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COVER PHOTO: Jakarta's Pramuka bird market illuminates both rich cultural roots and a monumental conservation challenge
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Songbird trade crisis in Southeast Asia leads to the formation of IUCN SSC Asian Songbird Trade Specialist Group

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Wildlife trade is one of the most important underlying causes of biodiversity loss. In Southeast Asia, massive growth in the wildlife trade is potentially threatening hundreds of species, and pushing many to the brink of extinction (Wilcove et al., 2013). Of the approximately 850 species of birds native to Southeast Asia, 52 are currently assessed as being Critically Endangered by the IUCN Red List of Threatened Species. Wildlife trade is expanding quickly, and at current rates of over-harvesting and habitat conversion it has been estimated that one-third of Southeast Asia's bird species will be extinct by 2100, with at least 50% of these representing global extinctions (Sodhi et al., 2004; Sodhi et al., 2010).

One group of birds threatened by the trade, perhaps more so than any other, are the passerine songbirds. Within Southeast Asia, and especially in Indonesia, the demand for songbirds as pets, and for songbird competitions, is enormous and involves hundreds of species and millions of individual birds each year (Chng et al., 2015; Chng and Eaton, 2016). Bird markets can be found in most major cities and towns throughout Indonesia, with some of the world's rarest songbirds openly for sale. Although the demand for pets and songbird competitions are the main drivers behind the trade, in some parts of Southeast Asia songbirds are also harvested for consumption as food, and for use in traditional medicines. Increasingly, songbirds are also traded online.

Sadly, less charismatic and smaller-bodied species,

such as the songbirds, have received little scientific or conservation attention, and many are vanishing. Some species have become so near to extinction that a mere handful remain, with some only known now from captive specimens (Eaton et al., 2015). The Straw-headed *Bulbul Pycnonotus zeylanicus* is a prime example. It is now extinct throughout most of its former range, and is currently confined to Singapore, a few localities in Malaysia, and possibly a few sites in western Indonesia, with the primary cause for this decline being the demand as cage birds and for singing competitions in Indonesia (Shepherd et al., 2013; Bergin et al., 2017). The Rufous-fronted Laughingthrush *Garrulax rufifrons*, endemic to the island of Java in Indonesia, is in even greater trouble. This species is all but gone from the wild, having only been observed in one location over the past 20 years, again due to trapping to meet demand within Indonesia (Collar and van Balen, 2013). Without intervention, species like the Straw-headed Bulbul and the Rufous-fronted Laughingthrush may vanish from the wild completely.

However, there is hope. In September 2015, in response to the urgent need for action, a group of dedicated people (researchers, practitioners, conservation leaders) came together in Singapore for the first Asian Songbird Trade Crisis Summit, hosted by Wildlife Reserves Singapore (WRS). During this summit, a Southeast Asian Songbird Working Group was formed, and commenced planning for a conservation strategy.

In 2016, the Conservation Strategy for Southeast

Asian Songbirds in Trade; Recommendations from the first Asian Songbird Trade Crisis Summit 2015 held in Jurong Bird Park, Singapore 27-29 September 2015 was published. Among other things, this plan included a list of priority species in need of urgent actions to prevent them from extinction, and laid out a number of recommendations and action points to enhance conservation efforts. It also called for the establishment of an official IUCN SSC Asian Songbird Trade Specialist Group, to officially represent the Southeast Asian Songbird Working Group and lead the conservation planning and decision making.

In February 2017, a second summit was held, again in Singapore, bringing experts together to share updates on developments since 2015, and to discuss opportunities including campaigns by zoos and behavioural change strategies to reduce

the unsustainable demand for wild birds. Central to these discussions was the implementation of the Conservation Strategy for Southeast Asian Songbirds in Trade. One of the recommendations from these summits, and the Strategy, was to better formalise the working group, and in May 2017, the IUCN SSC Asian Songbird Trade Specialist Group (ASTSG) was launched, committed to preventing the extinction of any of Southeast Asia's songbirds threatened by illegal and/or unsustainable trade, and ultimately to reverse the decline in these species.

The ASTSG is tasked with the implementation of the Strategy, and ultimately to prevent any of Southeast Asia's songbirds from further decline or extinction, and to recover these species. The ASTSG focuses on a number of priority themes, led by vice-chairs, including: (i) trade monitoring



Figure 1. Jakarta's infamous Pramuka bird market remains one of the main bird trading hubs in Southeast Asia. Thousands of illegally caught birds are traded here every month.

and policy interventions; (ii) ex-situ conservation breeding programmes; (iii) education and community engagement; (iv) genetic research; and (v) in-situ research on wild populations. Furthermore, the ASTSG will provide updated information and recommendations to BirdLife International to aid in future IUCN Red List status assessments, and will encourage publication of information on key taxa and related trade and policy issues.

The ASTSG is ultimately aimed at guiding conservation and research efforts, informing national and international laws and policies, raising awareness and reducing demand. The formation of the ASTSG is an essential step towards effective conservation of Southeast Asia's songbirds, but the real work now lies ahead.

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Both authors are members of the IUCN SSC Asian Songbird Trade Specialist Group. Chris R. Sheperd was heading the TRAFFIC office in Southeast Asia for many years, before returning to Canada two years ago to start up "Monitor".

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CONSERVATION RESEARCH SOCIETY

NEWS AND NOTES

New human fossils findings in Morocco could rewrite a lot of what we know about man's evolutionary history. They date back more than 300,000 years ago and are the oldest known *Homo sapien* remains ever found. As with all previous ancient human fossils there were dug up in Morocco, not East Africa where experts have previously said humans exclusively evolved. A few other publications cast exciting light on other ancient species.

The oldest human fossil found in Morocco

Fossil evidence points to an African origin of *Homo sapiens* from a group called either *H. heidelbergensis* or *H. rhodesiensis*. The exact place and time of emergence of *H. sapiens* remain obscure, because the fossil record is scarce and the chronological age of many key specimens remains uncertain. In particular, it is unclear whether the present day 'modern' morphology rapidly emerged approximately 200 thousand years ago (ka) among earlier representatives of *H. sapiens* or evolved gradually over the last 400 thousand years. The authors of the *Nature* publication describe the finding of human fossils from Jebel Irhoud, Morocco, and interpret the affinities of the hominins from this site with other archaic and recent human groups. From the identification of a mosaic of features including facial, mandibular and dental morphology that aligns the authors conclude that the Jebel Irhoud material with early or recent anatomically modern humans and more primitive neurocranial and endocranial morphology. In combination with an age of 315 ± 34 thousand years this evidence makes Jebel Irhoud the oldest and richest African Middle Stone Age hominin site that documents early stages of the *H. sapiens* clade in which key features of modern morphology were established.

Jean-Jacques Hublin et al., (2017). New fossils from Jebel Irhoud, Morocco and the pan-African origin of *Homo sapiens*. *Nature* **546**: 289–292. doi:10.1038/nature22336

Oldest human tools discovered

The earliest fossil attributed to a modern form of *Homo sapiens* comes from eastern Africa and is approximately 195 thousand years old with the emergence of modern human biology placed at around 200 thousand years ago. However, the earliest Middle Stone Age assemblages come from eastern and southern Africa but date much earlier. In this article, the authors report on the ages, determined by thermoluminescence dating, of fire-heated flint artefacts obtained from new excavations at the Middle Stone Age site of Jebel Irhoud, Morocco, which are directly associated with newly discovered remains of *H. sapiens*. The analysis places these Middle Stone Age artefacts and fossils at 315 ± 34 thousand years ago, which is supported the recalculated uranium series with electron spin resonance date of 286 ± 32 thousand years ago for a tooth from the Irhoud hominin mandible. The north African site of Jebel Irhoud contains one of the earliest directly dated Middle Stone Age assemblages, and its associated human remains are the oldest reported for *H. sapiens*.

Daniel Richter et al. (2017). The age of the hominin fossils from Jebel Irhoud, Morocco, and the origins of the Middle Stone Age. *Nature* **546**: 293–296 doi:10.1038/nature22335

A mid-Paleocene fossil from New Zealand reveals an unexpected diversity of world's oldest penguins

We describe leg bones of a giant penguin from the mid-Paleocene Waipara Greensand of New Zealand. The specimens were found at the type locality of *Waimanu manneringi* and together with this species they constitute the oldest penguin fossils known to date. Tarsometatarsus dimensions indicate a species that reached the size of *Anthropornis nordenskjoeldi*, one of the largest known penguin species. Stem group penguins therefore attained a giant size very early in their evolution, with this gigantism existing for more than 30 million years. The new fossils are from a species that is

phylogenetically more derived than Waimanu, and the unexpected coexistence of Waimanu with more derived stem group Sphenisciformes documents a previously unknown diversity amongst the world's oldest penguins. The characteristic tarsometatarsus shape of penguins evolved early on, and the significant morphological disparity between Waimanu and the new fossil conflicts with recent Paleocene divergence estimates for penguins, suggesting an older, Late Cretaceous, origin.

Mayr, G. et al. (2017). A new fossil from the mid-Paleocene of New Zealand reveals an unexpected diversity of world's oldest penguins. *Sci. Nat* **104:9**. doi:10.1007/s00114-017-1441-0

99 Million-Year-Old Baby Bird Trapped in Amber Discovered in Myanmar

A 99 million-year-old baby bird encased in amber has been unearthed in Myanmar (Fig.1). The

ancient hatchling died when it was just a few days or weeks old after a blob of sticky tree resin fell on it, leaving half of its body frozen in time. Xing Lida, from the China University of Geosciences, led an international team of researchers in analyzing the three-inch specimen. The amber encases the bird's skull, neck, a partial wing, a hind limb and one foot. The hatchling would have belonged to a group of birds called *enantiornithines*, that lived during the Cretaceous period, 145 to 65 million years ago. They died out during the mass extinction event that killed off the dinosaurs. The bird was unusual in several ways, for example, the structure of its wings was very similar to those seen in modern flying birds, but it retained some features that are seen in more primitive theropods --- that is, the group of dinosaurs from which modern birds emerged. It is believed to be the most complete view of a hatchling's plumage from the Cretaceous period discovered to date, and it provides an amazing reference point for comparisons with the body



Figure 1. A 99 million year old bird encased in amber when it was just days or weeks old © Elsevier/Xing et al/Gondwana Research

forms of other fossilized birds and feathers found in amber.

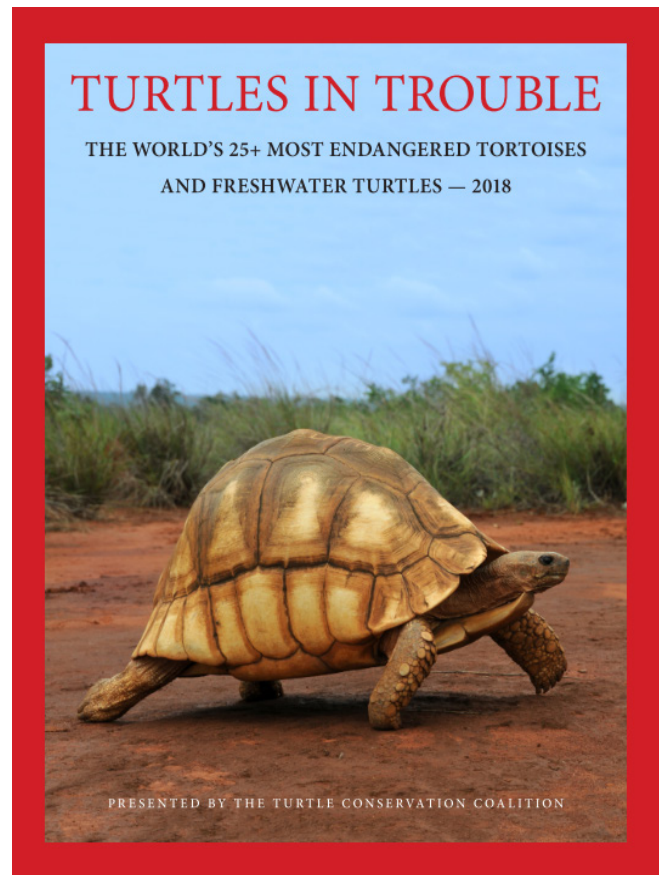
Lida Xinga et al. (2017). A mid-Cretaceous enantiornithine (Aves) hatchling preserved in Burmese amber with unusual plumage. *Gondwana Research* **49**: 264-277. <https://doi.org/10.1016/j.gr.2017.06.001>

Evidence for early life in Earth's oldest hydrothermal vent

It is not known when or where life on Earth began, but some of the earliest habitable environments may have been submarine-hydrothermal vents. In this study, a team lead by Matthew S. Dodd describe putative fossilized microorganisms that are at least 3,770 million and possibly 4,280 million years old from the Nuvvuagittuq belt in Quebec, Canada. The finds are from ferruginous sedimentary rocks, interpreted as seafloor-hydrothermal vent-related precipitates. The structures are similar to those of filamentous microorganisms from modern hydrothermal vent precipitates and analogous microfossils in younger rocks. Comprised of tiny tubes and filaments made of an iron oxide known as haematite, the microfossils are believed to be the remains of bacteria that once thrived underwater around hydrothermal vents, relying on chemical reactions involving iron for their energy.

Along with a range of other features, these observations are consistent with an oxidized biomass that provides evidence for biological activity in submarine-hydrothermal environments more than 3,770 million years ago. The new discovery supports the idea that life emerged and diversified rapidly on Earth. Like the oldest microfossils previously reported – samples from western Australia dating to about 3.46bn years ago – the new discovery is set to be the subject of hot debate.

Matthew S. Dodd, et al. (2017). Evidence for early life in Earth's oldest hydrothermal vent precipitates. *Nature* **543**: 60–64. [doi:10.1038/nature21377](https://doi.org/10.1038/nature21377)



New report about Turtles in Trouble

Indonesia's capital, Jakarta, has seen an increase in the sale of non-native species of tortoises and freshwater turtles that are prohibited for international commercial trade, according to a report by the wildlife-monitoring group TRAFFIC. Growing demand for these species, coupled with Indonesia's lax enforcement of customs regulation at international ports of entry and an outdated conservation act, have allowed the illicit international animal trade to grow, TRAFFIC said. The group has called on the Indonesian government to improve the country's conservation laws and regulations, and urged more stringent monitoring of the markets, pet stores and expos in Jakarta and across the country to document and assess the extent of any illegal trade. Jakarta is also known for its extensive bird markets, like Pramuka, where thousands of birds are traded every month. Most are illegally caught from the wild, resulting on a population decline and local extinction of many species that were common only a few years ago.

Primates in peril

Non-human primates play important roles in the livelihoods, cultures, and religions of many societies and offer unique insights into human evolution, biology, behaviour, and the threat of emerging diseases. They are an essential component of tropical biodiversity, contributing to forest regeneration and ecosystem health. Currently, there exists 504 species in 79 genera distributed in the Neotropics, mainland Africa, Madagascar, and Asia. Unfortunately, approx. 60% of all primate species are now threatened with extinction and 75% are in decline. This situation is the result of escalating anthropogenic pressures on primates and their habitats, leading to extensive habitat loss through the expansion of industrial agriculture, large-scale cattle ranching, logging, oil and gas drilling, mining, dam building, and the construction of new road networks in primate range regions. In addition, bush meat and the illegal trade of primates as pets and body parts, along with emerging threats, such as climate change and anthroponotic diseases. Given that primate range regions overlap extensively with a large, and rapidly growing, human population characterized by high levels of poverty, global attention is needed immediately to reverse the looming risk of primate extinctions.

Estrada et al. (2017). Impending extinction crisis of the world's primates: Why primates matter. *Sci. Adv.* **3** e1600946

The extinction of the Sumatran rhino

It is common knowledge that the Sumatran rhino, *Dicerorhinus sumatrensis harrissoni*, is close to extinction. The reasons for catastrophic population declines are less clear. Often, data necessary to improve decisions for conservation management are often lacking. The authors reviewed literature and assembled a comprehensive data set on surveys of the Sumatran rhino in the Malaysian state of Sabah on Borneo to chart the historical development of the population in Sabah and its exploitation until the present day. They fitted resource selection

functions to identify habitat features preferred by a remnant population of rhinos living in the Tabin Wildlife Reserve in Sabah, and ran a series of population viability analyses (PVAs) to extract the key demographic parameters most likely to affect population dynamics. We show that as preferred habitat, the individuals in the reserve were most likely encountered in elevated areas away from roads, in close distance to mud-volcanoes, with a low presence of human trespassers and a wallow on site, and within a neighbourhood of dense forest and grassland patches. The analysis also indicates that unrestrained hunting between 1930 and 1950 drastically reduced the historical rhino population in Sabah and that the remnant population could be rescued by combining the effort of total protection and stimulation of breeding activity. The authors recommend to translocate isolated reproductively healthy individuals to protected locations and to undertake measures to maximise conceptions, or running state-of-the-art reproductive management with assisted reproduction techniques.

P. Kretzschmar et al. (2016). The catastrophic decline of the Sumatran rhino (*Dicerorhinus sumatrensis harrissoni*) in Sabah: Historic exploitation, reduced female reproductive performance and population viability. *Global Ecology and Conservation* **6**: 257–275. <http://dx.doi.org/10.1016/j.gecco.2016.02.006>

The attitude, norm and perception of communities towards Sumatran tiger conservation initiatives in Aceh

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ABSTRACT

At the end of January 2014, the Indonesian Ulama Council announced a fatwa on *Wildlife Conservation for the Balance of the Ecosystem*. In Aceh province, Islam is strongly adhered to and it is expected that the fatwa would be beneficial to conservation in the province. We tested the effect of this fatwa in relation to attitude, norm and perception of the communities in relation to conservation initiatives. The study was conducted at the villages of Ulu Masen, Keumala Damlam and Pidie Jaya in April, 2015. The result of t test then partially there is significant relation (significance) between attitude, norm and behavior with intention with value $p < 0.05$, except on the knowledge variable having the sig value $p > 0.05$. In the F test results together to four independent variables have a significant relationship (significance) that is the value $p 0,000 < 0,05$. In the summary model there is a R number of 0.668. This shows that there is a good relationship between the four variables with the intention. While on the determination analysis R^2 illustrates all the independent variables contribute to the intention of 41.1%. From the result of regression equation in relation to the intention to conservation action according to TPB theory is norm, behavior, and attitude, and if will do intervention in conservation investment with limited funding, hence according to this research better done by norm.

ABSTRAK

Pada akhir Januari 2014, Majelis Ulama Indonesia (MUI), mengumumkan fatwa tentang Pelestarian Satwa Langka untuk Keseimbangan Ekosistem. Terkait dengan sosialisasi fatwa tersebut, perlu diketahui hubungan sikap, norma dan persepsi masyarakat terhadap aksi konservasi. Aceh merupakan provinsi dimana masyarakat Islam sangat taat sehingga memungkinkan peneliti mendapatkan gambaran tentang pentingnya norma (Islam) dihadirkan dalam mendorong aksi konservasi di Aceh. Penelitian dilakukan di sekitar desa Ulu Masen, yaitu di Desa Keumala Dalam dan Desa Genie Kabupaten Pidie pada bulan April 2015. Metode penelitian yang digunakan adalah survei dengan instrumen berupa kuesioner yang digunakan untuk mengukur sikap, norma, pengetahuan dan persepsi sebagai faktor determinan niat berpartisipasi sesuai dengan theory of planned Behavior (TPB) dengan skala likert 1-5. Analisis yang di gunakan menggunakan alat SPSS, dengan batas signifikan $p < 0,05$. Dari hasil uji t maka secara parsial adanya hubungan yang bermakna (signifikansi) antara sikap, norma dan perilaku terhadap niat dengan $p < 0,05$, kecuali pada variabel pengetahuan mempunyai nilai $p > 0,05$. Pada hasil uji F secara bersama-sama ke empat variabel independent memiliki hubungan yang bermakna (signifikansi) terhadap niat yaitu nilai $p < 0,05$. Pada model summary terdapat angka R sebesar 0,668. Hal ini menunjukkan bahwa terjadi hubungan yang baik antara ke empat variabel dengan niat. Sedangkan pada analisis determinasi R^2 empat variabel dengan niat. Sedangkan anberkontribusi pada niat sebesar 41,1%. Dari hasil persamaan regresi dalam kaitannya dengan niat terhadap aksi konservasi menurut teori TPB adalah norma, behavior, dan attitude. Dapat disimpulkan dan jika akan melakukan intervensi dalam investasi konservasi dengan pendanaan terbatas, maka menurut penelitian ini lebih baik dilakukan melalui norma.

Keywords: Attitude, norm, perception, conservation, fatwa, Aceh

INTRODUCTION

Indonesia is one of the world's most biodiversity

rich countries, second only to Brazil is a global priority for conservation (Brooks et al., 2006; Myers et al., 2000). One of the challenges faced in endangered species conservation is the general lack of knowledge and awareness of the importance of

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maintaining biodiversity. The effects of hunting, collection and trafficking of wildlife has made many of Sumatra's charismatic species endangered. Past studies have shown human behaviour and relationship to nature is influenced by knowledge of the environment, as well as attitudes and intentions (Busse and Menze, 2014; Suki 2013). However, few studies have focused on how current fatwas can affect and/or assist a community in developing policies related to conservation, where values, beliefs and norms play important roles (Stern, et al., 1999). In a Muslim society, religion forms a main value-pillar that forms socio-cultural life, including that of community involvement in conservation efforts, since it is believed that Islam also teaches people how to guard nature and all its beings (Bhangwat et al. 2011; Mangunjaya and McKay 2012; Palmer and Vinlay, 2003). This offers the opportunity to enhance conservation by using religion in addition to knowledge about human behaviour and education (St. John et al., 2010).

Indonesia faces major challenges in its efforts to manage and protect endangered species. Some umbrella species, such as tigers, rhinoceros, orangutan and elephants, are already listed as critically endangered on the IUCN Red-list (IUCN, 2017). Human-tiger conflicts bring about prolonged problems that may lead to further reduction and loss of tigers (Nyhus and Tilson, 2004).

The Sumatran provinces Aceh, Riau, Jambi, and South Sumatra are often in the spotlight due to many cases of human-wildlife conflicts. (Wibisono et al., 2011). The Sumatran tiger (*Panthera tigris sumatrae*) is one of the rarest cats in the World. After the extinction of the Javan tiger (*Panthera tigris sondaica*) and the Balinese tiger (*Panthera tigris balica*) in the middle and late 20th century, the Sumatran tiger is the only tiger species left in Indonesia (WWF, 2011). Currently, the species has sustained a drastic population decline due to habitat loss and poaching, with other conflicts continuing to undermine their existence and survival in nature (Sunarto, et al. 2012; Wibisono and Pusparini 2010).

There have been several conservation strategies

developed for tiger conservation in Indonesia. In general, they have focused on protecting tiger core habitat as well as eliminate poaching. Despite the development of the National Tiger Recovery Program (NTRP), created as part of the Global Tiger Recovery Program (KLHK 2010), the tiger population continues to decline.

There are three main drivers of population decline

1. habitat loss resulting from opening so-called economic development zones such as logging, land conversion to plantations and / or other functions (IUCN, 2017; Sunarto et al., 2012)
2. illegal hunting and trade in tiger products (Chng and Eaton, 2016)
3. lack of environmental awareness and incentive to protect the habitat

All three points are relevant to Aceh. The province also reveres Islam as the dominant religion in the region (Aspinall 2009). The attitude and perception of the public towards endangered species, especially tigers as flagship species present in Aceh, Sumatra may, therefore, be affected more by doctrines set out by local religious leaders and institutions.

This study aims at assessing the effect Fatwa MUI No. 4 (2014) on the of attitudes and perceptions of the general public, especially with regards to their intention of participating in conservation activities in Aceh.

METHODS

Data collection was done in the field around Ulu Masen Forest, Aceh, Keumala Dalam Village and Genie Village of Pidie Regency in April 2015. Ulu Masen spans over 266,573ha natural forest making 36% of the regency as Protected Area. Aside from being a tiger habitat, Ulu Masen is also used as a program model for REDD. The area is considered a very important Sumatran tiger habitat (Wibisono and Pusparini, 2010).

We developed a questionnaire to measure attitudes, norms, and perceptions as determinants of the intention of participating in conservation efforts in accordance with the theory of planned behaviour (Theory of Planned Behaviour (BAL) 1991). Behaviour in TPB is assumed as a function of beliefs that can be divided into three categories, namely (1) behavioural *beliefs* that are assumed to influence attitudes toward behaviour, (2) *normative beliefs* as determinants of subjective norms, and (3) control beliefs assumed to affect PBC. Our two main questions revolved around:

- a) Is there a qualitative relationship between attitudes, norms, behaviours, knowledge with the intention of participating in conservation?
- b) What is the relationships pattern (if any?) concerning attitudes, norms, behaviours and knowledge with the intention of participating in conservation in Aceh?

Subsequently, participants were asked to respond in the form of degree of approval following the Likert scale 1-5. Data were analysed using SPSS 22 with a 95% confidence limit ($p < 0.05$) for multiple regression analysis.

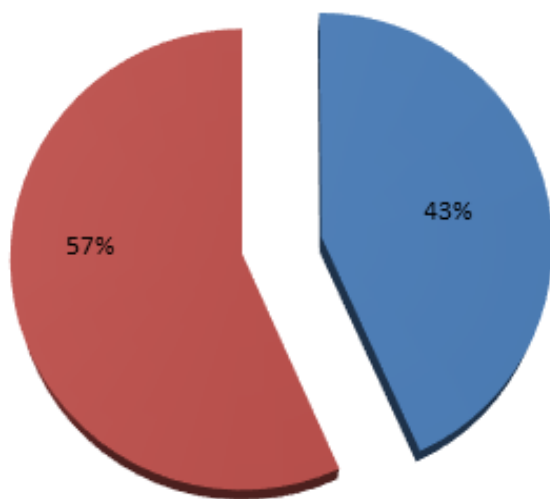


Figure 1. The number of respondents who were aware (blue) / not aware (red) of Fatwa MUI No. 4, 2014 in Ulu Masen Forest study area.

RESULTS AND DISCUSSION

Profile of Respondents

The survey was conducted on 67 respondents consisting of 14 women (20.9%) and 53 men (79.1%). This. The Acehnese are generally devout Muslims, however, our upon validating the level of obedience, our results reveal that, with regards to the obligation to perform the five daily prayers, 65.7% of respondents never performed prayers and 34.3% performed all prayers.

A little less than half (43.30%) was aware of the Fatwa, whereas 56.70% had no knowledge about it (Fig. 1). Some 3% had experienced conflicts with wildlife.

Relationships of attitudes, norms, behaviors, and knowledge with intent

The results reveal a high degree of willingness by the Acehnese to participate in conservation (69%), even with 31% “less interested” and with poor intentions (Fig. 2). Positive intention and attitude are important when transforming a Fatwa into action, since the individual’s desire to behave is a combination of attitudes toward behavior and subjective norms (Ajzen, 1991).

Data from the four independent variables

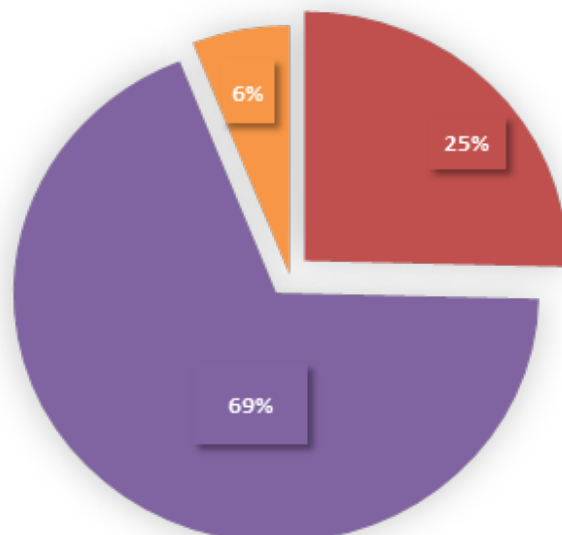


Figure 2. The number of respondents who expressed willingness to engage in conservation with “high (purple), medium (orange) and low interest (red).

Table 1. Relationships between attitude, norms, behaviour and knowledge in connection to the intention of participating in conservation activities.

Category	Intention (%) (n = 67)			
	Poor	Sufficient	Good	Very good
Attitude	12 (25,53)	31 (65,96)	4 (8,51)	0
Norm	17 (26,15)	44 (67,69)	4 (6,15)	0
Behaviour	10 (21,28)	33 (70,21)	4 (8,51)	0
Knowledge	9 (20,93)	34 (79,07)	0	0
Average	23,47%	70,73%	5,79%	0

Table 2. Regression coefficients.

Coefficients ^a						
Model		Non-standardized Coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	0,051	0,480		0,106	0,916
	Attitude	0,181	0,067	0,283	2,714	0,009
	Norm	0,365	0,125	0,298	2,915	0,005
	Knowledge	0,035	0,063	0,059	0,557	0,580
	Behaviour	0,244	0,071	0,379	3,425	0,001

a. Dependent variable: Intention

Table 3. Model Summary^b

Model	R	R ²	Adjusted R ²	SE - Estimate
1	0,668a	0,447	0,411	0,29613

a. Predictors: (Constant), Sikap, Norma, Pengetahuan, Perilaku

b. Dependent Variable: Niat

(attitudes, subjective norms, behaviour, and knowledge) were analysed for the accumulation of the effects on increasing participation in conservation. The intention of participating in the Acehese community is generally good, with 70.73% in the “sufficient” category and with some in the “less” category (23.47%). However, only 5.79% are categorized as good, and none were in the “very good” category. The results of this study indicate that; although Acehese’s attitude, norms,

behaviour and knowledge is positive, the intention to participate in conservation remains relatively low (Table 1).

The result of the multiple linear regression analysis showed significant relationship ($p < 0,05$) between attitude, norm, and optimism with participation intention; while there is no significant relationship between knowledge and the intention to participate in conservation. The relationship pattern suggest that improving “attitudes” can

increase the intention to participate in conservation by 0.181; improving the “norm” will increase the intention to participate in conservation by 0.365; and improving “behaviour” will increase the intention to participate in conservation by 0.244 (Table 2). Thus, the intention of participating in conservation in Aceh is more influenced by norms (Islam) than attitude and behaviour. Therefore, the priority sequence of interventions for increasing conservation intentions in Aceh is norms, behavior, and attitudes.

The attitude of subject norms in this survey raises the question of what role religious leaders and community leaders can play to contributing to the preservation of wildlife and conservation in general. Our results suggest that religious and community leaders can play an important role in conservation by improving communities’ intentions to engage in wildlife and forest conservation in Aceh. Our results also suggest that respondents believe that participating in wildlife conservation can improve livelihoods through income generating activities related to eco-tourism.

The relationship between attitude, norm, behaviour, and knowledge with the intention to participate in conservation suggest that “intention” is closely related to “norm” when compared to attitude and behaviour ($R = 0.668$). The four variables of attitude, norm, knowledge and behaviour can contribute to wildlife conservation action 41,1% (Table 3), meaning conservation interventions in Aceh should prioritize “norms” ahead of behaviour and attitude.

Our study suggests that, in general, people have enough time and money to play an active role in preserving the forest, and have a passion for wildlife conservation. The people of Aceh already scores high on attitudes, norms, behaviours and knowledge as the main capital to participate in conservation, but future conservation intervention can benefit from involving religious and community leaders. This may also be the most cost-effective way of raising awareness about the conservation needs in Aceh. Specifically for Aceh, knowledge does not appear related to intent and, therefore, conservation awareness raising through increasing knowledge is not likely to be as effective as “awareness” raising through “norms”.

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A rapid bird survey in Bukit Puar, Kerinci Seblat National Park; with notes on different survey methods

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ABSTRACT

A rapid bird survey was carried out in Bukit Puar, Kerinci Seblat National Park, South Sumatra Province. Three survey methods were applied to assess bird diversity in this area: transect line, mist-netting and riparian survey. A total of 53 species from 27 families was recorded during survey. Among three methods applied, transect line is the most effective method to detect more bird species (45 species), followed by mist-netting (14 species) and riparian survey (nine species). There are 10 species protected by Indonesia law and five birds are listed as Near Threatened (NT) by International Union for Conservation of Nature or IUCN. These findings show that Bukit Puar still good habitat for various of birds, and the forest remaining should be protected.

ABSTRAK

Sebuah survei cepat untuk mengetahui keragaman burung telah dilakukan di Bukit Puar, Taman Nasional Kerinci Seblat, Provinsi Sumatera Selatan. Tiga metode survey digunakan dalam survey ini, yaitu: jalur transek (transect line), mist-netting dan survei dengan menyusuri sungai (riparian survey). Tercatat 53 jenis jenis burung dari 27 famil dalam survei ini. Dari ketiga metode yang digunakan, metode jalur transek merupakan metode yang paling efektif untuk mendeteksi lebih banyak keragaman burung dengan 45 jenis, diikuti mist-netting dengan 14 jenis dan survei menyusuri sungai dengan 9 jenis. Tercatat juga 10 jenis merupakan jenis dilindungi oleh Pemerintah Indonesia dan lima jenis masuk dalam kategori terancam punah menurut International Union for Conservation of Nature atau IUCN. Hasil dari survei ini menunjukkan bahwa Bukit Puar masih merupakan habitat yang baik untuk keragaman burung, dan hutan yang masih tersisa disini sebaiknya tetap dilindungi.

Keywords: *Bird, Bukit Puar, Kerinci Seblat National Park, transect line, mist-netting, riparian survey*

INTRODUCTION

Kerinci Seblat National Park (KSNP) with a total area of 1.389.509ha (Kepmenhut No.420/Menhut-II/2004) is a largest National Park in Sumatra, spanning over four provinces: West Sumatra, Jambi, Bengkulu and South Sumatra (Anon, 2016). The area has great habitats diversity that spans over continuous forest from lowlands to montane, including some natural stands of tropical pine (MacKinnon and Philipps, 1993). KSNP has

been listed as an Important Bird Area (IBA), an Endemic Bird Area and World Heritage Site in Indonesia (Anon, 2016; Holmes and Rombang, 2001; Stattersfield, 1998). The park shelters several important populations of Sumatra's charismatic wildlife, including many Sumatran endemic birds (Cochrane and Cubitt, 2004; Myers, 2005).

The avian diversity in KSNP and adjacent areas comprises over 380 species, which include 17 of the 20 Sumatran endemics (Anon, 2002). Most ornithological exploration of KSNP have taken place in the central parts of the park or in areas adjacent to Gunung Kerinci (eg. Holden, 1997; Hurrell, 1989; Lambert and Howes, 1989; Simpson,

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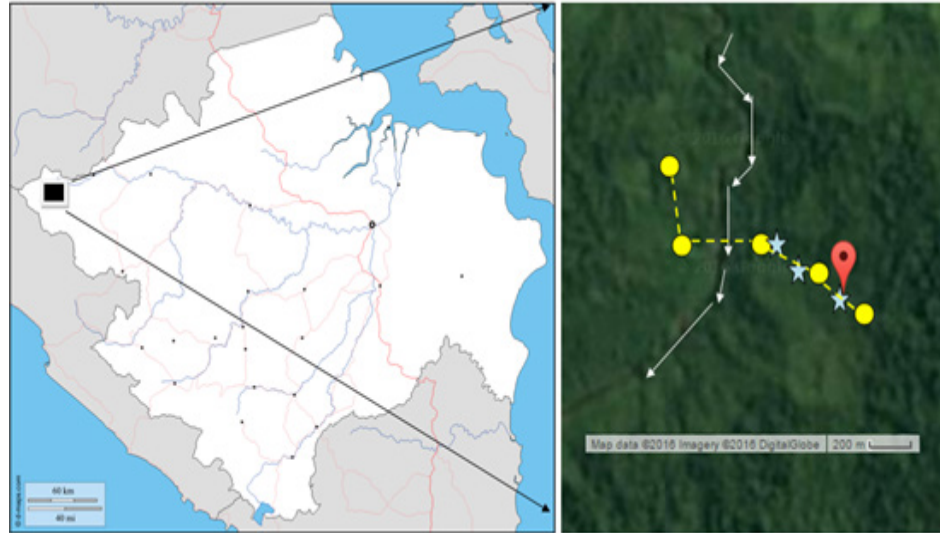


Figure 1. Location of survey at Bukit Puar, Kerinci Seblat National Park, South Sumatra province. Yellow circle with dotted line is transect line, blue star is mist-net stations, and white arrow show riparian survey tracks.

1995), whereas information about avifauna outside these areas remains little known. In South Sumatra, an area of 250.613ha of KSNP, the avifauna remains unstudied (Anon, 2016).

Bukit Puar is a hilly forest in a part of KSNP that is located in the province of South Sumatra, where the habitat remains relatively intact, yet with no information available on the fauna in Bukit Puar, including its bird diversity. This survey is the first bird diversity survey to be undertaken in the Bukit Puar area of KSNP.

METHODS

Study Area

The survey took place around Bukit Puar and its adjacent areas ($02^{\circ} 47'S$, $102^{\circ}23'E$) in KSNP (Fig. 1). The survey took place in approx 500ha of Bukit Puar. The area is under management area of subsection V or SPTN V (SPTN = Seksi Pengelolaan Taman Nasional Wilayah) of KSNP. Administratively, the site is located in Muara Kulam village, South Sumatra province. It consists of secondary dipterocarp forest with little encroachment, apart from low intensity selective illegal logging by local people. The topography is hilly with numerous riparian areas (Fig. 2).

Surveys

From 18-22nd April 2016, three survey were undertaken to rapidly assess the bird diversity in Bukit Puar. We applied standard methods for conducting survey, following protocols for rapid survey of terrestrial birds (eg. Bibby et al., 2000; Herzog et al., 2011). The survey methods used were line transect, mist-netting and survey by canoe along riparian zones. Identification of birds were done with the aid of field guides, mainly of MacKinnon and Phillipps (1993).



Figure 2. Bukit Puar consists of hilly secondary dipterocarp forest with little encroachment ©Muhammad Iqbal.

Five fixed-radius 100 m transect line surveys were conducted between sunrise to mid-morning. We recorded distance from observer (≤ 50 m or > 50 m), and time of observation of all birds that could be identified either based on vocalisation or direct observation.

Five mist-nets (15 x 3m, 3-4mm mesh) were deployed in the survey area. The nets were stretched between two poles and checked every two hours, or four times a day. Birds caught in the mist-nets were removed and placed in a cage for identification and morphometric measures.

Access to Bukit Puar from Muara Kulam village took place in canoe powered by a 15Hp outboard motor. This time was used to record birds and other wildlife along the river. A total of 6km over a duration of two hours was undertaken for riparian surveys around Bukit Puar and surrounding area.

RESULTS AND DISCUSSION

A total of 53 species from 27 families (taxonomy, scientific name and English name follow Sukmantoro

et al., 2007) was recorded during survey (Table 1). Among the three survey methods used, transect line survey resulted in most recordings (45 species), followed by mist-netting (14 species) and riparian zones survey (nine species). Only one observation of the Greater racket-tailed drongo was recorded across all three survey methods.

From 53 species recorded in Bukit Puar, 10 species are protected by Indonesia law (Noerdjito and Maryanto, 2001), and five species are listed as Near Threatened (NT) on the IUCN red-list (Birdlife International, 2016). Rufous-collared kingfisher is the only species recorded that is listed as both protected and NT.

Whereas the transect line resulted in more species of recorded birds (85% of total), mist-netting is an important tool to detect shy illusive species, such as small birds from the under-storey community (Rahman, 2002; Whitman et al., 1997). In this survey, mist-nets captured four species that were not recorded by the other survey methods: Green broadbill, Hooded pitta, Banded pitta and Chestnut-rumped babbler. The Green broadbill is a good sample of why mist-netting is important too.



Table 1. A list of species recorded during 18-22 April 2016, and methods use to detect the occurrence of birds in Bukit Puar, Kerinci Seblat National Park. P = Protected by Indonesian law, NT = Near threatened (IUCN red-list status), 1 = Transect line, 2 = Mist-netting, 3 = Riparian survey with canoe.

Family	Scientific Name	English name	Methods		
			1	2	3
Accipitridae	<i>Unidentified Accipitridae</i> (P)	Eagle	+		
	<i>Spilornis cheela</i> (P)	Crested Serpent Eagle			+
Columbidae	<i>Treron sp</i>	Green Pigeon	+		
	<i>Ducula aenea</i>	Green Imperial Pigeon	+		
Psittacidae	<i>Loriculus galgulus</i>	Blue-crowned Hanging Parrot	+		
Cuculidae	<i>Cuculus sp</i>	Cuckoo	+		
	<i>Cuculus micropterus</i>	Indian Cuckoo	+		
	<i>Centropus bengalensis</i>	Lesser Coucal	+		+
Strigidae	<i>Ketupa ketupu</i>	Buffy Fish Owl			+
Apodidae	<i>Collocalia sp</i>	Swiftlet	+		
Hemiprocnidae	<i>Hemiproctne comata</i>	Whiskered Treeswift	+		
Alcedinidae	<i>Actenoides concretus</i> (P, NT)	Rufous Collared Kingfisher		+	+
	<i>Halcyon smyrnensis</i> (P)	White-throated Kingfisher	+		+
	<i>Alcedo meninting</i> (P)	Blue-eared Kingfisher	+		+
Bucerotidae	<i>Buceros rhinoceros</i> (P)	Rhinoceros Hornbill	+		
	<i>Anthracoceus sp</i> (P)	Hornbill	+		
Meropidae	<i>Nyctornis amictus</i>	Red-bearded Bee-eater	+		+
Capitonidae	<i>Megalaima rafflesii</i> (NT)	Red-crowned Barbet	+	+	
	<i>Megalaima mystacophanos</i> (NT)	Red-throated Barbet	+	+	
	<i>Megalaima australis</i>	Blue-eared Barbet	+		
Picidae	<i>Picus miniaceus</i>	Banded Woodpecker	+		
	<i>Micropternus brachyurus</i>	Rufous Woodpecker	+		
Eurylaimidae	<i>Corydon sumatranus</i>	Dusky Broadbill	+		
	<i>Eurylaimus ochromolus</i>	Black-and-yellow Broadbill	+		
	<i>Calyptomena viridis</i>	Green Broadbill		+	
	<i>Cymbirhynchus macrorhynchus</i>	Black-and-red Broadbill	+		
Pittidae	<i>Pitta sordida</i> (P)	Hooded Pitta		+	
	<i>Pitta guajana</i> (P)	Banded Pitta		+	
Campephagidae	<i>Hemipus sp</i>	Flycatcher-shrike	+		
Pycnonotidae	<i>Pycnonotus atriceps</i>	Black-headed Bulbul	+		
	<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	+		
	<i>Pycnonotus melanicterus</i>	Black-crested Bulbul	+	+	
	<i>Pycnonotus brunneus</i>	Red-eyed Bulbul	+	+	
	<i>Criniger phaeocephalus</i>	Yellow-bellied Bulbul	+	+	
Chloropseidae	<i>Chloropsis cyanopogon</i> (NT)	Lesser Green Leafbird	+		
	<i>Chloropsis sonnerati</i>	Greater Green Leafbird	+		
	<i>Chloropsis cochinchinensis</i>	Blue-winged Leafbird	+		
Irenidae	<i>Irena puella</i>	Asian Fairy Bluebird	+	+	
	<i>Macronus gularis</i>	Striped Tit Babbler	+		

Timaliidae	<i>Stachyris maculata</i> NT	Chestnut-rumped Babbler		+	
	<i>Trichastoma bicolor</i>	Ferruginous Babbler	+	+	
	<i>Trichastoma rostratum</i>	White-chested Babbler	+		
Turdidae	<i>Copsychus saularis</i>	Oriental Magpie Robin	+		
Sylviidae	<i>Orthotomus ruficeps</i>	Ashy Tailorbird	+		
	<i>Prinia familiaris</i>	Bar-winged Prinia	+		
Muscicapidae	<i>Muscicapa dauurica</i>	Asian Brown Flycatcher	+		
Monarchidae	<i>Ficedula sp</i>	Flycatcher			+
	<i>Hypothymis azurea</i>	Black-naped Monarch	+		
Nectariniidae	<i>Arachnothera longirostra</i> P	Little Spiderhunter	+	+	
Dicaeidae	<i>Dicaeum sp</i>	Flowerpecker	+		
Dicruridae	<i>Dicrurus aeneus</i>	Bronzed Drongo	+		
	<i>Dicrurus paradiseus</i>	Greater Racquet-tailed Drongo	+	+	+
Corvidae	<i>Corvus enca</i>	Slender-billed Crow	+		
TOTAL			45	14	9

While Green broadbill is a common bird, it is often overlooked due to its behaviour, where it is often found stationary in the middle and high canopy and almost invisible (MacKinnon and Phillipps, 1993). For rapid bird censuses, however, transect line surveys are preferred to get an indication of species richness and abundance, since this method is less costly, less invasive, and less time-consuming (Arizaga et al., 2011).

As tropical landscapes become increasingly deforested, fragmented and human-dominated, riparian zones are becoming disproportionately important in connecting and harbouring populations of tropical forest organisms (Sekercioglu 2009). In South Sumatra, a bird survey was undertaken in Merang peat dome areas and Sembilang National Park (Goenner and Hasudungan, 2001, Iqbal, 2004, Waltert, 2008). Although surveys in riparian zones often result in low number of bird species, it is an important habitat that must be included in general biodiversity assessments. In this survey, we recorded three species Crested serpent eagle, Buffy fish owl and *Ficedula* flycatcher, that were not found elsewhere.

Birds are ideal subjects to assess an area for rapid biodiversity surveys, since they are the best known group of organisms in term of their taxonomy, biology, ecology, biogeography and conservation status (Herzog et al. 2011). Our studies in Bukit Puar suggest that the area is an important habitat for a range of bird species.

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First record of international trafficking of Critically Endangered long-beaked echidnas (*Zaglossus* sp.)

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ABSTRACT

The illegal wildlife trade is a major threat to an increasingly long list of species, and nowhere is this threat greater than in Southeast Asia. The demand for live animals from Southeast Asian countries for the exotic pet trade threatens a wide variety of species, including some already on the brink of extinction. Here we report on seizures made of the Critically Endangered western long-beaked echidna *Zaglossus bruijnii*, which took place in the Philippines in 2014. The animals originated from Indonesia where they are totally protected by law. Indonesia, however, remains a major source of illegally acquired wildlife for the international trade and it is imperative that actions is taken, nationally and internationally, to reduce current levels of illegal trade and ultimately to ensure species like the western long-beaked echidna are no longer threatened.

ABSTRAK

Perdagangan satwa ilegal merupakan ancaman utama yang memperpanjang daftar jenis yang terancam, bahkan tidak ada tempat lain dimanapun yang ancamannya melebihi Asia Tenggara. Permintaan terhadap satwa hidup dari berbagai negara Asia Tenggara sebagai hewan peliharaan eksotis mengancam jenis-jenis yang sangat bervariasi, termasuk jenis-jenis yang mengalami ancaman kepunahan. Pada tulisan ini kami memaparkan tindakan pencegahan perdagangan Ekidna-barat moncong-panjang *Zaglossus bruijnii* yang terjadi di Filipina pada tahun 2014. Satwa-satwa tersebut berasal dari Indonesia dimana spesies ini dilindungi penuh oleh peraturan yang berlaku. Indonesia, bagaimanapun juga merupakan sumber utama satwa liar ilegal yang diperdagangkan secara internasional dan sangat mengagumkan bahwa berbagai aksi telah dilakukan baik secara nasional maupun internasional, untuk mengurangitingkat perdagangan satwa liar saat ini dan terutaa sekali untuk meyakinkan bahwa jenis-jenis seperti Ekidna-barat moncong-panjang tidak lagi terancam.

Keywords CITES, echidna, Indonesia, monotreme, wildlife trade, *Zaglossus*

INTRODUCTION

Recently, there has been an apparent rise in the trade in short-beaked echidnas *Tachyglossus aculeatus* to supply international demand for exotic pets, and for zoos (Beastall and Shepherd, 2013). The trade in short-beaked echidnas is largely, if not completely, in violation of legislation in range countries, with some of the specimens being passed off as being commercially bred in captivity (Beastall and Shepherd, 2013) which is unlikely to be true. All animals entering the international trade appear to be sourced in Indonesia (Beastall and Shepherd,

2013), though short-beaked echidnas also occur in Australia and Papua New Guinea (PNG) (Aplin et al., 2016). Recently, there has been evidence of long-beaked echidnas *Zaglossus* species illegally entering the international trade as well.

Long-beaked echidnas are slow-moving, nocturnal monotremes that reach up to 75 cm in length, and weigh 5 to 10 kg (Leary et al., 2016a). Little is known of their life history, but it is presumed that they reproduce slowly, raising one young at a time, are long-lived (Leary et al. 2016a), and occur in low densities (Leary et al., 2016b). There are three species of long-beaked echidna in the genus *Zaglossus*, all of which occur in Indonesia (Table 1). One species, eastern long-beaked echidna *Zaglossus bartoni*, occurs in Papua New Guinea

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(PNG) as well, and one, western long-beaked echidna *Zaglossus bruijnii*, occurs in Australia, though it may now be extinct there (Leary et al., 2016b). Attenborough's echidna *Zaglossus attenboroughi* is known from a single specimen collected in 1961 from the Cyclops Mountains in the extreme north of Papua Province, Indonesia (Leary et al., 2016c).

Two species of long-beaked echidnas are assessed as being Critically Endangered, and one as Vulnerable (Table 1). All are vulnerable to hunting, with hunters using trained dogs to locate the otherwise extremely difficult to find animals (Leary et al., 2016b). Hunting is largely for local use, and local trade is limited (Leary et al., 2016a).

International trade

There appears to be very little international trade in long-beaked echidnas, legal or otherwise. All species of the genus *Zaglossus* were listed in Appendix II of CITES in 1977 (UNEP-WCMC, 2017), and according to the CITES Trade Database, a total of only six permitted transactions of live long-beaked echidnas have taken place since the time of their listing in 1977 to present (Table 2), comprising 13 individual animals. The animals were identified to a species level in only three of the cases, all being the Critically Endangered western long-beaked echidna *Zaglossus bruijnii*. In the remaining three cases, the species were identified to a genus level only. In only one of the cases was

Table 1. The four species of extant echidna, their range countries, and status as assessed by the IUCN Red List of Threatened Species (AU: Australia, ID: Indonesia, PNG: Papua New Guinea)

Species	Range countries	IUCN Red List status
Short-beaked echidna (<i>Tachyglossus aculeatus</i>)	ID, AU, PNG	Least Concern
Attenborough's echidna (<i>Zaglossus attenboroughi</i>)	ID	Critically Endangered
Eastern long-beaked echidna (<i>Zaglossus bartoni</i>)	ID, PNG	Vulnerable
Western long-beaked echidna (<i>Zaglossus bruijnii</i>)	ID, AU (possibly extinct in AU)	Critically Endangered

Table 2. International trade of live long-beaked echidnas (*Zaglossus* species) (1977-2017) as reported by CITES (AU – Australia, ID – Indonesia, GB – Great Britain (UK), GY – Guyana, NL – the Netherlands, TW – Taiwan, US – United States)

Year	Taxon	Importer	Exporter	Origin	Import quantity	Term	Purpose	Source
1981	<i>Zaglossus bruijnii</i>	GB	TW		1	live	T	
1985	<i>Zaglossus spp.</i>	NL	ID		1	live	S	
1985	<i>Zaglossus spp.</i>	US	GY		5	live	T	
1986	<i>Zaglossus bruijnii</i>	GB	US	PG	1	live		
1987	<i>Zaglossus spp.</i>	US	AU		2	live	Z	
1993	<i>Zaglossus bruijnii</i>	AU	GB		3	live	Z	W

the source identified, as being wild-caught (W), though it can be presumed that all came from the wild, as there is no known captive breeding of any of these species. While the exporting countries are listed in each case, it is unfortunate that in only one case, in 1986, the country of origin is listed – in this case Papua New Guinea (PNG), although Indonesia and Australia are listed as exporters in two of the cases respectively. Three of the countries for which no origin of the animals is named are not range countries. In five of the cases, the purpose of the trade is listed, with one being for science (S), two being for commercial trade (T) and two being for zoos (Z). Given that long-beaked echidnas are protected by law in all range countries, it is not known what provisions were used for wild capture and export?

Recently two seizures of the Critically Endangered western long-beaked echidna *Zaglossus bruijnii* were made in the Philippines in 2014. The first was made on 15 February 2014 at Lipata Port in Surigao City, Surigao del Norte Province, Mindanao Island, with three live western long-beaked echidnas along with other Indonesian wildlife being seized. The smuggled wildlife was transported by a van from Sarangani Province and were about to be loaded onto a ship en route to Manila when intercepted (Catoto, 2014). The second was made less than a week later on 21 February 2014 in mid-sea off the Municipality of Glan, Sarangani Province, Mindanao Island, with one live long-beaked echidna along with other Indonesian reptiles, mammals, and birds being seized (BMB-DENR, unpublished report). To the authors knowledge, these are the first records of long-beaked echidnas seized in the Philippines, or anywhere outside the range countries.

In the Philippines, the Wildlife Resources Conservation and Protection Act / Republic Act No. 9147 of 2001 accords legal protection to native and non-native wildlife. Section 27 of the Act prohibits the killing, maltreating, collecting, hunting, possessing, transporting, and trading of wildlife without permits from the Department of Environment and Natural Resources. Under this

Act, all the echidnas were seized by joint action by of the Department of Environment and Natural Resources, Philippine National Police, Philippine Coast Guard, and Philippine Ports Authority. The animals had been placed in plastic crates and wire cages and smuggled in by boat from Indonesia. The echidnas that were seized at the Lipata Port in Surigao City apparently escaped and the fate of the animal in Municipality of Glan is unknown, though it is thought to have died. The suspects involved in smuggling of the long-beaked echidnas and other Indonesian wildlife were charged in court for illegally possessing and transporting wildlife.

DISCUSSION

With the exception of marine species, most taxonomic groups studied so far are more threatened in Southeast Asia than anywhere else on Earth. Therefore, the Asian Species Action Partnership (ASAP) was established to develop and implement actions with the aim to prevent the extinction of any of the region's Critically Endangered species (Rao et al., 2014). Indonesia alone has 24 Critically Endangered mammals, more than any other country in the region. Illegal and unsustainable trade poses an immediate threat to many of the region's Critically Endangered species and urgent intervention is necessary. Unfortunately, the scale and seriousness of the illegal threat and the urgent need to intervene is often not recognized or adequately addressed (Rao et al., 2014).

Wildlife is frequently smuggled into the Philippines from Indonesia to meet demand there or to be trafficked on to other countries from there (eg. Shepherd, 2005). Indonesia is a major supplier of illegally-sourced wildlife, supplying the international demand for exotic pets with a wide variety of species (Nijman and Shepherd, 2009; Nijman et al., 2012). All species of long-beaked echidnas are protected by law in Indonesia, but as is the case with many other species protected in Indonesia, illegal collection, trade and international trafficking is a threat. Considering the limited existing knowledge about long-beaked echidnas,

and given that all three species are threatened, with two being Critically Endangered, investigations should be carried out to determine where they are captured, where they are sold and if the demand for echidna is on the rise? The identity of the species should be determined and recorded in all future seizures and registered in a database, so that data can be used to measure if these species are indeed subject to an increasing demand, following which appropriate actions can be taken.

RECOMMENDATIONS

The authors recommend that the central governments of Indonesia and the Philippines act to raise the profile of wildlife trafficking, especially within departments based at ports of entry and exit to the country, to enhance efforts to deter smuggling. The authors also suggest that the governments of both Indonesia and the Philippines increase collaborative efforts to reduce trafficking of wildlife between the two countries. The Philippines is encouraged to improve its facilities for holding and caring for seized wildlife, to prevent escapes and reduce mortalities. Finally, the authors suggest that all echidna range countries increase collaborative efforts to better understand the status and conservation needs of echidnas, and work together to prevent illegal exploitation.

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Fauna diversity recorded by camera traps in Bukit Tunku, Bukit Belading and Bukit Reban Kambing, Malaysia

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INTRODUCTION

Mount Ophir (Gunung Ledang) at Tangkak, Johor, West Malaysia, was gazetted as a Johor State Park on October 3rd, 2005 with a size of 8,611 hectares. Already in 1872, Alfred Russel Wallace journeyed to the area and recorded an impressive fauna diversity, including the now extinct in Peninsular Malaysia Sumatran rhinoceros (*Dicerorhinus sumatrensis*). On 2013, Madinah et al. recorded 17 species of mammals (10 families in three orders), 21 species of birds (15 families in five orders) and 12 species of anurans (5 families in one order) were recorded. For mammals, the most abundant species recorded was the Intermediate horseshoe bat, (*Rhinolophus affinis*), whereas for birds the highest species abundance was shared between Purple-naped sunbird (*Hypogramma hypogrammicum*) and Siberian blue robin (*Erithacus cyane*).

On March 2016, a “Johor Heritage” Expedition was setup by the Johor National Parks Corporation. The survey focused on three hilly areas, Bukit Tunku, Bukit Belading and Bukit Reban Kambing adjacent to Gunung Ledang National Park, Malaysia. The Johor State Authorities plan to gazette the area as part of Gunung Ledang State Park and rename it to the Royal Ledang State Park. Bukit Tunku, Bukit Belading and Bukit Reban Kambing constitute watersheds in the Tangkak landscape, but to date only a few biodiversity studies have been undertaken in the area. In

addition, wildlife monitoring constitutes part of the management obligations of this site and this study was undertaken to help form a fauna baseline for future monitoring and management activities. The main focus for the camera trap study was to, i) establish knowledge of the presence/absence of Flat-headed cat (*Prionailurus planiceps*) and, ii) document the diversity of fauna at the study site.

This is only the second fauna survey undertaken in the Gunung Ledang area.

METHODS

A total of nine (9) camera traps (Scoutguard 550-V, 560-P) were deployed at three different locations in Bukit Belading, Bukit Tunku and Bukit Reban Kambing area to detect the presence of Flat-headed cat (*Prionailurus planiceps*). Cameras were set at a height of 40-50 cm above the ground in areas with low risk of flooding. The location of camera traps was based on expected habitat suitability. Cameras were active 24/7 for a period of 155 consecutive days. Two events were considered “independent” if separated by 60 minutes intervals. Pictures were sorted and analysed using ReNamer, following the procedure described by Sanderson and Harris (2013) and Sanderson and Trolle (2005).

RESULTS AND CONCLUSION

A total of 1395 trap-nights produced a total number of 2626 events. Of these, 850 contained images of

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fauna, representing 407 independent events. This produced 26 vertebrate species from 18 families, including 9 birds and 3 reptiles species (Table 1). We did not record any Flat-headed cats. Our data suggest that common tree shrew (*Tupaia glis*) was the most dominant species, while Banded linsang (*Prionodon linsang*) and Masked palm civet (*Paguma larvata*) were the rarest. All species recorded are common in disturbed forest areas with most listed as Least Concern on the IUCN Red-list. Only the Pig-tailed macaque and Brown spiny rat are listed as Vulnerable.

We failed to detect any Flat-headed cat and other small cat species. This is symptomatic for areas



Figure 3. The masked palm civet, *Paguma larvata*, was one of the rarest species detected in the survey.

Table 1. Species recorded and number of pictures for each species. V=vulnerable, LC=least concern.

No.	Species	Common Name	# Pictures	IUCN Status
1	<i>Tupaia glis</i>	Common tree shrew	178	LC
2	<i>Chalcophaps indica</i>	Emerald dove	117	LC
3	<i>Sus scrofa</i>	Wild pig	72	LC
4	<i>Gallus gallus</i>	Red jungle fowl	67	LC
5	<i>Leopoldamys sabanus</i>	Long-tailed giant rat	57	LC
6	<i>Scincidae sp.</i>	Skink sp.	51	-
7	<i>Macaca fascicularis</i>	Long-tailed macaque	41	LC
8	<i>Tragulus kanchil</i>	Lesser mouse deer	41	LC
9	<i>Varanus salvator</i>	Asian water monitor	35	LC
10	<i>Maxomys rajah</i>	Brown spiny rat	29	V
11	<i>Macaca nemestrina</i>	Pig-tailed macaque	28	V
12	<i>Atherurus macrourus</i>	Brush-tailed porcupine	22	LC
13	<i>Callosiurus caniceps concolor</i>	Grey-bellied squirrel	21	LC
14	<i>Canis familiaris</i>	Domestic dog	16	-
15	<i>Varanus nebulosus</i>	Clouded monitor	14	LC
16	<i>Luscinia cyane</i>	Siberian blue robin	13	LC
17	<i>Unknown sp.</i>	Unknown Sp.	10	-
18	<i>Lariscus insignis</i>	Three-striped ground squirrel	10	LC
19	<i>Kittacincla malabarica</i>	White-rumped shama	9	LC
20	<i>Rallina fasciata</i>	Red-legged crane	6	LC
21	<i>Butorides striata</i>	Little Heron	3	LC
22	<i>Copsychus saularis</i>	Oriental-magpie robin	3	LC
23	<i>Centropus sinensis</i>	Greater coucal	3	LC
24	<i>Spilornis cheela</i>	Crested serpent eagle	2	LC
25	<i>Paguma larvata</i>	Masked palm civet	1	LC
26	<i>Prionodon linsang</i>	Banded linsang	1	LC

that have sustained human intrusion and habitat alteration. With the planned inclusion of the area in a wider protected areas network, there is hope that some of these rare elusive small predators will return to the area in the near future.

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Observations of Glossy Ibis *Plegadis falcinellus* in trade in bird markets in Java, Indonesia

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The Glossy Ibis *Plegadis falcinellus* is a small ibis, measuring 56-63 cm in height and weighing 500-800g, and is a dark bird with a striking bronze green tinge (Hancock *et al.*, 1992). The Glossy Ibis is the most widespread species of ibis and is found on all continents, with the exception of the Antarctic (Hancock *et al.*, 1992). In Indonesia, it breeds on Java and Sulawesi and is a visitor to Kalimantan, Flores, Sumba, Timor, Kai, Tanimbar, Halmahera, Ternate (Eaton *et al.*, 2016). While the Glossy Ibis may not be a large ibis species, it is considered a large bird in a cage-bird market. In Indonesia, a wide range of species, both protected and non-protected, are regularly observed openly for sale in bird markets in most major cities throughout the country (Shepherd *et al.*, 2004; Chng *et al.*, 2015; Chng and Eaton, 2016).

On 17 November 2017, a single Glossy Ibis was observed for sale in Jakarta's Pramuka bird market. The asking price was IDR 1.5 million (~USD 111). The bird was in its adult non-breeding plumage, not particularly dirty and its feathers were still intact and had retained their gloss, indicating - perhaps - that it had been captured recently. Another species of water bird, a Purple Swampphen *Porphyrio porphyrio*, was also present, together with two Ruddy Cuckoo-doves *Macropygia emiliana*, domestic cats, rabbits and chickens, and a few species of songbirds. Pramuka bird market is notorious for trade in illegal species, with reports

of blatant illegal trade being made for decades, yet enforcement efforts, and political will, have clearly been insufficient to stop illegal trade from taking place (Nash, 1993; Stengel *et al.*, 2011; Chng *et al.*, 2015).

The Glossy Ibis is protected in Indonesia under the Government Regulation (Peraturan Permerintah) No. 7, 1999 regarding the Preservation of Flora and Fauna Species. According to Act (Undang Undang) No. 5, 1990 concerning Conservation of Living Resources and their Ecosystems, any violation of the law carries a maximum penalty of five years in prison and / or a fine of up to IDR 100 million (~USD 7,400).

The Glossy Ibis is assessed as being of least concern (LC) by the IUCN Red List of Threatened Species (BirdLife International, 2016), and while the assessment states that Glossy Ibises are threatened by loss and degradation of their wetland habitats, pesticide use and hunting, trade in live birds for pets is not mentioned (BirdLife International, 2016). Systematic surveys have been carried out in Indonesia's bird markets for decades and this is the first record of a Glossy Ibis, indicating limited demand for this species to date (eg. Nash, 1993; Shepherd *et al.*, 2004; Chng *et al.*, 2015; Chng and Eaton, 2016). However, it is important to record the current observation and keep watch for further trade of this species in future surveys, as trends in trade can change quickly. Perhaps more importantly, this observation is important as the Glossy Ibis is protected by law in Indonesia, making the possession and trade of this species illegal. The authorities in Indonesia are encouraged to remain

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vigilant for this species, and other species illegally sold openly in Java's notorious bird markets. Future observations of Glossy Ibis in trade should be recorded and reported to the Natural Resources Conservation Agency (BKSDA), as the agency responsible for the enforcement of legislation protecting birds in Indonesia, under the Directorate General of Conservation of Natural Resources and Ecosystem (KSDAE). Those caught violating national legislation should be prosecuted to the full extent of the law, so as to serve as a deterrent to further illegal trade in birds, and markets where illegal trade persists should be closed.

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Proofs will be sent to authors as a portable document format (PDF) file attached to an e-mail note. PDF-readers can be downloaded free of charge from <http://www.adobe.com> and <http://www.nitropdf.com> for viewing PDF files. Corrected proofs should be returned to the Editor within 3 days of receipt. Minor corrections can be communicated by e-mail.

The Editorial Team also welcomes contributions to the other sections of the journal:

News

Concise reports (<300 words) on news of general interest to the study and conservation of Indonesia's natural history. News reports may include,

- Announcements of new initiatives; for example, the launch of new projects, conferences or funding opportunities.
- Announcements of important new reports or other publications related to Indonesian natural history.
- Summaries of important news from an authoritative published source; for example, new Indonesian species described in other journals, a new research technique, or a recent development in conservation.
- Summaries and analysis of new policies, decrees and laws relevant to the conservation of Indonesian natural history.

Letters to the Editor

Informative contributions (<650 words) in response to material published in the Journal.

Preparation of manuscripts

Full papers follow the style and format of papers published in the journal *Conservation Biology*. Authors should consult examples in *Conservation Biology* for guidance on general style.

Contributions should be in Bahasa Indonesia and/or UK English, double-spaced and in 'doc', 'rtf' or 'wpd' format, preferably as one file attached to one covering e-mail.

The cover page should contain;

The title and full mailing address, e-mail address and address of the Lead Author and all additional authors.

Contributing Papers should contain the following sections and be arranged in the following order: Abstract, Introduction, Methods, Results, Discussion, Acknowledgments, Literature Cited. Tables,

Figures and Plates (including legends), if included, should follow the Literature Cited.

All pages should be numbered consecutively. Do not number section headings or subheadings.

Title: This should be a succinct description of the work, in no more than 20 words.

Abstract: Abstracts should only be submitted for Full Papers. This should describe, in 100-300 words, the aims, methods, major findings and conclusions. It should be informative and intelligible without reference to the text, and should not contain any references or undefined abbreviations. Authors are encouraged to submit an English translation of Indonesian text and an Indonesian translation of an English text.

Keywords: From five to eight pertinent words, in alphabetical order.

Literature cited in text: Enclose citations in text in parentheses e.g. "Asian tapirs are no elephants when it comes to seed dispersal (Campos-Arceiz et al., 2011)."

Use an ampersand (&) between author surnames when the citation is parenthetical: (Traeholt & Idris, 2011).

When a citation is not parenthetical, use "and": "Our results agree with the predictions of Wolf and Rhymer (2001)."

For citations with more than two authors, use et al.: (Campos-Arceiz et al., 2011). Do not italicize et al.

List parenthetical citations in alphabetical order and chronologically from oldest to most recent and separate entries with a semicolon: (Campos-Arceiz et al., 2011; Geissman, 2009, 2010).

Separate the years with commas when citing multiple papers by the same author: (Corlett, 2007, 2010; Geissman, 1984, 1995, 1999, 2000).

"**In press**" means the cited paper has been accepted unconditionally for publication. Provide the year of publication in the text (Bird, 2010) and in Literature Cited section provide the volume number, and substitute "in press" for page numbers (Bird, I.M. 2010. Nesting success in arid lands. *Conservation Biology* 24: in press.).

Papers in review must be cited as unpublished and should not appear in the Literature Cited section.

Use an initial for the first (given) name and spell out the last name (surname) for other sources of unpublished data or information: (R. Fowler, unpublished data; M.E. Soulé, personal communication).

Software: capitalize the first letter only if the name of the program is a word (e.g., Vortex, ArcGIS). If the name of the program is not a word, use all capital letters (e.g., SAS).

The following are examples of Literature Cited house style:
Campos-Arceiz, A. and R.T. Corlett (2011). Big animals in a shrinking world—studying the ecological role of Asian megafauna as agents of seed dispersal. *Innovation* 10: 50–53.

Campos-Arciez, A., Larringa, A.R., Weerasinghe, U.R., Takatsuki, S.,

Pastorini, J., Leimgruber, P., Fernando, P. and L. Santamaria (2008). Behavior rather than diet mediates seasonal differences in seed dispersal by Asian elephants. *Ecology* 89: 2684–2691.

MacArthur, R.H. & Wilson, E.O. (1967). *The Theory of Island Biogeography*. Princeton University Press, Princeton, USA.

Sutherland, W.J. (ed.) (1998). *Conservation Science and Action*. Blackwell Science, Oxford, UK.

Beck, B.B., Rapaport, L.G. & Stanley Price, M.R. (1994). Reintroduction of captive-born animals. In *Creative Conservation: Interactive Management of Wild and Captive Animals* (eds P.J.S. Olney, G.M. Mace & A.T.C. Feistner), pp. 265-286. Chapman & Hall, London, UK.

Traeholt, C., Bonthoeun, R., Rawson, B., Samuth, M., Virak, C. and Sok Vuthin (2005). Status review of pileated gibbon, *Hylobates pileatus* and yellow-cheeked crested gibbon, *Nomascus gabriellae*, in Cambodia. *Fauna & Flora International*, Phnom Penh, Cambodia.

Sun H. (2000). Status of the tiger and its conservation in Cambodia. MSc thesis, University of Minnesota, Minneapolis, USA.

IUCN (2010). 2010 IUCN Red List of Threatened Species. [Http://www.redlist.org](http://www.redlist.org) [accessed 1 February 2011].

Biography: This should describe the main research interests of all authors (<150 words total), apart from what is obvious from the subject of the manuscript and the authors' affiliations.

Tables, figures and plates: These should be self-explanatory, each on a separate page and with an appropriate caption. Figures can be submitted in colour as well as in black and white. The Editorial Team may decide to convert coloured figures into black and white should it be necessary due to printing cost and without diluting the message. Plates (black and white only) will only be included in an article if they form part of evidence that is integral to the subject studied (e.g., a photograph of a rare species), if they are of good quality, and if they do not need to be printed in colour.

Appendices: Lengthy tables, and questionnaires are discouraged. In special circumstances these may be made available for viewing online.

Species names: The first time a species is mentioned, its scientific name should follow in parenthesis and in italics: e.g., Asian elephant (*Elephas maximus*). English names should be in lower case throughout except where they incorporate a proper name (e.g., Asian elephant, Cookson's wildebeest, long-billed vulture).

Abbreviations: Full expansion should be given at first mention in the text.

Units of measurement: Use metric units only for measurements of area, mass, height, etc.

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