ILLUSTRATION: PHILIPPINE SAILFIN LIZARD *HYDROSAURUS PUSTULATUS* WWF / URS WOY

A rapid survey of online trade in live birds and reptiles in the Philippines

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Introduction

The Philippines is the second largest archipelago in the world comprising 7641 islands and is both a mega-biodiverse country for harbouring wildlife species found nowhere else in the world, and one of eight biodiversity hotspots having a disproportionate number of species threatened with extinction; further, it has some of the highest rates of endemicity in the world (Myers *et al*., 2000). The illegal wildlife trade is one of the main reasons behind significant declines of some wildlife populations in Asia, including the Philippines (Anon., 2001; Sodhi *et al*., 2004; Nijman and Shepherd, 2007; Diesmos *et al*., 2012; Rao *et al*., 2014). The *Wildlife Act* of 2001 (*Republic Act No. 9147*) provides legal protection from trade to all native and non-native species in the Philippines, but in spite of the existing national regulatory safeguards, covert illegal wildlife trade is widespread (Sy, 2015a; Sy, in press).

Online commerce and networking platforms are emerging as the preferred alternatives to physical markets for trade in illegal wildlife; studies have been conducted to examine the prevalence of wildlife trade occurring in the popular social media site Facebook (Chng and Bouhuys, 2015; Sy, 2015b; Krishnasamy and Stoner, 2016; Nguyen and Willemsen, 2016; Sy, in press). Such a study has not yet been conducted for birds in the Philippines and this survey was therefore carried out to provide a snapshot of online bird and reptile trade in a given month in the Philippines.

Methods

A rapid online survey was undertaken between 6 and 28 February 2017 (17 days; approximately 4 hours/survey day) on 20 pre-selected Facebook groups specializing in the trade of live pets. Ten groups each for reptiles and birds were selected based on trading activities in the previous six months. The survey was carried out during week days (Monday to Friday) by going through each advertisement posted in the groups. Information, including that relating to species, quantity, and asking price, was noted. Species were identified to the lowest taxonomic level whenever possible. Taxonomy follows Gill and Donsker (2017) for birds and Uetz *et al*. (2017) for reptiles. The authors calculated the total potential value offered for birds and reptiles based on prices indicated by traders. Advertisements that did not specify prices were assigned the lowest known price for each taxon. Valuations in this report were based on a conversion rate of USD1=PHP50.1850 (Anon., 2017). It is not always possible during online surveys to verify that all offers are genuine.

Results

Researchers recorded a total of 700 advertisements involving 100 taxa (birds = 49; reptiles = 51) (Table 1–3) and 1623 live individuals posted in February 2017 by 494 unique Facebook traders' accounts (Table 1). Traders seemed to specialize in their specific faunal group as only one trader was documented to offer both birds and reptiles. All information collected that might indicate illegal activity was shared with relevant wildlife authorities and with Facebook for follow-up action.

	Bird	Reptile	Total
Advertisement	422	278	700
Taxon	49	51	100
Minimum number of individuals advertised	1166	457	1623
Number of unique traders	288	207	494*
Advertisements with price	269	198	467
Advertisements without price	153	80	233
Minimum potential value in PHP	4 734 570	2 759 699	7 494 269
Minimum potential value in USD	94 342	54 991	149 333

Table 1. Live birds and reptiles offered for sale in February 2017 in 20 pre-selected Philippines Facebook groups.
**One trader offered both birds and reptiles.*

BIRDS

A total of 288 unique Facebook traders' accounts posted 422 advertisements representing 49 taxa and 1166 birds. Approximately 98% of the advertised birds were juveniles; many were fledglings, but some were nestlings. Their minimum potential value, if sold, was estimated to be PHP4734 570 (USD94 342). Parrots (Psittaciformes) were the most traded taxa, with 1042 individuals of 23 species recorded. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I-listed Palm Cockatoo *Probosciger aterrimus*, a non-native species, was the most expensive bird documented in this study, with an asking price of PHP137 000 (USD2730).

Non-native Birds

The trade in non-native birds dominated trade, representing 97% all birds offered for sale at a minimum of 1130 individuals. These originated from 34 species of the 49 bird taxa recorded. Consequently, the top ten most traded birds, representing 1002 individuals (86%), were all non-native species and commonly kept and bred in captivity to supply the pet trade. For all other non-native species advertised, the authors deduce that some are being bred in registered Philippine commercial breeding facilities or by unregistered private breeders, or wild-caught and smuggled in, especially where advertised birds were in poor condition. It is a common practice of registered commercial farms to buy illegally from unregistered breeders/smugglers and declare such wildlife individuals as part of the farms' legal production.

Five species recorded have been assessed as Threatened or Near Threatened by the IUCN Red List (Table 2). Two species, Grey Parrot *Psittacus erithacus* (42 individuals) and Palm Cockatoo (four individuals), are both listed in CITES Appendix I, which means that international commercial trade in wild specimens is prohibited. While Grey Parrots are bred extensively in captivity by aviculturalists internationally, including in the Philippines, the Palm Cockatoos in the market are most likely wild-caught and smuggled (Sy, 2010). Another 789 individuals of 16 species are listed in CITES Appendix II, which means their trade is regulated (Table 2).

Native and Endemic Birds

Only 3% of the number of birds advertised for sale were native (15 species), but these are of potential conservation concern as seven species are endemic to the Philippines; two species assessed by IUCN as being of conservation concern are the Philippine Hawk-eagle *Nisaetus philippensis* (Endangered) and the Luzon Scops Owl *Otus longicornis* (Near Threatened). It is suspected that all native and endemic birds advertised are sourced from the wild, based on the fact that there are no commercial captive breeding operations for these species. Furthermore, the photographs posted online show birds that are in poor condition and many of these species can be easily trapped or collected from nests. Some traders are also reported to have the capacity to ship illegal wildlife nationwide and even smuggle native species out of the country (Agence France-Presse, 2016).

Also of particular interest are the birds of prey, comprising Strigiformes, Accipitriformes, and Falconiformes. Although only a small number were traded online (18 individuals of eight species), these were all native and some endemic, and included the endemic Philippine Hawk-eagle offered for PHP15 000 (USD299) by one trader. The authors have observed a recent surge in interest in the trade in raptor nestlings, used particularly for free-flying activities by private enthusiasts, and it is likely that an additional underground market exists offline.

REPTILES

A total of 207 unique Facebook traders' accounts posted 278 advertisements representing 51 taxa, representing 457 individual reptiles (Table 1). This comprised 13 lizard species (189 individuals), 20 snake species (182), 17 chelonian species (84), and one crocodilian species (2) (Table 3). In terms of species composition, 34 were non-native (333 individuals; 73%), six were native (74; 16%), and 11 were endemic taxa (50; 11%). The minimum potential value of traded reptiles in the study period was PHP2 759 699 (USD54 991) (Table 1). The most expensive reptile offered for sale was the Asian Giant Tortoise *Manouria emys* (one individual) with an asking price of PHP300 000 (USD5979).

The top ten most traded reptile taxa represented 347 individuals or 76% of the total quantity (Table 3). Of these, seven taxa (268 individuals) were non-native, but commonly bred in commercial quantities, while three taxa (78) were native/endemic.

Non-native Reptiles

One Critically Endangered and CITES Appendix I-listed species—the Radiated Tortoise *Astrochelys radiata*—was observed for sale. Although a few enthusiasts were granted an amnesty for wildlife obtained illegally during the initial implementation stage of the *Wildlife Act* in 2004–2005 (Sy, in press), the four juvenile Radiated Tortoises observed for sale were most likely recently smuggled into the Philippines since no importations of this species have been permitted since the Philippines became a Party to CITES in 1981 (Sy, 2015b). The species has also been observed to be traded online in other countries in the region such as Thailand, Malaysia, and Indonesia (Nijman and Shepherd, 2007; Krishnasamy and Stoner, 2016; Morgan, in review). Three species assessed by IUCN as Endangered were observed for sale, namely, Asian Giant Tortoise, Chinese Pond Turtle *Mauremys reevesii*, and Chinese Stripe-necked Turtle *M. sinensis*. While there is no legal import record for the Chinese Pond Turtle and Chinese Stripe-necked Turtle from 2000–2016 (CITES trade database; BMB, unpubl. data), both species are commonly available in the physical markets and are being smuggled regularly by the hundreds in legal shipments of ornamental fish (Sy, 2015a; Sy, unpubl. data).

Native and Endemic Reptiles

As is the case with the bird species, most if not all of the native and endemic reptile species being offered for sale were likely sourced illegally from the wild. Some

Taxon	# Individuals	CITES / IUCN	Native (A), Endemic (B) or Non-native (C)
Fischer's Lovebird *Agapornis fischeri*	367	II / NT	C
Yellow-collared Lovebird *Agapornis personatus*	248	II / LC	C
Budgerigar *Melopsittacus undulatus*	74	NL / LC	C
Cockatiel *Nymphicus hollandicus*	72	NL / LC	C
Zebra Finch *Taeniopygia guttata*	47	NL / LC	C
Pacific Parrotlet *Forpus coelestis*	46	II / LC	C
Sun Parakeet *Aratinga solstitialis*	43	II / NA	C
Grey Parrot *Psittacus erithacus*	42	I / EN	C
Rose-ringed Parakeet *Psittacula krameri*	38	NL / LC	C
Rosy-faced Lovebird *Agapornis roseicollis*	25	NL / LC	C
Green-cheeked Parakeet *Pyrrhura molinae*	21	II / LC	C
Rock Dove *Columba livia*	14	NL / LC	C
Eclectus Parrot *Eclectus roratus vosmaeri*	14	II / NA	C
Java Sparrow *Lonchura oryzivora*	11	II / VU	C
White Cockatoo *Cacatua alba*	9	II / EN	C
Sulfur-crested Cockatoo *Cacatua galerita*	9	II / LC	C
Monk Parakeet *Myiopsitta monachus*	8	NL / NA	C
Pink-necked Green Pigeon *Treron vernans*	6	NL / LC	A
Crested Myna *Acridotheres cristatellus*	5	NL / LC	C
Blue-and-yellow Macaw *Ara ararauna*	4	II / LC	C
Golden Pheasant *Chrysolophus pictus*	4	NL / LC	C
Luzon Scops Owl *Otus longicornis*	4	II / NT	B
Palm Cockatoo *Probosciger aterrimus*	4	I / LC	C
Rose-fronted Parakeet *Pyrrhura roseifrons*	4	II / LC	C
Rainbow Lorikeet *Trichoglossus moluccanus*	4	II / LC	C
Eastern Grass Owl *Tyto longimembris amauronota*	4	II / NA	B
Black-headed Parrot *Pionites melanocephalus*	3	II / LC	C
Mandarin Duck *Aix galericulata*	2	NL / LC	C
Wood Duck *Aix sponsa*	2	NL / LC	C
Little Corella *Cacatua sanguinea*	2	II / LC	C
Nicobar Pigeon *Caloenas nicobarica*	2	NL / NA	A
Common Emerald Dove *Chalcophaps indica*	2	NL / LC	A
Black Lory *Chalcopsitta atra*	2	II / LC	C
Asian Koel *Eudynamys scolopaceus*	2	NL / LC	A
Peregrine Falcon *Falco peregrinus*	2	I / LC	A
Brahminy Kite *Haliastur indus*	2	II / LC	A
Silver Pheasant *Lophura nycthemera*	2	NL / LC	C
Chattering Lory *Lorius garrulus*	2	II / VU	C
Philippine Falconet *Microhierax erythrogenys*	2	II / LC	B
Coleto *Sarcops calvus*	2	NL / LC	B
Philippine Serpent Eagle *Spilornis holospilus*	2	NL / LC	B
Grey-faced Buzzard *Butastur indicus*	1	II / LC	A
Coucal *Centropus* sp.	1	NL / LC	A
Diamond Dove *Geopelia cuneata*	1	NL / LC	C
Palawan Hill Myna *Gracula religiosa palawanensis*	1	NL / NA	B
Star Finch *Neochmia ruficauda*	1	NL / LC	C
Philippine Hawk-eagle *Nisaetus philippensis*	1	II / EN	B
Black-naped Oriole *Oriolus chinensis*	1	NL / LC	A
Blue-naped Parrot *Tanygnathus lucionensis*	1	II / NT	A

Table 2. Live birds offered for sale in 10 pre-selected Facebook groups.
NL = Not Listed; NA = Not Assessed; DD = Data Deficient; LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered

Fig. 1.

Seller offering an Eastern Grass Owl *Tyto longimembris amauronota* chick in exchange for a captive-bred female Reticulated Python *Malayopython reticulatus* morph.

of the indicators of wild-caught specimens include poor condition, routine availability of individuals in domestic black markets, few facilities in the country that breed them for commercial purposes, and the low asking prices. The Philippine endemic species such as the Philippine Sailfin Lizard *Hydrosaurus pustulatus*, Philippine Keeled Water Skink *Tropidophorus grayi*, Marbled Water Monitor Lizard *Varanus marmoratus*, Variable Paradise Tree Snake *Chrysopelea paradisi variabilis*, Luzon Red-tailed Rat Snake *Coelognathus erythrurus manillensis*, and Luzon Bronzeback Snake *Dendrelaphis luzonensis* were each offered for sale at PHP1000 (USD20) or less. These endemic species are also of potential conservation concern; according to the IUCN Red List, the Philippines Sailfin Lizard is assessed as Vulnerable and the Philippine Forest Dragon species complex (currently recognized as *Gonocephalus sophiae*) as Data Deficient, although the updated Philippine National Red List that is currently being finalized lists the latter species in the category of Other Threatened Species owing to poaching and illegal trade (Biodiversity Management Bureau, in prep.).

Discussion And Conclusion

The vast majority of birds and reptiles found in this rapid assessment are commonly bred in captivity. Among the 20 most traded taxa (for reptiles and birds), 18 were non-native species, widely bred in captivity throughout the country, and represented 1292 individuals (80%). This clearly illustrates the popularity of non-native species among enthusiasts as shown by previous studies (Sy, 2015a; Sy, 2015b; Sy, in press). However, under the Philippine wildlife law, it is illegal to possess and trade wildlife, captive-bred or wild-caught, without corresponding permits from the BMB. Two of the non-native CITES I-listed species observed during this study, Radiated Tortoise (four individuals) and Palm Cockatoo (four) are extremely unlikely to be captive-bred within the Philippines for domestic trade and may in fact represent illegally procured and/or smuggled wild-caught individuals. Although there are a few registered commercial farms with Palm Cockatoo parental stocks, reported captive-bred offspring are most likely destined for the more lucrative international bird market.

The demand for native and endemic wildlife in the domestic market is significantly less than for non-native species. In contrast, the demand in the international black market for Philippine endemic species is strong and lucrative for illegal traders. For instance, the endemic White-headed Water Monitor Lizard *Varanus nuchalis* and Cuming's Water Monitor Lizard *V. cumingi* can fetch between USD500–1000 per individual outside the country and a few enthusiasts are known to re-sell such animals internationally for high profit (TRAFFIC, unpubl. data).

Interestingly, there was almost no overlap between traders offering birds and reptiles. Hobbyists also appeared to specialize in a particular taxa (e.g. parrots or lizards), and may be unregistered breeders trying to sell offspring or resellers of smuggled wildlife.

Most of the traders appeared to be private individuals, and some of them offered to swap wildlife for other species (Fig. 1) or even other products. Social media has made it easy for such individuals to buy and sell wildlife conveniently and anonymously (Krishnasamy and Stoner, 2016; Nguyen and Willemsen, 2016; Sy, in

No. of arrests	No. of specimens seized	Species	Location	Date
4	58	Goffin's Cockatoo *Cacatua goffiniana*	Sarangani Province	7 May 2017
1	2	Philippine Serpent Eagle *Spilornis holospilus*	Metro Manila	25 June 2017
1	1	Gray's Monitor *Varanus olivaceus*	Cebu Province	14 July 2017
	1	Burmese Python *Python bivitattus*	"	"

Box 1. Wildlife seizures in Metro Manila, Cebu Province and Sarangani Province, May to July 2017.

Taxon	# Individuals	CITES / IUCN	Native (A), Endemic (B) or Non-native (C)
Leopard Gecko *Eublepharis macularius*	58	NL / LC	C
Burmese Python *Python bivittatus*	51	II / VU	C
Ball Python *Python regius*	47	II / LC	C
Bearded Dragon *Pogona vitticeps*	43	NL / NA	C
Reticulated Python *Malayopython reticulatus*	33	II / NA	A
Green Iguana *Iguana iguana*	32	II / NA	C
Southeast Asian Box Turtle *Cuora amboinensis*	31	II / VU	A
Veiled Chameleon *Chamaeleo calyptratus*	19	II / LC	C
Red-eared Slider *Trachemys scripta elegans*	19	NL / NA	C
Philippine Sailfin Lizard *Hydrosaurus pustulatus*	14	NL / VU	B
Marbled Water Monitor Lizard *Varanus marmoratus*	8	II / LC	B
Pacific Ground Boa *Candoia carinata*	7	II / NA	C
Philippine Yellow-spotted Pit Viper *Trimeresurus flavomaculatus*	7	NL / LC	B
Philippine Keeled Water Skink *Tropidophorus grayi*	7	NL / LC	B
Red-footed Tortoise *Chelonoidis carbonaria*	6	II / NA	C
Corn Snake *Pantherophis guttatus*	5	NL / NA	C
Radiated Tortoise *Astrochelys radiata*	4	I / CR	C
Indian Star Tortoise *Geochelone elegans*	4	II / VU	C
African Spurred Tortoise *Geochelone sulcata*	4	II / VU	C
Common Wolf Snake *Lycodon capucinus*	4	NL / LC	A
Red-tailed Boa *Boa constrictor*	3	II / NA	C
Variable Paradise Tree Snake *Chrysopelea paradisi variabilis*	3	NL / NA	B
Texas Rat Snake *Pantherophis obsoletus*	3	NL / LC	C
Green Red-tailed Rat Snake *Gonyosoma oxycephalum*	3	NL / LC	A
Luzon Smooth-scaled Mountain Rat Snake *Ptyas luzonensis*	3	NL / LC	B
Leopard Tortoise *Stigmochelys pardalis*	3	II / LC	C
Aldabra Tortoise *Aldabrachelys gigantea*	2	II / NA	C
Dog-toothed Cat Snake *Boiga cynodon*	2	NL / NA	A
Common Caiman *Caiman crocodilus*	2	II / LC	C
Pig-nosed Turtle *Carettochelys insculpta*	2	II / VU	C
Luzon Red-tailed Rat Snake *Coelognathus erythrurus manillensis*	2	NL / NA	B
Luzon Bronzeback Snake *Dendrelaphis luzonensis*	2	NL / NA	B
Japanese Rat Snake *Elaphe climacophora*	2	NL / NA	C
Philippine Forest Dragon *Gonocephalus sophiae*	2	NL / DD	B
Green Tree Python *Morelia viridis*	2	II / LC	C
Chinese Softshell Turtle *Pelodiscus sinensis*	2	NL / VU	C
Savannah Monitor Lizard *Varanus exanthematicus*	2	II / LC	C
Green Vine Snake *Ahaetulla prasina preocularis*	1	NL / NA	B
Common Snapping Turtle *Chelydra serpentina*	1	III / LC	C
Black Spiny-tailed Iguana *Ctenosaura similis*	1	NL / LC	C
Rainbow Boa *Epicrates cenchria*	1	II / NA	C
African Fat-tailed Gecko *Hemitheconyx caudicinctus*	1	NL / LC	C
Asian Giant Tortoise *Manouria emys*	1	II / EN	C
Chinese Pond Turtle *Mauremys reevesii*	1	III / EN	C
Chinese Stripe-necked Turtle *Mauremys sinensis*	1	III / EN	C
Razor-backed Musk Turtle *Sternotherus carinatus*	1	NL / LC	C
Common Musk Turtle *Sternotherus odoratus*	1	NL / LC	C
Hermann's Tortoise *Testudo hermanni*	1	II / NT	C
Keel-scaled Pit Viper *Tropidolaemus subannulatus*	1	NL / LC	A
Argentine Red Tegu *Salvator rufescens*	1	II / NA	C
Cuming's Water Monitor Lizard *Varanus cumingi*	1	II / LC	B

Table 3. Live reptiles offered for sale in 10 pre-selected Facebook groups.

press). However, the BMB, in co-operation with various NGOs such as TRAFFIC, is resolved to address seriously the illegal wildlife trade issue. This is exemplified by recent arrests of at least six suspected illegal traders in Metro Manila, Cebu Province, and Sarangani Province and the seizure of a minimum of 62 animals between May and July 2017 (Box 1) (TRAFFIC, unpubl. data; Dumaboc and Padayhag, 2017).

It is essential that the wildlife supply channel via online platforms continues to be closely monitored and any suspected illegal activities reported to authorities for law enforcement action. Social media can be a powerful tool for social change and can be used more often in advocacy against illegal wildlife trade, in order to raise awareness amongst consumers to buy pets only from legal and sustainable sources. Tackling the illegal online wildlife trade requires concerted efforts among law enforcement agencies, social media platforms, and conservation NGOs. Towards this end, TRAFFIC's continuing engagement with the BMB in the Philippines and Facebook is a positive step in supporting this effort and helping to ensure that illegal activities on the platform are adequately monitored and tackled; a number of arrests and seizures over recent months is an encouraging demonstration of this closer collaboration.

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