

Petition

Before the United States Fish and Wildlife Service United States Department of the Interior

April 12, 2023

Requesting Rulemaking to List the Southern Pig-Tailed Macaque (*Macaca nemestrina*) as a Threatened or Endangered Species Under the Endangered Species Act

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I. EXECUTIVE SUMMARY

Research analyzing wild populations of southern pig-tailed macaques “paints a concerning outlook for the long-term survival of this species.”¹ Data evidencing a population decline of at least fifty percent over the past thirty-three years (or three generations) led the International Union for Conservation of Nature (IUCN) to elevate the species’ status from “vulnerable” to “endangered” on the IUCN Red List of Threatened Species in 2022. Primatologists expect that the population will continue to decline if threats to the species are not addressed.

The Endangered Species Act (ESA) requires the U.S. Fish and Wildlife Service (FWS or “Service”) to list southern pig-tailed macaques as “endangered” or “threatened” if, throughout all or a significant part of their range, the species is in danger of extinction or is likely to become endangered within the foreseeable future. A single threatening factor can be sufficient to trigger listing status. But, here, the southern pig-tailed macaque is seriously threatened by multiple factors: (1) declining native habitats; (2) overutilization for scientific, commercial, and recreational purposes; (3) predation; and (4) inadequate regulatory mechanisms.

Records revealing high mean infant mortality dislodge the once-held perception that the southern pig-tailed macaque is adaptable to anthropogenic landscapes and less impacted by severe habitat disturbance and clear-cutting. As a species sensitive to these environmental transformations, as well as the threats posed by rampant trading (both legal and illegal), the outlook for the long-term survival of southern pig-tailed macaques is ominous.² Based on the petition herein, which summarizes, supplements, and incorporates by reference the IUCN’s detailed 2022 Assessment, the petitioners urge the Service to list the southern pig-tailed macaque as an endangered or threatened species under the ESA.

II. INTRODUCTION

A. Petitioners

People for the Ethical Treatment of Animals (PETA) is a non-profit organization dedicated to protecting animals from abuse, neglect, and cruelty, and undertakes these efforts through public education, cruelty investigations, research, animal rescue, legislation, special events, celebrity involvement, protest campaigns, and lawsuits to enforce laws enacted to protect animals. Beginning in 1981 with an investigation that uncovered primates suffering in a Maryland research facility, PETA has spent decades exposing abusive and deadly experiments on primates and persistently champions ending the use of animals in experiments. For example, to further its work to end the importation of primates into the United States for experiments, PETA launched a campaign that persuaded major airlines to stop transporting primates, including southern pig-tailed macaques, into the United States for use in experiments. And, when the biomedical research community petitioned the Department of Transportation to take enforcement action against the airlines, PETA submitted extensive comments in opposition. In 2022, PETA’s investigation of the Thai coconut industry’s abusive use of captive primates—particularly southern pig-tailed

¹ N. Ruppert et al., *Macaca nemestrina*, THE IUCN RED LIST OF THREATENED SPECIES 1 (2022), <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T12555A215350982.en> [hereinafter “IUCN 2022 Assessment”] [Ex. 1].

² *Id.* at 2.

macaques reportedly illegally abducted from their families and forced to pick coconuts—furthered its ongoing campaign to stop companies from sourcing canned coconut milk products from Thailand.³

Primatologist **Lisa Jones-Engel, Ph.D.** has studied the interface between humans and long-tailed and pig-tailed macaques in Indonesia, Singapore, Cambodia, Thailand, Myanmar and Bangladesh as well as in the primate biomedical facilities of the United States since the 1980s. Her scientific career has included field studies, research in the laboratory setting (most recently, the Washington National Primate Research Center), and teaching assignments. She has authored over 100 peer-reviewed articles, covering the fields of primatology, virology, epidemiology, microbiology, and conservation, and co-authored the IUCN 2022 Assessment. Dr. Jones-Engel currently serves as senior science advisor on primate experimentation with PETA's Laboratory Investigations Department.

Primatologist **Birutė Mary Galdikas, Ph.D.** has committed five decades to the conservation and study of primates in Indonesia. She is the world's authority on orangutans. Her field site in Indonesia is home to wild populations of long-tailed and pig-tailed macaques who share the rainforest with the orangutans. The Orangutan Foundation International, founded by Dr. Galdikas, takes a holistic and comprehensive approach with multiple complementary strategies to combat the complex challenges of conserving and protecting the animals and forests.

Dr. Jane Goodall, DBE, founder of the Jane Goodall Institute and UN Messenger of Peace, has for decades been a global champion for animal welfare and conservation. She travels the world asking each of us to take action on behalf of all living things and the planet we share.

Action for Primates is a UK-based project that advocates globally on behalf of non-human primates. Action for Primates recognizes that all animals, not just non-human primates, deserve respect and protection from harm by people.

Born Free USA is a leading wildlife charity, working for decades to end the exploitation of macaques and to enhance the survival of threatened species in the wild and protect natural habitats while respecting the needs and safeguarding the welfare of individual animals. They seek to have a positive impact on animals in the wild and protect their ecosystems in perpetuity, for their own intrinsic value and for the critical roles they play within the natural world.

Sarah Kite is co-founder of Action for Primates. She has spent decades working to bring awareness of the international trade and use of non-human primates, in particular macaques, for the global research and toxicity testing industries.

Dr Nedim Buyukmihci is Emeritus Professor of Veterinary Medicine at the School of Veterinary Medicine, University of California-Davis and co-founder of Action for Primates. His decades of non-human animal advocacy have included working on behalf of a wide range of

³ See, e.g., Rebecca Ratcliffe, *HelloFresh Drops Thai Coconut Milk After PETA Monkey Labour Campaign*, THE GUARDIAN (Mar. 7, 2023), <https://www.theguardian.com/us-news/2023/mar/07/hellofresh-drops-thai-coconut-milk-after-peta-monkey-labour-campaign> [Ex. 2].

species, in particular macaques and other non-human primates. He has many years of experience co-managing sanctuaries, including for farmed animals and non-human primates, and a wildlife refuge.

Angela Grimes is Chief Executive Officer of Born Free USA, a wildlife conservation and animal welfare organization. For the past decade Angela has campaigned to ensure that long-tailed and pig-tailed macaques caught up in the wildlife, pet or laboratory trade are provided with sanctuary.

Dr. Liz Tyler-Griffin has worked in animal protection and conservation, with a particular focus on primates, for twenty years. She currently works as Programs Director for Born Free USA and runs one of the largest long-tailed and pig-tailed macaque sanctuaries in the United States.

The Macaque Coalition (MACC) was initiated in 2020 and is a working group of the Asia for Animals Coalition. MACC aims to collate and share information on the many welfare issues faced by macaques, and to facilitate networking and collaboration geared towards promoting respectful coexistence, alleviating their suffering, and protecting them at both the individual level and the species level. MACC produced the 2022 Macaque Report: Indonesia's Unprotected Macaques.

Ecoflix is a not-for-profit media group that educates, inspires and supports meaningful actions which will deliver a tangible, measurable difference in saving animals and restoring the planet. Dr. Ian Redmond, Head of Conservation for Ecoflix has spent decades raising awareness, through advocacy and research, about the trade in wildlife, including long-tailed and pig-tailed macaques.

Wildlife biologist and conservationist, **Dr. Ian Redmond** has devoted decades to protecting and advocating for conservation. He is the founder and chairman of the Ape Alliance, a coalition of organizations and individuals dedicated to the conservation and welfare of apes and other primates. The Ape Alliance Primate Trade Working Group publicize cases of illegal trade, and support efforts to repatriate confiscated live animals to the nearest suitable sanctuary to the point of origin.

Since 1973, under the leadership of our founder, Dr. Shirley McGreal, **International Primate Protection League** has spent decades fighting to protect and save macaques around the world. These significant efforts included fighting smugglers, exposing the fate of long-tailed and pig-tailed macaques in research labs, establishing a gibbon sanctuary and much more.

For decades, **Wildlife Alliance** has worked with stakeholders around the globe to combat the illegal wildlife trade in long-tailed macaques and other species.

Through lobbying, publishing research, training scientists, and attending and conducting scientific meetings, the **Physicians Committee for Responsible Medicine** is dedicated to the goal of eliminating the exploitation and use of macaques in testing across the globe.

Dr. Michael Schillaci is a Professor of Anthropology, University of Toronto Scarborough. Dr. Schillaci has spent two decades studying macaque morphology, growth, hybridization and evolution, including *Macaca fascicularis*, in addition to other macaque species. He has also been involved in research examining the consequences of human macaque interactions in Southeast Asia.

One Voice has been involved in the fight against animal experiments since its foundation about 30 years ago. With regard to macaques in particular, OneVoice fights against the fact that they are still being captured in the wild and bred, transported, and experimented. One Voice investigates, petitions, goes to court, analyses data and advocates on their behalf. The organization is also a member of the macaque coalition at an international level, in Asia for Animals.

Abolición Vivisección is a Spanish NGO born in 2021. Their activities started exposing the terrible conditions of the macaques imported and held in Camarney (Spain), the largest macaque farm for experimentation in Europe. Currently, their work focuses on raising awareness about the trafficking of macaques, the suffering of animals, and the futility of vivisection as a valid scientific method.

Dr. Sam Shanee is a conservation biologist/conservationist who has worked in Asia and South America for over 20 years. Much of his work is centered on the illegal wildlife trade and human-wildlife conflict resolution, and as such he has observed first-hand the multiple threats faced by both long-tailed and pig-tailed macaques.

Gemunu de Silva is the co-founder of Tracks Investigations, an ethical investigations agency providing investigative content to the animal protection sector world-wide. He has been an advocate for animals for over 35 years and has worked on a variety of global projects and campaigns, most notably his work investigating the international trade of primates for research in Vietnam, Cambodia and Mauritius for which he was awarded the special investigation prize by the RSPCA.

Northwest Animal Rights Network (NARN) is an animal rights organization based in the Pacific Northwest (PNW). NARN monitors the use of macaques in the PNW, and campaigns for those used in research in facilities around the PNW.

Pam Mendoza has worked with many primate species in the US and Africa, specializing in research protocols and wildlife rehabilitation. She is active in campaigning and activism and heads the current board of International Primate Protection League, supporting work to end the illegal pet trade and conserve primates in their native habitat.

Phoenix Zones Initiative (PZI) advocates for global and local policy changes that safeguard people, animals, and the environment against exploitation. PZI continues to promote dialogue about the importance of moving away from the use of long-tailed and pig-tailed macaques in biomedical research.

Dr. Hope Ferdowsian is a double-board certified internal medicine, preventive medicine, and public health physician, and co-founder and president of Phoenix Zones Initiative, a global nonprofit organization that advances the interdependent rights, health, and wellbeing of people, animals, and the planet through education, research, and advocacy. Over two decades, she has worked across six continents on policy to address human, animal, and environmental exploitation.

Dr. Nikhil Kulkarni is a board certified anesthesiologist and cofounder of Phoenix Zones Initiative, a global nonprofit organization that advances the interdependent rights, health, and wellbeing of people, animals, and the planet through education, research, and advocacy. Over the years, Dr. Kulkarni has worked with a number of organizations focused on the promotion of animal and environmental protection.

Neotropical Primate Conservation has been using primates as “flagship species” for community conservation projects for decades ensuring long term habitat protection for our flagship species and all wildlife that shares their habitats. Through this work they help local communities strengthen their stewardship of nature as well as protect their traditional and cultural identities, benefiting both humans and the environment.

The **EMS Foundation** is a not for profit organization based in South Africa, we believe that there is a need to conserve and protect non-human primate populations that are living in the wild because of land transformation and persecution by humans and the resultant fragmentation of populations and decline in numbers. The existential crisis non-human primates find themselves in, whether they are taken from the wild or bred in captivity, is closely tied to the insatiable and ever-proliferating demand to own and kill rare and exotic wild animals.

Tim Ajax, Executive Director of the **Oklahoma Primate Sanctuary**, has spent the last three decades working with captive non-human primates including many species of macaques such as long-tailed and pig-tailed macaques. Whether retired from research or rehomed from the exotic pet trade, Tim has worked tirelessly to provide a high-quality level of care with a focus on large enclosures where these intelligent primates can engage in normal behaviors.

Rise for Animals is a national animal rights organization on a mission to end animal experimentation. Their efforts to expose cruelty in labs, rescue animals, mobilize support, get laws passed, and advocate for innovative, humane, and effective research will end an outdated industry and free animals from cruelty. Founded as New England Anti-Vivisection Society, Rise for Animals has been working to free macaques and other non-human primates from biomedical research for decades. Ed Butler is the Executive Director at Rise for Animals. For more than twenty years he has worked on campaigns to save animals—including macaques.

Wildlife Friends Foundation Thailand is a registered foundation under Thai law. They campaign against all forms of animal abuse and exploitation in Thailand. WFFT actively seeks to combat the illegal wildlife trade in macaques and to rescue animals from poor conditions or exploitation from human entertainment.

The **Douc Langur Foundation**, headed by Dr. Lois Lippold, focuses on exposing and mitigating the poaching, trapping and illegal trade of primates from the forests of Southeast Asia.

Fundacion Entropika works closely with local stakeholders in South America, in community-led projects, educational and social programs, capacity building and empowerment of civil society, enforcing environmental and primate welfare laws and cooperative research.

Dr. Angela Maldonado, Project Director of Fundacion Entropika, is a primatologist, ecologist and conservationist working for over 20 years in the Colombian Amazon. Her work focuses on fighting the illegal wildlife trade and in helping local communities. She has been the recipient of multiple awards in recognition of her dedication to conservation.

Animal Defenders International, headed by Jan Creamer, has worked for decades to expose the violence and death that is associated with the capture, transport and use of long-tailed and pigtailed macaques destined for use in experiments.

World Animal Protection and Lindsay Oliver, World Animal Protection's Executive Director, fights to keep animals in the wild, where they belong.

Paula Pebsworth works in the area of human-primate coexistence and is currently the Head Scientist on a project run by the National Center for Wildlife in the Kingdom of Saudi Arabia to reduce human-baboon conflict. She has worked in India on projects to reduce human-macaque conflict.

Yuichi Hasegawa is the Executive Director of the **Japan Anti-Vivisection Association (JAVA)** which has been working for many years to eliminate the use of macaque monkeys, especially Japanese macaques, for animal experiments, entertainment, and culling.

The petitioners submit this petition with an interest in ensuring the protection of southern pig-tailed macaques under the ESA.

B. Endangered Species Act

Congress enacted the ESA of 1973, 16 U.S.C. §§ 1531–1544, “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved [and] to provide a program for the conservation of such endangered species and threatened species.” 16 U.S.C. § 1531(b). An “endangered species” means “any species which is in danger of extinction throughout all or a significant portion of its range.” *Id.* § 1532(6). A “threatened species” is one “which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” *Id.* § 1532(20). Only those species listed as endangered or threatened receive the ESA’s protection. The FWS, through the authority delegated to it by the Secretary of the Interior (“Secretary”), must list a species if the species qualifies as endangered or threatened because of any one of the following factors:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;

- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; or
- (E) other natural or manmade factors affecting its continued existence.

50 C.F.R. § 424.11(c); *see* 16 U.S.C. § 1533(a)(1); 50 C.F.R. § 402.01(b).

To prevent the Secretary from implementing the ESA haphazardly (i.e., “on the basis of speculation or surmise”), *Bennett v. Spear*, 520 U.S. 154, 176 (1997), the statute requires the listing determination to be made “solely on the basis of the best available scientific and commercial information regarding the species’ status.” 16 U.S.C. § 1533(b)(1)(A); 50 C.F.R. § 424.11(b).

Within ninety days after receiving a petition to list a species, the Secretary must determine “whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted.” 16 U.S.C. § 1533(b)(3)(A). In other words, there must be “credible scientific or commercial information in support of the petition’s claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted.” 50 C.F.R. § 424.14(h)(i).

The “reasonable person” standard is a “lesser standard”; a petition does not need to contain “conclusive evidence of a high probability of species extinction to warrant further consideration of listing that species.” *Ctr. for Biological Diversity v. Morgenwreck*, 351 F. Supp. 2d 1137, 1141 (D. Colo. 2004). Rather, a petitioner must “simply show that the substantial information in the Petition demonstrates that listing of the species *may* be warranted.” *Id.* (emphasis added). As described in 50 C.F.R. section 424.14(d), whether a particular listing petition provides “substantial” information depends on:

- (1) Information on current population status and trends and estimates of current population sizes and distributions, both in captivity and the wild, if available;
- (2) Identification of the factors under [16 U.S.C. § 1533(a)(1)] that may affect the species and where these factors are acting upon the species;
- (3) Whether and to what extent any or all of the factors alone or in combination identified in [16 U.S.C. § 1533(a)(1)] may cause the species to be an endangered species or threatened species . . . and, if so, how high in magnitude and how imminent the threats to the species and its habitat are;
- (4) Information on adequacy of regulatory protections and effectiveness of conservation activities by States as well as other parties, that have been initiated or that are ongoing, that may protect the species or its habitat.

If the Secretary finds that substantial information exists then, within twelve months after receiving the petition, the Secretary must review the species status and determine whether the species should be listed. *See* 16 U.S.C. § 1533(b)(3)(B). If the finding demonstrates that the petition is not

warranted, the listing process ends but the negative finding may be judicially reviewed. *See* 16 U.S.C. § 1533(b)(3)(C)(ii).

III. NATURAL HISTORY⁴

A. Common Name

The common names for *Macaca nemestrina* are Southern Pig-tailed Macaque, Pig-tailed Macaque, Sunda Pig-tailed Macaque, and Sundaland Pigtail Macaque.⁵ Throughout this petition, the species is referred to as “southern pig-tailed macaque.”

B. Taxonomy

Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Primates
Family	Cercopithecidae
Genus	<i>Macaca</i>
Species	<i>nemestrina</i>

Table 1. Taxonomy of *Macaca nemestrina*.⁶

C. Description

With a tail that has a pig-like appearance—short (i.e., 5–10 inches in length) and held semi-erect—southern pig-tailed macaques are light-brown in color but have darker hair on top of their heads and back.⁷ Females measure between 15–19 inches in length and 10–13 pounds in weight.⁸ Males measure between 20–23 inches in length, weigh between 12–26 pounds, and have mane-like hair framing their faces.⁹ Fruits, supplemented by leaves, buds, flowers, and invertebrates comprise the majority of their diet.¹⁰ The species is quadrupedal and generally remains on the ground except for when foraging and sleeping in trees.¹¹

⁴ Refer to the IUCN 2022 Assessment [Ex. 1], pages 1, 6–7, for detailed notes on the species’ natural history.

⁵ IUCN Assessment, *supra* note 1, at 1; *Macaca nemestrina*, INTEGRATED TAXONOMIC INFO. SYS., https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=573021#null (last visited Mar. 31, 2023) [hereinafter “ITIS Report”] [Ex. 3].

⁶ ITIS Report, *supra* note 5.

⁷ K. Clare Quinlan, *Southern Pig-Tailed Macaque*, NEW ENGLAND PRIMATE CONSERVANCY (July 2022), <https://neprimateconservancy.org/southern-pig-tailed-macaque/> [Ex. 4].

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*; IUCN 2022 Assessment, *supra* note 1, at 7.

¹¹ Quinlan, *supra* note 7; *see* IUCN 2022 Assessment, *supra* note 1, at 7 (citing Ruppert et al. 2018 [Ex. 5]).

D. Habitat

Southern pig-tailed macaques live in Southeast Asia's dense tropical rainforests and occupy swamp, coastal, montane, and lowland forests.¹² Population densities are highest in primary forests, but the species also lives in secondary forests and agricultural areas (e.g., oil palm plantations).¹³ The species' habitat-elevation threshold is 1,900 m. above sea level but they are "best adapted to lowland and hill dipterocarp forests up to 900 m (Crockett and Wilson, 1980, Yanuar et al. 2009) and prefer dry forested grounds on the foot of hills and slopes (Bersacola et al. 2019)."¹⁴

IV. GEOGRAPHIC RANGE¹⁵

Southern pig-tailed macaques are native to Brunei Darussalam, Indonesia (Kalimantan, Sumatra), Malaysia (Peninsular Malaysia, Sabah, Sarawak), and Thailand.¹⁶ Although the overall geographic area with reported presence of the species is large, the area occupied by the species is small in comparison.¹⁷

For example, calculations for Peninsular Malaysia show that of the 131,600 km² available land area, only approximately half of it constitutes potential *Macaca nemestrina* habitat, with ca 68,000 km² lying in natural habitat sites such as primary and secondary forest (of which some lies above the 1,900 m elevation threshold beyond which the habitat is not suitable for this species), and ca 2,000 km² lying in oil palm plantations adjacent to forest (i.e., area calculated as a 500 m buffer zone from the forest edge into the plantation that macaques can potentially use to forage; B. Galea and N. Ruppert, unpublished data).¹⁸

¹² Quinlan, *supra* note 7; IUCN 2022 Assessment, *supra* note 1, at 6.

¹³ Quinlan, *supra* note 7.

¹⁴ IUCN 2022 Assessment, *supra* note 1, at 6 (citing Crockett and Wilson 1980, Yanuar et al. 2009 [Ex. 6], Bersacola et al 2019).

¹⁵ Refer to the IUCN 2022 Assessment [Ex. 1], pages 3–4, for detailed notes on the species' geographic range.

¹⁶ IUCN 2022 Assessment, *supra* note 1, at 3 (citing Groves 2001, Roos et al. 2014 [Ex. 7]).

¹⁷ *Id.*

¹⁸ *Id.*



Figure 1. Southern pig-tailed macaque distribution map.¹⁹

V. POPULATION STATUS AND TRENDS²⁰

The IUCN documents a decreasing population trend.²¹ Obtaining current, conclusive, population-size estimates has been fraught with difficulty given the challenges of encountering and counting wild macaques in the dense rainforest environment.²² However, it is estimated that, between 1957 and 1975, the species' population in Peninsular Malaysia declined 43.7% (from 80,000 individuals to 45,000).²³ Further population decline has likely occurred given the magnitude and rate of forest conversion to other land use forms since 1975.²⁴ Across the broader distribution range, the IUCN suspects that the population decreased by at least fifty percent between 1989 and 2022 and that the rate will not improve in the next three generations (from 2022 to 2055),²⁵ based on the following:

- 1) ongoing habitat degradation across [the species'] range from 2001 to 2020 (e.g., 29% of tree cover loss in Malaysia; 16% to 41%

¹⁹ *Distribution Map*, IUCN (2022), https://www.iucnredlist.org/api/v4/assessments/215350982/distribution_map/jpg [Ex. 8].

²⁰ Refer to the IUCN 2022 Assessment [Ex. 1], pages 5–6, for detailed notes on the species' population status and trends.

²¹ IUCN 2022 Assessment, *supra* note 1, at 6; *Southern Pig-Tailed Macaque*, IUCN, <https://www.iucnredlist.org/species/12555/215350982> (last visited Mar. 31, 2023) [Ex. 9].

²² See IUCN 2022 Assessment, *supra* note 1, at 5 (citing Bernstein 1967) (stating that there are “no conclusive reports about the current overall estimated population size of this species within their distribution range”).

²³ *Id.* (citing IUCN SSC 1982 [Ex. 10]).

²⁴ *Id.*

²⁵ *Id.*

tree cover loss across its range in Indonesia; Global Forest Watch 2022) which will certainly continue into the future;

2) evidence of local extirpation in former habitat sites (Holzner et al. 2021b);

3) evidence from the Pasoh Forest Reserve that highly degraded areas had a 10% decline in macaque site occupancy [between 2013 and 2017] (Holzner et al. 2021b); and

[4] a mean infant mortality rate of 66% (ranging from 30% to 100%) over an 8-year period (2014–2021) in/near oil palm plantations which already constitute a not-insignificant portion of the species’ potential habitat [(A. Holzner and N. Ruppert, unpublished data)].²⁶

These threats are in addition to other threats (discussed below), including trade, human-wildlife conflicts, and potential hybridization.

VI. THREATS²⁷

Although this species is common in some parts of its range, the population size has been severely reduced in many other places due to habitat loss and degradation, capture for the increased demand for use in biomedical research, the pet trade, and subsistence hunting.²⁸ All of the statutory listing factors described in 16 U.S.C. § 1533(a)(1) threaten the species. While many of the factors are threats independent of other factors (e.g., overutilization), the severity is exacerbated when the factors work in combination (e.g., overutilization and inadequate regulatory mechanisms).

A. Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Habitat loss and fragmentation in many parts of the southern pig-tailed macaque’s range presents a serious threat. Natural forces (e.g., forest fires and droughts) and human activity (e.g., clear felling conducted to “expand monocultures, such as oil palm plantations, durian and rubber, for mining activities and urban and industrial expansion,” and selective logging for timber extraction) threaten permanent loss to the species’ prime habitat in lowland tropical rainforest.²⁹ Malaysia

²⁶ *Id.* at 5, 6 (citing Global Forest Watch 2022, Holzner et al. 2021b [Ex. 11], Zainol et al. 2018 [Ex. 12]; *see also* Malaysia, GLOBAL FOREST WATCH, <https://www.globalforestwatch.org/> (last visited Mar. 30, 2023) (click on “Dashboard” and select Malaysia) (“From 2001 to 2021, Malaysia lost 8.67Mha of tree cover, equivalent to a 29% decrease in tree cover since 2000.”); Indonesia, GLOBAL FOREST WATCH, <https://www.globalforestwatch.org/> (last visited Mar. 30, 2023) (click on “Dashboard” and select Indonesia (Kalimantan) and Indonesia (Sumatera) (indicating 17% to 42% tree cover loss across these regions from 2001 to 2021).

²⁷ Refer to the IUCN 2022 Assessment [Ex. 1], pages 1, 8–10, for detailed notes on threats to the species.

²⁸ IUCN 2022 Assessment, *supra* note 1, at 5.

²⁹ *Id.* at 8 (citing Global Forest Watch 2020, Global Forest Watch 2022, Meijaard et al. 2007, ASMC 2022).

reported the following loss in primary forest and tree cover between 2009 and 2019; the breakdown evidences a significant uptick in loss in more recent years.

Primary Forest Loss		Tree Cover Loss	
2002–2009	2010–2019	2002–2009	2010–2019
M ha (%)		M ha (%)	
-.98 (-6.2%)	-1.65 (-11.0%)	-0.47 (-1.6%)	-4.84 (-16.9%)

Table 2. Primary forest and tree cover loss in Malaysia 2002–2019.³⁰

Between 2013 and 2017, the species “experienced a 10% decline in local site occupancy in heavily disturbed and clear-cut forest sites.”³¹

The spread of African oil palm (*Elaeis guinees*) has been identified as the greatest threat to the populations in Indonesia and Malaysia.

From 1967 to 2000, the area under oil palm cultivation [in Indonesia and Malaysia] increased from less than 2000 km² to more than 30,000 km². In 2011, 83,000 km² were planted with oil palm, including 20,000 km² in Peninsular Malaysia, 24,000 km² on Borneo, and 39,000 km² in Sumatra (Koh et al. 2011). In 2013, this number had grown to 116,000 km² (71,000 km² in Indonesia and 45,000 km² in Malaysia; Vijay et al. 2016), and the area planted with oil palm continues to increase rapidly (Meijaard and Sheil 2013). The establishment of oil palm monocultures does not only lead to loss of biodiversity but also contributes to habitat fragmentation and environmental pollution through chemical fertilizers or pesticide runoffs (reviewed in Fitzherbert et al. 2008), which directly affects *M. nemestrina*, who frequently uses plantations for short foraging bouts (Holzner et al. 2019, 2021a), and may thus get in direct and prolonged contact with dangerous chemicals, such as paraquat, which is a reportedly harmful herbicide (CDC 2018) still commonly used in Peninsular Malaysia (N. Ruppert, pers. obs.).³²

The southern pig-tailed macaque’s heavy dependence on intact forests “confirm[s] previous doubts on their ability to permanently persist in highly disturbed habitats.”³³ Southern pig-tailed macaques frequently use oil palm plantations as a foraging ground but exclusively choose mature trees in the forest as the place for sleeping and conducting most social behaviors (e.g., grooming).³⁴ Notably, “no populations are reported that thrive in oil palm plantations far from natural forests.”³⁵

³⁰ Rhett A Butler, *Rainforest Information*, MONGABAY (Aug. 14, 2020), <https://rainforests.mongabay.com/> [Ex. 13].

³¹ IUCN 2022 Assessment, *supra* note 1, at 8 (citing Holzner et al. 2021b [Ex. 11]).

³² *Id.* (citing Koh et al. 2011 [Ex. 14], Vijay et al. 2016 [Ex. 15]; Meijaard and Sheil 2013 [Ex. 16], Fitzherbert et al. 2008 [Ex.17]; Holzner et al. 2019 [Ex. 18], Holzner et al. 2021a [Ex. 11]; CDC 2018 [Ex. 19]).

³³ *See id.* at 7 (citing Caldecott 1986).

³⁴ *See id.* 7 (citing Ruppert et al. 2018 [Ex. 5]).

³⁵ *See id.* (citing A. Holzner and N. Ruppert, unpublished data).

Furthermore, the infant mortality rate averages sixty-six percent in oil palm plantation habitats, confirming the unsuitability of this habitat for the species.³⁶

B. Overutilization

Overutilization for scientific, commercial, and recreational purposes threatens the species. Between 53 and 136 individual southern pig-tailed macaques were exported annually from 2013–2018.³⁷ In 2017 and 2018, Indonesia led exportation and the United States led importation.³⁸ Southern pig-tailed macaques are bred (locally and internationally) in colonies for biomedical and behavioral research.³⁹ Specifically, they are sought for use in HIV/AIDS and other infectious disease research.⁴⁰

Commercially, farmers exploit the species for coconut harvesting. Juvenile southern pig-tailed macaques begin “commerce training” at one or two years of age after farmers remove them from the wild.⁴¹ While “extraction from the wild to meet the demand for coconut harvesting is perhaps the least documented,” primatologists estimate that farmers in southern Thailand alone keep several thousand pig-tailed macaques (southern and northern pig-tailed macaques) for coconut harvesting.⁴² The use of southern pig-tailed macaques in the coconut-plucking industry occurs in all range countries.⁴³

Domestic trade for pets and entertainment and the influence of social media platforms further threaten the species.⁴⁴ As examples, in venues in Thailand, southern pig-tailed macaques perform “circus-like tricks” (e.g., ride bicycles, shoot basketballs, and perform push-ups), for paying customers.⁴⁵ In Indonesia, “1,274 individuals were offered for sale on Facebook in 2020/21 alone.”⁴⁶ Malaysia has been a hot spot for illegal online pet trading.⁴⁷ An online search conducted in 2017/2018 of social media platforms in Malaysia showed consumer demand dictating a market

³⁶ See *id.* at 6–7 (citing A. Holzner and N. Ruppert, unpublished data).

³⁷ *CITES Trade Database*, CITES (2022), <https://trade.cites.org/> (last visited Apr. 3, 2023) (comparing gross imports and gross exports of live *Macaca nemestrina* from 2013–2018 for “all countries”). The IUCN 2022 Assessment cited to the CITES Trade Database (2022) as reporting “approximately 50–150 individuals exported per year between 2013–2020.” IUCN 2022 Assessment, *supra* note 1, at 8.

³⁸ See IUCN 2022 Assessment, *supra* note 1, at 8; *CITES Trade Database*, *supra* note 37. Data describing the United States’ importing numbers after 2018 does not appear in the CITES Trade Database. See *CITES Trade Database*, *supra* note 37.

³⁹ IUCN 2022 Assessment, *supra* note 1, at 8 (citing Sari et al. 2013 [Ex. 20]); see also *Primate Experimentation in Australia*, HUMAN RSCH. AUSTRALIA (Oct. 1, 2019), <https://www.humaneresearch.org.au/primate-experimentation-in-australia/> [Ex. 21]; *Nonhuman Primate Resources*, ORIP 2 (2023), https://orip.nih.gov/sites/default/files/ORIP_Nonhuman_Primate_Resources_Fact_Sheet.pdf [Ex. 22] (describing the breeding colonies maintained in the United States).

⁴⁰ IUCN 2022 Assessment, *supra* note 1, at 9 (citing as examples, Ha et al. 2000 [Ex. 23], Lee et al. 2021 [Ex. 24], Ritter et al. 2013 [Ex. 25]).

⁴¹ Devan Schowe et al., *Assessing the Welfare of Coconut-Harvesting Macaques in Thailand*, 242 APPLIED ANIMAL BEHAVIOR SCI. 2 (2021) <https://www.sciencedirect.com/science/article/pii/S0168159121002021> [Ex. 26].

⁴² *Id.*

⁴³ IUCN 2022 Assessment, *supra* note 1, at 9 (citing as an example, Bangkok Post 2015 [Ex. 27]).

⁴⁴ See IUCN 2022 Assessment, *supra* note 1, at 9.

⁴⁵ Nanchanok Wongsamuth, *Pay Coconuts, Get Monkeys*, BANGKOK POST (Sept. 6, 2015), <https://www.bangkokpost.com/thailand/special-reports/681936/paycoconuts-get-monkeys> [Ex. 27].

⁴⁶ IUCN 2022 Assessment, *supra* note 1, at 9 (citing “Anonymous, unpublished results”).

⁴⁷ See *id.* (citing Zainol et al. 2018 [Ex. 12]).

price of \$98 for a southern pig-tailed macaque—which was less than the range for the most frequently traded species (i.e., the dusky leaf monkey price ranged from \$129 to \$195) but more than the \$61 price for the slow loris, another frequently traded species.⁴⁸

C. Disease or Predation

Humans hunt and kill southern pig-tailed macaques for research, medicinal purposes, and food.⁴⁹ Human-wildlife conflict and the negative public perception of the species as “crop pests” have been described as “quite severe.”⁵⁰ For example, between 2015 and 2020, the southern pig-tailed macaque repeatedly placed among the top five most complained about wildlife species to the Department of Wildlife and National Parks (DWNP) Peninsular Malaysia.⁵¹

D. Inadequacy of Existing Regulatory Mechanisms

This species is listed under Convention on International Trade in Endangered Species (CITES) Appendix II and thus is monitored and requires permits for international trade of live specimens and parts.⁵² Only an export permit or re-export certificate is required; an import permit is not needed unless required by national law.⁵³ The IUCN 2022 Assessment acknowledges the protections already conferred in the species’ geographic range.

Brunei. The species is not protected but export is not allowed pursuant to the Brunei Wildlife Act 1978, updated 1984.⁵⁴

Indonesia. Although *Macaca nemestrina* is not listed as a protected species, the species is also not featured on the wildlife capture quota list.⁵⁵ Thus, “its capture from the wild is not

⁴⁸ Muhammad Zaki Zainol et al., *Assessment of Illegal Online Primate Trade in Malaysia*, SCH. OF BIOLOGICAL SCIS. (August 2018), https://www.researchgate.net/publication/327933004_Assessment_of_illegal_online_primate_trade_in_Malaysia [Ex. 12].

⁴⁹ Kayla Ayers & Candace Vanderpoel, *Macaca nemestrina*, ANIMAL DIVERSITY (2009), https://animaldiversity.org/accounts/Macaca_nemestrina/ [Ex. 28].

⁵⁰ IUCN 2022 Assessment, *supra* note 1, at 8.

⁵¹ *See, e.g.*, 2015 Annual Report 2015, PERHILITAN 166 (2015), https://www.wildlife.gov.my/images/stories/penerbitan/laporan_tahunan/%5BSOFTCOPY%5DPERHILITAN-annual-report-2015.pdf [Ex. 29] (reporting 320 annual complaints); 2016 Annual Report, PERHILITAN (2016), at Appendix D, <https://www.wildlife.gov.my/images/document/penerbitan/laporantahunan/LP2016%20-%2020022018.pdf> [Ex. 30] (reporting 330 annual complaints); 2017 Annual Report, PERHILITAN 182 (2017), <https://www.wildlife.gov.my/images/document/penerbitan/laporantahunan/LT2017.pdf> [Ex. 31] (reporting 320 annual complaints); 2020 Annual Report, PERHILITAN 153 (2020), <https://www.wildlife.gov.my/images/document/penerbitan/laporantahunan/LT2020.pdf> [Ex. 32] (reporting 363 annual complaints).

⁵² *Macaca nemestrina*, CITES, <https://cites.org/eng/taxonomy/term/1139> (last visited Mar. 22, 2023) [Ex. 33]; *Appendices*, CITES (Feb. 23, 2023), <https://cites.org/eng/app/appendices.php> [Ex. 34] (explaining that, when a species is included in Appendix II, “all parts and derivatives thereof are also included in the same Appendix); *How CITES Works*, CITES, <https://cites.org/eng/disc/how.php> (last visited Mar. 22, 2023) [Ex. 35].

⁵³ *How CITES Works*, *supra* note 52.

⁵⁴ IUCN 2022 Assessment, *supra* note 1, at 9.

⁵⁵ *Id.* (citing MOEF 2018 [Ex. 36], KLHK 2021); *see also* Malene F. Hansen et al., *Conservation of Long-Tailed Macaques: Implications of the Updated IUCN Status and the CoVID-19 Pandemic*, 35 PRIMATE CONSERVATION 5 (2021), https://www.researchgate.net/profile/Malene-Friis-Hansen-2/publication/349338354_Conservation_of_Long-tailed_Macaques_Implications_of_the_Updated_IUCN_Status_and_the_CoVID-19_Pandemic/links/602b825392851c4ed5752da6/Conservation-of-Long-tailed-Macaques-Implications-of-the-Updated-IUCN-Status-

allowed.”⁵⁶ Nonetheless, the rampant online pet trade of this species suggests that the zero harvest quota lacks stringent enforcement.⁵⁷

Malaysia. The species receives “protected” status—meaning a license is required for hunting, keeping, or trading—in Peninsular Malaysia under the Wildlife Conservation Act of 2010 (Act 716), in Sabah under the Wildlife Conservation Enactment of 1997 (Act 6 of 1997), and in Sarawak under the Wildlife Protection Ordinance of 1998.⁵⁸ The Wildlife Conservation Act of 2010 carves out subsistence hunting of the species by indigenous Malaysians in Peninsular Malaysia from the requirement.⁵⁹

Thailand. The southern pig-tailed macaque is not specifically listed on the Wild Animal Preservation and Protection Act, B.E. 2562 (2019), but the species “is given the general protection of wildlife, which restricts hunting and capture in all protected areas and forest lands.”⁶⁰

Yet, although *Macaca nemestrina* has been listed in CITES Appendix II since 1977,⁶¹ the population has declined and is now considered endangered by the IUCN based on the levels of exploitation driven, in part, by trade. CITES’ regulations have not adequately controlled the species trade.

E. Other Factors

Hybridization with other primates threatens the genetic integrity of the species. Hybridization with *Macaca fascicularis* has been observed in Sepilok, Sabah, and other parts of Malaysia.⁶² And, where the southern pig-tailed macaque’s range overlaps with *Macaca leonine* at the Surat Thani-Krabi depression, hybridization is expected.⁶³

VII. CONCLUSION

The petitioners urge the Service to list the southern pig-tailed macaque (*Macaca nemestrina*) as an “endangered” or “threatened” species under the ESA. The species has experienced catastrophic population decline for decades, and primatologists expect this decline to continue without mitigating action. Southern pig-tailed macaques continue to lose significant portions of their habitat across their range, and this loss has been associated with “lower site occupancy, higher

and-the-CoVID-19-Pandemic.pdf [Ex. 37] (“Since 2016, the quota for wild-caught macaques in Indonesia has been zero . . .”).

⁵⁶ IUCN 2022 Assessment, *supra* note 1, at 9.

⁵⁷ *See id.* at 8.

⁵⁸ *Id.* at 9.

⁵⁹ *Id.* (referring to Schedule 6 of the Wildlife Conservation Act of 2010 and citing Lappan and Ruppert 2019 [Ex. 38]).

⁶⁰ *Id.*

⁶¹ *Taxon: Macaca nemestrina (Animalia)*, CITES, <https://cites.application.developpement-durable.gouv.fr/viewtaxon.do?id=2570> [Ex. 39] (last visited Mar. 31, 2023).

⁶² IUCN 2022 Assessment, *supra* note 1, at 1 (citing Gilhooly et al. 2021 [Ex. 40], N. Ruppert (pers. obs.)).

⁶³ *Id.* at 1, 5 (citing Malaivijitnond et al. 2012 [Ex. 41]).

infant mortality, and local extirpation.”⁶⁴ Additional threats from the current levels of trade for scientific, commercial, and recreational purposes, and a general lack of protection (despite the laws in several habitat countries), are contributing to the species’ disappearance. As a major importer of the species for experimentation, the United States adds pressure to the stressed population. The FWS has the authority and obligation to act swiftly and add the southern pig-tailed macaque to the list of animals protected under the ESA.

⁶⁴ *See id.* at 5.

VIII. REFERENCES (EXHIBITS)

- Ex. 1 [IUCN 2022 ASSESSMENT] N. Ruppert et al., *Macaca nemestrina*, THE IUCN RED LIST OF THREATENED SPECIES 1 (2022), <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T12555A215350982.en>.
- Ex. 2 Rebecca Ratcliffe, *HelloFresh Drops Thai Coconut Milk After PETA Monkey Labour Campaign*, THE GUARDIAN (Mar. 7, 2023), <https://www.theguardian.com/us-news/2023/mar/07/hellofresh-drops-thai-coconut-milk-after-peta-monkey-labour-campaign>.
- Ex. 3 [ITIS Report] *Macaca nemestrina*, INTEGRATED TAXONOMIC INFO. SYS., https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=573021#null (last visited Mar. 31, 2023).
- Ex. 4 K. Clare Quinlan, *Southern Pig-Tailed Macaque*, NEW ENGLAND PRIMATE CONSERVANCY (July 2022), <https://neprimateconservancy.org/southern-pig-tailed-macaque/>.
- Ex. 5 [Ruppert et al. 2018] Nadine Ruppert et al., *Activity Budgets and Habitat Use of Wild Southern Pigtailed Macaques (Macaca nemestrina) in Oil Palm Plantation and Forest*, 39 INT’L J. PRIMATOLOGY 237, 237–251 (2018), <https://link.springer.com/article/10.1007/s10764-018-0032-z>.
- Ex. 6 [Yanuar et al. 2009] Achmad Yanuar et al., *The Population Distribution of Pig-Tailed Macaque (Macaca nemestrina) and Long-Tailed Macaque (Macaca fascicularis) in West Central Sumatra, Indonesia*, 1 ASIAN PRIMATES J. 2–11 (2009), <http://static1.1.sqspcdn.com/static/f/1200343/18198202/1337026351343/APJ1.2.MacaquesSumatra.pdf?token=aiuNBGbdWdyUI9egIWUCGuz3f%2BI%3D>.
- Ex. 7 [Roos et al. 2014] Christian Roos et al., *An Updated Taxonomy and Conservation Status Review of Asian Primates*, 4 ASIAN PRIMATES J. 2, 2–38 (2014), https://www.researchgate.net/publication/263412916_An_updated_taxonomy_and_conservation_status_review_of_Aasian_primates.
- Ex. 8 *Distribution Map*, IUCN (2022), https://www.iucnredlist.org/api/v4/assessments/215350982/distribution_map/jpg.
- Ex. 9 *Southern Pig-Tailed Macaque*, IUCN, <https://www.iucnredlist.org/species/12555/215350982> (last visited Mar. 31, 2023).
- Ex. 10 [IUCN SSC 1982] *Species Conservation Priorities in the Tropical Forests of Southeast Asia*, IUCN (Russell A Mittermeier & William R. Konstant eds., Oct. 4, 1982), <https://portals.iucn.org/library/efiles/documents/ssc-op-001.pdf>.

- Ex. 11 [Holzner et al. 2021b] Anna Holzner et al., *Occupancy of Wild Southern Pig-Tailed Macaques in Intact and Degraded Forests in Peninsular Malaysia*, PEER J (2021), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8679909/pdf/peerj-09-12462.pdf>.
- Ex. 12 [Zainol et al. 2018] Muhammad Zaki Zainol et al., *Assessment of Illegal Primate Online Trade in Malaysia*, SCH. OF BIOLOGICAL SCIS. (August 2018), https://www.researchgate.net/publication/327933004_Assessment_of_illegal_online_primate_trade_in_Malaysia.
- Ex. 13 Rhett A Butler, *Rainforest Information*, MONGABAY (Aug. 14, 2020), <https://rainforests.mongabay.com/>.
- Ex. 14 [Koh et al. 2011] Lian Pin Koh et al., *Remotely Sensed Evidence of Tropical Peatland Conversion to Oil Palm*, 108 PNAS 5127, 5127–5132 (2011), <https://www.pnas.org/doi/epdf/10.1073/pnas.1018776108>.
- Ex. 15 [Vijay et al. 2016] Varsha Vijay et al., *The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss*, 11 PLOS ONE (2016), <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0159668&type=printable>.
- Ex. 16 [Meijaard and Sheil 2013] Erik Meijaard & Douglas Sheil, *Oil-Palm Plantations in the Context of Biodiversity Conservation*, in 5 ENCYCLOPEDIA OF BIODIVERSITY 600, 600–612 (Simon Levin ed., 2d ed. 2007), https://www.cifor.org/publications/pdf_files/Books/CSheild1301.pdf.
- Ex. 17 [Fitzherbert et al. 2008] Emily B. Fitzherbert et al., *How Will Oil Palm Expansion Affect Biodiversity?* 23 TRENDS IN ECOLOGY & EVOLUTION 538, 538–545 (2008), <https://www.sciencedirect.com/science/article/pii/S0169534708002528>.
- Ex. 18 [Holzner et al. 2019] Anna Holzner et al., *Macaques Can Contribute to Greener Practices in Oil Palm Plantations When Used as Biological Pest Control*. 29 CURRENT BIOLOGY R1066, R1066–R1067 (2019), <https://www.sciencedirect.com/science/article/pii/S0960982219311716>.
- Ex. 19 [CDC 2018] *Facts About Paraquat*, CDC (Apr. 4, 2018), <https://emergency.cdc.gov/agent/paraquat/basics/facts.asp>.
- Ex. 20 [Sari et al. 2013] Isti Kartika Sari et al., *The Isolation and Molecular Identification of Papillomavirus in Macaca Fascicularis and Macaca Nemestrina at Animal Facility of Primate Research Centre – Bogor Agricultural University*, IPB UNIV. (2013), <https://repository.ipb.ac.id/handle/123456789/66968>.
- Ex. 21 *Primate Experimentation in Australia*, HUMAN RSCH. AUSTL. (Oct. 1, 2019), <https://www.humanresearch.org.au/primate-experimentation-in-australia/>.

- Ex. 22 *Nonhuman Primate Resources*, ORIP (2023), https://orip.nih.gov/sites/default/files/ORIP_Nonhuman_Primate_Resources_Fact_Sheet.pdf.
- Ex. 23 [Ha et al. 2000] J. C. Ha et al., *Demographic Analysis of the Washington Regional Primate Research Center Pigtailed Macaque Colony, 1967–1996*, 52 AM. J. PRIMATOLOGY 187, 187–98 (2000), https://onlinelibrary.wiley.com/doi/epdf/10.1002/1098-2345%28200012%2952%3A4%3C187%3A%3AAID-AJP3%3E3.0.CO%3B2-C?saml_referrer.
- Ex. 24 [Lee et al. 2021] Wen Shi Lee et al., *Anti-Drug Antibodies in Pigtailed Macaques Receiving HIV Broadly Neutralising Antibody PGT121*, 12 FRONTIERS IN IMMUNOLOGY 1, 1–10 (2021), <https://www.frontiersin.org/articles/10.3389/fimmu.2021.749891/full>.
- Ex. 25 [Ritter et al. 2013] J. M. Ritter et al., *Neurologic Melioidosis in an Imported Pigtail Macaque (*Macaca nemestrina*)*, 50 VETERINARY PATHOLOGY 1139, 1139–1144 (2013), <https://journals.sagepub.com/doi/epub/10.1177/0300985813485249>.
- Ex. 26 Devan Schowe et al., *Assessing the Welfare of Coconut-Harvesting Macaques in Thailand*, 242 APPLIED ANIMAL BEHAVIOR SCI. 2 (2021) <https://www.sciencedirect.com/science/article/pii/S0168159121002021>.
- Ex. 27 [Bangkok Post 2015] Nanchanok Wongsamuth, *Pay Coconuts, Get Monkeys*, BANGKOK POST (Sept. 6, 2015), <https://www.bangkokpost.com/thailand/special-reports/681936/paycoconuts-get-monkeys>.
- Ex. 28 Kayla Ayers & Candace Vanderpoel, *Macaca nemestrina*, ANIMAL DIVERSITY (2009), https://animaldiversity.org/accounts/Macaca_nemestrina/.
- Ex. 29 2015 Annual Report 2015, PERHILITAN 166 (2015), https://www.wildlife.gov.my/images/stories/penerbitan/laporan_tahunan/%5B%5DPERHILITAN-annual-report-2015.pdf.
- Ex. 30 2016 Annual Report, PERHILITAN (2016), at Appendix D, <https://www.wildlife.gov.my/images/document/penerbitan/laporantahunan/LP2016%20-%2020022018.pdf>.
- Ex. 31 2017 Annual Report, PERHILITAN 182 (2017), <https://www.wildlife.gov.my/images/document/penerbitan/laporantahunan/LT2017.pdf>.
- Ex. 32 2020 Annual Report, PERHILITAN 153 (2020), <https://www.wildlife.gov.my/images/document/penerbitan/laporantahunan/LT2020.pdf>.
- Ex. 33 *Macaca nemestrina*, CITES, <https://cites.org/eng/taxonomy/term/1139> (last visited Mar. 22, 2023).

- Ex. 34 *Appendices*, CITES (Feb. 23, 2023), <https://cites.org/eng/app/appendices.php>.
- Ex. 35 *How CITES Works*, CITES, <https://cites.org/eng/disc/how.php> (last visited Mar. 22, 2023).
- Ex. 36 [MOEF 2018] Menteri Lingkungan Hidup dan Kehutanan Republik (MOEF) Indonesia. 2018. Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia nomor P.20/MENLHK/SETJEN/KUM.1/6/2018 Tentang jenis tumbuhan dan satwa yang dilindungi dengan rahmat tuhan yang maha esa, http://ksdae.menlhk.go.id/assets/news/peraturan/P.20_Jenis_TSL_.pdf.
- Ex. 37 Malene F. Hansen et al., *Conservation of Long-Tailed Macaques: Implications of the Updated IUCN Status and the CoVID-19 Pandemic*, 35 PRIMATE CONSERVATION 5 (2021), https://www.researchgate.net/profile/Malene-Friis-Hansen-2/publication/349338354_Conservation_of_Long-tailed_Macaques_Implications_of_the_Updated_IUCN_Status_and_the_CoVID-19_Pandemic/links/602b825392851c4ed5752da6/Conservation-of-Long-tailed-Macaques-Implications-of-the-Updated-IUCN-Status-and-the-CoVID-19-Pandemic.pdf.
- Ex. 38 [Lappan and Ruppert 2019] Susan Lappan & Nadine Ruppert, *Primate Research and Conservation in Malaysia*, 14 CAB Revs. (2019), https://www.researchgate.net/publication/331503611_Primate_research_and_conservation_in_Malaysia.
- Ex. 39 *Taxon: Macaca nemestrina (Animalia)*, CITES, <https://cites.application.developpement-durable.gouv.fr/viewtaxon.do?id=2570> (last visited Mar. 31, 2023).
- Ex. 40 [Gilhooly et al. 2021] Lauren J. Gilhooly et al., *Tourist Behavior Predicts Reactions Of Macaques (Macaca Fascicularis And M. Nemestrina) At Sepilok Orang-utan Rehabilitation Centre, Sabah, Malaysia*, 42 INT’L J. PRIMATOLOGY 349, 349–68 (2021), <https://link.springer.com/article/10.1007/s10764-021-00205-7>.
- Ex. 41 [Malaivijitnond et al. 2012] Suchinda Malaivijitnond et al., *Boundary Zone Between Northern and Southern Pig-Tailed Macaques and Their Morphological Differences*, 53 PRIMATES 377, 377–89 (2012), <https://link.springer.com/article/10.1007/s10329-012-0316-4>.

IX. REFERENCES (NON-EXHIBITS)

[ASMC 2022] ASEAN SPECIALIZED METEOROLOGICAL CTR., <http://asmc.asean.org/home/> (last visited Mar. 13, 2022).

[Bernstein 1967] Irwin S. Bernstein, *A Field Study of the Pigtail Monkey (Macaca nemestrina)*, 8 PRIMATES 217, 217–228 (1967).

[Bersacola et al 2019] Elena Bersacola et al., *Abundance and Activity Pattern of Ungulates and Pig-Tailed Macaque Using Camera Traps on Borneo*, Oryx (2019), (in prep).

[Caldecott 1986] J.O. Caldecott, *An Ecological and Behavioural Study of the Pig-Tailed Macaque*, in 21 CONTRIBUTIONS TO PRIMATOLOGY (1986).

CITES Trade Database, CITES (2022), <https://trade.cites.org/> (last visited Mar. 29, 2023).

[Crockett and Wilson 1980] C.M. Crockett & W.L. Wilson, *The Ecological Separation of Macaca Nemestrina and M. Fascicularis in Sumatra*, in THE MACAQUES: STUDIES IN ECOLOGY, BEHAVIOR AND EVOLUTION 148–81 (Donald G. Lindburg ed., 1980).

[Global Forest Watch 2020] Interactive Forest Change Mapping Tool, GLOBAL FOREST WATCH (2020), <http://www.globalforestwatch.org/>.

[Global Forest Watch 2022] [Global Forest Watch 2020] Interactive Forest Change Mapping Tool, GLOBAL FOREST WATCH (2022), <http://www.globalforestwatch.org/>.

[Groves 2001] Colin Groves, *Primate Taxonomy* (2001).

Indonesia, GLOBAL FOREST WATCH, <https://www.globalforestwatch.org/> (last visited Mar. 30, 2023).

[KLHK 2021] Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia (KLHK). 2020. Buku Quota Pengambilan Tumbuhan Alam dan Pengangkatan Satwa Liar, <http://abschindonesia.menlhk.go.id/publikasi/index/Buku%20Kuota%20Pengambilan%20Tumbuhan%20Alam%20dan%20Pengangkatan%20Satwa%20Liar> (last visited Jan. 10, 2021).

Malaysia, GLOBAL FOREST WATCH, <https://www.globalforestwatch.org/> (last visited Mar. 30, 2023).

[Meijaard et al. 2007] Erik Meijaard et al., *Phylogenetic Age is Positively Correlated with Sensitivity to Timber Harvest in Bornean Mammals*, 40 BIOTROPICA 76, 76–85 (2007).

X. APPENDIX – Petitioners’ Contact Information and Signatures



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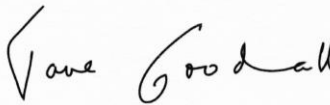
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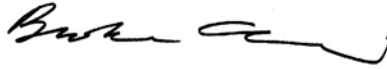


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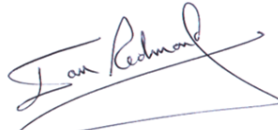


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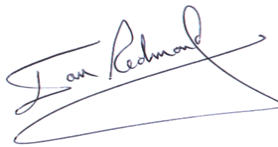


The Asia for Animals Macaque Coalition
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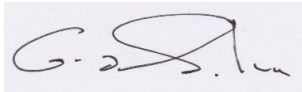
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Abolición Vivisección



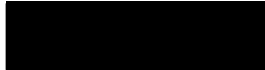
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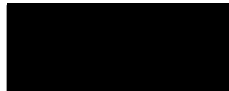
Rachel Bjork

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Rachel Bjork, Board President
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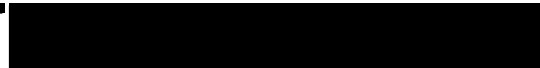
Sam Shanee

Sam Shanee, Ph.D., Board Representative
On behalf of International Primate Protection League
Pam Mendosa, Chairwoman



Phoenix Zones Initiative

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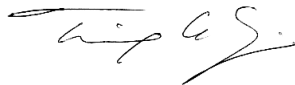


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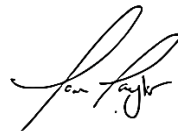
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