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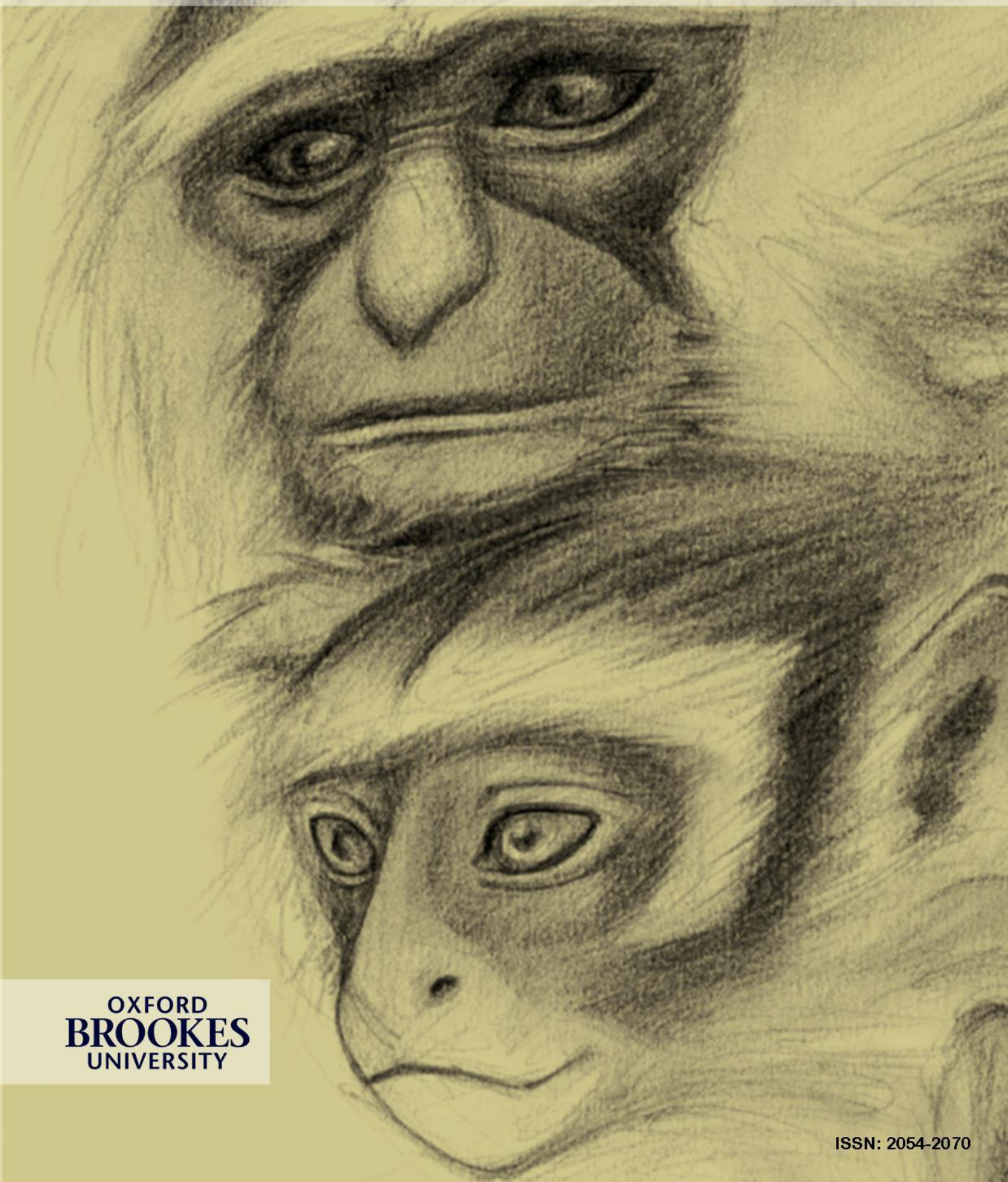

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Letter from the Editors

Welcome to the Spring 2018 edition of Canopy, the official journal of the MSc Primate Conservation and MRes in Primatology and Conservation courses at Oxford Brookes University.

The theme for this edition highlights methods utilising the web as a research tool for primate conservation. The internet has become an integral part of modern society communicating on a global scale contributing to both conservation threats and efforts. With conservation threats such as the illegal trade shifting to an online platform, conservation strategies to monitor and assess these threats have been developed in reaction. Social media is as a powerful tool to engage and share conservation messages and questionnaires to the public. It is also a platform for the science community to share data and knowledge through databases and research articles.

The articles chosen for this special issue show how diverse and in-depth web-based studies can be in furthering our conservation understanding. Online studies are not species restrictive as seen in this issue ranging from Great Apes, Neotropical primates to slow lorises. Nor is it subject restrictive for example reviewing a species representation in literature, ecology and guidelines for reintroduction.

We hope you enjoy reading the selected articles showing the research opportunities using web-based methodologies and the outcomes that can be achieved. We would like to thank all of the researchers who have contributed to this edition, as well as the organisations that have helped make their research possible.

All the best,

The editors
Kirsten Abbott, Grace Foreman, Chloe Chesney,
Ellesse Janda, Daniel Bergin and Magdalena Svensson

Letter from the Module Leader

Welcome to another issue of Canopy, the journal of the MSc in Primate Conservation and the MRes in Primatology and Conservation. The Internet and social media play a more and more integral part of our daily lives, how we communicate with each other, how we work and how we do business. It is firmly imbedded in how we teach and how we educate others and ourselves.

The Internet now connects over half the world's population, up from around 16% in 2005. In many primate range countries now about a third to half the people have access to the Internet, although these numbers are lower throughout much of Africa and parts of Southeast Asia. Much of this refers to access to mobile rather than fixed broadband. Affordability of broadband Internet is on the rise and it won't be long when truly most of the people in the world have the ability to connect with one another online.

Many of us are aware of the conservation costs of the Internet and the mobile devices that allow us access to it 24/7 – all one has to do is google 'gorilla and coltan' to get a feel. But the Internet also creates amazing opportunities to reach global audiences, to inform people one has never met (nor will ever meet), and to conduct research on topics that would have remain hidden otherwise. Databases, data gathering devices, and information services contain treasure troves of data and information that cries out to be analysed. While in the past tens of thousands transactions of trade in primates were piled up in the filing cabinets of customs officers or were stored on the computers of government officials –there for no one to see—now these data are freely available. All it takes is a few clicks on increasingly user-friendly interfaces. And then of course the more difficult task of putting it all in context and communicate it to the different audiences.

The editors of this issue of Canopy have made a good effort to select papers that have indeed made use of the Internet and social media to research primate conservation. I hope you enjoy reading them.

Prof Vincent Nijman
Module leader, Primate Conservation

Review on the linkages between great ape conservation and poverty alleviation: current trends and gaps in the literature

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The growth and expansion of human populations into forest habitats forces human and great apes to live in increasing proximity (Hockings & Humle, 2009). Under these circumstances, coexistence entails a myriad of inconveniences for both groups. In response, great apes have been reported to increasingly feed on agricultural crops (Hill & Wallace, 2012). The presence of large-bodied, potentially aggressive animals can pose risks for public health, and the loss of livestock and crops may decrease people's tolerance towards these animals (Campbell-Smith *et al.,* 2010). On numerous occasions, rural residents' have participated in retaliatory killings of wildlife and the reduction of wildlife's habitat through further expansion into forested areas (Nyhus *et al.,* 2005). On the other hand, all great ape species are considered protected, indicating local people may have no control over the presence of great apes impacting their livelihood (Gillingham & Lee, 2003). Considering this, the problem does not seem to be a mere competition over common resources, but a political conflict between rural populations and institutions (Treves *et al.,* 2006). The most common approaches that address integrated great ape conservation and poverty alleviation include:

• Tourism-revenue sharing programmes have been widely promoted as a source of funds for conservation and local development (Sandbrook & Roe, 2010). However, many authors voice their concerns about the health risk for endangered ape populations during the process of habituation (Woodford *et al*., 2002), the lack of sustainability reported in many case studies (Archabald & Naughton-Treves, 2001), and problems over the distribution of revenue and the actual impact of these initiatives on poverty alleviation (Spiteri & Nepal, 2006).

• Mitigation strategies are implemented with the intention of preventing or minimizing the costs that great ape conservation entails for local communities. The use of physical, visual, acoustic and chemical barriers or repellents as well as improving land use plans (e.g. the use of buffer zones or buffer crops) are the main methods addressed in the literature (Osborn & Hill, 2005; Hocking & Humle, 2009). As a last resort, translocation of the animal can be

considered (Osborn & Hill, 2005; Hockings & Humle, 2009). Education can play a very significant role by improving attitudes toward great apes and conservation, leading to a change in behaviour (Hockings & Humle, 2009).

• Compensation schemes have been developed to temper the financial losses incurred by wildlife. Nevertheless, the implementation of these measures has resulted in controversies over the targeted beneficiaries of compensation and the allocated amounts (Nyhus *et al.,* 2005).

• Reduced Emissions from Deforestation and forest Degradation (REDD) strategies can constitute a great source of revenue for local people and guarantee the conservation of the tropical forests. International communities can reduce the greenhouse gas emissions by paying landowners for managing forests in a sustainable way (Angelsen, 2009). Concerns, such as the lack of clarity over land tenure, should be addressed before widespread implementation takes place (Sandbrook & Roe, 2010).

• Incongruences over mandates and policy arrangements, along with the centralization of conservation management can lead to highly irresponsive measures (Ahebwa *et al.,* 2012). Conservationists can help to assess the actual effect of corruption on great ape conservation and poverty reduction (Smith & Walpole, 2005), and are considered a better voice to address claims than impoverished rural communities (Brockington, 2004).

In conclusion, and considering the dearth of funds for conservation and development programmes, new sustainable approaches that could supply funds should be carefully studied. The cooperation between biological and social sciences is advised to develop conservation measures that do not ignore social realities, and to develop strategies that are not detrimental for great ape conservation. These approaches also generate better attitudes among local residents and potentially influence behaviours towards conservation. The establishment of multi-stakeholder platforms can also constitute a good alternative to promote public discussion and cooperation.

Documenting, evaluating and monitoring interventions are critical steps towards any improvement. Both successful and failed projects should be closely analysed, and the results should be made available to the public. The standardization of evaluation methods would enable researchers to create comparative studies and make solid inferences based on experiences. This, along with predictive methods such as risk assessment or mapping, can be the key to adaptive management.

The impossibility of most conservation and development projects to provide short-term outcomes calls for a change in funding

dynamics. Long-term funding engagement would trigger long-term sustainable programmes with active local involvement in conservation management. In order to select programmes that are better informed and prepared, funding agencies should consider investing in preparatory studies, which would entail little expenditure but could immensely improve the programme's effectiveness.

Finally, further research on the role of governance, institutions and corruption should be done to assess the negative impacts that it may have on great ape conservation. Moreover, given that conservationists are better politically positioned than rural impoverished populations, they could more easily draw international attention to the detrimental effects of the poor governance and corruption that continuously coincides with great ape conservation and rural development.

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Media effect on pet crazes: slow lorises (*Nycticebus* spp.) on web 2.0 sites

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Pet owners create strong affective bonds with their animals, very often taking their pets as part of the family (Lago *et al*., 1988; Serpell, 1996), this is the surrogate function of companion animals. There is still a part of the population that buys pets for other reasons. One of them is the so-called projective function, concerning the selection of a specific animal as a token or statement about the owner's personal expression, for example Mike Tyson's pet tiger (Hergovich *et al*., 2011). A pet can serve as an accessory, like a car or clothes, that shapes the personality and the self-image that one wants to show. To some extent this process can be more or less intentional, knowing that a pet, specially an exotic one, denotes high economic status (Veevers, 1985).

The construction of personality and self-image is a complex process easily influenced by external cues. Media has a strong power on people's lifestyle and personal values (Hennig-Thurau *et al*., 2010): publicity, audiovisual materials, social media or celebrities have been reported to have an effect on people's body weight, intimate relationships, opinions and purchasing habits such as buying pets (Ross *et al*., 2011; Schroepfer *et al*., 2011). This urge for companion animals that become popular in the media has had fatal consequences (Malamud, 2010).

Animal stories are very popular in the media (Molloy, 2011) and they can make people more aware of species (Yong *et al*., 2011). Once an animal becomes a phenomenon, the demand often increases, and is reflected in its trade, both legal and illegal. The mere exposure to an animal in the media has been reported to increase its popularity, and when it is depicted in a human environment, the general public tends to think of the animal is a fit pet (Ross *et al*., 2011).

In recent years, slow lorises have become popular animals due to Internet videos in social video-sharing sites like YouTube. These

nocturnal primates are recorded as pets in anthropogenic settings and very often with human contact. Nekaris and colleagues (2013) studied the comments made by YouTube users on the first viral slow loris video "slow loris being tickled" first published in 2009. For this video, one out of five commenters found the animal "cute, adorable or funny". Slow lorises, due to their resemblance to the cute prototype (Figure 1), can raise caretaking attitudes in the audience. In this study I carried out with another viral video, "slow loris eating a rice ball", published in 2011, I found that cute is still the most commented aspect of the video (37 %). The number of people stating that they want one has diminished (6 %), and I found a large amount of users engaged in the "pet debate" where 6 % would defend the domestication of slow loris against the 11 % arguing against it.

The case of slow lorises is a complex one because the general public was unaware of the existence of these prosimians until the massive media attention that built perceptions exclusively based on the image portrayed in the videos. Social media has perpetuated the de-contextualization of slow lorises as cute pets. Conservation groups could use social media to turn the tables and

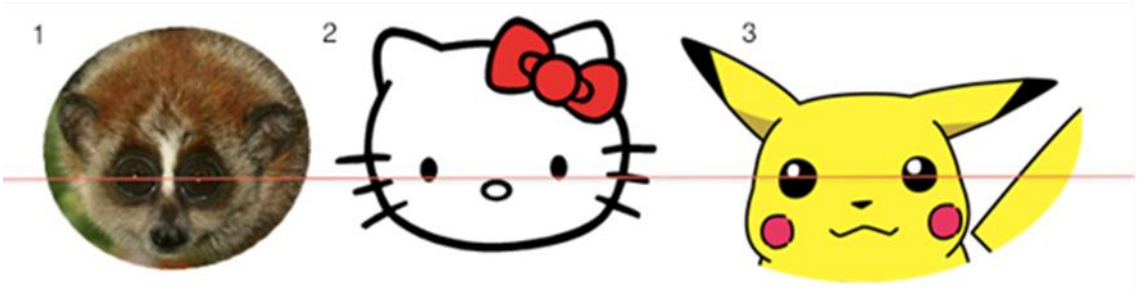

FIGURE 1 Traits of the cute prototype in the slow loris (*Nycticebus* spp.) (1), and Japanese cartoon characters Hello Kitty (2) and Pikachu (3). Slow lorises are portrayed as cute animals, reinforcing in the media the traits that unleash the cute-response. Compared to Hello Kitty and Pikachu we find big round heads in small chubby bodies. The face traits are the most characteristic with ears at similar positions of the head, with eyes in or below the middle line of the face and large foreheads.

send different messages, from anti-pet campaigns to simple promotional images of wild slow lorises. The damage done by the media effect is hardly removable and the perceptions are difficult to change. When animals become popular due to the media attention, it can be the best momentum to counteract the negative messages.

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Neotropical primates in protected areas

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As the ever-present question of how to meet global, national and local conservation targets, and following the guidelines in Le Saout *et al*. (2013) to assign responsibilities to increase the collective efforts of protected areas contribution preventing global species extinctions, I looked at the natural ranges of Neotropical primates (IUCN *et al*., 2008). The aim is to increase our understanding of how these primates are represented in the protected areas of their habitat countries, and to find conservation prospects and gaps in responsibilities that might need to be considered.

The geographic distribution of Neotropical primates was gathered from the IUCN web site (IUCN *et al*., 2008), and the intersection of the extent of occurrence within the protected areas of Neotropical countries included in the World Database on Protected Areas (IUCN & UNEP-WMCMC, 2014) were estimated. An analysis of comparison was undertaken to rank the extent of protection and responsibility that countries and protected areas have in the conservation and protection of wild Neotropical primate populations. Considering for analysis the number of primate species present and protected per country, percentage of primate distribution range per country and per protected area, and

IUCN red list category of species. This was done to pinpoint directions of conservation action at the national level and protected area level, as suggested to inform and guide actions that local and central authorities need to take in order to promote better nature conservation (Salafsky *et al*., 2002).

Out of 141 species of Neotropical primates listed in the IUCN red list database, 138 species were found to be present in 3813 protected areas distributed in 21 countries (in order of species richness: Brazil, Peru, Colombia, Bolivia, Ecuador, Venezuela, French Guyana, Guyana, Surinam, Panama, Argentina, Paraguay, Costa Rica, Honduras, Mexico, Nicaragua, Belize, Trinidad & Tobago, Salvador, and Uruguay). In the Neotropics, 97% of species range somewhat within protected areas, with an average of 30% of the primate range falling within protected area (Figure 1). Considering the IUCN criteria of threat, 59 species, or 42% of total primate species living in the Neotropics are classified under a threatened category (Critically Endangered (CR), Endangered (EN), or Vulnerable (VU)) and a further nine species are data deficient.

The total ranging area and ranging area within protected areas of Neotropical primates showed a high correlation (0.92), but very low correlations between either to the percentage of ranging area within protected areas. As shown in Table 1, ranging area showed two orders of magnitude in variation, from 300km^2 in the black- faced lion tamarind, *Leontopithecus caissara* to 3,604,054 km^2 in the common squirrel monkey, Saimiri sciureus, with a mean of 480,136 km^2. Ranging areas inside protected areas were on average 164,841 km^2, ranging from 40 km^2 in the hernandez-camacho night monkey, *Aotus jorgehernadezi*, to 1,467,655 km^2 in the common squirrel monkey. Protected areas were found to cover 1% to 85% of Neotropical primate species range.

FIGURE 1 Distribution of Neotropical primates.

Five countries (Brazil, Colombia, Bolivia, Peru and Venezuela) appear to have endemic species, of which Bolivia, Brazil and Colombia each having one species outside any protected area. These three species, whose range doesn't overlap with established protected areas, are the ayres black uacari, *Cacajao*

ayresi (endemic to Brazil), caqueta titi monkey, *Callicebus caquetensis* (endemic to Colombia) and olalla brothers' titi monkey, *Callicebus olallae* (endemic to Bolivia).

Not necessarily comparable but protected area cover of Neotropical primate ranges (30%) is higher than protected area cover in ecoregions worldwide (12%), but lower than some ecoregions in central Amazonia, which can reach more than 50% of cover under protection (Secretariat of the Convention on Biological Diversity, 2006). Despite a somewhat high average in protected area coverage of the Neotropical primate species ranges, what is clear about the data is that immediate resources and agreements would need to be taken on the three endemic species outside any protected area such as the *Cacajao ayresi* (endemic to Brazil), *Callicebus caquetensis* (endemic to Colombia) and *Callicebus olallae* (endemic to Bolivia).

TABLE 1 Descriptive statistics of Neotropical primate ranges and their covering within protected areas, n=138 species.

	Range Area (Km^2)	Area in Protected Areas (Km^2)	% area in Protected Areas
Mean	480,136	164,841	30%
Min	300	40	1%
Max	3'604,054	1'467,655	85%
Median	174,853	45,145	30%
SD	687,759	256,603	18%

The conservation strategy for the ayres black uacari, is to involve local communities, and establishing a conservation mosaic of protected areas managed in part with the traditional 'piassabeiros' who impose a seasonal hunting threat in the flooded forest of the species habitat where they exploit fiber from palms occurring in this habitat (Boubli & Veiga, 2008).

Already in the description of caqueta titi monkey (Defler *et al*., 2010) the urgency of requiring protected areas or other conservation strategies to help this critically endangered small-ranged species amid a heavily fragmented and fragmenting landscape has been identified. As the range area of this species is between two national parks, efforts are being undertaken to link them through corridors along the river networks of the area that include the range of caqueta titi monkey (J, Garcia, pers. comm.).

As for the Olalla brothers' titi monkey, three conservation programs working at a regional landscape level are being developed involving Conservation International, Wildlife Conservation Society and the Asociacion Boliviana para la Conservacion (Veiga *et al*., 2008). It has also been noted that the species is hunted as bait for fishing and cat hunting, and there are concerns they are under competition threats from Saimiri. The species is under protection of two municipal reserves, which are not included in the World Database of Protected Areas because they are not under national management (J. Martines, Pers. Comm.).

The countries with the highest biodiversity of primates, such as the top four Brazil, Peru, Colombia, and Bolivia, are also high biodiversity countries overall, but are also the ones with species still outside protected areas and with the gross amount of primate species under a threat category. Indicating the cost of keeping protected areas or species safe, must be increased dramatically as the number of species exceeds a threshold.

There is a difference in effort in protected area-primates at a national level. Two neighbouring countries seemed to be opposites in this respect: Guyana and French Guyana. Where French Guyana leads in primate protection protecting on average 50% of their primate ranges in 27 protected areas, while Guyana, is second last with an average percentage protection of 10% and 5 protected areas in two countries with the same number of species but twice the difference in size (83,534 km^2 and 214,970 km^2 respectively). Then, if the strategy of increasing protected areas worldwide to 17% by 2020 (Secretariat of the Convention on Biological Diversity, 2010), Paraguay, Guyana, Uruguay, Salvador and Suriname would top the list of countries to consider increasing the protected area coverage of primate habitat in their territory

There seems to be a straightforward conservation target achievement in increasing protected area coverage percentage on all world ecosystems, but the questions that is evident is the quantity-quality question. Despite the increment in protected areas are they conserving what they say they are? Are they really being effective, or just glorified by the Convention on Biological Diversity because it is an easy indicator to measure and in tune with the basic idea of titling the land. A review of the action plans and management activities of protected areas must also be considered.

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Implementing best practice guidelines: a preliminary study on the need for orangutan-specific guidelines for rehabilitation and re-introduction centres in Indonesia

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Wildlife rehabilitation involves taking animals who have been orphaned, injured, rescued from human homes, sick, or displaced, and encourages the development of normal behaviours in order to live healthy lives, ideally back in the wild (Guy *et al*., 2013). Unfortunately, in some cases, animals taken in by rehabilitation centres may never be re-introduced into the wild due to the severity of their injuries or their behavioural abnormalities from a lack of exposure to wild conspecifics (Lopresti-Goodman *et al.,* 2013).

Primate rehabilitation and re-introduction (R&R) centres have increased in numbers due to human expansion into primate habitats and habitat degradation, creating negative interactions with humans resulting in direct harm through hunting pressures, bushmeat trade, and the live pet trade (Ferrie *et al*., 2013). A large number of infant and juvenile apes residing in rehabilitation centres have been confiscated from the pet trade or donated from owners or traders (Nijman, 2017). The process of obtaining an ape at an age deemed profitable typically involves removing it from the mother, which is predominately done through killing the mother and, depending on the species, many other group members as well (Peterson, 2003). For orangutans specifically, recent studies have estimated at least 260 Bornean orangutans and 180 Sumatran orangutans have been formally confiscated and brought to R&R centres from 1993-2016 (Nijman, 2017). Formal confiscation refers to the seizing of orangutans by authorities and does not include the hundreds of orangutans "donated" by traders and owners, who were allowed to voluntarily give their orangutans to the authorities before formal confiscation (Nijman, 2017).

Fortunately, for primates rescued, confiscated, or donated, the majority of rehabilitation centres provide the care and treatment they need to maintain their welfare and potentially re-introduce them back into the wild. But, unlike other common mammal species residing in rehabilitation centres, primates present a unique challenge to R&R practitioners. Due to their complex social

structures, behaviours, cognitive abilities, and their long maternal dependency (Gijsbertus *et al.,* 2006), the overall likelihood of a successful R&R remains low (Russon *et al.,* 2016). Orangutans typically spend around seven to eleven years with their mothers before separating completely (Russon *et al.,* 2016), and since 63-97% of centre intakes are under the age of seven (Russon, 2009), those residing in R&R centres have learned very little skills in order to survive in the wild.

Because of the numerous challenges associated with rehabilitating and re-introducing orangutans, centres should be working within the frame of guidelines best suited for the species they are rehabilitating and planning re-introductions for. Without guidelines that are relevant to a species and their current conservation status, centres may be less likely to comply with recommended guidelines due to their lack of detailed information regarding the species in their care.

In 2007, the International Union for the Conservation of Nature (IUCN) in collaboration with The Primate Specialist Group and multiple great ape experts and R&R practitioners, published Best Practice Guidelines for the Re-Introduction of Great Apes (Beck *et al*., 2007). Within the document, editors focused predominately on basic information relating to the general re-introduction of all species of great apes including preparation and planning, disease risk, transport and release strategies, post-release monitoring, and translocation.

While the guidelines mention orangutan R&R, there exists no orangutan-specific case-studies throughout the document, and lacks editors that are involved directly with orangutan R&R. As a result, this may limit the ways in which practitioners can relate to and take from the guidelines.

The importance of following guidelines throughout the entire process is stressed by multiple studies assessing overall success rates of primate R&R programs (Cheyne, 2009; Russon *et al.,* 2016). It is understood that the purpose of the guidelines was not to provide a list of 'how to' perform certain practices, with its main purpose to provide all considerations when planning and practicing great ape re-introductions. But great ape rehabilitation is unique, and without proper standards practiced by centres, the potential success of the individuals re-introduced may decrease. Again, while the document is not a guide on 'how to' rehabilitate great apes, ten years later there are still very little 'how to' guidelines for practitioners to use based on species-specific knowledge.

Thus, for this study I aimed to determine 1) the applicability of the IUCN Best Practice Guidelines for the Re-Introduction of Great Apes (Beck *et al*., 2007) to orangutan R&R and 2) the potential need for orangutan-specific updates to the guidelines to make them more

applicable and relevant to orangutan R&R and the current status of their forest homes.

Questionnaires were developed in order to obtain knowledge and opinions from orangutan R&R practitioners currently practicing at centres in Indonesia, and some in Malaysia. Each question was derived from the sections that were covered in the IUCN guideline including: behavioural assessments, genetic analyses, assessment of release sites, and post-release monitoring practices. Additionally, practitioners were asked to provide their opinions on the sufficiency of information regarding orangutan R&R, whether the guidelines help implement Indonesia's Strategy and Action Plan for National Conservation of Orangutans 2007-2017 (Orangutan Indonesia Conservation Strategies and Action Plan, 2009), and their suggestions and/or changes if a new set of guidelines were developed.

The questionnaire was delivered via email to five orangutan R&R centres in both Indonesia and Malaysia. Additionally, questionnaires were delivered to attendees of the 2017 Orangutan Veterinary Advisory Meeting in Yogyakarta, Java.

Answers from the questionnaire were coded and placed into multiple categories depending on themes found within each answer (Newing, 2011). Because of the small sample size of questionnaires obtained from practitioners, it was only possible to analyse data through descriptive statistics (i.e. percentages of practitioners in each category and the representation of this data as simple figures).

In total, questionnaires were completed by 17 participants from nine identified orangutan R&R centres, one zoo, and three unidentified institutions. Of the identified institutions, nine were located in Borneo, Indonesia, one located in Sumatra, Indonesia, two in Borneo, Malaysia, and one zoo in Singapore. The majority of participants who gave their position, 11 out of 17, were orangutan vets. Two participants were directors, one a wildlife officer, and the remaining three did not give their position.

Out of the five centres that were emailed, two responded with completed questionnaires. The two that did respond were the individuals that were emailed, and were not passed onto other practitioners at the centres. The response rate for centres emailed was 40%. The bulk of the completed questionnaires were filled out from OVAG meeting attendees.

When asked whether participants believed there was a sufficient amount of orangutan-specific information throughout the current guidelines, eight out of the 17 participants indicated that they felt there is either no information about orangutans at all, that some information is lacking, or that the guidelines seemed to be dominated by chimpanzee and gorilla R&R best practices. Additionally, one participants expressed the

opinion that the guidelines do not reflect the current situation in Indonesia, therefore making some information inapplicable to orangutan R&R. Another suggested that the guidelines only painted a general picture of R&R, but lacked technical methods for re-introductions. Six out of 17 participants replied with “yes”. Out of the 17 participants, five believed that the current guidelines enabled centres to carry out the Indonesian government action plan for orangutan conservation.

One participant said that while they think the guidelines do help implement the action plan, organizations and groups running the centres are responsible for doing this with little involvement of the government or authorities. Seven participants responded with various forms of “no”, including responses expressing that it was “generally accepted that the action plan was unrealistic” and that they “follow the IUCN guidelines, not the action plan”.

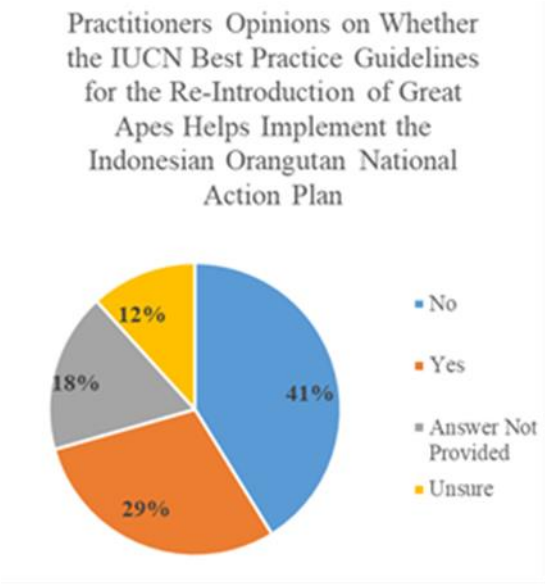

FIGURE 2 Percentages of 17 practitioner answers to whether they believe the IUCN Best Practice Guidelines for the Re-Introduction of Great Apes helps implement the Indonesian Orangutan Action Plan 2007-2017.

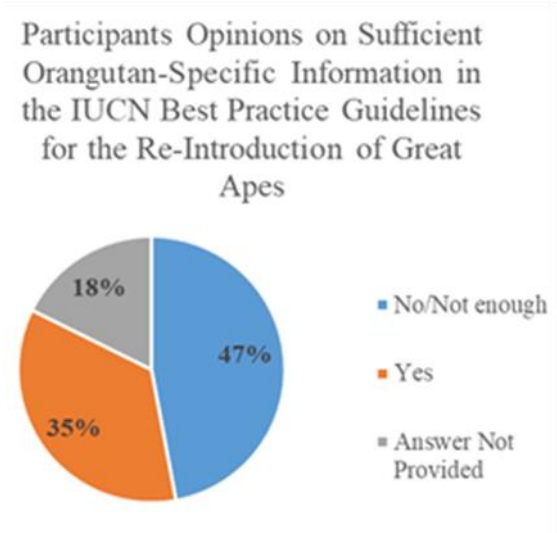

FIGURE 1 Percentages of 17 practitioners answers to whether they believe the IUCN Best Practice Guidelines for the Re-Introduction of Great Apes contains a sufficient amount of orangutan-specific information applicable to orangutan rehabilitation and re-introduction.

The final question asked participants to provide their top two additions and/or changes they would make if new best practice guidelines for great apes were written in the future.

Out of the 17 questionnaires completed, 14 participants provided answers. Answers were placed into 11 separate categories: behaviour, diet, disease, genetics, habitat protection, policy/protocol, population analysis, post-release monitoring, re-introduction, results of re-introductions, and a general need for more orangutan-specific information or a separate guideline entirely.

Out of the 11 categories, the three most suggested additions and/or changes fell into three categories: policy/protocol, post-release monitoring, and a general need for more orangutan specific information or a separate guideline entirely, all with 4 counts.

Orangutan R&R centres should ideally be complying with recommended practices developed by the IUCN (Beck *et al*., 2007), while additionally looking to the Indonesian action plan for orangutan conservation (Orangutan Indonesia Conservation Strategies and Action Plan, 2009) to produce the best results from re-introductions to help secure a future for wild orangutan populations. While these two governing bodies should be providing practices and conservation recommendations all R&R centres feel are appropriate for orangutans, this project indicated that the majority of practitioners feel otherwise. A lack of relevant guidelines for orangutan R&R is concerning, not only because of the potential R&R has to increase wild orangutan populations if practiced correctly under the right circumstances (Utami-Atmoko *et al*., 2017), but because it is hard to know what guidelines centres are following if they feel the IUCN guidelines are not applicable. This does not mean to assume that centres are following no standard procedure for R&R, but rather shed light on the importance and need for an official guideline relevant to a Critically Endangered species highly prevalent in R&R centres.

The lack of guidelines or standards specific to certain species found in R&R centres has been a voiced concern of wildlife R&R practitioners in different parts of the world (Dubois &

Fraser, 2003). For example, those rehabilitating species in South Africa wish to have their field become more professional through minimum R&R standards and guideline enforcement, but have expressed that a lack of communication between practitioners is a main obstacle in achieving their goal (Wimberger *et al*., 2010). Communicating with others is crucial in developing guidelines in order to learn successful practices and to avoid previous mistakes. Without relying on various sources and experienced practitioners to develop species-specific guidelines, they stand a chance to be general, vague, or inapplicable to centres/institutions, resulting in low guideline compliance.

Even though the results from this study show that the majority of participants believed there is little orangutan-specific information within the guidelines, a study by Wimberger *et al* (2010) indicated that some wildlife R&R practitioners believe guidelines to be of little use. Within 65% of the known wildlife R&R centres in South Africa, 17% of practitioners expressed that they saw little benefit to guidelines because the knowledge was already there, as well as stating the concern about who establishes such guidelines (Wimberger *et al*., 2010). These are important points to discuss when considering potentially updating guidelines for orangutans. Although practitioners may believe the guidelines lack orangutan R&R information, what is the likelihood that they will look to it for guidance? Has orangutan R&R been going on long enough that practitioners and centres feel they would no longer benefit from the information provided within an updated guideline? Because orangutan R&R is ever changing, along with the status of Indonesian forests, delaying the development of such guidelines because of these reasons is a moot point. With a continued influx of orphaned or injured orangutans taking up residence at orangutan R&R centres, it is arguably now more important than ever to increase guideline compliance by creating one specifically aimed at orangutans, developed by experienced orangutan R&R practitioners.

For primates, there currently only exists three species-specific guidelines that have been published and are accessible through online sources: Proposed guidelines for in situ gibbon rescue, rehabilitation and reintroduction (Cheyne *et al*., 2012), the IUCN Best Practice for the Rehabilitation and Translocation of Gibbons (Campbell *et al*., 2015), and the Guidelines for the Rehabilitation and Release of Vervet Monkeys (Guy & Curnoe, 2013). The three guidelines contain more detailed information regarding all phases of primate R&R than either the IUCN Guidelines for Nonhuman Primate Re-introductions (Baker, 2002) or the IUCN Best Practice Guidelines for the Re-Introduction of Great Apes (Beck *et al.,* 2007). Like the population status of many gibbons, both species of orangutans are

Critically Endangered and facing increasing threats from agricultural development and negative human interactions. The continued existence of orangutans in R&R centres is an undeniable reality and because of this, it is crucial that they be rehabilitated and re-introduced in ways applicable to them and relevant to the status of their habitats. The results from this project, while gathered from a small sample size, have indicated that the majority of practitioners from nine orangutan R&R centres in both Indonesia and Malaysia do not believe the IUCN guidelines hold enough information that can be used to rehabilitate and re-introduce the hundreds of orangutans held in centres. Because of this, it is ultimately recommended that there be further research in order to begin the process of developing proposed best practice guidelines for the rehabilitation and re-introduction of orangutans.

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Culture shock in volunteer tourists

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Culture shock has long been a problem facing international volunteers. Culture shock can lead to anxiety, depression, and early returns from the volunteer program (Bock, 1970; Furham & Bochner, 1986; Mumford, 2000). There are six agreed-upon aspects of culture shock: 1) The strain caused by attempted psychological adaptations, 2) Feelings of loss concerning friends, socio-cultural status, belongings, and profession, 3) Cases of one-sided, or mutual, rejection of/by members of the new culture, 4) Confusion in role and role expectations, values and personal identity, 5) Surprise, anxiety, disgust and indignation at cultural differences that were previously unknown, 6) Feelings of impotence at ones inability to cope (Furham & Bochner, 1986).

The term 'culture shock' was originally given by Kalervo Oberg during his observations of American expatriates. It has since grown to be a well studied field. There is said to be a "U curve of culture shock" which includes the stages an individual might go through during culture shock including: euphoria, disillusionment, hostility, adaptation, and finally, assimilation (Mumford, 2000; Hottola, 2004).

Culture shock is more likely the more cultural distance there is between the home and the host country (Mumford, 2000). Cultural distance is described as the scale of dissimilarity between two cultures; the more pronounced the dissimilarities the greater the likelihood for culture shock to occur (Furnham & Bochner, 1986). In countries with greater differences in living conditions, food culture, environment and language from the visitors home country the cases of culture shock were seen to be much greater, according to a study conducted by Mumford (2000) on international volunteers.

However, according to Hottola (2004) environment differences, referred to as 'environmental shock' by Furnham & Bochner (1986), should not be a factor to culture shock

as the human body is capable of adjusting to drastically different climates in a relatively short amount of time. What is seen as the most important causes of culture shock related to cultural distance is the anxieties that accompany a new environment in which the visitor can no longer rely on personal knowledge, learned social cues, or culturally relative predictors to cope in social situations (Mumford, 2000; Hottola, 2004). This can create confusion, frustration and high anxiety when the social situations faced are completely out of the control of the visitor (Bock, 1970). When anxieties, frustration, and depression overwhelm the visitor the visitor may abandon their trip.

A survey was distributed which consisted of 35 questions, 4 of which were open-ended response questions. The questions focused on volunteer experience, motivation, and prior experience with exotic animals. The survey was created using Survey Monkey.

The survey was online from April 6th, 2015 until June 29th, 2015 in which time it gained 147 total responses. This online survey took inspiration from Carvalho-Junior & Schmidt's (2006) study.

Culture shock in volunteers was calculated through the open-ended response question "What was the most difficult thing to adjust to when you first arrived?" in which the responses were categorised into 9 categories. Each response could belong to multiple categories. The categories were: 'Accommodation', 'animal-specific culture shock', 'climate', 'culture shock', 'language barrier', 'other volunteers', 'physical demands of work', and 'staff '. The most frequently encountered problem by volunteers was adjustment to the climate, 34.95% of volunteers said that they had some sort of problem adjusting to the climate. The next most frequently encountered problem was what the volunteers called 'culture shock,' which was the term many of them gave, so it is unable to be determined exactly which type of culture shock, though where it could be decided, the responses were categorised again. Animal specific culture shock was quite common (10.68%, half of all responses originally categorised as 'culture shock') as the participants stated that they had been unprepared for how animals, both domestic and wild, were treated and/or viewed by the local people.

By using the Survey Monkey text analysis the top four words that were used most frequently when the participants were asked to describe the most difficult thing they encountered were: climate (14.56%; 15 occurrences), animals (12.62%; 13 occurrences), heat (12.62%; 13 occurrences), humidity (13.62%; 13 occurrences).

There are several ways to combat culture shock including pre-departure readings on the culture in which the volunteer will be attempting to integrate, structured cultural

training programs, briefing seminars, or a 'cultural friend' (Furnham & Bochner, 1986; Mumford, 2000; Hottola, 2004). 'Cultural friends' are suggested by Furnham & Bochner (1986) as a person who is intimately familiar with the culture that the visitor is attempting to integrate into or cope with being immersed in, who leads the visitor through the transition, being there in real time to help explain and interpret any cultural differences or misunderstandings.

Another step that could be implemented that, through survey responses, could ease the cultural transition as well as managing expectations would be providing substantial reading material to volunteers ample time before they depart. It would be beneficial to the volunteers to have packets that not only give them an introduction to the culture, but also to the language, and any differences that may be shocking to westerners going to a foreign part of the globe for the first time. Things that were most commonly listed as 'difficult to adjust to' were: bathrooms, language barrier, how animals are housed, and how animals were viewed in the local culture (ex. exotics as pets, treatment of domestic species). By promoting cultural relativism before the volunteers arrive it can help ease culture shock and the idea of ethnocentricity that is deeply imbedded in many societies. By providing the titles of novels that may explore the local culture or be written from the perspective of someone within that culture the barriers that separate the volunteers and the locals could begin to be lowered.

This could lead to a more positive exchange between the tourists and the local people. If this began to occur then the problem with tourists entering a destination and having the locals act only as 'servants' in the tourisms industry could be abolished and the path to the tourists seeing the local people as equals. This could also lead to help further fulfil certain volunteer tourist motivations as determined by Wearing (2013): cultural immersion, making a difference, and seeking camaraderie.

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Familiarity breeds contempt: does the literature on the long-tailed macaque (*Macaca fascicularis*) reflect its true value?

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The long-tailed macaque (*Macaca fascicularis*) is a cercopithecine monkey found throughout SE Asia. It is a populous species that lives commensally with humans (Ong & Richardson 2008); and is known for its adaptable behaviour in different habitats; its use of stone tools (Gumert *et al.,* 2013) and for its gregarious if antisocial behaviour at tourist locations (Fuentes *et al.,* 2007). There is however, a darker side to this monkey's coexistence with humans as it is the most heavily-traded species of live mammal listed on the UNEP-WCMC CITES database (UNEP-WCM, 2017). This is largely due to the long-tailed macaque being one of the most widely used non-human primate for biomedical research and as such is commercially bred, factory farmed and harvested from the wild to supply global laboratory demands (SSN, 2016).

Eudey (2008) observed that while the long-tailed macaque is widespread in SE Asia, population numbers were rapidly declining; so much so that in some areas populations have been extirpated (Molur *et al.,* 2003). This situation is the result of numerous pressures on this species; habitat loss, the culling of large numbers of these animals as pests and the extensive, often illegal harvesting have been flagged as potentially unsustainable (Eudey, 2008; SSN, 2016) and assumptions based on this being a 'common' species and capable of adapting to survive these multiple pressures are being questioned.

The long-tailed macaque is currently listed as Least Concern under the IUCN Red List of Threatened Species reflecting "an ongoing debate that concerns the listing of small and stable versus large but declining populations" (Mace *et al.,* 2008) and inevitably affords common species less protection than rare ones, despite their potentially significant role in ecosystem function (Gaston, 2008). Being a 'common' species with a large population and range, its declining numbers are not severe enough to meet higher level criteria, despite the fact that of the ten subspecies, two are listed as Vulnerable; one Near Threatened, six are Data Deficient, and population estimates are very vague. This suggests a questionable level of information to base management and conservation policy on.

This study aimed to investigate the literature on the conservation ecology of the long-tailed macaque and how it relates to the commercial trade of these monkeys, if at all. Two online literature searches were used; the primary search utilised Google Scholar as it is open source and produces a relatively comprehensive coverage of papers (Meijjard *et al.,* 2015); this was supplemented by any additional papers found on the Web of Science database, the research then focussed on:

• Categorising the literature by study focus; country of origin and date of research.

• Determining the export/import figures for live trade in long-tailed macaques by querying the UNEP-WCMC CITES database.

• Comparison of the literature for the long-tailed macaque with other comparable species.

• Identifying potential correlations that might reveal drivers and useful conservation tools.

Initial queries of the Google Scholar database (Any time) revealed approximately 66,300 papers on Google Scholar which, with crude filters to exclude captive animals and medical papers reduced to 9,600. Similar searches for the other *Macaca* spp; the mammals from the 100 most invasive species and the 10 rarest species were run to gain comparisons. The long-tailed macaque generated the second highest number of papers after filters were applied of the macaque genus, after the rhesus macaque another medical model, which had roughly twice as many papers at 17,300, while the species not used for research had far less representation. Comparisons with other SE Asian primate genera revealed that the macaques used in research were again disproportionately reported on, the Bornean Orangutan (*Pongo pygmaeus*) alone generating a similar number of filtered publications at 8,100. Comparisons with the 10 rarest mammals were revealing, the Javan Rhino (*Rhinoceros sondaicus*) and Sumatran Rhinos (*Dicerorhinus sumatrensis*) had the most publications with 947 and 980 respectively, a tenth of the long-tailed macaque. This was in sharp contrast with the invasive species, where the long-tailed macaque came only 9th out 14 species. The most published species was the house mouse (*Mus musculus*), which had four times as many papers as the long-tailed macaque with 40,800 papers, closely followed by the wild boar or pig (*Sus scrofa*), with 36,500. Most of these invasive animals were animals with commercial value, many of which have tendencies to turn feral following human introductions, both features that generate interest and research.

Of the initial 66,300 publications generated, a manual sort excluded the remaining captive and medical papers, leaving 594 papers related to conservation biology and representing less than 1% of the original

papers a finding in line with Sussman *et al*. (2011). The types of studies and place of research varied greatly and are dominated by work carried out in Indonesia and to a lesser extent Malaysia (Figure 1), while the majority of the publications are of Ecological studies followed by General surveys.

The trade figures for live long-tailed macaques reveal a continuous though uneven growth in exports from the late 1970s (reflecting changing trade of rhesus macaque), increasing greatly around 2003 and peaking at more than 60,000 in 2008. Total global exports during the survey period were just under one million individual animals. This includes approximately a quarter of a million animals exported from China (UNEP-WMDC CITES database accessed at the same time). China therefore accounts for approximately a quarter of the global exports and with borders on to Laos DPR, Myanmar and Viet Nam, is highly influential. Of the home range countries five regularly exported live long-tailed macaques during the period: Viet Nam, 92210; Cambodia, 82732; Indonesia, 39310; Laos DPR, 34,255 and Philippines, 28,379 (records for Cambodia and Laos PDR only starting in 2003, while Myanmar has one record of exports: 8,000 animals in 2006). It should be remembered that these are the declared and therefore legal trade figures and do not include any illegal trade, estimates of which suggest the numbers could be considerably higher (Nijman, 2010).

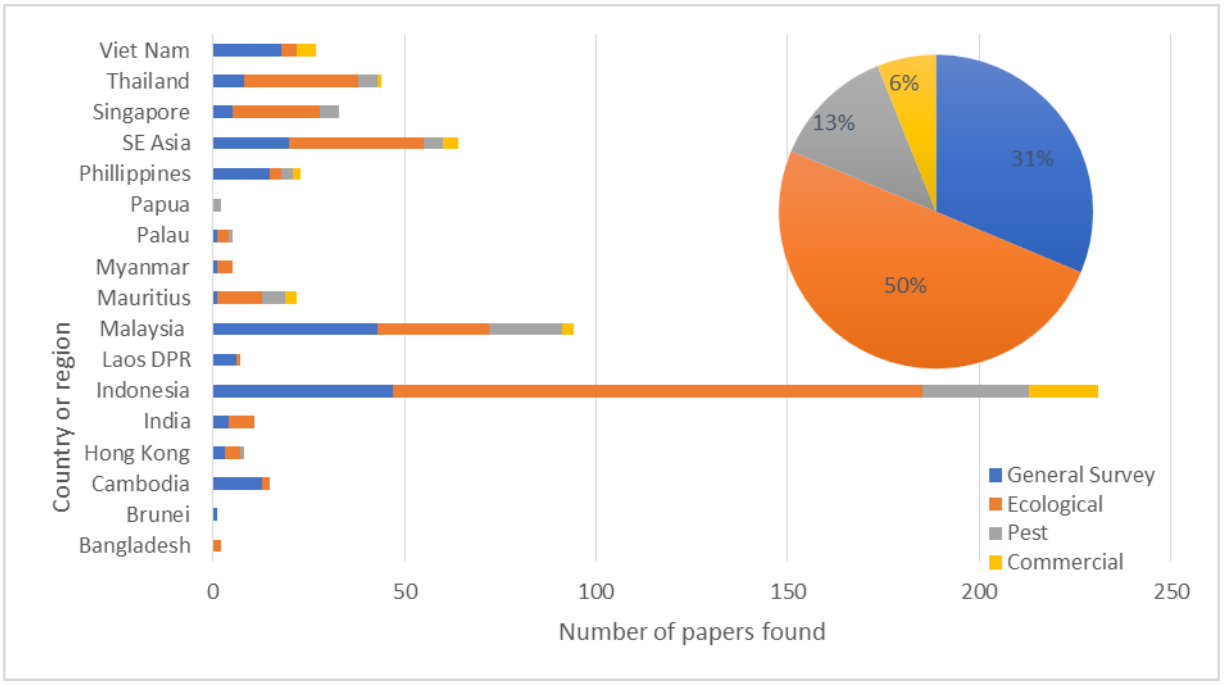

FIGURE 1 Total papers found for all countries and regions studied with distribution of papers in major categories indicated for each. Pie chart to show proportion of total for each type.

Analysis using Spearman's Rank correlation suggested there was no relationship between the papers produced for countries of origin with trade in the long-tailed macaque; nor were there correlations with the biodiversity or development indices utilised. Correlations were found however for CO2 emissions, ($r=0.585$, $p\leq0.01$, $N=16$) and for Foreign Investment ($r=0.620$, $p\leq0.01$, $N=13$). This interestingly does not appear to link the Sundarland biodiversity hotspot with the large number of papers from Indonesia and Malaysia but instead may suggest research is being carried out in areas of high development and potential habitat change. Is the fact that this species is a generalist and therefore found in many habitats significant? Perhaps this reflects not science's interest in the species, but that it is found in many habitats that also happen to be in a state of flux, and that in this case research is indicative of change? However fanciful that may be, this study does suggest that this species would benefit from more research into its many subspecies and isolated populations and that equally, further information and understanding of existing population sizes and harvesting activities are needed to ensure this species remains the common monkey of SE Asia.

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University Events

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5 Feb	**Andrew Walmsley** (Independent Photographer)
12 Feb	**Dr Mika Peck** (University of Sussex)
19 Feb	**Dr Qingyong Ni** (Sichuan Agricultural University, China)
26 Feb	**Dr David Chivers** (University of Cambridge)

5 March	**Dr Kim Reuter** (Conservation International)
12 March	**Dr Tatyana Humle** (University of Kent)
19 March	**Prof E.J. Milner-Gulland** (University of Oxford)
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