

WILD IN THE CITY: UNAUTHORIZED POSSESSION OF WILD FAUNA IN RESIDENCES OF VALENCIA CITY, BUKIDNON, PHILIPPINES

Khean Harvey Selgas Acuevas, Adrian Caparoso Aturo, and Dave Paladin Buenavista*

Animal Biology Division, Institute of Biological Sciences, College of Arts and Sciences,
Central Mindanao University, Bukidnon 8715, Philippines

ARTICLE HIGHLIGHTS

- Covert surveys revealed undocumented wildlife possession within Valencia City residences.
- Fifteen species were identified, including three threatened endemic species.
- Philippine long-tailed macaque was documented in all study sites.
- Human-wildlife interactions may have fueled locals to keep wild animals.
- Findings advocate amnesty programs to bolster biodiversity conservation in the urban areas.

Article Information

Received : 17 June 2025

Revised : 29 January 2026

Accepted : 12 February 2026

Available Online : 19 June 2026

***Corresponding author, e-mail:**

davista.cmu@gmail.com



Copyright (c) 2026@author(s).

ABSTRACT

The illegal wildlife trade is a globally recognized industry, and the unauthorized possession of wildlife by locals is a significantly overlooked facet of this field. While significant seizures of poached animals were recorded in the country, many remain undocumented and undetected, specifically in small-scale collections or privately owned wildlife. This study assessed the ownership of wild fauna in five locations in Valencia City, Bukidnon, Philippines. A covert research approach was used to elicit information from the owners, which was done randomly within the months of March to April 2025. A total of 26 owners were interviewed, the majority are male (19; 73%), aged 40 – 45 years old (12; 46%), low-income farmers (17; 65%), and with primary education (16; 62%). The results revealed 63 individuals from 15 species: 8 species of birds, 4 species of mammals, and 3 species of reptiles. Of which, 12 (80%) species are classified as least concern, two (13%) are endangered, and one is undetermined. Birds are the most frequently recorded group (24 individuals), mainly intended for consumption, while *Macaca fascicularis philippensis* exist across all five barangays because of their behavioral flexibility and presumed human compatibility. Owners' responses indicate that they keep such animals mainly for recreation or hobby (15; 25%), which reflects the affinity of locals to keep wild animals in the city may have been associated with human-wildlife interactions and humans' familiarity with native and endemic animals. Therefore, the study recommends strengthening the enforcement of existing national laws and international provisions through community-based conservation models, local wildlife amnesty programs, and partnerships with government and non-government organizations.

Keywords: biodiversity, conservation, human-wildlife interactions, illegal trade

INTRODUCTION

The illegal and unsustainable collection and trade of wildlife and their byproducts is a transnational multi-billion-dollar industry that threatens the survival of vulnerable species globally. Hundreds of millions of animals from tens of thousands of species are caught from the wild and sold as pets, food, and medicine, among others (World Wildlife Fund 2006; Sas-Rolfes *et al.* 2019; Esmail *et al.* 2020), making the illegal wildlife trade (IWT) one of the most lucrative industries in the world due to its high profitability and low risk of prosecution (Nellemann *et al.* 2014; Mozer & Prost 2023). While the IWT is a globally recognized industry, the unauthorized possession of wildlife by locals is a significantly overlooked facet of this field. The Philippines serves as a consumer, source, and transit point for the international wildlife trade, which puts both native and endemic fauna in the country at high risk of extinction via overexploitation (Asian Development Bank 2019; Archer *et al.* 2021), yet the distinction between profit-driven syndicates and individual wildlife owners is frequently blurred in conservation discourse.

The unauthorized possession of wildlife by locals is a unique and ongoing conservation challenge that is largely undocumented in the country, especially undetected cases involving threatened species. Only one study has such data, like the local use of critically endangered pangolins (*Manis culionensis*) in the Palawan Province, where locals involved in the collection of pangolins catch them for food, and harvest them to sell other parts of the species to third-party intermediaries (Archer *et al.*, 2021). Most of the scientific attention towards IWT in the country revolves around native and exotic animals traded as pets (Asian Development Bank 2019), where, to meet the increasing demand for pets, even social media platforms such as Facebook became major avenues for animal trade due to their accessibility, affordability, and lack of government regulations (Sy & Lorenzo, 2023). Several local studies recorded numerous species of vertebrate and invertebrate fauna traded online for pets both within the country and internationally, with some still undescribed species endemic to the Philippines (Raymundo *et al.* 2023; Sy & Lorenzo 2023; Raymundo *et al.* 2024). With the lack of data on the drivers and/or factors influencing the local ownership of wildlife in the country, the study was conducted to provide a local-scale analysis of this facet of the IWT.

The Wildlife Resources Conservation and Protection Act of 2001 (RA 9147), among other Philippine environmental laws, is an act that aims to conserve and protect wildlife species and their habitats. This act prohibits the collection, possession, and trade of wildlife without permits (Section 27), and implements penalties and sanctions for violators (Section 28). However, despite the existence of such laws and protocols in the Philippines, weak enforcement creates loopholes in the legal system, which enable undocumented illegal trade and ownership of wildlife in the country to persist. The complexity of the illicit trade and unauthorized ownership of animals in the Philippines is an established yet understudied field, especially in the local setting (Archer *et al.* 2021). While significant seizures of poached animals were recorded in the Philippines (Sy 2021), several cases remain undocumented and undetected, specifically in small-scale collections or privately owned wildlife.

Often originating at the community level (Toomes *et al.* 2022), addressing and documenting the involvement of local communities in illegal keeping of wild fauna in the Philippines, particularly in Bukidnon, with its uniquely rich biodiversity, is of top priority. Multiple observations of caged or chained wild animals, like monkeys, reticulated pythons, owls, and turtles kept as pets were observed in residences within Valencia City, Bukidnon. Also, online pet markets for exotic animals in Mindanao exist, which post Philippine wild animals for sale. Hence, the study hypothesizes that there is an existing community of owners in Valencia City that keeps Philippine wildlife as pets. Therefore, the study aimed to quantitatively assess the ownership of Philippine wild fauna in Valencia City, Bukidnon, specifically, the socio-demographic profile of the owners, the species richness and quantity, conservation status, and the factors that drive the possession of the Philippine wildlife.

MATERIALS AND METHODS

Place and Duration of the Study

The study was conducted in selected residences situated in Valencia City, Bukidnon. Surveys were carried out randomly in seven nonconsecutive days within the months of March to April 2025 at different locations, namely Barangay Batangan, Barangay Concepcion, Barangay Guinoyoran, Barangay Laligan, and Barangay Pinatilan (Fig. 1).

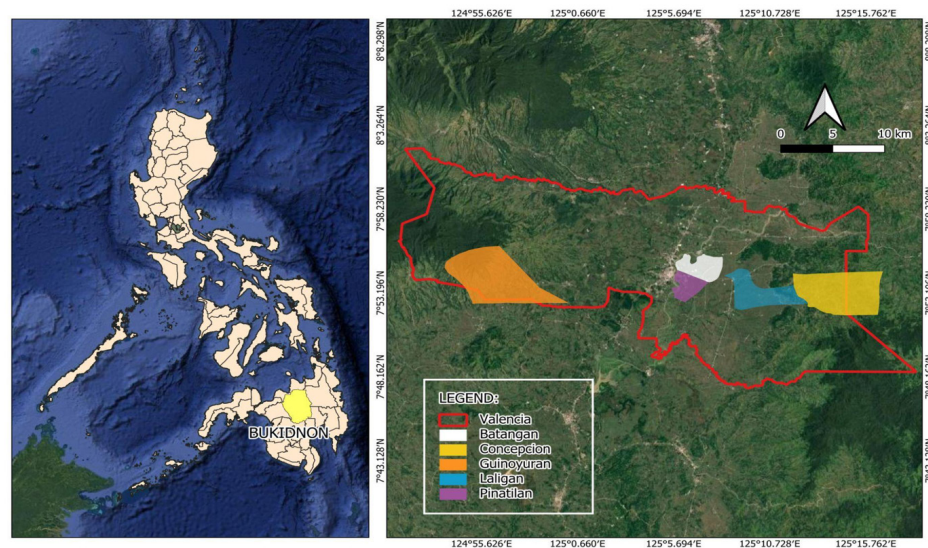


Figure 1 Map imagery of Valencia City, Bukidnon, and the five selected sites

The five sites were selected based on accessibility and proximity to roads and forests, which positively influence the illegal possession of animals via the pet market trade by facilitating easier movement, transport, and distribution of wildlife in these areas (Shepherd *et al.* 2007; Clements *et al.* 2014).

Field Surveys

Research Approach and Data Collection

The study adopted a covert research approach, which is applied in both social science research (Homan 1980; Spicker 2011; Calvey 2018; Hopman 2021) as well as in conservation science research (Imanda & Wright 2019 ; Skidmore 2021; Thompson *et al.* 2021; Morcatty *et al.* 2024). In this study, the researchers concealed their identities and intentions. Hence, the respondents were not informed of the research objectives to accurately document activities associated with the unauthorized possession of Philippine wildlife in Valencia City, specifically in private residences. The researchers pretended to be anonymous collectors or hobbyists to collect field data (e.g., animal species, number of individuals, prices, etc.) and photographs of the specimens.

Additionally, prior data on the total number of residences keeping Philippine wildlife in each barangay is not available. As such, the study employed opportunistic sampling. This sampling method is typically used in wildlife crime studies that are clandestine in nature, which are often difficult and unpredictable (Skidmore 2021). Therefore, the number of owners interviewed in each barangay was not predetermined.

Covert Observation and Interviews

A random seven-day survey from March to April 2025 was conducted to document ownership of Philippine native and endemic fauna in selected barangays in Valencia City, Bukidnon, Philippines. Observations and interviews were discreetly recorded using a mobile phone and an audio recorder application to collect data. All gathered information was compiled and photo-documented. The interview prioritized private residences with Philippine wildlife on display, in cages, or man-made enclosures.

Survey of Owned Animals

The survey only included Philippine native and endemic animals privately kept or owned in Valencia City, Bukidnon. As defined by Iannone *et al.* (2020), “native” animals are naturally occurring species of fauna in a particular region with established populations not introduced by humans. Whereas, “endemic” animals are species of fauna restricted to a specific geographic area only (Kraus *et al.* 2022), in this case, the Philippines. Therefore, both legally and illegally sourced, captive-bred, and wild-caught native and endemic animals were included in the research.

A field data sheet or questionnaire, and triangulation data from multiple sources were utilized to gather data on the respondents or informants. Informants include owners (both legal and illegal) of Philippine wildlife, and key informants who know or are close to the owners. The following information was included: socio-demographic information of the respondents,

taxonomic classification of the animals, number of individuals per species, local and common names, prices, and purpose or reasons for keeping these animals

Field Documentation and Identification

The photographs of each specimen, as well as their local and common names, were used as basis for the identification. Following Salas-Picazo *et al.* (2023), recorded local and common names of animals as well as photographs can help with the identification of illegally obtained wild animals as well as their age, in particular taxa (e.g., in mammals – cub, young, and adult). Through this method, the diagnostic characteristics of the animals were recorded in a live state from different angles. These include their colorations, complex scale or fur patterns, feathers, head shape, shell, tail, and limb structures, among other diagnostic characteristics.

Since the study only dealt with the covert documentation of Philippine wildlife kept or owned privately, permits were unnecessary for the photographs taken. Field images of animals are indispensable noninvasive tools for species and individual identification in wildlife research, specifically studies involving camera traps (Falzon *et al.* 2019; Miele *et al.* 2021; Narouzzadeh *et al.* 2018). Instead of camera traps, a smartphone camera was used to document each animal specimen encountered during the surveys. Following Takaya *et al.* (2023), whole-body and images of the animals were collected for identification. Moreover, relevant taxonomic and illustrated keys from reputable sources were used for accurate species identification (Hutchinson *et al.* 2019; Ingle & Heaney 1992; Leviton *et al.* 2011; Leviton *et al.* 2018; Shepherd & Shepherd 2018; Weinell *et al.* 2019). Preliminary identifications were then verified by experts.

Assessment of Conservation

The conservation status of each recorded species was determined based on the IUCN Red List of Threatened Species (IUCN 2024), Department of Environmental and Natural Resources (DENR) Administrative Order No. 2019-09, and CITES Appendices (2025). The recorded fauna were

classified as data deficient (DD), least concern (LC), near threatened (NT), vulnerable (VU), endangered (EN), and critically endangered (CR) based on the data available.

Data Management and Analysis

The study applied a descriptive research design to accurately and systematically analyze and describe the collected information relevant to the study (e.g., socio-demographic data of the respondents or owners, factors that drive the possession of Philippine wildlife in the city, and the quantitative data collected). The quantitative data (e.g., the total number of species, individuals, conservation status, price ranges, number of affirmative answers per question, etc.) collected were computed and expressed in frequencies and percentages using the Microsoft Excel software, which were then visualized in the form of tables and graphs.

RESULTS AND DISCUSSION

Sociodemographic Profile of Owners in Valencia City

A total of 26 owners of Philippine wild fauna were recorded across the five barangays surveyed in Valencia City. Among the barangays, Barangay Concepcion had the highest number of respondents (14; 54%), followed by Barangay Batangan (5; 19%), Barangay Laligan (4; 15%), Barangay Guinoyoran (2; 8%), and Barangay Pinatilan (1; 4%) (Fig. 2). Most respondents were male (19; 73%), while females accounted for seven respondents (27%).

Table 1 presents the sociodemographic profile of the owners. Respondent ages ranged from 10 to 65 years, with the 40 – 45 year age group being the most represented (12; 46%). In terms of educational attainment, 16 respondents (62%) had completed only primary education, four (15%) had completed secondary education, and six (23%) had completed tertiary education. Most respondents were farmers (17; 65%) who relied on agriculture as their main source of income, followed by business owners (4; 15%) who owned fuel stations and concrete block businesses, then politicians (2; 8%), and construction worker, nurse, and motorcycle driver with one respondent each.

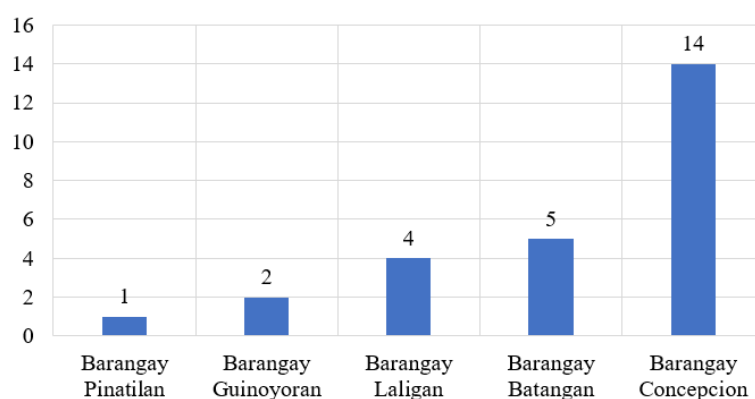


Figure 2 Number of respondents possessing wildlife in selected barangays of Valencia City

Table 1 Sociodemographic profile of respondents possessing wildlife in selected barangays of Valencia City

Variables		Frequency	Percentage
Gender	Male	19	73
	Female	7	27
Age (years)	10 – 15	1	4
	30 – 35	2	8
	35 – 40	2	8
	40 – 45	12	46
	45 – 50	1	4
	50 – 55	5	19
	55 – 60	2	8
	60 – 65	1	4
Education	Primary	16	62
	Secondary	4	15
	Tertiary	6	23
Occupation	Business owner	4	15
	Construction worker	1	4
	Farmer	17	65
	Nurse	1	4
	Motorcycle driver	1	4
	Politician	2	8

Species Richness and Abundance of Philippine Native and Endemic Fauna Kept in Valencia City

A total of 63 individuals representing 15 species of Philippine wildlife were documented in Valencia City, Bukidnon (Table 2). These species belonged to the classes Aves, Mammalia, and Reptilia. Aves was the most represented class, comprising eight species (53%), followed by Reptilia with four species (27%) (Fig. 3). Mammalia was the least represented class, with only three species (20%) recorded (Fig. 3).

Class Aves (Birds) was the most frequently recorded taxonomic group of privately kept wild fauna across the surveyed barangays, with a

total of 24 individuals. Among these, *Phapitreron leucotis*, locally known as “*alimukon*”, was the most commonly encountered species, accounting for 16 individuals (67%) of the total avian records. Nationally, birds constitute the most traded vertebrate group in the Philippines, representing approximately 43.92% of all documented wildlife trade transactions (Cruz & Lagunzad 2021).

Among the surveyed barangays, Barangay Concepcion had the highest number of recorded wildlife, with 19 bird individuals, four mammals, and four reptiles, totaling 27 individuals (Fig. 4).

Table 2 List of Philippine wildlife kept in the selected barangays of Valencia City, Bukidnon.

Class	Species	Brgy. Batangan (n = 10)	Brgy. Concepcion (n = 27)	Brgy. Guinoyoran (n = 8)	Brgy. Laligan (n = 17)	Brgy. Pinatilan (n = 1)	No. of individuals per species
Aves	<i>Amaurornis phoenicurus</i>		1				1
	<i>Chalcophaps indica</i>				1		1
	<i>Corvus philippinus</i>				1		1
	<i>Haliastur indus</i>			1			1
	<i>Loriculus philippensis</i>		2				2
	<i>Phapitreron leucotis</i>		16				16
	<i>Spilornis holospilus</i>				1		1
	<i>Tyto longimembris</i>				1		1
Mammalia	<i>Macaca fascicularis philippensis</i>	2	2	2	2	1	9
	<i>Paradoxurus hermaphroditus</i>	1	1	1	2		5
	<i>Pteropus vampyrus</i>		1				1
Reptilia	<i>Cuora philippinensis</i>		4		9		13
	<i>Malayopython reticulatus</i>	4		3			7
	<i>Naja samarensis</i>	2					2
	<i>Varanus cumingi</i>	1		1			2
	Total						63

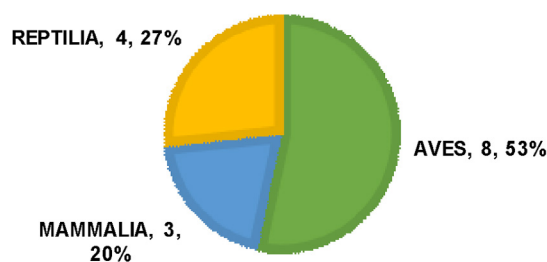


Figure 3 Species richness of wild fauna from private collections by class in Valencia City, Bukidnon

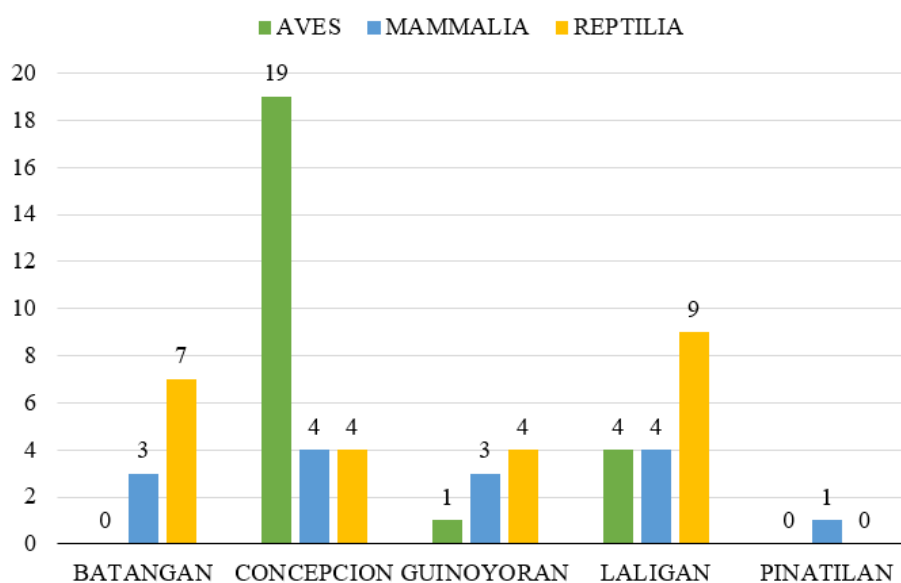


Figure 4 Record of kept wildlife across the five barangays of Valencia City

This was followed by Barangay Laligan, which recorded four bird individuals, four mammals, and nine reptiles, totaling 17 individuals. Barangay Batangan had no recorded birds, but three mammals and seven reptiles were recorded, totaling 10 individuals. Barangay Guinoyoran recorded one bird individual, three mammals, and four reptiles, totaling eight individuals. Barangay Pinatilan had the fewest recorded animals, with only one individual of *Macaca fascicularis philippensis*.

The distribution of wild animal species across the five barangays is presented in Table 3 and Figure 5.

Four species were exclusively recorded in Barangay Laligan: *Spilornis holospilus*, *Corvus philippinus*, *Chalcophaps indica*, and *Tyto longimembris*.

Similarly, four unique species were found only in Barangay Concepcion: *Loriculus philippensis*, *Phapitreron leucotis*, *Amaurornis phoenicurus*, and *Pteropus vampyrus*. In addition, Batangan and Guinoyoran shared two species, *Varanus cumingi* and *Malayopython reticulatus*, which were not recorded in the other three barangays. Guinoyoran also had one unique species, *Haliastur indus*, while Batangan had one distinct species, *Naja samarensis*. Barangay Pinatilan had no unique species recorded. Notably, *Macaca fascicularis philippensis* was the only species found across all five barangays. Figure 6 presents the documentation of the kept wildlife across the five barangays of Valencia City.

Table 3 Distribution of wildlife across the five barangays of Valencia City

Study sites	Species present	Total
Batangan, Concepcion, Guinoyoran, Laligan, Pinatilan	<i>Macaca fascicularis philippensis</i>	1
Batangan, Concepcion, Guinoyoran, Laligan	<i>Paradoxurus hermaphroditus</i>	1
Batangan, Guinoyoran	<i>Varanus cumingi</i> , <i>Malayopython reticulatus</i>	2
Concepcion, Laligan	<i>Cuora philippinensis</i>	1
Batangan	<i>Naja samarensis</i>	1
Concepcion	<i>Loriculus philippensis</i> , <i>Phapitreron leucotis</i> , <i>Amaurornis phoenicurus</i> , <i>Pteropus vampyrus</i>	4
Guinoyoran	<i>Haliastur indus</i>	1
Laligan	<i>Spilornis holospilus</i> , <i>Corvus philippinus</i> , <i>Chalcophaps indica</i> , <i>Tyto longimembris</i>	4

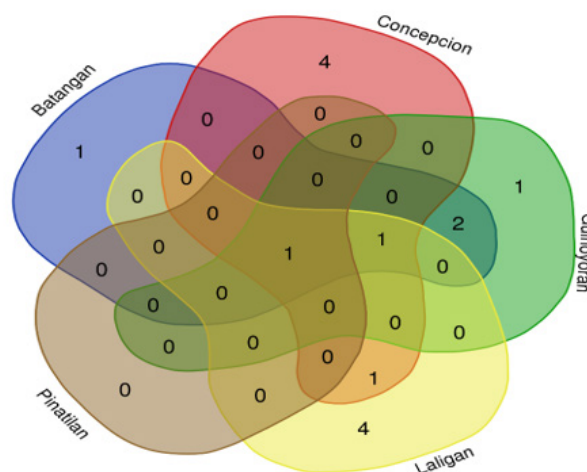


Figure 5 Wildlife distribution across the five barangays of Valencia City



Figure 6 Live Philippine native and endemic fauna kept across the five barangays of Valencia City
 Notes: (A–E) Aves: A. *Amaurornis phoenicurus*; B. *Chalcophaps indica*; C. *Loriculus philippensis*; D. *Phapitreron leucotis*; E. *Spilornis holospilus*;
 (F–G) Mammals: F. *Macaca fascicularis philippensis*; G. *Paradoxurus hermaphroditus*; (H–J) Reptiles: H. *Cuora philippinensis*;
 I. *Malayopython reticulatus*; J. *Naja samarensis*

The persistent demand for birds in the pet trade is primarily attributed to their recreational value, symbolic and status-related associations, and use in competitive activities. Species with vibrant plumage, distinctive vocalizations, or mimicry abilities are particularly favored, rendering them highly susceptible to capture and trade (Canlas *et al.* 2017). Barangay Concepcion exhibited the highest number of wild-caught birds, with 19 individuals reportedly acquired locally. This finding suggests ongoing exploitation of birds in the area, including their use as a food source.

The high number of wild-caught fauna documented in Barangay Concepcion may be attributed to its remote location and proximity to forested mountain ecosystems. This setting leads to frequent wildlife sightings and interactions reported by the residents since childhood. Frequent human-wildlife interactions have been shown to positively

influence the mental health of humans (Rosales Chavez *et al.* 2023); hence, the tendency of owning commonly encountered wildlife. Furthermore, the prevalence of these observations is reinforced by the residents' tradition of hunting birds and other wild animals for food despite their access to the city.

Endemism, Conservation Status, and CITES Listings of the Documented Fauna

Of the 15 animal species recorded in Valencia City, six species (40%) were identified as Philippine endemics, while nine species (60%) were classified as Philippine natives. Based on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (2024), 12 species (80%) were categorized as Least Concern, two species (13%) as Endangered, and one species (*Cuora philippinensis*) remained undetermined.

Under Department of Environment and Natural Resources Administrative Order No. 2019-09 (DAO 2019-09) on threatened Philippine fauna, nine species (60%) were classified as Other Wildlife Species (OWS). Meanwhile, three species (20%) were listed as Other Threatened Species (OTS). Furthermore, one species, *Loriculus philippensis*, was categorized as Critically Endangered, *Pteropus vampyrus*, as Endangered, and *Cuora philippinensis* remained unclassified under this framework.

According to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2025) nine (9) species (60%) were listed under Appendix II, while *Paradoxurus hermaphroditus* was listed under Appendix III. The remaining five species (33%) were not listed under any CITES Appendix (Table 4).

According to Sections 6 – 8 of the Republic Act 9147, the collection and possession of wildlife are lawful only when authorized by the DENR Secretary, provided that the required permits have been obtained and the collector can demonstrate technical and financial capability to maintain the wildlife. However, the illegal collection and possession of threatened wildlife species persist, including *Macaca fascicularis philippensis* and *Pteropus vampyrus*, both classified as Endangered under the IUCN Red List of Threatened Species. In addition, *Loriculus philippensis* is categorized as Critically Endangered (CR) under the national list of threatened Philippine fauna (DAO 2019-09), while *Pteropus vampyrus* is listed as Endangered (EN) under the same Administrative Order.

Despite the existence of laws prohibiting the possession of threatened species, these illegal practices continue to be documented in Valencia City. This situation highlights significant loopholes in the implementation of the Philippine environmental laws regulating wildlife collection and possession.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement that aims to ensure that international trade in wild animals and plants specimens does not threaten the species survival (CITES 2025). In line with this, nine species of wild fauna recorded in this study were listed under Appendix II of CITES. These

include four bird species (*Haliastur indus*, *Loriculus philippensis*, *Spilornis holospilus*, and *Tyto longimembris*), two mammal species (*Macaca fascicularis philippensis* and *Pteropus vampyrus*), and three reptile species (*Malayopython reticulatus*, *Naja samarensis*, and *Varanus cumingi*). Additionally, one species, *Paradoxurus hermaphroditus*, was listed under Appendix III.

A notable finding of this study was the frequent misidentification of *Loriculus philippensis*, commonly known as the Philippine hanging parrot, as an ornamental bird or lovebird due to its similarities in coloration, size, and overall appearance. This misidentification, compounded by a lack of awareness about its true identity, contributes to its population decline, making it one of the most poached and illegally traded birds in the Philippines (Sy 2021).

The presence of *Macaca fascicularis philippensis*, commonly known as the long-tailed macaque, across five barangays may be associated with its ecological and behavioral adaptability, which is known to be highly social primates, adapting to a wide array of habitats, including human settlements (van Schaik *et al.* 2003). This behavior implies easy and favorable companionship with humans compared to other wild animals.

Interviews with residents who kept *Macaca fascicularis philippensis* revealed a common rationale for maintaining these animals in captivity, either caged or chained, rather than releasing them back into the wild. The majority expressed concern that, without human care and supervision, the animals would be unable to survive and would likely perish alone in their natural habitat.

Taking their opinions optimistically, this might become an opportunity for a community engagement conservation (CBC). By promoting shared responsibility and actively engaging local communities in decision-making processes, this approach enhances awareness and understanding of existing environmental challenges (Gurung & Tapa 2023). Moreover, it substantially increases the likelihood of achieving long-term, sustainable conservation initiatives that align with both local priorities and the overarching goals of the global conservation community (Everett *et al.* 2021). However, it is still discouraged to keep any wild animals as pets, as it is against the law.

Table 4 List of Philippine native and endemic fauna documented in the residences of Valencia City

Class	Species	Endemism	Conservation status		CITES (2025)
			IUCN (2024)	DAO (2019-09)	
Aves	<i>Amaurornis phoenicurus</i>	N	LC	OWS	-
	<i>Chalcophaps indica</i>	N	LC	OWS	-
	<i>Corvus macrorhynchos</i>	N	LC	OWS	-
	<i>Haliastur indus</i>	N	LC	OWS	II
	<i>Loriculus philippensis</i>	PE	LC	CR	II
	<i>Phapitreron leucotis</i>	PE	LC	OWS	-
	<i>Spilornis holospilus</i>	PE	LC	OWS	II
	<i>Tyto longimembris</i>	N	LC	OWS	II
Mammalia	<i>Macaca fascicularis philippensis</i>	N	EN	OWS	II
	<i>Paradoxurus hermaphroditus</i>	N	LC	OWS	III
	<i>Pteropus vampyrus</i>	N	EN	EN	II
Reptilia	<i>Cuora philippinensis</i>	PE	-	-	-
	<i>Malayopython reticulatus</i>	N	LC	OTS	II
	<i>Naja samarensis</i>	PE	LC	OTS	II
	<i>Varanus cumingi</i>	PE	LC	OTS	II

Notes: N = Native; PE = Philippine Endemic; DD = Data Deficient; LC = Least Concern; NT = Near Threatened; V = Vulnerable; EN = Endangered; CR = Critically Endangered; OTS = Other Threatened Species; OWS = Other Wildlife Species; I = Appendix I; II = Appendix II; III = Appendix III.

Factors that Drive the Possession of Philippine Native and Endemic Pets

All 26 owners responded that the Philippine fauna they are keeping are all wild-caught, mostly from nearby (even adjacent) forests, grasslands, or rice fields within Valencia City, specifically in Barangay Banlag, Barangay Concepcion, Sitio Narulang in Barangay Laligan, Sitio Nagubaan and San Vicente in Barangay Tongantungan, and some from Mount Kalatungan, Pangantucan, Bukidnon, Barangay Kawayan and Halapitan in the municipality of San Fernando, Bukidnon, and undisclosed areas in Iligan City, Lanao del Norte. Of which, four species were said to be bought from locals or indigenous peoples (IPs), namely: *Macaca fascicularis philippensis*, *Paradoxurus hermaphroditus*, *Cuora philippinensis*, and *Malayopython reticulatus*, which denotes the existence of trade in the city.

Summarized in Table 5 are responses indicating that the possession of Philippine native and endemic animals is mainly driven by the desire to have a personal collection of such animals and the passion to keep them. Fifteen respondents (25%) reported keeping Philippine wildlife for recreational purposes or as a part of their hobby or collection.

Other commonly reported reasons included adoption (7; 11.67%) and giving or gifting of animals (7; 11.67%). The majority of the animals in

these categories were either given by acquaintances or tamed due to continuous interactions with the animals in the wild via feeding, then adopted. Followed by rescue (6; 10%) and love for pets (6; 10%), wherein animals in these categories were mostly bought from poachers, farm owners, and former keepers due to pity from mistreatment. Some species, such as *Macaca fascicularis philippensis* and *Cuora philippinensis* were regarded as pests in cornfields and rice fields, respectively, and were also sold for food or as pets.

Additional motivations included personal satisfaction (5; 8.33%), primarily related to the use of wildlife as food, and other factors (5; 8.33%) specifically as attractions or displays in businesses, and the intentional trapping and taking of animals from their nests, roosting sites, or habitats. Furthermore, love for nature or wildlife (3; 5%) followed, then profit or selling (2; 3.33%) where animals were intentionally caught by trapping, kept and reared to be sold to potential buyers for food (e.g., *Pteropus vampyrus*, *Phapitreron leucotis*, *Varanus cumingi*, etc.) or as pets. Traditional practices (2; 3.33%) were documented. For example, *Cuora philippinensis* was reportedly used in traditional remedies for chicken diseases by soaking the animal in water that was subsequently mixed with chicken feed or directly administered to poultry. In addition, the blood and spleen of *Naja samarensis* were consumed because of their alleged medicinal benefits.

Table 5 Factors considered by owners in keeping Philippine wild fauna

Factors	Statements	Frequency	Percentage (%)
Recreation/hobby	I like collecting such animals	15	25
Adoption	I adopted it as it is tamed	7	11.67
Given/Gifted	I keep it as it was a gift from a peer	7	11.67
Rescue	I rescued them from poachers, and farm owners	6	10
Love for pets	I love pets, regardless of their kind	6	10
Personal satisfaction	It satisfies our personal needs (e.g., food, popularity, etc.)	5	8.33
Others	We use them as attractions or displays; we just intentionally trap them	5	8.33
Love for nature or wildlife	Our family loves the forest and the wildlife within it	3	5
Profit/Selling	I sold it to someone for food, pets, or medicine	2	3.33
Traditional relevance	I keep it for its medicinal value	2	3.33
Color/Morph	It has colorful wings	1	1.67
Personal preference	I just like keeping such animals compared to the common ones	1	1.67

The least frequently reported reasons for keeping Philippine wildlife were personal preference (1; 1.69%) and preference for specific colors or specific morphs of animals (1; 1.69%).

The private ownership of wild animals is generally clandestine, specifically keeping native and endemic animals, due to ethical and legal concerns. However, keeping native and endemic animals as pets has been increasing in recent decades (Cronin *et al.* 2022). In this study, this trend may be associated with human-wildlife interactions and human familiarity with native and endemic wild animals.

Living alongside the documented species of fauna for decades has positively influenced the likelihood of residents in Valencia City, Bukidnon, to keep Philippine wildlife. Due to their familiarity with the wild animals in the city, the human-animal relationship established through constant human-wildlife interactions has led to domestication activities and the deliberate capture of certain fauna encountered in the area. The domestication process involves constant feeding of the animals until tamed or the intentional capturing (via hand-capture, traps, shooting, etc.) of animals (neonates-adults) either from their natural habitat or from agricultural areas where they are deemed as pests, then directly caging and keeping them or selling them to other locals or buyers from different barangays for personal collections (e.g., *Macaca fascicularis philippensis*, *Paradoxurus hermaphroditus*, *Phapitreron leucotis*, *Loriculus philippensis*, *Spilornis*

holospilus, etc.). These practices, although not well-documented in the Philippines, exist and threaten the survival of certain native and endemic animals, especially those with threatened conservation status (Alves *et al.* 2016; Romero-Vidal *et al.* 2024).

Furthermore, Mohamad Muslim *et al.* (2018) suggest that childhood nature-related experiences are positively correlated with human's attitudes toward wild animals and their willingness to coexist with them in urban and suburban areas, hence highlighting that early exposure to nature positively influences the lasting affinity of humans for wild animals, thereby influencing positive preferences to own them. This is backed up by respondents in Valencia City stating that they like keeping the documented species of animals as pets, as these species of fauna are easy to tame, and it's been a constant practice of theirs since childhood.

Additionally, it was recorded that keeping Philippine native and endemic fauna was also practiced by younger generations represented by the 10 – 15-year-old respondents, implying that this practice may have been passed from generations through observations. This supports the notion that observational learning through imitation facilitates the transmission of knowledge and behaviors in humans across generations (Hopper *et al.* 2010).

Moreover, the plight of using wild animals as traditional medicines for both humans and livestock, as well as the local consumption of

certain species of birds, mammals, and reptiles for food, and a local pet trade, were recorded. These practices and activities are also documented all throughout the Philippines (Scheffers *et al.* 2012; Brandis *et al.* 2023), and the persistence of such practices are significant contributor to the decline of the local populations of the species involved. Hence, local regulations must be imposed to control or halt these activities.

CONCLUSION

The study reveals the existence of an undocumented community of owners keeping Philippine wildlife within private residences in selected barangays situated in Valencia City, Bukidnon. Here, owners, primarily male farmers with primary education, showed a consistent trend of capturing Philippine wildlife from nearby habitats, with the involvement of indigenous peoples or fellow residents in informal trade. Factors motivating ownership range from aesthetic appreciation to recreational hobbies, as well as rescue and medicinal uses, with a minor percentage admitting to profit or trade intentions. Notably, *Macaca fascicularis philippensis* was present in all surveyed barangays, suggesting a higher preference for this species due to its behavioral adaptability and perceived human compatibility. With 15 documented species, including critically endangered (*Loriculus philippensis*) and CITES-listed animals (10 species) being kept, and with owners knowing the existence of national laws and agencies concerned with the legalities of such practices, the data reflect gaps in the local enforcement of RA 9147 and CITES provisions in these barangays within Valencia City. This underscores the need to:

1. Determine the overall population of owners keeping Philippine wildlife in Valencia City, Bukidnon, as well as the extent of the collection they possess;
2. Strengthen community engagements and foster collaborations with residents and/or indigenous peoples in the community through capacity-building initiatives and educational programs tailored to the demographics of the existing community;
3. Prioritize the development of community-based conservation (CBC) programs or models with a badge rewards system that integrates locals and wildlife protection with livelihood programs to lessen reliance, and protect wildlife resources, thereby avoiding exploitation and reducing human-wildlife conflict;
4. Strengthen local enforcement of existing laws and provisions by implementing a local wildlife amnesty program which encompasses a no-penalty surrender initiative allowing local owners to turn in illegally possessed wildlife without the fear of prosecution; and
5. Establish partnerships with local institutions, the DENR, and NGOs for the continuous monitoring and evaluation of the conservation programs implemented, as well as to provide veterinary assessments to ensure safe rehabilitation and release of wild animals surrendered.

ACKNOWLEDGMENTS

The authors thank Mr. Rolande T. Beseos, Ms. Cindy Lou A. Cadorna, Mr. Charlie M. Alavanza, and Ms. Fredelyn S. Acuevas for their assistance during the survey. The constructive comments and suggestions of all the anonymous reviewers are likewise appreciated. The authors would also like to express their gratitude to the Department of Science and Technology – Science and Technology Regional Alliance of Universities for National Development (DOST-STRAND) for the scholarship and financial assistance.

REFERENCES

- Alves MM, Lopes F, Nóbrega Alves RR. 2016. Wild vertebrates kept as pets in the semiarid region of Brazil. *Trop Conserv Sci* 9(1):354–368. DOI: 10.1177/194008291600900119
- Archer LJ, Turvey ST, Apale C M, Corona DB, Amada RL, Papworth SK. 2021. Digging deeper: Understanding the illegal trade and local use of pangolins in Palawan Province, Philippines. *Front Conserv Sci* 2:746366. DOI: 10.3389/fcsc.2021.746366
- Asian Development Bank. 2019. Addressing illegal wildlife trade in the Philippines. [Internet]. Available from: <https://www.adb.org/sites/default/files/publication/490006/addressin-illegal-wildlife-trade-philippines.pdf>
- Badihi G, Nielsen DRK, Garber PA, Gill M, Jones-Engel L, Maldonado AM, ..., Hansen MF. 2024. Perspectives on conservation impacts of the global primate trade. *Int J Primatol* 45(4):972–999. DOI: 10.1007/s10764-024-00431-9
- Brandis KJ, Meagher P, Schoppe S, Zawada K, Widmann I, Widmann P, ..., Francis R. 2023. Determining the provenance of traded wildlife in the Philippines. *Animals* 13(13):2165. DOI: 10.3390/ani13132165

- Calvey D. 2018. Covert ethnography in criminal justice and criminology: The controversial tradition of doing undercover fieldwork. *OREs*. DOI: 10.1093/acrefore/9780190264079.013.296
- Canlas CP, Sy EY, Chng S. 2017. A rapid survey of online trade in live birds and reptiles in the Philippines. *TRAFFIC Bulletin* 29(2):58–62.
- Clements GR, Lynam AJ, Gaveau D, Yap WL, Lhota S, Goosem M, ..., Laurance WF. 2014. Where and how are roads endangering mammals in Southeast Asia's Forests? *PLoS One* 9(12):e115376. DOI: 10.1371/journal.pone.0115376
- Cronin KA, Leahy M, Ross SR, Schook MW, Ferrie GM, Alba AC. 2022. Younger generations are more interested than older generations in having non-domesticated animals as pets. *PLoS One* 17(1):e0262208. DOI: 10.1371/journal.pone.0262208
- Cruz RAL, Lagunzad CGB. 2021. The big picture: Consolidating national government and CITES records of animal trade in the Philippines from 1975 to 2019. *Philipp Sci Lett* 14:79–100.
- Esmail N, Wintle BC, Sas-Rolfes M, Athanas A, Beale CM, Bending Z, ... Milner-Gulland EJ. 2020. Emerging illegal wildlife trade issues: A global horizon scan. *Conserv Lett* 13(4):e12715. DOI: 10.1111/conl.12715
- Falzon G, Lawson C, Cheung W, Vernes K, Ballard GA, S Fleming PJ, ..., Meek PD. 2019. ClassifyMe: A field-scouting software for the identification of wildlife in camera trap images. *Animals* 10(1):58. DOI: 10.3390/ani10010058
- Garber PA, Estrada A, Shanee S, Svensson MS, Arregoitia LV, Nijman V, ..., Hansen MF. 2024. Global wildlife trade and trafficking contribute to the world's nonhuman primate conservation crisis. *Front Conserv Sci* 5:1400613. DOI: 10.3389/fcsc.2024.1400613
- Homan R. 1980. The ethics of covert methods. *Br J Sociol* 31(1):46–59. DOI: 10.2307/590062
- Hopman MJ. 2022. Covert qualitative research as a method to study human rights under authoritarian regimes. *J Hum Rights Pract* 13(3):548–564. DOI: 10.1093/jhuman/uaab056
- Hopper LM, Flynn EG, Wood LAN, Whiten A. 2010. Observational learning of tool use in children: Investigating cultural spread through diffusion chains and learning mechanisms through ghost displays. *J Exp Child Psychol* 106(1):82–97. DOI: 10.1016/j.jecp.2009.12.001
- Hutchinson R, Tañedo M, Constantino A, Constantino T. 2019. A naturalist's guide to the birds of the Philippines. Oxford (UK): John Beaufoy Publishing.
- Iannone BV, Carnevale S, Main MB, Hill JE, McConnell JB. 2020. Invasive species terminology: Standardizing for stakeholder education. *J Ext* 58(3):1–20. DOI: 10.34068/joe.58.03.27
- Imanda H, Wright J. 2019. Location privacy in conservation. *ArXiv*:1–9. DOI: 10.48550/arXiv.1907.07054
- Ingle NR, Heaney LR. 1992. A key to the bats of the Philippine Islands. Illinois (US): Field Museum of Natural History.
- Kittelberger KD, Neate-Clegg MHC, Blount JD, Posa MRC, McLaughlin J, Şekercioğlu ÇH. 2021. Biological correlates of extinction risk in resident Philippine avifauna. *Front Ecol Evol* 9:664764. DOI: 10.3389/fevo.2021.664764
- Kraus D, Enns A, Hebb A, Murphy SR, Drake DA, Bennett B. 2022. Prioritizing nationally endemic species for conservation. *Conserv Sc Pract* 5(1):e12845. DOI: 10.1111/csp2.12845
- Leviton AE, Brown RM, Siler CD. 2011. The dangerously venomous snakes of the Philippine Archipelago with identification keys and species accounts. *Calif Acad Sci* 1(1):473–530.
- Leviton AE, Siler CD, Weinell JL, Brown RM. 2018. Synopsis of the snakes of the Philippines: A synthesis of data from biodiversity repositories, field studies, and the literature. *Proc Calif Acad Sci* 64(14):399–568.
- Maisels F, Strindberg S, Blake S, Wittemyer G, Hart J, Williamson EA, ..., Warren Y. 2013. Devastating decline of forest elephants in Central Africa. *PLoS One* 8(3):e59469. DOI: 10.1371/journal.pone.0059469
- Marshall BM, Strine C, Hughes AC. 2020. Thousands of reptile species threatened by under-regulated global trade. *Nat Commun* 11(1):1–12. DOI: 10.1038/s41467-020-18523-4
- Miele V, Dussert G, Spataro B, Chamaillé-Jammes S, Allainé D, Bonenfant C. 2021. Revisiting animal photo-identification using deep metric learning and network analysis. *Methods Ecol Evol* 12(5):863–873. DOI: 10.1111/2041-210X.13577
- Mohamad Muslim HF, Tetsuro H, Shinya N, Yahya NA. 2018. Nature experience promotes preference for and willingness to coexist with wild animals among urban and suburban residents in Malaysia. *Ecol Process* 7(1):1–12. DOI: 10.1186/s13717-018-0127-7
- Morcatty TQ, Su S, Siriwat P, Andersson AA, Atoussi S, Feddema K, ..., Roberts DL. 2024. Navigating ethical challenges in online wildlife trade research. *Conserv Biol* 38(5):e14341. DOI: 10.1111/cobi.14341
- Mozar A, Prost S. 2023. An introduction to illegal wildlife trade and its effects on biodiversity and society. *Forensic Sci Int* 3:100064. DOI: 10.1016/j.fsiae.2023.100064
- Nellemann C, Henriksen R, Raxter P, Ash N, Mrema E. 2014. The environmental crime crisis: Threats to sustainable development from illegal exploitation and trade in wildlife and forest resources. United Nations.
- Nijman V. 2009. An overview of international wildlife trade from Southeast Asia. *Biodivers Conserv* 19(4):1101–1114. DOI: 10.1007/s10531-009-9758-4
- Norouzzadeh MS, Nguyen A, Kosmala M, Swanson A, Palmer MS, Packer C, Clune J. 2018. Automatically identifying, counting, and describing wild animals in camera-trap images with deep learning. *Proc Natl Acad Sci USA* 115(25):E5716. DOI: 10.1073/pnas.1719367115
- Raymundo JJG, Chng S, Sy EY. 2024. The trade of live tarantulas and scorpions in a social media platform in the Philippines. *J Nat Stud* 23(2):1–21. DOI: 10.56899/152.6A.07

- Raymundo JJG, Sy EY, Chng S. 2023. Farmers of the forest in cages: The online trade of hornbills in the Philippines. Cambridge (UK): TRAFFIC.
- Romero-Vidal P, Blanco G, Barbosa JM, Carrete M, Hiraldo F, Pacifico EC, ..., Tella JL. 2024. The widespread keeping of wild pets in the Neotropics: An overlooked risk for human, livestock and wildlife health. *People Nat* 6(3):1–13. DOI: 10.1002/pan3.10625
- Rosales Chavez J, Morales Guerrero J, Clark JA. 2023. Evaluating how varied human-wildlife interactions affect physical, mental, social, and spiritual health. *SSM Qual Res Health* 4:100302. DOI: 10.1016/j.ssmqr.2023.100302
- Salas-Picazo RI, Ramírez-Bravo OE, Meza-Padilla I, Camargo-Rivera EE. 2023. The role of social media groups on illegal wildlife trade in four Mexican states: A year-long assessment. *Glob Ecol Conserv* 45:e02539. DOI: 10.1016/j.gecco.2023.e02539
- Sas-Rolfes M, Challender DW, Hinsley A, Veríssimo D, Milner-Gulland EJ. 2019. Illegal wildlife trade: Scale, processes, and governance. *Annu Rev Environ Resour* 44(1):201–228. DOI: 10.1146/annurev-environ-101718-033253
- Scheffers BR, Corlett RT, Diesmos A, Laurance WF. 2012. Local demand drives a bushmeat industry in a Philippine Forest preserve. *Trop Conserv Sci*. DOI: 10.1177/194008291200500203
- Sengottuvel RR, Mendis A, Shukla NSS, Chaudhuri A, Mendiratta U. 2023. From pets to plates: network analysis of trafficking in tortoises and freshwater turtles representing different types of demand. *Oryx* 58(1):1–12. DOI: 10.1017/S0030605323000376
- Shan S, Ju X, Wei Y, Wen X. 2022. Concerned or apathetic? Using social media platform (Twitter) to gauge the public awareness about wildlife conservation: A case study of the illegal rhino trade. *Int J Environ Res Public Health* 19(11):6869. DOI: 10.3390/ijerph19116869
- Shepherd CR, Compton J, Warne S. 2007. Transport infrastructure and wildlife trade conduits in the GMS: Regulating illegal and unsustainable wildlife trade. Cambridge (UK): TRAFFIC.
- Shepherd CR, Shepherd LA. 2019. A naturalist's guide to the primates of Southeast Asia. Oxford (UK): John Beaufoy Publishing.
- Skidmore A. 2021. Uncovering the nuances of criminal motivations and modus operandi in the Russian Far East: A wildlife crime case study. *Methodol Innov* 14. DOI: 10.1177/20597991211022015
- Sy EY. 2021. Wildlife from forests to cages: An analysis of wildlife seizures in the Philippines. Cambridge (UK): TRAFFIC.
- Sy EY, Krishnasamy K. 2023. Endangered by trade: The ongoing illegal pangolin trade in the Philippines. Cambridge (UK): TRAFFIC.
- Sy EY, Lorenzo AN. 2023. Online trade of freshwater turtle and tortoises in the Philippines. *Philipp J Sci* 152(6A):2111–2128.
- Takaya K, Taguchi Y, Ise T. 2023. Individual identification of endangered amphibians using deep learning and smartphone images: Case study of the Japanese giant salamander (*Andrias japonicus*). *Sci Rep* 13:16212. DOI: 10.1038/s41598-023-40814-1
- Thompson RM, Hall J, Morrison C, Palmer NR, Roberts DL. 2021. Ethics and governance for internet-based conservation science research. *Conserv Biol* 35(6):1747–1754. DOI: 10.1111/cobi.13778
- Toomes A, García-Díaz P, Stringham OC, Ross JV, Mitchell L, Cassey P. 2022. Drivers of the Australian native pet trade: The role of species traits, socioeconomic attributes and regulatory systems. *J Appl Ecol* 59(5):1268–1278. DOI: 10.1111/1365-2664.14138
- Weinell JL, Hooper E, Leviton AE, Brown RM. 2019. Illustrated key to the snakes of the Philippines. *Proc Calif Acad Sci* 66(1):1–49.
- Whitfort A. 2021. COVID-19 and wildlife farming in China: legislating to protect wild animal health and welfare in the wake of a global pandemic. *J Environ Law* 33(1):57–84. DOI: 10.1093/jel/eqaa030
- World Wildlife Fund. 2006. Illegal and unsustainable wildlife trade. [Internet]. Available from: https://wwfint.awsassets.panda.org/downloads/wildlife_trade_factsheet2006.pdf