Halting species loss in ASEAN

BASELINE INFORMATION ANALYSIS

IUCN SSC Species Survival Commission

ASAP! ASIAN SPECIES ACTION PARTNERSHIP

BCAMP Biodiversity Conservation and Management of Protected Areas in ASEAN

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Halting Species Loss in ASEAN:
Baseline Information Analysis

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About the cover: Cat Ba Langur (*Trachypithecus poliocephalus)* by Neahga Leonard | Cat Ba Langur Conservation Project

ASEAN CENTRE FOR BIODIVERSITY

The ASEAN Centre for Biodiversity (ACB) was established in 2005 by the ASEAN Member States as a response to biodiversity loss in the region. The ACB supports and coordinates the implementation of activities in the ASEAN toward the conservation and sustainable use of biological diversity, for the benefit of ASEAN Member States, the region, and the global community. It also serves as the Secretariat of the ASEAN Heritage Parks Programme.

IUCN SSC ASIAN SPECIES ACTION PARTNERSHIP

Convened by the International Union for Conservation of Nature Species Survival Commission (IUCN SSC), the Asian Species Action Partnership (ASAP) is a coalition of organisations committed to averting extinctions of Critically Endangered land and freshwater vertebrates in Southeast Asia. ASAP mobilises resources, builds capacity and catalyses action for neglected species. The Partnership has over 100 Partners, mainly based in the ASEAN region, comprising conservation implementing groups, ex situ facilities, research institutions, and donors amongst others. As a growing network, ASAP adds value to organisations through building connections, providing bespoke support and increasing visibility. The Partnership provides a platform for collective impact and collaboration to conserve species on the brink of extinction.

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Boo-Liat's Kukri Snake | *Oligodon booliati* by L. Lee Grismer

List of acronyms

ACB	ASEAN Centre for Biodiversity
AHP	ASEAN Heritage Park
AML	Anti-Money Laundering
AMS	ASEAN Member States
ASAP	IUCN SSC Asian Species Action Partnership
ASC	Aquaculture Stewardship Council
ASEAN	Association of Southeast Asian Nations
AZE	Alliance for Zero Extinction
CBD	Convention on Biological Diversity
CMS	Convention on Migratory Species
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered as in the IUCN Red List of Threatened Species™
EAAFP	East Asian-Australasian Flyway Partnership
ED	Evolutionary Distinctiveness
EDGE	Evolutionarily Distinct and Globally Endangered
EIA	Environmental Impact Assessment
EN	Endangered as in the IUCN Red List of Threatened Species™
EU	European Union
FATF	Financial Action Task Force
FSC	Forest Stewardship Council
GE	Global Endangerment
HCV	High Conservation Value
HCVF	High Conservation Value Forest
HFP	Human Footprint
ICCA	Indigenous and Community Conserved Area

IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for Conservation of Nature
IUCN SSC	International Union for Conservation of Nature Species Survival Commission
KBA	Key Biodiversity Area
METT	Management Effectiveness Tracking Tool
MLA	Mutual Legal Assistance
MLAT	ASEAN Mutual Legal Assistance Treaty on Criminal Matters
NBSAP	National Biodiversity Strategy and Action Plan
NDF	Non-detriment Finding
NGO	Non-governmental Organisation
OECM	Other Effective Area-based Conservation Measure
PA	Protected Area
PAME	Protected Area Management Effectiveness
PES	Payments for Ecosystem Services
RSPO	Roundtable on Sustainable Palm Oil
SEA	Southeast Asia
SMART	Spatial Monitoring and Reporting Tool
The Flyway	The East Asian-Australasian Flyway
UN	United Nations
UNCAC	United Nations Convention Against Corruption
UNTOC	United Nations Convention Against Transnational Organized Crime
WEN	Wildlife Enforcement Networks
WCPA	IUCN World Commission on Protected Areas
WDPA	World Database on Protected Areas
ZIMS	Zoological Information Management Software

Foreword

As the ASEAN's intergovernmental organisation mandated to facilitate regional cooperation on biodiversity conservation and the achievement by ASEAN Member States of biodiversity targets, the ASEAN Centre for Biodiversity (ACB) commissioned the conduct of this study and the publication of this report to generate knowledge on species loss in the region, and to contribute to informed policymaking and implementation.

The ACB, through its Biodiversity Conservation and Management of Protected Areas in ASEAN (BCAMP) project, with the support of the European Union, initiated the collaboration with the IUCN Species Survival Commission Asian Species Action Partnership (ASAP) Secretariat and one of its implementing partners, the Wildlife Conservation Society (WCS) to undertake the study and analyse the data. While the report focuses on critically endangered land and freshwater vertebrate species in Southeast Asia, the data, insights, and recommendations that it presents are nevertheless relevant to many other threatened species across the region.

Ever cognisant of the rich biodiversity in the region and its importance to the lives and livelihoods of the peoples of ASEAN, the ASEAN Member States may use the results of this study in developing the ASEAN action plan on species conservation including critically endangered and migratory species, pursuant to the ASEAN Working Group on Nature Conservation and Biodiversity (AWGNCB) Action Plan. Species conservation is one of specific targets of the AWGNCB's programme area on Key Terrestrial Biodiversity Area Conservation Including Protected Areas, under its Strategic Priority on Nature Conservation and Biodiversity. It is also aligned to the ASEAN Socio-Cultural Community (ASCC) Blueprint 2025 key result area on Conservation and Sustainable Management of Biodiversity and Natural Resources.

This report is being released at a time when the global community is crafting its new biodiversity targets for the next 10 to 30 years. The ACB is confident that this baseline report will serve as a useful reference for the region, and will provide a solid basis for the development of an ASEAN action plan on the conservation of critically endangered species in line with the new targets. The ASEAN database is being updated based on the data gathered through this study, and will be available to all ASEAN Member States for reference and utilisation.

The world is on the cusp of losing around one million plant and animal species, just as it grapples with the unprecedented and cross-cutting impacts of the COVID-19 pandemic. May *Halting Species Loss in ASEAN: Baseline Information Analysis*, serve as an impetus for immediate and informed transformative action for the conservation and sustainable use of biodiversity as we build a better normal.

Over the years, some of the critically endangered land and freshwater vertebrate species have been receiving significant conservation attention. As we will see from this report, however, there is a need to scale up efforts toward the protection of several species of amphibians, birds, turtles, primates and freshwater fish, particularly those that are found outside of protected areas. It is therefore crucial for survival of these species to identify priority needs, and catalyse management actions towards conservation.

DR. THERESA MUNDITA S. LIM
Executive Director
ASEAN Centre for Biodiversity

Executive summary

The ASEAN region is of global biodiversity importance, exceptionally species-rich and contains extremely high proportions of country-endemic species found nowhere else on Earth. Species and their habitats are under pressure from unsustainable offtake by illegal wildlife trade, in addition to habitat loss driven by commercial agriculture, infrastructure and energy projects. Hence, without urgent attention, many species within ASEAN could become extinct in the next few decades. Loss of regionally endemic species in the region would equal global extinctions and a loss of unique natural and cultural heritage across ASEAN.

Halting imminent species extinctions in the ASEAN region is an urgent global priority.[1] This assessment focuses on ASAP species defined as land or freshwater vertebrate species found in Southeast Asia and listed as Critically Endangered on the IUCN Red List of Threatened Species™.

This assessment provides an overview of current conservation status and available baseline data for ASAP species. Through a comprehensive analysis of primary threats and drivers, a review of area-based conservation measures, ongoing conservation efforts and the policy context, the assessment generates recommendations for species conservation and recovery for all threatened land and freshwater vertebrate species in the ASEAN region.

Effectively addressing unsustainable offtake at the site level and along the trade chain together with strengthening area based conservation measures such as protected and conserved areas, including ASEAN Heritage Parks (AHPs), can contribute to the ecological recovery of threatened species in the ASEAN region. This assessment compiles the evidence base to draw attention to the problem and inform a collective ASEAN response to safeguard the region's unique biodiversity.

Bold and urgent action is needed for biodiversity in the ASEAN region. An ASEAN species declaration is recommended as a vital policy platform to galvanise urgent action to avert species extinctions and secure the region's extraordinary biodiversity.

[1] Duckworth et al. (2012)

Recommended actions for ASAP species conservation in the ASEAN region

The baseline information analysis has brought to focus actions listed below as necessary for the conservation and recovery of ASAP species in the ASEAN region.

1. CATALYSE CONSERVATION ACTION

1.1 Increase financial resources for conservation action

Initiating new conservation action and scaling up existing conservation efforts is only possible through increased availability and allocations of financial resources for species recovery. Developing new financing mechanisms will be key to catalysing needed conservation action.

1.2 Build capacity of individuals and organisations

Strengthening technical capacity of individuals and organisations can contribute significantly toward amplification of effective action for species recovery in the region. Developing targeted capacity building mechanisms can be an important strategic approach for long-term, sustainable local and national efforts.

1.3 Enhance knowledge of status and distribution of ASAP species

Significant gaps in knowledge on the current status and distribution in the ASEAN region are a key deterrent to effective conservation action. Priorities include confirming the status of existing populations, identifying new populations, monitoring trends of known populations through targeted surveys, strategic assessments of priority sites for protection and evaluating the impacts of conservation efforts on species recovery through monitoring.

1.4 Target conservation action for freshwater fishes

Freshwater fishes constitute a high proportion of Critically Endangered vertebrate species in the region and are neglected in terms of conservation attention. Addressing major threats and ensuring targeted conservation action is urgently needed. Priorities include protection of key habitats, managing overharvesting, reducing impacts from agriculture to freshwater ecosystems, mainstreaming fish conservation into freshwater management and aquaculture policy and practice, initiating ex situ conservation measures as needed, and mitigating the impact of dams.

1.5 Implement priority actions and developing action plans

Conservation actions for protection and management already identified in ASAP species action plans are high priorities for implementation. Given that approximately 45 per cent of ASAP species lack any conservation effort, new action plans need to be developed where there is a need and demand from the field to support implementation.

2. STRENGTHEN EFFECTIVENESS OF SITE-BASED CONSERVATION ACTION

2.1 Improve governance, management and protection for effective site-based conservation

Based on available knowledge, there is a need to ramp up site-based protection efforts and policy action to protect key populations of ASAP species, including regionally endemic species and those with restricted ranges. Specifically, ensuring effective governance, site protection and management of area-based measures (e.g. ASEAN Heritage Park (AHPs), protected areas (PAs), Alliance for Zero Extinction sites (AZEs), Key Biodiversity Area (KBAs)) is critically important to secure populations that occur within such areas.

2.2 Integrate ASAP species needs into site management plans

Integrating ASAP species conservation needs into existing site management plans, law enforcement and monitoring activities will be essential for conservation and recovery.

2.3 Increase financial allocations for site management

PAs need to have sufficient financial investment to ensure their effectiveness in conserving bio-diversity. Increasing financial allocations towards PAs in general, and sites important for ASAP species in particular, will be essential to secure sites effectively.

2.4 Strengthen governance, management and protection of AHPs

Several AHPs are important sites for one or more ASAP species. Strengthening governance, protection and management of AHPs, and in particular those with ASAP species, combined with urgent action to address threats to species and habitat through site and policy action is needed. Improving the knowledge base of the status of ASAP species populations and their habitats within AHPs will be an important step in catalysing conservation action to ensure that AHPs can become strongholds for these populations.

2.5 Create new PAs with diverse governance mechanisms

Support the creation of new PAs, Indigenous and Community Conserved Areas (ICCAs) and Other Effective Area-based Conservation Measures (OECMs) ensuring representation of freshwater ecosystems for ASAP species. ICCAs and unprotected areas that are important for ASAP species could be considered priority candidates for AHP nomination. Develop co-management mechanisms for formal PAs that enable community participation in all levels of governance and management.

3. IMPLEMENT EFFECTIVE RESPONSES TO POACHING, TRAFFICKING AND UNSUSTAINABLE OFFTAKE OF ASAP SPECIES

3.1 Strengthen site protection through implementation of best practice tools such as Spatial Monitoring and Reporting Tool (SMART)

Taking immediate and effective action to address known threats such as poaching and habitat loss will be essential to stem population declines, strengthen protection and achieve recovery. Emerging technologies and existing tools, such as SMART for law enforcement monitoring, offer opportunities to strengthen the quality and ecological effectiveness of all area-based conservation measures including PAs and AHPs across the ASEAN region.

3.2 Address snaring as a serious threat to wildlife populations

Snaring to supply wildlife for the illegal commercial trade is recognised as an important driver of population declines and species extinctions, especially of many ground-dwelling birds and mammals, across many PAs including AHPs. The response to snaring can involve the following actions:

- *Close commercial wildlife markets to reduce greatly the commercial trade in wildlife, to reduce both the demand that fuels the current snaring crisis, and the probability of zoonotic disease outbreaks*
- *Implement site-specific partnerships with local communities to address motivations of snaring in specific PAs that includes nutritional and economic alternatives*
- *Strengthen criminal justice responses to snaring, including updating legal frameworks with regard to snare use, enhancing site-based law enforcement and aligning judicial processes to treat snare cases proportionately to the damage snares cause.*

3.3 Strengthen the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) implementation for CITES-listed ASAP species

Strengthening CITES implementation and compliance can directly benefit CITES-listed ASAP species. Recommendations include strengthening domestic legislation for CITES compliance (especially for Appendix I species), developing non-detriment findings (NDFs) for Appendix II species and tightening import/export permit systems to eliminate fraudulent practice and abuse. An assessment is also needed to develop a list of international trade-threatened ASAP species to be prioritised for potential inclusion in CITES appendices.

3.4 Address consumer demand for wildlife

Support behaviour change campaigns, social marketing, hotlines and other long-term communication programmes to reduce consumer demand for wildlife and build public support for wildlife law enforcement.

3.5 Strengthen and implement existing national legal frameworks

Supporting the implementation of existing national laws and ensuring the inclusion of ASAP species into national Red Lists can contribute to strengthening national policies for protection.

4. ADDRESS DRIVERS OF HABITAT LOSS, DEGRADATION AND FRAGMENTATION

4.1 Prioritise and integrate threatened species considerations into relevant policy mechanisms

An assessment to identify opportunities to integrate biological values represented by ASAP species into EIA (Environmental Impact Assessment) legislation, voluntary certification standards (such as Aquaculture Stewardship Council (ASC), Roundtable on Sustainable Palm Oil (RSPO)) and other relevant policy mechanisms linked to agriculture, energy, mining, aquaculture, forestry (e.g. oil palm, rubber, timber etc) and other development, will be an important step in strengthening biodiversity considerations in economic decision making.

4.2 Strengthen regulation for economic activities at sites important for ASAP species

Incorporating the mitigation hierarchy approach as a regulatory requirement for economic activities impacting biodiversity-rich natural ecosystems including threatened species habitats in the ASEAN region, can potentially mitigate deforestation driven habitat loss and conversion of wetlands.

5. STRENGTHEN INTEGRATION OF EX SITU AND IN SITU CONSERVATION

5.1 Identify species for urgent ex situ action

A number of ASAP species will require some level of ex situ conservation intervention to avert their extinction. Identification of species that urgently require ex situ conservation measures for survival and recovery is critically important.

5.2 Strengthen ex situ and in situ integration of ASAP species in captivity

Efforts are needed to ensure that species currently held in ex situ facilities in the ASEAN region are part of well-managed captive programmes and integrated into wider ex situ and in situ conservation initiatives as appropriate. Implementing integrated ex situ and in situ recovery programmes as required through strategic multi-stakeholder partnerships is needed.

6. CREATE AN ENABLING REGIONAL POLICY AND REGULATORY FRAMEWORK FOR ASAP SPECIES CONSERVATION

Strengthen ASEAN-wide protection to ensure that all ASAP species are adequately protected, even in the countries in which they occur only through trade. In addition, strengthen implementation of international agreements (CITES, Convention on Biological Diversity (CBD), Convention on Migratory Species (CMS), AHPs) and implement Strategic Measures (i) through (x) in the ASEAN Socio-Cultural Blueprint - Section C1. Page 10.[2]

7. LEVERAGE FINANCIAL SUPPORT FOR CONSERVATION AND RECOVERY OF ASAP SPECIES

7.1. Develop new financing streams

Efforts are needed to develop new financing streams and leverage new funds in emerging areas including biodiversity offsets, payment for ecosystem services (PES), and international development finance.

[2] ASEAN Socio-Cultural Community Blueprint

7.2. Develop innovative financing mechanisms

Identification and development of new and innovative financing mechanisms are needed that include public-private sector blended financing models. Examples include outcome oriented, species-focused bonds (e.g. the Rhino Bonds[3]) or Government-issued bonds for habitat protection for ASAP species.

[3] More information can be found at https://www.zsl.org/conservation/ our-priorities/wildlife-back-from-the-brink/animals-on-the-edge/rhino-impact-investment

Introduction

The ASEAN region: biodiversity significance and the urgency of the species extinction crisis

1

Elongated tortoise | *Indotestudo elongata* by Scott Trageser | NatureStills LLC

THE GLOBAL PICTURE

1 MILLION SPECIES ARE THREATENED WITH EXTINCTION

The landmark 2019 UN Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment indicates that globally, nature is declining at rates unprecedented in human history.

Chinese Pangolin
Manis pentadactyla
by Roland Wirth

1 million

species already face premature extinction, many within decades.

The largest relative negative impact on nature since 1970 comes from land-use change, of which the most widespread form is agricultural expansion, causing loss of natural ecosystems. Extinction risk is uneven across the world, and Southeast Asia is a key area of concern.

Mekong Giant Catfish
Pangasianodon gigas
by Roland Wirth

Bleeding Toad
Leptophryne cruentata
by Sasi Kirono

Pulau Tioman Ground Snake
Gongylosoma mukutense
by L. Lee Grismer

● ASEAN REGION

A GLOBAL PRIORITY FOR AVERTING SPECIES EXTINCTIONS[4,5]

The ASEAN region, almost entirely covered by four biodiversity hotspots, has extraordinarily high levels of species richness and endemism.

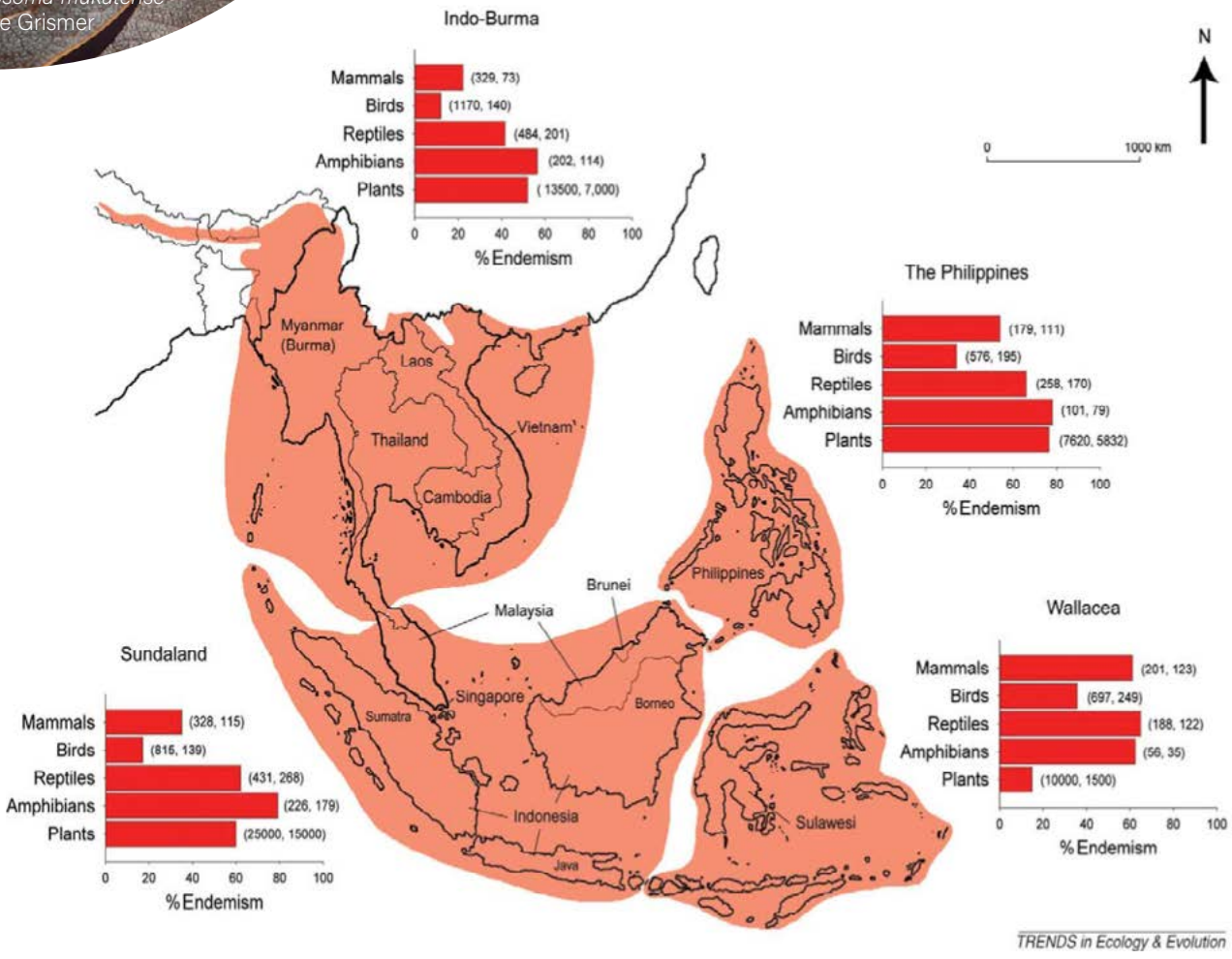


Figure 1: Map of Southeast Asia's biodiveristy hotspots. Bars represent the percentage of species endemic to the respective hotspot. Numbers in parentheses represent total and endemic species known to science, respectively.
Source: Sodhi et al. (2004)

[4] Allan et al. (2019)
[5] Duckworth et al. (2012)

BRINGING ATTENTION TO THREATENED SPECIES IN THE ASEAN REGION

THROUGH THE LENS OF CRITICALLY ENDANGERED LAND AND FRESHWATER VERTEBRATE SPECIES

This report provides on baseline information analyses of ASAP species, a subset of the most highly threatened species in ASEAN. ASAP species are the focus of the IUCN SSC Asian Species Action Partnership and are based on the IUCN Red List of Threatened Species™.

This report uses the list of ASAP species based on the IUCN Red List of Threatened Species™ published in July 2019. The ASAP species list is updated concurrently with new IUCN Red List publications and therefore once a species is listed as Critically Endangered it automatically becomes an ASAP species.

ASAP species are land or freshwater vertebrate species found in Southeast Asia and listed as Critically Endangered on the IUCN Red List of Threatened Species™. Species which have at least part of their life cycle on land or in freshwater are included as ASAP species, such as seabirds or marine turtles nesting on dryland, or marine fishes where part of their life is in estuarine waters.

Although this report is based on ASAP species, there are many other species equally on the edge of extinction which require actions comparable in scope and urgency, including those found in marine habitats, and taxonomic groups such as invertebrates, plants etc. The analysis in this report provides details on a subset of the most threatened species in ASEAN, as through the existence of the IUCN SSC Asian Species Action Partnership there is an information base and understanding of the issues, as well as a mechanism for catalysing and implementing action. The analysis on ASAP species is used to illustrate conservation needs and priorities for all threatened land and freshwater vertebrate species in ASEAN.

The full list of ASAP species can be found at the end of the Introduction chapter (pages 20-25). Numbers include possibly extinct and reintroduced species, but exclude extinct, vagrant, unknown and introduced species. Species occurrence in a particular country is based on current information listed on the IUCN Red List of Threatened Species™ and includes current or historical records and available distribution range data. Countries may have species listed as Critically Endangered on their own National Red Lists or have national species priorities which are not necessarily aligned with ASAP species criteria.

221

There are 221 species that are classified as ASAP species
(based on July 2019 IUCN Red List of Threatened Species™)

WHAT IS AN ASAP SPECIES?

- **FOUND IN SOUTHEAST ASIA**
- **LIVES ON LAND OR IN FRESHWATER**
- **VERTEBRATE**
- **LISTED AS CRITICALLY ENDANGERED**
  ON THE IUCN RED LIST OF THREATENED SPECIES™

- **FRESHWATER FISH, BIRD, MAMMAL, REPTILE OR AMPHIBIAN**

ASAP SPECIES BY COUNTRY

	Fishes	Birds	Mammals	Reptiles	Amphibians	Total
Brunei	-	3	2	1	-	**6**
Cambodia	8	7	3	4	1	**23**
Indonesia	27	29	24	8	3	**91**
Lao PDR	10	7	7	6	--	**30**
Malaysia	9	9	4	16	8	**46**
Myanmar	2	11	4	7		**24**
Philippines	16	15	3	5	1	**40**
Singapore	1	3	1	1	-	**6**
Thailand	12	9	4	10	-	**35**
Viet Nam	9	8	11	12	2	**42**

Table 1: Number of ASAP species by country. Analysis is based on the IUCN Red List of Threatened Species™ publications from July 2019. Numbers include possibly extinct and reintroduced species, but exclude extinct, vagrant, unknown and introduced species.[6] Species occurrence in a particular country is based on current information listed on the IUCN Red List of Threatened Species™ and includes current or historical records and available distribution range data. Some key groups of species have not been assessed for the Red List or require re-assessments which will affect these numbers. For example, freshwater fishes of the Philippines. The ASAP species list is updated concurrently with new IUCN Red List publications and therefore once a species is listed as Critically Endangered, it automatically becomes an ASAP species.

Figure 2: Map showing number of ASAP species by country. Numbers include possibly extinct and reintroduced species, but exclude extinct, vagrant, unknown and introduced species.
Data source: IUCN Red List of Threatened Species™ (2019)

[6] See Appendix 1 for the full list of ASAP species by country

Giant Carp | *Catlocarpio siamensis* by Wildlife Reserves Singapore

ASAP FRESHWATER FISHES

- Critically Endangered freshwater fishes currently make up the largest group of ASAP species.
- They are highly threatened by anthropogenic activities.
- Freshwater habitats are highly neglected and poorly studied.

over **30%** of all ASAP species are **freshwater FISHES**

INTRODUCTION: **CHAPTER SUMMARY**

- **The ASEAN region overlaps with four of the world's biodiversity hotspots[7] and three out of the 10 AMS represent megadiverse[8] countries.**

- **As in other regions globally, rapid economic growth in the ASEAN region has resulted in negative outcomes for biodiversity.**

- **The majority of ASAP species are endemic to the region, meaning their loss across ASEAN results in global extinction. Hence there is an urgent need to address the threats facing species in this region.**

- **This report focuses on ASAP species as a means to illustrate the conservation needs of threatened land and freshwater vertebrate species across ASEAN and provides:**

    - *Recommendations for conservation and recovery in the ASEAN region*
    - *An investment framework with identified strategic priorities and conservation actions*
    - *An overview of current conservation status*
    - *Analysis of primary threats and drivers*
    - *Analysis of area-based conservation measures*
    - *An outline of the regulatory and policy context, identifying gaps and opportunities.*

[7] Sodhi et al. (2004)
[8] Mittermeier et al. (1997)

LIST OF ASAP SPECIES

FISHES 

Aaptosyax grypus	Mekong Giant Salmon Carp
Adrianichthys kruyti	Duck-billed Buntingi
Adrianichthys roseni	-
Balantiocheilos ambusticauda	Siamese Bala-shark
Barbodes amarus	Pait
Barbodes baoulan	Baolan
Barbodes clemensi	-
Barbodes disa	Disa
Barbodes flavifuscus	-
Barbodes herrei	-
Barbodes katalo	-
Barbodes lanaoensis	-
Barbodes manalak	-
Barbodes pachycheilus	-
Barbodes palata	-
Barbodes resimus	Bagangan
Barbodes tras	-
Barbodes truncatulus	Bitungu
Betta burdigala	-
Betta chloropharynx	-
Betta cracens	-
Betta fusca	-
Betta hendra	-
Betta miniopinna	Red Fin Betta
Betta omega	-
Betta pardalotos	-
Betta pinguis	-
Betta rutilans	-
Betta simplex	Krabi Mouth Brooding Betta
Catlocarpio siamensis	Giant Carp
Ceratoglanis pachynema	Club-barbel sheatfish
Chilatherina sentaniensis	Sentani Rainbowfish
Clarias batu	-
Clarias sulcatus	-
Datnioides pulcher	Siamese Tiger Perch
Encheloclarias kelioides	-
Epalzeorhynchos bicolor	Redtail Sharkminnow

Glyphis siamensis	Irrawaddy River Shark
Hampala lopezi	Manumbok / Hampala
Hemileiocassis panjang	-
Hyalobagrus ornatus	-
Lepidocephalus pahangensis	-
Nemacheilus troglocataractus	Blind Cave Loach
Oreoglanis lepturus	-
Oryzias soerotoi	-
Oryzias timorensis	-
Pandaka pygmaea	Dwarf Pygmy Goby
Pangasianodon gigas	Mekong Giant Catfish
Pangasius sanitwongsei	Giant Pangasius
Parosphromenus alfredi	-
Parosphromenus gunawani	-
Parosphromenus ornaticauda	-
Parosphromenus phoenicurus	-
Parosphromenus quindecim	-
Pristis pristis	Largetooth Sawfish
Pristis zijsron	Green Sawfish
Probarbus jullieni	Jullien's Golden Carp
Puntius compressiformis	-
Rasbora tawarensis	Depik
Scaphognathops theunensis	-
Schistura leukensis	-
Schistura nasifilis	-
Schistura spiloptera	-
Schistura tenura	-
Sewellia albisuera	-
Sewellia breviventralis	Butterfly Loach
Trigonostigma somphongsi	Somphongs's Rasbora
Weberogobius amadi	Poso Bungu
Xenopoecilus poptae	Popta's Buntingi
Xenopoecilus sarasinorum	-

BIRDS

Acridotheres melanopterus	Black-winged Myna
Acridotheres tertius	Grey-rumped Myna
Acridotheres tricolor	Grey-backed Myna
Alcedo euryzona	Javan Blue-banded Kingfisher
Anthracoceros montani	Sulu Hornbill

Ardea insignis	White-bellied Heron / Imperial heron
Aythya baeri	Baer's Pochard
Cacatua haematuropygia	Philippine Cockatoo
Cacatua sulphurea	Yellow-crested Cockatoo
Calidris pygmaea	Spoon-billed Sandpiper
Carpococcyx viridis	Sumatran Ground Cuckoo
Centropus steerii	Black-hooded Coucal
Ceyx sangirensis	Sangihe Dwarf Kingfisher
Charmosyna toxopei	Blue-fronted Lorikeet
Cissa thalassina	Javan Green Magpie
Columba argentina	Silvery Pigeon / Grey Wood-pigeon
Coracornis sanghirensis	Sangihe Whistler
Corvus unicolor	Banggai Crow
Cyornis ruckii	Rueck's Blue-flycatcher
Dicaeum quadricolor	Cebu Flowerpecker
Emberiza aureola	Yellow-breasted Bunting
Eurochelidon sirintarae	White-eyed River Martin
Eutrichomyias rowleyi	Cerulean Paradise-flycatcher
Fregata andrewsi	Christmas Frigatebird / Andrews' Frigatebird
Gallicolumba keayi	Negros Bleeding-heart
Gallicolumba menagei	Sulu Bleeding-heart
Gallicolumba platenae	Mindoro Bleeding-heart
Garrulax rufifrons	Rufous-fronted Laughingthrush
Gracula robusta	Nias Hill Myna
Gracupica jalla	Javan Pied Starling / Javan Pied Myna
Gyps bengalensis	White-rumped Vulture
Gyps tenuirostris	Slender-billed Vulture
Houbaropsis bengalensis	Bengal Florican
Leucopsar rothschildi	Bali Myna
Lophura edwardsi	Edwards's Pheasant
Nisaetus floris	Flores Hawk-eagle
Oriolus isabellae	Isabela Oriole
Otus siaoensis	Siau Scops-owl
Phapitreron frontalis	Cebu Brown Dove
Pithecophaga jefferyi	Philippine Eagle
Prioniturus verticalis	Sulu/Blue-winged Racquet-tail
Pseudibis davisoni	White-shouldered Ibis
Ptilinopus arcanus	Negros Fruit Dove
Pycnonotus zeylanicus	Straw-headed Bulbul
Rhabdotorrhinus waldeni	Rufous-headed Hornbill
Rhinoplax vigil	Helmeted Hornbill

Rhodonessa caryophyllacea	Pink-headed Duck
Sarcogyps calvus	Red-headed Vulture
Symposiachrus boanensis	Black-chinned Monarch
Thalasseus bernsteini	Chinese Crested Tern
Thapsinillas platenae	Sangihe Golden Bulbul
Thaumatibis gigantea	Giant Ibis
Vanellus macropterus	Javan Lapwing
Zosterops nehrkorni	Sangihe White-eye

MAMMALS

Ailurops melanotis	Talaud Bear Cuscus
Axis kuhlii	Bawean Deer
Bos sauveli	Kouprey
Bubalus mindorensis	Tamaraw
Dendrolagus mayri	Wondiwoi Tree-kangaroo
Dendrolagus pulcherrimus	Golden-mantled Tree Kangaroo
Dicerorhinus sumatrensis	Sumatran Rhinoceros
Dobsonia chapmani	Philippine Bare-backed Fruit Bat
Eudiscoderma thongareeae	Thongaree's Disc-nosed Bat
Macaca nigra	Celebes Crested Macaque
Macaca pagensis	Pagai Island Macaque
Manis javanica	Sunda Pangolin
Manis pentadactyla	Chinese Pangolin
Melomys fraterculus	Manusela Melomys / Manusela Mosaic-tailed Rat
Muntiacus vuquangensis	Large-antlered Muntjac / Giant Muntjac
Murina balaensis	Bala Tube-nosed Bat
Nomascus concolor	Black Crested Gibbon
Nomascus leucogenys	Northern White-cheeked Gibbon
Nomascus nasutus	Cao-vit Crested Gibbon
Nycticebus javanicus	Javan Slow Loris
Pongo abelii	Sumatran Orangutan
Pongo pygmaeus	Bornean Orangutan
Pongo tapanuliensis	Tapanuli Orangutan
Presbytis chrysomelas	Sarawak Surili / Bornean Banded Langur
Pseudoryx nghetinhensis	Saola
Pteropus aruensis	Aru Flying-fox
Pygathrix cinerea	Grey-shanked Douc Langur
Rhinoceros sondaicus	Javan Rhinoceros
Rhinopithecus avunculus	Tonkin Snub-nosed Monkey
Rhinopithecus strykeri	Myanmar Snub-nosed Monkey

Simias concolor	Pig-tailed Langur; Pig-tailed Snub-nosed Monkey
Spilocuscus rufoniger	Black-spotted Cuscus
Spilocuscus wilsoni	Blue-eyed Spotted Cuscus
Sus cebifrons	Visayan Warty Pig
Tarsius tumpara	Siau Island Tarsier
Trachypithecus delacouri	Delacour's Langur
Trachypithecus poliocephalus	Cat Ba Langur / Golden-headed Langur
Uromys boeadii	Biak Giant Rat
Uromys emmae	Emma's Giant Rat
Zaglossus attenboroughi	Sir David's Long-beaked Echidna
Zaglossus bruijnii	Western Long-beaked Echidna

REPTILES 

Batagur affinis	Southern River Terrapin
Batagur baska	Northern River Terrapin
Batagur borneoensis	Painted Terrapin
Batagur trivittata	Burmese Roofed Turtle
Brachymeles cebuensis	Cebu Small Worm Skink
Calamaria ingeri	-
Calamaria prakkei	Prakke's Reed Snake
Chelodina mccordi	Roti Island Snake-necked Turtle
Chitra chitra	Asian Narrow-headed Softshell Turtle
Cnemaspis temiah	Temiah Rock Gecko
Crocodylus mindorensis	Philippines Crocodile
Crocodylus siamensis	Siamese Crocodile
Cuora bourreti	Bourret's Box Turtle
Cuora galbinifrons	Indochinese Box Turtle
Cuora picturata	Southern Viet Nam Box Turtle
Cuora trifasciata	Chinese Three-striped Box Turtle
Cyrtodactylus chanhomeae	-
Cyrtodactylus gialaiensis	Gialai Bent-toed Gecko
Cyrtodactylus guakanthanensis	Gua Kanthan Bent-toed Gecko
Cyrtodactylus jaegeri	-
Cyrtodactylus jarakensis	Jarak Island Bent-toed Gecko
Cyrtodactylus nigriocularis	-
Cyrtodactylus takouensis	Takou Bent-toed Gecko
Dixonius kaweesaki	Sam Roi Yot Leaf-toed Gecko
Eretmochelys imbricata	Hawksbill Turtle
Gekko lauhachindai	Lauhachinda's Cave Gecko
Geochelone platynota	Burmese Starred Tortoise

Gongylosoma mukutense	Pulau Tioman Ground Snake
Goniurosaurus huuliensis	-
Heosemys depressa	Arakan Forest Turtle
Indotestudo elongata	Elongated Tortoise
Larutia penangensis	Penang Island Larut Skink
Leucocephalon yuwonoi	Sulawesi Forest Turtle
Lycodon chrysoprateros	Ross's Wolf Snake
Manouria emys	Asian Giant Tortoise
Mauremys annamensis	Vietnamese Pond Turtle
Oligodon booliati	Boo-Liat's Kukri Snake
Pseudocalotes flavigula	Malaya False Bloodsucker
Pseudocalotes rhaegal	Rhaegal's False Garden Lizard
Rafetus swinhoei	Yangtze Giant Softshell Turtle
Siebenrockiella leytensis	Palawan Forest Turtle

AMPHIBIANS

Ansonia guibei	Mesilau Stream Toad
Ansonia vidua	Murud Black Slender Toad
Bancet tompotika	Occidozyga tompotika
Kalophrynus yongi	Cameron Highland Sticky Frog
Leptobrachella botsfordi	Botsford's leaf-litter frog
Leptobrachella kecil	-
Leptobrachella palmata	-
Leptobrachium kantonishikawai	-
Leptophryne cruentata	Bleeding Toad / Fire Toad
Megophrys damrei	-
Oreolalax sterlingae	Sterling's Toothed Toad
Pelophryne linanitensis	-
Pelophryne murudensis	-
Philautus jacobsoni	Jacobson's Bubble-nest Frog
Platymantis insulatus	Gigante Wrinkled Ground Frog

Policy

2

Straw-headed Bulbul | *Pycnonotus zeylanicus* by Chiok Wen Xuan

THE POLICY CONTEXT FOR ASAP SPECIES

PREVENTING EXTINCTIONS AND PROMOTING RECOVERY

- Several policy platforms are relevant to highly threatened species recovery and conservation in the ASEAN region.
- The focus of **Aichi Target 12** is averting species extinction: by 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
- Targets for species recovery and avoided extinctions will continue to have an emphasis in the **Post 2020 Global Biodiversity Framework** and these targets will be critically important to the recovery of highly threatened species in the ASEAN region.

Bali Myna | *Leucopsar rothschildi* by Chiok Wen Xuan

- UN Sustainable Development Goals are an urgent call for action, with **Goal 15**[9] focused on conservation and preventing further loss to biodiversity: protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

- The **IPBES Report**[10] found that around 1 million animal and plant species are now threatened with extinction, more than ever before in human history, many within decades. This is particularly relevant to the ASEAN region which has a disproportionately high number of species on the brink of extinction.[11] The report outlines the need to address the underlying causes of species loss by mainstreaming biodiversity into government policies and business practices.

- Strategic measures (i) to (x) under C1 Conservation and Sustainable Management of Biodiversity and Natural Resources in the **ASEAN Socio-Cultural Community Blueprint**[12] outline the need to create and implement an enabling policy framework to avert biodiversity loss and species extinctions.

- The **EU Larger Than Tigers Report**[13] acknowledges the importance of the ASEAN region for the recovery of highly threatened species and lays out clear priorities for action.

[9] United Nations Development Programme (2020)
[10] IPBES (2019)
[11] Allan et al. (2019)
[12] ASEAN (2016)
[13] European Union (2018)

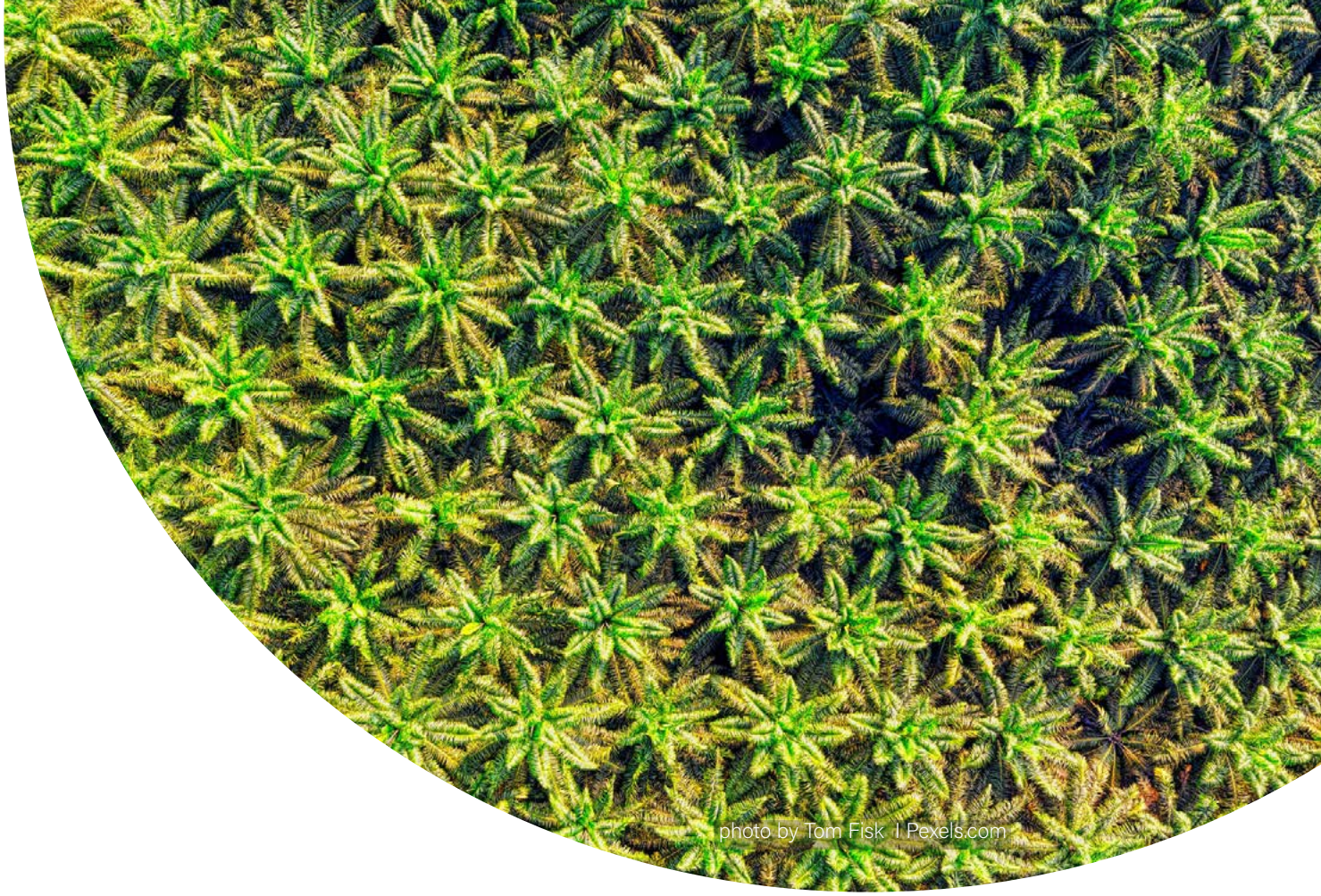


photo by Tom Fisk | Pexels.com

TACKLING THE THREAT OF HABITAT LOSS AND DEGRADATION

Commercial agriculture and forestry (for commodities such as oil palm, rubber, coffee, rice, pulp and paper), in addition to mining, dams and other infrastructure developments are key drivers of habitat loss and degradation in the ASEAN region. Expansion of rubber and oil palm, has come primarily at the cost of natural forests. Deforestation-driven habitat loss has particularly serious consequences for both habitat specialists and wide-ranging species. Conversion of wetlands to agriculture (particularly rice farming), and alteration of water-flow, pollution, and dam development degrade freshwater ecosystems and threaten freshwater species

- Area-based conservation measures such as PAs (including AHPs), Indigenous and Community Conserved Areas (ICCAs) and Other Effective Area-based Conservation Measures (OECMs) represent the primary mechanism to secure critically important habitats and sites for ASAP species OECMs in particular represent new opportunities to secure and effectively manage areas that have biodiversity values that are not included in the PA systems.
- At the national level, **Environmental Impact Assessments** (EIAs) represent a good opportunity to integrate biodiversity values that include ASAP species.

- There are additional mechanisms to secure important habitats for species from drivers of deforestation through integration of species priorities into the voluntary standards of certification systems established to ensure sustainable land and forest management. For example, the Roundtable on Sustainable Palm Oil (RSPO) requires members to identify and set-aside areas of **High Conservation Value** (HCV) in order for plantations to be certified.

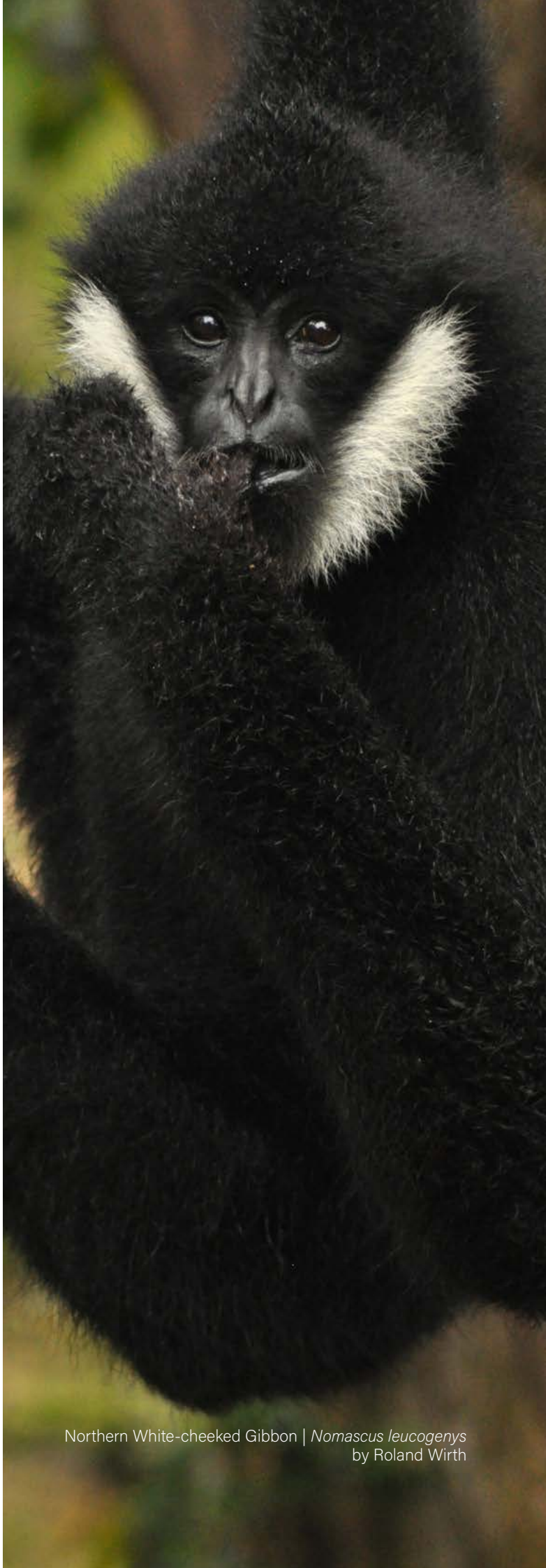
- The HCV concept was originally developed by the Forest Stewardship Council (FSC) to help define forest areas of outstanding and critical importance - High Conservation Value Forests (HCVF) - for use in forest management certification. A HCV area is simply the area (e.g. a forest, a grassland, a watershed, or a landscape-level ecosystem) where these values are found, or more precisely, the area that needs to be appropriately managed in order to maintain or enhance the identified values. Identifying the areas where these values occur is therefore the essential first step in developing appropriate management for them. The first category of HCV areas (HCV1) represent areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species). Ensuring that habitats and sites important for ASAP species (categorised as HCV1 areas) represents a key mechanism to address the threat of deforestation to biologically significant sites in the region.

Vietnam Pheasant | *Lophura edwardsi*
by Roland Wirth

- The HCV concept is being increasingly applied to other commodities, with many companies adopting 'no deforestation' supply chain commitments, which include HCVs in their definition of areas to protect. Such commitments have emerged across the supply chains of multiple commodities (including rubber and cocoa), however implementation at scale remains a challenge, particularly for smallholders. Some companies have used Spatial Monitoring and Reporting Tool (SMART) to monitor and manage HCV areas.

- Even in certification systems with requirements for HCVs and biodiversity management, implementation is a big challenge. RSPO, for example, requires HCV monitoring and management, but this is not always implemented. Companies have to demonstrate HCV monitoring and management plans but this does not necessarily mean that resources are allocated.

- Ensuring that nationally-developed, mandatory standards and legislation incorporate biodiversity values relevant to threatened species could be one approach towards mitigating deforestation impacts on biologically significant habitats. Including and integrating biodiversity values in general, and threatened species in particular, into criteria used to establish standards will be key to securing biologically significant habitats in the ASEAN region. Economic pressures to convert natural ecosystems will continue to represent a threat to biodiversity in the ASEAN region. Prioritising and securing areas with high biodiversity values that include habitats for ASAP species, with strict prohibitions on conversion and utili-



Northern White-cheeked Gibbon | *Nomascus leucogenys*
by Roland Wirth

sation of such areas, while recognising acceptable tradeoffs in other areas will be essential to mitigating habitat loss. A **mitigation hierarchy approach** for nature conservation through a four-step process (avoid, minimise, remediate and offset) provides a powerful framework to integrate multiple goals and to evaluate tradeoffs in achieving biodiversity and economic outcomes. Areas with high biodiversity values including PAs are positioned at the highest and most important step of the mitigation hierarchy, and the avoidance of impact to these areas will be essential to reconciling economic growth with conservation objectives, while achieving the sustainable development goals. Recognising sites with important and critical habitat for ASAP species as areas with high biodiversity values can help secure these sites as areas to be 'avoided' for economic activities.

Recommendations for ASAP species threatened by habitat loss and degradation in the ASEAN region:

- *An assessment to identify the opportunities to integrate biological values represented by ASAP species into EIA legislation, voluntary certification standards (such as Aquaculture Stewardship Council (ASC), Roundtable on Sustainable Palm Oil (RSPO)) and other relevant policy mechanisms linked to agriculture and forestry (eg oil palm, rubber, timber etc)*

- *An assessment of the challenges facing companies in undertaking high quality assessments and effective monitoring and management of HCVs*

- *The mitigation hierarchy approach represents a powerful tool to integrate multiple goals including biodiversity values into economic decision-making. Incorporating the approach as a regulatory requirement for economic activities impacting natural ecosystems including threatened species habitats in the ASEAN region can potentially mitigate deforestation driven habitat loss.*

WILDLIFE TRAFFICKING AND ASAP SPECIES

CITES

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments with the aim to ensure that international trade in specimens of wild animals and plants does not threaten their survival. It is an important mechanism to regulate legal trade in species and protect species adversely impacted by trade. CITES is a relevant framework for the protection and sustainable use of several ASAP species. All 10 AMS are parties to the CITES Convention.

All AMS already have relatively comprehensive national CITES enabling laws covering wildlife offences that extend beyond wildlife trafficking including varying degrees of provisions on the possession of prohibited or protected wildlife. Normally annexed under legislation, it is possible to find a list of species that are granted protection or whose trade must be authorised by competent authorities. However, trade-threatened species that are often not included in annexed lists of protected or reserved species across all AMS or in individual AMS require legal protection. As wildlife crime becomes increasingly transnational and organised in nature, it is important for non-native species to be legally protected. Traffickers do not discriminate between domestic and foreign wildlife species, which are shipped and consumed throughout the region.

72 ASAP species are listed on **CITES**[14]

For CITES Appendix I and II species,[15] the most important conditions are legal acquisition and that international trade must not be detrimental to their survival in the wild.

Appendix I includes

41 ASAP species

Appendix II includes

31 ASAP species

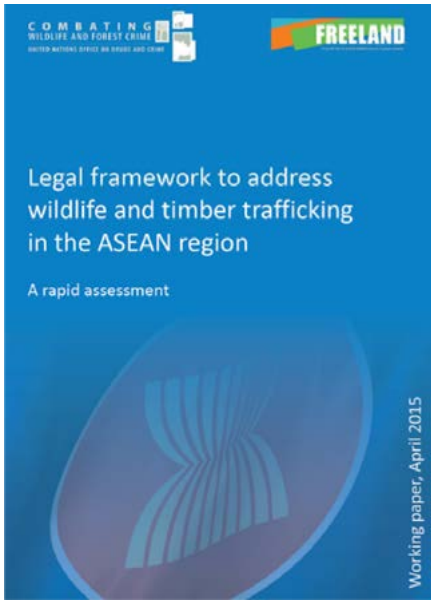
[14] See Appendix 2 for the list of ASAP species listed under CITES Appendices I and II

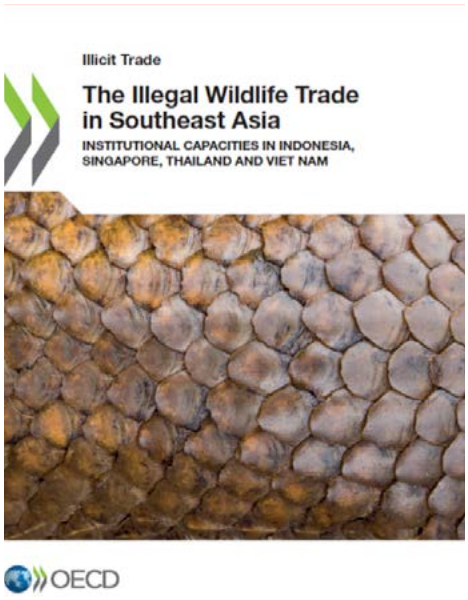
[15] Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilisation incompatible with their survival (CITES 2020)

THE LEGAL AND REGULATORY CONTEXT

- ASEAN countries are source, transit and destination markets for wildlife trade. Approximately 140 (out of 221 ASAP species) (66 per cent) are affected by overharvest for subsistence and the commercial wildlife trade (both legal and illegal).[16]

- Detailed studies[17] have been published on the legal and regulatory context with clear and relevant (to ASAP species) recommendations to strengthen the legal and regulatory context.





[16] See page 43 for the detailed overview of ASAP species' threats
[17] UNODC and Freeland (2015); OECD (2019); DLA Piper (2015); The World Bank (2018); USAID (2019)

Sunda Pangolin | *Manis javanica*
by Sofiya Shukhova

- All AMS recognise wildlife trafficking as a transnational organised crime.

- AMS have high adherence to international treaties and conventions, which is useful to build a regional legal basis for criminal justice cooperation in the field of wildlife trafficking. The AMS have ratified/accessed the following instruments:

    - *(a) United Nations Convention against Transnational Organized Crime (UNTOC)*
    - *(b) United Nations Convention against Corruption (UNCAC)*
    - *(c) ASEAN Mutual Legal Assistance Treaty on Criminal Matters (MLAT)*
    - *(d) International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation (FATF)*
    - *(e) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)*

- The UN Convention against Transnational Organized Crime can be considered as the legal basis for international cooperation in criminal matters in the field of wildlife crimes, especially through mutual legal assistance, information exchange and joint/parallel operations. Parties have yet to agree on the establishment of a review mechanism to monitor implementation.

- All AMS frame offences against wildlife as "serious crimes", either by explicit reference in their national legislation or de facto through reference to existing international standards set in the UNTOC.

- All AMS have a relatively solid legal foundation to address wildlife crimes. However, the legislative provisions in each country appear to vary significantly, as a result of different legal structures and national policies. Most AMS provide a maximum penalty of four years or more, and there are various domestic legal provisions to treat wildlife crime as a serious crime. In terms of punishment of offenders for wildlife and forest crimes, the regional picture is highly diverse.

- International cooperation in criminal matters among criminal justice systems is an essential prerequisite to combating transnational organised crime which includes wildlife trafficking. There are different forms of international cooperation, such as extradition, mutual legal assistance, transfer of criminal proceedings, transfer of sentenced persons, joint investigations, and so on.

- Seven out of ten AMS have domestic legislation to implement the Treaty on Mutual Legal Assistance in Criminal Matters. Wildlife trafficking is eligible for request of Mutual Legal Assistance (MLA) in all AMS with the exception of Cambodia and Philippines.

Pagai Island Macaque | *Macaca pagensis*
by Roland Wirth

- Inter-agency cooperation is recognised as a key to successful law enforcement efforts but the number of cases involving inter-agency cooperation for illegal wildlife trade investigations and prosecutions is low. Several countries have adopted 'Wildlife Enforcement Networks' (WENs). Furthermore, anti-corruption authorities and financial intelligence units are included in WENs in only some countries.

- Legal loopholes and gaps in implementation of laws continue to prevent effective prosecution of illegal wildlife trade. Illegal wildlife products can be licensed for export or sale through captive breeding programs or in open markets, often masquerading as legally obtained products.

- Corruption risks are facilitators of wildlife trade in several countries and national border crossings are hotspot for corruption.

- Overall, AMS have a strong legislation and regulatory framework to tackle wildlife crime. There is need to strengthen national and sub-national legal frameworks, to increase penalties and prosecution rates, and to address wildlife laundering through farms and wildlife markets. Addressing site-based pervasive threats such as snaring through legal reform, effective enforcement and demand reduction will be essential to eliminate trafficking as a threat to ASAP species.

Recommendations for CITES listed ASAP species:

- *AMS: Strengthening domestic legislation for CITES compliance (especially for Appendix I listed species), developing non-detriment findings (NDFs) for Appendix II listed species and tightening import/export permit systems to eliminate fraudulent practice and abuse is recommended.*

- *CITES compliance and stronger national protection of trade-threatened CITES and non-CITES listed ASAP species is recommended.*

- *Ensuring national protected species lists include CITES-listed species and ASAP species will further help strengthen the policy basis for protection and recovery of CITES-listed ASAP species.*

Given that a large number of ASAP species (140) are threatened by overharvesting for subsistence and commercial wildlife trade, and only 71 ASAP species are CITES-listed, an assessment is needed to determine which of the non-CITES listed ASAP species (69) threatened by overharvesting need to be prioritised for potential inclusion in the CITES appendices.

CONVENTION ON MIGRATORY SPECIES

The Convention on the Conservation of Migratory Species of Wild Animals, also known as the Convention on Migratory Species (CMS) or the Bonn Convention, is an international agreement that aims to conserve species, the populations of which occur across international borders and would be difficult to conserve with a single-country approach. The Convention is an important mechanism to protect the ranges of migratory ASAP species listed below. In the ASEAN region, except for the Philippines which is a Party to the CMS, all remaining AMS are non-parties to the CMS.

Appendix I

Birds	*Aythya baeri*	Baer's Pochard
	Thalasseus bernsteini	Chinese Crested Tern
	Fregata andrewsi	Christmas Frigatebird/ Andrews' Frigatebird
	Sarcogyps calvus	Red-headed Vulture
	Gyps tenuirostris	Slender-billed Vulture
	Calidris pygmaea	Spoon-billed Sandpiper
	Gyps bengalensis	White-rumped Vulture
	Emberiza aureola	Yellow-breasted Bunting
Fishes	*Pristis zijsron*	Green Sawfish
	Pristis pristis	Largetooth Sawfish
	Pangasianodon gigas	Mekong Giant Catfish
Mammal	*Bos sauveli*	Kouprey
Reptile	*Eretmochelys imbricata*	Hawksbill Turtle

Appendix II

Birds	*Aythya baeri**	Baer's Pochard
	*Sarcogyps calvus**	Red-headed Vulture
	*Gyps tenuirostris**	Slender-billed Vulture
	*Calidris pygmaea**	Spoon-billed Sandpiper
	*Gyps bengalensis**	White-rumped Vulture
Fishes	*Pristis zijsron*	Green Sawfish
	Pristis pristis	Largetooth Sawfish
Reptile	*Eretmochelys imbricata**	Hawksbill Turtle

Table 2: ASAP species included in Convention on Migratory Species Appendices I and II.
*Appendix I comprises migratory species that have been assessed as being in danger of extinction throughout all or a significant portion of their range. Appendix II covers migratory species that have an unfavourable conservation status and that require international agreements for their conservation and management, as well as those that have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement.[18] Species marked with * are included into Appendix II as part of their higher taxa that are listed under Appendix II.*
Data source: Convention on the Conservation of Migratory Species of Wild Animals (2019)

[18] As per CMS (2020) definintion

POLICY: **CHAPTER SUMMARY**

- **International, regional and national policy platforms offer good opportunities to integrate threatened species priorities in the ASEAN region.**

- **Habitat loss and trafficking, two of the most insidious threats to threatened species need to be addressed effectively through national and sub-national level legal and policy frameworks.**

- **An ASEAN species declaration is recommended as a policy platform to galvanise urgent conservation action to avert species extinctions and secure the region's biodiversity.**

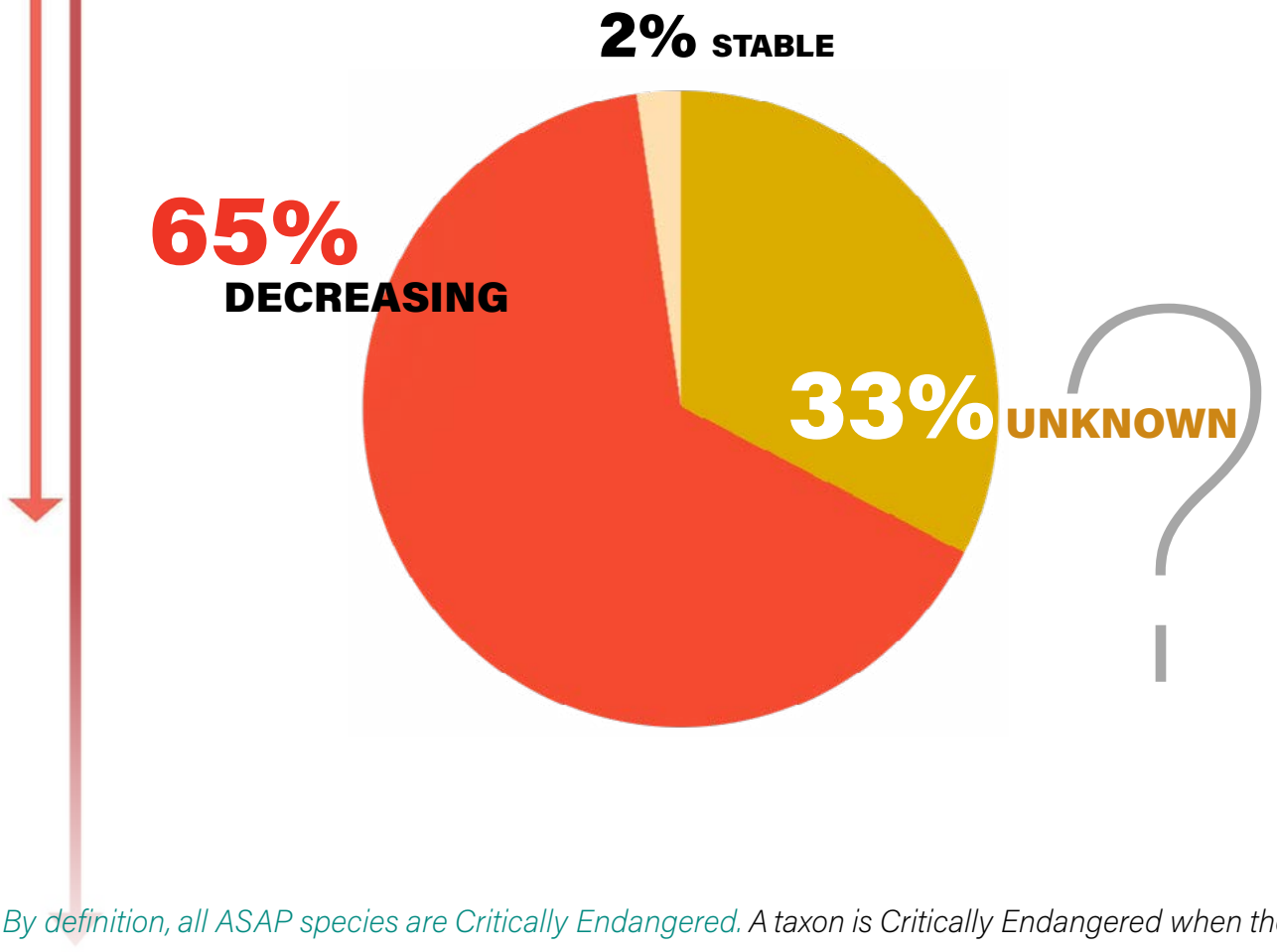
Population trends, endemism, uniqueness

3

Siau Island Tarsier | *Tarsius tumpara* by Geoff Deehan

ASAP SPECIES POPULATIONS IN DECLINE

- **The vast majority show declining population trends (144).**
- **Population trends are unknown for a third (72) of species.**



By definition, all ASAP species are Critically Endangered. A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.[19]

A. Declining population (past, present and/or projected)
B. Geographic range size, and fragmentation, decline or fluctuations
C. Small population size and fragmentation, decline or fluctuations
D. Very small population or very restricted distribution
E. Quantitative analysis of extinction risk (e.g. Population Viability Analysis)

[19] IUCN Red List of Threatened Species™ (2019)

ASAP SPECIES LISTED AS EDGE SPECIES

Evolutionarily Distinct and Globally Endangered (EDGE) species are threatened species that have few or no close relatives on the tree of life. EDGE species are usually extremely distinct in the way they look, live and behave, as well as in their genetic make-up. If they disappear, there will be nothing like them left on the planet.[20, 21]

64 ASAP species are also **EDGE species**[22]

The top EDGE mammal species are both ASAP species and receive very little conservation attention:

- Sir David's Long-beaked Echidna *(Zaglossus attenboroughi)*
- Western Long-beaked Echidna *(Zaglossus bruijnii)*

Number of ASAP species listed in the EDGE species lists:
(noting that the EDGE list is a global list and not restricted to the ASEAN region)

List	*Number of ASAP species*
Top 50 EDGE amphibians	1 amphibian
Top 50 EDGE birds	16 birds
Top 50 EDGE mammals	12 mammals
Top 50 EDGE reptiles	5 reptiles
Top 100 EDGE amphibians	3 amphibians
Top 100 EDGE birds	24 birds
Top 100 EDGE mammals	14 mammals
Top 100 EDGE reptiles	9 reptiles

[20] Fishes have not been assessed
[21] More information on EDGE species can be found at https://www.edgeofexistence.org/
[22] See Appendix 3 for the list of ASAP species with their EDGE ranking and ED score

Bawean Deer | *Axis kuhlii*
by Roland Wirth

ENDEMISM PATTERNS

Total number of ASAP species endemic* to the ASEAN region: 195

** Native to, and restricted to, a particular geographical region. Highly endemic species, those with very restricted natural ranges, are especially vulnerable to extinction if their natural habitat is eliminated or significantly disturbed.*[23]

[23] IUCN (2018)

COUNTRY AND REGION ENDEMIC SPECIES

- Many ASAP species are endemic to a single country - nearly all are ASEAN region endemics.
- All ASAP amphibians are country endemics.

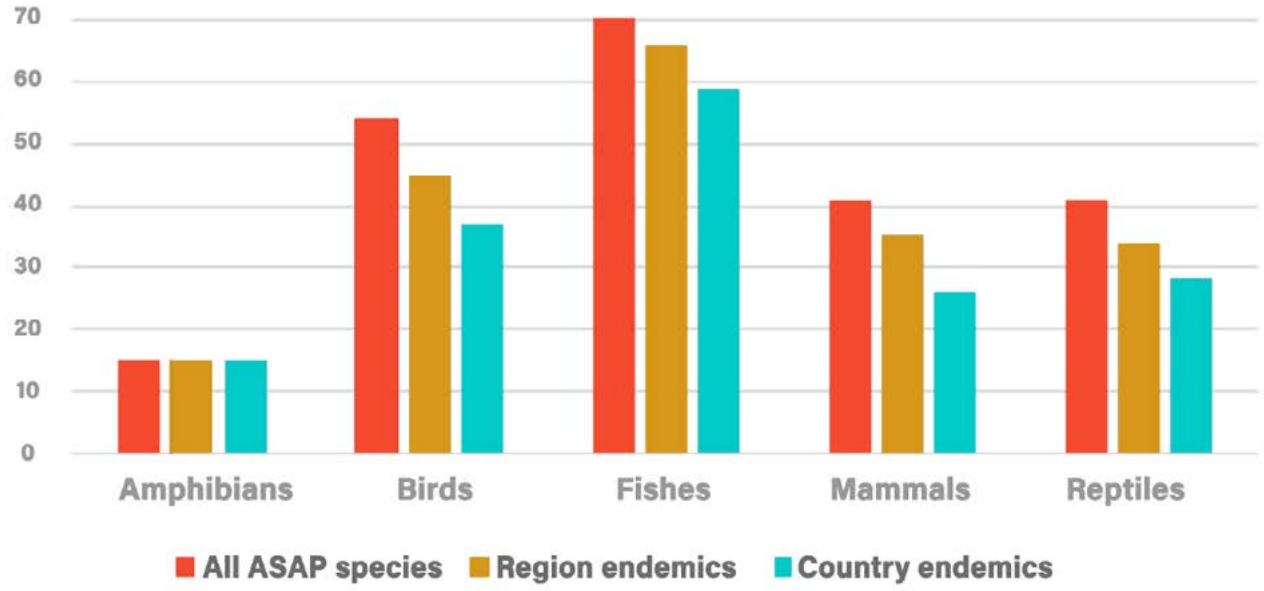


Figure 3: Number of ASAP species that are country endemics and ASEAN region endemics.
Data source: IUCN Red List of Threatened Species™ (2019) supplemented by information from ASAP partners and desk-based research.

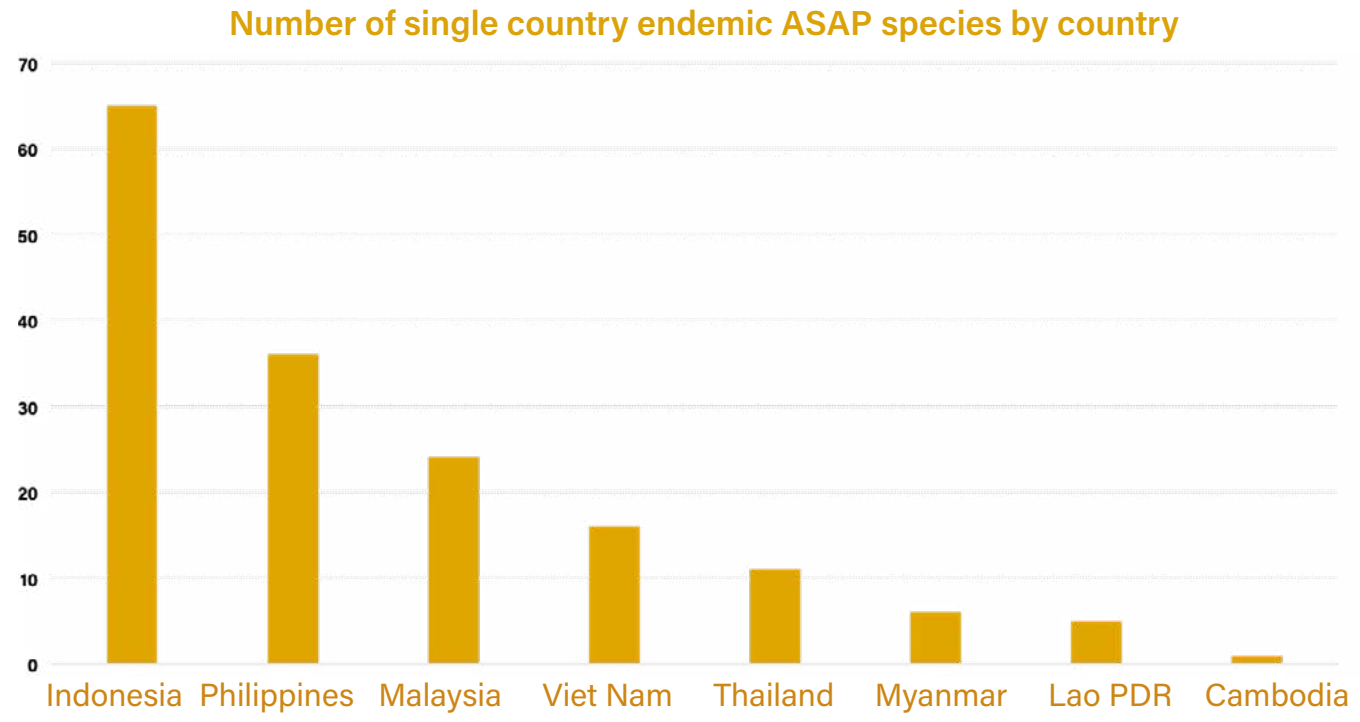


Figure 4: Number of single country endemic ASAP species by country.
Data source: IUCN Red List of Threatened Species™ (2019) supplemented by information from ASAP partners and desk-based research.

HIGH LEVELS OF FINE-SCALE ENDEMISM AND HABITAT SPECIALISATION IN ASAP FISHES

- Many only occur in single drainage basins, making them especially vulnerable to even small-scale localised disturbances that can quickly lead to population declines and extinctions.

- Similarly, some are highly specialised to certain habitats such as the acidic waters of peat swamp forests or fast-flowing waters of hill stream forests - any disturbance that changes these habita conditions risks pushing these species to extinction.

CASE STUDY #1
BUTTERFLY LOACH

Butterfly Loach
Sewellia breviventralis
by Gregoire Germeau

English name: Butterfly Loach

Scientific name: *Sewellia breviventralis*

Population trend: Decreasing[24]

- **Known from single locality in Pako River, central Viet Nam**
- **Occurs in fast-flowing rapids; uses specialised fins to cling onto rocks and boulders**

Key threats:

- Overfishing
- Habitat degradation from development
- Siltation caused by deforestation practices

[24] IUCN Red List of Threatened Species™ (2019)

photo by Pok Rie | Pexels.com

A PRIORITY FOR ENDEMIC SPECIES

PHILIPPINES

- The archipelago nature of Philippines means that the country is home to many restricted-range endemics.
- **90 per cent of ASAP species in the Philippines are endemic to the country.**

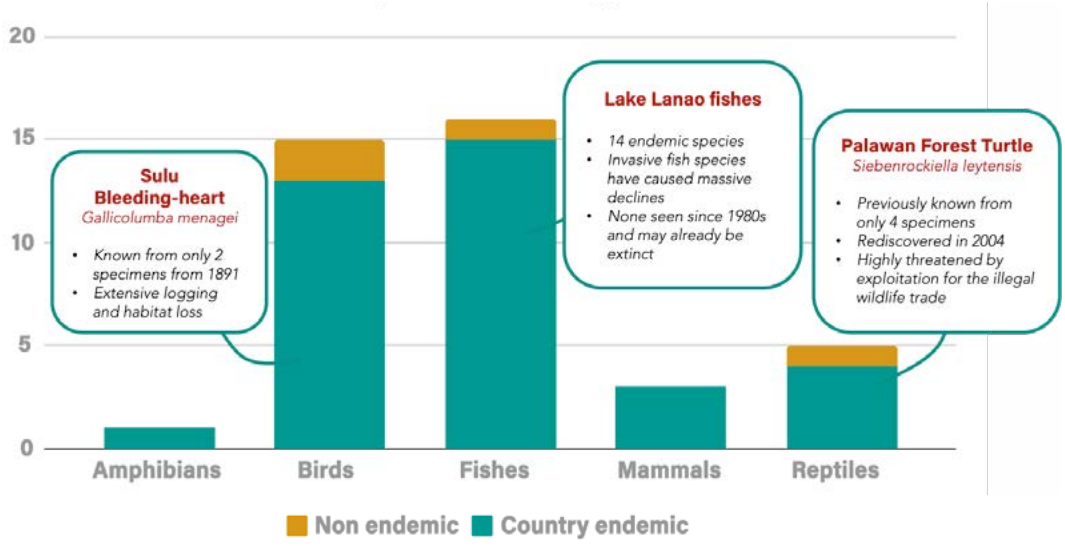


Figure 5: Scale of country-level endemic ASAP species found in Philippines.
Data source: IUCN Red List of Threatened Species™ (2019) supplemented by information from ASAP partners and desk-based research.

INDONESIA

- The archipelago nature of Indonesia means that there are many country endemic ASAP species, many of which are restricted-range endemics, for example the *Tarsius tumpara* (Siau Island Tarsier) which is restricted to Siau Island.

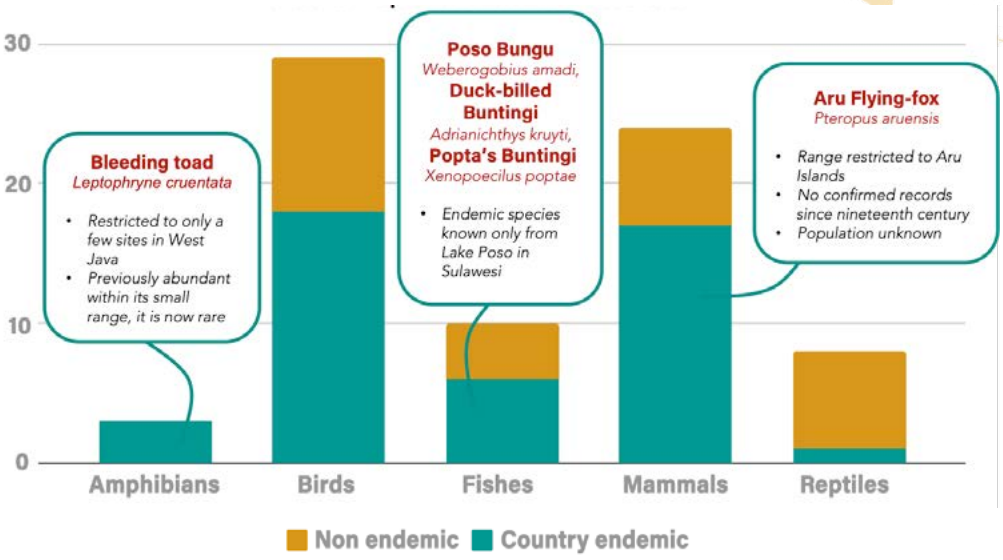


Figure 6: Scale of country-level endemic ASAP species found in Indonesia.
Data source: IUCN Red List of Threatened Species™ (2019) supplemented by information from ASAP partners and desk-based research.

POPULATION, TRENDS AND ENDEMISM: **CHAPTER SUMMARY**

- **Declining populations of ASAP species are a serious concern and need immediate measures for protection and recovery.**

- **The significant number of country-level and restricted-range endemics in the region implies the need for urgent and targeted attention on these species; all ASAP amphibians are country endemics.**

- **Loss of regionally endemic species in the ASEAN region would equal global extinctions and a loss of unique natural and cultural heritage in ASEAN.**

- **Freshwater fishes represent the largest number of country-level endemic species, are much neglected and need attention.**

CONSERVATION ACTION

- *Confirm existing populations of ASAP species, identify new populations and monitor population trends through research and surveys*
- *Ramp up efforts to protect key populations of regionally endemic species, and especially those with restricted ranges*
- *Prioritise regionally endemic species for conservation action, mitigating threats of habitat loss and unsustainable offtake*

Threats and drivers

4

Siamese Crocodile | *Crocodylus siamensis* by Wildlife Reserves Singapore

THREATS TO ASAP SPECIES

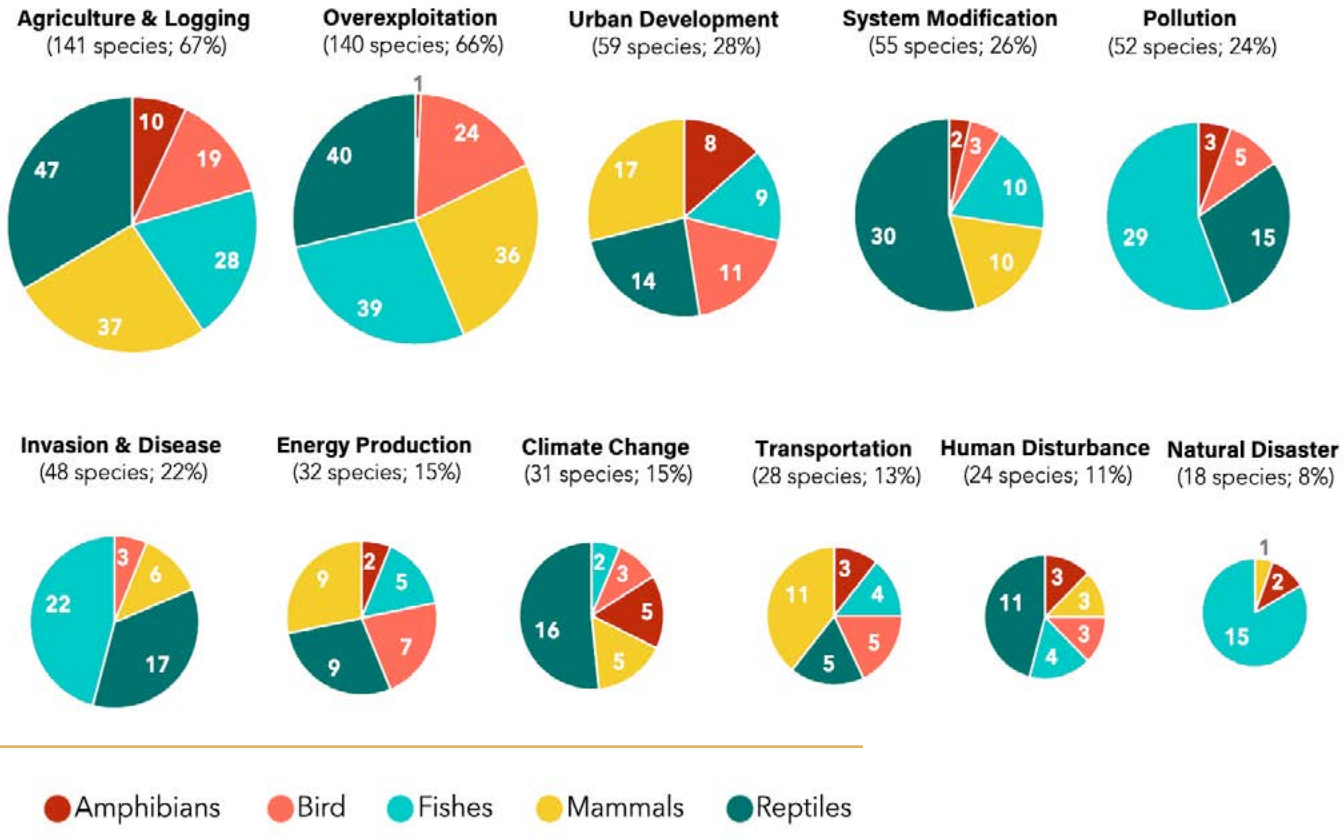


Figure 7: Threats to ASAP species based on the analysis of 213 (out of 221) species for which the threats are known. Data source: IUCN Red List of Threatened Species™ (2019)


photo by FFI-Cambodia

UNSUSTAINABLE OFFTAKE

- Unsustainable offtake is a major threat for many ASAP species.
- Driven by a high demand for wildlife and wildlife products for the international wildlife trade, as well as local consumption and use.
- Trade in wildlife products include:
  - *Live captures for the pet trade*
  - *Use of various body parts for enhancing social standing such as luxury ornamental products, meat and traditional medicines.*

WILDLIFE SNARING

- Commercially driven for wild meat
- Indiscriminate: driving extinctions of many species including non-target (by-catch) highly threatened species
- Resulting in "Empty Forest Syndrome" particularly impacting ground-dwelling mammals

The cumulative number of snares removed from Southern Cardamom National Park, Srepok/ Phnom Prich Wildlife Sanctuaries, Seima Wildlife Sanctuary, Nam Et–Phou Louey National Protected Area and Hue/Quang Nam Saola Reserves has increased from 24,242 in 2011 to 55,282 in 2015.[26]

Conservation action:

- Need for legislative reform that criminalises the possession of snares, and the materials used for their construction, where possible, inside and immediately adjacent to PAs; consistent enforcement of such legislation is essential
- Need for improved capacity for PA Management and enforcement, and SMART patrolling
- Need for incentivising local communities to stop hunting for commercial trade[25]

SNARING
- driving force behind many vertebrate species at risk of extinction in the ASEAN region

[25,26] Gray et al. (2018)

CASE STUDY #2

DEMAND FOR COMMERCIALLY VALUED PRODUCTS: HELMETED HORNBILL CASQUES

English name: Helmeted Hornbill

Scientific name: *Rhinoplax vigil*

Population trend: Decreasing

CITES Appendix I

Key threat:

- Heavily targeted by hunters and illegally traded for its casque, which is often carved carved for decorations

Helmeted Hornbill I *Rhinoplax vigil* casque by Yong Ding Li I BirdLife

Conservation action:

- Ten-year Conservation Strategy and Action Plan for the range countries focusing on:
  - *Increasing financial resources for Helmeted Hornbill conservation*
  - *Eliminating trafficking and trade*
  - *Habitat protection*
  - *Community empowerment.*
- National plans being developed in some range countries
- Need for strengthened site-based law enforcement, regional cooperation for combatting trafficking and demand reduction

Helmeted Hornbill | *Rhinoplax vigil* by Morten Strange


photo by Sofiya Shukhova

CASE STUDY #3

DEMAND FOR THE PET TRADE: SONGBIRDS

- **44 Southeast Asian songbird species identified as threatened by trade and of high conservation concern.[27]**
- **10 of them are Critically Endangered.[28]**
- **Few species are legally protected in range countries, and fewer are protected at international levels.**

Key threats:

- Unsustainable trapping
- Trade in wild-caught passerines

Conservation action:

- Need for protection by national legislation in the range countries and under CITES where appropriate
- Need for effective regulation and enforcement along the trade chain
- Need for improving regulation and monitoring of commercial breeding operations
- Need for targeted demand reduction and behaviour change campaigns

[27] IUCN SSC Asian Songbird Trade Specialist Group (2019)
[28] IUCN Red List of Threatened Species™ (2019)

LAND TRANSFORMATION

The ASEAN region has achieved rapid economic growth, and is undergoing one of the highest rates of recent land transformation in the world. This has come at a high environmental cost, causing habitat degradation and loss of biodiversity. The ASEAN region has globally significant levels of deforestation for agricultural expansion, especially commodity-driven deforestation and logging.

photo by Pok Rie | Pexels.com

PEAT SWAMP FORESTS UNDER THREAT

- Important habitat for freshwater fishes, and other biodiversity
- Store huge amounts of carbon, which is released when drained
- Under threat from deforestation, drainage and fire
- Rate of loss between 2007 and 2015 was 2.6 per cent per year in Sumatra and Kalimantan (Indonesian Borneo).[29]


photo by Pok Rie | Pexels.com

WETLAND DESTRUCTION


photo by Michael Lo

- Freshwater wetlands are being destroyed or converted at a scale three times greater than forest loss.[30]
- Over 31% of the world's wetlands are located in Asia, with extremely high representation of peatlands.
- Southeast Asia has been found to have the highest rate of threatened freshwater-dependent vertebrates and decapods (crabs, shrimp, crayfish).[31]

[29] Miettinen et al. (2016)
[30] Ramsar Convention on Wetlands (2018)
[31] Collen et. al (2014)

CASE STUDY #4

RECOVERY OF THE ROTE ISLAND SNAKE-NECKED TURTLE

English name: Rote Island Snake-necked Turtle

Scientific name: *Chelodina mccordi*

Geography: Endemic to Rote Island in the Lesser Sunda Islands, Indonesia

Not seen in the wild since 2009

Key threats:

- Collection for the pet trade
- Habitat being converted into agricultural rice fields
- Increased exposure to agricultural chemicals and pesticides

Conservation action:

- Ex situ and in situ species and habitat recovery actions
- Assurance colonies held globally with Wildlife Reserves Singapore holding the only population in Asia

Rote Island Snake-necked Turtle | *Chelodina mccordi*
by Wildlife Reserves Singapore

CASE STUDY #5

A FROG IN PERIL

English name: Gigante Wrinkled Ground Frog

Scientific name: *Platymantis insulatus*

Geography: four tiny islands in the Gigante Island group

Gigante Wrinkled Ground Frog
Platymantis insulatus
by Pierre Fidenci

Key threats:

- Agriculture
- Forest encroachment
- Guano mining
- Limestone quarrying

Conservation action:

- Efforts to increase protection and establish conservation measures
- Need for declaring site as High Conservation Value area

CASE STUDY #6

A COCKATOO IN CRISIS

English name: Philippine Cockatoo

Scientific name: *Cacatua haematuropygia*

Population trend: Decreasing

Philippine Cockatoo
Cacatua haematuropygia
by Katala Foundation

Key threats:

- Trapping for pet trade
- Forest loss
- Agricultural encroachment

Conservation action:

- Protection of nest sites
- Management of conservation areas
- Habitat restoration
- Education
- Community involvement
- Conservation-breeding and reintroductions

KEY ISSUES FOR ASAP FISHES

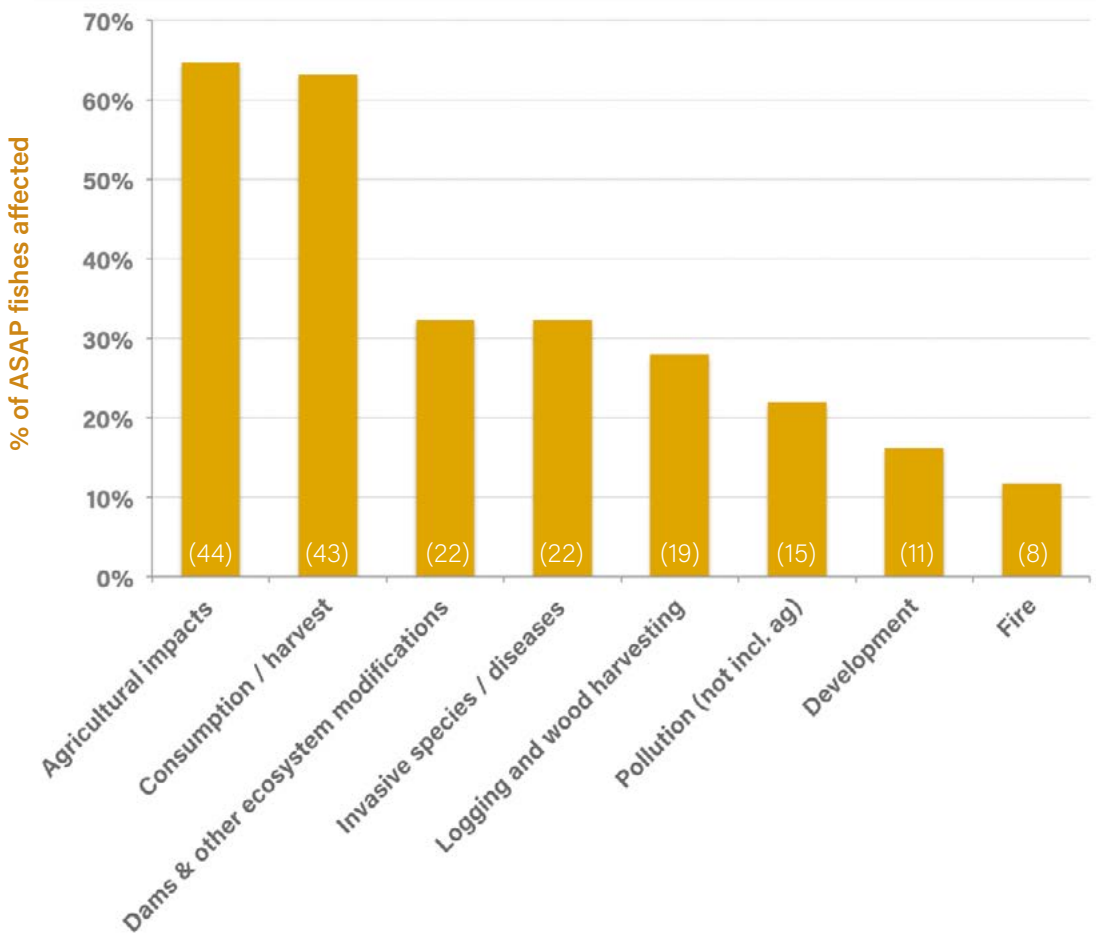


Figure 8: Known threats affecting ASAP fishes. Numbers in parentheses represent number of ASAP fish species affected. Data source: IUCN Red List of Threatened Species™ (2019)

There is a need to address the major drivers for declines of freshwater fishes including pollution of freshwater systems from mining and other industries; impact of dams on hydrodynamics and fish migration routes; impacts of invasive species including from aquaculture; and peat swamp forest loss and degradation.

Mekong Giant Catfish | *Pangasianodon gigas*
by Wildlife Reserves Singapore

CASE STUDY #7

MEKONG GIANT CATFISH IN DECLINE

English name: Mekong Giant Catfish

Scientific name: *Pangasionodon gigas*

Population trend: Decreasing

CITES Appendix I

- Large migratory fish endemic to the Mekong Basin
- One of the world's largest freshwater fish weighing over 250kg

Key threats:

- Dams which block migration routes and isolate populations
- Overfishing

Conservation action:

- Limit construction of dams and mitigate threats to maintain migratory routes
- Research and monitoring to better understand the species
- Species has some level of protection but efforts to increase and enforce control of fishing and legislation are needed across its range
- Ex situ conservation efforts
- Awareness raising

THREATS AND DRIVERS: **CHAPTER SUMMARY**

- **Land use change, driven by agriculture and logging, and unsustainable offtake for subsistence and commercial use, is the primary threat for many highly threatened species in the ASEAN region.**

- **Expansion of commercial agriculture for commodities such as oil palm, coffee, rubber, paper, as well as timber exploitation, have led to large-scale conversion of natural forests.**

- **Conversion of wetlands to agriculture (especially rice), alteration of water-flow, water abstraction, pollution and invasive species have serious impacts on freshwater species.**

- **Mining and dam development have contributed to significant habitat loss and degradation across the region, including from pollution and changes in hydrodynamics.**

- **Unsustainable offtake of wildlife including for meat, medicinal purposes, ornamental products and the pet trade, has been driven by a growing demand for wildlife products, often deemed luxury items, alongside growing levels of income and prosperity in the region.**

- **Land use change and unsustainable offtake have also affected area-based conservation measures established to protect biodiversity.**

Area-based conservation measures

5

Bleeding Toad | *Leptophryne cruentata* by Arief Tajalli

HUMAN IMPACT ACROSS THE ASEAN REGION

Over the past several decades, unprecedented levels of anthropogenic pressures have transformed natural habitats and ecosystems across the ASEAN region. The rapid pace of environmental transformation associated with strong economic growth continues to have significant ecological repercussions on the region's extraordinary biodiversity.

Within a context of significant anthropogenic influence on natural habitats in the ASEAN region, area-based conservation measures assume great significance for the conservation and recovery of ASAP species.

- Hotspots of human impact occur across the region.
- Strengthening management and protection of area-based conservation measures in regions of high human footprint will be essential for the recovery of species.
- Vast areas of low human impact still remain as opportunities for protected area creation.

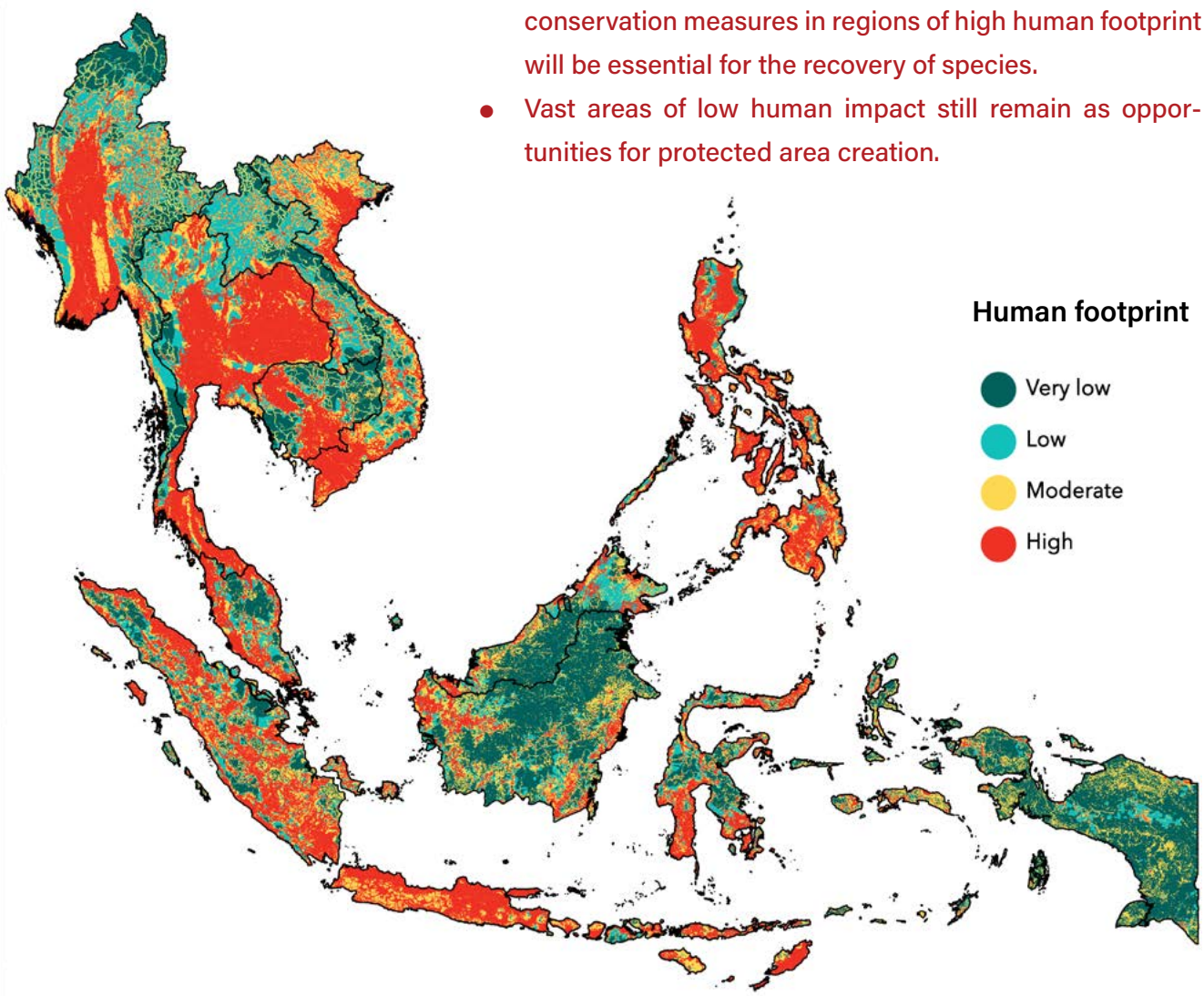


Figure 9: Spatially explicit data on the distribution of threats to species were obtained from the Human Footprint maps. These are globally standardised maps of cumulative human pressures on the natural environment at 1 km² resolution globally for eight of the most harmful pressures humans exert on nature, comprising 1) built environments, 2) population density, 3) electric infrastructure, 4) crop lands, 5) pasture lands, 6) roads, 7) railways, and 8) navigable waterways (Venter et al. 2016, 2018).[32] Data source: Socioeconomic Data and Application Center (2019)

[32] See Appendix 4 for more details on human footprint map

AREA-BASED CONSERVATION MEASURES IN THE ASEAN REGION

This section reviews ASEAN Heritage Parks (AHPs), World Heritage Sites, Alliance for Zero Extinction Sites, Key Biodiversity Areas (KBAs), East Asian-Australasian Flyway Network sites, and Protected Areas (PAs) in the ASEAN region in relation to the known distribution ranges of ASAP species.[33]

[33] See Appendix 5 for the data desciption used for the analysis of the area-based conservation measures for ASAP species

PROTECTED AREAS

Protected Areas (PAs) together with species protection laws represent the most common approach adopted by the ASEAN countries to conserve biodiversity.

The IUCN Protected Area Management Categories help classify PAs based on their primary management objectives,[34] while the IUCN Governance Types classify PAs according to who holds authority, responsibility and accountability for them.[35] PAs exist under the authority of diverse governance regimes, including indigenous peoples, local communities, private individuals and companies, governments, and combinations of these.

Effective, nationally designated PAs are important mechanisms for ASAP species conservation and recovery, and are particularly important for endemic species. A key measure of the ecological outcome of a PA is represented by the status of species populations within the PA.

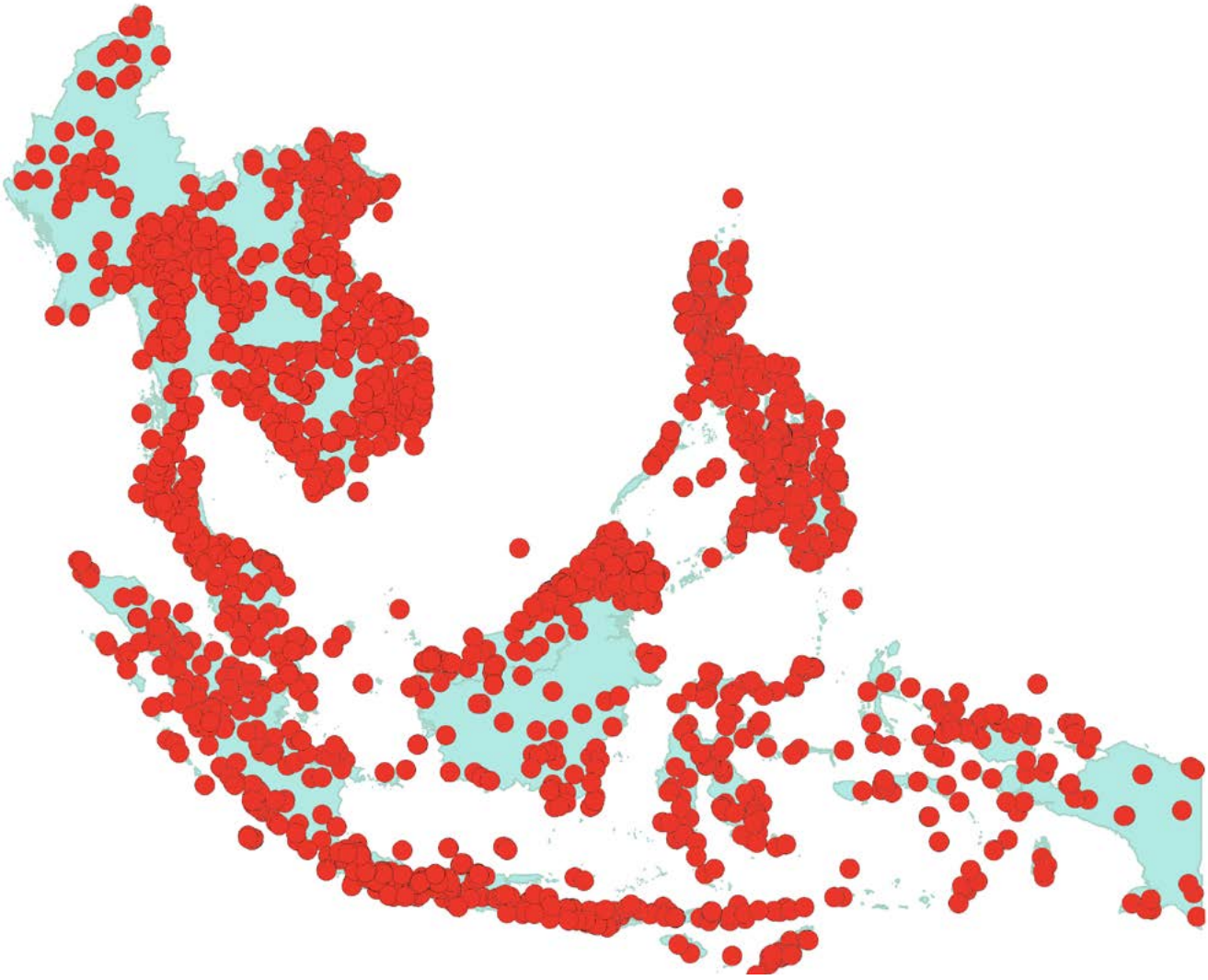


Figure 10: PAs as submitted to the World Database on Protected Areas and including both CBD and IUCN definitions of PAs. Data Source: UNEP-WCMC and IUCN Red List of Threatened Species™ (2019)

[34] Dudley (2008)
[35] Borrini-Feyerabend et al. (2013)

EFFECTIVENESS OF PROTECTED AREAS IN THE ASEAN REGION FOR BIODIVERSITY CONSERVATION

- PAs in the ASEAN region have an important role to play in securing populations of ASAP species. PA effectiveness is critical to ensure that biodiversity values are conserved.

- Ecological integrity is a critical factor underlying the effectiveness of PAs and non-established PAs. For established PAs to conserve biodiversity effectively, strong governance and management are essential to mitigate threats such as exploitation and habitat loss. In some PAs, continuing exploitation have resulted in declining species populations and extinctions.

- Protected Area Management Effectiveness (PAME) evaluations can be defined as: *"the assessment of how well protected areas are being managed – primarily the extent to which management is protecting values and achieving goals and objectives".*[36]

- PAME methodologies are designed to capture information on management elements hypothesised to contribute to biodiversity outcomes.[37]

Bornean Orangutan | *Pongo pygmaeus*
by Orangutan Foundation

[36] Hockings et al. (2006)
[37] More infromation on PAME methodologies can be found at https://www.protectedplanet.net/c/protected-areas-management-effectiveness-pame/methodologies

- PAME data can help increase our understanding of the impact of aspects of PA management on conservation outcomes. Management Effectiveness Tracking Tool (METT) in combination with independent metrics of population status and threats can help to ensure PAs across the ASEAN region are effective in conserving viable populations of ASAP species.
- Effective law enforcement and ranger-based monitoring is an essential element of site-based management. SMART (Spatial Monitoring and Reporting Tool) is a management tool developed to assist rangers on the ground to stop poachers and curb the illegal trade of wildlife.[38] It helps PA and wildlife managers better measure, monitor, evaluate and improve the effectiveness of wildlife law enforcement patrols and site-based conservation activities and adaptively manage patrolling activities.

PAME assessments:

- *Evaluate the management elements of planning, inputs, processes, outputs and outcomes – with the feedback of information into an adaptive management process*
- *Need to use independent, empirical data on outcomes.*

[38] More infromation on SMART can be found at https://smartconservationtools.org/

Chinese Pangolin | *Manis pentadactyla* by Roland Wirth

ASEAN HERITAGE PARKS

AHPs are selected PAs in the ASEAN region, recognised for their importance as conservation areas, and are known for their unique biodiversity, ecosystems, wilderness and outstanding values.

As of 2019, a total of **49** ASEAN Heritage Parks have been established.

Through the ASEAN Declaration on Heritage Parks and Reserves, the ASEAN Member States (AMS) agreed to manage these AHPs effectively to maintain ecological processes and life support systems; preserve genetic diversity; ensure sustainable utilisation of species and ecosystems; and maintain wilderness supporting scenic, cultural, educational, research, recreational and tourism values.[39]

ASAP SPECIES DISTRIBUTION OVERLAP WITH AHPs

AHPs are important sites for ASAP species.[40] Certain AHPs are critically important sites for geographically restricted, endemic species. For example, *Oreolalax sterlingae* (Sterling's Toothed Toad) and *Leptobrachella botsfordi* are both known only from a single stream on Mount Fansipan, Hoang Lien National Park, Lao Cai Province, Viet Nam.[41] Similarly, the amphibian species *Megophrys damrei* is endemic to Preah Monivong (Bokor) National Park, between 428-1,000m asl in the southeastern Cardamom Mountains of southern Cambodia.[42]

The presence of a large number of endemic species, makes PAs (including AHPs) in the Philippines critically important for these species. Mt. Iglit-Baco National Park, for example, is important for endemic species such as *Centropus steerii* (Black-hooded Coucal) and *Bubalus mindorensis* (Tamaraw).

AHPs present a unique opportunity as strongholds to secure populations and promote species recovery.

[39] More infromation on AHPs can be found at https://aseanbiodiversity.org/
[40] See Appendix 6 for the list of AHPs with ASAP species
[41] Nguyen et al. (2013); Rowley et al. (2013)
[42] Mahony (2011); Neang et al. (2013)

Appendix 6 provides an indicative (not comprehensive) list of ASAP species occurrence within AHPs. 43 ASAP species are listed as potentially occurring across 40 AHPs derived from intersections of species ranges (IUCN Red List) with the AHPs, followed by expert consultations. There is an urgent need to improve the information base for ASAP species distribution as they remain poorly surveyed. However, the available information does provide opportunities to strengthen management of AHPs and take targeted action such as controlling snaring (as an example) to strengthen protection and effectiveness of these AHPs. Integrating ASAP species into existing AHP management plans can also help bring focus and attention to their recovery within relevant AHPs.

Figure 11: Map showing the distribution of 40 (out of 49) AHPs. Numbers in circles represent the following AHPs: 1 - Tasek Merimbun Heritage Park; 2 - Gunung Leuser National Park; 3 - Kerinci-Seblat National Park; 4 - Vu Quang National Park; 5 - Gunung Mulu National Park, 6 - Kinabalu National Park; 7 - Taman Negara National Park; 8 - Mt Apo Natural Park; 9 - Mts Iglit-Baco National Park; 10 - Khao Yai National Park; 11 - Tarutao National Park; 12 - Preah Monivong (Bokor) National Park; 13 - Virachey National Park; 14 - Nam Ha National Protected Area; 15 - Alaungdaw Kathapa National Park; 16 - Hkakaborazi National Park; 17 - Indawgyi Lake Wildlife Sanctuary; 18 - Inlay Lake Wildlife Sanctuary; 19 - Lampi Marine National Park; 20 - Meinmahla Kyun Wildlife Sanctuary; 21 - Sungei Buloh Wetland Reserve; 22 - Ao Phang-Nga- Mu Ko Surin- Mu Ko Similan National Park; 23 - Kaeng Krachan Forest Complex; 24 - Ba Be National Park; 25 - Chu Mom Ray National Park; 26 - Hoang Lien Sa Pa National Park; 27 - Kon Ka Kinh National Park; 28 - Mt Kitanglad Range Natural Park; 29 - Mt Malindang Range Natural Park; 30 - Bukit Timah Nature Reserve; 31 - Nat Ma Taung ; 32 - U Minh Thuong National Park; 33 - Bidoup Nui-Ba National Park; 34 - Mt Hamiguitan Range Wildlife Sanctuary; 35 - Tubbataha Reefs Natural Park; 36 - Way Kambas National Park; 37 - Bantimurung Bulusaraung National Park; 38 - Bai Tu Long National Park; 39 - Kepulauan Seribu National Park; 40 - Wakatobi National Park.
Data Source: ASEAN Centre of Biodiversity (2019)

ASEAN HERITAGE PARKS: **SUMMARY**

- **AHPs are recognised as priority sites for conservation and management across the ASEAN by the AMS. A number of AHPs are highly important sites for certain ASAP species and represent good opportunities to secure their populations.**

- **Research and surveys can help confirm population status of species to identify priority AHPs.**

- **Improving the knowledge base of the status of ASAP species populations and their habitat within AHPs will be an important step in catalysing conservation action to ensure that AHPs can become strongholds for these species.**

- **For AHPs with ASAP species, it is recommended to assess protection and needs for strengthened management. Addressing specific threats to species within these AHPs is recommended and should be included within their management plans.**

- **Taking urgent action to ensure viable populations of ASAP species within AHPs will be key to ensuring that AHPs offer effective protection and represent secure refuges for the recovery of these species.**

KEY BIODIVERSITY AREAS

The Global Standard for the Identification of KBAs[43] sets out globally agreed criteria for the identification of KBAs worldwide.[44] The KBA Standard establishes a consultative, science-based process for KBA identification, founded on the consistent application of global criteria with quantitative thresholds that have been developed through an extensive consultation exercise spanning several years.

Sites qualify as global KBAs if they meet one or more of 11 criteria, clustered into five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and, irreplaceability. The KBAs criteria can be applied to species and ecosystems in land, inland water and marine environments. Although not all KBAs criteria may be relevant to all elements of biodiversity, the thresholds associated with each of the criteria may be applied across all taxonomic groups (other than micro-organisms) and ecosystems.

ASAP SPECIES DISTRIBUTION OVERLAP WITH KBAs

There are 579 protected and 342 unprotected KBAs that intersect with ASAP species range in the ASEAN region. There is need to identify, protect and connect priority KBAs in this region.

KBAs can support the strategic expansion of PA networks by governments and civil society working towards achievement of the Aichi Biodiversity Targets (in particular Target 11, but also targets 5, 12, 13 and others), as established by the Convention on Biological Diversity (CBD). However, securing legal protection status for KBAs may not always be possible or necessary. Other management approaches such as Other Effective Area-based Conservation Measures (OECMs) may be suitable to maintain the conservation values of KBAs. Strengthening the protection and management of priority KBAs important for ASAP species and identifying new KBAs could be important actions in the ASEAN region.

[43] IUCN (2016)
[44] More infromation on KBAs can be found at http://www.keybiodiversityareas.org/what-are-kbas

photo by Grégoire Dubois

ALLIANCE FOR ZERO EXTINCTION

The Alliance for Zero Extinction (AZE)[45] aims to prevent extinctions by identifying and safeguarding key sites, each one of which is the last remaining refuge of one or more Endangered or Critically Endangered species. AZE uses the following criteria to identify priority sites. An AZE site must meet all three criteria to qualify:[46]

1. Endangerment

An AZE site must contain at least one Endangered (EN) or Critically Endangered (CR) species, as assessed on the IUCN Red List.

2. Irreplaceability

An AZE site should only be designated if it is the sole area where an EN or CR species occurs, contains the overwhelmingly significant known resident population (>95 per cent) of the EN or CR species, or contains the overwhelmingly significant known population (>95 per cent) for one life history segment (e.g. breeding or wintering) of the EN or CR species.

3. Discreteness

The area must have a definable boundary within which the character of habitats, biological communities, and/or management issues have more in common with each other than they do with those in adjacent areas.

These criteria are the equivalent of KBA criterion A1e: Site regularly holds effectively the entire global population size of a Critically Endangered or Endangered species. Therefore, all AZE sites are also KBAs.

[45] More infromation on AZE can be found at https://zeroextinction.org/

[46] Alliance for Zero Extinction (2019)

AZE sites are particularly significant for threatened species conservation and hence for ASAP species. There are a total of 80 AZE sites in the region, all listed as KBAs; 57 are protected and 20 are unprotected and together they overlap with the range of 37 ASAP species. Nine AZE sites intersect with the ranges of 10-15 ASAP species.

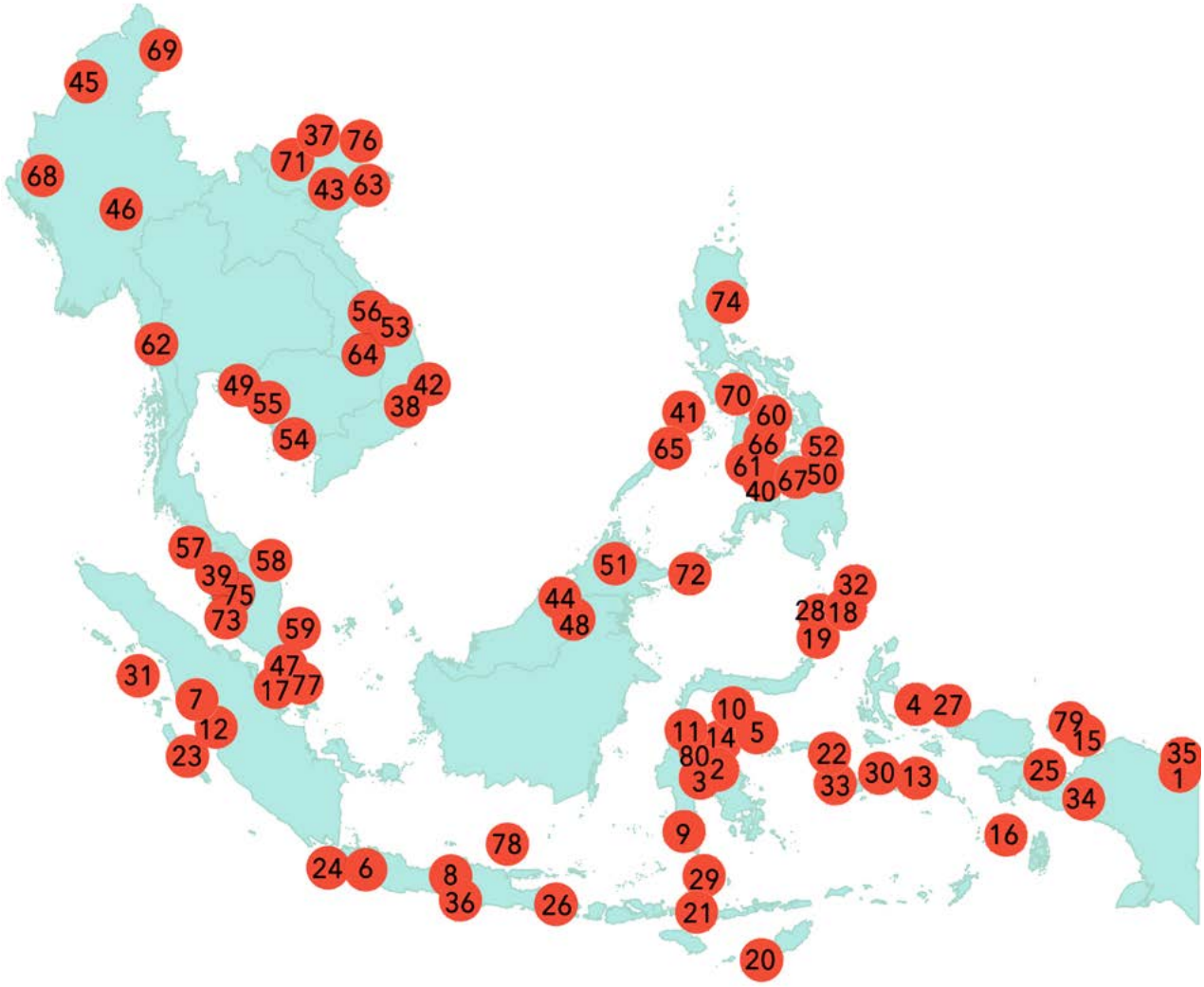


Figure 12: Map showing AZE sites. Numbers in circles represent the following AZE sites:
1 - Danau Sentani; 2 - Danau Towuti; 3 - Feruhumpenai - Matano; 4 - Gebe Island; 5 - Kokolomboi; 6 - Gunung Gede - Pangrango; 7 - Gunung Talakmau; 8 - Gunung Unggaran; 9 - Karaeng - Lompobattang; 10 - Kepulauan Togean; 11 - Lore Lindu; 12 - Lubuk Selasi; 13 - Manusela; 14 - Morowali; 15 - Owi Island; 16 - Pegunungan Daab - Boo; 17 - Pulau Kundur; 18 - Pulau Salibabu; 19 - Pulau Siau; 20 - Roti Island; 21 - Ruteng; 22 - Sanana; 23 - Pulau Sipora; 24 - Ujung Kulon; 25 - Wondiwoi Nature Reserve; 26 - Bali Barat; 27 - Waigeo Utara / Timur; 28 - Gunung Sahendaruman; 29 - Pulau Tana Jampea; 30 - Pulau Buano; 31 - Pulau Nias; 32 - Karakelang Utara; 33 - Gunung Kepala Madang; 34 - Paniai Lakes; 35 - Pegunungan Cyclops Nature Reserve; 36 - Bribin Underground River System; 37 - Bat Dai Son; 38 - Bi Dup - Nui Ba; 39 - Bintang Range; 40 - Cuernos de Negros; 41 - Culion Island; 42 - Deo Ca - Hon Nua; 43 - Dong Mo Lake; 44 - Mulu - Buda Protected Area; 45 - Htamanthi; 46 - Inle Lake; 47 - Central Forest; 48 - Kelabit Highlands; 49 - Khao Chamao - Khao Wong; 50 - Lake Mainit; 51 - Lipaso Protection Forest Reserve; 52 - Mount Kambinlio and Mount Redondo; 53 - Ngoc Linh; 54 - Phnom Bokor; 55 - Phnom Samkos; 56 - Phou Ahyon; 57 - Pulau Langkawi; 58 - Pulau Redang; 59 - Pulau Tioman; 60 - South and North Gigante Island; 61 -Southwestern Negros; 62 - Tanintharyi Nature Reserve; 63 - Tay Yen Tu; 64 - Virachey National Park; 65 - San Vicente - Roxas Forests; 66 - Mount Kanla-on Natural Park; 67 - Timpoong and Hibok-hibok Natural Monument; 68 - Nat Ma Taung; 69 - May Hka Area; 70 - Balogo Watershed; 71 - Fan Si Pan; 72 - Tawi-tawi Island; 73 - Sungai Besar - Tanjong Malim hydrobasin; 74 - Cave no 6 Disiluad and associated hydrobasin; 75 - Central Titiwangsa Range; 76 - Trung Khanh; 77 - Batam Island; 78 - Bawean Island; 79 - Biak Island; 80 - Danau Poso.
Data Source: World Database of Key Biodiversity Areas™ (2019)

ASAP TRIGGER SPECIES AT AZE SITES

37 AZE sites have 1-4 ASAP species as trigger species. They are listed below.

country	AZE sites	class	scientific name	English name
Cambodia	**Phnom Bokor**	Amphibian	*Megophrys damrei*	-
Indonesia	**Gunung Gede-Pangrango**	Amphibian	*Leptophryne cruentata*	Bleeding Toad
	Gunung Unggaran	Amphibian	*Philautus jacobsoni*	-
	Bali Barat	Bird	*Acridotheres tertius*	Grey-rumped Myna
		Bird	*Leucopsar rothschildi*	Bali Myna
	Gunung Kepala Madang	Bird	*Charmosyna toxopei*	Blue-fronted Lorikeet
	Gunung Sahendaruman	Bird	*Colluricincla sanghirensis*	Sangihe Shrike-thrush
		Bird	*Eutrichomyias rowleyi*	Cerulean Paradise Flycatcher
		Bird	*Thapsinillas longirostris*	Sangihe Golden Bulbul
		Bird	*Zosterops nehrkorni*	Sangihe White-eye
	Pulau Nias - Banyak Islands	Bird	*Gracula robusta*	Nias Hill Myna
	Pulau Buano	Bird	*Symposiachrus boanensis*	Black-chinned Monarch
	Pulau Siau	Bird	*Otus siaoensis*	Siau Scops-owl
		Mammal	*Tarsius tumpara*	Siau Island Tarsier
	Pulau Salibabu	Mammal	*Ailurops melanotis*	Talaud Bear Cuscus
	Bawean Wildlife Reserve	Mammal	*Axis kuhlii*	Bawean Deer
	Wondiwoi Nature Reserve	Mammal	*Dendrolagus dorianus*	Wondiwoi Tree-kangaroo
	Manusela	Mammal	*Melomys fraterculus*	Manusela Melomys
	Ujung Kulon	Mammal	*Rhinoceros sondaicus*	Javan Rhinoceros
	Owi Island	Mammal	*Uromys emmae*	Emma's Giant Rat
	Pegunungan Cyclops Nature Reserve	Mammal	*Zaglossus attenboroughi*	Sir David's Long-billed Echidna
	Rote Island	Reptile	*Chelodina mccordi*	Rote Island Snake-necked Turtle
Malaysia	**Lipaso forest reserve**	Amphibian	*Leptobrachella palmata*	-
	Kelabit Highlands	Amphibian	*Pelophryne linanitensis*	-
		Amphibian	*Pelophryne murudensis*	-
Myanmar	**May Hka Area**	Mammal	*Rhinopithecus strykeri*	Myanmar Snub-nosed Monkey
	Htamanthi	Reptile	*Batagur trivittata*	Burmese Roofed Turtle
Philippines	**South and North Gigante Island**	Amphibian	*Platymantis insulatus*	Gigante Island Ground Frog
	Tawi-tawi Island	Bird	*Anthracoceros montani*	Sulu Hornbill
		Bird	*Gallicolumba menagei*	Sulu Bleedingheart
		Bird	*Prioniturus verticalis*	Sulu Raquet-tail
	Mount Kanla-on Natural Park	Bird	*Ptilinopus arcanus*	Negros Fruit-dove
Viet Nam	**Fan Si Pan**	Amphibian	*Leptolalax botsfordi*	Botsford's Leaf-litter Frog
		Amphibian	*Oreolalax sterlingae*	Sterling's Toothed Toad
	Deo Ca - Hon Nua	Reptile	*Cuora picturata*	Southern Viet Nam Box Turtle
	Dong Mo Lake	Reptile	*Rafetus swinhoei*	Yangtze Giant Softshell Turtle

Table 3: List of ASAP trigger species at AZE sites
Data source: World Database of Key Biodiversity Areas™ (2019)

photo by Grégoire Dubois

NATURAL AND MIXED WORLD HERITAGE SITES WITH ASAP SPECIES IN THE ASEAN REGION

Natural World Heritage sites are globally recognised as some of the world's most important natural sites, representing irreplaceable ecosystems and habitats, and supporting globally threated species.

There are a number of natural and mixed World Heritage Sites in the ASEAN region which can make a significant contribution to the conservation of ASAP species.

Investing in efforts to strengthen effective management and protection of these sites, including from extractive activities incompatible with natural World Heritage status, is essential.

World Heritage Site	scientific name	English name
Indonesia		
Komodo National Park	*Cacatua sulphurea*	Yellow-crested Cockatoo
	Eretmochelys imbricata	Hawskbill Turtle
Tropical Rainforest Heritage of Sumatra	*Carpococcyx viridis*	Sumatran Ground Cuckoo
	Dicerorhinus sumatrensis	Sumatran Rhinoceros
	Rhinoplax vigil	Helmeted Hornbill
	Pycnonotus zeylanicus	Straw-headed Bulbul
	Manis javanica	Sunda Pangolin
	Pongo abelii	Sumatran Orangutan
Ujung Kulon National Park	*Rhinoceros sondaicus*	Javan Rhinoceros
Malaysia		
Gunung Mulu National Park	*Manis javanica*	Sunda Pangolin
Kinabalu Park	*Ansonia guibei*	Mesilau Stream Toad
Philippines		
Tubbataha Reefs Natural Park	*Eretmochelys imbricata*	Hawskbill Turtle
Mount Hamiguitan Range Wildlife Sanctuary	*Cacatua haematuropygia*	Philippine Cockatoo
	Pithecophaga jefferyi	Philippine Eagle
Thailand		
Thungyai-Huai Kha Khaeng Wildlife Sanctuaries	*Indotestudo elongata*	Elongated Tortoise
	Gyps bengalensis	Bengal Florican
	Sarcogyps calvus - previously	Red-headed Vulture - previously
	Manouria emys	Asian Giant Tortoise
Dong Phayayen-Khao Yai Forest Complex	*Manis javanica*	Sunda Pangolin
	Crocodylus siamensis	Siamese Crocodile
Viet Nam		
Ha Long Bay	*Trachypithecus poliocephalus*	Cat Ba Langur
Phong Nha-Ke Bang National Park	*Manis javanica*	Sunda Pangolin

Table 4: List of all natural and mixed World Heritage Sites in the ASEAN region with ASAP species. This is a non-exhaustive, indicative list of species based on known occurrence. It is possible that these sites have additional ASAP species not listed above. It is also possible that other World Heritage sites in the region have ASAP species but are not included in the list above. Data source: BirdLife International (2020); Chape (2005); De Rooij (1915); Dinata et al. (2008); Imansyah et al. (2016); IUCN SSC Amphibian Specialist Group (2018); Mindanao Development Authority (2015); Newton et al. (2008); Phillipps (2016); Pusparini (2015); Schrudde et al. (2009); Setiawan et al. (2018); Singleton (2015); Tubbataha Reefs Natural Park (2020); UNESCO World Heritage Centre (2020)

EAST ASIAN-AUSTRALASIAN FLYWAY PARTNERSHIP

Adopted in the list of the World Summit on Sustainable Development, the East Asian-Australasian Flyway Partnership (EAAFP)[47] is an informal and voluntary initiative that aims to protect migratory waterbirds, their habitat and the livelihoods of people dependent upon them. There are currently 37 Partners including 18 countries, six intergovernmental agencies, 11 international non-governmental organisations (NGOs) and one international private enterprise.[48]

The East Asian-Australasian Flyway (the Flyway) is one of nine major migratory waterbird flyways around the globe and is home to over 50 million migratory waterbirds – including shorebirds, Anatidae (ducks, geese and swans), cranes, and seabirds (for example divers, cormorants, gulls, shearwaters, and auks) – from over 250 different populations.

With the exception of Lao PDR and Brunei, the remaining eight of the ten AMS are members of this Partnership.

Two ASAP species [*Aythya baeri* (Baer's Pochard) and *Calidris pygmaea* (Spoon-billed Sandpiper)] are included in the initiative, and important localities within the ASEAN region sites for their conservation are listed below. There are vital areas outside the ASEAN region for these species.

[47] More infromation on EAAFP can be found at https://www.eaaflyway.net/
[48] EAAFP (2017)

EAAFP: IMPORTANT SITES FOR PROTECTION BY COUNTRY

BAER'S POCHARD

AYTHYA BAERI

- Indawgyi Lake, Kachin, Myanmar
- Mandalay Lakes (Pyu Inn, Paleik Inn), Mandalay region, Myanmar

Baer's Pochard | *Aythya baeri*
by Roland Wirth

SPOON-BILLED SANDPIPER

CALIDRIS PYGMAEA

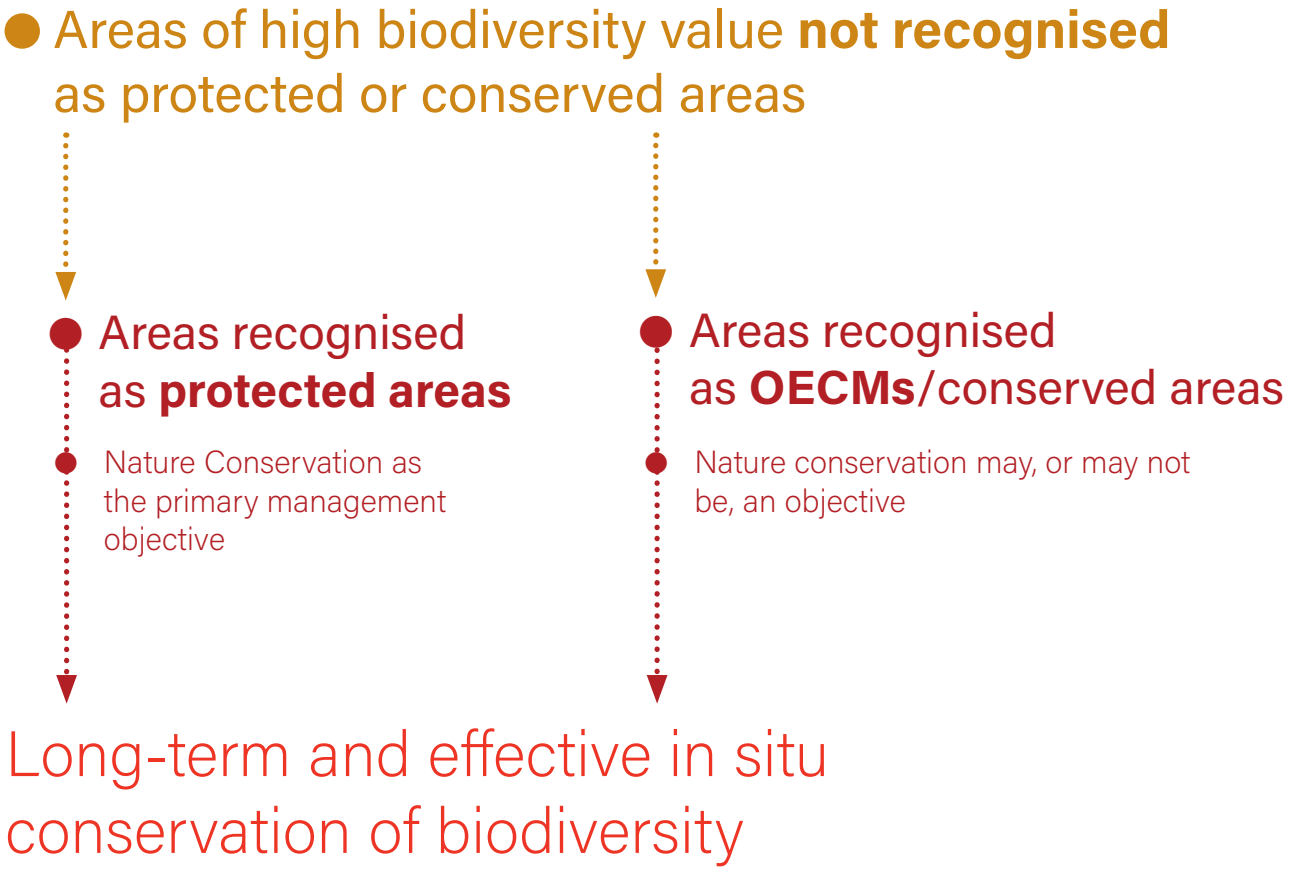
Spoon-billed Sandpiper | *Calidris pygmaea*
by Jon Slaght | Wildlife Conservation Society

- Khok Kham and Pak Thale salt pans, Thailand
- Nanthar Island, Rakhine, Myanmar
- Gulf of Mottama, Mon State, Bago, and Yangon Region, Myanmar

OTHER EFFECTIVE AREA-BASED CONSERVATION MEASURES

Other Effective Area-based Conservation Measures (OECMs) represent a new opportunity for greater recognition, support and security to areas of high biodiversity value outside PAs, and offer a mechanism to protect and conserve ASAP and species occurring in these areas.

OECM is "a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values."[49]



[49] Definition adopted by the Parties to the CBD at the 14th Conference of the Parties in November 2018 (CBD/COP/DEC/14/8)

AREA-BASED CONSERVATION MEASURES: **RECOMMENDATIONS**

- **Human impact across the ASEAN region is unprecedented in its scale and scope with significant implications for the future of species and ecosystems. Urgent measures are needed to mitigate threats and secure biodiversity within effective area-based conservation measures such as PAs and OECMs, effectively engaging governments, civil societies, indigenous groups and the private sector.**

- **PA establishment is necessary but insufficient in itself to ensure viable populations of species and integrity of ecosystems: effective governance and management mechanisms need to be in place in existing and new PAs.**

- **All area-based conservation measures (PAs, AHPs, AZEs, KBAs etc) with viable ASAP species populations are high priorities for conservation and management attention.**

- **Ensuring effective site protection and management is critically important to secure populations of ASAP species. Taking immediate and effective action to address known threats (such as snaring) within area-based conservation measures will be essential to stem population declines, strengthen protection and recovery.**

- **Emerging technologies and existing tools such as SMART for Law Enforcement Monitoring offer opportunities to strengthen the quality of PAs across the ASEAN region.**

- **Integrating ASAP species into existing site management plans, law enforcement and monitoring activities will be essential for conservation and recovery.**

- **Establishing the status of ASAP species' populations through targeted research and surveys can help inform targeted action.**

- **PAs that are important for ASAP species should be considered as candidates for AHP nomination.**

- **Unprotected sites (including unprotected KBAs) deemed important for ASAP species need evaluation for recognition as formal protected areas or as OECMs.**

- **PAME assessments are subjective assessments designed as tools for adaptive management of PAs. It is highly desirable for PAME data to be combined with independent measures of PA impact to evaluate effectiveness of management interventions on conservation outcomes.**

- **PAs need to have sufficient financial investment to ensure their effectiveness in conserving biodiversity. Capacity and resources are correlated with biodiversity persistence in PAs.**

Conservation action

6

Arakan Forest Turtle | *Heosemys depressa* by Scott Trageser | NatureStills LLC

CONSERVATION ACTION PLANS

- Conservation Action Plans have been developed for some ASAP species. 29 per cent of ASAP species (65) have action plans or are included in blueprints with other species.
- These plans have identified priority actions for species and habitat protection and management, together with policy actions at the national, regional and international levels.
- Actions identified in these plans are priorities for implementation.
- Integrating actions within plans into relevant national and regional policies is recommended.

Javan Green Magpie | *Cissa thalassina*
by Cikananga Conservation Breeding

SPECIES WITH NO CONSERVATION ATTENTION

approximately **45%** of all ASAP species

LACK CONSERVATION EFFORT

- Urgent need to draw attention to neglected species and the need for conservation action to enhance recovery and prevent extinctions.

PERCENTAGE OF ASAP SPECIES WITH NO CONSERVATION EFFORT VS WITH SOME LEVEL OF CONSERVATION EFFORT

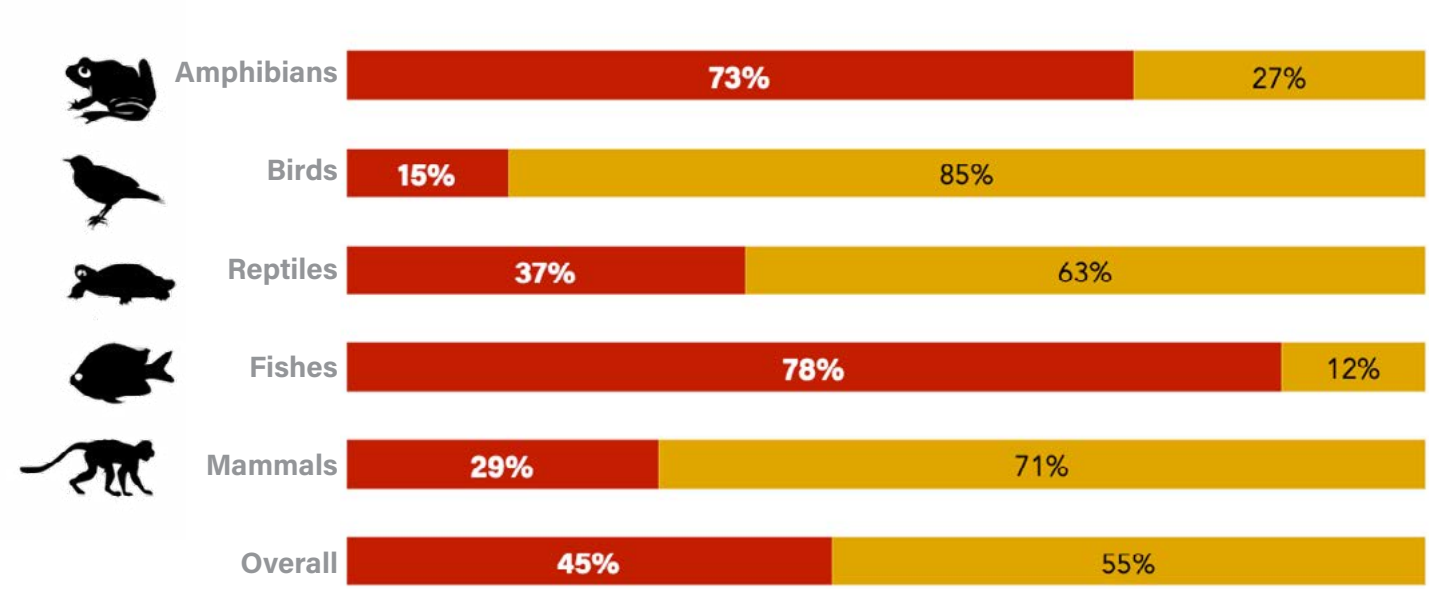


Figure 13: Percentage of ASAP species with no conservation effort (in red) to ASAP species with some level of conservation effort (in yellow). Type of conservation effort: habitat protection and management; habitat restoration; monitoring, surveys and research; wildlife trade/trafficking tackling; demand reduction; education and raising awareness; training and capacity building; community-based conservation; eco-tourism; wildlife research and rescue; translocation; captive breeding; invasive species control; national or regional policy and advocacy; international policy; others.
Data source: IUCN Red List of Threatened Species™ (2019) supplemented by information from ASAP partners, institutional knowledge and desk-based research.

Conservation research needs for ASAP species:

- *Strategic assessment of priority sites for protection*
- *Population size, distribution and trends*
- *Threats and status of threats*
- *Monitoring population, trade, habitat trends*

Parosphromenus phoenicurus by Wentian Shi | Parosphromenus Project

CONSERVATION NEEDS FOR CRITICALLY ENDANGERED FRESHWATER FISHES

As the largest group of ASAP species, and the most neglected in conservation terms, addressing major threats and ensuring targeted conservation action for freshwater fishes is urgently needed. Although specific priorities and actions need to be identified for individual species, or groups of species, general conservation measures needed to protect threatened fishes include:

- Ensuring the protection of key habitats for threatened fish species from habitat loss and degradation, with special emphasis on restricted-range, endemic species, and preventing any further conversion of peat swamp forest.

- Managing overharvesting of threatened fish species by:
    - *Ensuring protection of threatened fishes at the national level*
    - *Ensuring harvest management plans are developed and implemented for those species which are impacted by overfishing*
    - *Assessing the impacts of trade on threatened fish species and developing appropriate legislation.*

- Reducing the agricultural impacts (for example from pollution and runoff) on freshwater ecosystems. Developing criteria for conservation friendly agricultural practices, especially related to agricultural and forestry effluents, to improve water and habitat quality of freshwater ecosystems.

- Mainstreaming fish conservation into aquaculture policy and practice, ensuring best practices, taking mitigation measures to avoid introduction of species and raising awareness amongst stakeholders.

- Identifying species for ex situ conservation management where other in situ conservation measures are unlikely to prevent the extinction of the species.

- Mitigating impacts of dams through integrating threatened fish species conservation needs into EIAs and other mechanisms.

photo by Mazhar Zandsalimi | Unsplash

Multiple ASAP species of vulture by Eleanor Briggs

EX SITU CONSERVATION STATUS

Out of 221 ASAP species:

- 19 have Action Plans which include some level of guidance on ex situ conservation recommendations and needs
- 44 have ex situ conservation actions in place[50]
- 59 are identified as needing ex situ conservation action[51]
- 73 are held in Zoological Information Management Software (ZIMS)[52] registered facilities[53]
- 87 are not found under any form of ex situ facility.

[50, 51] IUCN Red List of Threatened Species™ (2019)
[52] Species360 Zoological Information Management System (ZIMS) (2019)
[53] These data do not include data from institutions that are not registered on ZIMS. Most rescue centres, confiscation centres and ex situ conservation programmes in the field do not use ZIMS. 'Animals held in captivity' does not mean they are part of a conservation managed programme or self-sustaining captive populations, as defined by Frankham et al. (2002).

Institutions with ASAP species[54]

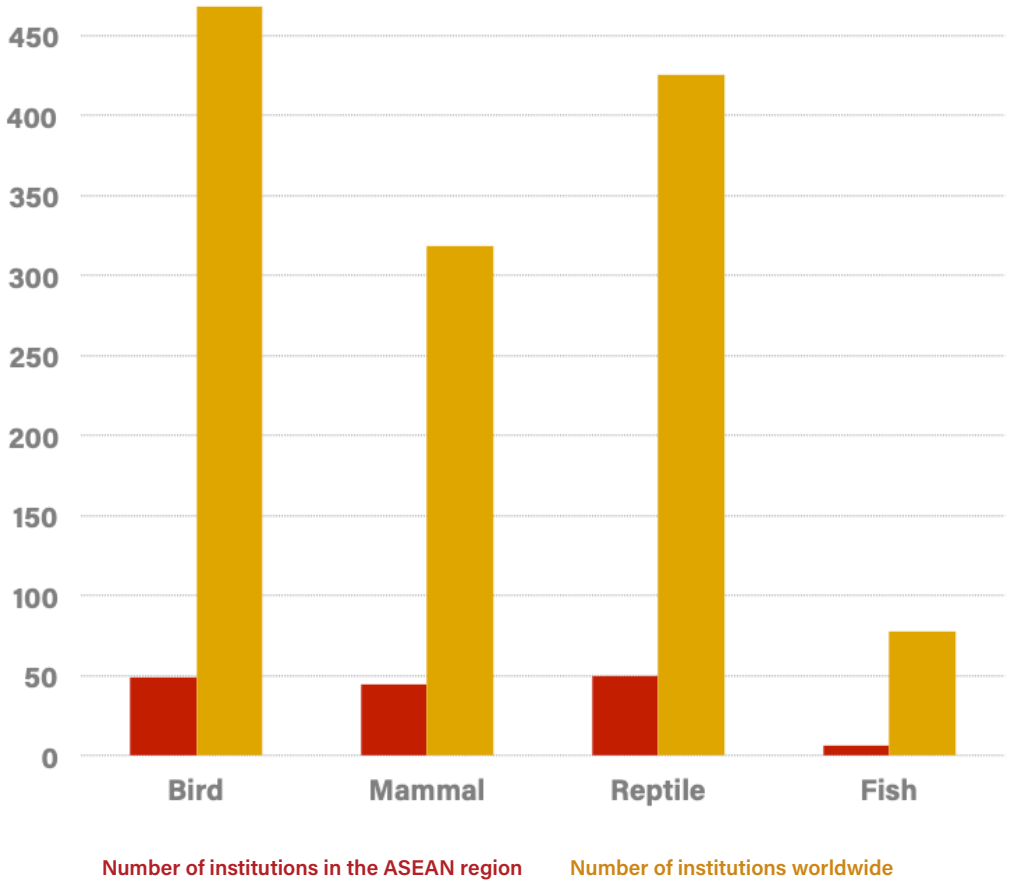


Figure 14: Institutions with ASAP species.
Data source: Species360 Zoological Information Management System (ZIMS) (2019)

[54] See Appendix 7 for the list of institutions in Southeast Asia with ASAP species

Burmese Starred Tortoise | *Geochelone platynota* by Eleanor Briggs

CASE STUDY #8

BACK FROM THE BRINK: EX SITU CONSERVATION OF THE BURMESE STARRED TORTOISE

English name: Burmese Starred Tortoise

Scientific name: *Geochelone platynota*

Critically Endangered

CITES Appendix I

Endemic to the dry zone of Central Myanmar

Key threats:

- High demand in the international pet trade
- Food and medicinal purposes
- Habitat degradation and fragmentation

Driven to near-extinction due to overharvesting of wild populations

Conservation action:[55]

- 2004: three ex situ assurance colonies established in Myanmar (Lawkanandar, Minsontaung and Shwesettaw wildlife sanctuaries) to:
    - *ensure the biological survival of the species through captive populations, and*
    - *produce sufficient numbers of offspring for eventual reintroduction into protected natural habitat.*
- 2008 onwards: number of hatchlings produced has been increasing at an annual rate of 37 per cent.
- 2016: total captive population in Myanmar reached 7,150 individuals.
- 2020: captive population reached 15,000 individuals; 3,000 tortoises were reintroduced to Minsontaung and Shwesettaw Wildlife Sanctuaries; expanding reintroduction effort to Chatthin Wildlife Sanctuary.[56]

Ex situ conservation efforts have averted the near-certain extinction of the Burmese Starred Tortoise and its continued survival is no longer in question.

Burmese Starred Tortoise | *Geochelone platynota* by Forest Department, Minsontaung Wildlife Sanctuary, WCS Myanmar Program

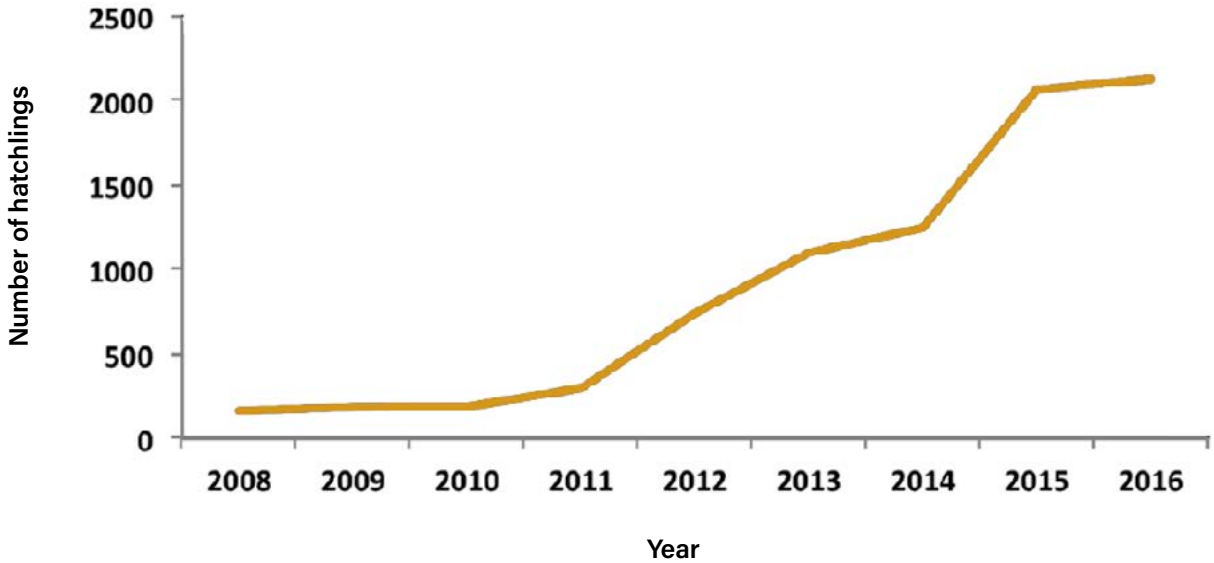


Figure 15: Increase in Burmese Starred Tortoise hatchling numbers. Data source: Platt et al. (2017)

[55] Platt et al. (2017)
[56] Platt (2020)

EX SITU CONSERVATION: **CHAPTER SUMMARY**

- **The majority of ASAP species do not have action plans integrating in situ and ex situ conservation. Action plans should be developed where there is a need and demand from the ground to support conservation of the species. Plans developed in the absence of those who will implement them rarely lead to improvement in the conservation prospects of the species concerned.**
- **A number of ASAP species have ex situ conservation needs identified on the IUCN Red List which need implementation.**
- **The majority of ASAP species are not held in any ex situ facility.**
- **Many ASAP species held in ex situ facilities are not part of a well integrated conservation programme.**

EX SITU CONSERVATION NEEDS FOR ASAP SPECIES

- *Identify which species held in ex situ facilities are part of a well managed captive programme*
- *Identify which species held in ex situ facilities are part of a well managed captive programme and integrated into wider holistic ex situ in situ conservation initiatives*
- *Develop methodology to assess which species should be considered for ex situ conservation interventions*
- *Generate recommendations for ASEAN ex situ priorities and country level actions*
- *Ensure ex situ conservation needs are assessed as part of any future conservation planning initiatives and integrated into in situ conservation plans as appropriate*

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Appendices

White-shouldered Ibis | *Pseudibis davisoni* by Roland Wirth

APPENDIX 1

List of ASAP species by country

Species marked with ★ are country endemics. Numbers exclude extinct, vagrant, unknown and introduced species. 'Possibly extinct' column refers to the species extinct at the country level and not necessarily at the species level.

Data source: IUCN Red List of Threatened Species™ (2019)

BRUNEI

	possibly extinct	reintroduced	present in country	total
Birds			3	3
Christmas Frigatebird/ Andrews' Frigatebird *Fregata andrewsi*			1	1
Helmeted Hornbill *Rhinoplax vigil*			1	1
Straw-headed Bulbul *Pycnonotus zeylanicus*			1	1
Mammals			2	2
Sarawak Surili; Bornean Banded Langur *Presbytis chrysomelas*			1	1
Sunda Pangolin *Manis javanica*			1	1
Reptiles			1	1
Painted Terrapin *Batagur borneoensis*			1	1
Total			6	6

CAMBODIA

	possibly extinct	reintroduced	present in country	total
Amphibians			1	1
Megophrys damrei ★			1	1
Birds			8	8
Bengal Florican *Houbaropsis bengalensis*			1	1
Christmas Frigatebird/ Andrews' Frigatebird *Fregata andrewsi*			1	1
Giant Ibis *Thaumatibis gigantea*			1	1
Red-headed Vulture *Sarcogyps calvus*			1	1
Slender-billed Vulture *Gyps tenuirostris*			1	1
White-rumped Vulture *Gyps bengalensis*			1	1
White-shouldered Ibis *Pseudibis davisoni*			1	1

	possibly extinct	reintroduced	present in country	total
Yellow-breasted Bunting			1	1
Emberiza aureola				
Fishes	2		5	7
Giant Carp			1	1
Catlocarpio siamensis				
Giant Pangasius			1	1
Pangasius sanitwongsei				
Jullien's Golden Carp			1	1
Probarbus jullieni				
Largetooth Sawfish	1			1
Pristis pristis				
Mekong Giant Catfish			1	1
Pangasianodon gigas				
Mekong Giant Salmon Carp	1			1
Aaptosyax grypus				
Siamese Tiger Perch			1	1
Datnioides pulcher				
Mammals	1		2	3
Kouprey	1			1
Bos sauveli				
Large-antlered Muntjac; Giant Muntjac			1	1
Muntiacus vuquangensis				
Sunda Pangolin			1	1
Manis javanica				
Reptiles			4	4
Elongated Tortoise			1	1
Indotestudo elongate				
Hawksbill Turtle			1	1
Eretmochelys imbricate				
Siamese Crocodile			1	1
Crocodylus siamensis				
Southern River Terrapin			1	1
Batagur affinis				
Total	3		20	23

INDONESIA

	possibly extinct	reintroduced	present in country	total
Amphibians			3	3
Bleeding Toad/ Fire Toad ★			1	1
Leptophryne cruentata				
Jacobson's Bubble-nest Frog ★			1	1
Philautus jacobsoni				
Bancet Tompotika ★			1	1
Occidozyga tompotika				
Birds	1		28	29
Bali Myna ★			1	1
Leucopsar rothschildi				
Banggai Crow ★			1	1
Corvus unicolor				
Black-chinned Monarch ★			1	1
Symposiachrus boanensis				

	possibly extinct	reintroduced	present in country	total
Black-winged Myna ★ *Acridotheres melanopterus*			1	1
Blue-fronted Lorikeet ★ *Charmosyna toxopei*			1	1
Cerulean Paradise-flycatcher ★ *Eutrichomyias rowleyi*			1	1
Chinese Crested Tern *Thalasseus bernsteini*			1	1
Christmas Frigatebird/ Andrews' Frigatebird *Fregata andrewsi*			1	1
Flores Hawk-eagle ★ *Nisaetus floris*			1	1
Grey-backed Myna ★ *Acridotheres tricolor*			1	1
Grey-rumped Myna ★ *Acridotheres tertius*			1	1
Helmeted Hornbill *Rhinoplax vigil*			1	1
Javan Blue-banded Kingfisher ★ *Alcedo euryzona*			1	1
Javan Green Magpie ★ *Cissa thalassina*			1	1
Javan Lapwing ★ *Vanellus macropterus*	1			1
Javan Pied Starling/ Javan Pied Myna ★ *Gracupica jalla*			1	1
Nias Hill Myna ★ *Gracula robusta*			1	1
Rueck's Blue-flycatcher ★ *Cyornis ruckii*			1	1
Rufous-fronted Laughingthrush ★ *Garrulax rufifrons*			1	1
Sangihe Dwarf Kingfisher ★ *Ceyx sangirensis*			1	1
Sangihe Golden Bulbul ★ *Thapsinillas platenae*			1	1
Sangihe Shrike-thrush ★ *Colluricincla sanghirensis*			1	1
Sangihe White-eye ★ *Zosterops nehrkorni*			1	1
Siau Scops-owl ★ *Otus siaoensis*			1	1
Silvery Pigeon/ Grey Wood-pigeon *Columba argentina*			1	1
Straw-headed Bulbul *Pycnonotus zeylanicus*			1	1
Sumatran Ground Cuckoo ★ *Carpococcyx viridis*			1	1
White-shouldered Ibis *Pseudibis davisoni*			1	1
Yellow-crested Cockatoo *Cacatua sulphurea*			1	1

	possibly extinct	reintroduced	present in country	total
Fishes			**27**	**27**
Adrianichthys roseni ★			**1**	**1**
				1
Betta burdigala ★			**1**	**1**
Betta chloropharynx ★			**1**	**1**
Betta cracens ★			**1**	**1**
Betta fusca ★			**1**	**1**
Betta hendra ★			**1**	**1**
Betta pardalotos ★			**1**	**1**
Betta pinguis ★			**1**	**1**
Betta rutilans ★			**1**	**1**
Betta spilotogena ★			**1**	**1**
Encheloclarias kelioides			**1**	**1**
Hemileiocassis panjang ★			**1**	**1**
Oryzias soerotoi ★			**1**	**1**
Oryzias timorensis ★			**1**	**1**
Parosphromenus gunawani ★			**1**	**1**
Parosphromenus ornaticauda ★			**1**	**1**
Parosphromenus phoenicurus ★			**1**	**1**
Parosphromenus quindecim ★			**1**	**1**
Xenopoecilus sarasinorum ★			**1**	**1**
Duck-billed Buntingi ★			**1**	**1**
Adrianichthys kruyti				
Dwarf Pygmy Goby			**1**	**1**
Pandaka pygmaea				
Green Sawfish			**1**	**1**
Pristis zijsron				
Largetooth Sawfish			**1**	**1**
Pristis pristis				
Popta's Buntingi ★			**1**	**1**
Xenopoecilus poptae				
Poso Bungu ★			**1**	**1**
Weberogobius amadi				
Red Fin Betta ★			**1**	**1**
Betta miniopinna				

	possibly extinct	reintroduced	present in country	total
Sentani Rainbowfish ★ *Chilatherina sentaniensis*			1	1
Mammals	2		22	24
Aru Flying-fox ★ *Pteropus aruensis*	1			1
Bawean Deer ★ *Axis kuhlii*			1	1
Biak Giant Rat ★ *Uromys boeadii*			1	1
Black-spotted Cuscus *Spilocuscus rufoniger*			1	1
Blue-eyed Spotted Cuscus ★ *Spilocuscus wilsoni*			1	1
Bornean Orangutan *Pongo pygmaeus*			1	1
Celebes Crested Macaque ★ *Macaca nigra*			1	1
Emma's Giant Rat ★ *Uromys emmae*			1	1
Golden-mantled Tree Kangaroo *Dendrolagus pulcherrimus*			1	1
Javan Rhinoceros ★ *Rhinoceros sondaicus*			1	1
Javan Slow Loris ★ *Nycticebus javanicus*			1	1
Manusela Melomys/Manusela Mosaic-tailed Rat ★ *Melomys fraterculus*			1	1
Pagai Island Macaque ★ *Macaca pagensis*			1	1
Pig-tailed Langur/ Pig-tailed Snub-nosed Monkey ★ *Simias concolor*			1	1
Sarawak Surili/ Bornean Banded Langur *Presbytis chrysomelas*			1	1
Siau Island Tarsier ★ *Tarsius tumpara*			1	1
Sir David's Long-beaked Echidna★ *Zaglossus attenboroughi*			1	1
Sumatran Orangutan ★ *Pongo abelii*			1	1
Sumatran Rhinoceros *Dicerorhinus sumatrensis*			1	1
Sunda Pangolin *Manis javanica*			1	1
Talaud Bear Cuscus ★ *Ailurops melanotis*			1	1
Tapanuli Orangutan ★ *Pongo tapanuliensis*			1	1
Western Long-beaked Echidna *Zaglossus bruijnii*			1	1
Wondiwoi Tree-kangaroo ★ *Dendrolagus mayri*	1			1

	possibly extinct	reintroduced	present in country	total
Reptiles			8	8
Asian Giant Tortoise *Manouria emys*			1	1
Asian Narrow-headed Softshell Turtle *Chitra chitra*			1	1
Hawksbill Turtle *Eretmochelys imbricata*			1	1
Painted Terrapin *Batagur borneoensis*			1	1
Rote Island Snake-necked Turtle *Chelodina mccordi*			1	1
Siamese Crocodile *Crocodylus siamensis*			1	1
Southern River Terrapin *Batagur affinis*			1	1
Sulawesi Forest Turtle ★ *Leucocephalon yuwonoi*			1	1
Total	3		88	91

LAO PDR

	possibly extinct	reintroduced	present in country	total
Birds	1		6	7
Baer's Pochard *Aythya baeri*			1	1
Giant Ibis *Thaumatibis gigantea*			1	1
Red-headed Vulture *Sarcogyps calvus*			1	1
Slender-billed Vulture *Gyps tenuirostris*			1	1
White-rumped Vulture *Gyps bengalensis*	1			1
White-shouldered Ibis *Pseudibis davisoni*			1	1
Yellow-breasted Bunting *Emberiza aureola*			1	1
Fishes			10	10
Oreoglanis lepturus ★			1	1
Scaphognathops theunensis ★			1	1
Schistura leukensis ★			1	1
Schistura tenura ★			1	1
Giant Carp *Catlocarpio siamensis*			1	1
Giant Pangasius *Pangasius sanitwongsei*			1	1
Jullien's Golden Carp *Probarbus jullieni*			1	1

	possibly extinct	reintroduced	present in country	total
Mekong Giant Catfish *Pangasianodon gigas*			1	1
Mekong Giant Salmon Carp *Aaptosyax grypus*			1	1
Siamese Tiger Perch *Datnioides pulcher*			1	1
Mammals	1		6	7
Black Crested Gibbon *Nomascus concolor*			1	1
Chinese Pangolin *Manis pentadactyla*			1	1
Kouprey *Bos sauveli*	1			1
Large-antlered Muntjac; Giant Muntjac *Muntiacus vuquangensis*			1	1
Northern White-cheeked Gibbon *Nomascus leucogenys*			1	1
Saola *Pseudoryx nghetinhensis*			1	1
Sunda Pangolin *Manis javanica*			1	1
Reptiles			6	6
Cyrtodactylus jaegeri ★			1	1
Bourret's Box Turtle *Cuora bourreti*			1	1
Chinese Three-striped Box Turtle *Cuora trifasciata*			1	1
Elongated Tortoise *Indotestudo elongata*			1	1
Indochinese Box Turtle *Cuora galbinifrons*			1	1
Siamese Crocodile *Crocodylus siamensis*			1	1
Total	2		28	30

MALAYSIA

	possibly extinct	reintroduced	present in country	total
Amphibians			8	8
Leptobrachella palmata ★			1	1
Leptobrachium kantonishikawai ★			1	1
Leptolalax kecil ★			1	1
Pelophryne linanitensis ★			1	1
Pelophryne murudensis ★			1	1

	possibly extinct	reintroduced	present in country	total
Cameron Highland Sticky Frog ★			1	1
Kalophrynus yongi				
Mesilau Stream Toad ★			1	1
Ansonia guibei				1
Murud Black Slender Toad ★			1	1
Ansonia vidua				1
Birds	2		7	9
Chinese Crested Tern			1	1
Thalasseus bernsteini				
Christmas Frigatebird/ Andrews' Frigatebird			1	1
Fregata andrewsi				
Helmeted Hornbill			1	1
Rhinoplax vigil				
Red-headed Vulture	1			1
Sarcogyps calvus				
Silvery Pigeon/ Grey Wood-pigeon			1	1
Columba argentina				
Spoon-billed Sandpiper			1	1
Calidris pygmaea				
Straw-headed Bulbul			1	1
Pycnonotus zeylanicus				
White-shouldered Ibis	1			1
Pseudibis davisoni				
Yellow-breasted Bunting			1	1
Emberiza aureola				
Fishes			9	9
Betta omega ★			1	1
Clarias batu ★			1	1
Clarias sulcatus ★			1	1
Encheloclarias kelioides			1	1
Hyalobagrus ornatus ★			1	1
Lepidocephalus pahangensis ★			1	1
Parosphromenus alfredi ★			1	1
Green Sawfish			1	1
Pristis zijsron				
Jullien's Golden Carp			1	1
Probarbus jullieni				
Mammals			4	4
Bornean Orangutan			1	1
Pongo pygmaeus				
Sarawak Surili; Bornean Banded Langur			1	1
Presbytis chrysomelas				
Sumatran Rhinoceros			1	1
Dicerorhinus sumatrensis				
Sunda Pangolin			1	1
Manis javanica				

	possibly extinct	reintroduced	present in country	total
Reptiles			**16**	**16**
Calamaria ingeri ★			**1**	**1**
Asian Giant Tortoise *Manouria emys*			**1**	**1**
Asian Narrow-headed Softshell Turtle *Chitra chitra*			**1**	**1**
Boo-Liat's Kukri Snake ★ *Oligodon booliati*			**1**	**1**
Elongated Tortoise *Indotestudo elongata*			**1**	**1**
Gua Kanthan Bent-toed Gecko ★ *Cyrtodactylus guakanthanensis*			**1**	**1**
Hawksbill Turtle *Eretmochelys imbricata*			**1**	**1**
Jarak Island Bent-toed Gecko ★ *Cyrtodactylus jarakensis*			**1**	**1**
Malaya False Bloodsucker ★ *Pseudocalotes flavigula*			**1**	**1**
Painted Terrapin *Batagur borneoensis*			**1**	**1**
Penang Island Larut Skink ★ *Larutia penangensis*			**1**	**1**
Prakke's Reed Snake ★ *Calamaria prakkei*			**1**	**1**
Pulau Tioman Ground Snake ★ *Gongylosoma mukutense*			**1**	**1**
Rhaegal's False Garden Lizard ★ *Pseudocalotes rhaegal*			**1**	**1**
Southern River Terrapin *Batagur affinis*			**1**	**1**
Temiah Rock Gecko ★ *Cnemaspis temiah*			**1**	**1**
Total	**2**		**44**	**46**

MYANMAR

	possibly extinct	reintroduced	present in country	total
Birds	**2**		**9**	**11**
Baer's Pochard *Aythya baeri*			**1**	**1**
Helmeted Hornbill *Rhinoplax vigil*			**1**	**1**
Pink-headed Duck *Rhodonessa caryophyllacea*	**1**			**1**
Red-headed Vulture *Sarcogyps calvus*			**1**	**1**
Slender-billed Vulture *Gyps tenuirostris*			**1**	**1**
Spoon-billed Sandpiper *Calidris pygmaea*			**1**	**1**

	possibly extinct	reintroduced	present in country	total
Straw-headed Bulbul			1	1
Pycnonotus zeylanicus				
White-bellied Heron/ Imperial heron			1	1
Ardea insignis				
White-rumped Vulture			1	1
Gyps bengalensis				
White-shouldered Ibis	1			1
Pseudibis davisoni				
Yellow-breasted Bunting			1	1
Emberiza aureola			1	
Fishes			2	2
Puntius compressiformis/ Systomus compressiformis ★			1	1
Irrawaddy River Shark ★			1	1
Glyphis siamensis				
Mammals	1		3	4
Chinese Pangolin			1	1
Manis pentadactyla				
Myanmar Snub-nosed Monkey ★			1	1
Rhinopithecus strykeri				
Sumatran Rhinoceros	1			1
Dicerorhinus sumatrensis				
Sunda Pangolin			1	1
Manis javanica				
Reptiles	1		6	7
Arakan Forest Turtle ★			1	1
Heosemys depressa				
Asian Giant Tortoise			1	1
Manouria emys				
Burmese Roofed Turtle ★			1	1
Batagur trivittata				
Burmese Starred Tortoise ★			1	1
Geochelone platynota				
Elongated Tortoise			1	1
Indotestudo elongata				
Hawksbill Turtle			1	1
Eretmochelys imbricata				
Northern River Terrapin	1			1
Batagur baska				
Total	4		20	24

PHILIPPINES

	possibly extinct	reintroduced	present in country	total
Amphibians			1	1
Gigante Wrinkled Ground Frog ★			1	1
Platymantis insulatus				
Birds			15	15
Black-hooded Coucal ★			1	1
Centropus steerii				

	possibly extinct	reintroduced	present in country	total
Cebu Brown Dove ★ *Phapitreron frontalis*			1	1
Cebu Flowerpecker ★ *Dicaeum quadricolor*			1	1
Chinese Crested Tern *Thalasseus bernsteini*			1	1
Christmas Frigatebird/ Andrews' Frigatebird *Fregata andrewsi*			1	1
Isabela Oriole ★ *Oriolus isabellae*			1	1
Mindoro Bleeding-heart ★ *Gallicolumba platenae*			1	1
Negros Bleeding-heart ★ *Gallicolumba keayi*			1	1
Negros Fruit Dove ★ *Ptilinopus arcanus*			1	1
Philippine Cockatoo ★ *Cacatua haematuropygia*			1	1
Philippine Eagle ★ *Pithecophaga jefferyi*			1	1
Rufous-headed Hornbill ★ *Rhabdotorrhinus waldeni*			1	1
Sulu Bleeding-heart ★ *Gallicolumba menagei*			1	1
Sulu Hornbill ★ *Anthracoceros montani*			1	1
Sulu/Blue-winged Racquet-tail ★ *Prioniturus verticalis*			1	1
Fishes	1		15	16
Barbodes flavifuscus ★			1	1
Barbodes herrei ★			1	1
Barbodes katalo ★			1	1
Barbodes lanaoensis ★			1	1
Barbodes manalak ★			1	1
Barbodes pachycheilus ★			1	1
Barbodes palata ★			1	1
Barbodes tras ★			1	1
Puntius clemensi ★			1	1
Bagangan ★ *Barbodes resimus*			1	1
Baolan ★ *Barbodes baoulan*			1	1
Bitungu ★ *Barbodes truncatulus*			1	1
Disa ★ *Barbodes disa*			1	1

	possibly extinct	reintroduced	present in country	total
Dwarf Pygmy Goby *Pandaka pygmaea*	1			1
Manumbok/ Hampala ★ *Hampala lopezi*			1	1
Pait ★ *Barbodes amarus*			1	1
Mammals			3	3
Philippine Bare-backed Fruit Bat ★ *Dobsonia chapmani*			1	1
Tamaraw ★ *Bubalus mindorensis*			1	1
Visayan Warty Pig ★ *Sus cebifrons*			1	1
Reptiles			5	5
Cebu Small Worm Skink ★ *Brachymeles cebuensis*			1	1
Hawksbill Turtle *Eretmochelys imbricata*			1	1
Palawan Forest Turtle ★ *Siebenrockiella leytensis*			1	1
Philippines Crocodile ★ *Crocodylus mindorensis*			1	1
Ross's Wolf Snake ★ *Lycodon chrysoprateros*			1	1
Total	1		39	40

SINGAPORE

	possibly extinct	reintroduced	present in country	total
Birds			3	3
Christmas Frigatebird/ Andrews' Frigatebird *Fregata andrewsi*			1	1
Straw-headed Bulbul *Pycnonotus zeylanicus*			1	1
Yellow-breasted Bunting *Emberiza aureola*			1	1
Fishes			1	1
Dwarf Pygmy Goby[57] *Pandaka pygmaea*			1	1
Mammals			1	1
Sunda Pangolin *Manis javanica*			1	1
Reptiles			1	1
Hawksbill Turtle[58] *Eretmochelys imbricata*			1	1
Total			6	6

[57] Larson et al. (2016)
[58] As reported by Singapore

THAILAND

	possibly extinct	reintroduced	present in country	total
Birds	2		7	9
Baer's Pochard *Aythya baeri*			1	1
Chinese Crested Tern *Thalasseus bernsteini*			1	1
Christmas Frigatebird/ Andrews' Frigatebird *Fregata andrewsi*			1	1
Helmeted Hornbill *Rhinoplax vigil*			1	1
Red-headed Vulture *Sarcogyps calvus*	1			1
Spoon-billed Sandpiper *Calidris pygmaea*			1	1
White-eyed River Martin ★ *Eurochelidon sirintarae*			1	1
White-rumped Vulture *Gyps bengalensis*	1			1
Yellow-breasted Bunting *Emberiza aureola*			1	1
Fishes	3		9	12
Blind Cave Loach ★ *Nemacheilus troglocataractus*			1	1
Club-barbel sheatfish *Ceratoglanis pachynema*			1	1
Giant Carp *Catlocarpio siamensis*			1	1
Giant Pangasius *Pangasius sanitwongsei*			1	1
Green Sawfish *Pristis zijsron*	1			1
Jullien's Golden Carp *Probarbus jullieni*			1	1
Krabi Mouth Brooding Betta ★ *Betta simplex*			1	1
Mekong Giant Catfish *Pangasianodon gigas*			1	1
Mekong Giant Salmon Carp *Aaptosyax grypus*	1			1
Redtail Sharkminnow ★ *Epalzeorhynchos bicolor*			1	1
Siamese Bala-shark ★ *Balantiocheilos ambusticauda*	1			1
Somphong's Rasbora ★ *Trigonostigma somphongsi*			1	1
Mammals			4	4
Bala Tube-nosed Bat ★ *Murina balaensis*			1	1
Chinese Pangolin *Manis pentadactyla*			1	1

	possibly extinct	reintroduced	present in country	total
Sunda Pangolin			1	1
Manis javanica				
Thongaree's Disc-nosed Bat ★			1	1
Eudiscoderma thongareeae				
Reptiles			10	10
- ★			1	1
Cyrtodactylus chanhomeae				
Asian Giant Tortoise			1	1
Manouria emys				
Asian Narrow-headed Softshell Turtle			1	1
Chitra chitra				
Elongated Tortoise			1	1
Indotestudo elongata				
Hawksbill Turtle			1	1
Eretmochelys imbricata				
Lauhachinda's Cave Gecko ★			1	1
Gekko lauhachindai				
Painted Terrapin			1	1
Batagur borneoensis				
Sam Roi Yot Leaf-toed Gecko ★			1	1
Dixonius kaweesaki				
Siamese Crocodile			1	1
Crocodylus siamensis				
Southern River Terrapin			1	1
Batagur affinis				
Total	5		30	35

VIET NAM

	possibly extinct	reintroduced	present in country	total
Amphibians			2	2
Botsford's Leaf-litter Frog ★			1	1
Leptolalax botsfordi				
Sterling's Toothed Toad ★			1	1
Oreolalax sterlingae				
Birds	2		6	8
Baer's Pochard			1	1
Aythya baeri				
Giant Ibis			1	1
Thaumatibis gigantea				
Red-headed Vulture			1	1
Sarcogyps calvus				
Slender-billed Vulture	1			1
Gyps tenuirostris				
Spoon-billed Sandpiper			1	1
Calidris pygmaea				
Vietnam Pheasant ★			1	1
Lophura edwardsi				

	possibly extinct	reintroduced	present in country	total
White-rumped Vulture *Gyps bengalensis*	1			1
Yellow-breasted Bunting *Emberiza aureola*			1	1
Fishes			9	9
Schistura nasifilis ★			1	1
Schistura spiloptera ★			1	1
Sewellia albisuera ★			1	1
Butterfly Loach ★ *Sewellia breviventralis*			1	1
Giant Carp *Catlocarpio siamensis*			1	1
Giant Pangasius *Pangasius sanitwongsei*			1	1
Jullien's Golden Carp *Probarbus jullieni*			1	1
Mekong Giant Catfish *Pangasianodon gigas*			1	1
Siamese Tiger Perch *Datnioides pulcher*			1	1
Mammals			11	11
Black Crested Gibbon *Nomascus concolor*			1	1
Cao-vit Crested Gibbon *Nomascus nasutus*			1	1
Chinese Pangolin *Manis pentadactyla*			1	1
Delacour's Langur ★ *Trachypithecus delacouri*			1	1
Grey-shanked Douc Langur ★ *Pygathrix cinerea*			1	1
Large-antlered Muntjac/ Giant Muntjac *Muntiacus vuquangensis*			1	1
Northern White-cheeked Gibbon *Nomascus leucogenys*			1	1
Saola *Pseudoryx nghetinhensis*			1	1
Sunda Pangolin *Manis javanica*			1	1
Tonkin Snub-nosed Monkey ★ *Rhinopithecus avunculus*			1	1
White-headed Langur/ Cat Ba Langur/ Golden-headed Langur *Trachypithecus poliocephalus*			1	1
Reptiles		1	11	12
Cyrtodactylus nigriocularis ★			1	1
Goniurosaurus huuliensis ★			1	1

	possibly extinct	reintroduced	present in country	total
Bourret's Box Turtle *Cuora bourreti*			1	1
Chinese Three-striped Box Turtle *Cuora trifasciata*			1	1
Elongated Tortoise *Indotestudo elongata*			1	1
Gialai Bent-toed Gecko ★ *Cyrtodactylus gialaiensis*			1	1
Hawksbill Turtle *Eretmochelys imbricata*			1	1
Indochinese Box Turtle *Cuora galbinifrons*			1	1
Siamese Crocodile *Crocodylus siamensis*		1		1
Southern Viet Nam Box Turtle ★ *Cuora picturata*			1	1
Takou Bent-toed Gecko ★ *Cyrtodactylus takouensis*			1	1
Vietnamese Pond Turtle ★ *Mauremys annamensis*			1	1
Total	**2**	**1**	**39**	**42**

APPENDIX 2

ASAP species listed on CITES

Data source: CITES (2019)

CITES Appendix I

class	English name	scientific name
Birds	Bali Myna	*Leucopsar rothschildi*
	Bengal Florican	*Houbaropsis bengalensis*
	Christmas Frigatebird/ Andrews' Frigatebird	*Fregata andrewsi*
	Vietnam Pheasant	*Lophura edwardsi*
	Helmeted Hornbill	*Rhinoplax vigil*
	Philippine Cockatoo	*Cacatua haematuropygia*
	Philippine Eagle	*Pithecophaga jefferyi*
	Pink-headed Duck	*Rhodonessa caryophyllacea*
	White-eyed River Martin	*Eurochelidon sirintarae*
	Yellow-crested Cockatoo	*Cacatua sulphurea*
Fishes	Green Sawfish	*Pristis zijsron*
	Largetooth Sawfish	*Pristis pristis*
	Mekong Giant Catfish	*Pangasianodon gigas*
	-	*Probarbus jullieni*
Mammals	Bawean Deer	*Axis kuhlii*
	Black Crested Gibbon	*Nomascus concolor*
	Bornean Orangutan	*Pongo pygmaeus*
	Cao-vit Crested Gibbon	*Nomascus nasutus*
	Chinese Pangolin	*Manis pentadactyla*
	Grey-shanked Douc Langur	*Pygathrix cinerea*
	Javan Rhinoceros	*Rhinoceros sondaicus*
	Javan Slow Loris	*Nycticebus javanicus*
	Kouprey	*Bos sauveli*
	Large-antlered Muntjac; Giant Muntjac	*Muntiacus vuquangensis*
	Myanmar Snub-nosed Monkey	*Rhinopithecus strykeri*
	Northern White-cheeked Gibbon	*Nomascus leucogenys*
	Pig-tailed Langur; Pig-tailed Snub-nosed Monkey	*Simias concolor*
	Saola	*Pseudoryx nghetinhensis*
	Sumatran Orangutan	*Pongo abelii*
	Sumatran Rhinoceros	*Dicerorhinus sumatrensis*
	Sunda Pangolin	*Manis javanica*
	Tamaraw	*Bubalus mindorensis*
	Tonkin Snub-nosed Monkey	*Rhinopithecus avunculus*
Reptiles	Asian Narrow-headed Softshell Turtle	*Chitra chitra*
	Burmese Starred Tortoise	*Geochelone platynota*
	Hawksbill Turtle	*Eretmochelys imbricata*
	Northern River Terrapin	*Batagur baska*
	Philippines Crocodile	*Crocodylus mindorensis*
	Rote Island Snake-necked Turtle	*Chelodina mccordi*
	Siamese Crocodile	*Crocodylus siamensis*
	Southern River Terrapin	*Batagur affinis*

CITES Appendix II

class	English name	scientific name
Birds	Blue-fronted Lorikeet	*Charmosyna toxopei*
	Nias Hill Myna	*Gracula robusta*
	Red-headed Vulture	*Sarcogyps calvus*
	Rueck's Blue-flycatcher	*Cyornis ruckii*
	Siau Scops-owl	*Otus siaoensis*
	Slender-billed Vulture	*Gyps tenuirostris*
	Straw-headed Bulbul	*Pycnonotus zeylanicus*
	Sulu Hornbill	*Anthracoceros montani*
	Sulu/Blue-winged Racquet-tail	*Prioniturus verticalis*
	White-rumped Vulture	*Gyps bengalensis*
Mammals	Aru Flying-fox	*Pteropus aruensis*
	Celebes Crested Macaque	*Macaca nigra*
	Delacour's Langur	*Trachypithecus delacouri*
	Pagai Island Macaque	*Macaca pagensis*
	Sarawak Surili; Bornean Banded Langur	*Presbytis chrysomelas*
	Siau Island Tarsier	*Tarsius tumpara*
	Sir David's Long-beaked Echidna	*Zaglossus attenboroughi*
	Western Long-beaked Echidna	*Zaglossus bruijnii*
	White-headed Langur/ Cat Ba Langur/ Golden-headed Langur	*Trachypithecus poliocephalus*
Reptiles	Arakan Forest Turtle	*Heosemys depressa*
	Bourret's Box Turtle	*Cuora bourreti*
	Burmese Roofed Turtle	*Batagur trivittata*
	Chinese Three-striped Box Turtle	*Cuora trifasciata*
	Elongated Tortoise	*Indotestudo elongata*
	Indochinese Box Turtle	*Cuora galbinifrons*
	Painted Terrapin	*Batagur borneoensis*
	Palawan Forest Turtle	*Siebenrockiella leytensis*
	Southern Viet Nam Box Turtle	*Cuora picturata*
	Sulawesi Forest Turtle	*Leucocephalon yuwonoi*
	Vietnamese Pond Turtle	*Mauremys annamensis*
	Yangtze Giant Softshell Turtle	*Rafetus swinhoei*

APPENDIX 3

ASAP species listed as EDGE species

Evolutionary Distinctiveness (ED) score refers to the amount of unique evolutionary history the species represents.

EDGE ranking is a combination of the species' ED score and its conservation status, also known as Global Endangerment (GE).

Data source: EDGE (2019)

		ED score	EDGE ranking
Amphibians			
Bleeding Toad/ Fire Toad	*Leptophryne cruentata*	**26.1**	**38**
-	*Leptobrachella kecil*	**21.1**	**100**
Botsford's Leaf-litter Frog	*Leptobrachella botsfordi*	**21.1**	**100**
-	*Megophrys damrei*	**18.89**	**158**
-	*Leptobrachium kantonishikawai*	**18.4**	**166**
Jacobson's Bubble-nest Frog	*Philautus jacobsoni*	**18.4**	**164**
Gigante Wrinkled Ground Frog	*Platymantis insulatus*	**17.69**	**203**
Birds			
Giant Ibis	*Thaumatibis gigantea*	**37.96**	**2**
Christmas Frigatebird/ Andrews' Frigatebird	*Fregata andrewsi*	**22.68**	**6**
Sumatran Ground Cuckoo	*Carpococcyx viridis*	**18.02**	**10**
Philippine Eagle	*Pithecophaga jefferyi*	**16.61**	**14**
White-shouldered Ibis	*Pseudibis davisoni*	**16.34**	**16**
Spoon-billed Sandpiper	*Calidris pygmaea*	**15.97**	**18**
Black-hooded Coucal	*Centropus steerii*	**15.06**	**21**
Helmeted Hornbill	*Rhinoplax vigil*	**14.56**	**26**
Red-headed Vulture	*Sarcogyps calvus*	**11.82**	**35**
Sangihe Whistler	*Coracornis sanghirensis*	**11.19**	**40**
Sulu Hornbill	*Anthracoceros montani*	**11.13**	**41**
Cebu Brown Dove	*Phapitreron frontalis*	**10.8**	**46**
Javan Lapwing	*Vanellus macropterus*	**10.45**	**52**
White-eyed River Martin	*Eurochelidon sirintarae*	**10.21**	**56**
Sulu Bleeding-heart	*Gallicolumba menagei*	**8.06**	**84**
Mindoro Bleeding-heart	*Gallicolumba platenae*	**8.05**	**85**
Negros Bleeding-heart	*Gallicolumba keayi*	**8.01**	**86**
Sangihe Golden Bulbul	*Thapsinillas platenae*	**7.81**	**89**
Straw-headed Bulbul	*Pycnonotus zeylanicus*	**7.56**	**91**
Flores Hawk-eagle	*Nisaetus floris*	**7.44**	**94**
White-bellied Heron/ Imperial Heron	*Ardea insignis*	**7.4**	**97**

		ED score	EDGE ranking
Cebu Flowerpecker	*Dicaeum quadricolor*	**7.26**	**101**
Javan Green Magpie	*Cissa thalassina*	**6.49**	**122**
Philippine Cockatoo	*Cacatua haematuropygia*	**6.45**	**126**
Siau Scops-owl	*Otus siaoensis*	**6.42**	**129**
Silvery Pigeon/ Grey Wood-pigeon	*Columba argentina*	**6.33**	**135**
Negros Fruit Dove	*Ptilinopus arcanus*	**5.92**	**150**
Mammals			
Sir David's Long-beaked Echidna	*Zaglossus attenboroughi*	**46.57**	**1**
Western Long-beaked Echidna	*Zaglossus bruijnii*	**46.57**	**1**
Sumatran Rhinoceros	*Dicerorhinus sumatrensis*	**30.02**	**8**
Javan Rhinoceros	*Rhinoceros sondaicus*	**25.33**	**12**
Chinese Pangolin	*Manis pentadactyla*	**20.69**	**17**
Sunda Pangolin	*Manis javanica*	**20.69**	**18**
Javan Slow Loris	*Nycticebus javanicus*	**18.89**	**24**
Siau Island Tarsier	*Tarsius tumpara*	**14.9**	**38**
Talaud Bear Cuscus	*Ailurops melanotis*	**13.82**	**42**
Saola	*Pseudoryx nghetinhensis*	**13.68**	**43**
Bornean Orangutan	*Pongo pygmaeus*	**13.67**	**44**
Sumatran Orangutan	*Pongo abelii*	**13.67**	**44**
Blue-eyed Spotted Cuscus	*Spilocuscus wilsoni*	**9.87**	**85**
Black-spotted Cuscus	*Spilocuscus rufoniger*	**9.76**	**92**
Visayan Warty Pig	*Sus cebifrons*	**8.68**	**117**
Reptiles			
Rote Island Snake-necked Turtle	*Chelodina mccordi*	**45.305**	**7**
Hawksbill Turtle	*Eretmochelys imbricata*	**41.44**	**16**
Asian Narrow-headed Softshell Turtle	*Chitra chitra*	**36.278**	**20**
Yangtze Giant Softshell Turtle	*Rafetus swinhoei*	**36.278**	**20**
-	*Goniurosaurus huuliensis*	**21.99**	**33**
Lauhachinda's Cave Gecko	*Gekko lauhachindai*	**16.92**	**70**
Cebu Small Worm Skink	*Brachymeles cebuensis*	**15.063**	**88**
-	*Cyrtodactylus nigriocularis*	**14.997**	**89**
Temiah Rock Gecko	*Cnemaspis temiah*	**14.55**	**97**
-	*Cyrtodactylus chanhomeae*	**14.158**	**110**
Penang Island Larut Skink	*Larutia penangensis*	**13.438**	**125**
Malaya False Bloodsucker	*Pseudocalotes flavigula*	**11.393**	**167**

APPENDIX 4

Human Footprint Data (Figure 13)

The global Human Footprint Map (HFP) represents the cumulative human impact on the environment. This map is built from eight base layers: (i) the extent of built environments; (ii) crop land; (iii) pasture land; (iv) human population density; (v) night-time lights; (vi) railways; (vii) roads; and (viii) navigable waterways. Following the approach originally proposed by Sanderson and colleagues, each layer was placed in a 1–10 scale with a value weighted according to the relative intensity of human pressure (see Venter et al. (2014) for full justification and validation):

(i) all built environments were assigned a score of 10 while non-built environment had a score of zero;

(ii) areas mapped as croplands were assigned a score of 7;

(iii) areas mapped as pasture lands were assigned a score of 4;

(iv) areas with a high human population density of > 1,000 people/km^2 received a score of 10, while areas with lower density received a lower log-scaled score;

(v) areas were divided into 10 quantiles of increased night-time light intensity associated to score of 1 to 10, while areas with no lights were assigned a zero;

(vi) railways and their immediate 500m buffers were given a score of 8, with a value of zero elsewhere (i.e. assuming no indirect impact);

(vii) roads and their immediate 500m buffers were given a score of 8 (direct impact), while nearby areas up to 15 km had score that decayed exponential to zero (indirect impact);

(viii) areas adjacent to navigable water bodies were assigned a score of 4, which decayed exponentially out to 15 km away from the waters. After each pressure layer was standardised within the same values range, they were summed together to create a cumulative map of human pressure.

Data Source: SEDAC (2019).

Human footprint raster files were separated based on levels of human intensity (max score: 50) with thresholds based on Marco et al. (2018) and Venter et al. (2016).

- 0-3: very low [Threshold taken from Marco et al. (2018)];
- 4-5: moderate pressure;
- 6-11: high pressure;
- 12-50: very high pressure.

APPENDIX 5

Description of data used in the area-based conservation analyses

Data source:

ASAP Species Distribution: Species range distribution data were obtained as polygons from the IUCN Red List of Threatened Species™ (2019-3).

Protected Areas: Data were obtained from the World Database on Protected Areas (WDPA). The WDPA accepts data on protected areas as defined by IUCN and the CBD:

> *IUCN definition: "A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values." (Dudley 2008)*

> *CBD definition: "A geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives" (Article 2 of the Convention on Biological Diversity). This definition is further expanded upon under Article 8 of the same convention.*

All spatial analyses were conducted using QGIS (v2.18.23). Country borders were taken from WDPA and used as the basis of the maps. Polygons were converted to points using QGIS centroid feature.

APPENDIX 6

ASAP species occurring within AHPs

Data source: A list of ASAP species potentially occurring in AHPs was generated on the basis of intersections of species ranges (as in the IUCN Red List of Threatened Species™ (2019) data) and the AHPs.

Twenty-eight regional experts and specialists were consulted to confirm the probability of occurrence of these ASAP species within the AHPs. The results of these consultations are provided in the Table below. 43 ASAP species were found to occur across 40 AHPs.

It is important to note that this is an indicative and not a comprehensive list of ASAP species given the following limitations - (i) low level of knowledge on confirmed occurrence of ASAP species (ii) low resolution and accuracy of species distribution range data. Therefore, it is highly probable that additional ASAP species could occur within AHPs but remain undocumented, hence the urgent need for surveys to increase knowledge of distribution of ASAP species.

class	scientific name	probability of occurrence		
		high	medium	low
Brunei				
Tasek Merimbun Heritage Park				
Birds	*Pycnonotus zeylanicus*	x		
Birds	*Rhinoplax vigil*		x	
Mammals	*Manis javanica*	x		
Reptiles	*Manouria emys*	x		
Cambodia				
Preah Monivong Bokor National Park				
Amphibian	*Megophrys damrei*	x		
Birds	*Emberiza aureola*			x
Mammals	*Manis javanica*		x	
Reptiles	*Batagur affinis*			x
Reptiles	*Indotestudo elongata*		x	
Virachey National Park				
Birds	*Emberiza aureola*			x
Birds	*Gyps bengalensis*			x
Birds	*Gyps tenuirostris*			x
Birds	*Pseudibis davisoni*			x
Birds	*Sarcogyps calvus*			x
Birds	*Thaumatibis gigantea*			x
Mammals	*Manis javanica*	x		
Mammals	*Muntiacus vuquangensis*			x
Reptiles	*Crocodylus siamensis*	x		
Reptiles	*Indotestudo elongata*	x		

class	scientific name	probability of occurrence		
		high	medium	low
Indonesia				
Bantimurung Bulusaraung National Park				
Birds	*Cacatua sulphurea*		x	
Gunung Leuser National Park				
Birds	*Cyornis ruckii*			x
Birds	*Pycnonotus zeylanicus*			x
Birds	*Rhinoplax vigil*	x		
Mammals	*Dicerorhinus sumatrensis*	x		
Mammals	*Manis javanica*	x		
Mammals	*Pongo abelii*	x		
Reptiles	*Manouria emys*		x	
Kepulauan Seribu National Park				
Birds	*Fregata andrewsi*	x		
Kerinci Seblat National Park				
Birds	*Carpococcyx viridis*	x		
Birds	*Rhinoplax vigil*	x		
Mammals	*Dicerorhinus sumatrensis*			x
Mammals	*Manis javanica*	x		
Reptiles	*Manouria emys*		x	
Wakatobi National Park				
Birds	*Cacatua sulphurea*		x	
Way Kambas National Park				
Birds	*Fregata andrewsi*		x	
Mammals	*Dicerorhinus sumatrensis*		x	
Mammals	*Manis javanica*		x	
Lao PDR				
Nam Ha National Protected Area				
Birds	*Eurochelidon sirintarae*			x
Mammals	*Manis javanica*	x		
Mammals	*Manis pentadactyla*		x	
Mammals	*Nomascus concolor*	x		
Mammals	*Nomascus leucogenys*			x
Reptiles	*Indotestudo elongata*			x
Malaysia				
Gunung Mulu National Park				
Birds	*Pycnonotus zeylanicus*		x	
Birds	*Rhinoplax vigil*			x
Mammals	*Manis javanica*	x		
Reptiles	*Manouria emys*	x		
Kinabalu National Park				
Amphibian	*Ansonia guibei*	x		
Birds	*Pycnonotus zeylanicus*			x
Birds	*Rhinoplax vigil*			x
Mammals	*Manis javanica*	x		
Mammals	*Pongo pygmaeus*			x

	class	scientific name	probability of occurrence		
			high	medium	low
Taman Negara National Park					
	Birds	*Pycnonotus zeylanicus*			x
	Birds	*Rhinoplax vigil*			x
	Mammals	*Manis javanica*	x		
	Reptiles	*Chitra chitra*	x		
	Reptiles	*Manouria emys*	x		
Myanmar					
Alaungdaw Kathapa National Park					
	Birds	*Emberiza aureola*			x
	Mammals	*Manis pentadactyla*			x
	Reptiles	*Indotestudo elongata*		x	
Hkakaborazi National Park					
	Birds	*Ardea insignis*		x	
	Birds	*Aythya baeri*			x
	Birds	*Emberiza aureola*		x	
	Mammals	*Manis pentadactyla*	x		
Indawgyi Lake Wildlife Sanctuary					
	Birds	*Aythya baeri*	x		
	Birds	*Emberiza aureola*	x		
	Birds	*Gyps bengalensis*	x		
	Birds	*Gyps tenuirostris*	x		
	Mammals	*Manis pentadactyla*		x	
	Reptiles	*Indotestudo elongata*			x
Inlay Lake Wildlife Sanctuary					
	Birds	*Aythya baeri*	x		
	Birds	*Gyps bengalensis*		x	
	Birds	*Gyps tenuirostris*		x	
	Birds	*Sarcogyps calvus*		x	
	Mammals	*Manis javanica*	x		
	Mammals	*Manis pentadactyla*			x
	Reptiles	*Indotestudo elongata*		x	
Lampi Marine National Park					
	Birds	*Emberiza aureola*			x
Meinmahla Kyun Wildlife Sanctuary					
	Birds	*Calidris pygmaea*	x		
	Birds	*Emberiza aureola*		x	
Nat Ma Taung National Park					
	Birds	*Emberiza aureola*			x
	Reptiles	*Indotestudo elongata*			x
Philippines					
Mt Apo Natural Park					
	Birds	*Pithecophaga jefferyi*	x		
Mt Hamiguitan Range Wildlife Sanctuary					
	Birds	*Pithecophaga jefferyi*	x		
Mt Kitanglad Range Natural Park					
	Birds	*Pithecophaga jefferyi*	x		

	class	scientific name	probability of occurrence		
			high	medium	low
Mt Malindang Range Natural Park					
	Birds	*Pithecophaga jefferyi*	x		
Mts Iglit Baco National Park					
	Birds	*Centropus steerii*	x		
	Birds	*Gallicolumba platenae*		x	
	Mammals	*Bubalus mindorensis*	x		
Tubbataha Reefs Natural Park					
	Birds	*Fregata andrewsi*	x		
Singapore					
Bukit Timah Nature Reserve					
	Birds	*Pycnonotus zeylanicus*		x	
	Mammals	*Manis javanica*		x	
Sungei Buloh Wetland Reserve					
	Birds	*Pycnonotus zeylanicus*		x	
	Mammals	*Manis javanica*			x
Thailand					
Ao Phang Nga-Mu Ko Surin-Mu Ko Similan National Park					
	Birds	*Fregata andrewsi*			x
Kaeng Krachan Forest Complex					
	Mammals	*Manis javanica*	x		
	Reptiles	*Crocodylus siamensis*			x
	Reptiles	*Indotestudo elongata*		x	
	Reptiles	*Manouria emys*	x		
Khao Yai National Park					
	Mammals	*Manis javanica*	x		
	Reptiles	*Indotestudo elongata*	x		
Tarutao National Park					
	Birds	*Fregata andrewsi*			x
Viet Nam					
Ba Be National Park					
	Birds	*Aythya baeri*			x
	Mammals	*Manis pentadactyla*		x	
	Reptiles	*Cuora galbinifrons*	x		
Bai Tu Long National Park					
	Birds	*Calidris pygmaea*	x		
	Birds	*Emberiza aureola*	x		
	Reptiles	*Eretmochelys imbricata*			x
Bidoup Nui Ba National Park					
	Mammals	*Manis javanica*	x		
	Mammals	*Muntiacus vuquangensis*	x		
	Reptiles	*Indotestudo elongata*			x
Chu Mom Ray National Park					
	Mammals	*Manis javanica*	x		
	Mammals	*Muntiacus vuquangensis*		x	
	Mammals	*Pygathrix cinerea*		x	
	Reptiles	*Indotestudo elongata*	x		

class	scientific name	probability of occurrence		
		high	medium	low
Hoang Lien Sa Pa National Park				
Amphibian	*Leptobrachella botsfordi*	x		
Amphibian	*Leptolalax botsfordi*	x		
Amphibian	*Oreolalax sterlingae*	x		
Birds	*Aythya baeri*			x
Birds	*Eurochelidon sirintarae*			x
Mammals	*Manis pentadactyla*	x		
Mammals	*Nomascus concolor*			x
Reptiles	*Cuora galbinifrons*	x		
Kon Ka Kinh National Park				
Birds	*Gyps bengalensis*			x
Birds	*Sarcogyps calvus*			x
Mammals	*Manis javanica*	x		
Mammals	*Muntiacus vuquangensis*		x	
Mammals	*Pygathrix cinerea*	x		
Reptiles	*Crocodylus siamensis*			x
Reptiles	*Cuora bourreti*	x		
Reptiles	*Indotestudo elongata*	x		
U Minh Thuong National Park				
Mammals	*Manis javanica*	x		
Vu Quang National Park				
Birds	*Emberiza aureola*			x
Mammals	*Manis javanica*	x		
Mammals	*Manis pentadactyla*		x	
Mammals	*Muntiacus vuquangensis*		x	
Mammals	*Pseudoryx nghetinhensis*			x
Reptiles	*Cuora galbinifrons*	x		
Reptiles	*Indotestudo elongata*			x

APPENDIX 7

Institutions in the ASEAN region with ASAP species

Data source: Species360 Zoological Information Management System (ZIMS) (2019)

	class	scientific name	English name
Cambodia			
Angkor Centre for Conservation of Biodiversity			
	Bird	*Houbaropsis bengalensis*	Bengal Florican
	Bird	*Pseudibis davisoni*	White-shouldered Ibis
	Bird	*Sarcogyps calvus*	Red-headed Vulture
	Bird	*Thaumatibis gigantea*	Giant Ibis
	Reptile	*Indotestudo elongata*	Elongated Tortoise
Indonesia			
Bali Bird Park			
	Bird	*Acridotheres tertius*	Grey-rumped Myna
	Bird	*Cacatua sulphurea*	Yellow-crested Cockatoo
	Bird	*Cissa thalassina*	Javan Green Magpie
	Bird	*Gracula robusta*	Nias Hill Myna
	Bird	*Leucopsar rothschildi*	Bali Myna
Bali Safari and Marine Park			
	Bird	*Leucopsar rothschildi*	Bali Myna
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
Batu Secret Zoo			
	Bird	*Acridotheres melanopterus*	Black-winged Myna
	Mammal	*Macaca nigra*	Celebes Crested Macaque
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Mammal	*Zaglossus bruijnii*	Western Long-beaked Echidna
	Reptile	*Leucocephalon yuwonoi*	Sulawesi Forest Turtle
Begawan Foundation			
	Bird	*Leucopsar rothschildi*	Bali Myna
Cikananga Wildlife Centre			
	Bird	*Acridotheres melanopterus*	Black-winged Myna
	Bird	*Cissa thalassina*	Javan Green Magpie
	Bird	*Garrulax rufifrons*	Rufous-fronted Laughingthrush
	Bird	*Leucopsar rothschildi*	Bali Myna
	Mammal	*Manis javanica*	Sunda Pangolin
	Mammal	*Nycticebus javanicus*	Javan Slow Loris
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Manouria emys*	Asian Giant Tortoise
Kebun Raya dan Kebun Binatang Gembira Loka Yogyakarta			
	Mammal	*Manis javanica*	Sunda Pangolin
PT Taman Safari Indonesia			
	Bird	*Cissa thalassina*	Javan Green Magpie
	Bird	*Garrulax rufifrons*	Rufous-fronted Laughingthrush
	Bird	*Gracula robusta*	Nias Hill Myna

	class	scientific name	English name
	Bird	*Gracupica jalla*	Javan Pied Starling/ Javan Pied Myna
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
Sumatran Orangutan Conservation Programme			
	Mammal	*Pongo abelii*	Sumatran Orangutan
	Mammal	*Dicerorhinus sumatrensis*	Sumatran Rhinoceros
Taman Safari Indonesia			
	Bird	*Acridotheres melanopterus*	Black-winged Myna
	Bird	*Cissa thalassina*	Javan Green Magpie
	Bird	*Leucopsar rothschildi*	Bali Myna
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
Lao PDR			
Lao Conservation Trust for Wildlife			
	Mammal	*Manis javanica*	Sunda Pangolin
	Mammal	*Manis pentadactyla*	Chinese Pangolin
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Indotestudo elongata*	Elongated Tortoise
Malaysia			
Zoo Taiping and Night Safari			
	Bird	*Cacatua sulphurea*	Yellow-crested Cockatoo
	Mammal	*Axis kuhlii*	Bawean Deer
	Reptile	*Batagur baska*	Northern River Terrapin
	Reptile	*Batagur borneoensis*	Painted Terrapin
	Reptile	*Manouria emys*	Asian Giant Tortoise
Philippines			
Kabankalan Breeding Centre			
	Bird	*Gallicolumba keayi*	Negros Bleeding-heart
	Bird	*Rhabdotorrhinus waldeni*	Rufous-headed Hornbill
	Mammal	*Sus cebifrons*	Visayan Warty Pig
Negros Forest Park			
	Bird	*Gallicolumba keayi*	Negros Bleeding-heart
	Bird	*Rhabdotorrhinus waldeni*	Rufous-headed Hornbill
	Mammal	*Sus cebifrons*	Visayan Warty Pig
Philippine Eagle Foundation			
	Bird	*Pithecophaga jefferyi*	Philippine Eagle
Singapore			
Wildlife Reserves Singapore			
	Bird	*Acridotheres melanopterus*	Black-winged Myna
	Bird	*Acridotheres tricolor*	Grey-backed Myna
	Bird	*Aythya baeri*	Baer's Pochard
	Bird	*Cacatua haematuropygia*	Philippine Cockatoo
	Bird	*Cacatua sulphurea*	Yellow-crested Cockatoo
	Bird	*Gracupica jalla*	Javan Pied Starling/ Javan Pied Myna
	Bird	*Leucopsar rothschildi*	Bali Myna
	Bird	*Lophura edwardsi*	Vietnam Pheasant
	Bird	*Pithecophaga jefferyi*	Philippine Eagle
	Bird	*Pycnonotus zeylanicus*	Straw-headed Bulbul
	Fish	*Catlocarpio siamensis*	Giant Carp

	class	scientific name	English name
	Fish	*Epalzeorhynchos bicolor*	Redtail Sharkminnow
	Fish	*Pangasianodon gigas*	Mekong Giant Catfish
	Fish	*Pangasius sanitwongsei*	Giant Pangasius
	Fish	*Parosphromenus ornaticauda*	
	Fish	*Probarbus jullieni*	Jullien's Golden Carp
	Mammal	*Macaca nigra*	Celebes Crested Macaque
	Mammal	*Manis javanica*	Sunda Pangolin
	Mammal	*Nycticebus javanicus*	Javan Slow Loris
	Mammal	*Pongo abelii*	Bornean Orangutan
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Batagur affinis*	Southern River Terrapin
	Reptile	*Batagur borneoensis*	Painted Terrapin
	Reptile	*Batagur trivittata*	Burmese Roofed Turtle
	Reptile	*Chelodina mccordi*	Rote Island Snake-necked Turtle
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Cuora galbinifrons*	Bourret's Box Turtle
	Reptile	*Cuora trifasciata*	Chinese Three-striped Box Turtle
	Reptile	*Geochelone platynota*	Burmese Starred Tortois
	Reptile	*Indotestudo elongata*	Elongated Tortoise
	Reptile	*Manouria emys*	Asian Giant Tortoise
	Reptile	*Mauremys annamensis*	Vietnamese Pond Turtle
Thailand			
Chiangmai Zoological Garden			
	Bird	*Cacatua sulphurea*	Yellow-crested Cockatoo
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Batagur baska*	Northern River Terrapin
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Geochelone platynota*	Burmese Starred Tortoise
	Reptile	*Indotestudo elongata*	Elongated Tortoise
	Reptile	*Manouria emys*	Asian Giant Tortoise
Khao Kheow Open Zoo			
	Bird	*Cacatua haematuropygia*	Philippine Cockatoo
	Bird	*Cacatua sulphurea*	Yellow-crested Cockato
	Bird	*Pycnonotus zeylanicus*	Straw-headed Bulbul
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Batagur affinis*	Southern River Terrapin
	Reptile	*Batagur borneoensis*	Painted Terrapin
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Indotestudo elongata*	Elongated Tortoise
	Reptile	*Manouria emys*	Asian Giant Tortoise
Khao Suan Kwang Zoo			
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Indotestudo elongata*	Elongated Tortoise
Nakhon Ratchasema Zoological Park			
	Bird	*Pseudibis davisoni*	White-shouldered Ibis

	class	scientific name	English name
	Bird	*Sarcogyps calvus*	Red-headed Vulture
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Batagur baska*	Northern River Terrapin
	Reptile	*Batagur borneoensis*	Painted Terrapin
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Cuora galbinifrons*	Indochinese Box Turtle
	Reptile	*Geochelone platynota*	Burmese Starred Tortoise
	Reptile	*Indotestudo elongata*	Elongated Tortoise
	Reptile	*Manouria emys*	Asian Giant Tortoise
Songkhla Zoo			
	Bird	*Cacatua sulphurea*	Yellow-crested Cockato
	Bird	*Pycnonotus zeylanicus*	Straw-headed Bulbul
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Reptile	*Batagur baska*	Northern River Terrapin
	Reptile	*Batagur borneoensis*	Painted Terrapin
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Indotestudo elongata*	Elongated Tortoise
	Reptile	*Manouria emys*	Asian Giant Tortoise
Ubon Ratchathani Zoo			
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Indotestudo elongata*	Elongated Tortoise
Wildlife Friends Foundation Thailand			
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
Viet Nam			
Endangered Primate Rescue Centre			
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Mammal	*Pygathrix cinerea*	Grey-shanked Douc Langur
	Mammal	*Trachypithecus delacouri*	Delacour's Langur
	Mammal	*Trachypithecus poliocephalus*	White-headed Langur/ Cat Ba Langur/ Golden-headed Langur
Saigon Zoo and Botanical Garden			
	Bird	*Lophura edwardsi*	Vietnam Pheasant
	Mammal	*Manis javanica*	Sunda Pangolin
	Mammal	*Manis pentadactyla*	Chinese Pangolin
	Mammal	*Nomascus leucogenys*	Northern White-cheeked Gibbon
	Mammal	*Pongo pygmaeus*	Bornean Orangutan
	Mammal	*Pygathrix cinerea*	Grey-shanked Douc Langur
	Reptile	*Crocodylus siamensis*	Siamese Crocodile
	Reptile	*Indotestudo elongata*	Elongated Tortoise
	Reptile	*Mauremys annamensis*	Vietnamese Pond Turtle
Save Vietnam's Wildlife			
	Mammal	*Manis javanica*	Sunda Pangolin
	Mammal	*Manis pentadactyla*	Chinese Pangolin

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Leucocephalon yuwonoi
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