, however their reproductive success rates in captivity are particularly low, with most slow loris species listed as rare or non-breeders in accredited zoos (Fuller et al., 2013; Nekaris et al., 2013a). We cannot discount that some individuals observed during our study were truly legally captive bred. However, data from the European studbooks reports that since 1990 the highest number of births per annum of captive Pygmy Slow Loris *N. pygmaeus* across 26 European Association of Zoos and Aquaria (EAZA) institutions is 19 individuals, with a population size at the end of the study period of 90 (Elvidge, 2013). In our study we discovered 29 Pygmy Slow Lorises for sale in pet shops and 33 in videos in two months of investigation, which points strongly towards the infeasibility of them all having been captive bred. Slow lorises are particularly susceptible to stress in non-natural environments and have the highest infant mortality rates of all prosimian primates in accredited zoos (Debyser, 1995; Fuller et al., 2014). It is unlikely that their care would be met to a high enough standard in pet shops to produce viable reproductive individuals and ensure infant survival (Streicher, 2004a; Fuller et al., 2014). Slow lorises also have a specific copulation method whereby the female

Table 2. Frequencies of *Nycticebus* spp. seizures and numbers involved.

<i>Nycticebus</i> spp. listing only			<i>Nycticebus</i> spp. including 'monkey' listings	
Exporting Country	Frequency of seizures	Number of individuals	Frequency of seizures	Number of individuals
China	1	7	1	7
Indonesia	7	74	8	85
Philippines	1	1	1	1
Singapore	2	8	2	8
Thailand	17	219	18	249
Total	28	309	30	350

Note: with and without those listed as 'monkey', and the exporting countries from confiscation records from Japanese airports and marine border controls between 2003 (the first year of data detailing exporting country) and 2013 (the last year of available data for analysis). Data obtained from Ministry of Economy, Trade and Industry (METI).

**Fig. 2.** Number of *Nycticebus* spp., with and without those listed as 'monkey', from confiscation records from Japanese airports and marine border controls between 2000 and 2013 (the last year of available data). Data obtained from Ministry of Economy, Trade and Industry (METI).

must suspend from a branch upside down in order for mating to occur, which further reduces their breeding ability in non-natural environments (Fitch-Snyder et al., 2001; Dixson, 2012). These factors raise doubt that inadequate facilities, lacking in specialised knowledge, could have produced the 74 slow lorises discovered for sale in pet shops and the further 114 seen in the videos.

Sakamoto (2007) found 29 slow lorises for sale in four in-store pet shops in Tokyo, Japan during a short investigation. While the majority of pet shop dealers denoted private breeding as their source, the quantity and age range for sale strongly suggested wild collection, particularly from Java, Sumatra and China (Sakamoto, 2007). While some of the individuals discovered for sale in our investigations may have legitimately derived from breeding facilities, it is likely that these pet shops are used as a 'front' to launder illegally caught individuals from their natural habitats. The cost of captive breeding outweighs the time and expenditure of wild harvesting and wild individuals collect much higher profits from buyers (Brooks et al., 2010; Abbott & Van Kooten, 2011). Consequently, extracting animals from their natural habitats and concealing their acquisition is a common activity repeatedly observed in the global illegal wildlife trade (Nijman & Shepherd, 2009; Lyons & Natusch, 2011).

The concealment of illicit trade under that which looks to be legal is often made possible through the transfer of goods by long-distance public transport, hiding products and animals amongst legal goods, corrupt border control agents, and the use of false trade permits (Li & Wang, 1999; Warchol, 2004; Van Song, 2008). Like many other countries, Japan's involvement in such activities has been intimated. Ishihara et al. (2010) revealed the ease with which Japanese traders can participate in illegal activities over the Internet while Dalebout et al. (2002) told of the concealment of illegal trade of CITES Appendix I listed Minke Whale *Balaenoptera acutorostrata* (Lacépède, 1804) from Japan's oceans through scientific permits. Furthermore, Wyatt (2009) detailed how the illegal trade of raptors from Russia to Japan is made possible through organised crime networks facilitating smuggling under the facade of legal exports. During our investigations informants indicated the possibility of acquiring wild individuals, and records confirmed the illegal smuggling of slow lorises. Continued discrepancies with regards to CITES permits were also highlighted and we recorded 30 slow lorises that were said to have been imported prior to their trade ban in 2007, while 11 had no permit at all.

Trade links between Japan and Southeast Asia are known to be strong, particularly from Thailand and Indonesia (Ishihara et al., 2010; Baker et al., 2013). Since Indonesia's inception as a Party in 1979, only two cases of legal exportation of live *Nycticebus* spp. have been recorded, to Hungary and to the USA (CITES Trade Database, 2014). As Japan has never legally imported live *Nycticebus* spp. from Indonesia, Hungary or the USA, the 12 *N. javanicus* (an Indonesian endemic) discovered for sale in our study (Table 1) must be illegal and their CITES permits stating that they had been imported prior to 2007 must have been falsified. Evidence of attempted smuggling of species from Indonesia was also frequent, totalling more than 70 individuals (Table 2). This is a particularly pertinent issue as *N. javanicus* is the only species of slow loris listed as Critically Endangered on the IUCN Red List, as a result of habitat degradation and their consistent and severe exploitation for the pet trade (Nekaris et al., 2013b). While the pet trade is recognised as a primary threat to all slow loris species (Shepherd et al., 2004; Nekaris et al., 2013a), it is causing such a significant population decline to *N. javanicus* that traders in Java are now unable to find individuals to smuggle and are resorting to overexploiting alternative slow loris species (Nijman & Nekaris, 2014).

Slow lorises have adequate regulation supporting their protection that in theory should prevent any detriment to wild populations. National legislation across their distribution range now protects slow loris species from hunting, trading and possession, and their CITES listing provides the framework for Parties to develop and enforce their own domestic laws to end all commercial trade (Streicher, 2004b; Schneider, 2012). In 1980 Japan joined CITES as a Party, yet it continues to list reservations (Mofson, 1994; Takahashi, 2009), and it was not until 1992 that Japan implemented The Law for the Conservation of Endangered Species of Wild Fauna and Flora (LCES) in line with CITES regulation (Knight, 2007). This legislation has moreover been criticised for its limited commitment to CITES, including a lack of communication regarding wildlife trade matters and weak control on imports (Reeve, 2002). However, the import and distribution of slow lorises is also prohibited by Japanese national legislation: the Customs Act, the Foreign Exchange and Foreign Trade Act, the Endangered Species Act and the Invasive Diseases Act, and perpetrators are in violation of these laws. While this legislation exists and seems robust, it requires increased regulation and enforcement to deal with the diversified modes of trade, particularly the Internet (Ishihara et al., 2010)

where slow lorises are predominantly being sold.

Under current Japanese legislation, penalties imposed upon those involved in illegal trade or non-compliance with CITES regulation are weak. Fines of less than ~USD 2,600 are given for falsified permits and less than ~USD 40,000 is set for wildlife smuggling along with an occasional short prison sentence; moreover court cases are regularly dismissed (Sakamoto, 2007, 2009). When considering these penalties compared with the rate and price at which slow lorises are sold in Japan, offenders are not likely to be deterred from continuing their activities. Across the slow loris distribution range there is a lack of resources and manpower supporting legislation, which has resulted in an absence of fear among poachers, hunters and traders with regard to penalties and prosecution (Shepherd, 2010; Nijman & Nekaris, 2014). Japanese enforcement agencies need to increase support and funding so officials can better monitor the legitimacy of wildlife sales and provision of permits, and regularly investigate pet shops. It is imperative that law enforcement officials undergo training regarding trade issues, are provided with resource materials, and are fully equipped to identify wildlife to the correct genus and species level (Pantel, 2008; Zhang et al., 2008). This will help ensure population viability and species-specific breeding if individuals confiscated from the trade are later transferred to a zoo or sanctuary where reproduction could occur (Frankham et al., 2010). Furthermore, if government agencies are seen to take strong action against illicit trade, even those heavily involved are more likely to be influenced by such punitive measures and reduce their involvement to avoid punishment (Natusch & Lyons, 2012).

Despite official figures from METI indicating a sharp increase in smuggling the year prior to and during the 2007 CITES trade ban (Fig. 2), there seems to be a reduction in illegal trade, which the government considers a success (Ministry of Environment staff, pers. comm.). Nevertheless, according to Rivalan et al. (2007) this occurrence of an upsurge in harvesting prior to and during the legislative alterations and up-listing of species is a legitimate concern when instigating trade bans. They are likely to be responsible for adding market value through perceived rarity to traders and consumers stimulating overexploitation before any declines in the trade are detected, and even then illegal activities are likely to remain prominent (Rivalan et al., 2007; Sollund, 2011). Courchamp et al. (2006) found that a quarter of species were subject to a significant increase in illegal trade during and after their altered CITES protection. Species with CITES status were

also significantly more expensive than those without. According to wildlife traders this was attributable to confirmation of their rarity by conservation organisations (Courchamp et al., 2006) and highlights the need for improved enforcement efforts to help deter any potential upsurge.

Irrespective of the harvesting purpose, this phenomenon can have dire consequences for species (Courchamp et al., 2006; Gault et al., 2008). Within two years of up-listing rhinos, their horn price on Korean markets increased by 400% and corresponded to an increase in rhino poaching and illegal trade (Rivalan et al., 2007). Similarly, after the new description of the Roti Island Snake-necked Turtle *Chelodina mccordi* (Rhodin, 1994), its perceived rarity was confirmed and its sale price and trade increased tenfold (Shepherd & Ibarrondo, 2005). Perceived rarity has also been found to significantly influence consumer choice; Gault et al. (2008) confirm the exaggerated preference for caviar derived from rare sturgeon species, and Lyons & Natusch (2013) demonstrate how Green Pythons *Morelia viridis* (Schlegel, 1872) from areas of low harvest were perceived as the least common, and therefore fetched the highest sale price. Tournant et al. (2012) similarly found that collectors of stag beetles in Japan were primarily interested in purchasing rare specimens irrespective of sale price.

Termed the Anthropogenic Allee Effect (AAE), this predisposition to value rarity increases species' and their derivatives' economic value and purchasing incentive (Courchamp et al., 2006; Gao & Clark, 2014), and poses an additional threat to slow loris populations and their future survival. Using a bioeconomic model, Hall et al. (2008) illustrate that the ultimate outcome of rarity-fuelled demand for species is extinction, as either the species becomes trapped at a low population size where it is particularly vulnerable, or intensified hunting pressure to meet demand drives extinction. According to informants slow lorises are perceived as rare and valuable species in Japan, and their popularity has not wavered since 2007. Despite individual slow lorises being sold for ~USD 1,810 in the mid-2000s, buyers are now willing to pay up to ~USD 8,650 per individual. As slow lorises are non-native to Japan, their perceived rarity and protection status on CITES could contribute to their demand and significant price increase since the 2000s. Furthermore, their presence on social media as pets has made these animals available for viewing to audiences that would otherwise have been unaware of their existence (Nekaris et al., 2013a).

At the moment data are too sparse to confirm that the change in CITES listing and perceived rarity has definitely contributed to demand for and price increase in slow lorises, and investigating this relationship should be a focus of future studies. Forthcoming investigations might also benefit from visiting private breeders to examine slow loris breeding records and sale information. With such high prices and demand in Japan, legitimate breeders, much like livestock and domestic animal breeders (McGreevy & Nicholas, 1999; Derry, 2006), would have records of the birth of slow loris offspring, parental lineage, longevity and health, as well as financial accounts regarding sales to pet shops and consumers. These details would help confirm any discrepancies between those claimed to have derived from private breeders by pet shop owners and the actual rate of slow loris reproduction through private breeding. Such information would also further substantiate our evidence of the illegal slow loris pet trade in Japan. Additionally, talking to slow loris pet owners regarding their desire to possess these species, and knowledge of their ecological, behavioural and welfare needs, would help inform future mitigation efforts and awareness-raising campaigns. Finally, unlike the online stores, our investigations into in-store pet shops were geographically restricted to Tokyo for logistical reasons. This limited the amount of information we could collect from informants concerning source and demand. We strongly recommend that future studies gather information from across the country and that investigations are conducted for a longer period of time, ideally over a few years.

Slow lorises are consistently sourced and sold as pets in the global black-market wildlife trade and Japan represents one of the major destinations. Given Japan's patterns of wildlife and natural resource use, their established trade links with Southeast Asia and current law enforcement, their involvement in the trade of *Nycticebus* spp. as pets is noteworthy. Evidence from our investigation reveals illegal trade of slow lorises for the pet trade, high rates of sale and demand, elevated market price, and perceptions of species as desirable. This information should be used to put pressure on the Japanese government to implement more stringent regulation of national law and the LCES in accordance with their international protection, as well as initiate educational resources and campaigns. Increased scrutiny of CITES permits by Japanese authorities is a necessity as are continued pet shop investigations. Only through cooperation of the international community and more rigorous protective measures will the future survival of the slow loris be ensured.

ACKNOWLEDGEMENTS

First and foremost we thank Mitsuko Hirose and Yuichi Takahashi at the Japan Wildlife Conservation Society for their time and cooperation, including translation, support and logistical aid, throughout the execution of this research. We thank V. Nijman for advice on the international wildlife trade and CITES data and analysis. This research was in part funded by the Leverhulme Trust (RPG-084), the Cleveland Zoo Asian Seed Fund, Dierenpark Amersfoort, Columbus Zoo, International Primate Protection League, Brevard Zoo, Henry Doorly Zoo, Zoologische Gesellschaft für Arten- und Populationsschutz, Primate Action Fund, Mohamed bin Zayed Species Conservation Fund (152511813), National Geographic GEFNE 101-13, and People's Trust for Endangered Species.

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