

The Trade of Live Monitor Lizards (Varanidae) in the Philippines

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Abstract - Monitor lizards (genus *Varanus*) are utilized for their skin, meat and parts, or as pets. Eleven endemic species are currently recognized in the Philippines, including the only three known frugivorous monitor species in the world. We conducted a 30-month online study and reviewed 30 years (1989–2018) of CITES trade data to determine the dynamics of the live monitor lizard trade in the Philippines. A total of 541 individuals representing 13 species were documented for sale from September 2017 to February 2020. *Varanus marmoratus* (n = 266) was the most commonly-traded and least expensive species (\$8–29 USD), while CITES Appendix-I listed *V. komodoensis* (n = 1) was the most expensive at \$16,667 USD. CITES trade data showed that the Philippines imported 671 live individuals of 20 species from at least 20 countries and exported 144 live individuals of nine species during the period of 1989–2018. Exported non-native species did not have a legal source based on CITES trade data, while some of the endemic species were suspected to be wild-caught and fraudulently declared as captive bred to obtain CITES export permits. Based on these findings, recommendations to authorities include (1) close monitoring and taking action on illegal wildlife traders offering animals for sale online, (2) putting in place a more robust regulatory and verification process to prevent wildlife laundering in the country, and (3) enhancing vigilance to intercept the illegal import and export of wildlife.

Introduction

Monitor lizards (Varanidae) are a group of reptiles that occur in Old World tropics and exhibit diversity in morphology, behavior, and ecology. The adult body sizes and weights of monitor lizards range from a total length (TL) of 23 cm and body mass of 16 g for the smallest species, *Varanus sparnus* (Doughty *et al.*, 2014), to 183 cm TL (average size based on 110 specimens) and 54 kg for the largest, *V. komodoensis* (Auffenberg, 1981). They occur in a wide range of habitats including deserts, shrublands, tropical forests, and even agricultural areas (Rajpoot *et al.*, 2016). Currently, 81 species of *Varanus* Merrem, 1820, are recognized (Uetz *et al.*, 2020).

Monitor lizards are traded for different purposes: their skin for the leather industry (Shine *et al.*, 1996; Koch *et al.*, 2013; Crook & Musing, 2016), meat for

human consumption (Klemens & Thorbjarnason, 1995; Scheffers *et al.*, 2012; Koch *et al.*, 2013), live specimens for household pets (Sy, 2015; Janssen, 2018), and their body parts (hemipenes) and by-products (dried flesh, body oil) for traditional folk medicine (da Nóbrega Alves *et al.*, 2008; Rajpoot *et al.*, 2016; Bhattacharya & Koch, 2018). These usages fuel both the legal and illegal trade (Nijman & Shepherd, 2009; Scheffers *et al.*, 2019). Some of the most sought after monitor lizards for the pet trade are from Southeast Asia, particularly Indonesia and the Philippines where several new species had been described in recent years (Koch *et al.*, 2010; Weijola & Sweet, 2010; Welton *et al.*, 2014).

As currently understood, the Philippines harbors 11 endemic *Varanus* species comprising the only three known frugivorous monitor lizards in the world (*V. bitatawa*, *V. mabitang*, and *V. olivaceus*) (Gaulke & Curio,

2001; Welton *et al.*, 2010) and eight members of the *V. salvator* complex (*V. bangonorum*, *V. cumingi*, *V. dalubhasa*, *V. marmoratus*, *V. nuchalis*, *V. palawanensis*, *V. rasmusseni*, and *V. samarensis*) (Koch *et al.*, 2010; Welton *et al.*, 2014; Auliya & Koch, 2020).

In the Philippines, all wildlife, including non-native species, is protected through the Wildlife Resources Conservation and Protection Act of 2001, or the Republic Act No. 9147. This law prohibits the collection, possession, transportation, and trade of wildlife without permits from the Department of Environment and Natural Resources (DENR). The Philippines is also a signatory of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which requires import or export permits for international wildlife trade in CITES-listed species.

The Philippine wildlife authority has not issued permits to collect and trade native wild reptiles for commercial purposes since 2001. However, previous physical and online trade studies (Welton *et al.*, 2013; Canlas *et al.*, 2017; Sy, 2018) have documented eight endemic monitor lizards traded illegally in the Philippines, including the most recently described frugivorous *V. bitatawa* (Welton *et al.*, 2010; Sy, 2012). Some of these endemic monitor lizards have been successfully smuggled or laundered through falsified paperwork and exported legally to Europe, Japan, and the US (Auliya *et al.*, 2016; Sy, 2018; Sy, in prep.; Ziegler & Vences, in press). The illegal wildlife trade in the Philippines has shifted from a physical to online presence in recent years particularly on Facebook, a popular social networking site (Canlas *et al.*, 2017; Sy, 2018). This market shift is not unique to the Philippines; in fact, it has also been observed in several other Asian countries (Chng & Bouhuys, 2015; Krishnasamy & Stoner, 2016; Nguyen & Willemsen, 2016; Phassaraudomsak & Krishnasamy, 2018).

Empirically, the trade dynamics of live monitor lizards in the Philippines are poorly understood due to limited studies. This study was undertaken to determine the species, magnitude, trends, and value of monitor lizards in the Philippine pet trade.

Methods

We conducted a 30-month online survey, from September 2017 to February 2020, by documenting reptile posts in 20 pre-selected Philippine Facebook groups that specialized in the trade of live reptiles. The groups were selected based on active wildlife trading activities six months prior to the start of this study. All posts offering to sell or trade reptiles were recorded, with those offer-

ing monitor lizards for sale then extracted and analyzed. Duplicate posts offering the same monitor lizard individuals were removed from the dataset to avoid inflating the total number of available animals within the study period. Posts that did not indicate available quantity or provide photos were counted as a minimum of one individual each. In instances where a trader was known to use multiple accounts to post, those accounts were combined to form one account for analysis. Relevant information such as the trader's Facebook account name and location, price, source, and life stage (*i.e.* hatchling, juvenile, adult) of the animal were documented as well.

To determine possible legal sources of non-native monitor lizards offered for sale in the Philippines, we retrieved import data from the CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora) Trade Database from 1989–2018 (the latest year with available data in the database) and used exporter-reported quantities for analysis. We also analyzed importer-reported (Philippines) data to determine differences in reported species and quantities.

We calculated the market value of monitor lizards based on the advertised prices. Posts that did not indicate prices were assigned the lowest known prices of the specific species within the study period. For the species advertised with no recorded price during the study period, they were assigned the lowest known retail price in the Philippine market. The exchange rate of the Philippine Peso (PHP) to United States Dollar (USD) fluctuated between PHP 49.81 and PHP 54.27 to \$1 USD during the study period according to www.freecurrency-rates.com. For consistency, the exchange rate of PHP 51 = \$1 USD (29 February 2020) was used in this study.

Results

A total of 359 monitor lizard posts by 187 unique accounts involving 13 species and 541 individual animals were documented during the 30-month online survey of 20 Facebook groups (Table 1). The quantity of monitor lizards per individual post ranged from 1–40 individuals. Trade activities were most active in the second quarter (April–June) with the influx of wild-caught hatchlings and juveniles, and were least active in the fourth quarter of the year (October–December). Monitor lizards offered for sale were mostly hatchlings/juveniles (88%; $n = 474$), and 55 individuals (10%) were adults. The remaining 12 individuals (2%) were of unknown life stages since traders did not include photos with their posts.

The price was indicated on 214 out of the 359 posts

Table 1. Live monitor lizards offered for sale in 20 Facebook groups. IUCN Red List categories: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), Not Evaluated (NE).

English Name	Species name	Qty	CITES	IUCN	Status	Distribution
Marbled Water Monitor	<i>Varanus marmoratus</i>	226	II	LC	endemic	Philippines
Savannah Monitor	<i>Varanus exanthematicus</i>	150	II	LC	non-native	Africa
Cuming's Water Monitor	<i>Varanus cumingi</i>	66	II	LC	endemic	Philippines
Green Tree Monitor	<i>Varanus prasinus</i>	40	II	LC	non-native	New Guinea, Australia
White-headed Water Monitor	<i>Varanus nuchalis</i>	28	II	NT	endemic	Philippines
Samar Water Monitor	<i>Varanus samarensis</i>	12	II	NE	endemic	Philippines
Northern Philippine Forest Monitor	<i>Varanus olivaceus</i>	10	II	VU	endemic	Philippines
White-throated Monitor	<i>Varanus albigularis</i>	2	II	NE	non-native	Africa
Crocodile Monitor	<i>Varanus salvadorii</i>	2	II	LC	non-native	New Guinea
Komodo Dragon	<i>Varanus komodoensis</i>	1	I	VU	non-native	Indonesia
Nile Monitor	<i>Varanus niloticus</i>	1	II	NE	non-native	Africa
Lace Monitor	<i>Varanus varius</i>	1	II	LC	non-native	Australia
Common Water Monitor	<i>Varanus salvator</i>	2	II	LC	non-native	South and Southeast Asia
TOTAL		541				

(60%) during the 30-month period. Prices were indicated in 73% of the posts in the beginning of the study, but gradually declined to 35% at the end of the study. This may be due to Facebook's policy of rejecting posts of wildlife images with prices. To circumvent this stricter policy on live animal trade on the platform, traders used code words (e.g., intentionally misspelling price in words) or asked potential buyers to inquire by private message. Posts offering *V. salvadorii*, *V. niloticus*, and *V. varius* did not have any price data. The total market value of offered monitor lizards was PHP 3,489,000 (\$68,412 USD).

The Philippine endemic marbled water monitor *V. marmoratus* (n = 226) was the only species consistently available throughout the study period and the least expensive. This species is also commonly seen in both forested and disturbed areas in the Philippines. The typical asking price for a hatchling or juvenile ranged from PHP 700–1,500 (\$12–29 USD), but could go as low as PHP 400 (\$8 USD) per individual. Among the non-native monitors, the savannah monitor *V. exanthematicus* (n = 150), one of the most traded monitors in the world, was available in 22 out of 30 months. We also documented one post made by a convicted wildlife trafficker in the Philippines that offered a CITES Appendix I-listed Komodo dragon *V. komodoensis* for PHP 850,000 (\$16,667 USD) in August 2018 (Fig. 1). However, it was uncertain if the animal had already been smuggled into the Philippines at the time the offer was made.

Online Traders

Out of the 187 unique accounts, at least 11 traders had been observed to use at least two Facebook accounts

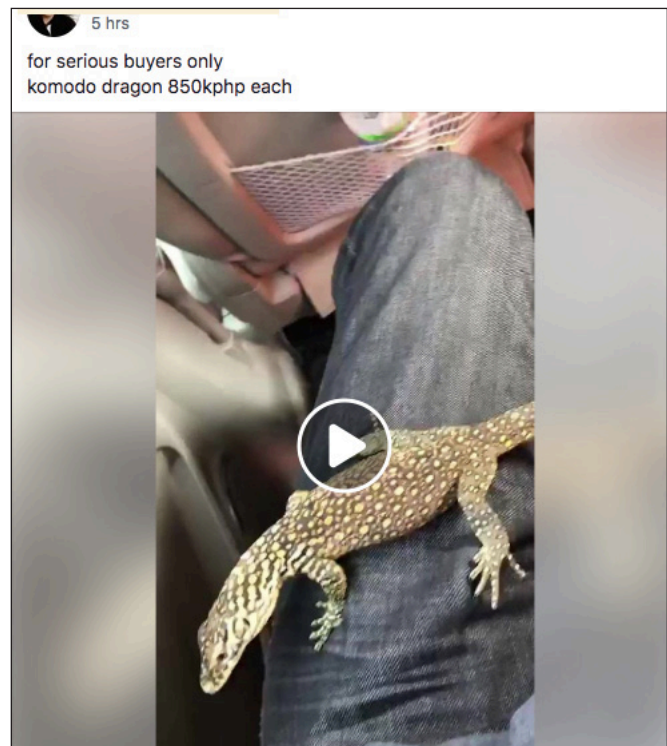


Fig. 1. Screen-captured photo showing a CITES Appendix I-listed Komodo dragon *Varanus komodoensis* for sale in the Philippines in 2018.

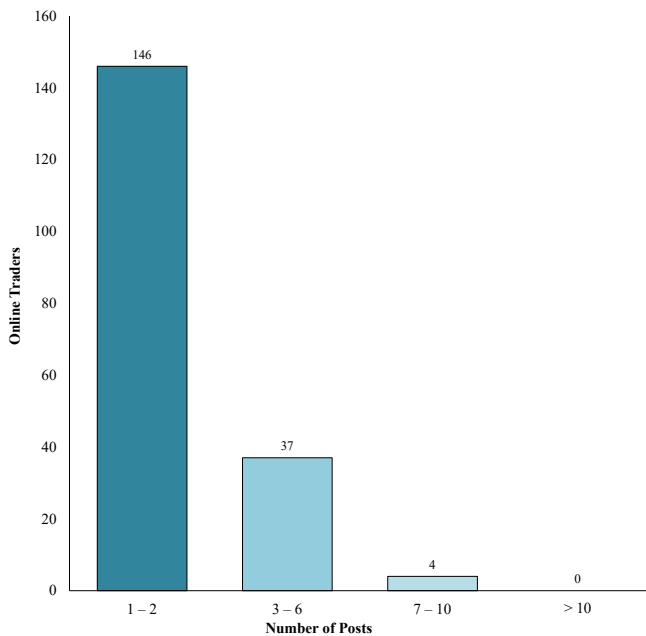


Fig. 2. Number of posts by online traders.

to engage in online wildlife trading activities. More than half (57%) of the traders made only one post that offered a single animal each (Fig. 2). However, a few traders in this group made several posts on their own Facebook wall. The 10 most active traders made 51 posts (10%), but accounted for 177 out of 529 individual monitor lizards (33%) in the trade.

The majority of the traders (74%; n = 138), based on location information declared on the accounts, were located on Luzon Island in the National Capital Region (NCR), Region IV-A, and Region III (Fig. 3). Eleven and five traders were based on Mindanao and Cebu, respectively. The remaining 33 traders did not declare their location (Fig. 3).

CITES Trade Data

From 1989 to 2018, there were 47 import records of live monitor lizard into the Philippines, representing 20 species and 671 animals (Table 2). Imported quantities ranged from 0–247 individuals and averaged 22.4 individuals per year between 1989 and 2018. During the 30-year period, records of monitor lizard imports were only reported for 16 years (Fig. 4). However, the year 2016 documented a significant increase in both species (n = 12) and quantity (n = 247) of imported monitor lizards. *Varanus exanthematicus* accounted for 73% (n = 180)

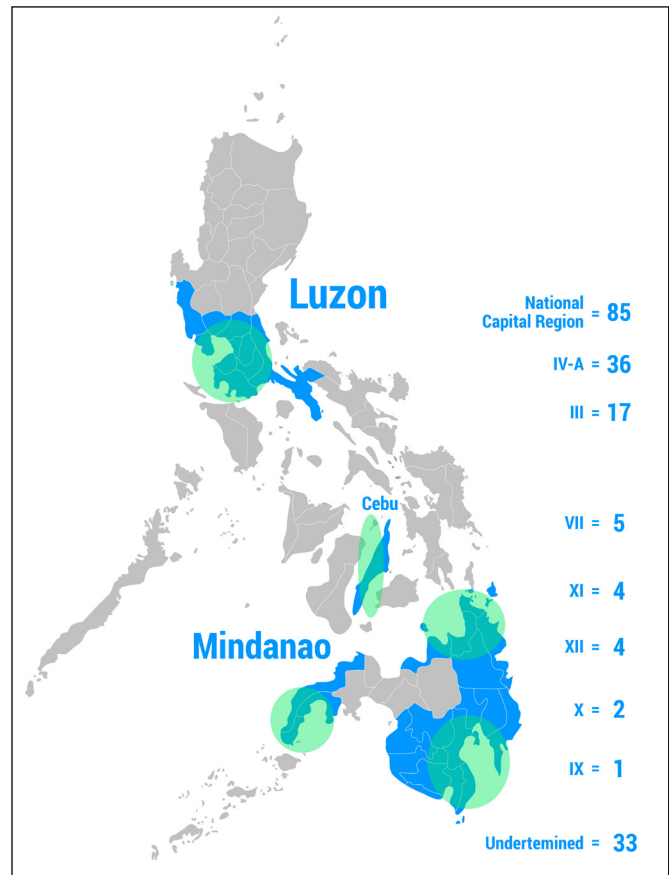


Fig. 3. Location of online traders by region.

of imported monitor lizards in 2016. The vast majority (91%; n = 609 individuals) were declared for commercial trade (purpose code “T”) while 60 individuals (8%) were undeclared. Nearly half of imported monitor lizards (48%; n = 319) were sourced from the wild (source code “W”) and 220 individuals (33%) were ranched (source code “R”) (Table 2). CITES defines ranched specimens as “animals reared in a controlled environment, taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood.” The most frequently reported source country was Indonesia, which exported 281 (42%) monitor lizard individuals to the Philippines.

Based on export records in the CITES Trade Database, the Philippines exported a total of 18,863 live monitor lizards (importer-reported quantity) between 1989 and 2018. The quantity was largely due to an export record of 18,719 live Mindanao water monitor *V. cumingi* to Japan in 1989. However, it is very likely that the trade was for skins instead of live specimens since the Philippines was a major source of the commodity during that period. We therefore omitted this record

Table 2. Exporter-reported quantity to the Philippines between 1989 and 2018. Source code C = animals bred in captivity, W = specimens taken from the wild, F = animals born in captivity that do not fulfil the definition of bred in captivity, and R = ranched specimens; Purpose code T = commercial, P = personal, and Q = circus or travelling exhibition.

Species	Total	Source				Purpose				
		C	W	F	R	Undeclared	T	P	Q	Undeclared
<i>Varanus acanthurus</i>	17	17	-	-	-	-	17	-	-	-
<i>Varanus albigularis</i>	3	-	3	-	-	-	3	-	-	-
<i>Varanus beccarii</i>	7	-	-	7	-	-	7	-	-	-
<i>Varanus doreanus</i>	21	-	21	-	-	-	21	-	-	-
<i>Varanus dumerilii</i>	21	-	1	-	-	20	1	-	-	20
<i>Varanus exanthematicus</i>	363	-	142	1	220	-	362	1	-	-
<i>Varanus indicus</i>	5	5	-	-	-	-	5	-	-	-
<i>Varanus jobiensis</i>	14	-	14	-	-	-	14	-	-	-
<i>Varanus macraei</i>	7	-	-	7	-	-	7	-	-	-
<i>Varanus melinus</i>	5	-	-	5	-	-	5	-	-	-
<i>Varanus niloticus</i>	2	-	2	-	-	-	2	-	-	-
<i>Varanus panoptes</i>	3	-	3	-	-	-	3	-	-	-
<i>Varanus prasinus</i>	7	7	-	-	-	-	7	-	-	-
<i>Varanus reisingeri</i>	5	-	-	5	-	-	5	-	-	-
<i>Varanus rudicollis</i>	3	-	3	-	-	-	3	-	-	-
<i>Varanus salvadorii</i>	26	-	26	-	-	-	26	-	-	-
<i>Varanus salvator</i>	138	-	98	-	-	40	97	-	1	40
<i>Varanus similis</i>	6	-	6	-	-	-	6	-	-	-
<i>Varanus timorensis</i>	13	13	-	-	-	-	13	-	-	-
<i>Varanus yuwonoi</i>	5	-	-	5	-	-	5	-	-	-

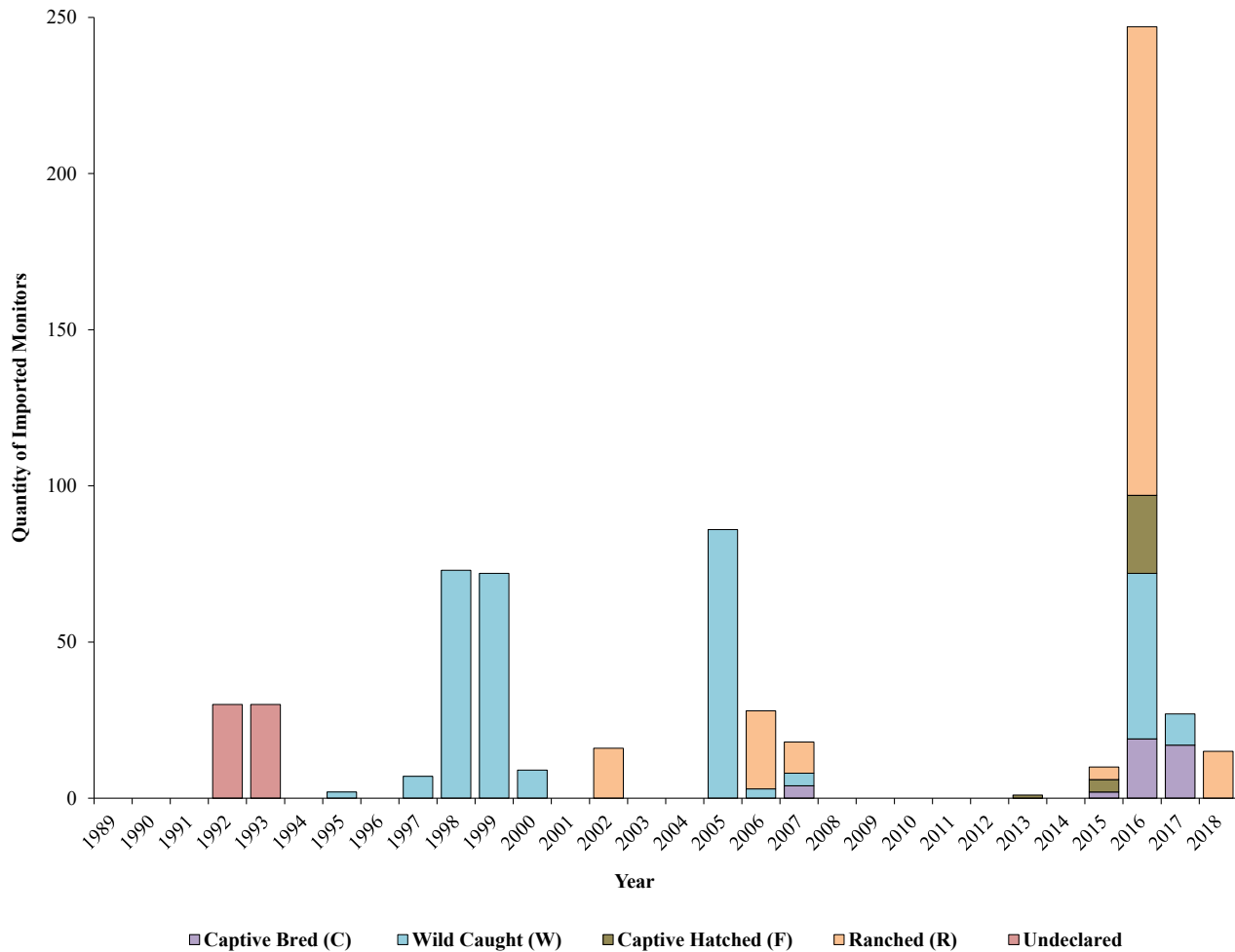


Fig. 4. Quantity and source of monitors imported to the Philippines from 1989 to 2018.

Table 3. Monitor lizard exported from the Philippines between 1989 and 2018. Source code C = animals bred in captivity, W = specimens taken from the wild, and I = confiscated or seized specimens.

Species	Total	C	W	I	Undeclared
<i>Varanus cumingi</i>	4	4	-	-	-
<i>Varanus dumerilii</i>	15	-	15	-	-
<i>Varanus marmoratus</i>	6	6	-	-	-
<i>Varanus nuchalis</i>	3	3	-	-	-
<i>Varanus olivaceus</i>	18	18	-	-	-
<i>Varanus prasinus</i>	41	-	-	41	-
<i>Varanus rudicollis</i>	16	-	16	-	-
<i>Varanus salvadorii</i>	4	-	4	-	-
<i>Varanus salvator</i>	37	-	31	-	6

from the analysis. The remaining 11 export records involved nine species and 144 live monitor lizards (Table 3). Aside from Japan, the other main importers of live monitor lizards from the Philippines between 1989 and 2018 were the United States of America, Germany, and Czech Republic.

Four exported species (*V. cumingi*, *V. marmoratus*, *V. nuchalis*, and *V. olivaceus*) are endemic to the Philippines and were declared to be bred in captivity. The four re-exported non-native species (*V. dumerilii*, *V. rudicollis*, *V. salvadorii*, and *V. salvator*) were all sourced from the wild, while exported *V. prasinus*, endemic to Indonesia, were specimens seized in the Philippines.

Discussion

Non-traditional pet keeping in the Philippines is driven by rarity and novelty. As such, more common and widespread monitor lizards are not in great demand as pets due to being readily available, and having high maintenance costs and large spatial requirements to house them properly. On the other hand, frugivorous monitor lizards were offered at higher prices because of their perceived rarity.

Sources of monitors

The vast majority, if not all of Philippine endemic monitor lizards offered for sale on Facebook were very likely poached from the wild and traded illegally since there are no registered wildlife facilities breeding monitors in the Philippines for commercial purposes. The low asking prices (as low as \$8 USD per individual)

of endemic species are also a strong indicator that they were not bred in captivity since these prices would not cover the cost of maintaining and breeding carnivorous lizards.

Varanus marmoratus is widespread and found in a range of habitats including urban, semi-urban, and disturbed habitats throughout Luzon Island. Its constant availability in the online trade was not a surprise since 74% of traders were Luzon-based and had easy access to wild-caught specimens. Currently, endemic water monitors are commonly trapped using snares and bamboo traps, and the species are consumed as a snack during liquor drinking session or sold as pets (Welton *et al.*, 2012, 2013).

Among the seven non-native monitor lizards documented in the online trade, only *V. komodoensis* did not have import records to the Philippines in the last 30 years. The species is protected by Indonesian law and international trade for commercial purposes is prohibited by CITES. The 40 *V. prasinus* offered for sale were most likely smuggled since only seven individuals were legally imported in 2015–2016 and wildlife authorities have seized smuggled Indonesian wildlife including *V. prasinus* in recent years (Sy, *in prep.*). For instance, a long-time legal wildlife farm permittee in the Philippines was caught smuggling eight species of wildlife including one *V. prasinus* in her luggage upon a return trip from Thailand to the Philippines in December 2018. This incident clearly illustrates the practice by which some permittees illegally acquire and transport additional wildlife and include such wildlife in their registered (*i.e.*, legal) inventory. The lack of exhaustive physical and paper audits by wildlife authorities allows this

fraudulent practice to perpetuate throughout the country. In addition, the fact that the suspect was not charged in court for wildlife smuggling encourages individuals who are involved in wildlife smuggling to continue their illegal activities.

A review of monitor lizard exports from the Philippines between 1989 and 2018 indicated that wildlife laundering was not just a recent occurrence. Five non-native species sourced from the wild, namely, *V. dumerilii* (n = 15), *V. prasinus* (n = 41), *V. rudicollis* (n = 16), *V. salvadorii* (n = 4), and *V. salvator* (n = 31) were exported in 1994. However, based on CITES trade database data, there were no legal importations of *V. rudicollis*, *V. salvadorii* or *V. prasinus* to the Philippines prior to the export of these wild-caught specimens in 1994.

Legality of the trade

During the initial implementation of the Wildlife Conservation and Protect Act in 2004, the Philippine wildlife authority allowed the legalization of all wildlife in the possession of enthusiasts through a registration process without questioning the source of the animals. This action created a larger pool of legal wildlife in the country. Laundering of endemic and smuggled wildlife has been ongoing in the Philippines since many registered wildlife farm permittees benefitted from their newly-legalized wildlife as a cover to continue with illegal acquisitions and fraudulent declarations of poached or smuggled wildlife as captive-bred (Diesmos *et al.*, 2012; Sy, 2018; Sy *et al.*, in press). There is a growing body of evidence that illustrates that a few wildlife facilities in the Philippines have obtained CITES export permits of purportedly captive-bred wildlife to trade internationally even though they neither had the capacity nor evidence of captive breeding (Sy, 2014; Auliya *et al.*, 2016). One such case was the legal export of 14 allegedly captive-bred *V. olivaceus* to the US in 2006 (Bennett, 2014). The wildlife laundering issue persists, allowing illegal online trade to flourish as well, and requires immediate attention from the Philippine wildlife authority to ensure compliance with CITES.

There is a persistent demand for endemic monitor lizards in international markets and some enthusiasts will exert great efforts, even illegally, to obtain specimens. At least six wildlife traders from the Philippines who actively-traded online have been linked to smuggling monitor lizards to Hong Kong, Malaysia, Thailand, Europe, and the US (Philippine Bureau of Customs, unpubl. data). Some key illegal traders were also observed posting in international monitor lizard Facebook groups.

Based on seizure records from the Philippine Customs, the most common smuggling method during the study period was concealing illegal wildlife in packages and sending them via courier services. The Philippine Customs and the United States Fish and Wildlife Service had intercepted numerous illegal wildlife shipments sent through this method in the last five years (Sy, unpubl. data). Seven traffickers in the Philippines and Austria (Anonymous, 2017, 2019; Dumaboc, 2017; Ching, 2018; Lopez, 2018) and at least three buyers in the US (USDOJ, 2017, 2019) have been implicated for being involved in international monitor lizard smuggling and trafficking.

Another smuggling method is through airports, as exemplified by an incident involving an Austrian national who flew by commercial airline from the Philippines to Vienna with approximately 90 wild-caught reptiles in his luggage on 7 September 2019. The suspect was intercepted only upon his arrival at Vienna International Airport, where authorities found 22 Philippine endemic species including 18 *V. marmoratus* and *V. cumingi*. The suspect intended to sell the reptiles during the Terraristika Hamm 2019 expo in Germany scheduled on 14 September 2019. The fair is reputed to be the biggest reptile show in the world, but is also a known hub for wildlife traffickers (Hruby, 2019).

Conclusion and Recommendations

The market for monitor lizards in the Philippines is considered to be relatively small when compared to other larger markets such as Japan, Europe, and the US. However, this and previous studies show that poaching, illegal domestic trade, international smuggling, and wildlife laundering do occur and should be addressed expeditiously. The following recommendations are offered to authorities to mitigate illegal trade in wildlife including monitor lizards:

- 1) Closely monitor and take action on those offering wildlife for sale online, considering that almost all of this trade is illegal by law. Wildlife law enforcement activities should be sustained to become an effective deterrent. The high probability of being caught and prosecuted will discourage would-be poachers and wildlife traders from engaging in illegal wildlife trade.
- 2) Initiate regular and comprehensive physical and paper audits by wildlife authorities on owners, traders, and those who declare breeding animals in captivity to detect fraudulent addition of illegally-acquired wildlife

into existing inventories and wildlife laundering.

3) Increased vigilance at seaports and airports is encouraged to prevent movement and smuggling of illegal wildlife domestically and internationally.

Acknowledgments - We thank a donor who wishes to remain anonymous for funding this and related studies in the Philippines, Cristine Canlas for assisting in data gathering, Faril Izzadi for the map illustration, and Serene Chng, Kanitha Krishnasamy, Thomas Ziegler, and an anonymous reviewer for suggesting improvements on an earlier draft.

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