Why South-east Asia should be the world’s priority for averting imminent species extinctions, and a call to join a developing cross-institutional programme to tackle this urgent issue


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Surveys

Why South-East Asia should be the World’s Priority for Averting Imminent Species Extinctions, and a Call to Join a Developing Cross-Institutional Programme to Tackle this Urgent Issue


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Global species loss during the present human-caused mass-extinction far exceeds background rates and is detrimental to human existence. Across the globe, vertebrate extinction risks are highest in South-east Asia. This region has among the world’s fastest recent habitat-loss rates. More of a determinant to the conservation status of many vertebrates has been a huge explosion in South-east and East Asian trade demand, and thus harvest rates, for wild species for luxury food, medicine, tonics, horns and other trophy parts, and captive animals. The region has little tradition of effectively managed protected areas. Consequently, many South-east Asian species will become extinct in the near future if current trends continue. An emerging programme coordinated by IUCN SSC on behalf of its member organisations is being developed to assist implementing agencies and their partners minimise the impending extinctions among South-east Asian non-marine vertebrates. The programme is neither a direct implementing body nor a direct donor, but is a supporter using the synergistic strength of its constituent organisations and IUCN’s intergovernmental status to ameliorate perennial challenges to these species’ conservation. Its two main components are (1) to identify species at greatest risk of extinction, specify their conservation needs and support conservation efforts to reduce this risk; and (2) to build, in selected ways, an enabling environment for species-specific interventions. To address the first component, the programme will: develop and maintain a priority species list with associated priority sites necessary to reduce extinction; determine what conservation mechanisms are already in place (many species presently have none), and encourage additional actions as warranted; and serve as a clearinghouse for information and skills exchange. To address the second component, the programme will: work with existing and new donors to prioritise these species and develop emergency and long-term conservation funding mechanisms for them; encourage the integration of priority species into relevant conservation plans; serve as a liaison body to support dialogue among relevant parties in improving species’ conservation (e.g. governmental and non-governmental site- and higher-level implementing agencies, and donors); support the functionality of information/expertise-based bodies such as IUCN SSC specialist groups; serve as a mechanism to link recommended conservation strategies with appropriate stakeholders; and increase public awareness of the severity of this extinction crisis. By October 2012, working species and site lists will be available and a stakeholder meeting will have discussed the working mechanics of the programme. Any highly collaborative effort of this magnitude faces stiff challenges. It must serve only as a catalyst, recognising and supporting existing efforts, and encouraging action for species presently not receiving it. All parties must recognise that not all conservation efforts will be successful: extinction potential of high-risk species is, by definition, not negligible. Many of the most-threatened South-east Asian species have high market value, or are bycatch of those which do, meaning that powerful vested interests oppose their conservation. Considerably increased funding, primarily to implementing agencies, for highly-threatened species in South-east Asia is required. Funding to run the programme must not compete with the implementing agencies’ existing sources. Human capacity is also limiting outcomes, and how to effect an appropriate increase in capable and committed personnel to use increased funding effectively remains unclear. Finally, the philosophy of the programme must be recognised by all as only part of overall species conservation in South-East Asia.

Keywords: Extinction risk, inter-agency collaboration, overharvest, site-based conservation, South-east Asia, species, wildlife trade.

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1. INTRODUCTION

The world’s biodiversity is in crisis (e.g. Terborgh, 1999; Ceballos et al., 2010; Cardinale et al., 2012). Of biodiversity’s various levels, species hold a special place in the imagination of conservationists and the public alike: people equate to them more readily than to elements such as genes and ecosystems. The IUCN Red List of Threatened Species’ categorises species’ extinction risk (Vié et al., 2009). Recent comprehensive Red List assessments show high threat levels for amphibians (30% of 6,347 species considered globally threatened), birds (12% of 9,990), mammals (21% of 5,488), cycads (52% of 289), conifers (28% of 620) and freshwater crabs (17% of 1,281 species; but a further 49% of these were listed as Data Deficient) (Cumberlidge et al., 2009; Hilton-Taylor et al., 2009). Recent losses far exceed typical ‘background’ extinction rates, those before people dominated the earth (e.g. Baillie et al., 2004; McCullum, 2007; Ceballos et al., 2010). Moreover, the Red List Index shows that extinction risks are increasing (Hilton-Taylor et al., 2009). The various factors driving species to extinction result directly and indirectly from the hugely increased human population and its increased disposable income (e.g. Vitousek et al., 1997; Steffen & Tyson, 2001; TRAFFIC, 2008; Cardinale et al., 2012).

1 www.iucnredlist.org
Species loss is problematic for humanity at multiple levels, although precise effects of any given level of loss remain uncertain (Ehrlich & Ehrlich, 1981; Balmford & Bond, 2005; Millennium Ecosystem Assessment, 2005; Cardinale et al., 2012). Unsurprisingly, species directly harvested for use are more likely to be assessed as globally threatened by the Red List than those that are not (Hilton-Taylor et al., 2009). Many species, whether harvested or not, are vital for ecosytem function and, thus, ultimately for human survival. Averting species loss, once seen as a niche luxury (e.g. Prendergast & Adams, 2003), is thus now stated policy of a growing majority of the world’s governments. Most countries (192 so far) are Parties to the Convention on Biological Diversity (CBD), which came into force in December 1993. The CBD’s 2011–2020 strategic plan includes the 20 ‘Aichi targets’. Target 12 contains the most explicit, concise mainstream recognition yet of the primacy of species conservation: “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” [CBD, 2011, p.16].

This contribution profiles one part of the world with a high concentration of threatened species, and describes a response under preparation. It aims to encourage further discussion about how to respond and to encourage involvement in such responses.

2. WILDLIFE AND CONSERVATION IN SOUTH-EAST ASIA

Extinction risk is uneven across the earth’s surface. Confining discussion to non-marine species, most taxonomic groups so far studied are more threatened in South-east Asia (here, the countries of ASEAN, the Association of South-East Asian Nations [Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam] plus Timor-Leste) than elsewhere (e.g. Broek et al., 2003; Cardillo et al., 2006; Sodhi & Brook, 2004; Lee & Jetz, 2008; Schipper et al., 2008; Hilton-Taylor et al., 2009; Sodhi et al., 2010). Notably, compared with Meso-America, South America or sub-Saharan Africa, and it increased between 1990–2000 and 2000–2005 (Sodhi et al., 2010). Forest loss through conversion, fragmentation and degradation is high, particularly in the lowlands (e.g. Jepson et al., 2001), although loss is generally somewhat lower in and near declared protected areas (e.g. Curran et al., 2004; Gaveau et al., 2009). The past few decades saw massive conversion of Sundaic forest to plantation agriculture, notably oil palm Elaeis guineensis and rubber Hevea brasiliensis (e.g. Mohd-Azlan & Lawes, 2011; Miettinen et al., 2012). Such conversion is now intensifying in northern South-east Asia, with eucalyptus Eucalyptus, sugar-cane Saccharum officinarum, biofuels and varieties of rubber and even oil palm able to cope with a marked dry season (e.g. Ziegler et al., 2009). Of all large South-east Asian countries, the Philippines has lost by far the highest proportion of forest. Over 93% of the country’s original forest cover has been converted, reflecting its position as the region’s most densely populated large country. Most of this loss has been driven by commercial logging operations instigated during U.S. and post-colonial administrations (e.g. Ong et al., 2002). This circumstance is exacerbated by the Philippines Archipelago being divided into at least six ‘major’ (and many more ‘minor’) faunal regions. Each constitutes a distinct and separate centre/sub-centre of endemism, wherein the country’s most severely threatened taxa are concentrated. As a result, the Philippines supports more severely threatened endemic species than does any other country in the world (Oliver & Heaney, 1997; Oliver, 2006).

Despite these habitat encroachment rates, overharvest is the main threat to many vertebrates, especially outside the Philippines. The marked and widespread ‘empty forest’ syndrome (Redford, 1992: forests largely devoid of noticeable wildlife), stems from overhunting (e.g. Robinson & Bennett, 2000; Nooren & Claridge, 2001; Corlett, 2007). The following discussion focuses on extinction risks in the next 10-30 years.
although if current habitat trends continue, within 50+ years many more South-east Asian species, hunted and non-hunted alike, may go extinct (e.g. Laurance, 2006).

Heavy hunting in South-east Asia, particularly its northern part, reflects the apparently limitless trade demand for wildlife in the region and in East Asia (China, Korea, Japan, Mongolia and the Russian Far East). Many species are in demand, particularly for consumption, as ‘strengthening’ food, tonics and medicines (e.g. Yang et al., 2000; Nooren & Claridge, 2001; Bell et al., 2004; Lee et al., 2005; World Bank, 2005; Nguyen, 2008; Zhang et al., 2008; Pantel & Chin, 2009; Nijman, 2010; Caillabet, 2011; Felbab-Brown, 2011; Nijman et al., 2012). Increasingly, these perceived attributes seem subsidiary to the status-symbolism of wild mammal and reptile meat’s rarity and thus expense (Drury, 2009; see also Rivalan et al., 2007). This is the reverse of the situation in many other tropical areas, where wild meat is an important protein source for the urban poor who cannot afford farmed meat (e.g. van Vliet et al., 2012), as are wild fish in South-east Asia. The long-distance luxury consumption trade comprises mostly large (over 1 kg) mammals, turtles and tortoises (Testudines), crocodiles (Crocodilia), suitably large snakes, monitors Varanus, Tockay Gekko gecko and salamanders (Caudata). A much wider taxonomic variety is consumed largely locally. These are generally not so threatened by off-take, in part because the high-demand species have moved from local consumption to long-distance trade as urban markets have developed (e.g. Newton et al., 2008; Challender, 2011).

Trade in South-east Asia’s species for live captives and body parts not for eating has had similar severe impacts. Body parts, such as horns and other trophies, and reptile, pangolin and otter skins, are usually sought for display and to enhance parts, such as horns and other trophies, and reptile, pangolin and otter skins, are usually sought for display and to enhance parts, such as horns and other trophies, and reptile, pangolin and otter skins, are usually sought for display and to enhance parts, such as horns and other trophies, and reptile, pangolin and otter skins, are usually sought for display and to enhance parts. Sanctuary and recovery of some of these species has been partly achieved by intensive monitoring and management, but the causes of their decline remain largely unclear.

Local live markets are huge in some South-east Asian countries, but export is also massive: over 500,000 shipments of wildlife, containing over 1,480,000,000 live animals, were imported by the USA during 2000–2006 (Smith et al., 2009). Mostly (92%) these were for commercial purposes, largely the pet trade: over 69% of these live animal imports originated in Southeast Asia (Smith et al., 2009). Laundering of wild-caught South-east Asian animals, particularly reptiles, as captive-bred, to circumvent trade regulations, occurs and may be a very significant threat (Nijman & Shepherd, 2009; Lyons & Natusch, 2011; Luiselli et al., in press).

The various wildlife trade demands are penetrating South-east Asia at different rates. In part this presumably reflects great diversity within South-east Asia in governance, civil obedience, religious and socio-economic factors, and thus basic predisposition for poaching and consuming wildlife (see Milledge, 2007). In some areas low market-value wildlife still remains little affected. In general, those parts of South-east Asia initially less permeated by traders are increasingly targeted as animals are extirpated in early supply areas (e.g. van Dijk et al., 2000; Challender, 2011). Additionally, as high-value species become scarce, formerly lower-value species, or classes within species (e.g. smaller individuals) are increasingly demanded (e.g. Tungittiplakorn & Dearden, 2002; Allan et al., 2005).

Freshwater fish are a special case in that large legal off-takes occur, many of which are assumed to be sustainable, although firm evidence of this is rare. Declines in catch per unit effort are widespread, but the fisheries but the fisheries rather than faunistics focus” to “but the fisheries (rather than faunistics) focus of much inland fish survey work hinges the identification of species in steep decline. And where these are identified, it is often unclear whether they are being pushed to extinction, or ‘just’ economic collapse, and whether the cause is overharvest rather than factors such as pollution or changing hydrodynamics (e.g. Allan et al., 2005). For many fish, such threats are augmented by the proliferation of hydroelectric power dams across the region’s rivers. These prevent essential migrations undertaken by many South-east Asian river fish. Equally they may change all habitat in the entire range of sedentary micro-endemics: species such as Schistura leukensis and S. tenura, discovered during pre-project surveys for hydropower dams, have not been seen since impoundment (Kottelat, 2000; Halls & Kshatriya, 2009; Dugan et al., 2010; ICEM, 2010; Ferguson et al., 2011; Ziv et al., 2012; CEPF, in prep.). South-east Asia, notably the region’s rivers. These prevent essential migrations undertaken by many South-east Asian river fish. Equally they may change all habitat in the entire range of sedentary micro-endemics: species such as Schistura leukensis and S. tenura, discovered during pre-project surveys for hydropower dams, have not been seen since impoundment (Kottelat, 2000; Halls & Kshatriya, 2009; Dugan et al., 2010; ICEM, 2010; Ferguson et al., 2011; Ziv et al., 2012; CEPF, in prep.). South-east Asia, notably the region’s rivers. These prevent essential migrations undertaken by many South-east Asian river fish. Equally they may change all habitat in the entire range of sedentary micro-endemics: species such as Schistura leukensis and S. tenura, discovered during pre-project surveys for hydropower dams, have not been seen since impoundment (Kottelat, 2000; Halls & Kshatriya, 2009; Dugan et al., 2010; ICEM, 2010; Ferguson et al., 2011; Ziv et al., 2012; CEPF, in prep.). South-east Asia, notably the region’s rivers. These prevent essential migrations undertaken by many South-east Asian river fish. Equally they may change all habitat in the entire range of sedentary micro-endemics: species such as Schistura leukensis and S. tenura, discovered during pre-project surveys for hydropower dams, have not been seen since impoundment (Kottelat, 2000; Halls & Kshatriya, 2009; Dugan et al., 2010; ICEM, 2010; Ferguson et al., 2011; Ziv et al., 2012; CEPF, in prep.).
ultimate conservation challenge" (Dudgeon et al., 2006, p.163). Across the globe, the challenge is believed to be greatest in tropical Asia (Dudgeon, 2000).

Wildlife trade is problematic in much of the world (e.g. Bennett et al., 2002; Fa et al., 2002; Oldfield, 2003; Sutherland et al., 2009; Bennett, 2011), but several factors make it especially so in today’s South-east Asia. These mostly reflect breakneck economic growth there and in adjacent East Asia [TRAFFIC, 2008; Drury, 2009; McNeely et al., 2009; Nijman, 2010] and the commensurate expansion and improvements to transport infrastructure that increases both access to wildlife areas and the capacity for transporting wildlife, while reducing overall costs. These factors have fuelled a massive demand for wildlife and their products, which has then driven both the use of new, highly capture-efficient, harvesting technologies [e.g. small-mesh nylon gill-nets for fish; Poulsen et al., 2004] and made existing but expensive technologies cost-effective [e.g. guns and cable snaring; e.g. Bennett et al., 2000; Hansel, 2004; SWG, 2009].

This economic growth has not been matched by strengthening the enforcement of hunting and wildlife trading laws. Political and citizen appreciation of the consequences of mass extinctions is uneven. Many still see trade-driven hunting as a scaled-up local misdemeanour, not as the high-tech, large-scale, high-investment–high-return, crime that it is. Available resources are thus insufficient to tackle the challenge [McNeely et al., 2009; Bennett, 2011; South & Wyatt, 2011]. In many areas personal conscience is the main deterrent to illegal offtake. The region’s limited tradition of effectively managed protected areas means that many hunting-sensitive species have no actively secured populations. By contrast, neighbouring South Asia, not much more distant from big markets, has more generally functional protected areas (Yonzon, 2006). There are effectively protected areas in South-east Asia [at least, for their target species; see below], but harvest-sensitive species persist mostly only because sufficiently large and remote areas remain for enough animals to escape hunting [e.g. Timmins & Duckworth, 1999; Rawson et al., 2011]. Such passive persistence cannot be relied upon much longer, given regional trends in habitat fragmentation and notably road expansion [see above]. Even high-profile areas with longstanding large budgets may effectively protect only small parts [e.g. Lynam et al., 2006; Dudley & Stolton, 2011]. And the more valuable a species is, the harder people will work to find it. Nowhere in mainland South-east Asia, seems to have proven remote enough to retain a viable rhinoceros population [Brook et al., 2012; Zafir et al., 2011].

Many taxonomic groups particularly susceptible to overharvest, and with three or more species occurring solely or predominantly in South-east Asia, have 80–100% of these species considered globally threatened by the Red List, e.g. crocodiles, tortoises [Testudinidae], softshell turtles [Trionychidae], storks [Ciconiidae] and ibises [Threskiornithidae], resident vultures Gyps and Sarcogyps, wild hogs [Suidae], wild cattle (Bovini), typical [i.e. non-muntjac Muntiacus] deer (Cervinae), odd-nosed colobines [Rhinopithecus, Pygathrix, Nasalis and Simias] and apes [Hylobatidae and Pongo]. More comprehensive Red List assessment of reptiles and fish would reveal yet more such groups.

Trade threats to wild populations are exacerbated by the region’s ongoing habitat conversion (notably heavy forest conversion to plantations), degradation and fragmentation. This compromises populations’ resilience to offtake: it is easier to extirpate a population the smaller is its habitat-block, particularly when blocks are isolated [e.g. Peres, 2001; Reed, 2004; Linkie et al., 2006; Ferraz et al., 2007; Gray et al., 2010]. Wetlands, grasslands and other flatland habitats have been particularly affected because they are preferentially cleared for agriculture, particularly rice. Even those that remain are not safe: over 45% of South-east Asia’s ‘protected’ wetlands are considered threatened [Hilton-Taylor et al., 2009]. Thus, many wetland [including wet grassland] species too small or dispersed to be targets of harvesting have declined markedly, such as Rufous-rumped Grass Babbler Graminicola bengalensis, a bird unrecorded in South-east Asia since 1923 [Leader et al., 2010]. Fortunately it survives elsewhere [Leader et al., 2010], but Schomburgk’s Deer Rucervus schomburgki, only ever known from Thailand’s seasonally inundated central plains, was hunted while the plains were rapidly converted for rice, and the last known individual was killed in 1938 [Lekagul & McNeely, 1977]. The loss of the wetlands is of particular concern: despite covering less than 1% of the world’s surface, they hold about 6–7% of the world’s species [Balian et al., 2008], with wet grasslands holding highly distinctive animals such as Bengal Florican Houbaropsis bengalensis. Hunting is also not responsible for the threatened status of many species, particularly small-bodied ones, in South-east Asia’s two large archipelagos, the Philippines and Indonesia–East Malaysia–Brunei Darussalam–Timor Leste. These hold many restricted-range endemic species heavily threatened by habitat change, introduced species and other factors [e.g. Brooks et al., 1997; Oliver & Heaney, 1997; BirdLife International, 2001; Amori et al., 2008; Clausnitzer et al., 2009].

The situation of increased trade-driven hunting in decreasing but more accessible habitat occurs in many parts of the world: South-east Asia is distinct only in degree. Moreover, some particularly hunting-sensitive wildlife is already sourced outside South-east Asia to meet market needs, in, e.g. turtles, pangolins Manis, big cats Panthera, rhinoceroses (Rhinocerotidae) and elephants Elephas and Loxodonta [Blake & Hedges, 2004; Sze & Dudgeon, 2006; Bennett, 2011; Bouché et al., 2011; Challender, 2011; TRAFFIC, 2011].

Most of the highly damaging wildlife trade involving South-east and East Asia contravenes national laws and international treaties, notably CITES [the Convention on International Trade in Endangered Species of Wild Fauna and Flora, to which all South-east Asian countries except Timor-Leste are
Many South-east Asian species will become extinct during the next human generation, on current trends (Bennett, 2011). In the interim, even with the highest levels of trade enforcement, the best prevention is time-buying activities focussed on key populations, both in situ and ex situ (which are, increasingly, ends of a continuum; Pritchard et al., 2011). Without ex situ management, Père David’s Deer Elaphurus davidianus of China, the Vietnamese race of Sika Cervus nippon pseudaxis, Bali Starling and several other species of South-east Asia and surrounds would probably be extinct (Ratajściuczak et al., 1993; Jiang et al., 2000; BirdLife International, 2001; Mattioli, 2011). But in situ conservation of highly threatened species can at the same time prevent mass extinctions, preserve habitat function and integrity, and maintain evolutionary potential and ecosystem services (Drummond et al., 2010). The appropriate balance between these approaches differs between species, depending on their population status and threats. Unfortunately, the region’s protected area systems are mostly recently created and far from effectively managed (e.g. Smith et al., 1999; Rao et al., 2002; ICEM, 2003a–b; Tordoff et al., 2004; Mjint Aung, 2007; Gumal et al. 2008, Or & Tang, 2011; Mohd-Azlan & Lawes, 2011; Harrison, 2011). Despite the need for systems-level improvement, there are some notable successes of site-based conservation in South-east Asia. Some are long-term, such as the Javan Rhinoceroses Rhinoceros sondaicus of Ujung Kulon National Park, Java, which have remained at a few dozen animals for decades (Griffiths, 1993; Griffiths et al., 2012). Although the population needs to rise to secure the species’ future, this animal fetches such high prices in the trade that the prevention of its extinction, in such a densely populated island, demonstrates that with sufficient will almost any species must be conservable. Also excellent indicators of what is possible are the recent events in several formerly heavily hunted areas, such as resurgent ungulate populations in a previously heavily poached part of Thung Yai Naresuan Wildlife Sanctuary, Thailand (Steinmetz et al., 2009) and large, sustained, increases in various
diverse hunted species in Seima Protection Forest, Cambodia (O’Kelly & Nut 2010). Such successes show that appropriate types and intensities of law enforcement and liaison with local people can conserve species of even high trade value on site, even those not conventionally of high public appeal (e.g. van der Ploeg et al., 2011). Despite this, some of the region’s conservation practitioners are pessimistic about site-based conservation. Indeed, many site-based conservation projects do not deliver the intended benefits, although this is rarely written up (e.g. Redford & Taber, 2000; Webber et al., 2007). In some cases, project methodologies were flawed (e.g. unrealistic expectations from so-called integrated development and conservation projects; e.g. Wells et al., 1998; Linkie et al., 2008), in others, sound plans were poorly executed; and for hardly any is there any credible outcomes monitoring (Ferraro & Pattanyak, 2006; Gratwicke et al., 2007). The challenge is to make more site-based species-focussed projects work effectively.

3. A RESPONSE UNDER DEVELOPMENT

Each species extinction is a loss to everyone across the world, even to those not directly aware of it. Thus, global resources should be mobilised to minimise the number of extinctions, particularly because the opportunity costs of in situ conservation often fall largely on already marginalised local people (Adams et al., 2004; Scherl et al., 2004; Coad et al., 2008). Raising and deploying effectively the financial and technical (including human capacity) resources to restrain projected extinction rates of South-east Asian species is arguably the conservation community’s biggest challenge in meeting Aichi 2020 Target 12. Among the broad scope of conservation-oriented resources deployed in South-east Asia, targeted funding for highly threatened species is supported by various donors including the IUCN-Global Environment Facility-World Bank funding programme SOS (Save Our Species) and the Critical Ecosystems Partnership Fund (CEPF). Both these funding sources are relatively recent, responding to the region’s situation. They are not, so far, sufficient to meet all the urgent funding needs, and do not (and were not intended to) address the gaps in other resources. An emerging programme, here called by its interim name of Action Asia (AA), has the goal of minimising global extinctions among South-east Asia’s non-marine vertebrates. The restriction to non-marine species reflects the reality that marine conservation often involves different people, institutions and techniques from those of land and freshwater undertakings. There are many severely threatened marine species in South-east Asian waters (e.g. Polidoro et al., 2008; Field et al., 2009; Chong et al., 2010), but for AA to try to cover them increases the risks of its early failure through overambitious objectives. For similar reasons, the invertebrates, fungi and plants of land and freshwater habitats have to be excluded, at least initially.

AA will be a coalition of organisations involved in wildlife conservation in the region (most of which are IUCN
AA’s focus on assisting implementing agencies in alleviating direct threats to specific populations is complementary to the ongoing vital thematic undertakings above the site level. These include the reduction of wildlife trade through work at transit and consumer levels (e.g. TRAFFIC\(^4\) and the ASEAN Wildlife Enforcement Network\(^5\)), research to learn more about species’ conservation status, and education programmes for the general public at all levels about biodiversity’s values.

AA’s two main components are: [1] to identify the species in urgent need, agree their conservation needs (mostly relating to habitat and harvesting, the balance differing greatly between species), and support the latter’s implementation; and [2] to build, in selected ways, an enabling environment for these species-specific interventions. This second component, perhaps seeming at variance with a focussed approach, is not an attempt to build an overarching conservation strategy for South-east Asia. It is a recognition that specific interventions needed by each species require sufficient finance, technical capacity and political support, and that where AA can bring something additional to the existing system, it should do so. The contents of each component have been determined by extensive discussion, of the current conservation status and environment in South-east Asia, with many people within and outside IUCN SSC. As well as the authorship and those named in the acknowledgements, these include participants at workshops in Abu Dhabi (February 2012, for AA, during the IUCN SSC Specialist Group Chairs’ meeting) and in Hanoi (May 2012, specific to Vietnam). Many people have spoken in more than one role, e.g. for the institution employing them and for an IUCN SSC specialist group or Red List authority.

### 3.1 Species with urgent conservation needs

1. Maintain a list (‘eligible species list’) of highly threatened non-marine vertebrate species which occur (other than as vagrants or aliens) in South-east Asia, based on species Critically Endangered on the Red List; presently about 150 species meet these criteria. Support the relevant Red List Authorities to assess the (as-yet unknown number of) species likely to warrant such listing but presently in other categories, including Not Evaluated and Not Recognised.

2. Within the eligible species list, identify species of immediate priority (‘priority species list’): those at the most imminent risk of extinction. Many of these are not yet established priorities, or even well-known, in much of the wider conservation community. This is among the biggest hurdles to their conservation (e.g. SWG, 2009).

3. Generate a list of ‘vital sites’, those irreplaceable or nearly so for one or more eligible species (Box 1). This list will be very different from most other site-priority lists, such as Important Bird Areas [BirdLife International, 2004], Endemic Bird Areas [Stattersfield et al., 1998], Key Biodiversity Areas (e.g. CEPF, in prep.), important habitats (e.g. wetlands; Ramsar sites\(^6\)) which all produce site lists far lengthier than will AA. Such lists are complementary to AA, informing activities such as designing balanced national protected area systems. The closest existing site list may be that of the Alliance for Zero Extinction\(^7\) (sites holding species with no viable population elsewhere); but a fair number of highly threatened species are suspected to have potentially viable populations at more than one site (or, at least, no one site of the several which may possibly do so can be said to be more likely to do so than the others) and, conversely, many single-site species are not on the brink of extinction.

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3 Wildlife trade monitoring network: [www.traffic.org](http://www.traffic.org)
4 [www.asean-wen.org](http://www.asean-wen.org)
5 [www.ramsar.org](http://www.ramsar.org)
6 [www.zeroextinction.org](http://www.zeroextinction.org)
4. Determine for each priority species whether: (1) it has a support system in place, which may or may not need additional inputs (financial, technical, political, public interest), or (2) it has no current such system and so is in danger of extinction by neglect. Despite the proliferation of action plans over the last 20 years, regional conservation still largely relies upon implementing agencies selecting themselves to take on any given species. There is no centralised mechanism to rectify gaps or even, necessarily, notice them, thus enhancing risk of extinction by oversight.

5. Encourage action for priority species presently with no support, or at risk of losing it through, for example, impending personnel changes or funding uncertainties (see Rawson et al., 2011, p. 36; most of the many such cases are never documented). This includes lobbying donors to prioritise such species.

6. Support the relevant taxon-focussed overseers [such as IUCN SSC specialist groups; see IUCN SSC, 2012] to provide a discussion platform about each priority species’ short- and long-term conservation needs and exchange species-specific information with on-the-ground implementing agencies. Few species so far have active such systems, the Saola Working Group of the IUCN SSC Asian Wild Cattle Specialist Group being one (e.g. SWG, 2009). Directly consult with taxon-focussed overseers about what additional support, if any, they would welcome; and, where practicable, assist in sourcing such support.

7. Develop a system of tracking of each priority species’ conservation status, ensuring that this does not become an end in itself demanding so many resources as to stint interventions. Produce an annual overview of the eligible species’ conservation status, (i) determining which have priority actions underway or in preparation (and the extent to which these are expected to meet each species’ needs), which are being incidentally conserved under general interventions (with similar assessment of appropriateness to needs) and which are not being addressed at all; and (ii) giving implementing agencies a place to highlight areas they would welcome assistance and to communicate their progress.

Incomplete information on wildlife status is problematic at many levels. On present information, it is impossible to know how many AA-priority species are in fact beyond recovery and so deployment of resources solely in their favour is not justified, how many are seriously overlooked and remain common enough not to warrant AA-priority status, and how many genuinely could vanish or, if assisted, recover. In particular, concluding that a species is beyond recovery is fraught with risks because of the difficulties of comprehensive survey and predictions of intervention success. On current knowledge, Kouprey <i>Bos sauveli</i> is a candidate for this status (Timmins, 2011), but a single chance record could change this. Past arguments were made that Asian Crested Ibis <i>Nipponia nippon</i> and Mauritius Kestrel <i>Falco punctatus</i> were doomed, but both have, through intensive management, shown high recent population growth (Conway, 1980; Burnham, 1999; Xi et al., 2001) to the extent that the ibis is now merely Endangered and the kestrel Vulnerable on the Red List. Even determining which species might be highly at risk requires much inference. For example, Hose’s Civet <i>Diplogale hosei</i> is known by only 17 museum specimens, and, before camera-trapping became widespread, very few other records; all came from a small area of north-eastern Borneo (Van Rompaey & Azlan, 2004). Taking the records to reflect its true status would consider this a very rare animal. But recent camera-trapping has found several new sites, with one such record in Kalimantan, Indonesia (Samejima & Semiadi, 2012), almost doubling the species’ known latitudinal range. It remains, however, unknown why it is localised and generally at very low densities, and it is quite possible that it is seriously threatened (Mathai et al., 2010). This is one of several dozen South-east Asian vertebrates with the current conservation priority being research to determine the intervention priorities and their urgency. Even more extreme, an animal as large and distinctive as the Saola remained

**Box 1. Selecting vital sites, exemplifying the problem of incomplete information.**

Walston et al. (2010) argued persuasively for the need to prioritise resources for Tiger <i>Panthera tigris</i> conservation to ‘source sites’, those most likely to drive population recovery. Their analysis revealed that over two-thirds of surviving Tigers were in just 6% of present (and < 0.5% of historical) Tiger range. Few tropical Asian species have such population detail. Most AA-priority species do not allow the luxury of choice between many possible implementation sites. Some, such as Javan Rhinoceros, occur only at one locality (Griffiths et al., 2012); at the other extreme, the giant softshell turtle <i>Rafetus swinhoei</i> is down to four animals in three locations (Turtle Conservation Coalition, 2011). Most AA-priority species will probably be found to resemble Saola <i>Pseudoryx nghetinhensis</i> and Edward’s Pheasant <i>Lophura edwardsi</i>: these may conceivably inhabit a dozen or more landscapes [but probably many fewer] but, equally conceivably, numbers may be too low for likely recovery in any of these landscapes (SWG, 2009; Mahood et al., in prep.). Non-priority AA-eligible species are more likely to have multiple potential recovery sites. Site prioritisation through biological information may be very difficult, and anyway human-dimension factors may be more important; notably, the chance and efficiency of success (Coudrat et al., in press).
unsuspected by the scientific world until 1992 (Vu et al., 1993). Indeed, Saola was just one of several startling discoveries in the Lao PDR—Vietnam—Cambodia area in the 1990s-2000s. Fish are particularly poorly known: for example, Kottelat (2011) estimated that 19 (11%) of the 175 fish species so far found in the Xe Kong catchment in Lao PDR were certainly or potentially unnamed. In a region with such pervasive knowledge gaps, decisions need to be taken on the best, albeit imperfect, available information. No objective process can dispel these uncertainties.

3.2 BUILDING AN ENABLING ENVIRONMENT FOR SPECIES-SPECIFIC INTERVENTIONS IN SOUTH-EAST ASIA

1. Encourage existing conservation donors to prioritise highly threatened species of South-east Asia, and, most importantly, seek additional donors to do likewise.

2. Work with donors to meet two specific funding needs for AA-eligible species: (i) a rapid-response short-term emergency/bridging fund, and (ii) longer-term funding commitments (provided progress is satisfactory), mindful of the problematic expectation of some donors (particularly those reliant on public funds) that the problem can be ‘solved’ in a few-year project. These two approaches have been used for over 20 years by ZGAP’s [Zoologische Gesellschaft für Arten- und Populationsschutz] involvement with highly threatened species, often those with low public profiles, and with notable success. These include a number of Asian species, for example Blue-crowned Laughingthrush Garrulax courtoisi (Wilkinson et al., 2004) and Philippine Spotted Deer Rusa alfredi (Heckel et al., 2012). Short-term funding cycles have long been recognised as problematic (e.g. Janzen, 1986; Leisher, 2001); repackaging long-term projects every few years to fit donor expectations uses significant staff time, particularly from those individuals with most creative technical capacity, and most needed in direct implementation. Examples of long-term conservation funding in the region do exist, e.g. Allwetterzoo Münster’s ongoing financial commitment to the Cat Ba Langur Trachypithecus poliocephalus Conservation Project [Schrudder et al., 2010] and Twycross Zoo’s long-term funding to FFI [Fauna & Flora International] for conservation of Cao Vit Gibbon Nomascus nasutus along the China—Vietnam border (Insua-Cao et al., 2010). Perhaps more than any other NGO, WCS [Wildlife Conservation Society] has committed to long-term presence in high-priority conservation landscapes in South-east Asia (14 at present): sourcing the ongoing funds is a joint, and demanding, responsibility of field projects and headquarters. Some donors, such as the Wildlife Conservation Network (http://wildlifeconservationnetwork.org) already do operate with a suitably long-term perspective. An investigation of why long-term commitments of donors to implementing agencies are not more widespread, with case studies of the benefits (and risks) of long-term funding, would help tackle this issue.

3. Act as a broker between individual donors, notably those intending long-term commitments or emergency funds, and individual species projects. Simultaneously work with implementing agencies to minimise the need for recurrent outside funding wherever possible, i.e. to ensure that sa-lient local governments and other internal stakeholders assume responsibilities commensurate with their resources. Dependence on outside sources, which will necessarily remain the case for many of the AA-eligible species, brings its own risk of vulnerability to external changes.

4. Support the implementing agencies in (or, where appropriate, engage additional parties for) high-level dialogue with the region’s governments to ensure their full awareness of the gravity of the regional extinction crisis and its effects on humanity at all scales.

5. Encourage the new round of National Biodiversity Strategies and Action Plans’, national wildlife protection laws, and other laws and policies, to pay due attention to AA-eligible species conservation.

6. Provide technical, and potentially arrange financial, support to taxon-focussed overseers with AA-eligible species in their mandate. AA will not duplicate their work, but can offer support to presently under-resourced groups. Each overseeing group needs to manage a body of technical expertise on which field-based projects can draw, and act as a clearing house for species information. Currently these groups’ outputs vary highly, reflecting their reliance on volunteerism (e.g. Rabb & Sullivan, 1995). Some AA-eligible species are not presently within any such group’s remit, and, while this is so, AA will directly undertake species information collation and circulation.

7. Link people with shared implementation challenges; for example, most IUCN SSC specialist groups are taxonomically defined, yet information exchange between people working in a given country to save animals from different taxonomic groups is also helpful. The IUCN SSC Freshwater Committee is a habitat-based cross-taxonomic group, and many specialist groups for plants have a geographic rather than taxonomic focus (IUCN SSC, 2012).

8. Raise the profile, among conservation organisations, all sectors of governments, international bodies and the general public of the extinction crisis in South-east Asia and its effects on humanity, through both publications and media outreach, including new social media. In some cases wide awareness may not be beneficial, given how rarely often adds market value (e.g. in the captive reptile and bird trade; see above).

7 www.ias.unu.edu/resource_centre/UNU-IAS_Biodiversity_Planning_NBSAPs_Assessment_final_web_Oct_2010.pdf
9. Liaise with organisations and programmes that reduce consumer demand, educate the wider public, research species conservation status and other essential thematic undertakings and, where AA can specifically and efficiently advance these programmes, do so.

3.3 MINIMISING POTENTIAL PITFALLS AND LIMITATIONS

AA faces several challenges, common to almost any collaborative programme in almost any form of sustainable development.

First is the reality that conservation organisations may fail to collaborate to the extent that might be expected. Sometimes this reflects fundamental incompatibilities between differing sectoral or organisational goals, sometimes entrenched differences in opinion of how to attain a shared goal, and sometimes an unwarranted sense of ‘ownership’ by an individual or institution of a species (e.g. Juniper 2002, Knight, 2006; Gerber et al., 2011; Nicholls, 2012). This is different from the strong sense of responsibility and other attributes of insight, charisma, hard work, persistence, flexibility, skills diversity and leadership usually found to be present in one or two key individuals involved in any successful species project. But often non-collaboration is simply an almost inevitable result of conservation taking place in open competition for insufficient resources (financial, skilled human capital, and others); being credited for success is vital to conservation bodies (e.g. Redford & Taber, 2000; Knight, 2006).

A new entity, particularly one risking being perceived as appropriating the destinies of rare species, some high profile, will be less welcomed the more it is seen as a potential competitor. Open sharing of information becomes even less likely when projects risk being seen as underperforming (e.g. Redford & Taber, 2000; Knight, 2006). Linked to this, by definition the AA-priority species are difficult challenges; some will not be recoverable. An implementer, donor or other supporter taking up such a species’ cause must accept that extinction may not be averted. This can be managed by explicit objective-setting, recognising that the recovery of certain species may be extraordinarily difficult, with significant likelihood of failure, even though this is unpalatable. Reflecting these linked challenges, AA must keep a low profile (despite this impeding sourcing of its own running costs), must not blur its distinctions from implementing agencies, must not seek its costs from sources already used by implementing agencies, and should remember and communicate scrupulously that its precise niche is supportive not competitive. IUCN SSC specialist groups probably have the closest remit of anything extant: catalytic rather than directly implementing, institutionally non-affiliated (despite their nesting within IUCN) by being open to people from all bodies, and facing the image-risk of being ‘interfering’ by having a clear, and mostly accepted, mandate to be involved.

The omens for AA in this respect are good: when the Red List Global Mammal Assessment highlighted the desperate situation for South-east Asia (Schipper et al., 2008) the major international conservation NGOs agreed broadly on the need for, and urgency of, a cross-institutional response, and committed to participate. Regional- and national-level such bodies already exist, such as, respectively, the Global Tiger Initiative8 and MYCAT, the Malaysian Conservation Alliance for Tigers9 [Kawanishi & Seidensticker, 2010], as do alliances specific to issues (e.g. ASEAN-WEN10) and methodology (e.g. the SMART partnership for conservation monitoring11). Similarly, at the loss of Vietnam’s last rhinoceros (Brook et al., 2012), nearly all conservation NGOs with a role in Vietnam of conservation of species near extinction responded favourably to the suggestion of a conservation alliance to help everyone perform better. Finally, one of the highest-profile, highest-risk species undertakings in the region – the management of Javan Rhinoceros in Ujung Kulon National Park – recently invited external assessment of the present population (Griffiths et al., 2012). To nurture this collaborative spirit, AA must never forget that its genesis was through the organisations that were already active.

A second stiff challenge is that while the extra money certainly needed for these species will, with sufficient determination, be sourced, it remains unclear where the necessary concomitant expansion of readily available technical competence and commitment will come from. Already many conservation projects speaking of highly threatened species do not successfully conserve them, and in some cases this reflects insufficiently experienced personnel in decision-making roles. There is wide perception in the region not just of the scarcity of trained permanent staff, but of ‘off the shelf’ capacity to act as technical advisors and trainers. Significant progress could be made by catalysing the relevant IUCN SSC specialist groups, and comparable bodies. Other approaches may well be needed, and this topic is a focus of ongoing AA discussions.

Third, many AA-eligible species have significant market value when dead, or are bycatch of species which do. For almost all these, present oftakes are unambiguously illegal. Irrespective of who actually takes the animals, the systems are underwritten by powerful individuals able to pay to live outside the law. Conserving these species will require these people to forego some of their illegal income. Hence AA’s aim to build high-level political support for these species’ conservation.

Finally, AA philosophy must remain only part of overall conservation activity, even in South-east Asia. Focus on species on the edge of the extinction (some of which will not be recoverable) risks diverting attention from next-decade’s potential crisis species, and hastening their decline. Moreover, vital products of conservation, such as ecosystem services, require conservation management of large proportions of land and water, even if these lack AA-eligible species. The costs needed for single-species-focused, single-site management for all 150 Critically Endangered species of South-east Asia would be a small part of the total estimated by Bruner et al. (2004) to be required for effective management of all existing protected areas in developing countries and expansion into high-priority new areas. Those authors found this amount to be well within
the reach of the international community. To avert increasing risk to species facing ‘next generation’ imminent extinction, still today locally abundant (e.g. Red-shanked Douc Pygathrix nemaeus; Coudrat et al., in press), AA must result in additional resources (financial and technical) for South-east Asian species conservation, not reassignment of the existing sources.

3.4 A COUNTRY EXAMPLE: VIETNAM

Evolving in parallel with AA is a national approach to threatened species conservation in Vietnam, stimulated in particular by the recent loss of the country’s last wild rhinoceros (Brook et al., 2012). This, initially independently of AA, identified many of the same issues, constraints and potential solutions for averting species extinctions in the region. For about 10 highly threatened tetrapod vertebrate species, global conservation relies upon Vietnamese populations, a total exceeding that for most other South-east Asian countries. Vietnam has high biodiversity values and endemicity as well as very high threats: as well as those at global risk, many species face imminent national extirpation (Sterling et al., 2006). Of particular concern are Vietnam’s five species of Critically Endangered endemic or near-endemic monkeys and apes, some of the most highly threatened primates globally (Nadler et al., 2003; Mittermeier et al., 2009; Rawson et al., 2011), and a similar concentration of high-priority turtles (Turtle Conservation Coalition, 2011).

Developing an alliance of conservation practitioners at a national scale may be more challenging than doing so regionally. Keys to success in promoting interaction between species conservation implementers for improved collaboration, sharing of technical resources and improved transparency, will include overcoming implementers’ fears about an additional level of bureaucracy which brings no net benefit and the vulnerability that transparency brings in an environment where accountability is presently limited. Provision of core funding (additional to current sources) is a key desire for implementing agencies. Additional access to technical input is only variably perceived as beneficial. The unsupportive context within which conservation is implemented is perceived as the major constraining factor, with internal factors seen as secondary. Nonetheless, building a more enabling environment is a key role of this institutional alliance for Vietnam, which presently is in discussion with 54 people from 27 institutions, because it provides a united voice and message to government agencies, media and the public.

3.5 PROGRESS TO DATE AND NEXT STEPS

The information and thinking within IUCN SSC and its partners that has led to the recognition of the need for AA has already, in advance of formation of AA itself, informed the funding scope of SOS and the 2012–2013 EAZA [European Association of Zoos and Aquaria]–IUCN SSC South-east Asia Campaign. The feedback from the wider conservation community during the setting-up of these collaborations was instrumental in developing the concepts here presented, but further dialogue is needed and is ongoing. Indonesia is vital for the future of the two South-east Asian rhinoceros species (Brook et al., 2012; Zafir et al., 2011), so IUCN SSC worked with several conservation NGOs active in the rhino areas to meet the Indonesian Vice President in October 2011; he was very receptive to the six urgent recommendations presented (Stuart & Smart, 2012). And as a result of this earlier meeting, the Indonesian President declared the International Year of the Rhino in June 2012 and, at the time of writing, appears to have adopted most, if not all, of the six recommendations delivered to the Vice President nine months earlier.

By the time of the World Conservation Congress in Jeju, Republic of Korea, in September 2012, working AA species and site lists will have been prepared. Consistent with the need for rapid and flexible response of AA these two lists will be somewhat dynamic, reflecting changes in species assessed on the Red List as Critically Endangered, and the fluidity in threats and their impacts. During this Congress, a meeting of available stakeholders will discuss the working mechanics of AA: precise objectives, modes of operation, governance and structure, first-year deliverables, and options for generating AA resources (including core costs). This meeting’s output will be followed by extensive correspondence to ensure adequate opportunity for input by those unable to attend the meeting. Extensive discussion is particularly important for an initiative that aims mostly to support and link existing bodies (Pfeffer & Sutton, 1999). Initial AA involvement is likely to start in countries with many AA-priority species and expand to other countries only when progress in the former is consolidated.

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