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Illegal pet trade on social media as an emerging impediment to the conservation of Asian otters species

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ABSTRACT

Social media has become an increasingly popular platform to trade legal and illegal wildlife. Here, we evaluate the online trade of otters, a group of globally threatened taxa in Thailand, a country of high global social media use. During the 14-month period, we monitored five Facebook groups to establish a primary understanding of the scope and scale of the trade. We recorded 160 sales posts (337 individual otters) of two species, the Asian small-clawed otter (*Aonyx cinereus*) (81%) and the smooth-coated otter (*Lutrogale perspicillata*) (19%). Newborn otter pups accounted for 53% of the offers, whereas young otters accounted for 35%. Prices averaged US$78, where the smooth-coated otter was offered at a significantly higher price than the Asian small-clawed otter. Juvenile otters were also significantly more expensive than newborns. Trade appears to be domestic; however, the potential for international trade cannot be overlooked. Although otters are protected domestically, we find that the trade is easily accessible and prevalent. The results reflect current inadequacies in enforcement and legislation in keeping pace with the rapidly shifting nature of the Internet in Thailand and throughout the global Internet community. A consistent collaborative effort from consumers, enforcement agencies, and operators is required to address this illicit trade.

Introduction

The global legal and illegal trade in wildlife is an increasingly growing threat to global biodiversity and species conservation (Challender et al 2015). One key driver of the global wildlife trade is the demand for pets (Baker et al 2013; Tingley et al 2017). Wildlife consumption for the pet trade has multiple inevitable consequences, from species population loss (Bush et al 2014), nonnative species introductions (Fong and Chen 2010), zoonotic risks and implications (Palvin et al 2009), as well as welfare issues (Baker et al 2013).

Developments in factors that influence modern-day market structures, such as increased accessibility to wildlife, exposure of trade, and enhanced infrastructure of transport have reshaped the modern pet industry (Lavorgna 2014). As a result, increased numbers of species are at risk of overharvesting or extinction (Bush et al 2014). Accessibility to and the exposure of the exotic pet trade have amplified due to the growth of the Internet, which has massively expanded both the legal and illegal wildlife markets through the creation of novel hybrid marketplaces (Lavorgna 2015). This dual platform combines traditional social and economic opportunities within the new virtual Internet marketplace (Lavorgna 2014), offering alternative distribution channels with endless destinations not limited to just traditional pet stores (Baker et al 2013).

In the past decade, the Internet has become a key platform for the trade of legal and illegal wildlife where products from high-profile species such as elephants, rhinoceroses, and tigers, as well as live reptiles, amphibians, and birds, were reported on platforms such as eBay and Amazon (Derraik and Phillips 2010; IFAW 2008; Todd 2011; Wu 2007). In addition to these traditional platforms, social media has also played a novel influential role on the modern pet trade (Morgan and Chng 2017). Directly, social media has been used as a tool for advertising, sourcing, and the online trade of animals and plants alike (Hinsley et al 2016; IFAW 2018; Vaglica et al 2017; Yu and Jia 2015). It has also been an indirect stage for the spread of viral exotic pet videos on social media (Nekaris et al 2013), as well as an area for comments that often entice more

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people to acquire illicit exotic pets themselves (Morgan and Chng 2017).

The growth of the Internet and the role of social media platforms in the trade of exotic pets have posed challenges in regulation of trade (IFAW 2008). Law enforcement officers constantly require new tools and methods to monitor and regulate these virtual markets (Vaglica et al 2017). However, the fast-moving nature of these e-commerce platforms often mean that international and domestic laws implemented in many countries are outdated (Wu 2007). Previous investigations into the scope and scale of the role of social media have shown growing volumes of wildlife trade after increased Internet accessibility; however, they have predominantly been limited to short-term immersive monitoring sessions of a few weeks with a focus on key high-profile species (IFAW 2018).

To review the characteristic of the exotic pet trade on social media platforms, we use otters as a case study. In recent years, otters have been traded online in Southeast Asia (Aadrean 2013; Gomez and Bouhuys 2018; Gomez et al 2016; Krishnasamy and Stoner 2016). Otter species are threatened worldwide from habitat loss, as well as legal and illegal trade including the fur trade, the exotic pet trade, for traditional medicine, and trophies purposes (Duckworth 2013; Melisch 1998; Shepherd and Nijman 2014). Five otter species are found in Asia, including the Eurasian otter (*Lutra lutra)*, the hairy-nosed otter (*L. sumatrana)*, the Asian small-clawed otter (*Aonyx cinereus)*, the smooth-coated otter (*Lutrogale perspicillata*), and the sea otter (*Enhydra lutris)*. All these five species are considered globally threatened according to the International Union for Conservation of Nature (IUCN) Red List criteria, and their international trade is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (IUCN Otter Specialist Group 2016). In the past 35 years, seizure records reveal that otters are traded in around 15 Asian countries, the majority being in China, India, and Nepal (Gomez et al 2016). However, in recent years, there have been a growing number of seizures of "live otters" in Southeast Asia which suggested an emerging trend of otters being caught for the commercial pet trade in this region (Gomez and Bouhuys 2017).

Here, we review the otter trade on Facebook in Thailand, a key hub for the illegal wildlife trade (Nijman 2011). Thailand has a very strong global social media presence, ranking among the top 10 nations in the world for social media use, increasing an average of 20% year on year for users on Facebook, Instagram, and Twitter (Leesa-nguansuk and Fredrickson 2017). With the exception of the sea otter, four of the Asian otter species are recorded in Thailand (Mason et al 1990). The range of the Asian small-clawed otter and the smooth-coated otter is distributed across Thailand, whereas the other two species are rare and are limited to isolated populations in the north of Thailand (Conroy et al 1998; Kanchanasaka 2001). In Thailand, possession of otters is prohibited; all native otters are domestically protected under the National Wildlife Protection Act of 2535 B.E. (Gomez et al 2016). However, despite the legislation in place, domestic and international trade exists. For instance, in 2017, there were two separate airport seizures resulting from attempts to smuggle more than 20 live otters out to Japan (Gomez and Bouhuys 2017). We conduct a 14-month analysis of the otter trade on social media platforms in Thailand. We aim to establish a primary understanding of the extent of the trade through factors which focus on the species sold, the vendors, and geographic location of the trade as well as highlight challenges in management policies and regulations of the trade.

Material and methods

Five Facebook groups were monitored from 1 March 2017 until 30 April 2018. All groups monitored were listed as "Buy and Sell Groups" and thus acted as public virtual marketplaces. The search for exotic pet groups was made in Thai and English using search tags for "exotic pets". There were many groups with Thai names; anyone with access to Facebook is able to find these groups, and the request for access to join the group is instantly approved within a day. Each group clearly describes itself as a market platform, with public sales posts, and displayed interaction between seller and buyers, all of which was carried out in Thai. We approached each monitoring session as a typical economic market approach without direct interaction and followed common market survey protocols as interactions between sellers and buyers can be freely observed by anyone in the group (cf. Barber-Meyer 2010; Nekaris et al 2010). To ensure anonymity of group members and to minimize any resulting increase in trade due to our research, we followed the guidelines from the Ethics Working Committee of the Association of Internet Researchers (cf. Markham and Buchanan 2012).

Each monitoring session consisted of browsing through all items listed for sale, and posts related to otters were recorded. Where available, details were collected on the date, number of otters sold, species, price, age category, location of post, delivery methods offered, and when or if the sale ended. Usernames and URLs were anonymously coded, and pictures were saved for future reference. Compared to other retail platforms, Facebook can be challenging to monitor as there is no comprehensive approach to conduct an automatic search within groups (Hinsley et al 2016). Therefore, we used the group photo limit approach to define our monitoring sessions, which uses Facebook's 5000 photos cap as a marker to end each monitoring period (cf. Iqbal 2016). Each group was monitored every 4–6 weeks.

Cases of otters being readvertised or resold may inevitably lead to some amount of double counting, but to avoid duplication, all posts were compiled in this study and cross-checked for date of post, the vendor's username, and approximate age of otters listed for sale, and cases of the same username reposting similar-aged otters within 3 days were removed. Repeat posts across different groups were also monitored for duplication. In any case in which there is a lack of information or a clear duplication of items being sold (such as the same photos used), the entry was removed from further analysis.

Otters were listed for sale only by their common name. The Asian short-clawed otter was also referred to as "small otter" and the smooth-coated otter as the "large otter". We identified the otters for sale on the basis of single or multiple photographs posted; 34 photographs of unidentified otters were identified with the help of members of the IUCN Specialist Otter Group. Otters listed for sale were often in their early life stages, therefore classified as newborns (eyes yet to open) and young (eyes opened, usually around 6 weeks). For very young newborn individuals, species identification was often not possible.

Using the data available, we analyzed the overall trade through content of the sale posts in terms of the number of independent posts and total number of otters posted for sale over time. Batch size averages were also analyzed, for which prices of individual otters were taken into account in cases in which there was more than one otter posted for sale in a single post (cf. Nijman and Bergin 2017). We incorporate spatial factors such as distance to an international border and regional analysis to further explain the distribution of the trade. As trade is evident in other countries in the region (Gomez and Bouhuys 2018), distance to an international border was included as a proxy for trade activity that may be intended to cross to other countries. Data were log transformed before analysis. Statistical analysis was conducted using simple linear (lm) model and t test functions in R (R Core Team 2018). A χ^2 test was carried out to for spatial analysis to compare observed regional outcomes. The prices reported in this study is US Dollars,

converted from Thai baht with the exchange rate of 1 US Dollar = 33.2 Thai Baht (rates ranged from 31.5 to 34.9 Thai baht within the monitoring period).

Results

From March 2017 to April 2018, 160 sale posts from 59 individual sellers were recorded in the five market groups, with a total of up to 337 individual otters posted for sale (Table 1; Figure 1). Each group was monitored 8–10 times, with the exception of one group that was only monitored once as it shut down within the study period. All the trading was carried out in Thai, and in the 111 posts in which information was available, 81 posts originated from the south of Thailand, followed by 27 posts in the central region, including Bangkok the capital, and a single post each from the north, east, and west (Figure 2). There was a statistically significant skew in the number of posts concentrated in the southern region of Thailand (χ^2=217.51, df = 4, p<0.001). However, there was no statistically significant relationship between the number of sales posts and the distance to an international border (linear regression, $F_{1,16} = 1.61$, $p = 0.22$). In addition to otters, groups also sold other animals, ranging from domestic cats, dogs, and birds to exotic wildlife including small carnivores, primates, and reptiles.

Only two species were specifically listed for sale, the Asian short-clawed otter and the smooth-coated otter. The Asian small-clawed otter attributed to 57 posts (127 individuals), and smooth-coated otters contributed to 15 posts (29 individuals). There were 88 posts (183 individuals) that were unidentifiable as the photos posted were unclear or the otter were too young to identify them as the species level. Based on their geographical origins of the posts, the unidentified otters are most likely either the Asian small-clawed otter or the smooth-coated otters. The other two species (Eurasian otter and hairy-nosed otter) are rarer and have a distribution limited to the north of Thailand.

Newborn pups accounted for the majority with 77 posts (179 individuals) compared with young otters with 67 posts (117 individuals). Two posts offered adult otters for sale, stating that the otter pet required rehoming, and there were 16 posts (48 individuals) in which otters could not be classified by age. Newborn pups were frequently sold within a litter with up to six pups in one post; this was statistically significant when compared with young otters that tend to be sold individually [t test, t (142) = 2.78, $p = 0.0061$].

Price information was stated in 132 of 161 posts, in which the prices of otter ranged from $39 to $203, with an average price at $78 per otter when calculated by individual posts and when considering the batch size. The average price of the Asian small-clawed otter ($97; batch size average $94; S.D. $30) was found to be lower than that of smooth-coated otters ($112; batch size average $109; S.D. $23), but this difference was statistically significant [t (130) = 2.40, $p = 0.018$]. Juvenile or older otters were listed at a higher price ($99; batch average $98; S.D. $27) than newborn pups ($89; batch size average $88; S.D. $26); there was also a significant statistical difference [t (303) = 3.70, $p = 0.0003$]. Overall, there was no significant change in the average price for the otters over time (linear regression, $F_{1,12} = 0.098$, $p = 0.76$). There is a negative nonsignificant relationship between the number of otters posted and the average batch price (Figure 3; linear regression, $F_{1,12} = 2.90$, $p = 0.11$).

Where stated (n = 32 posts), turnover rates observed were within 48 hours within the post date, where sellers would comment on the post as “end of sale”. In five posts, young otters were described as “guaranteed to live;” this assurance was not seen for newborn pup posts. Other common descriptive terms in the sales posts include “cute/good size,” “friendly,” and “converted to cat food diet”. In nine posts, the otter on sale was advertised as “resell” from previous buyers, citing reasons such as “insufficient time to raise the pet” or “the otter was too loud for a small condominium”. In regard to transporting of live otters, 101 posts offered guaranteed delivery methods throughout the country; the most common delivery method stated is via bus transfers and often excludes any face-to-face exchange. Further transaction details with serious buyers were often taken privately via direct messaging.

Discussion and conclusions

General findings

Social media has become a popular platform used to openly sell exotic pets, as seen here for otters in Thailand, as previously reported in many countries in Southeast Asia (Aadrean 2013; Gomez and Bouhuys 2018; Gomez et al 2016). The fluctuation in numbers of otters posted for sale over time reflects that the acquisition of otters were opportunistic as found in previous reports (Aadrean 2013). Chances of survival for newborn otters in the trade appear to be low; this is reflected from the juvenile otters which that offered at a higher price as a result of increased survival chance. However, the much higher volume of newborn pups supplied in the trade indicates that otters are indiscriminately extracted from the wild, even as a newborn, despite the risk of death. While each trader individually sells a small number of otters each time, the overall volume of the trade itself is significant, raising concerns for the wild populations of smooth-coated otter and Asian small-clawed otter, both of which are already recognized by the IUCN Red List as Vulnerable (Gomez et al 2016).

From the four species found in Asia, the two species found traded are the *Lutrogale* and *Aonyx* otter species. The other two species, the Eurasian otter and the hairy-nosed otter, are rare, distributed limitedly, and are even locally extinct in some previous ranges (Conroy et al 1998; Kanchanasaka 2001). As a result, it is not expected that they are traded in large numbers as the two species in the study. Nevertheless, these species are all globally threatened populations and of international conservation concern (IUCN Otter Specialist Group 2016). Otter trade as observed here in the Thai market is mainly for exotic pets, rather than traditional medicial purposes as observed (Aadrean 2013; Gomez and Bouhuys 2018).

Despite the fact that all locally found otter species are protected under Thai legislation prohibiting hunting, possession, and trade, we find that the sales advertisements were very much targeted

Table 1. Wildlife trade groups monitored on Facebook from March 2017 to April 2018, with details of poster, species, and age composition of otters posted for sale.

Group number	No. members (date updated)	No. times monitored	No. posts (no vendors)	Total# of otters posted for sale	No. posts by species (small-clawed/ smooth-coated//unidentified)	No. posts by age (new-born/young/ undetermined)
1	9,810 (04/2018)	9	4 (3)	12	2/0/3	2/1/1
2	14,216 (04/2018)	8	21 (5)	47	13/2/7	11/8/2
3	28,617 (04/2018)	10	46 (21)	102	13/3/29	24/15/7
4	14,619 (04/2018)	9	88 (30)	181	28/10/49	40/42/6
5	64,800 (05/2017)	1	1 (1)	1	1/-/-	-/1/-

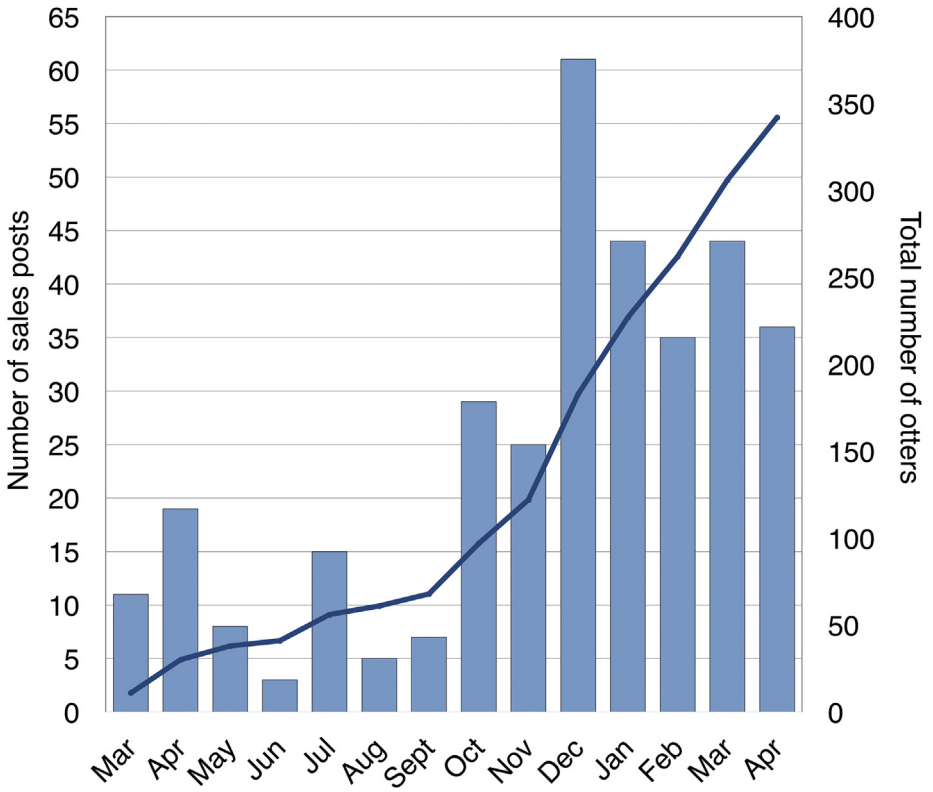

Figure 1. The number of sales posts advertising otters (bars) over time and the cumulative number of individual otters posted for sale (line) over the period from March 2017 to April 2018.

toward a domestic clientele. All correspondence was in Thai language, prices were offered in Thai baht, and shipping or transport was offered across Thailand. When asked about the legality of the trade, replies all acknowledge that pet otters are indeed illegal; however, "one or two are usually not a problem" (P. Siriwat, pers. observ.). The regularity of the sales posts and the very quick turnover rates reflect that the market is very active and that there is still a very high demand.

The geographic location of the posts clearly originated in the southern region, especially in the provinces that directly border Malaysia such as Yala and Pattani. Online otter trade in Malaysia has also been reported, especially in the northern region of Kelantan which borders Thailand; this suggests a potential link in trade which needs to be further explored (Gomez and Bouhuys 2018). This aspect of potential international trade should not be overlooked as it has implications to the implementation of CITES, with a possible likelihood that the otters could also be sourced from Malaysia and also transported across to satisfy the rampant pet trade across the border (Krishnasamy and Stoner 2016).

Enforcement and legislation

This research is a preliminary analysis as the five Facebook groups are only a representation of entire online trade in otters. Importantly, beyond otters, other wildlife species were also found to be traded on the Internet (IFAW 2008; Smith et al 2016; Todd 2011; Wu 2007). This research highlights the potential of monitoring social media sites to inform management and conservation. Most traders of illegal wildlife do not need to venture to the dark web as most of the trading is freely carried out and loosely monitored on the clear web (Roberts and Hernandez-Castro 2017). Investigations into the potential of social media as a commercial trade platform is increasingly acknowledged, albeit current studies have been limited to monitoring periods of a few weeks (Hinsley et al 2016; IFAW 2018). Therefore, it is pertinent to conduct long-term monitoring to gain information to better regulate and enforce trade on these platforms (Vaglica et al 2017), and this should be considered a conservation research priority (Yu and Jia 2015). Analytical methods to better understand trade networks (Patel et al 2015) and the development of novel technological tools (Hernandez-Castro and Roberts 2015) are also applications that can further detect and monitor trade.

To the credit of the Royal Thai Government, cyber taskforces have been established by the Royal Thai Police and Department of National Parks, Wildlife and Plant Conservation to combat this issue. Publicized sting operations mainly targeting individual sellers have led to increased private settings and shifted discussions to private or direct messaging rather than public comments. The shut down and constant displacement of groups is a common practice once the marketplace is exposed or gets too large (Krishnasamy and Stoner 2016). Therefore, it is essential for enforcement officers to quickly crackdown on sellers before groups become even more exclusive and secretive. It is also necessary for countries to strengthen legislation; within this region, countries vary in protective regulations, and not all countries have protection of otters (Gomez et al 2016). It may be more difficult to trace the offender on these virtual networks as many may hide behind relatively anonymous profiles (Lavorgna 2014) as well as use closed groups as cover (Yu and Jia 2015). Given their current ability to monitor this trade, movement to the dark net will undoubtedly create further challenges for law enforcement officers (Roberts and Hernandez Castro 2017).

Cooperation between law enforcement, operators, and consumers will be the key priority (de Magalhaes 2012). A growing

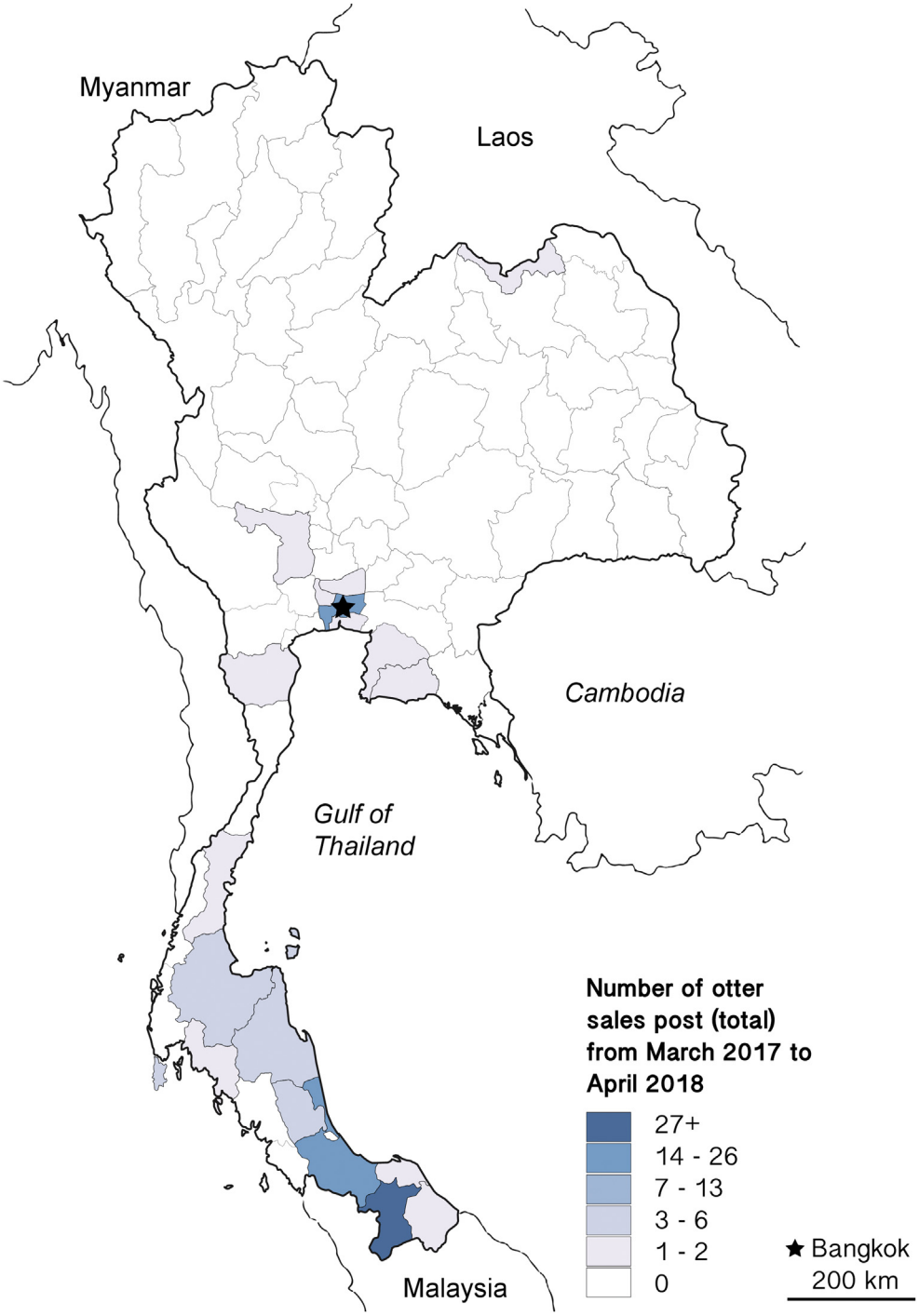

Figure 2. Spatial distribution of otter sales posts (n = 111) based on originating provinces recorded from 5 Facebook market groups from March 2017 to April 2018.

number of traditional online retailers such as eBay (Anonymous 2008) and Alibaba (IFAW 2009) are committed to preventing the sales of wildlife products on their platforms, albeit the enforcement of such policies is a work in progress (Anonymous 2015). Social media platforms such as Instagram and Facebook have started to follow suit; Facebook is has voiced its support to remove illegal trade and has generally been responsive and cooperative in receiving tips on illicit activity (Krishnasamy and Stoner 2016), and Instagram has recently launched their new Wildlife Alert System that warns behavior of users which harms wildlife (Anonymous 2017). Thailand's recent dealings with Facebook have received certain criticism due to contradictory legislative interpretation; this case study provides another opportunity for the Thai state to work alongside Facebook in regulating these markets through enforcement of the Wildlife Protection Legislation.

Internet consumer awareness

The Internet provides an additional platform for national and international wildlife trade through users which create and share content (Lavorgna 2014). On social media networks, likes and comments can potentially increase desirability and thereby entice more people to purchase exotic pets, despite its illegality (Morgan and Chng 2017). The "cute" factor is a key marketing point for the

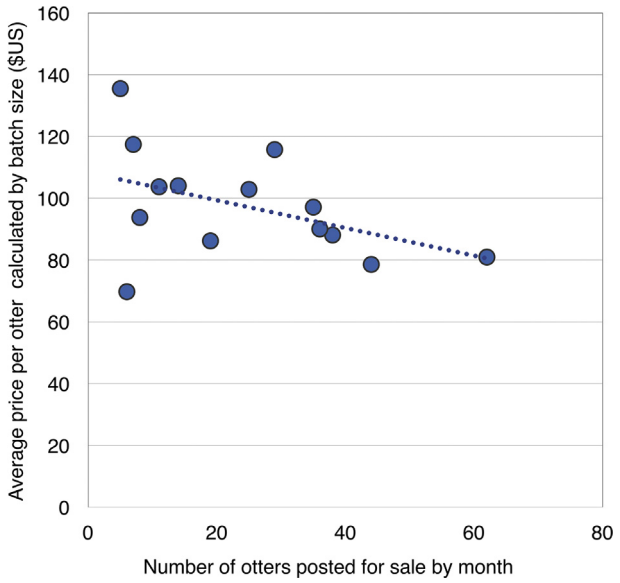

Figure 3. The price of otters posted for sale calculated by batch size average. Each data point is the number of otters posted for sale in each month.

otter pups for sale; this has also been evident for other cases such as slow loris videos on YouTube influencing uninformed consumers (Nekaris et al 2013). Providing more information on legal penalties, welfare issues, disease risk, and biodiversity implications may deter potential consumers from purchasing illegal wildlife as pets and engaging in illegal trade (Moorhouse et al 2016). Furthermore, raising consumer awareness for sharing viral Internet content on illegal pets or wildlife makes a difference in managing the online wildlife trade (Challender et al 2015).

The responsibility for law enforcement agencies to take on and monitor social media in its entirety is not realistic. Whilst the impact of social media platforms has increased accessibility and exposure to the illicit pet trade, in a way, it also provides an opportunity to shine light on this issue considering the wide range of audience (Waters and Harrad 2013). For example, it provides an opportunity for more eyes to monitor and report such illicit activity and inform local government authorities and conservationists (Waters and Harrad 2013). When combined with increased awareness and cooperation between enforcement agencies, operators, NGOs, and consumers, social media can in fact become a powerful tool for social change and a key platform to advocate for tackling the illegal wildlife trade.

Conflicts of interest

The authors declare that there is no conflicts of interest.

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