

TRADE IN NATIVE BIRDS AT CHATUCHAK WEEKEND MARKET, BANGKOK, THAILAND

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ABSTRACT

This study examines native bird trade levels in one of Thailand’s most important wildlife trade hot spots: Chatuchak Weekend Market in Bangkok (formerly located at Sanam Luang near the Royal Palace and known as “Sunday Market” or “Weekend Market”). We analyzed unpublished trade data, gathered during 30 market surveys conducted between 2007 and 2022. We then compared these data to trade records from three published studies, accounting for a total of 131 surveys between 1966 and 2001, to determine historical trade trends. In addition, we carried out a three-month online trade survey between December 2019 and January 2020 to assess online trade levels. During the 30 market surveys, we found a total of 7,126 individuals, belonging to 145 native species, all of which are protected under Thai law. The mean numbers of recorded native birds found during these surveys (238) were much lower than the mean numbers found during surveys in the late 1960s (5,789) and late 1980s (2,233) and slightly higher than those found during surveys in the early 2000s (189), suggesting a decline in the open availability of native birds in the market over the past fifty years. This decline was found to be particularly steep from 2016 onwards, coinciding with increased enforcement efforts. We found 887 individuals of 50 native species during our online survey, confirming the importance of the internet as an alternative trading space in Thailand’s native bird trade. To reduce the illegal and unsustainable domestic bird trade in Thailand, we recommend increased online trade monitoring and enforcement, as well as continued enforcement efforts in physical markets and campaigns to raise consumer awareness.

Keywords: Asian songbird crisis, songbird trade, online bird trade, illegal wildlife trade, conservation

INTRODUCTION

The illegal and unsustainable trade in cage birds affects wild populations in Southeast Asia (BIRDLIFE INTERNATIONAL, 2018) and has resulted in severe population declines and even local extinctions of many species (EATON *ET AL.*, 2015; HARRIS *ET AL.*, 2017). In recent years, coordinated research efforts to address what has been dubbed the “Asian songbird crisis” (SYKES, 2017) have begun to shed light on the scale and scope of this crisis, with trade volumes and conservation impacts being particularly high in Indonesia (CHNG *ET AL.*, 2015). Thailand

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has also been identified as an important bird trade country (CHNG & EATON, 2016) with a rich bird-keeping culture (ROUND, 1990; TECHACHOCHERT & ROUND, 2013; KIRICHOT *ET AL.*, 2015), but many questions regarding the dynamics of this trade remain. Here we focus on the open trade in native protected bird species in one of the country's most significant wildlife markets, Chatuchak Weekend Market.

Chatuchak Weekend Market (also known as the Chatuchak or Jatujak Market) is a large and popular market in Thailand's capital city, Bangkok. A broad variety of products are sold across the market's thousands of stalls, ranging from food and clothes to pets, including wild birds (CHNG & EATON, 2016). It must be noted that, since its inception in the 1950s, the market has undergone changes in both location and name. It was originally located at Sanam Luang, in front of Bangkok's Royal Palace, where it was known as the "Sunday Market" (McCLURE & CHAIYAPHUN, 1971). In the early 1980s the market was moved to Chatuchak Park, a larger venue which allowed the number of shops selling wildlife to increase (ROUND & JUKMONGKOL, 2003). During this time, the market continued to be referred to as the "Sunday Market" or "Weekend Market" (ROUND, 1990) and it was not until 1987 that the name "Chatuchak" was officially adopted. For the sake of simplicity, references to Chatuchak Weekend Market hereinafter will encompass the market in both its past and current forms, recognizing that its location and name have been subject to change throughout history. Historical accounts from the 1960s (McCLURE & CHAIYAPHUN, 1971), late 1980s (ROUND, 1990) and early 2000s (ROUND & JUKMONGKOL, 2003) highlighted an active bird trade at Chatuchak Weekend Market. More recent published studies of the market have largely focused on other wildlife commodities such as reptiles (NIJMAN & SHEPHERD, 2007; SHEPHERD & NIJMAN, 2008; NIJMAN & SHEPHERD, 2011; TODD, 2011; NIJMAN & SHEPHERD, 2015; JANSSEN & SHEPHERD, 2019) and ivory (KRISHNASAMY *ET AL.*, 2016). We examine the Thai native bird trade in Chatuchak Weekend Market through an analysis of trade records gathered through intermittent surveys over the past two decades. We also look at the online trade in songbirds to investigate the apparent shift from physical to online trade platforms. The aim of this study is to update our understanding of the Thai native bird trade, highlight illegal and unsustainable trade trends and inform conservation efforts, policy interventions and enforcement actions.

LEGISLATION

Until recently, the primary legislation pertaining to wildlife harvest and trade in Thailand was the *Wild Animal Reservation and Protection Act B.E. 2535 (1992)* (hereafter referred to as WARPA 1992). In November 2019, WARPA 1992 was amended to form the *Wildlife Reservation and Protection Act B.E. 2562 (2019)* (WARPA 2019). Our analysis is predominantly based on WARPA 1992, as it was in force during most of our research period. Our online survey and one physical survey were conducted after WARPA 2019 had come into effect and were analyzed within that updated legal framework.

WARPA 1992 classified species as "Reserved" (rare or endangered wildlife) or "Protected" (any wildlife considered of importance to the ecosystem) under different schedules. Species on the reserved or protected lists, the latter accounting for almost all Thai native bird species, could not be hunted (section 16), kept (section 19) or traded (section 20). Section 23 prohibited the import and export of reserved or protected wildlife unless the animals were bred in captivity. The maximum penalty for transgression was four years imprisonment and/or a fine

of THB 40,000 (USD 1,129). WARPA 2019 retained the WARPA 1992 species classifications (“Reserved” and “Protected”) while adding “Controlled” wildlife (species that are listed in the Convention on International Trade in Endangered Species of Flora and Fauna [CITES]) and “Dangerous Wildlife” concerning species that may cause harm to humans, other wildlife, or the environment. Additionally, changes were made to the Act’s definition of “trade”, which under WARPA 2019 includes transactions conducted via “information technology systems” to account for online trade. Prison sentences and fines also increased under WARPA 2019, with new maximum penalties of 10 years imprisonment and/or THB 1,000,000 (USD 28,221) for the trading of protected wildlife.

Section 18 of WARPA 1992 stated that reserved or protected species could be captive-bred with a required license, as per *Ministerial Regulation B.E. 2546 on the Protection to wildlife species breeding* which stipulated 43 species (either native or introduced) allowed for captive breeding. Only specified breedable protected and controlled wildlife can be legally bred under WARPA 2019. Monetary penalties for illegal captive breeding were increased from a maximum of THB 30,000 (USD 847) under WARPA 1992 to a maximum of THB 300,000 (USD 8,467) under WARPA 2019, while prison sentences have remained the same, ranging between zero and three years.

METHODS

Physical Market Surveys

Market data analysis is an effective way to map out trade trends and identify over-exploited species (HARRIS *ET AL.*, 2015). We compiled data from 30 surveys carried out in Chatuchak Weekend Market between 10 April 2007 and 25 June 2022 (Table 1). All but one of the surveys were carried out by at least one of the authors, the exception being the 25 June 2022 survey, which was carried out by a consultant. One survey in our dataset (March 2015) was previously published as a stand-alone inventory paper (CHNG & EATON, 2016). Stalls in Chatuchak Weekend Market are open to the public on weekends, with birds and other animals openly displayed for sale and readily observable. The bulk of native birds are sold in temporary stalls in the open area of the animal section, or in permanent shops that are tucked away in quieter alleys and can be closed at a moment’s notice. Most of the surveys were one-off inventories conducted in an ad-hoc fashion. Only from December 2014 to April 2016 were surveys conducted on a regular basis (14 consecutive monthly surveys). The June 2022 survey was conducted after two years of COVID-related trade bans and market shutdowns to check the current state of the market and to make a preliminary assessment of changes from pre-COVID trade levels. All surveys took place in the early afternoon when the market was at its busiest and most stalls were likely to be open. During each survey, a full inventory of birds on open display was made. Native birds recorded were extracted for this study. Surveys in which at least one native bird was found are referred to as “positive surveys”. No covert investigation or other research methods were employed. It is worth acknowledging some limitations of direct observation in physical market surveys and of the data collected. Some shops or stalls selling native birds were shut on survey days. Additionally, for seven of ten years where only few surveys were conducted, results cannot be considered indicative of annual trade trends.

Table 1. Number of surveys per year conducted at Chatuchak Weekend Market, Bangkok, between 2007 and 2022.

Year	No. of surveys
2007 (Apr.)	1
2009 (Nov.)	1
2010 (Jan., Feb.)	2
2011 (Jan., Jun.)	2
2014 (Dec.)	1
2015 (Jan., Feb., Mar., Apr., Jun., Aug., Sep., Oct., Nov., Dec.)	10
2016 (Jan., Feb., Apr., Aug.)	4
2018 (Apr., Oct.)	2
2019 (Mar., Apr., May, Jun., Jul., Oct.)	6
2022 (Jun.)	1
TOTAL	30

Birds were identified to species for the analyses in this study, except for analyses on origins, for which the subspecies level, where available, was used. In a few cases, individual animals could not be identified to species due to their poor condition or the very young age of some chicks. These observations were omitted from our analysis. Taxonomy and vernacular names follow HBW and BIRDLIFE INTERNATIONAL (2022).

Bird species that were present in large volumes and known to be widely captive-bred were not always counted. As a result, exact volumes of Eastern Spotted Dove *Spilopelia chinensis* and Zebra Dove *Geopelia striata* were not recorded in eight of the 30 surveys. Due to their incomplete data sets, these two species were removed from our analysis.

Visual observation was largely used to identify the birds, but where photographs could be obtained, these were used to verify identification. As some traders, particularly in temporary stalls, were aware that at least part of their trade was illegal, they generally did not allow the taking of photographs. Although some price data were obtained by observing openly advertised prices and through enquiry, our price data set was not sufficiently extensive to be used for analysis. No wildlife was purchased during the surveys. All monetary values mentioned are based on a conversion rate of USD 1 = THB 35.2 (<https://www.oanda.com/currency-converter/fr/?from=USD&to=THB&amount=1>, accessed on 15 August 2022).

Historical Data Comparison

Three historical bird trade studies were analyzed and compared to our survey data to determine trade trends in the market: 1. McCLURE & CHAIYAPHUN (1971), which looked at data of 82 surveys conducted from 1966 to 1968 in what was then still known as the “Sunday Market” at Sanam Luang; 2. ROUND (1990), which consisted of 25 surveys from 1987 to 1988 in the “Sunday Market” or “Weekend Market” at Chatuchak Park; and 3. ROUND & JUKMONGKOL (2003), which incorporated data of 24 surveys conducted from December 2000 to May 2001 in what the study refers to as the “Weekend Market”,

encompassing various relevant sections of the Chatuchak Weekend Market complex. In each of these studies complete counts of the (native) birds on sale were conducted, enabling comparison of trade numbers across these historical surveys and our own.

Online Trade Survey

An online survey was conducted from 14 December 2019 to 20 January 2020 to determine current online bird trade levels in Thailand. This survey was conducted on Facebook, as this platform has been identified as the main online wildlife trade hub in the country (PHASSARAUDOMSAK & KRISHNASAMY, 2018; PANTER & WHITE, 2020; SIRIWAT & NIJMAN, 2020). Relevant Facebook groups were found by using both Thai and English keywords. Access was requested and granted for each of the identified groups. Once access to these groups was acquired, we used a snowballing technique to find and join other relevant groups. Unlike the physical surveys, which included all birds, the online survey focused solely on songbirds (Passeriformes). This was done in the interest of time and because passerines are a frequently traded species group. We gathered data pertaining to all native and non-native songbirds for the period from 20 October 2019 to 20 January 2020, meaning that sale posts between 20 October and 14 December were gathered retrospectively. Not all surveyed groups were found to have posts dating back to October; some only had posts dating back to November. Information regarding the species, volume, price, geographic location of the seller and (lack of) documentation supporting any claims of captive breeding was gathered for each post, as well as additional information concerning dietary requirements, rearing method and singing ability of the birds, where available. We followed a typical economic market approach (BARBER-MEYER, 2010; NEKARIS *ET AL.*, 2010). Due to the potentially sensitive and illegal activity on the Facebook groups, we followed ethical guidelines for conducting covert observations as laid out by ROULET *ET AL.* (2017). We did not interact with any group members and only collected information that was publicly displayed either in the post or in conversations in the comment section. Potential duplicates, including identical posts posted across different groups, were excluded from our analysis.

RESULTS

Physical Surveys

A total of 7,126 birds of 145 species native to Thailand were found in 25 of the 30 surveys conducted from 10 April 2007 to 25 June 2022 (Appendix I). An additional 172 individuals could not be identified to species level; these were omitted from our analysis (Appendix II). The number of individual native birds found per positive survey ranged between 1 and 1,040, while the number of species ranged between 1 and 64.

Species and origin

The Red-whiskered Bulbul *Pycnonotus jocosus* was by far the most frequently encountered species ($n = 3,361$) (Table 2), distantly followed by the Pin-tailed Parrotfinch *Erythrura prasina* ($n = 228$) and White-rumped Shama *Copsychus malabaricus* ($n = 188$). Several shops and stalls appeared to specialize in the sale of Red-whiskered Bulbuls, with

volumes often being high (in some cases over 100 individuals per shop or stall), particularly in the earlier years of the survey (see Discussion).

All the recorded species are on the list of protected species under both WARPA 1992 and WARPA 2019. Thirteen recorded species (369 individuals) are currently assessed as Near Threatened (NT) on the IUCN Red List of Threatened Species and 13 individuals from one species as Endangered (EN) (Table 3). The other 131 species (90.3%), accounting for 6,744 (94.6%) individuals, are classified as Least Concern (LC).

Distribution and habitat

Most of the recorded species were year-round Thai residents (84.1%) (Fig. 1). There were more forest-associated species (51.7%) than open habitat (wetland and grassland) species (30.3%), but in terms of volume, open habitat birds (60.2%) dominated (Fig. 2). At least 66.9% ($n = 97$) of the recorded species can be found within a 150 km radius of Bangkok.

Volume of trade

An average of 238 native birds per survey was recorded across the 30 surveys, ranging from 0 to 1,040, but this varied each year with an overall downward trend from 2015 onwards (Fig. 3). The highest average number of birds per survey was recorded in 2011, although it must be noted that only two surveys were conducted that year. In 2015, the year with the most surveys ($n = 10$), the average was at 330 birds per survey. Notably, since April 2016, the number of native birds recorded in Chatuchak Weekend Market has diminished to insignificant levels, with a mere average of 11 native birds found across the final ten surveys that were conducted from that month onwards. In only five of those ten surveys were native birds recorded, accounting for a total of 111 individuals belonging to four species: Alexandrine Parakeet *Palaeornis eupatria* ($n = 18$), Asian Blue Quail *Synoicus chinensis* ($n = 52$), White-rumped Munia *Lonchura striata* ($n = 37$) and Blossom-headed Parakeet *Himalayapsitta roseata* ($n = 4$). In five surveys, including the study's final two surveys (5 October 2019 and 25 June 2022), no native birds were recorded.

Volume variation between surveys was observed between December 2014 and April 2016, when Chatuchak Weekend Market was surveyed on a near-monthly basis. Figure 4 shows that, during that timeframe, bird volumes were particularly high during surveys in March, September, October, and November and lower in February and April. Three of the four years with the lowest average numbers of birds per survey (2007, 2018 and 2019, Fig. 3) included surveys conducted in April, possibly a “low” month, which may have resulted in lower overall bird volumes for those years. Even so, recorded April numbers in 2007, 2018 and 2019 were much lower than the numbers recorded in April 2015 and April 2016 (Fig. 4). Only in 2019 did the April survey coincide with Thailand's national Songkran holiday where more stalls were closed than usual, which may have resulted in lower trade activity that day.

Table 2. Top-ten most frequently encountered bird species during 30 surveys conducted at Chatuchak Weekend Market, Bangkok, between 2007 and 2022.

#	Species	No. of individuals	% of total
1	Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	3,361	47.2
2	Pin-tailed Parrotfinch <i>Erythrura prasina</i>	228	3.2
3	White-rumped Shama <i>Copsychus malabaricus</i>	188	2.6
4	Black-crested Bulbul <i>Rubigula flaviventris</i>	165	2.3
5	Greater Necklaced Laughingthrush <i>Pterorhinus pectoralis</i>	143	2.0
6	Alexandrine Parakeet <i>Palaeornis eupatria</i>	135	1.9
7	Indian or Swinhoe's White-eye <i>Zosterops palpebrosus</i> or <i>simplex</i> *	126	1.8
8	Black-winged Kite <i>Elanus caeruleus</i>	116	1.6
9	Black-throated Laughingthrush <i>Pterorhinus chinensis</i>	112	1.6
10	Common Hill Myna <i>Gracula religiosa</i>	110	1.5
TOTAL		4,684	65.7

* These birds were initially recorded as Oriental White-eye *Zosterops palpebrosus* before the new taxonomy split them into Indian and Swinhoe's White-eye *Zosterops palpebrosus* and *Z. simplex*. Both species occur commonly in Thailand so it could not be determined which species the observed birds were likely to be.

Table 3. Species with an IUCN Red List classification of Near Threatened (NT) and higher, recorded during 30 surveys conducted at Chatuchak Weekend Market, Bangkok, between 2007 and 2022.

#	Species	IUCN Red List Status	Year of classification
1	Crested Jay <i>Platylophus galericulatus</i>	NT	2004
2	Green Broadbill <i>Calyptomena viridis</i>	NT	2004
3	Lesser Green Leafbird <i>Chloropsis cyanopogon</i>	NT	2004
4	Red-crowned Barbet <i>Psilopogon rafflesii</i>	NT	2004
5	Red-throated Barbet <i>Psilopogon mystacophanos</i>	NT	2004
6	Scaly-breasted Bulbul <i>Ixidia squamata</i>	NT	2004
7	Streaked Bulbul <i>Ixos malaccensis</i>	NT	2004
8	Alexandrine Parakeet <i>Palaeornis eupatria</i>	NT	2013
9	Blossom-headed Parakeet <i>Himalayapsitta roseata</i>	NT	2013
10	Grey-headed Parakeet <i>Himalayapsitta finschii</i>	NT	2013
11	Red-breasted Parakeet <i>Psittacula alexandri</i>	NT	2013
12	Blue-rumped Parrot <i>Psittinus cyanurus</i>	NT	2014
13	Chestnut-capped Laughingthrush <i>Garrulax mitratus</i>	NT	2017
14	Greater Green Leafbird <i>Chloropsis sonnerati</i>	EN	2019

IUCN Red Lists statuses: EN = Endangered; NT = Near Threatened (see <https://www.iucnredlist.org/>).

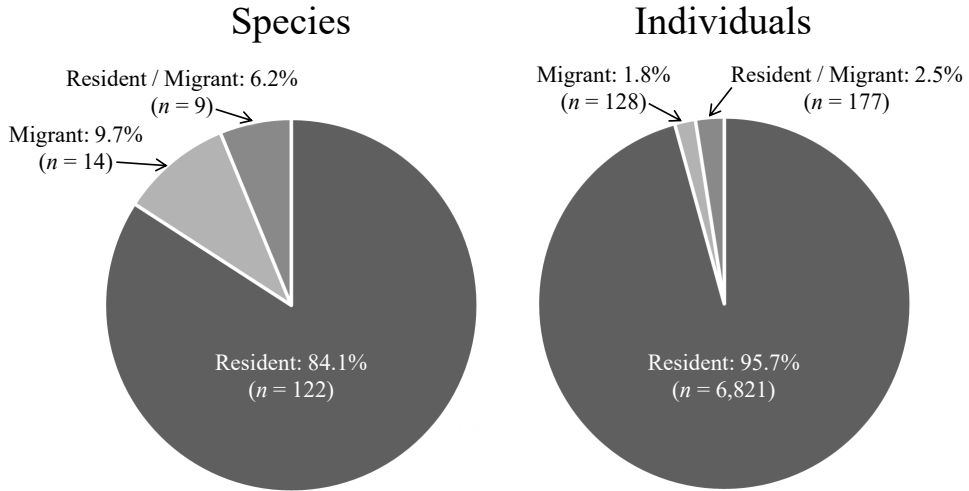


Figure 1. Numbers of resident and migrant birds (left, species; right, individuals) recorded during 30 surveys conducted at Chatuchak Weekend Market, Bangkok, between 2007 and 2022.

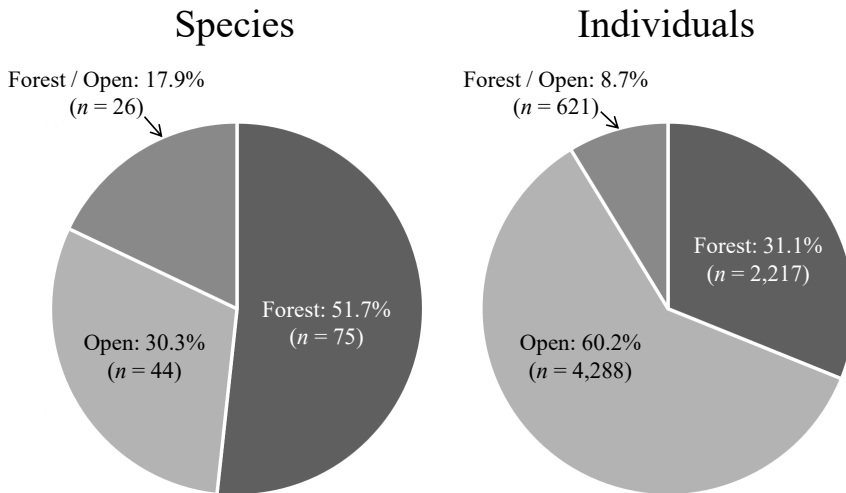


Figure 2. Numbers of forest and open country birds (left, species; right, individuals) recorded during 30 surveys conducted at Chatuchak Weekend Market, Bangkok, between 2007 and 2022.

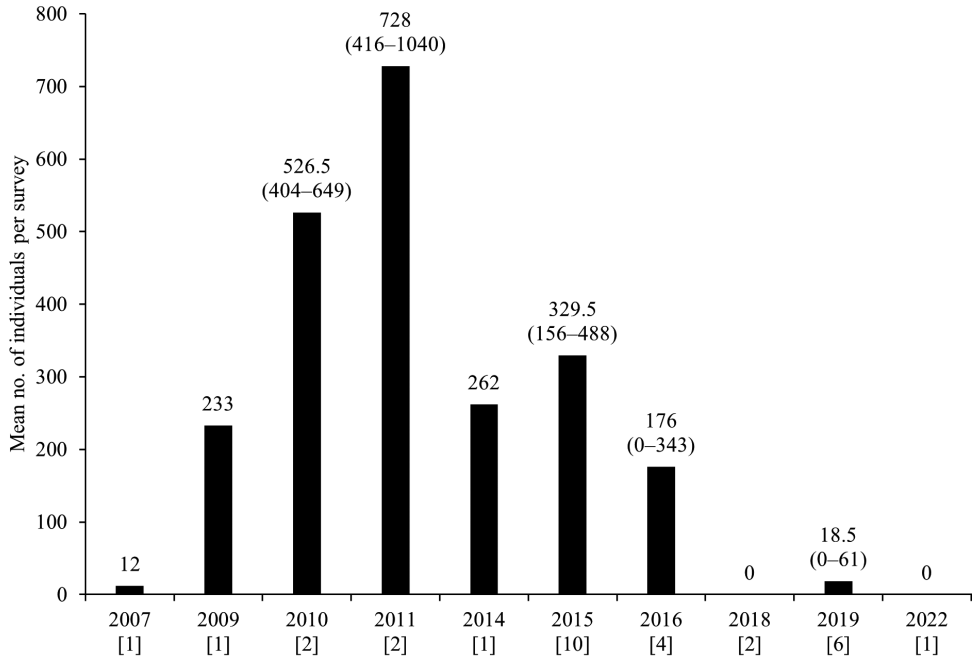


Figure 3. Mean number of individuals per survey per year recorded at Chatuchak Weekend Market, Bangkok, between 2007 and 2022. Numbers in square brackets and parentheses indicate number of surveys per year and range of individuals per survey, respectively.

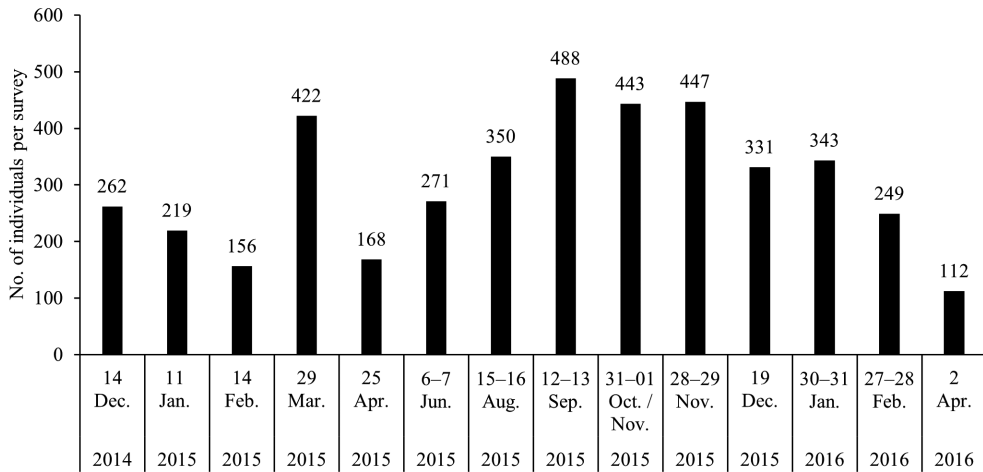


Figure 4. Number of individuals per survey recorded at Chatuchak Weekend Market, Bangkok, from December 2014 to April 2016.

Comparing Then and Now

Trade numbers

Three historical bird surveys; McCLURE & CHAIYAPHUN (1971), ROUND (1990) and ROUND & JUKMONGKOL (2003) show that trade numbers of native birds in the market were higher in the past. Although the survey frequency differed per study, the overall data shows a clear downward trend (Fig. 5). In the current study, the average number of birds per survey (mean = 238) was higher than that found by ROUND & JUKMONGKOL (2003) (mean = 189), particularly during the period between December 2014 and April 2016 in fourteen consecutive monthly surveys (mean = 304). These averages are nevertheless much lower than those found by McCLURE & CHAIYAPHUN (1971) (mean = 5,789) and ROUND (1990) (mean = 2,233). Species diversity was also found to be higher in the 1960s and late 1980s (Fig. 5).

Of the 145 species found during the present study, 127 had been recorded in at least one of the three historical studies. Most of these previously recorded species were found to have decreased in volume. This was the case for 95 of the 112 species encountered in both McCLURE & CHAIYAPHUN (1971) and the present study, and 88 of the 112 species that were encountered in both Round (1990) and the present study. Thirty-eight of the 45 species that were recorded by ROUND & JUKMONGKOL (2003) were also found in the present study. Of these, most ($n = 25$) had increased in volume. However, the trade volumes we encountered for these species were nevertheless low (mean volumes per survey ranging between 0 and 6 individuals per species). One exception was the Red-whiskered Bulbul, for which the mean number of individuals per survey had increased from 27 as observed by ROUND & JUKMONGKOL (2003) to 116 as observed in the present study.

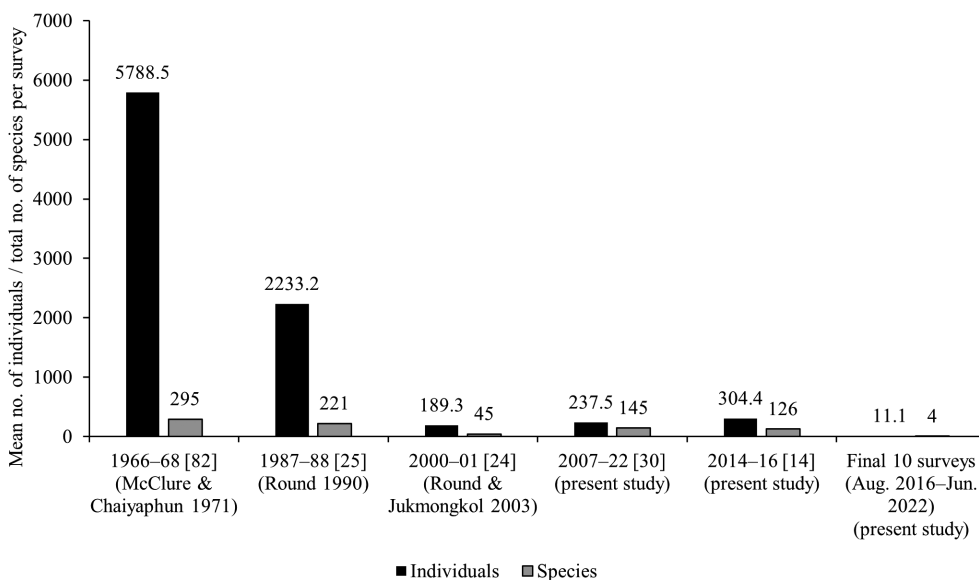


Figure 5. Mean number of native birds (individuals) found per study and total number of encountered species across four studies: McCLURE & CHAIYAPHUN (1971), ROUND (1990), ROUND & JUKMONGKOL (2003), and the present study. Numbers in square brackets indicate number of surveys in each study.

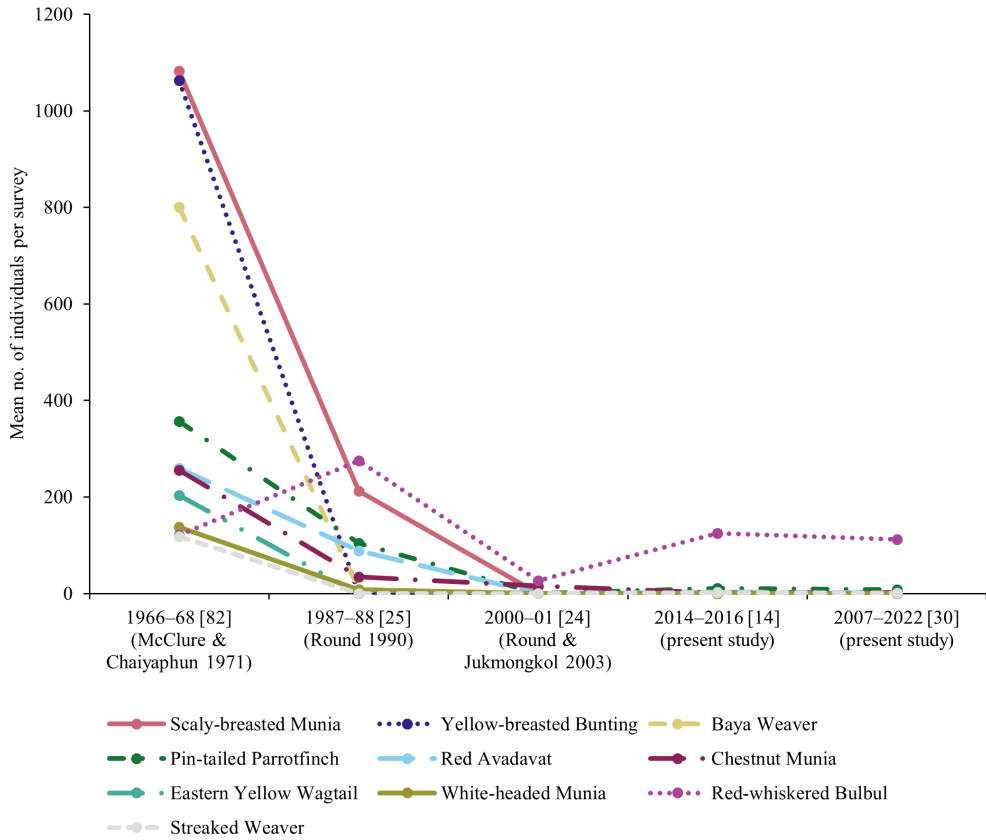


Figure 6. Top-ten species with most drastic decline rates based on mean number of individuals per survey across four studies: McCLURE & CHAIYAPHUN (1971), ROUND (1990), ROUND & JUKMONGKOL (2003), and the present study. Numbers in square brackets indicate number of surveys in each study.

Scaly-breasted Munia *Lonchura punctulata*, Chestnut Munia *Lonchura atricapilla*, Red Avadavat *Amandava amandava*, Pin-tailed Parrotfinch and the Streaked Weaver *Ploceus manyar* saw particularly steep decline rates (Fig. 6). Some of the species found in previous studies but not the present study also showed extreme declines throughout the years, such as Yellow Breasted Bunting *Emberiza aureola*, Eastern Yellow Wagtail *Motacilla tschutschensis*, Baya Weaver *Ploceus philippinus* and White-headed Munia *Lonchura maja*.

When comparing the top-ten most traded taxa across the three historical studies and the present study, drastic changes in species composition become apparent. Some of the most popular species in the older studies are now no longer traded, while currently popular species were not among the most heavily traded species in the past (Table 4). Historic trade volumes of currently popular species were nevertheless much higher than they are now.

Table 4. A comparison of mean trade volumes per survey of top-ten most heavily traded species from each of the four studies: McCLURE & CHAIYAPHUN (1971), ROUND (1990), ROUND & JUKMONGKOL (2003) and the current study. Numbers in square brackets indicate number of surveys in each study. NA refers to species that were not recorded in that study.

Species	Present study 2007–2022 [30]	ROUND & JUKMONGKOL (2003) [24]	ROUND (1990) [25]	McCLURE & CHAIYAPHUN (1971) [82]
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	112.0	26.6	275.6	121.3
Pin-tailed Parrotfinch <i>Erythrura prasina</i>	7.6	NA	104.5	357.1
White-rumped Shama <i>Copsychus malabaricus</i>	6.3	3	79.7	31.0
Black-crested Bulbul <i>Rubigula flaviventris</i>	5.5	2.3	41.8	20.8
Greater Necklaced Laughingthrush <i>Pterorhinus pectoralis</i>	4.8	NA	2.3	0.7
Alexandrine Parakeet <i>Palaeornis eupatria</i>	4.5	2.5	6.8	60.0
Indian or Swinhoe's White-eye <i>Zosterops palpebrosus</i> or <i>simplex</i>	4.2	NA	16.4	10.4
Black-winged Kite <i>Elanus caeruleus</i>	3.9	0.2	2.4	3.9
Black-throated Laughingthrush <i>Pterorhinus chinensis</i>	3.7	14.9	61.2	3.1
Common Hill Myna <i>Gracula religiosa</i>	3.7	0.3	131.8	62.6
White-rumped Munia <i>Lonchura striata</i>	2.0	59.8	22.1	75.2
Collared Grosbeak <i>Mycerobas affinis</i>	NA	34.6	NA	NA
Chestnut Munia <i>Lonchura atricapilla</i>	2.2	15.4	34.2	255.6
Red Turtle-dove <i>Streptopelia tranquebarica</i>	0.2	8.4	23.8	16.0
Red-breasted Parakeet <i>Psittacula alexandri</i>	3.2	5.8	179.8	107.7
Silver-eared Mesia <i>Leiothrix argenteauris</i>	2.5	3.8	8.3	NA
Scaly-breasted Munia <i>Lonchura punctulata</i>	0.5	NA	212.0	1082.9

Table 4. (continued).

Species	Present study 2007–2022 [30]	ROUND & JUKMONGKOL (2003) [24]	ROUND (1990) [25]	McCLURE & CHAIYAPHUN (1971) [82]
Great Myna <i>Acridotheres grandis</i>	1.7	NA	140.6	55.6
Red Avadavat <i>Amandava amandava</i>	2.1	0.1	88.9	259.9
Black-collared Starling <i>Gracupica nigricollis</i>	1.1	0.5	60.1	11.8
Yellow-breasted Bunting <i>Emberiza aureola</i>	NA	NA	NA	1063.5
Baya Weaver <i>Ploceus philippinus</i>	0.1	NA	8.9	800.8
Eastern Yellow Wagtail <i>Motacilla tschutschensis</i>	NA	NA	NA	203.9
White-headed Munia <i>Lonchura maja</i>	NA	NA	7.7	138.2
Streaked Weaver <i>Ploceus manyar</i>	0.9	NA	0.1	118.4

Online Survey

During our online survey, 999 birds from at least 54 Passeriformes species were found in 815 sale posts across 17 Facebook groups (Appendix III), including 102 that could not be identified to species and were omitted from our analysis. Of the remaining 897 birds, almost all individuals ($n = 887$ [98.8%]) and species ($n = 50$ [92.6%]) were native to Thailand. Of these native birds, Red-whiskered Bulbul was the most recorded ($n = 325$), followed by White-rumped Shama ($n = 117$) and Asian Fairy-bluebird *Irena puella* ($n = 71$) (Table 5).

Sale posts often included detailed descriptions of the birds offered for sale. One factor commonly referred to was “domestication”, which included information regarding a bird’s singing abilities, dietary requirements and ability to sit still in a cage (measured as percentages). In some cases, information on the source of the birds was given, which would then be described as either wild-sourced ($n = 70$) or “egg-reared” ($n = 28$). In 52 posts, sellers described the advertised birds as either being “new” or ‘old’, which referred to how recently the birds were caught. Sometimes, pictures of the day’s bird trapping yields were posted alongside the sale offer to increase legitimacy of the seller.

Location details were mentioned in 353 posts. The majority (69.1%; $n = 244$) of these posts were from the southern region of Thailand, particularly Yala Province ($n = 52$). Outside of southern Thailand, Bangkok had the most posts ($n = 34$). Only seven posts explicitly stated that the birds on offer originated from outside of Thailand. The mentioned countries were Malaysia, Myanmar and Vietnam. In only 12 posts, all of which concerned Red-whiskered Bubluls, the seller explicitly stated that the birds for sale were registered and that a government certification of legal breeding and possession would be provided along with the bird upon purchase.

Table 5. Top-ten most recorded species across 17 Facebook groups between 20 October 2019 and 20 January 2020.

#	Species	No. of posts	No. of individuals	% of total individuals*
1	Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	296	325	32.5
2	White-rumped Shama <i>Copsychus malabaricus</i>	108	117	11.7
3	Asian Fairy Bluebird <i>Irena puella</i>	57	71	7.1
4	Greater Green Leafbird <i>Chloropsis sonnerati</i>	42	45	4.5
5	Common Hill Myna <i>Gracula religiosa</i>	30	37	3.7
6	Stripe-throated Bulbul <i>Pycnonotus finlaysoni</i>	22	34	3.4
7	Lesser Green Leafbird <i>Chloropsis cyanopogon</i>	29	31	3.1
8	Blue-winged Leafbird <i>Chloropsis moluccensis</i>	20	23	2.3
9	Black-throated Laughingthrush <i>Pterorhinus chinensis</i>	16	19	1.9
10	Black-crested Bulbul <i>Rubigula flaviventris</i>	11	16	1.6
TOTAL		614	718	71.8

*All birds found during the online study, including those that could not be identified to species level.

DISCUSSION

Recorded trade numbers of native protected birds in Chatuchak Weekend Market have sharply declined over the last fifty years. Roughly five years after ROUND's (1990) study, NASH (1993) observed little to no trade in native birds in the market, stating that vendors now predominantly sold cats, dogs and "captive bred birds", largely as the result of the implementation of WARPA 1992, which prohibited the sale of any non-captive bred reserved and protected wild animals. Although surveys throughout the 2000s show that trade in native protected birds still occurred at Chatuchak Weekend Market after Nash's 1993 account, volumes as high as the ones recorded by McCLURE & CHAIYAPHUN (1971) and ROUND (1990) have not been reported since. From 2016 onwards, native bird trade levels in Chatuchak Weekend Market were found to have plummeted. This sharp reduction in open trade levels appears to be the direct result of

increased and effective law enforcement efforts. These efforts were reportedly stepped up after the public profile of conservation and welfare issues surrounding the wildlife trade in Chatuchak Weekend Market had grown stronger (ELLIS, 2015; CHNG & EATON, 2016).

Meanwhile, and likely in part resulting from these stricter enforcement efforts in the physical market, the trade in native protected birds appears to have at least partly shifted to online platforms. In July 2016, a one-month study of Thailand's online wildlife trade found birds to be among the most heavily traded animals on Facebook (PHASSARAUDOMSAK & KRISHNASAMY, 2018). During a 2018 follow-up survey it was found that, compared to 2016, the number of members in the surveyed Facebook groups had nearly doubled (PHASSARAUDOMSAK & KRISHNASAMY, 2018). Our findings of a large number of native birds for sale on Facebook hint at a partial shift to online trade. In fact, more native birds ($n = 887$) were found for sale during three months of online surveying than during the present study's final 13 physical market surveys ($n = 815$), conducted between 2016 and 2022.

Decreased native bird trade numbers could also reflect population declines in the wild. A good example of this is the Yellow-breasted Bunting, which was among the most heavily traded species in the late 1960s but was not recorded in any of the later studies. Wild populations of this species have reportedly been decimated by trapping for trade (KAMP *ET AL.*, 2015), causing this once very common bird to now be assessed as Critically Endangered on the IUCN Red List. Although discussing all declining species found during our surveys is beyond the scope of this paper, several species of particular concern are worth highlighting:

Red-whiskered Bulbul (LC)

In Thailand, the Red-whiskered Bulbul is one of the most popular cage birds. Singing competitions for the species occur across the country and nearly every province has its own Red-whiskered Bulbul club (TECHACHOOCHERT & ROUND, 2013). Although trade numbers found in the late 1960s by McCLURE & CHAIYAPHUN (1971) (mean = 121 per survey) were similar to those found in the present study ($n = 3,361$, mean = 112 per survey), the numbers found in our study represent a 59.3% decline in mean birds per survey from those found in the late 1980s by ROUND (1990) (mean = 276). No Red-whiskered Bubluls were found during the final ten surveys of the present study (August 2016–June 2022), whereas they had been observed in all surveys before that period. Shops specializing in Red-whiskered Bubluls were often observed in narrow back-alleys of the market in windowless shop lots with doors often closed, suggesting exclusivity. On only a few surveys were surveyors able to observe and therefore count the birds in these shops. It is therefore likely that Red-whiskered Bulbul trade still occurs at Chatuchak Weekend Market, but out of sight of casual observers. Red-whiskered Bubluls are still traded in relatively high numbers online, indicating that the species' popularity remains unchanged. Although commercial captive breeding of Red-whiskered Bubluls appears to be common, it has been reported that high demand for the species has nevertheless resulted in continued high levels of trapping, which in turn has led to its disappearance from much of its Thai range (TECHACHOOCHERT & ROUND, 2013).

White-rumped Shama (LC)

The White-rumped Shama is among the most popular songbirds in Southeast Asia (LEUPEN *ET AL.*, 2018). A total of 2,540 birds (mean = 31) was found in the late 1960s by McCLURE & CHAIYAPHUN (1971) and 1,992 individuals (mean = 80) were found in the late 1980s by ROUND (1990). The sizeable number of Thai White-rumped Shama seizures (at least 187 seizures, accounting for 7,373 birds, between January 2008 and June 2018) (LEUPEN *ET AL.*, 2018) further confirms the species' popularity in the country. White-rumped Shama availability at Chatuchak Weekend Market appears to have sharply decreased, with only 73 birds (mean = 3) found by ROUND & JUKMONGKOL (2003) between 2000 and 2001 and 188 birds (mean = 6) found in the present study, reflecting a 92.1% decline in mean birds per survey compared to ROUND (1990) and a 79.8% decline from McCLURE & CHAIYAPHUN (1971). Again, no birds were found during the final ten surveys of the present study. The high number ($n = 117$) of White-rumped Shammas found during our online survey further indicates a shift to online bird trade. Although some commercial captive breeding of the species occurs, wild-caught birds continue to be popular and are sometimes preferred over their captive bred counterparts (BURIVALOVA *ET AL.*, 2017). A study of White-rumped Shama seizures and market observations in Southeast Asia found that Thailand was the destination for at least 15 seizures in Malaysia, indicating active smuggling of the species across the Thai–Malaysian border (LEUPEN *ET AL.*, 2018). Despite its large geographical range, continuing demand is likely to negatively impact White-rumped Shama's conservation status. The devastating effects of its trade have already been recorded in parts of its range (EATON *ET AL.*, 2015) and the species was listed on CITES Appendix II in 2022 to record and regulate international trade. Subpopulations of the Thai-Malay Peninsula are currently listed in Tier 2 of the IUCN SSC Asian Songbird Trade Specialist Group's priority taxa list (hereafter referred to as ASTSG [2023]), meaning the species is of concern but more research is needed to determine the impacts of trade.

Common Hill Myna (LC)

The Common Hill Myna *Gracula religiosa* is another popular songbird in Southeast Asia that is considered to be increasingly under serious threat from trade. Although these concerns apply predominantly to several Indonesian island-specific subspecies (EATON *ET AL.*, 2015), decreased availability at Chatuchak Weekend Market suggests that population declines may be occurring across its Thai range. Whereas 5,137 birds (mean = 63) of the species were found in the late 1960s by McCLURE & CHAIYAPHUN (1971) and 3,295 (mean = 132) in the late 1980s by ROUND (1990), no more than 110 individuals (mean = 4) were found in the present study, signifying a 97.2% decline in mean birds per survey compared to ROUND (1990) and a 94.1% decline from McCLURE & CHAIYAPHUN's 1971 study. No birds were recorded during the last eleven surveys (since January 2016) of the present study. Thirty-seven individuals were found during our online survey, once again confirming that trade continues online.

Greater Green Leafbird (EN)

Greater Green Leafbirds *Chloropsis sonnerati* have historically been recorded in trade across the Southeast Asian region (CHNG *ET AL.*, 2017), including in Thailand. Although the number of individuals encountered at Chatuchak Weekend Market was relatively low ($n = 13$, mean = 0 individuals per survey, representing an 83.6% decline from McCLURE & CHAIYAPHUN

[1971] and a 58.3% decline from ROUND [1990]), 45 individuals were recorded during our online survey, making it the fourth most frequently recorded species of that survey. In recent years, due to increased trade pressure and declining populations, the species has gone from Least Concern on the IUCN Red List to Vulnerable in 2016 and Endangered in 2019. The species' dire conservation status has also led it to be uplisted from a Tier 2 to a Tier 1 species on the ASTSG priority taxa list (ASTSG, 2023), meaning that its survival is under high threat due to trade and immediate conservation action is required. Considering the likely wild origin of individuals in trade (the species is hard to breed in captivity and no large-scale commercial captive breeding efforts are known to the authors), as well as worrying population trends, any trade should be of concern. Continued monitoring and rigorous enforcement are needed to prevent further population declines. Other leafbird species (Blue-winged *C. moluccensis*, Golden-fronted *C. aurifrons*, and Lesser *C. cyanopogon*) were also recorded across the various physical and online surveys, with Lesser Green Leafbird (NT) being among the most frequently encountered birds during the online survey. The impacts of trade on these species are either unknown or thought to be minimal, but the monitoring of populations and trade trends is needed to guard against any future overexploitation. This is especially so considering Greater Green Leafbirds' increasing rarity in the wild and the potential demand for substitute species.

Munias, weavers and avadavats (LC)

Munias, weavers and the Red Avadavat had steep decline rates in the market. The White-rumped Munia, Scaly-breasted Munia and Chestnut Munia experienced mean decline rates of 90.8%, 99.7% and 93.7%, respectively since ROUND's 1990 study and of 70.6%, 80.4% and 86.6%, respectively since McCLURE & CHAIYAPHUN's 1971 study. The Scaly-breasted Munia particularly stands out in this respect, with no less than 88,796 birds of the species found by McCLURE & CHAIYAPHUN (1971), 5,299 by ROUND (1990) and a mere 16 in the present study. Similarly, declines for the Baya Weaver and Red Avadavat were extremely steep (99.2% and 97.6%, respectively since ROUND [1990] and 98.9% and 99.9%, respectively since McCLURE & CHAIYAPHUN [1971]). We found a total of 27 Streaked Weavers, which formed a large increase (650%) compared to ROUND (1990), but a staggering 99.2% decline in comparison to the trade numbers found by McCLURE & CHAIYAPHUN (1971). These species are known to be popular for merit release. It is possible that due to the niche demand for these merit release birds, they are not sold at Chatuchak Weekend Market or online, but rather at religious institutions or more localized markets. Changes in demand and trade logistics, rather than declines in the wild, may therefore explain the steep decreases recorded for these species and more research into this is warranted.

Parakeets (NT)

The numbers of the four native parakeet species observed in the present study (Grey-headed Parakeet *Himalayapsitta finschii*, Red-breasted Parakeet *Psittacula alexandri*, Blossom-headed Parakeet *Himalayapsitta roseata* and Alexandrine Parakeet *Palaeornis eupatria*), were significantly lower over time, representing decreases of 99.1%, 98.2%, 96% and 33.4%, respectively since ROUND (1990) and 98.4%, 97%, 98.9% and 92.5%, respectively since McCLURE & CHAIYAPHUN (1971). All four species are classified as Near Threatened on



Figure 7. Spotted Owlet *Athene brama* (A, taken December 2015 by M. Phassaraudomsak / TRAFFIC) and Black-winged Kite *Elanus caeruleus* juveniles (B, taken January 2016 by Elizabeth John / TRAFFIC) offered for sale at Chatuchak Weekend Market, Bangkok.

the IUCN Red List due to substantial population declines throughout these species' ranges, including Thailand (BIRDLIFE INTERNATIONAL, 2017). Online availability of these species remains unclear and warrants further research.

Owls (LC)

The high demand for keeping owls (Strigiformes) as pets appears to continue and may be in part due to the “Harry Potter” films (AHMED, 2010; NIJMAN & NEKARIS 2017). Several individuals had been adorned with ribbons to make them look more attractive to potential buyers. During the present study, 124 native, protected individuals of seven species were recorded (Fig. 7). Most birds were observed to be in poor physical condition, gaping and lying on their side with their wings partially spread, indicating overheating, dehydration and exhaustion, with some on the verge of unconsciousness, suggesting a high level of mortality. On the IUCN Red List, neither hunting nor trade is currently listed as a threat to any of the owl species recorded in the present study.

Bred, Ratched or Taken from the Wild?

Sections 17 of WARPA 1992 and WARPA 2019 state that protected species can only be bred with explicit permission by the authorities and if this is done under license. *Ministerial Regulation B.E. 2546 (2003) on the Protection to wildlife species breeding lists* 42 native bird species that are allowed to be captive-bred, 23 of which were encountered

in the present study. Four of the top-ten most frequently traded birds (Pin-tailed Parrotfinch, Black-crested Bulbul *Rubigula flaviventris*, Indian or Swinhoe's White-eye *Zosterops palpebrosus* or *simplex* and Black-winged Kite *Elanus caeruleus*) are not allowed to be bred, which means the recorded individuals were either illegally bred or poached from the wild.

Many of the recorded native birds are believed to be wild-sourced. While captive breeding may occur for some of the species that were encountered across the present study, the extent of such captive breeding practices remains unclear. Even for species for which commercial captive breeding is known to take place, wild individuals are still being caught and sold. Studies in Indonesia have shown that consumers of songbirds may prefer wild-caught passerines because of their supposedly superior song (BURIVALOVA *ET AL.*, 2017) or lower prices, and it is possible that a similar preference exists in Thailand. During the physical surveys, large numbers of nestlings and fledglings were observed. Some of the psittacines (e.g., Alexandrine Parakeet, Blossom-headed Parakeet), were claimed to have been captive-bred but no evidence, such as leg rings, was observed to confirm this. As Alexandrine Parakeets are now rare in the wild in Thailand, it is likely that these are bred or imported from neighbouring countries (J.A. Eaton, in litt. 2023). The passerine (largely corvids and sturnids), owl and raptor (mostly Black-winged Kites) chicks observed were almost certainly taken from the wild; in some instances, entire wild nests with chicks were displayed. In other cases, the chicks offered for sale were of varying ages, suggesting they were taken from different nests. Moreover, most nestling and fledgling observations were made in the months of March and April, which coincides with the peak of the breeding season in the wild (PANTER & WHITE, 2020). Poorly regulated sourcing of wild nestlings can have devastating effects on wild populations. For example, the Black-winged Kite has declined nationally due to a combination of habitat loss and theft of nestlings from the species' often easily accessible nests (P. Round, in litt. 2020) (Fig. 7).

Commercial captive breeding may be a useful conservation tool providing certain conditions are met (PHELPS *ET AL.*, 2013; TENSEN, 2016). The species in question would have to lend themselves for breeding in captivity, demand for wild birds would have to be eliminated and the laundering of wild-caught birds would have to be avoided through clear regulation and strong enforcement.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, while increased enforcement efforts have led to a clear decline in the open availability of native protected birds at Chatuchak Weekend Market since 2016, the illegal trade appears to have at least partly shifted online. As physical bird markets in other large Thai cities, as well as smaller towns, were not included in the study, it is possible that native protected birds continue to be sold there. While the volume of overt physical trade is now much less, the continued occurrence of protected species in trade, many of which have declined or are still declining in the wild, remains a matter for conservation concern. The recent implementation of WARPA 2019, which has increased penalties for trade offenses and added provisions regarding online trade, provides a solid basis for future Thai bird trade enforcement. We recommend the following:

- **Enforcement:** the Department of National Parks, Wildlife and Plant Conservation (DNP) is encouraged to continue its strong enforcement efforts in Chatuchak Weekend Market. These monitoring efforts should be extended to wildlife markets in other large cities around the country. *In situ* enforcement should be increased to combat the illegal and unsustainable offtake of nestlings and fledglings in the wild.

- **Online trade monitoring, regulation and enforcement:** The increasing use of online platforms for the illegal sale of native Thai birds requires a strong government response. WARPA 2019 has extended the jurisdiction to act on illegal online trade. This legislative change should be utilized fully and monitoring of online trade made an integral part of Thai bird trade enforcement. The DNP created the Wild Hawk Unit, a specialized enforcement task force that has had notable successes cracking down on illegal online trade. Online platforms also have a responsibility to ensure that they are not enabling and facilitating illegal wildlife trade and should have mechanisms to detect and remove violating content.

- **Prosecution:** under WARPA 2019, penalties, including for illegal trade, have been greatly increased. This new legislation lays a strong foundation for increased and more effective prosecution of offenders. Too often, profits in the illegal wildlife trade heavily outweigh the risks. More successful convictions are needed to deter poachers, sellers, and buyers of protected native Thai birds.

- **Captive breeding:** clear regulations, based on solid scientific evidence regarding wild population trends and consumer preferences, are needed if the commercial captive breeding of Thailand's native birds is to have a positive conservation impact. Under WARPA 2019, only the propagation of "breedable" protected birds is allowed. At the time of writing, the list of species allowed for captive breeding under *Ministerial Regulation B.E. 2546 (2003) on the Protection to wildlife species breeding* has not yet been updated. It remains unclear what is meant by "breedable", but it is likely to refer to the practical feasibility of breeding a species in captivity. Other factors such as consumer preferences for captive-bred birds and price differences between wild and captive-bred birds need to be considered too. Strong enforcement of captive breeding regulations will be needed to avoid the laundering of wild-caught birds. Increased fines under WARPA 2019 pave the way for this.

- **Awareness:** campaigns highlighting the potential illegality and conservation implications of the trade in native protected birds should be undertaken to raise awareness amongst potential buyers and the general public. These campaigns should focus on both physical and online trade. Online trade campaigns should include partnerships with social media platforms, especially Facebook, on which the large majority of Thailand's online wildlife trade is conducted.

- **Research:** Continued research into Thailand's native bird trade in both physical and online markets by government authorities, NGOs and academic institutions is necessary to guide effective enforcement efforts and future conservation initiatives.

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REFERENCES

- AHMED, A. 2010. *Imperilled custodians of the night: a study on illegal trade, trapping and utilization of owls in India*. TRAFFIC India/WWF India, New Delhi. 76 pp.
- ASIAN SONGBIRD TRADE SPECIALIST GROUP (ASTSG) 2023. *Priority Taxa List*. Available from: <https://www.asiansongbirdtradesg.com/taxa-list>.
- BARBER-MEYER, S. 2010. Dealing with the Clandestine Nature of Wildlife-Trade Market Surveys. *Conserv. Biol.* 24: 918–923.
- BIRDLIFE INTERNATIONAL. 2017. *Psittacula alexandri* (amended version of 2016 assessment). *The IUCN Red List of Threatened Species* 2017: e.T22685505A111371703. <http://dx.doi.org/10.2305/IUCN.UK.2017-1.RLTS.T22685505A111371703.en>. Downloaded on 03 July 2019.
- BIRDLIFE INTERNATIONAL. 2018. *State of the world's birds: taking the pulse of the planet*. BirdLife International, Cambridge. 76 pp.
- BURIVALOVA, Z., T. M. LEE, F. HUA, J. S. H. LEE, D. M. PRAWIRADILAGA, AND D. S. WILCOVE. 2017. Understanding consumer preferences and demography in order to reduce the domestic trade in wild-caught birds. *Biol. Conserv.* 209: 423–431.
- CHNG, S. C. L., AND J. A. EATON. 2016. Snapshot of an on-going trade: an inventory of birds for sale in Chatuchak weekend market, Bangkok, Thailand. *BirdingASIA* 25: 24–29.
- CHNG, S. C. L., J. A. EATON, K. KRISHNASAMY, C. R. SHEPHERD, AND V. NIJMAN. 2015. *In the market for extinction: an inventory of Jakarta's bird markets*. TRAFFIC, Southeast Asia Regional Office, Petaling Jaya, Selangor. 31 pp.
- CHNG, S. C. L., J. A. EATON, AND A. E. MILLER. 2017. Greater Green Leafbirds: the trade in South-east Asia with a focus on Indonesia. *TRAFFIC Bull.* 29 (1): 4–8.
- EATON, J. A., C. R. SHEPHERD, F. E. RHEINDT, J. B. C. HARRIS, S. VAN BALEN, D. S. WILCOVE, AND N. J. COLLAR. 2015. Trade-driven extinctions and near-extinctions of avian taxa in Sundaic Indonesia. *Forktail* 31: 1–12.
- ELLIS, L. 2015. *Chatuchak – an illegal wildlife marketplace*. Aljazeera America, December 8, 2015. Available from: <http://america.aljazeera.com/watch/shows/techknow/articles/2015/12/8/chatuchak-an-illegal-wildlife-marketplace.html>.
- HARRIS, J. B. C., J. M. H. GREEN, D. M. PRAWIRADILAGA, X. GIAM, D. H. GIYANTO, C. A. PUTRA, AND D. S. WILCOVE. 2015. Using market data and expert opinion to identify overexploited species in the wild bird trade. *Biol. Conserv.* 187: 51–60.
- HARRIS, J. B., M. W. TINGLEY, F. HUA, D. L. YONG, J. M. ADENEY, T. M. LEE, W. MARTHY, D. M. PRAWIRADILAGA, C. H. SEKERCIOGLU, SUYADI, N. WINARNI, AND D. S. WILCOVE. 2017. Measuring the impact of the pet trade on Indonesian birds. *Conserv. Biol.* 31: 394–405.
- HBW (HANDBOOK OF THE BIRDS OF THE WORLD) AND BIRDLIFE INTERNATIONAL. 2022. *Handbook of the Birds of the World and BirdLife International digital checklist of the birds of the world*. Version 7. Available from: http://datazone.birdlife.org/userfiles/file/Species/Taxonomy/HBW-BirdLife_Checklist_v7_Dec22.zip. (Accessed on 1 September 2023)
- JANSSEN, J., AND C. R. SHEPHERD. 2019. Trade in Endangered and Critically Endangered Japanese herpetofauna endemic to the Nansei Islands warrants increased protection. *Curr. Herpetol.* 38 (1): 99–109.
- KAMP, J., S. OPEL, A. A. ANANIN, Y. A. DURNEV, S. N. GASHEV, N. HÖLZEL, A. L. MISHCHENKO, J. PESSA, S. M. SMIRENSKI, E. G. STRELNIKOV, S. TIMONEN, K. WOLANSKA, AND S. CHAN. 2015. Global population collapse in a superabundant migratory bird and illegal trapping in China. *Conserv. Biol.* 29 (6): 1648–1694.
- KIRICHOT, A., S. UNTAYA, AND S. SINGYABUTH. 2015. The Culture of Sound: A Case Study of Birdsong Competition in Chana District, Thailand. *Asian Cult. Hist.* 7 (1): 5–15.
- KRISHNASAMY, K., T. MILLIKEN, AND C. SAVINI. 2016. *In transition: Bangkok's ivory market – an 18-month survey of Bangkok's ivory market*. TRAFFIC, Southeast Asia Regional Office, Petaling Jaya, Selangor. 25 pp.
- LEUPEN, B. T. C., K. KRISHNASAMY, C. R. SHEPHERD, S. C. L. CHNG, D. BERGIN, J. A. EATON, D. A. YUKIN, S. K. P. HUE, A. MILLER, K. A. NEKARIS, V. NIJMAN, S. SAABAN, AND M. A. IMRON. 2018. Trade in White-rumped Shamas *Kittacincla malabarica* demands strong national and international responses. *Forktail* 34: 1–8.

- MCCLORE, H. E., AND S. CHAIYAPHUN. 1971. The sale of birds at the Bangkok "Sunday Market", Thailand. *Nat. Hist. Bull. Siam Soc.* 24 (1 & 2): 41–78.
- NASH, S. V. 1993. *Sold for a Song: The Trade in Southeast Asian Non-CITES Birds*. TRAFFIC International, Cambridge. 84 pp.
- NEKARIS, K. A. I., C. R. SHEPHERD, C. R. STARR, AND V. NIJMAN. 2010. Exploring Cultural Drivers for Wildlife Trade via an Ethnoprimateological Approach: A Case Study of Slender and Slow Lorises (*Loris* and *Nycticebus*) in South and Southeast Asia. *Am. J. Primatol.* 72 (10): 877–886.
- NIJMAN, V., AND K. A. NEKARIS. 2017. The Harry Potter effect: the rise in trade of owls as pets in Java and Bali, Indonesia. *Glob. Ecol. Conserv.* 11: 84–94.
- NIJMAN, V., AND C. R. SHEPHERD. 2007. Trade in non-native, CITES-listed, wildlife in Asia, as exemplified by the trade in freshwater turtles and tortoises (Chelonidae) in Thailand. *Contrib. Zool.* 76: 207–212.
- NIJMAN, V., AND C. R. SHEPHERD. 2011. The Role of Thailand in the international trade in CITES-listed live reptiles and amphibians. *PLoS ONE* 6 (3): e17825.
- NIJMAN, V., AND C. R. SHEPHERD. 2015. Analysis of a decade of trade of tortoises and freshwater turtles in Bangkok, Thailand. *Biodiv. Conserv.* 24 (2): 309–318.
- PANTER, C. T., AND R. L. WHITE. 2020. Social media reveals insights into the illegal trade of wild raptors in Thailand. *TRAFFIC Bull.* 32 (1): 5–12.
- PHASSARAUDOMSAK, M., AND K. KRISHNASAMY. 2018. *Trading faces: A rapid assessment on the use of Facebook to trade in wildlife in Thailand*. TRAFFIC, Petaling Jaya, Selangor. 22 pp.
- PHELPS, J., L. R. CARRASCO, AND E. L. WEBB. 2013. A framework for assessing supply-side wildlife conservation. *Conserv. Biol.* 28 (1): 244–257.
- ROULET, T. J., M. GILL, S. STENGER, AND D. J. GILL. 2017. Reconsidering the value of covert research: The role of ambiguous consent in participant observation. *Organiz. Res. Meth.* 20 (3): 487–517.
- ROUND, P. D. 1990. Bangkok Bird Club survey of the bird and mammal trade in the Bangkok weekend market. *Nat. Hist. Bull. Siam Soc.* 38: 1–43.
- ROUND, P. D., AND R. JUKMONGKOL. 2003. *A survey of the bird trade in and around the Bangkok Weekend Market*. Bird Conservation Society of Thailand and WWF International Thailand Programme, Bangkok. 86 pp.
- SHEPHERD, C. R., AND V. NIJMAN. 2008. *Pet freshwater turtle and tortoise trade in Chatuchak Market, Bangkok, Thailand*. TRAFFIC Southeast Asia, Petaling Jaya. 16 pp.
- SIRIWAT, P., AND V. NIJMAN. 2020. Wildlife trade shifts from brick-and-mortar markets to virtual marketplaces: a case study of birds of prey trade in Thailand. *J. Asia-Pacif. Biodiv.* 13 (3): 454–461.
- SYKES, B. 2017. The elephant in the room: addressing the Asian songbird crisis. *BirdingASIA* 27: 35–41.
- TECHACHOCHERT, S., AND P. D. ROUND. 2013. Red-whiskered Bulbul: are trapping and unregulated avicultural practices pushing this species towards extinction in Thailand? *BirdingASIA* 20: 49–52.
- TENSEN, L. 2016. Under what circumstances can wildlife farming benefit species conservation? *Glob. Ecol. Conserv.* 6: 286–298.
- TODD, M. 2011. *Trade in Malagasy reptiles and amphibians in Thailand*. TRAFFIC Southeast Asia, Petaling Jaya, Selangor. 30 pp.

APPENDICES

Appendix I. Species encountered during 30 market surveys conducted at Chatuchak Weekend Market, Bangkok, between 2007 and 2022.

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	LC	Open	Resident	3,361	20
Pin-tailed Parrotfinch <i>Erythrura prasina</i>	LC	Forest	Resident	228	9
White-rumped Shama <i>Copsychus malabaricus</i>	LC	Forest	Resident	188	19
Black-crested Bulbul <i>Rubigula flaviventris</i>	LC	Forest	Resident	165	15
Greater Necklaced Laughingthrush <i>Pterorhinus pectoralis</i>	LC	Forest	Resident	143	14
Alexandrine Parakeet <i>Palaeornis eupatria</i>	NT	Forest	Resident	135	14
Indian or Swinhoe's White-eye <i>Zosterops palpebrosus</i> or <i>simplex</i> *	LC	Forest	Resident	126	10
Black-winged Kite <i>Elanus caeruleus</i>	LC	Open	Resident	116	12
Black-throated Laughingthrush <i>Pterorhinus chinensis</i>	LC	Forest	Resident	112	14
Common Hill Myna <i>Gracula religiosa</i>	LC	Forest	Resident	110	16
Red-breasted Parakeet <i>Psittacula alexandri</i>	NT	Forest	Resident	96	15
Vernal Hanging-parrot <i>Loriculus vernalis</i>	LC	Forest/ Open	Resident	83	7
Silver-eared Mesia <i>Leiothrix argentauris</i>	LC	Forest/ Open	Resident	76	12
Asian Blue Quail <i>Synoicus chinensis</i>	LC	Open	Resident	75	5
Oriental Magpie Robin <i>Copsychus saularis</i>	LC	Forest	Resident	74	13
Chestnut-tailed Starling <i>Sturnia malabarica</i>	LC	Open	Resident/ Migrant	72	12
Asian Fairy-bluebird <i>Irena puella</i>	LC	Forest	Resident	70	12
White-crested Laughingthrush <i>Garrulax leucolophus</i>	LC	Forest	Resident	70	14

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Black-naped Oriole <i>Oriolus chinensis</i>	LC	Forest/ Open	Resident/ Migrant	67	11
Chestnut Munia <i>Lonchura atricapilla</i>	LC	Open	Resident	65	5
Red Avadavat <i>Amandava amandava</i>	LC	Open	Resident	64	4
White-rumped Munia <i>Lonchura striata</i>	LC	Open	Resident	61	6
Blue-crowned Hanging-parrot <i>Loriculus galgulus</i>	LC	Forest	Resident	56	10
Black-headed Greenfinch <i>Chloris ambigua</i>	LC	Forest	Migrant	54	7
Coppersmith Barbet <i>Psilopogon haemacephalus</i>	LC	Forest/ Open	Resident	52	9
Great Myna <i>Acridotheres grandis</i>	LC	Open	Resident	50	5
Collared Scops Owl or Sunda Scops Owl <i>Otus lettia</i> or <i>Otus lempiji</i>	LC	Forest/ Open	Resident	44	15
White-breasted Waterhen <i>Amaurornis phoenicurus</i>	LC	Open	Resident	44	12
Red-billed Blue Magpie <i>Urocissa erythroryncha</i>	LC	Forest/ Open	Resident	41	10
Stripe-throated Bulbul <i>Pycnonotus finlaysoni</i>	LC	Forest/ Open	Resident	41	14
Asian Barred Owlet <i>Glaucidium cuculoides</i>	LC	Forest	Resident	38	13
Golden-crested Myna <i>Ampeliceps coronatus</i>	LC	Forest	Resident	37	7
Grey-capped Emerald Dove <i>Chalcophaps indica</i>	LC	Forest	Resident	36	8
Large-billed Crow <i>Corvus macrorhynchos</i>	LC	Forest/ Open	Resident	36	5
Common Hoopoe <i>Upupa epops</i>	LC	Open	Resident	35	7
Black-collared Starling <i>Gracupica nigricollis</i>	LC	Open	Resident	34	6
Thick-billed Green-pigeon <i>Treron curvirostra</i>	LC	Forest	Resident	34	6
Blossom-headed Parakeet <i>Himalayapsitta roseata</i>	NT	Forest/ Open	Resident	33	10

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Black-headed Bulbul <i>Brachypodius atriceps</i>	LC	Forest	Resident	31	7
Lineated Barbet <i>Psilopogon lineatus</i>	LC	Forest	Resident	30	14
Spotted Owlet <i>Athene brama</i>	LC	Forest/ Open	Resident	29	7
Red-crowned Barbet <i>Psilopogon rafflesii</i>	NT	Forest	Resident	28	1
Streaked Weaver <i>Ploceus manyar</i>	LC	Open	Resident	27	1
Golden-fronted Leafbird <i>Chloropsis aurifrons</i>	LC	Forest	Resident	25	5
Scarlet-backed Flowerpecker <i>Dicaeum cruentatum</i>	LC	Forest/ Open	Resident	24	4
Lesser Whistling-duck <i>Dendrocygna javanica</i>	LC	Open	Resident	23	6
Thai Pied Starling <i>Gracupica floweri</i>	LC	Open	Resident	22	6
Blue-winged Leafbird <i>Chloropsis moluccensis</i>	LC	Forest	Resident	22	9
Garganey <i>Spatula querquedula</i>	LC	Open	Migrant	22	2
Western Koel <i>Eudynamis scolopaceus</i>	LC	Forest	Resident	22	8
Yellow-vented Bulbul <i>Pycnonotus goiavier</i>	LC	Open	Resident	22	7
Common Myna <i>Acridotheres tristis</i>	LC	Open	Resident	20	7
Black Kite <i>Milvus migrans</i>	LC	Open	Resident/ Migrant	19	3
Common Moorhen <i>Gallinula chloropus</i>	LC	Open	Resident	19	3
Eyebrowed Thrush <i>Turdus obscurus</i>	LC	Forest/ Open	Migrant	19	7
Racquet-tailed Treepie <i>Crypsirina temia</i>	LC	Forest	Resident	18	6
Silver-eared Laughingthrush <i>Trochalopteron melanostigma</i>	LC	Forest	Resident	18	4
Black Drongo <i>Dicrurus macrocercus</i>	LC	Open	Resident	16	2

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Rufous Treepie <i>Dendrocitta vagabunda</i>	LC	Forest/ Open	Resident	16	6
Scaly-breasted Munia <i>Lonchura punctulata</i>	LC	Open	Resident	16	4
Great Tit <i>Parus major</i>	LC	Forest	Resident	14	7
Blue-winged Pitta <i>Pitta moluccensis</i>	LC	Forest	Migrant	13	6
Chestnut-capped Laughingthrush <i>Pterorhinus mitratus</i>	NT	Forest	Resident	13	4
Greater Green Leafbird <i>Chloropsis sonnerati</i>	EN	Forest	Resident	13	5
Greater Racquet-tailed Drongo <i>Dicrurus paradiseus</i>	LC	Forest	Resident	13	4
Lesser Necklaced Laughingthrush <i>Garrulax monileger</i>	LC	Forest/ Open	Resident	13	7
Red-wattled Lapwing <i>Vanellus indicus</i>	LC	Open	Resident	13	6
Grey-headed Parakeet <i>Himalayapsitta finschii</i>	NT	Forest	Resident	12	3
Lesser Green Leafbird <i>Chloropsis cyanopogon</i>	NT	Forest	Resident	12	6
Brown-breasted Bulbul <i>Pycnonotus xanthorrhous</i>	LC	Open	Resident	11	3
Scaly-breasted Bulbul <i>Ixidia squamata</i>	NT	Forest	Resident	11	7
Barred Buttonquail <i>Turnix suscitator</i>	LC	Open	Resident	10	1
Crested Finchbill <i>Spizixos canifrons</i>	LC	Open	Resident	10	4
Asian Glossy Starling <i>Aplonis panayensis</i>	LC	Forest/ Open	Resident	9	2
Blue-rumped Parrot <i>Psittinus cyanurus</i>	NT	Forest	Resident	9	8
Common Green Magpie <i>Cissa chinensis</i>	LC	Forest	Resident	9	5
Sooty-headed Bulbul <i>Pycnonotus aurigaster</i>	LC	Forest/ Open	Resident	9	5
Ashy Bulbul <i>Hemixos flavala</i>	LC	Forest	Resident	8	3

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Brahminy Kite <i>Haliastur indus</i>	LC	Open	Resident	8	5
Bronze-winged Jacana <i>Metopidius indicus</i>	LC	Open	Resident	8	3
Green Broadbill <i>Calyptomena viridis</i>	NT	Forest	Resident	8	6
Puff-throated Bulbul <i>Alophouixus pallidus</i>	LC	Forest	Resident	8	4
Red-throated Barbet <i>Psilopogon mystacophanos</i>	NT	Forest	Resident	8	3
Orange-bellied Leafbird <i>Chloropsis hardwickii</i>	LC	Forest	Resident	7	4
Oriental Scops Owl <i>Otus sunia disturbans</i>	LC	Forest	Resident	7	4
Indochinese Roller <i>Coracias affinis</i>	LC	Open	Resident	6	4
Kalij Pheasant <i>Lophura leucomelanos</i>	LC	Forest	Resident	6	2
Lesser Coucal <i>Centropus bengalensis</i>	LC	Forest/ Open	Resident	6	3
Purple-backed Starling <i>Agropsar sturninus</i>	LC	Forest/ Open	Migrant	6	3
Red-tailed Laughingthrush <i>Trochalopteron milnei</i>	LC	Forest	Resident	6	4
Watercock <i>Gallicrex cinerea</i>	LC	Open	Resident/ Migrant	6	2
Crested Goshawk <i>Accipiter trivirgatus</i>	LC	Forest	Resident	5	2
Green-billed Malkoha <i>Phaenicophaeus tristis</i>	LC	Forest	Resident	5	3
Large Hawk-cuckoo <i>Hierococcyx sparverioides</i>	LC	Forest	Resident/ Migrant	5	5
Red Turtle-Dove <i>Streptopelia tranquebarica</i>	LC	Open	Resident	5	1
Sultan Tit <i>Melanochlora sultanea</i>	LC	Forest	Resident	5	4
Black-hooded Oriole <i>Oriolus xanthornus</i>	LC	Forest/ Open	Resident/ Migrant	4	3
Grey-headed Parrotbill <i>Paradoxornis gularis</i>	LC	Forest	Resident	4	1

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Pink-necked Green Pigeon <i>Treron vernans</i>	LC	Forest	Resident	4	1
White Wagtail <i>Motacilla alba</i>	LC	Open	Migrant	4	1
White-headed Bulbul <i>Hypsipetes thompsoni</i>	LC	Forest/ Open	Resident	4	2
Blue-eared Barbet <i>Psilopogon cyanotis</i>	LC	Forest	Resident	3	1
Brown Wood-owl <i>Strix leptogrammica</i>	LC	Forest	Resident	3	3
Eared Pitta <i>Hydrornis phayrei</i>	LC	Forest	Resident	3	2
Greater Painted Snipe <i>Rostratula benghalensis</i>	LC	Open	Resident	3	1
Oriental Skylark <i>Alauda gulgula</i>	LC	Forest	Resident	3	2
Shikra <i>Accipiter badius</i>	LC	Forest	Resident	3	1
Streaked Bulbul <i>Ixos malaccensis</i>	NT	Forest	Resident	3	2
Vinous-breasted Myna <i>Acridotheres leucocephalus</i>	LC	Open	Resident	3	2
Ashy Drongo <i>Dicrurus leucophaeus</i>	LC	Forest	Resident	2	2
Baya Weaver <i>Ploceus philippinus</i>	LC	Open	Resident	2	1
Black Baza <i>Aviceda leuphotes</i>	LC	Forest/ Open	Resident	2	2
Black-and-Red Broadbill <i>Cymbirhynchus macrorhynchos</i>	LC	Forest	Resident	2	2
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	LC	Open	Resident	2	2
Blue-throated Barbet <i>Psilopogon asiaticus</i>	LC	Forest	Resident	2	1
Common Barn-owl <i>Tyto alba</i>	LC	Open	Resident	2	1
Great Barbet <i>Psilopogon virens</i>	LC	Forest	Resident	2	2
Green-eared Barbet <i>Psilopogon faiostrictus</i>	LC	Forest	Resident	2	2
Indian Thick-knee <i>Burhinus indicus</i>	LC	Forest/ Open	Resident/ Migrant	2	2

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Long-tailed Sibia <i>Heterophasia picaoides</i>	LC	Forest	Resident	2	2
Olive-winged Bulbul <i>Pycnonotus plumosus</i>	LC	Forest	Resident	2	2
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	LC	Forest	Resident	2	2
Scarlet Minivet <i>Pericrocotus flammeus</i>	LC	Forest	Resident	2	1
Siberian Rubythroat <i>Calliope calliope</i>	LC	Open	Migrant	2	1
Spot-breasted Parrotbill <i>Paradoxornis guttaticollis</i>	LC	Open	Resident	2	1
Western Hooded Pitta <i>Pitta sordida</i>	LC	Forest/ Open	Migrant	2	2
White-breasted Kingfisher <i>Halcyon smyrnensis</i>	LC	Open	Resident	2	2
White-browed Laughingthrush <i>Pterorhinus sannio</i>	LC	Open	Resident	2	1
Ashy Minivet <i>Pericrocotus divaricatus</i>	LC	Forest/ Open	Migrant	1	1
Black Bulbul <i>Hypsipetes leucocephalus</i>	LC	Forest	Resident	1	1
Blue-winged Minla <i>Siva cyanouroptera</i>	LC	Forest	Resident	1	1
Chestnut-winged Cuckoo <i>Clamator coromandus</i>	LC	Forest/ Open	Resident/ Migrant	1	1
Common Flameback <i>Dinopium javanense</i>	LC	Open	Resident	1	1
Common Kestrel <i>Falco tinnunculus</i>	LC	Open	Migrant	1	1
Crested Jay <i>Platylophus galericulatus</i>	NT	Forest	Resident	1	1
Grey-capped Woodpecker <i>Picooides canicapillus</i>	LC	Forest	Resident	1	1
Hainan Blue-flycatcher <i>Cyornis hainanus</i>	LC	Forest	Resident	1	1
Japanese Sparrowhawk <i>Accipiter gularis</i>	LC	Forest/ Open	Migrant	1	1
Laced Woodpecker <i>Picus vittatus</i>	LC	Forest	Resident	1	1
Marsh Sandpiper <i>Tringa stagnatilis</i>	LC	Open	Migrant	1	1

Appendix I (continued).

Species	IUCN Red List Status	Habitat	Seasonal status	No. of individuals	No. of surveys
Orange-headed Thrush <i>Geokichla citrina</i>	LC	Forest	Resident/ Migrant	1	1
Oriental Bay-owl <i>Phodilus badius</i>	LC	Forest	Resident	1	1
Oriental Paradise-flycatcher <i>Terpsiphone affinis</i>	LC	Forest	Resident	1	1
Pied Harrier <i>Circus melanoleucos</i>	LC	Forest	Migrant	1	1
Wood Sandpiper <i>Tringa glareola</i>	LC	Open	Migrant	1	1
TOTAL				7,126	30

* These birds were initially recorded as Oriental White-eye *Zosterops palpebrosus* before the new taxonomy split them into Indian and Swinhoe's White-eye *Zosterops palpebrosus* and *Z. simplex*. Both species occur commonly in Thailand so it could not be determined which species the observed birds were likely to be. IUCN Red Lists statuses: EN = Endangered; LC = Least Concern; NT = Near Threatened (see <https://www.iucnredlist.org/>).

Appendix II. Number of omitted non-identified birds per species group.

Species	No. of individuals	No. of surveys
Accipitridae spp.	25	3
<i>Anthus</i> spp.	2	2
<i>Pycnonotus</i> spp.	7	2
<i>Carduelis</i> sp.	22	1
Corvidae spp.	11	3
<i>Chloris</i> spp.	20	3
Surniinae sp.	1	1
Leiothrichidae spp.	18	4
<i>Lophura</i> sp.	4	1
Pericrocotinae sp.	2	1
Lonchurinae spp.	7	2
Ieraglaucinae sp.	2	1
<i>Otus</i> spp.	6	3
Sturnidae spp.	34	7
<i>Ploceus</i> spp.	11	2
TOTAL	172	13

Appendix III. Songbirds found for sale on Facebook between 20 October 2019 and 20 January 2020.

Species	IUCN Red List Status	No. of posts	No. of individuals	Average price (THB)	Average price* (USD)
Native species					
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	LC	296	325	3,007	101
White-rumped Shama <i>Copsychus malabaricus</i>	LC	108	117	1,953	65
Asian Fairy-bluebird <i>Irena puella</i>	LC	57	71	1,475	49
Greater Green Leafbird <i>Chloropsis sonnerati</i>	EN	42	45	1,016	34
Common Hill Myna <i>Gracula religiosa</i>	LC	30	37	1,180	40
Stripe-throated Bulbul <i>Pycnonotus finlaysoni</i>	LC	22	34	1,775	59
Lesser Green Leafbird <i>Chloropsis cyanopogon</i>	NT	29	31	718	24
Blue-winged Leafbird <i>Chloropsis moluccensis</i>	LC	20	23	700	23
Black-throated Laughingthrush <i>Pterorhinus chinensis</i>	LC	16	19	1,318	44
Black-crested Bulbul <i>Rubigula flaviventris</i>	LC	11	16	450	15
Scaly-breasted Bulbul <i>Ixidia squamata</i>	LC	6	16	283	9
White-crested Laughingthrush <i>Garrulax leucolophus</i>	LC	11	16	1,233	41
Oriental Magpie-robin <i>Copsychus saularis</i>	LC	11	11	1,040	35
Black-naped Oriole <i>Oriolus chinensis</i>	LC	11	11	1,417	47
Indian or Swinhoe's White-eye <i>Zosterops palpebrosus</i> or <i>simplex</i>	LC	1	10	-	-
Straw-headed Bulbul <i>Pycnonotus zeylanicus</i>	CR	5	9	8,600	288
Black-headed Bulbul <i>Brachypodius atriceps</i>	LC	4	8	600	20
Ochraceous Bulbul <i>Alophoixus ochraceus</i>	LC	8	8	333	11

Appendix III (continued).

Species	IUCN Red List Status	No. of posts	No. of individuals	Average price (THB)	Average price* (USD)
Sooty-headed Bulbul <i>Pycnonotus aurigaster</i>	LC	7	8	267	9
Yellow-vented Bulbul <i>Pycnonotus goiavier</i>	LC	7	7	3,000	101
Racquet-tailed Treepie <i>Crypsirina temia</i>	LC	3	6	1,200	40
Scarlet Minivet <i>Pericrocotus flammeus</i>	LC	6	6	1,800	60
Golden-fronted Leafbird <i>Chloropsis aurifrons</i>	LC	4	5	-	-
Black-and-red Broadbill <i>Cymbirhynchus macrorhynchos</i>	LC	2	4	-	-
Crested Jay <i>Platylophus galericulatus</i>	NT	3	3	-	-
Greater Necklaced Laughingthrush <i>Pterorhinus pectoralis</i>	LC	2	3	-	-
Orange-bellied Flowerpecker <i>Dicaeum trigonostigma</i>	LC	1	3	-	-
Orange-headed Thrush <i>Geokichla citrina</i>	LC	3	3	850	28
Red-billed Blue-magpie <i>Urocissa erythrorhyncha</i>	LC	3	3	633	21
Great Myna <i>Acridotheres grandis</i>	LC	2	2	-	-
Hainan Blue-flycatcher <i>Cyornis hainanus</i>	LC	2	2	-	-
Maroon-bellied Sunbird <i>Leptocoma brasiliana</i>	LC	2	2	3,600	121
Ruby-cheeked Sunbird <i>Chalcoparia singalensis</i>	LC	2	2	700	23
Scarlet-breasted Flowerpecker <i>Prionochilus thoracicus</i>	NT	2	2	800	27
Spectacled Bulbul <i>Ixidia erythroptalmos</i>	LC	2	2	-	-
Western Hooded Pitta <i>Pitta sordida</i>	LC	1	2	-	-

Appendix III (continued).

Species	IUCN Red List Status	No. of posts	No. of individuals	Average price (THB)	Average price* (USD)
Yellow-bellied Prinia <i>Prinia flaviventris</i>	LC	1	2	-	-
Ashy Bulbul <i>Hemixos flavala</i>	LC	1	1	-	-
Ashy Drongo <i>Dicrurus leucophaeus</i>	LC	1	1	500	17
Asian Glossy Starling <i>Aplonis panayensis</i>	LC	1	1	-	-
Black-collared Starling <i>Gracupica nigricollis</i>	LC	1	1	2,000	67
Black-throated Babbler <i>Stachyris nigricollis</i>	NT	1	1	-	-
Grey-eyed Bulbul <i>Iole propinqua</i>	LC	1	1	-	-
Orange-bellied Leafbird <i>Chloropsis hardwickii</i>	LC	1	1	-	-
Pin-tailed Parrotfinch <i>Erythrura prasina</i>	LC	1	1	50	2
Red-eyed Bulbul <i>Pycnonotus brunneus</i>	LC	1	1	-	-
Scarlet-backed Flowerpecker <i>Dicaeum cruentatum</i>	LC	1	1	-	-
Temminck's Sunbird <i>Aethopyga temminckii</i>	LC	1	1	-	-
Thai Pied Starling <i>Gracupica floweri</i>	LC	1	1	-	-
White-bellied Erpornis <i>Erpornis zantholeuca</i>	LC	1	1	-	-
TOTAL		727	887		
Non-native species					
Red-vented Bulbul <i>Pycnonotus cafer</i>	LC	4	5	-	-
Java Sparrow <i>Padda oryzivora</i>	EN	1	2	-	-
White-eared Bulbul <i>Pycnonotus leucotis</i>	LC	2	2	-	-
Chinese Hwamei <i>Garrulax canorus</i>	LC	1	1	12,000	402
TOTAL		8	10		

Appendix III (continued).

Species	IUCN Red List Status	No. of posts	No. of individuals	Average price (THB)	Average price* (USD)
Unidentified species					
Minivet sp(p). Campephagidae sp(p).	N/A	5	5	385	13
Leafbird sp(p). Chloropseidae sp(p).	N/A	23	23	784	26
Drongo sp(p). Dicacidae sp(p).	N/A	3	3	-	-
Sunbird sp(p). Nectariniidae sp(p).	N/A	1	1	-	-
Bulbul sp(p). Pycnonotidae sp(p).	N/A	11	11	3,550	119
Starling sp(p). Sturnidae sp(p).	N/A	1	1	-	-
Songbird sp(p). Passeriformes sp(p).	N/A	46	58	-	-
TOTAL		88	102		
GRAND TOTAL		815	999		

* Only data from posts advertising a single bird per species were used to calculate mean prices. This was done to avoid misinterpretation of unity prices in posts advertising multiple birds per species. Conversion rate: USD 1 = THB 29.75 (1 January 2020, <https://www1.oanda.com/currency/converter/>). IUCN Red Lists statuses: CR = Critically Endangered; EN = Endangered; LC = Least Concern; NT = Near Threatened (see <https://www.iucnredlist.org/>).