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Holistic management of live animals confiscated from illegal wildlife trade

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Introduction

The illegal wildlife trade is one of the most pressing environmental issues globally and a substantial contributor to the Anthropocene extinction crisis (Nijman 2010). In response combatting wildlife trade has attracted considerable global political support and, between 2010 and 2016, approximately U.S. $1.3 billion in donor and governmental funding (Wright et al. 2016). Much of this momentum has focused on iconic megafauna – rhinoceros Rhinocerotidae, elephant Elephantidae, and tiger *Panthera tigris*– and the transcontinental trade between Africa and Asia (Wright et al. 2016). However the majority of species and individual animals traded illegally are not high priority flagship species but a vast array of species traded both internationally and domestically and with uses as varied as medicine, pets, and food (UNODC 2016). The World Wildlife Seizure database (World WISE), of the United Nations Office on Drugs and Crime (UNODC), highlights the breadth of the illegal trade listing, from between 2004 and 2015, more than 164,000 seizures from 120 countries of more than 7,000 species (UNODC 2016). Similarly a recent analysis of live seizures of species listed under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) documented more than 64,000 animals, from 359 species, seized between 2010 and 2014 (D'Cruze & Macdonald 2016).

The global community has acknowledged that responses to illegal wildlife trade need to be multi-facetted and holistic with, for example, an increasing recognition of the role of both engaging communities and targeted evidence-based behaviour change communication

(Challender & MacMillian 2014, Biggs *et al*. 2016). We suggest that a similarly comprehensive and holistic conservation-oriented approach is required to deal with live animals confiscated from the illegal wildlife trade as a result of law enforcement. The inability to effectively address this issue may create conservation, ethical, animal rights, and resource issues. And is an often-overlooked aspect of the global response to illegal wildlife trade potentially undermining otherwise successful initiatives (D'Cruze & Macdonald 2016, Zhou *et al*. 2016). In this Practitioner's Perspective we provide some applied solutions to this important conservation issue, and identify outstanding research needs, based on more than 15 years' experience of the Wildlife Rapid Rescue Team (WRRT) in Cambodia

Cambodia and the Wildlife Rapid Rescue Team

Dealing with the illegal wildlife trade is particularly pertinent in countries, such as Cambodia, which are source, transit, and destinations for illegally traded wildlife products (Table 1). The problem is compounded by pervasive corruption, Cambodia is ranked 156th out of 176 countries globally by Transparency International (Transparency International 2016), combined with limited governmental and civil society capacity and funding for tackling domestic and regional drivers of unsustainable wildlife trade. In Cambodia, as with much of South East Asia, extensive regional trade and domestic consumption, combined with limited effective law enforcement, is driving defaunation and the distinctively Indochinese phenomenon of genuinely empty forests (Harrison *et al*. 2016).

The 2002 Forestry Law of the Ministry of Agriculture Forestry and Fisheries (MAFF) governs the hunting, consumption, and trade in wildlife in Cambodia. Under the law it is prohibited to "transport and trade an amount exceeding that necessary for customary use" any species of mammal, bird, or reptile. The hunting, possessing, or trading any of 16 'Endangered' or 76 'Rare' species, defined in a 2007 Ministerial Proclamation, is illegal under any circumstances with mandatory custodial or financial penalties. The Wildlife Rapid Rescue Team (WRRT) was created by Wildlife Alliance in collaboration with the Royal Government of Cambodia in 2001 in response to the extensive domestic wildlife trade and the opportunities for effective enforcement created by the Forestry Law and Cambodia's earlier ratification of CITES. The WRRT is Cambodia's only wildlife trade enforcement unit with a national mandate and judicial police authority to arrest traffickers and seize smuggled wildlife. The WRRT has a 24/7 confidential public Wildlife Trafficking Hotline and a network of informants which allows the unit to quickly respond to reported cases of wildlife crime. As a result of the action of the WRRT, there has been a clear reduction in the extent of illegal wildlife trade in the country (Martin & Martin 2013, authors pers. obs.) and specialist wildlife markets, openly selling threatened species, are much less ubiquitous than in neighboring countries such as Thailand, Lao PDR, and Myanmar (Nijman & Shepherd 2015a&b). For example the number of wildlife traders operating in Chi Phat, a known trafficking hot-spot in the Cardamom Rainforest Landscape, declined from ten to two individuals between 2005 and 2015 (Wildlife Alliance unpublished-data).

However, it quickly became apparent that the success of the WRRT in implementing the Forestry Law resulted in a large number of seizures and confiscations of live animals and the

realization of the need for clear protocols for effectively and ethically dealing with confiscated animals (Fig. 1). As an example of the extent of the trade, and operations of the WRRT, between 2007 and 2015, a total of 24,963 live animals from 173 species of mammal, bird, and reptile were seized. This is in addition to confiscation of dead animals (>26,000 individuals) and wildlife meat (>9.500-kg) and body parts (>7,500 items). Live individuals from five IUCN Critically Endangered (Sunda pangolin *Manis javanica,* Siamese crocodile *Crocodylus siamensis*, southern river terrapin *Batagur affinis,* white-shouldered ibis *Pseudibis davisoni*, and white-rumped vulture *Gyps bengalensis*,), 17 Endangered, 16 Vulnerable and 13 Near Threatened species were rescued (Fig. 2). The majority of the species confiscated were IUCN listed as Least Concern (69%) and the majority of live individuals confiscated (65%) were reptiles (Fig. 2).

This posed the question of how to deal with the live proceeds from the illegal wildlife trade. Consequently Wildlife Alliance worked closely with the Royal Government of Cambodia to develop clear operational guidelines for dealing with confiscated and seized wildlife so as to ensure no individuals could be laundered back into illegal trade (Fig. 1). If seized animals appear to be healthy and are known to have been recently caught from the wild they are “hard-released” into suitable habitat. A relationship was also established with Phnom Tamao Wildlife Rescue Center, the sole official government wildlife rescue center in Cambodia, with Wildlife Alliance supporting management and ensuring high-quality animal husbandry, veterinary care, expert training for staff, and natural enclosures for animals. However the commitment to life-time care to any animals which require it, irrespective of their conservation status, creates both financial and human resource challenges. The annual operating costs of Wildlife Alliance’s support to

Phnom Tamao Wildlife Rescue Center exceed U.S. $350,000 and additional investment was required to increase local veterinary and animal husbandry capacities. Therefore such an approach may not be generically suitable globally.

There is also a strong focus on conservation reintroductions where appropriate. Leopard cat *Prionailurus bengalensis*, sambar *Rusa unicolor,* red muntjac *Muntiacus muntjak*, and golden jackal *Canis aureus,* have been reintroduced in the protected forest surrounding Phnom Tamao and captive-bred binturong *Arctictis binturong*, among other species, into the Southern Cardamom National Park of the Cardamom Rainforest Landscape (Marx 2008, Marx & Roth 2014). All reintroductions adhere to the guidelines of the IUCN Reintroduction Specialist Group (IUCN SSC 2013). Excitingly, captive bred Indochinese silvered langur *Trachypithecus germaini* and pileated gibbon *Hylobates pileatus*, one of Asia's most charismatic species, have been released, and are breeding, in one of the country's most evocative landscapes – the forests surrounding the world heritage site of Angkor Watt. This represents a rare global example of successful gibbon reintroduction (Osterberg *et al*. 2015) and places a valid conservation purpose for animals that likely would spend the rest of their lives in a cage.

As a multi-agency inter-governmental team with technical oversight provided by an international conservation NGO, opportunities for corruption and mismanagement within the WRRT are limited and this has also contributed to its effectiveness. A major challenge, however, remains the often obsolete classification of species, as 'Endangered', 'Rare', and 'Common' under the Forestry Law. No non-native species are protected, whilst the 13 mammal species receiving the

highest level of protection ('Endangered') include one mythical (khting vor "*Pseudonovibos spiralis"*), one globally extinct (kouprey *Bos sauveli*), and two extirpated species from Cambodia (Javan Rhinoceros *Rhinoceros sondaicus* and tiger). Of the 47 IUCN Threatened or Near-Threatened mammal species occurring in Cambodia 13, including fishing cat *Prionailurus viverrinus*, binturong and sambar, are classified as 'Common' with their trade and consumption involving minimum penalties. The conservation community, including some of the authors of this paper, are currently engaging with the Royal Government of Cambodia on an extensive and far-sighted modification of the country's environmental legislation (The Natural Resource and Environmental Code) and are recommending revision of the wildlife protection law to align protection of species, including those non-native to Cambodia, with their global IUCN Red List status.

While in the last decade significant progress has been made in Cambodia with respect to reducing the open trade in wildlife (e.g. Martin & Martin 2013, authors pers. obs.) and dealing with confiscated wildlife, effective prosecution of offenders is lacking behind. Prosecuting and sentencing law breakers not only punishes offenders but it also sends a clear message to society about what is and what is not tolerated, and as such acts as a deterrent to future offenders. Fines, seizure of goods, recouping monetary proceeds of criminal activities and prison sentences all increase the (real or perceived) cost facing criminals, ideally up to the point where these costs outstrip the (potential) benefits (Nijman 2017). Hitherto many of the confiscations of wildlife do not result in prosecution of those involved in their trade, with the possible exception when high-profile species are involved. And, as elsewhere in South East Asia, the political will for prosecuting environmental lawbreakers has always been lacking. It will require a paradigm shift

on part of the judiciary, the forest departments and other government agencies, as well as the general public, to see the illegal wildlife trade as the economic crime it is rather than a crime committed against an individual animal that is traded.

Applied research need for strengthening the holistic approach for dealing with live animal confiscations from illegal trade

The care and rehabilitation of confiscated live animals is a critical, but often missing, aspect in approaches for disrupting the illegal wildlife trade. The importance of such a comprehensive approach is clear. Law enforcement without care or consideration for seized wildlife is likely to create additional problems and may be as irresponsible as doing nothing. A holistic approach to dealing with live animals confiscated from the illegal wildlife trade, as outlined above, must be considered in conservation planning and high-level inter-governmental dialogues on combatting wildlife trafficking. In order to ensure science-based best practices and knowledge influences such dialogue a number of applied research questions need to be addressed.

There is a need to further understand the scale and breadth of the illegal trade in wildlife particularly for species that are not global conservation flagships. This is required to ensure that sufficient funding and technical support can be provided by the global community to the, often less developed countries such as Cambodia, which account for a significant proportion of live wildlife seizures. Applied ecological research into the abundance and distribution of trade target

taxa and more transparent data on trade numbers at illegal markets and confiscations is required. This will assist in ensuring that conservation funds can be appropriately allocated both geographically and by taxa. There is also a need for improved basic knowledge on species natural history and taxonomy, both areas critically neglected in South East Asia (Koh & Sodhi 2010), in order to fine-tune species wildlife rehabilitation, care, and develop reintroduction programs. A major challenge requiring targeted research is post-release monitoring of wildlife particularly 'hard releases' of recently captured animals. There is a need to understand survivorship, and the factors which facilitate it, for adaptive management of future releases. Understanding the extent to which rapidly released animals are able to survive, and fine-tuning protocols, may reduce pressure on rescue and animal care facilities globally.

The global wildlife trade, both legal and illegal, is also increasingly acknowledged as having strong consequences for zoonotic disease transmission to both humans and wildlife (Smith *et al*. 2012). Greater understanding of pathogen pools in healthy wild populations of widely traded species is required for planning responsible releases and reintroductions of individuals confiscated from the illegal wildlife trade. For example Phnom Tamao Wildlife Rescue Centre currently houses more than 100 seized long-tailed macaques *Macaca fascicularis* and pig-tailed macaque *Macaca nemestrina* a proportion of which carry Herpes 1 and 2 (Wildlife Alliance unpublished data). Releasing these individuals is not possible without understanding background levels of Herpes and other pathogens, which may be benign, in wild primate populations. Similarly more than half of confiscated pileated gibbons in Cambodia carry Hepatitis B antigens or antibodies (Wildlife Alliance unpublished data). Infected individuals are not suitable for release or re-wildling without understanding natural levels of Hepatitis in wild gibbon

populations and the extent to which this specific strain of Hepatitis is unique to gibbons. Such research issues need addressing to help conservation practitioner's implement the full potential of using seized animals for establishing *in-situ* and well managed conservation breeding programs for some of the planet's most threatened species.

Finally it is recognized that in order to understand the persistence of the illegal wildlife trade, an untangling of the criminal networks involved is needed. It is difficult to design an effective policy to deal with wildlife crime without having a good knowledge of the networks involved in and driving that crime. These will often be specific to the geographical area and species involved (Ayling 2013). This entanglement then needs to be accompanied by effective law enforcement and prosecution; both areas that need investigating as to why this, by and large, has failed to curb the trade in wildlife in South East Asia and indeed elsewhere.

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Data Availability

Data have not been archived as this paper does not contain data.

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Biosketch

Thomas Gray is Director of Science for Wildlife Alliance and has undertaken applied conservation research on threatened mammals and birds in Cambodia since 2005. **Nick Marx** is Wildlife Alliance's Director of Care for Rescued Wildlife at Phnom Tamao Wildlife Rescue Centre and leads the reintroduction of seized wildlife. **Khem Vuthravong** and **Dean Lague**

manage the multi-agency Wildlife Rapid Rescue Team and have combined more than 50 years practical law enforcement experience. **Vincent Nijman**, Professor in Anthropology, conducts research on wildlife trade in Asia informing governments, NGOs and industry how to mitigate the adverse effects of unregulated and unsustainable trade on imperiled wildlife. **Suwanna Gauntlett** is the founder and CEO of Wildlife Alliance and assisted the Forestry Administration in the creation of WRRT in 2001. She has 22 years' experience in wildlife anti-poaching and anti-trafficking law enforcement and park protection.

282 # Tables

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Source	Transit	Demand
Long-tailed macaque *Macaca fascicularis* for supplying medical and cosmetic testing facilities regionally and Malayan porcupine *Hystrix brachyura* and common palm civet *Paradoxurus hermaphrodites* for supplying wildlife farms in Vietnam	Sunda pangolin *Manis javonica* and Asiatic black bear *Ursus thibetanus* increasingly sourced in Thailand, due to hunting driven declines elsewhere in region, and transiting through Cambodia to Lao PDR and Vietnam	Chinesse serow *Capricornis milneedwardsii* and Bengal slow loris *Nycticebus bengalensis* widely used in traditional Cambodian medicine
Clouded leopard *Neofelis nebulosa* and smooth-coated otter *Lutrogale perspicillata* for trophy skins and exotic home décor features in China	African elephant *Loxodonta Africana* ivory and White Rhinoceros *Ceratotherium simum* horn transiting through Cambodia to Vietnam and Lao PDR with 16 seizures in international harbors and airports since 2013	Alexandrine parakeet *Psittacula eupatria* and hill myna *Gracula religiosa* for pet trade
Elongated tortoise *Indotestudo*		Lesser mouse deer *Tragulus*

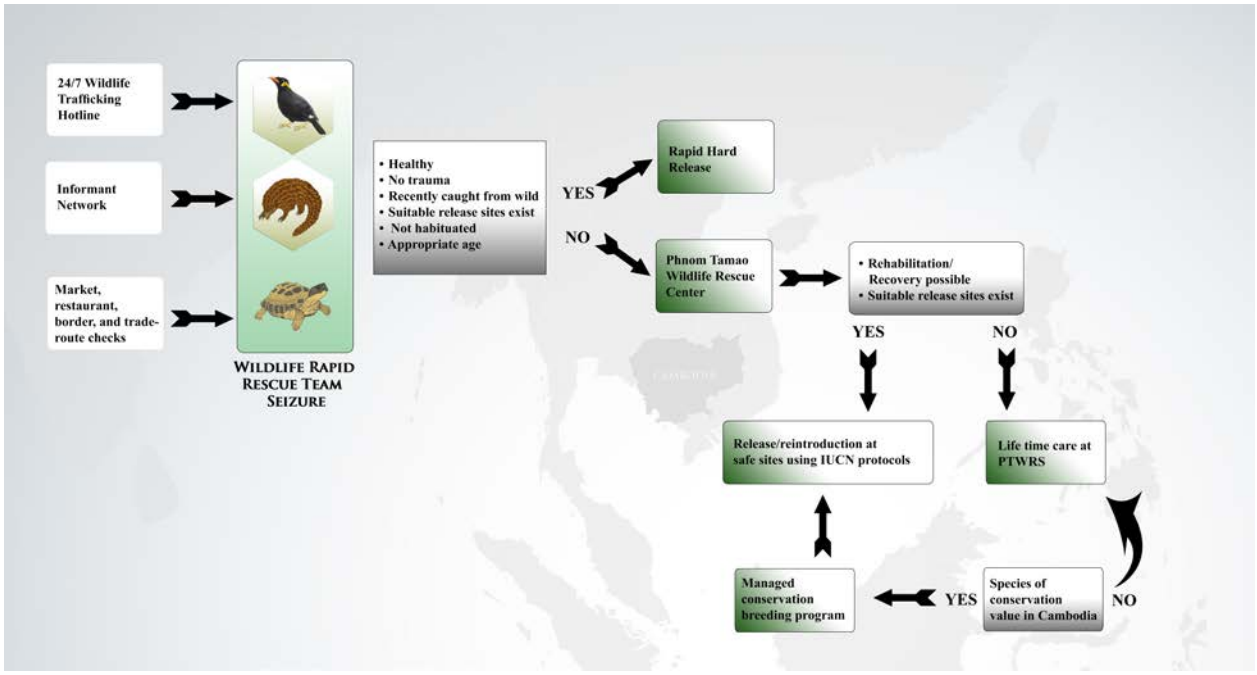
elongata for meat and export to Thailand and Vietnam	*kanchil,* red muntjac *Muntiacus muntjak* and sambar *Rusa unicolor* for meat consumption in restaurants
Sarus crane *Grus antigone* for pets and stocking zoos in Thailand	Mekong snail-eating turtle *Malayemys subtrijuga* for consumption

Table 1. Examples of species involved in the illegal wildlife trade in Cambodia illustrating species sourced (i.e. originating in Cambodia), transiting (i.e. transiting through Cambodia from a source elsewhere to final destination elsewhere), and in demand (i.e. consumer market in Cambodia) in the country. Many of these example species occur in more than one category e.g. Sunda pangolin also sourced in Cambodia and some demand, particularly from Chinese restaurants, in the country. Table compiled based on data from seizures and information collected by Wildlife Alliance and the Wildlife Rapid Rescue Team.

Figure Legends

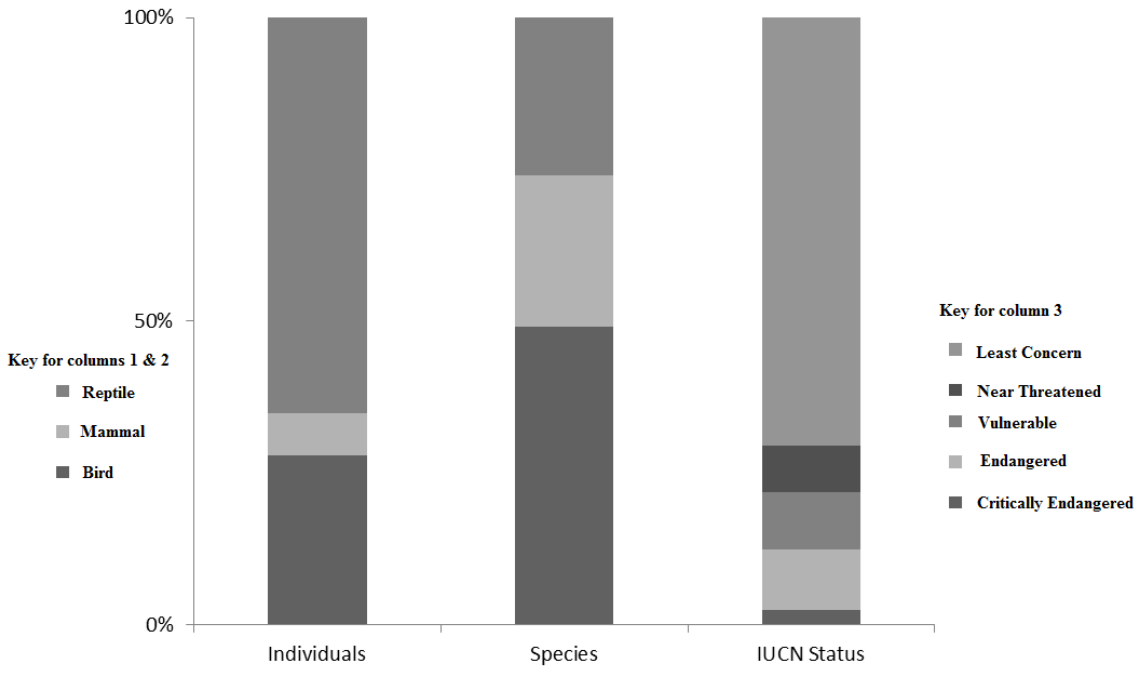
Figure 1. Decision-tree for implementing the holistic approach of Cambodia's Wildlife Rapid Rescue Team for dealing with seized live wildlife.

Figure 2. Proportion of individuals and species (columns 1 and 2) confiscated by Wildlife Rapid Rescue Team 2007 to 2015 according to taxonomic groups and, at species level, IUCN Red List status (column 3).


24/7 Wildlife Trafficking Hotline
Informant Network
Market, restaurant, border, and trade-route checks
WILDLIFE RAPID RESCUE TEAM SEIZURE
• Healthy
• No trauma
• Recently caught from wild
• Suitable release sites exist
• Not habituated
• Appropriate age
YES
Rapid Hard Release
NO
Phnom Tamao Wildlife Rescue Center
• Rehabilitation/ Recovery possible
• Suitable release sites exist
YES
NO
Release/reintroduction at safe sites using IUCN protocols
Life time care at PTWRS
Managed conservation breeding program
YES
Species of conservation value in Cambodia
NO

302

303


100%
50%
0%
Individuals
Species
IUCN Status
Key for columns 1 & 2
Reptile
Mammal
Bird
Key for column 3
Least Concern
Near Threatened
Vulnerable
Endangered
Critically Endangered

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