

## INSIGHTS FROM SOCIAL MEDIA INTO THE ILLEGAL TRADE OF WILD RAPTORS IN THAILAND

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### INTRODUCTION

The rise of the internet, e-commerce and social media has facilitated the illegal wildlife trade (Chng and Bouhuys, 2015; Krishnasamy and Stoner, 2016; Phassaraudomsak and Krishnasamy, 2018), opening new global online markets for those wishing to sell wildlife and/or wildlife products. The illegal wildlife trade has been identified as a threat to many species, especially in Southeast Asia (Blair *et al.*, 2017). Numerous studies have reported “snapshots” of the extent of the online illegal wildlife trade (Morgan and Chng, 2017; Gomez and Bouhuys, 2017) and previous scientific literature has highlighted the prominence of illegal wildlife trade activities in countries such as Thailand (Nijman and Shepherd, 2011; Siriwat and Nijman, 2018). Thailand ranks highly in the world for social media use (Leesa-nguansuk and Fredrickson, 2017), with the largest social media platform estimated to have more than 26.9 million active users by the end of 2019, representing approximately 40% of the total Thai population (Statista, 2019).

The legal global trade in diurnal and nocturnal birds of prey (hereafter “raptors” and “owls”, respectively) has increased since the 1970s, driven mostly by consumer demands from the pet and falconry trades (Panter *et al.*, 2019). However quantified data regarding the

unregulated, illegal trade in such species remains poorly represented within the scientific literature (MaMing *et al.*, 2014; Panter *et al.*, 2019).

Previous studies have reported trends in illegal trading of raptors and owls in Indonesia online and during surveys at bird markets, highlighting issues concerning the effectiveness of relevant wildlife laws (Shepherd, 2012; Iqbal, 2016; Nijman and Nekaris, 2017). A rapid survey at Thailand’s Chatuchak weekend market found raptors and owls for sale despite a prohibition on the trade of all native species (Chng and Eaton, 2016). Another study focusing on wildlife trade on e-commerce sites in Viet Nam found that more than half of the posts offering wildlife commodities were likely to be illegal (Nguyen and Willemsen, 2016). Such studies highlight the extent and dynamics of illegal wildlife trade and are vital baselines for effective species conservation.

Raptors and owls are particularly extinction-prone and Southeast Asia has been identified as a key area for raptor conservation (Buechley *et al.*, 2019). Shifts in trade patterns from physical markets to online, e-commerce and social media platforms appear to be occurring (Phassaraudomsak and Krishnasamy, 2018) and there has yet to be a study focusing on the online trade dynamics of raptors and owls in Thailand.

This study aims to provide a snapshot of the online trade of raptors and owls across Thailand on the social media platform Facebook, providing baseline data for future raptor conservation.

▲ Changeable Hawk-eagle *Nisaetus cirrhatus*, the most frequent raptor species recorded for sale during the study.



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**Black-winged Kite *Elanus caeruleus***

## METHODS

Surveys of online posts offering raptor and owl species were conducted on Facebook, which is the most-used social media platform in Thailand (Statista, 2019). Data were collected on offers for sale published throughout a four-year period from February 2015 until June 2019; prior online content was unavailable.

Eight Facebook pages and three groups where offers of raptor and owls were being made were identified using an in-built search function following a keyword search methodology similar to that used by Phassaradomsak and Krishnasamy (2018). Two of the three groups had privacy settings requiring group membership, however, all Facebook pages were public and accessible for anyone to view. Keywords were translated into Thai local language and included “buy-sell eagles”, “buy-sell

hawks”, “buy-sell owls”, “buy-sell raptors” and “raptor trade”. Species, number of individuals, date of post, bird growth stage, asking price (Thai Baht) and seller location were recorded by manually scrolling through offers of sale. These were then geo-referenced using a GIS to explore the distribution of seller activity highlighting trade “hot spots”. Care was taken to minimise double counting within and across trading groups and any duplicates were subsequently eliminated from data analyses.

Bird identification was assisted by a field guide (Ferguson-Lees and Christie, 2007) and verified by an expert ornithologist. Taxonomy was standardised following the accepted names recognised by del Hoyo *et al.* (2014). Data management and analyses were conducted using the software package R version 3.5.1. (R Core Team, 2018). A Pearson’s Chi-square test was performed on categorical trade data to test for significant differences between trade volumes and month of the post. A two-sample *t* test was also used to test for a significant difference between mean prices for raptors and owls. Currency conversions were conducted on 23 June 2019 using the exchange rates of USD1=THB30.6 and GBP1=THB38.5 (<https://www.xe.com>). Conservation status and global population trend data were obtained from the International Union for Conservation of Nature’s Red List of Threatened Species (IUCN Red List) (IUCN, 2019).

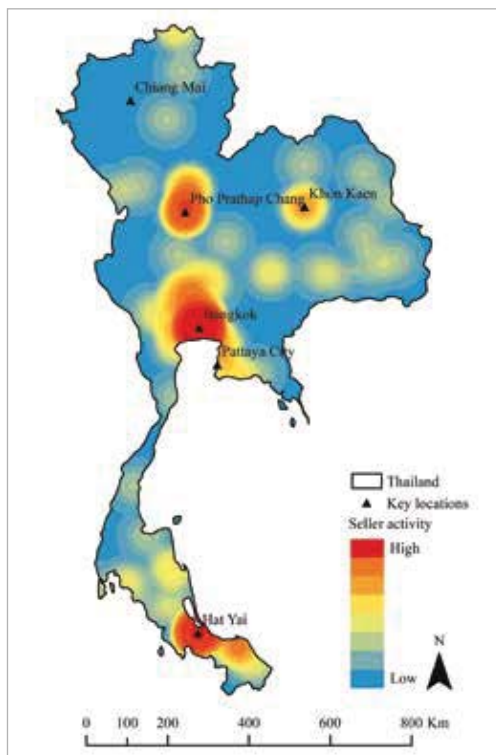
It should be noted that photographs of specimens offered online may not reflect actual availability and could be fraudulent posts using stock photos or images used for different offers.

## LEGISLATION

The possession and sale of all native bird species in Thailand is prohibited. The newly revised *Wildlife Reservation [sic] and Protection Act B.E. 2562* (2019) (WARPA) effective November 2019, and which replaces the *Wildlife Preservation and Protection Act B.E. 2535* (1992), includes a new category “Controlled Wild Animal”. This covers CITES-listed species, and currently includes 50 non-native species that will be subject to immediate regulation for possession, breeding and trade. Conviction for violations pertaining to hunting, possession and trade carries a maximum fine of 10 years’ imprisonment and a fine of THB1,000,000 (USD32,436). Violations relating to the import and export of species carry a maximum penalty of 15 years’ imprisonment and/or a fine of THB1,500,000 (USD48,654) (Phassaradomsak *et al.*, 2019). The law will also be supplemented by a series of subsidiary legislations that are being developed to direct its implementation and enforcement. WARPA 2019 also considers internet trade a violation (Krishnasamy and Zavagli, 2020).

## RESULTS

A total of 260 posts offering raptors and owls for sale were recorded and comprised 396 individuals. Collectively 28 species of raptors (N=18) and owls (N=10) were identified to species-level and two individuals identified to genus-level (Table 1).



**Fig. 1. Kernel density estimation of online seller activity throughout Thailand.** Map created using seller location point data (N=218 representing 84% of all recorded posts).

Common name	Scientific name	No. of birds	CITES	National Threat Status	IUCN Threat Status	Pop. trend <sup>1</sup>	WARPA B.E. 2562 <sup>2</sup>
Changeable Hawk-eagle	<i>Nisaetus cirrhatus</i>	123	II	VU	LC	↓	Listed
Black-winged Kite	<i>Elanus caeruleus</i>	64	II	NT	LC	→	Listed
Brahminy Kite	<i>Haliastur indus</i>	52	II	LC	LC	↓	Listed
Black Kite	<i>Milvus migrans</i>	23	II	EN	LC	?	Listed
Crested Goshawk	<i>Accipiter trivirgatus</i>	23	II	LC	LC	↓	Listed
Blyth's Hawk-eagle	<i>Nisaetus alboniger</i>	18	II	NT	LC	↓	Listed
Shikra	<i>Accipiter badius</i>	9	II	LC	LC	↓	Listed
Harris's Hawk	<i>Parabuteo unicinctus</i>	6	II		LC	↓	Unlisted
Crested Serpent-eagle	<i>Spilornis cheela</i>	4	II	LC	LC	→	Listed
Common Kestrel	<i>Falco tinnunculus</i>	2	II	LC	LC	↓	Listed
Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i>	1	II	LC	LC	→	Listed
Ferruginous Hawk	<i>Buteo regalis</i>	1	II		LC	↑	Unlisted
Pied Harrier	<i>Circus melanoleucos</i>	1	II	LC	LC	↓	Listed
Peregrine Falcon	<i>Falco peregrinus</i>	1	I	LC	LC	→	Listed
Saker Falcon	<i>Falco cherrug</i>	1	II		EN	↓	Unlisted
Steppe Eagle	<i>Aquila nipalensis</i>	1	II	EN	EN	↓	Listed
Wallace's Hawk-eagle	<i>Nisaetus nanus</i>	1	II	EN	VU	↓	Listed
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	1	II	LC	LC	↓	Listed
	<i>Circus sp.</i>	1					
Spotted Owlet	<i>Athene brama</i>	22	II	LC	LC	→	Listed
Collared Owlet	<i>Glaucidium brodiei</i>	12	II	LC	LC	↓	Listed
Buffy Fish-owl	<i>Ketupa ketupu</i>	6	II	LC	LC	→	Listed
Oriental Scops-owl	<i>Otus sunia</i>	6	II	LC	LC	→	Listed
Eastern Barn-owl	<i>Tyto javanica</i>	4	II	LC	LC	→	Unlisted‡
Eastern Grass-owl	<i>Tyto longimembris</i>	3	II	LC	LC	↓	Listed
Barred Eagle-owl	<i>Bubo sumatranus</i>	3	II	NT	LC	→	Listed
Brown Boobook	<i>Ninox scutulata</i>	3	II	LC	LC	↓	Listed
Collared Scops-owl	<i>Otus lettia</i>	2	II	LC	LC	→	Listed
Brown Wood-owl	<i>Strix leptogrammica</i>	1	II	LC	LC	↓	Listed
	<i>Tyto sp.</i>	1					
Total		396					

**Table 1. Raptor and owl species recorded for sale, February 2015 to June 2019.**

National Threat Status derived from the Bird Conservation Society of Thailand (BCST, 2019). <sup>1</sup>Global population trend data derived from the IUCN Red List. <sup>2</sup>Species protected under the Wildlife Reservation and Protection Act, B.E. 2562 (2019). ‡Recent taxonomic change (see Recommendations).

### Seller activity

The largest proportion of online seller activity was distributed across central Thailand (Fig. 1). When analysing seller activity at city-level, offers of sale in Bangkok and Hat Yai were the most frequent, comprising 45% of all geo-referenced posts (N=218). At district-level, Pho Prathap Chang comprised 6% of all geo-referenced posts. Due to the ambiguous nature of online seller locations, it was unclear whether sellers referred to Khon Kaen as a city or province. Therefore the authors regarded all offers of sale in Khon Kaen at a provincial-level, which comprised 3% of all geo-referenced posts.

### Most traded species

The most frequent raptor species recorded as offered for sale was the Changeable Hawk-eagle *Nisaetus cirrhatus*, representing 31% of all identified species, followed by the Black-winged Kite *Elanus caeruleus* and the Brahminy Kite *Haliastur indus* representing 16% and 13%, respectively (Table 1). Chicks (including all hatchlings, nestlings and juvenile birds) comprised the majority of birds for sale. Approximately 76% (N=93) of Changeable Hawk-eagles, 92% (N=59) of Black-winged Kites and 85% (N=44) of Brahminy Kites were offered for sale as chicks.

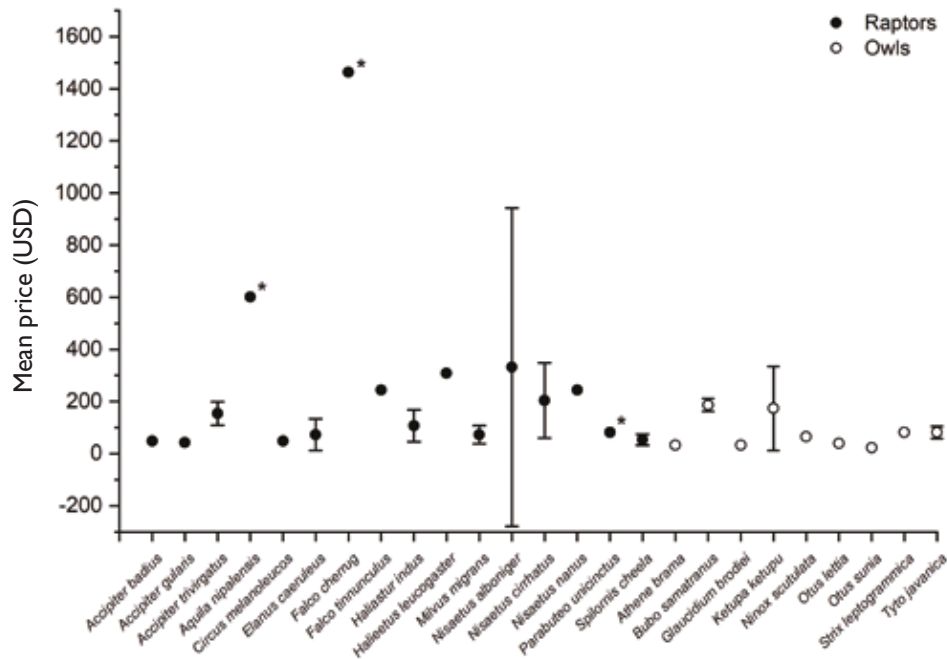


Fig. 2. Mean prices (USD) ( $\pm$ SD) for species recorded during the survey with available price data (N=26).

The most frequent owl species for sale was the Spotted Owllet *Athene brama* which comprised approximately 6% of all species. The Collared Owllet *Glaucidium brodiei* and the Buffy Fish-owl *Ketupa ketupu* represented the second and third most frequent owl species comprising 3% and 2% of all traded species, respectively (Table 1). The majority of owls were offered as chicks, comprising 86% (N=19) of Spotted Owllets, 83% (N=10) of Collared Owllets and 50% (N=3) of Buffy Fish-owls.

#### Distribution and conservation status

Of the species identified to species-level, 86% were native to Thailand (N=24) and approximately 11% non-native (N=3). Of the latter, these included the Harris's Hawk *Parabuteo unicinctus*, Ferruginous Hawk *Buteo regalis* and Saker Falcon *Falco cherrug*. All species identified to species-level are listed in CITES Appendix II, with the exception of the Saker Falcon which is listed in CITES Appendix I, prohibiting all international commercial trade. Approximately 57% of species (N=16) had decreasing global population trends, three of which are threatened and are of global conservation concern (Saker Falcon, Steppe Eagle *Aquila nipalensis* and Wallace's Hawk-eagle *Nisaetus nanus*) (Table 1). At a national level, two threatened species in Thailand, the Changeable Hawk-eagle and the Black Kite were frequently recorded for sale on Facebook (Table 1).

#### Annual trends and prices

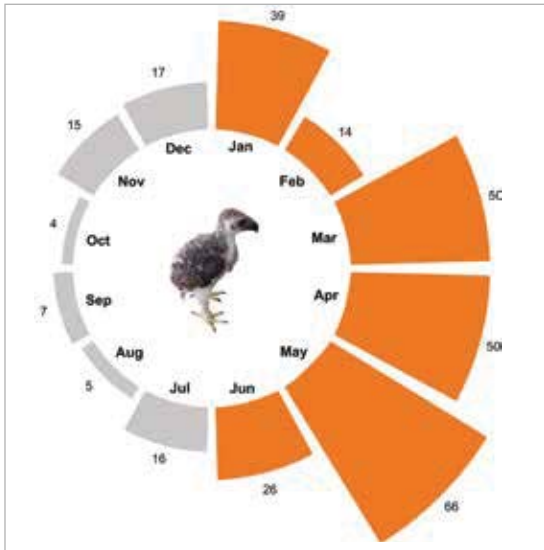
There was a peak in the number of posts in 2018, contributing 48% of total records. Conversely, the fewest

posts occurred in 2016, totalling 5%. The data collected only included posts in 2019 up until June therefore underrepresenting the total for that year. The authors surmise that the removal of older posts was the likely reason 2016 had the lowest total number of posts in their dataset.

Price data were available for 65% of posts and for 86% of species (Fig. 2). Prices ranged from USD16 and USD2,440 for all species. There was a significant difference between mean prices for raptors and owls ( $t=3.249$ ,  $df=166$ ,  $p < 0.05$ ). Owls had a lower monetary value compared to raptors, with average asking prices for owls and raptors being USD87 ( $\pm$ 98) and USD184 ( $\pm$ 251), respectively (Fig. 2). The most expensive bird offered for sale was a mature Blyth's Hawk-eagle *Nisaetus alboniger* priced at USD2,440. Despite owls having a lower monetary value, Black-winged Kites were one of the cheapest species—two hatchlings were on sale for USD16 each.

#### Growth stage

Throughout the study, a total of 308 chicks were recorded for sale, comprising 78% of all recorded individuals. Of these, 79% (N=245) were offered for sale during the wild bird breeding period for the reported species (Ferguson-Lees and Christie, 2007). There was a significant difference between the number of chicks for sale during the breeding period compared to the non-breeding period ( $\chi^2=51.415$ ,  $df=1$ ,  $p < 0.05$ ). Posts offering chicks for sale peaked in May, with the second-highest number occurring in March and April (Fig. 3).



◀ **Fig. 3. No. of chicks for sale/month.**

Numeric values represent the number of chicks for sale across the surveyed trading groups in each corresponding month. Data pooled from four-year survey period. Orange = approximate breeding season.

*Welfare concern*

Considerable welfare concerns for some birds offered for sale were noted. Inadequate conditions were frequently observed, with birds often kept in small cages (Fig. 5a) and showing signs of stress such as gaping from heat stress, trying to hide from the photographer (Fig. 5b) and in poor physical condition, with visible wounds and missing feathers (Fig. 5c and 5d).

**DISCUSSION AND CONCLUSIONS**

This study provides a “snapshot” of the online trade of raptors and owls on social media. The majority of species offered for sale were native to Thailand and evidence suggests that the illegal taking and trade of wild birds is openly occurring online. Chicks were most frequently for sale, with posts peaking during the wild breeding season. The authors highlight an emerging conservation concern as more than half of the recorded species are experiencing global wild population declines and two of the most traded species are threatened in Thailand.

In comparison to the more generic search methodology of Phassaraudomsak and Krishnasamy

*Wild-caught birds*

The authors found evidence suggesting wild-caught birds were actively being illegally offered for sale on Facebook, signifying an emerging unrecognised conservation threat for some threatened species already experiencing regional population declines, such as the Changeable Hawk-eagle. It is likely that wild birds were taken from nests and offered for sale online, however, the true origins of these birds could not be ascertained (Fig. 4a). Additionally, other sellers posted images of eggs (Fig. 4b) and chicks (Fig. 4c and Fig. 4d) in the parental nest implying that these individuals may have derived from wild sources.



**Fig. 4. Images of suspected wild raptors uploaded by sellers onto the surveyed trading groups.** a) nestlings for sale, online seller requests price bids via private message; b) a posted image of a wild nest with eggs; c) two wild nestlings in the nest; d) nestling birds in the nest (seller asks whether other members of the trading group would like to buy the birds).

(2018), more raptor and owl species were found for sale during this study suggesting the online trade is ongoing. The number of posts were higher in 2018 compared to other years, likely due to increased enforcement in physical markets resulting in a shift to online platforms, enabling sellers to trade wildlife with ease due to a wider customer reach and the ability to remain anonymous (S.C.L. Chng, pers. comm., August 2019). Seller activity was concentrated within and around the peripheries of large cities such as Bangkok and Hat Yai where nearly half of all geo-referenced posts were recorded. This is where human densities are highest and access to the internet more readily available. However a considerable number of birds were offered for sale in the more rural Pho Prathap Chang district, suggesting a single major supplier operating there.

Similar to Iqbal (2016), the Changeable Hawk-eagle was the most frequent raptor species for sale in Thailand and the second most frequent in Indonesia (Iqbal, 2016). The Black-winged Kite featured as the second most common raptor species for sale in this study and the most commonly offered raptor species recorded in Indonesia (Iqbal, 2016). This species has broad geographic distributions across Southeast Asia and often occurs within human-modified landscapes such as agricultural farmland (Li, 2011). The majority of the species recorded in this study occur throughout lowland habitats overlapping with areas of human activity such as rice fields. It is likely that lowland species are more

readily poached from the wild and traded online due to the encroachment of human settlements into lowland habitats. This is evident by the high number of Changeable Hawk-eagles observed in this study. However these findings were not as numerous as those by Iqbal (2016), reporting 1,216 Changeable Hawk-eagles comprising more than 7,500 raptors and owls for sale on Indonesian Facebook groups. Those findings are likely the result of Indonesia's long cultural heritage of bird keeping and status as the largest importer and exporter of wild birds in Asia (Harris *et al.*, 2016). The prevalence of Changeable Hawk-eagles offered for sale in this study and by Iqbal (2016) highlights a considerable emerging conservation threat that could result in the species' national threat status being increased from Vulnerable to Endangered due to overexploitation for the falconry and pet trade.

The majority of species for sale were native to Thailand and mostly comprised chicks. The number of posts peaked during the wild breeding period, suggesting a threat of illegal overexploitation of wild individuals subsequently entering the online trade. The majority of sellers provided no open information regarding the origin of birds, although some openly offered wild birds for sale using phrases such as "wild hawk", "strong wild bird" and offering to supply wild chicks. Such illegal activities raise considerable conservation concerns that overexploitation and unsustainable trade of wild populations is threatening many Asian species (Nijman and Shepherd, 2015). The Changeable Hawk-eagle (the most traded species in this



**Fig. 5. Examples of birds offered for sale online in unsuitable conditions.**

a) Juvenile Shikra *Accipiter badius* in a small cage, seller reported the bird as wild-caught; b) Two Brown Hawk-owls *Ninox scutulata* in a wooden crate; c) Changeable Hawk-eagle *Nisaetus cirrhatus* in poor condition; and d) Crested Goshawk *Accipiter trivirgatus* showing signs of stress.

study) and the Black Kite (the fourth most commonly traded species) are threatened in Thailand and listed as Vulnerable and Endangered by the Bird Conservation Society of Thailand (Table 1; BCST, 2019). This snapshot survey highlights an alarming emerging conservation issue surrounding wild populations of these and other threatened raptors in Thailand.

The study also highlights animal welfare concerns, whereby the capture, transport and sale of wild birds to fuel consumer demand is likely to be a stressful process for the birds. Animal welfare does not appear to be a high priority for many online sellers as evidenced by the unsuitable and unhygienic conditions in which some of the birds are kept (Fig. 5). Thai law states that traders must have appropriate trade permits to sell goods online, however, no evidence of any permits was observed during the survey. The findings correlate with those of a Philippines study which also found a lack of evidence surrounding the use of trade permits by online sellers advertising wildlife products (Canlas *et al.*, 2017).

Local hobbyists and small falconry groups were found to be the predominant drivers of sales of raptors and owls in Thailand during this study. Falconry equipment was frequently observed for sale alongside live birds. Some posts also included videos and photographs of raptors being flown for recreational and hunting purposes.

Although identification of the bird species for sale was in some cases reviewed by a taxonomy expert, identification was sometimes based on examination of a single photograph provided by the online sellers, which were often of poor quality; furthermore the identification of juveniles can be difficult. The survey only provides a snapshot of the online trade in raptors and owls in Thailand and the sampling efforts employed were only ever likely to capture a small proportion of Facebook posts trading wild birds. Such errors may overestimate and/or underestimate some species within the dataset, however, as all native species in Thailand are protected by WARPA, this does not weaken the conservation value of these findings.

Overall legislative protection of species recorded in this study is good (Table 1), with the majority of species listed under WARPA. However perceptions of WARPA are weak across Thailand due to low prosecution rates, sending the wrong message for raptor and owl conservation (Phassaraudomsak and Krishnasamy, 2018).

## RECOMMENDATIONS

Recent taxonomic revisions identify the Eastern Barn Owl *Tyto javanica* as a single species (previously recognised as a subspecies of the Western Barn Owl *Tyto alba*) (Uva *et al.*, 2018). Continued revisions to WARPA concerning updated taxonomic changes are recommended, however, to date there is no evidence to suggest this will help protected species. Therefore, an increase in enforcement of the WARPA legislation on illegal sellers throughout the country is imperative if overexploitation of wild populations is to be prevented and



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▲ Spotted Owlet *Athene brama*, the most frequent owl species recorded for sale during the study.

protection provided for native species. Further monitoring and specific enforcement (via the identification of key illegal wildlife trade actors) targeting the illegal trade of nationally threatened species such as the Changeable Hawk-eagle and Black Kite is highly recommended. Continued collaboration between authorities and social media platforms to tackle the online illegal wildlife trade is required, as highlighted by Phassaraudomsak and Krishnasamy (2018). The development of the Wild Hawk Unit, known locally as *Yiaw Dong* and focused on tackling online illegal wildlife trafficking in Thailand, provides a positive outlook for future conservation (Phassaraudomsak and Krishnasamy, 2018), with several arrests made in recent years (The Nation, 2018). However the effectiveness of the unit has yet to be assessed from a conservation perspective and the impact on wildlife crime prevention is unknown. The illegal trade of wild raptors and owls continues on social media. Consequently behaviour change communications and continued education are fundamental to protect wild raptor and owl populations in Thailand and across Southeast Asia.

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