

VOL. 28 NO. 2

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TRAFFIC

B U L L E T I N

WILDLIFE DNA FORENSICS

**REDUCING DEMAND FOR
ILLEGAL WILDLIFE PRODUCTS**

ENHANCING PLANT TRADE REGULATION

STRAW-HEADED BULBULS IN SINGAPORE

The journal of the TRAFFIC network disseminates information
on the trade in wild animal and plant resources

OCTOBER 2016

TRAFFIC

the wildlife trade monitoring network

TRAFFIC was established in 1976 to perform what remains a unique role as a global specialist, leading and supporting efforts to identify and address conservation challenges and solutions linked to trade in wild animals and plants.



WILD WONDERS OF EUROPE, MARKUS VARESVOU / WWF

TRAFFIC's Vision is of a world in which trade in wild plants and animals is managed at sustainable levels without damaging the integrity of ecological systems and in such a manner that it makes a significant contribution to human needs, supports local and national economies and helps to motivate commitments to the conservation of wild species and their habitats.

TRAFFIC

Trade in wildlife is vital to meeting the needs of a significant proportion of the world's population. Products derived from tens of thousands of species of plants and animals are traded and used for the purposes of, among other things, medicine, food, fuel, building materials, clothing and ornamentation.

Most of the trade is legal and much of it sustainable, but a significant proportion is not. As well as threatening these resources, unsustainable trade can also lead to species declining in the wild to the point that they are threatened with extinction. Illegal trade undermines local, national and international efforts to manage wild natural resources sustainably and causes massive economic losses.

TRAFFIC is a strategic alliance of WWF and IUCN, the International Union for Conservation of Nature. The role of

TRAFFIC is to seek and activate solutions to the problems created by illegal and/or unsustainable wildlife trade. TRAFFIC's aim is to encourage sustainability by providing government, decision-makers, traders, businesses, consumers and others with an interest in wildlife trade with reliable information about trade volumes, trends, pathways and impacts, along with guidance on how to respond where trade is illegal or unsustainable. Five regional TRAFFIC offices are co-ordinated by the TRAFFIC headquarters in Cambridge, UK.

TRAFFIC's reports and advice provide a technical basis for the establishment of effective conservation policies and programmes to ensure that wildlife is maintained within sustainable levels and conducted according to national and international laws and agreements. The journal of the TRAFFIC network, *TRAFFIC Bulletin*, is the only publication devoted exclusively to issues relating to international trade in wild plants and animals. Provided free of charge to over 4000 subscribers and freely available from the TRAFFIC website (www.traffic.org), it is a key tool for disseminating knowledge of wildlife trade and an important source of information for those in a position to effect change and improve awareness.



JURGEN FREUND / WWF

Much of the content published in the *TRAFFIC Bulletin* arises from investigations carried out by TRAFFIC staff, whose wide-ranging expertise allows for a broad coverage of issues. TRAFFIC has also built up a global network of contacts with, for example, law enforcement agents, scientists, and wildlife experts, some of whom are regular contributors to the *TRAFFIC Bulletin*.

TRAFFIC welcomes articles on the subject of wildlife trade that will bring new information to the attention of the wider public; guidelines are provided in this issue and online to assist in this process. For more information, please contact the editor: Kim Lochen (kim.lochen@traffic.org).



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The *TRAFFIC Bulletin* is a publication of TRAFFIC, the wildlife trade monitoring network, which is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development. TRAFFIC is a strategic alliance of WWF and IUCN.

The *TRAFFIC Bulletin* publishes information and original papers on the subject of trade in wild animals and plants, and strives to be a source of accurate and objective information.

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A. Timoshyna, H.K. Chen and B. Morgan



Opening to the sound of delegates participating in a plenary-wide drum workshop and closing with the equally regular beat of the Chair's gavel marking agreement on a remarkable array of new decisions, resolutions and listing proposals, the seventeenth meeting of the Conference of the Parties (CoP17) to CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) has been widely heralded a conservation success.

Held in Johannesburg, South Africa, from 24 September to 4 October 2016, and reportedly attended by 3500 participants representing 152 governments, international

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organizations, non-governmental organizations and media, CoP17 was certainly the largest meeting of the Convention to date. In closing comments, the CITES Secretary-General, John E. Scanlon stated, "The most critical meeting in the 43-year history of CITES has delivered for the world's wildlife. CoP17 is a game changer for the planet's most vulnerable wild animals and plants."

It is indeed true that there were some very positive decisions reached at this meeting. CITES Appendix II regulation will be introduced for various commercially important species of sharks, rays and rosewoods. Proposals to re-open commercial trade in ivory and rhinoceros horn were not approved, at least in part because of valid concerns that current over-heated markets for these commodities manipulated by organized and adaptive criminals pose unacceptable risks that legal trade options would not deliver claimed benefits. The meeting also made progress on some important policy matters gaining traction for the first time, including enhancement of the role of local communities in CITES decision making, recognition of the impact of corruption in undermining wildlife trade regulation, the potential of strategic demand reduction actions, the development of systems for legal trade traceability and measures to improve verification of captive-breeding claims.

Indeed, there is much to celebrate, albeit with the usual proviso that it is effective action, not encouraging words that will prove the eventual worth of the decisions taken. On that front, the continued international attention to the conservation, economic and security implications of illegal wildlife trade and associated criminality is certainly bringing important new actors and resources to the CITES table. Running alongside the CoP this time was a global meeting of the Wildlife Enforcement Networks, a session of the INTERPOL Wildlife Crime Working Group and a packed timetable of other side events on topics ranging from forensic science to cybercrime. There is no doubt that international co-operation and local action within many countries to address wildlife trade challenges are as vigorous now as at any time since CITES was crafted.

Nevertheless, there is undoubtedly room for further improvement. CITES is often billed as "the environmental treaty with teeth". This may be the case, but its drawn-out decision making, supported by an obviously under-resourced Secretariat, often means those teeth are employed to chew ponderously over key national compliance issues, rather than credibly threaten the sort of sharp bite that might prompt faster action.

At the same time, the basic "rules of the game", the listing criteria that member countries adopted to help guide their decisions about regulatory treatment for particular species, are in need of some thoughtful review and revision. As we reflected in the introduction to TRAFFIC's published recommendations on proposals to amend the CITES Appendices at CoP17, current criteria do not provide the sort of clear guidance needed to judge whether a proposed change in CITES regulatory treatment would, on balance, be "in the best interest of the conservation of the species concerned, and be a proportionate response to anticipated risks" (in the words of Resolution Conf. 9.24 (Rev. Conf. 16)).

Such judgement requires: a clear identification of a trade-related problem; a credible explanation of how the regulatory change proposed could help, alongside a balanced assessment of opportunities, risks and alternative solutions; and a realistic appraisal of the likelihood of adequate implementation and enforcement. More guidance is also needed on strategies for dealing with uncertainty in making such judgements, including on interpretation of often patchy biological and trade information. Moreover, as demonstrated by the recent habit of adopting ever more convoluted annotations to the Appendices, the range of recommended precautionary measures in CITES' regulatory armoury sorely needs to be modernized. Lessons must be learned from cases where long-term regulatory attention by CITES for species such as Asian pangolins and the African Grey Parrot have not delivered positive conservation outcomes—their listing in CITES Appendix I at this meeting is a sign of failure, not a cause for celebration.

That the CITES community has a strong rhythm moving forward is not in doubt and CoP17 may well prove to mark a breakthrough in international efforts to achieve the treaty's goals. With so much international interest in this subject, there is a unique opportunity right now to ensure CITES really does change the game and deliver positive outcomes for many species in the longer term, and bring wider conservation benefits. For many other species, the next few years leading to CITES CoP18 in Sri Lanka in 2019 are nothing short of critical.

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The sustained trafficking of wildlife is partly a result of the effective networking by traffickers, collaboration and real-time exchange of information, using innovative technology. It is therefore generally recognized that more effective and real-time information sharing and cross-border collaboration between wildlife law enforcement officials is critical to deter and/or reduce this threat and the associated criminal activities. An online information sharing and collaboration system has been developed by TRAFFIC in partnership with the Central Africa Forest Commission (COMIFAC)¹, the AFRICA-TWIX (Trade in Wildlife Information eXchange) system aimed at promoting

on Drugs and Crime (UNODC), the World Customs Organization (WCO), the Economic Community of Central African States (ECCAS), INTERPOL, the Observatory for Central African Forests (OFAC), WWF and the Zoological Society of London (ZSL). Since its launch, the four countries have designated a total of 95 agents for inclusion in the mailing list; 68 of them are registered and 45 are actively communicating and sharing information. Types of information being shared include seizure details, such as the countries involved along an illegal shipment route and the *modus operandi* of the traffickers. A total of about 200 messages have been exchanged between users and four investigations triggered and/or supported thanks

THE AFRICA TRADE IN WILDLIFE INFORMATION EXCHANGE SYSTEM: Promoting regional collaboration in the fight against illegal wildlife trade in Central Africa.

the sharing of information, in real-time, and working together with law enforcement agents in Central Africa to combat illegal wildlife trade. The initiative was inspired by the success of the European Union Trade in Wildlife Information eXchange (EU-TWIX) system established by TRAFFIC and government partners in Europe in 2005 (TRAFFIC, 2016). EU-TWIX has a total of 847 users in 36 European countries and the database holds over 47 000 seizure records. Information from the EU-TWIX triggered 13 investigations in Europe in 2014 (TRAFFIC, 2015).

Like EU-TWIX, AFRICA-TWIX has two components—a digital mailing list and a database. The mailing list brings together all relevant law enforcement agencies responsible for combating wildlife trade and associated crime, Customs, police, border forces, forestry officers, environmental inspectorates and prosecutors, as well as international institutions, connecting them on a daily basis, allowing the exchange of information in real time. The database will contain information on seizures, violations and prosecutions that can be used to analyse the scale of trade and trends at sub-regional level. It is anticipated that national law enforcement authorities will carry out their own analyses of seizure information held in the AFRICA-TWIX database to assist their targeting and risk profiling. The system is being piloted in four Central African countries (Cameroon, Congo, Gabon and the Democratic Republic of Congo) and will be gradually expanded into other countries over time. As in EU-TWIX, access to AFRICA-TWIX is only granted to law enforcement agencies mandated by the respective governments.

The AFRICA-TWIX system was formally endorsed by representatives from law enforcement agents from the four pilot countries at a workshop in Douala, Cameroon, in February 2016 (Mahonghol *et al.*, in prep.). Support for AFRICA-TWIX was voiced by international and regional organizations including the United Nations Office

to the information shared on the AFRICA-TWIX system. Users are also sharing news from open sources and thus the mailing list also serves as a central source of information on illegal wildlife trade, thereby saving considerable effort and time otherwise needed to keep officers up to date on the latest developments and news in the region.

Funding for the systems was provided by the German Polifund project, implemented by GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB); WWF France; and the US Fish and Wildlife Service.

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¹COMIFAC is the principal political and technical forum for guidance, co-ordination, harmonization and decision-making in the conservation and sustainable management of forest and savannah ecosystems in Central Africa. Created in 1999 by the Yaoundé Declaration, COMIFAC is composed of the Forestry Ministers of its 10 member countries and has an Executive Secretariat based in Yaoundé, Cameroon.



THE 17TH MEETING OF THE CONFERENCE OF THE PARTIES TO CITES

Johannesburg, South Africa,
24 September–4 October 2016

The seventeenth meeting of the Conference of the Parties (CoP17) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) took place in Johannesburg, South Africa, from 24 September to 4 October 2016. The following listing proposals submitted to the meeting and a summary of their outcomes are recorded below; an account of the meeting highlighting key discussions will feature in *TRAFFIC Bulletin* Vol. 29 No. 1 (April 2017).

OUTCOME OF LISTING PROPOSALS SUBMITTED TO CoP17.

Species	English common name	Proposal	Result
<i>Bison bison athabasca</i>	Wood Bison	Delete from Appendix II	Adopted
<i>Capra caucasica</i>	Western Tur	Inclusion in App II as amended	Adopted as amended
<i>Vicugna vicugna</i>	Vicuña	Amendment pops in App II	Adopted as amended
<i>Panthera leo</i>	Lion	Transfer App II to App I	Adopted as amended
<i>Puma concolor coryi</i> and <i>Pc. cougar</i>	Florida Puma Eastern Puma	Transfer App I to App II	Adopted
<i>Equus zebra zebra</i>	Cape Mountain Zebra	Transfer App I to App II	Adopted
<i>Ceratotherium simum simum</i>	Southern White Rhinoceros	To allow a limited trade	Rejected
<i>Manis crassicaudata</i> <i>M. culionensis</i> <i>M. javanica</i> <i>M. pentadactyla</i>	Indian Pangolin Philippine Pangolin Sunda Pangolin Chinese Pangolin	Transfer App II to App I " " "	Adopted
<i>Manis gigantea</i> <i>M. temminckii</i> <i>M. tetradactyla</i> <i>M. tricuspis</i>	Giant Pangolin Temminck's Ground Pangolin Long-tailed Pangolin White-bellied Pangolin	Transfer App II to App I " " "	Adopted
<i>Macaca sylvanus</i>	Barbary Macaque	Transfer App II to App I	Adopted
<i>Loxodonta africana</i>	African Elephant	All pops in App I (with transfer of Botswana, Namibia, South Africa, Zimbabwe pops)	Rejected
<i>Loxodonta africana</i>	African Elephant	Delete annotation Namibia pop.	Rejected
<i>Loxodonta africana</i>	African Elephant	Remove annotation Zimbabwe pop. to list in App II	Rejected
<i>Falco peregrinus</i>	Peregrine Falcon	Transfer App I to App II	Rejected
<i>Lichenostomus melanops cassidix</i>	Helmeted Honeyeater	Transfer App I to App II	Adopted
<i>Psittacus erithacus</i>	African Grey Parrot	Transfer App II to App I	Adopted
<i>Ninox novaeseelandiae undulata</i>	Norfolk Island Boobook Owl	Transfer App I to App II	Adopted
<i>Crocodylus acutus</i>	American Crocodile	Transfer Cispatá Bay and Sector Aledaño del Delta Estuarino del Río Sinú pop. App I to App II	Adopted

OUTCOME OF LISTING PROPOSALS SUBMITTED TO CoP17 ctd.

Species	English common name	Proposal	Result
<i>Crocodylus moreletii</i>	Morelet's crocodile	Delete Mexico pop. zero quota from App II	Adopted
<i>Crocodylus niloticus</i>	Nile Crocodile	Maintain Malagasy pop. with annot.	Withdrawn
<i>Crocodylus porosus</i>	Saltwater Crocodile	Transfer Malaysia pop. I to II with annots	Adopted
<i>Abronia anzuetoii</i>	Anzuetoii Arboreal	Inclusion in App I with annot.	Adopted as amended
<i>A. campbelli</i>	Campbell's Alligator Lizard	"	
<i>A. fimbriata</i>		"	
<i>A. frosti</i>	Frost's Arboreal Alligator Lizard	"	
<i>A. meledona</i>	Meledona Arboreal Alligator Lizard	"	
<i>A. aurita</i>	Cope's Arboreal Alligator Lizard	Inclusion in App II with annot.	
<i>A. gaiophantasma</i>	Brilliant Arboreal Alligator Lizard	"	
<i>A. montecristoi</i>	Monte Cristo Arboreal Alligator Lizard	"	
<i>A. salvadorensi</i>	Salvador Arboreal Alligator Lizard	"	
<i>A. vasconcelosii</i>	Bocourt's Arboreal alligator Lizard	"	
<i>Abronia</i> spp.	Alligator Lizards	Inclusion in App II	Adopted as amended
<i>Rhampholeon</i> spp. and <i>Rieppeleon</i> spp.	Pygmy Chameleons	Inclusion in App II	Adopted
<i>Cnemaspis psychedelica</i>	Psychedelic Rock Gecko	Inclusion in App I	Adopted
<i>Lygodactylus williamsi</i>	Turquoise Dwarf Gecko	Inclusion in App I	Adopted
<i>Paroedura masobe</i>	Masobe Gecko	Inclusion in App II	Adopted
Lanthanotidae spp.	Earless Monitor Lizard	Inclusion in App I	Amended—App II with zero quota
<i>Shinisaurus crocodilurus</i>	Chinese Crocodile Lizard	Transfer App II to App I	Adopted
<i>Atheris desaixi</i>	Ashe's Bush Viper	Inclusion in App II	Adopted
<i>Bitis worthingtoni</i>	Kenya Horned Viper	Inclusion in App II	Adopted
<i>Cyclanorbis elegans</i>	Nubian Flapshell Turtle	Inclusion in App II	Adopted
<i>C. senegalensis</i>	Senegal Flapshell Turtle	"	
<i>Cycloderma aubryi</i>	Aubry's Soft-shelled Turtle	"	
<i>C. frenatum</i>	Zambezi Flapshell Turtle	"	
<i>Trionyx triunguis</i>	Nile Soft-shelled Turtle	"	
<i>Rafetus euphraticus</i>	Soft-shelled Turtle	"	
<i>Dyscophus antongilii</i>	Tomato Frog	Transfer from App I to App II	Adopted
<i>Dyscophus guineti</i>	False Tomato Frog	Inclusion in App II	Adopted
<i>Dyscophus insularis</i>	Antsouhy Tomato Frog		
<i>Scaphiophryne boribory</i>	Burrowing Frog	Inclusion in Appendix II	Adopted
<i>S. marmorata</i>	Green Burrowing Frog	"	
<i>S. spinosa</i>	Burrowing frog	"	
<i>Telmatobius culeus</i>	Titicaca water frog	Inclusion in App I	Adopted
<i>Paramesotriton hongkongensis</i>	Hong Kong Warty Newt	Inclusion in App II	Adopted

OUTCOME OF LISTING PROPOSALS SUBMITTED TO CoP17 ctd.

Species	English common name	Proposal	Result
<i>Carcharhinus falciformis</i>	Silky Shark	Inclusion in App II	Adopted (12 months' delay)
<i>Alopias</i> spp.	Thresher Sharks	Inclusion in App II	Adopted (12 months' delay)
<i>Mobula</i> spp.	Devil Rays	Inclusion in App II	Adopted (6 months' delay)
<i>Potamotrygon motoro</i>	Ocellate River Stingray	Inclusion in App II	Withdrawn
<i>Pterapogon kauderni</i>	Banggai Cardinalfish	Inclusion in App II	Withdrawn
<i>Holacanthus clarionensis</i>	Clarion Angelfish	Inclusion in App II	Adopted
Nautilidae	Nautilus	Inclusion in App II	Adopted
<i>Polymita</i> spp.	Cuban Landsnails	Inclusion in App I	Adopted
<i>Beaucarnea</i> spp.	Ponytail Palm, Elephant-foot Tree	Inclusion in App II	Adopted
<i>Tillandsia mauryana</i>	Maury's Tillandsia	Delete from App II	Adopted
<i>Sclerocactus cloverae</i> <i>S. sileri</i> <i>S. spinosior</i> ssp. <i>blainei</i>	New Mexico Fishhook Cactus Siler's Fishhook Cactus Blaine's Fishhook Cactus	Transfer App II to App I	Adopted
<i>Dalbergia cochinchinensis</i>	Siamese Rosewood	Amend annotation	Adopted
<i>Dalbergia calderonii</i> <i>D. calycina</i> , <i>D. congestiflora</i> <i>D. cubilquitzensis</i> , <i>D. glomerata</i> <i>D. longepedunculata</i> , <i>D. luteola</i> <i>D. melanocardium</i> , <i>D. modesta</i> <i>D. palo-escrito</i> , <i>D. rhachiflexa</i> <i>D. ruddae</i> , <i>D. tucurensis</i>	Rosewood	Inclusion in App II	Adopted as amended
<i>Dalbergia</i> spp.	Rosewood, Palisander	Inclusion in App II except spp. in App I	Adopted as amended
<i>Guibourtia demeusei</i> <i>G. pellegriniana</i> ; <i>G. tessmannii</i>	Bubinga	Inclusion in App II	Adopted as amended
<i>Pterocarpus erinaceus</i>	Kosso, African Rosewood	Inclusion in App II without annot.	Adopted
<i>Adansonia grandidieri</i>	Baobab	Inclusion in App II with annot.	Adopted
<i>Abies numidica</i>	Algerian Fir	Inclusion in App I	Withdrawn
<i>Aquilaria</i> spp. <i>Gyrinops</i> spp.	Agarwood	Amendment of listings in App II	Adopted
<i>Siphonochilus aethiopicus</i>	Natal Ginger	Inclusion of Mozambique, South Africa, Swaziland and Zimbabwe pops in App II	Adopted
<i>Bulnesia sarmientoi</i>	Holy wood	Amendment of listing in App II	Adopted

China and Africa collaborating against illegal trade of fauna and flora

In a milestone move in early December 2015, Heads of States of 50 African countries and China collaborating under the Forum on China-Africa Cooperation (FOCAC) committed to bold action to protect wildlife resources and to address jointly illegal trade in fauna and flora. This collaborative pledge was addressed for the first time in the FOCAC Johannesburg Action Plan (2016–2018) (FOCAC, 2015) in reaction to previously unseen levels of poaching and wildlife trafficking and to the growing global recognition—including by the African Union (African Union, 2015)—of the impact of wildlife crime on broader issues such as rule of law, national security, rural livelihoods and economic development. The Johannesburg Action Plan was issued following the Second FOCAC Summit, which was preceded by the Sixth Ministerial Conference of FOCAC. During the FOCAC Summit, the Chinese government also issued “China’s second position paper on Africa” which specifically calls for a crack down on transnational organized crimes related to endangered wildlife trafficking (Xinhua, 2015).

Within the Johannesburg Action Plan, Africa and China committed to co-operate on biodiversity protection, including on sustainable forest management. It was further agreed that both sides will enhance co-operation in preventing and combating the illegal trade of fauna and flora products, including marine products. Furthermore, they agreed to strengthen co-operation in the area of wildlife protection, with China helping African countries to build the capacity of environmental rangers, provide African countries with training opportunities on conservation, explore and fight jointly against the illegal trade of fauna and flora products, especially addressing poaching of threatened species on the African continent, in particular elephants and rhinoceroses. Whilst the two sides also agreed on addressing the root causes of piracy, namely poverty, underdevelopment and illegal fishing, China will further encourage and support Chinese enterprises to implement co-operation projects focusing on, for example, forestry and fisheries. The two sides will explore the signing of criminal judicial assistance and extradition treaties and strengthen co-operation in the fields of combating and preventing transnational crimes, including corruption and the illegal trade in fauna, flora and associated products, while strengthening *inter alia* repatriation of illicit funds, asset recovery and law enforcement capacity building. The Seventh Ministerial Conference of FOCAC will be held in China in 2018.

African Ministers meeting in April 2016 in Cairo, Egypt, stepped up their commitment to fight against wildlife crime at the sixth special session of the African Ministerial Conference on the Environment (AMCEN) through adopting an implementation roadmap with an action-oriented matrix for the *African Strategy on Combating Illegal Exploitation and Illegal Trade in Wild Fauna and Flora in Africa* (TRAFFIC, 2016).

Since the FOCAC Summit, China has continued to address Africa-based members of its ethnic Chinese business communities through two consecutive workshops in Maputo, Mozambique, and Johannesburg, South Africa. Hosted by TRAFFIC and WWF, in collaboration with the Chinese government and supported by the governments of South Africa and Mozambique, awareness was raised among Chinese nationals working in the two African countries on regulations protecting wildlife and to help support international efforts to reduce the demand for products of threatened wildlife. The workshops were each attended by 70 Chinese nationals from State-owned enterprises, private businesses and local residences in Mozambique and South Africa. Representatives from China’s State Forestry Administration (SFA, the Chinese CITES Management Authority), China Customs and China’s National Forestry Police spoke about wildlife protection and management laws in China, CITES regulations and recent smuggling cases, in order to discourage local Chinese nationals from buying and carrying ivory and other endangered wildlife products to China from Africa. Both events were also supported by the Chinese embassies and the China International Contractors Association (CICA).

TRAFFIC is grateful to African governments, the African Union Commission and to the governments of China and Germany for supporting its work on Africa-China collaboration.

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The conservation status, legal protection and assessment of the trade in Straw-headed Bulbuls *Pycnonotus zeylanicus* in Singapore

INTRODUCTION

South-east Asia is regarded as one of the largest illegal wildlife trading centres in the world, with the trade of birds in the region considerable both in its diversity (an estimated 400 species) and volume (in the millions annually) (Nash, 1993; Koh *et al.*, 2013). Live bird markets in many countries in South-east Asia are huge in scale and value (Duckworth *et al.*, 2012; Koh *et al.*, 2013) largely as a result of the popularity of keeping songbirds and songbird singing contests in countries such as Thailand, Malaysia, Indonesia and Singapore (Nash, 1993; Jepson and Ladle, 2005; Shepherd, 2006; Kirichot *et al.*, 2014, Chng *et al.*, 2015). Additionally, rare and protected species may serve as a symbol of affluence, power or prestige (Lee, 2006). Bulbuls (Pycnonotidae) produce a broad range of complex and appealing vocalizations, making them amongst the most popular wild-caught birds for this trade (Kamtaeja *et al.*, 2012), with the Straw-headed Bulbul *Pycnonotus zeylanicus* the most sought after species in this family of birds on account of its renowned melodious song (Jepson and Ladle, 2005; Shepherd *et al.*, 2013).

Straw-headed Bulbuls are widely available in Indonesian bird markets, with many traders claiming that the birds originate from Sumatra and Kalimantan (Shepherd *et al.*, 2004; 2006; Chng *et al.*, 2015; Harris *et al.*, 2015; Chng and Eaton, 2016). Birds are chosen at a young age and “trained” for the purpose of competing (Kirichot *et al.*, 2014). In order to meet market demand, the species is being bred in some numbers by traders, leading to concern that the wild phenotype is being lost, as particular traits (e.g. singing ability, physical characteristics and cage adaptation) are deliberately selected in captive breeding (Collar *et al.*, 2012; Shepherd *et al.*, 2013).

Trapping for the songbird trade is the primary cause of the species’s decline (Shepherd *et al.*, 2001; Shepherd *et al.*, 2013). Formerly widespread across its range, the Straw-headed Bulbul is currently thought to be extinct in Thailand and Java (Fishpool and Tobias, 2005; Kamtaeja *et al.*, 2012), with no confirmed records in Sumatra since 2009 (Eaton *et al.*, 2015). Anecdotal reports from trappers and traders in Indonesia state that the now-rare birds were once relatively easy to obtain from the wild (Shepherd, 2006; Collar *et al.*, 2012). Its status in Brunei is unknown, but a small population persists in Kalimantan (Tan, 2001; Brickle *et al.*, 2010; Shepherd *et al.*, 2013). Likewise, the situation in Myanmar is poorly known. Populations remain in Malaysia and Singapore (Tan, 2001; Wells, 2007; Lim, 2009).

The species is infrequently seen in Malaysian bird shops. An active underground trade network for the species is suspected to occur in the country that warrants further investigation (Shepherd *et al.*, 2013). According

to Collar *et al.* (2012), the Straw-headed Bulbul is a species that merits great consideration for conservation action. This was echoed at the Songbird Trade Crisis Summit, held in Singapore in September 2015, where the species was identified by bird experts as one of the top 12 most threatened taxa (Lee and Chng, in prep.).

STATUS IN SINGAPORE

Although classified as Endangered in the Singapore Red Data Book (Davison *et al.*, 2008), Singapore is one of the few remaining strongholds for the species. It occurs in a range of habitats and is tolerant to human-altered landscapes. Several populations are known to occur across key sites. A recent study revealed that the population of Straw-headed Bulbuls on the offshore island of Pulau Ubin has nearly doubled in 10 years, with a growth rate of 3.7% per year (Yong *et al.*, in press). The mainland Singaporean population seems stable, with a conservative reported increase of 0.56% based on annual bird censuses of standard sites. The current population estimate for the whole of Singapore is a minimum of 202 individuals, or about 1–2% of BirdLife’s global estimate (Yong *et al.*, in press).

The Straw-headed Bulbul is protected under the national *Wild Animals and Birds Act 1965*, which prohibits the killing, trapping or offering for sale or export of any wild birds other than those specified in the Act. It is also listed on the First Schedule of Singapore’s *Endangered Species (Import and Export) Act*, which controls all import and export of specimens. The species is listed in CITES Appendix II and as Vulnerable under the IUCN (International Union for Conservation of Nature) Red List (BirdLife International, 2012). The Agri-Food and Veterinary Authority (AVA) is the national authority charged with the protection of fauna in Singapore and the issuing of licences to pet shops, farms and captive-breeding centres for the sale of birds, and was designated as the CITES Management and Scientific Authority when Singapore joined CITES in 1986 (Lee, 2006).

Despite its legal protection, the illegal sourcing and trade still occurs occasionally in Singapore. Lee (2006) reports on a number of native birds, including the Straw-headed Bulbul, which are threatened by poaching for the bird trade in Singapore. Anecdotal accounts of poaching of the species in Singapore include a report from 2006 recording an encounter with two poachers in the Mandai area (Bird Ecology Study Group, 2006). Such illegal activities purportedly led to the decline of birds in areas such as Choa Chu Kang and involved well-organized poaching efforts by a local bird trader. The species was also observed in 2010 at a pet shop in close proximity to one of the known wild breeding populations (D.L. Yong, *in litt.*, August 2016).

Little is known about the extent of the threat that trapping for the illegal trade in Singapore is imposing on natural wild populations (Shepherd *et al.*, 2013). It was thought that most of the trade is for export to neighbouring countries like Malaysia (Shepherd *et al.*, 2013). However, claims by local bird traders and enthusiasts indicate that Straw-headed Bulbuls are sporadically smuggled into Singapore from Malaysia, perhaps due to a preference for Malaysian birds that are larger and deemed to sing louder (Shepherd *et al.*, 2013).

As Singapore is one of the last remaining strongholds for this fast-declining species, this paper aims to consolidate information concerning the trade of Straw-headed Bulbuls in Singapore using observations of trade in pet shops and online, CITES trade and seizure records, and examine if this is a cause for conservation concern.

METHODS

Ad-hoc observations were opportunistically conducted at a number of bird shops across Singapore in 2015, targeting shops known to carry rare and high-value species including Straw-headed Bulbuls. Additionally, observations of Straw-headed Bulbuls as part of a wider inventory of all pet shops in Singapore selling birds (Eaton *et al.*, in prep.) were included. Records of birds observed for display in the pet shops were reported to AVA for investigation.

A search on the internet using the terms “Singapore”, “Straw-headed Bulbul”, “*barau-barau*” (the Malay name for the species), “sale” was carried out in July 2016 for examples of online trade in the species. Information on seizures of Straw-headed Bulbuls involving Singapore were searched from open sources such as news sites and AVA or Singapore Customs press releases, as well as enquiries made about any confiscated birds passed on to Jurong Bird Park (of Wildlife Reserves Singapore, the official holding centre for confiscated wildlife) and Animal Concerns Research and Education Society (ACRES), a local NGO that also functions as a wildlife rescue centre. CITES trade data records were obtained from the UNEP-WCMC CITES Trade Database.

RESULTS

Trade observations in Singapore

A total of eight birds from two shops were recorded over the course of four visits during ad-hoc observations of pet shops selling birds in Singapore; it was difficult to determine whether they were the same eight individuals.

Although recorded only in very small numbers for display in pet shops, it is suspected that much of this trade is underground, as is the case in Malaysia (Shepherd *et al.*, 2013).



D. BERGIN / TRAFFIC

There is a market for the species in Singapore, as evidenced by the availability of birds online, with the Malay name for the bird “*barau-barau*” often used. An internet search uncovered advertisements offering six Straw-headed Bulbuls posted in 2013 and 2015 on Adpost.sg, for between SGD350 (USD250) and SGD1500 (USD1100). One advertisement suggested that a pair offered was wild-caught, while another said that the bird advertised was “tamed”. There appears to be some level of awareness of the value and illegality of this trade, with hobbyists on a forum taking the conversation to private messages.

Date (2015)	7 Feb	22 Feb	Jun	5 Nov*
No. of individuals	3	2	2	1
No. of shops	2	2	1	1

Table 1. The number of Straw-headed Bulbuls observed for sale in shops in Singapore in 2015.

*This observation was part of a wider inventory of pet shops selling birds in Singapore and the only Straw-headed Bulbul record (Eaton *et al.*, in prep.).

< STRAW-HEADED BULBULS AT A MARKET IN PUTUSSIBAU, WEST KALIMANTAN, INDONESIA.

The quality of its song makes the Straw-headed Bulbul a very popular cage-bird, which has resulted in extensive trapping for both domestic and international trade. It was widespread, common, and even locally abundant across much of its range until as recently as two decades ago. Persecution for the pet trade and habitat destruction continue to threaten populations across the species's range, and these factors are suspected to be driving a rapid and ongoing decline.

Source: BirdLife International (2016)

DISCUSSION

Although Lee (2006) did not find any Straw-headed Bulbuls in pet shop surveys between August 2005 and January 2006, small numbers have subsequently been recorded in pet shops and offered online. The prices offered for these individuals are comparable to those in Indonesia (a median of USD564 from 2014 and 2015 surveys; Bergin *et al.*, in prep.), suggesting a similar level of demand from specialist hobbyists.

There are three possible sources for Straw-headed Bulbuls traded in Singapore: they are the same individuals that were legally imported into the country before 2000; they were smuggled in from neighbouring countries; or they were poached from Singaporean wild populations. If the birds recorded for sale are indeed the same CITES-recorded individuals, they would be at least 16 years old. The average lifespan of a mid-sized passerine such as a Straw-headed Bulbul is up to approximately 20 years (J.A. Eaton, pers. comm., August 2016), meaning that all the legally imported individuals are “old” birds. As a number of the online advertisements were offering young birds, these birds must have been sourced from illegal means.

Although there was a lack of available seizure data for the species involving Singapore, it does not discount the fact that birds may have been smuggled into Singapore for sale. Singapore serves as an important trans-shipment junction for global bird exports, as well as a consumer nation in the bird trade (Nash, 1993; Shepherd *et al.*, 2001; Poole and Shepherd, 2016). Internationally, it is suspected that CITES-reported imports and exports of this species insufficiently reflect the actual scale of trade and it was proposed as a candidate species for the Review of Significant Trade in Specimens of Appendix-II Species in 2004 (TRAFFIC-IUCN, 2004).

The third possibility of local populations being illegally trapped is perhaps the most concerning given the relatively small size of the global stronghold Singaporean population and how accessible the known habitats are. Estimates of populations in Singapore are the most robust of anywhere in the species's wild distribution (Yong *et al.*, in press). Population estimates outside Singapore are highly uncertain, with Peninsular Malaysia populations disappearing from several previously known areas (C.R. Shepherd, pers. obs., August 2016; J.A. Eaton, *in litt.*, August 2016). Furthermore, given that the species is known to be extinct in over half of its previous areas of distribution, the Singapore population is of significant

Seizures

To date, there have been no publicly available records of animal rescues or confiscations from Jurong Bird Park or ACRES.

CITES trade records

According to the CITES Trade Database, the only reported imports of Straw-headed Bulbuls into Singapore were from Malaysia, and took place only in 1997 to 2000, involving a total of 107 importer-reported wild-caught individuals for commercial trade (Table 2).

Year	Importer	Exporter	Origin	Importer reported quantity	Exporter reported quantity	Term	Purpose	Source
1997	Singapore	Malaysia			10	live	trade	wild
1998	Singapore	Malaysia		12		live	trade	wild
1999	Singapore	Malaysia		80	80	live	trade	wild
1999	Netherlands	Singapore	Malaysia		50	live	trade	wild
2000	Singapore	Malaysia		15	15	live	trade	wild

Table 2. All reported trade of Straw-headed Bulbuls involving Singapore between 1986 and 2015.

Source: UNEP-WCMC CITES Trade Database.

global conservation importance. Therefore, even relatively low levels of collection from Singaporean populations for trade could jeopardize the survival of this species globally. On the other hand, given the small area and relative ease of vigilance to counter poaching, this is one problem where a solution could be implemented quickly and effectively. As such, this species should be a high priority for conservation efforts in Singapore and every endeavour made to address any illegal trade.

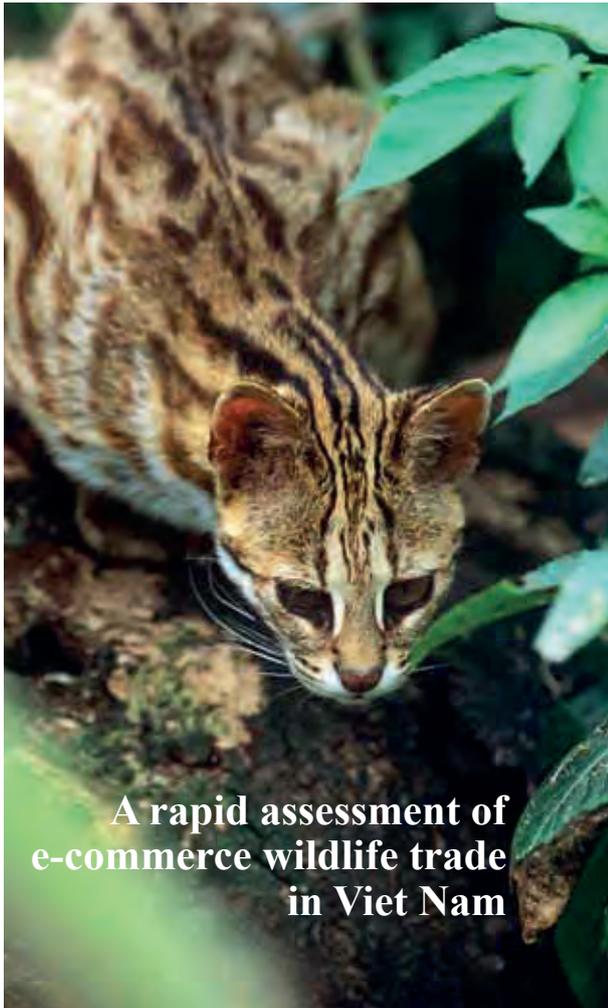
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A rapid assessment of e-commerce wildlife trade in Viet Nam

DAVID LAWSON / WWF-UK

INTRODUCTION

Online trade through e-commerce websites is increasing in Viet Nam with a market value estimated to reach USD7.5 billion by 2019 (Vietnamnet, 2016). TRAFFIC's research shows that these online market places, and social media such as Facebook in Malaysia (Krishnasamy and Stoner, 2016) and e-commerce sites in China (Yu and Jia, 2015; Stoner, 2014) are commonly used to sell and purchase wildlife illegally.

It is difficult to determine the impact of online trade on threatened species listed in CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) (Sajeva *et al.*, 2013). Therefore, at the sixteenth meeting of the Conference of the Parties (CoP16) to CITES, Decisions 15.57 and 16.62 were adopted. Under these Decisions the Parties are urged to assess and publish the extent and trends of CITES-listed species in e-commerce and social media trade.

This rapid assessment of the illegal sales of wildlife through e-commerce channels provides insights into the online trade of species protected by the Vietnamese wildlife protection law Decree 160 (2013), and those covered by CITES. It also provides actionable information for Vietnamese law enforcement agencies. However, as the regulatory framework is weak and law enforcement ineffective, other strategic approaches and partnerships

◀ Leopard Cat *Prionailurus bengalensis*

are required to strengthen efforts to combat illegal online wildlife trade in Viet Nam. An example of such a partnership is the co-operative agreement TRAFFIC signed with the Vietnam E-commerce Association (VECOM) in April 2016. VECOM and TRAFFIC are working together to reduce wildlife (cyber) crime in Viet Nam by implementing a range of interventions, which will make it harder to sell and buy threatened wildlife on the Vietnamese e-commerce sites.

METHODOLOGY

Eight e-commerce websites were surveyed for 30 minutes a day over a 23-day period (total of 11.5 hours) on regular working days (Monday to Friday) during June 2016. The keywords used are outlined in Table 1. These websites were selected from the VECITA list (Vietnam E-commerce and Information Technology Agency, a body that evaluates and reports on the economic status of the e-commerce trade and websites in Viet Nam) (VECITA, 2015) on the basis of best performing sites (i.e. generating the highest revenue through sales). Though not on the VECITA list, 5giay.vn was added because an earlier survey found 11 rhinoceros horn advertisements on this website (TRAFFIC, unpublished data).

English	Vietnamese
rhino	tê giác
rhino horn	sừng tê giác, sừng tê, sừng
elephant	voi
elephant ivory	ngà voi, ngà
otter	rái cá
leopard cat	mèo rừng
langur	voọc
gibbon	vượn
pangolin	tê tê
pangolin scale	vảy tê tê, vảy
bird	chim, chim cảnh

Table 1. The list of Vietnamese keywords used for the search on e-commerce websites.

RESULTS

During the course of the rapid assessment, 180 advertisements were found to be offering 10 different types of wildlife commodities (Table 2). The majority of advertisements—74%—offered live birds, which were likely traded as pets. The second highest percentage of advertisements, at 16%, was devoted to the sale of ivory products. There was one advertisement for rhinoceros horn and one for an Elongated Tortoise *Indotestudo elongata*. A total of eight Leopard Cats *Prionailurus bengalensis*—three live and five stuffed specimens—were also advertised, as well as eight elephant tails.

Wildlife advertisements were found on five out of eight e-commerce sites. These five sites are all VECOM members.

Class	Species commodity advertised	CITES Appendix
Bird	Live specimen (see Table 4 for the species list)	See Table 4
	Meat <i>Phasianus</i> spp.	
	Egg <i>Phasianus</i> spp.	
	Whole stuffed specimen (unknown species)	
Mammal	Ivory (pieces, jewellery, trinkets) Elephantidae	CITES I or II
	Stuffed and mounted Leopard Cat <i>Prionailurus bengalensis</i>	CITES I or II
	Elephant tail Elephantidae	CITES I or II
	Live Leopard Cat <i>Prionailurus bengalensis</i>	CITES I or II
	Rhinoceros horn Rhinocerotidae	CITES I or II
Reptile	Elongated Tortoise <i>Indotestudo elongata</i>	CITES II

Table 2. Wildlife commodities offered for sale on e-commerce websites.

The species of elephant and rhinoceros for associated items was not specified.



It is noteworthy that the largest number of advertisements for wildlife commodities were found on 5giay.vn (Table 3).

A total of 62% of advertisements were offering CITES I, II, or III Appendix-listed species, and/or species protected under the Vietnamese wildlife protection law, Decree 160 (2013), or regulated by Circular 47 (2012). Although there was no attempt made to determine whether any of the sellers had appropriate permits, previous experience has indicated this is unlikely to be the case, thus any sales are likely to be illegal.

Of the 180 advertisements, 15 referred to the provenance of the specimen (captive bred or wild caught) of which eight reported the commodity to be from the wild (all birds apart from one live Leopard Cat); the other seven were referred to as captive bred. None of the eight advertisements for wild-caught species provided the specific locations of where specimens had been obtained. It is not illegal to capture birds in the wild and trade these in Viet Nam, unless they fall under Decree 160 (2013). However, the Leopard Cat is protected under Decree 160 and therefore was likely illegally obtained and traded.

Name of websites	No. of advertisements	Species of the commodities advertised
5giay.vn	98	birds, elephant, Leopard Cat, rhinoceros
Enbac.com	51	birds, Elongated Tortoise
Rongbay.com	27	birds, elephant
Vatgia.com	3	elephant
Sendo.vn	1	elephant
Adayroi.com	0	n/a
Chodientu.vn	0	n/a
Lazada.vn	0	n/a
Total	180	

Table 3. E-commerce websites and the number of advertisements and species of the commodities advertised on these websites.

Some 38% of advertisements offered non-native or exotic species. For example, large numbers of (assumed) commercially bred non-native Island Canaries *Serinus canaria*, Saffron Finches *Sicalis flaveola*, and Budgerigars *Melopsittacus undulatus* were advertised. Some advertisements offered the Seychelles Magpie-robin *Copsychus sechellarum*, however it is questionable that the sellers are providing the correct identification. The videos and photographs accompanying advertisements suggest that these were in fact Pied Bushchats *Saxicola caprata*, which are native to Viet Nam. There is no evidence that the Seychelles Magpie-robin is available in Viet Nam; it has not been seen at physical bird markets and there is no mention of captive breeding of this species on bird fora in the country. It is possible that sellers are marketing Pied Bushchats as the more exotic and rare Seychelles Magpie-robin in order to fetch higher prices.

The Red-whiskered Bulbul *Pycnonotus jocosus* and Oriental Magpie-robin *Copsychus saularis* were advertised in large numbers: both are native, although neither is endemic and these species are assumed wild caught. They do not fall under any environmental protection or commercial breeding legal frameworks. This kind of unregulated and uncontrolled overexploitation of native species can threaten the viability of the wild populations of these species (Harris *et al.*, 2015). Furthermore the unregulated trade in non-native and native species also increases the risk for transmission of zoonosis such as avian influenza (Edmunds *et al.*, 2011).

CONCLUSIONS

Not all trade in wildlife species and products on e-commerce websites is illegal under the current legislative framework in Viet Nam. However, this rapid assessment found 62% of wildlife advertisements on these sites potentially offering commodities illegally. Vietnamese e-commerce websites appear to be a low risk channel to supply consumers with illicit wildlife commodities. It is important, given the growth of e-commerce trade in Viet Nam, that this wildlife supply

Scientific Name	Common name	CITES Appendix/ IUCN*
<i>Accipiter badius</i>	Shikra	II
<i>Acridotheres tristis</i>	Common Myna	
<i>Aix galericulata</i>	Mandarin Duck	
<i>Forpus</i> spp.	Parrotlet	
<i>Chrysolophus pictus</i>	Golden Pheasant	
<i>Copsychus malabaricus</i> ¹	White-rumped Shama	
<i>Copsychus saularis</i>	Oriental Magpie-robin	
<i>Copsychus sechellarum</i>	Seychelles Magpie-robin	Endangered
<i>Elanus axillaris</i>	Black-shouldered Kite	II
<i>Erythrura gouldiae</i>	Gouldian Finch	
<i>Garrulax canorus</i>	Chinese Hwamei	II
<i>Garrulax chinensis</i>	Black-throated Laughingthrush	
<i>Gracula religiosa</i>	Hill Myna	II
<i>Sturnus nigricollis</i>	Black-collared Starling	
<i>Leiothrix argentea</i>	Silver-eared Mesia	II
<i>Melopsittacus undulatus</i>	Budgerigar	
<i>Neochmia ruficauda</i>	Star Finch	
<i>Paradisaea rubra</i>	Red Bird-of-paradise	II
<i>Pavo cristatus</i>	Indian Peafowl	III
<i>Pavo muticus</i> ¹	Green Peafowl	II / Endangered
<i>Pellorneum albiventris</i>	Spot-throated Babbler	
<i>Phasianus colchicus</i> ²	Common Pheasant	
<i>Phasianus versicolor</i>	Green Pheasant	
<i>Poephila acuticauda</i>	Long-tailed Finch	
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	
<i>Serinus canaria</i>	Island Canary	
<i>Sicalis flaveola</i>	Saffron Finch	
<i>Spilopelia chinensis</i>	Eastern Spotted Dove	
<i>Spilornis cheela</i> ¹	Crested Serpent-eagle	II
<i>Stachyris herberti</i>	Sooty Babbler	
<i>Stagonopleura guttata</i>	Diamond Firetail	
<i>Taeniopygia bichenovii</i>	Double-barred Finch	
<i>Taeniopygia guttata</i>	Zebra Finch	
<i>Zosterops lateralis</i>	Silvereye	

Table 4. List of advertised bird species (in alphabetical order) on the surveyed e-commerce websites.

*IUCN Red List of Threatened Species ¹listed in Decree 160/2013/ND-CP Criteria for identification and management of endangered, rare and precious species, prioritized for protection; ²listed in Circular 47/2012/TT-BNNPTNT Regulating the Management of wild exploitation and Farming of common wild animals.

channel is closely monitored and any illegal activity reported to authorities for law enforcement action.

TRAFFIC's partnership with VECOM provides tangible opportunities to weaken the trade chains in wildlife illegally traded on e-commerce websites. In 2015, TRAFFIC alerted the moderators of 5giay.vn to 15 illegal advertisements for rhinoceros horn on its site. The website has since been moderated and only one illegal posting for rhinoceros horn was found during this assessment. This website however seems to be one of the most popular for traders and consumers in other illegal wildlife commodities.

In partnership with TRAFFIC, VECOM is increasing the barriers to trade wildlife illegally on e-commerce websites, consequently limiting the supply of illicit wildlife commodities to consumers. The outcomes of this rapid assessment prompted VECOM to develop a system for e-commerce websites—including 5giay.vn—to moderate advertisements for illegal wildlife commodities.

In countries such as Viet Nam, where regulatory frameworks are weak and law enforcement ineffective, strategic partnerships with civil society organizations (CSOs) like VECOM are critical to combat illegal wildlife trade.

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DNA analysis of wildlife is unquestionably providing valuable insights into ecology, evolution and conservation (Frankham *et al.*, 2009) but is the technique being used effectively for international wildlife law enforcement as a wildlife forensic tool? At the seventeenth meeting of the Conference of the Parties to CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) (CoP17) dedicated wildlife forensic events and discussion featured prominently in subjects as diverse as synthetic fabrication of rhinoceros horn to monitoring the trade in timber. With all this attention on the emerging discipline of wildlife forensics—which can be subject to divergent interpretations by the international community—it is important to evaluate the current landscape and challenges when applying wildlife forensics for various purposes.



TRACE WFN

OUT OF SEQUENCE: is wildlife DNA forensics delivering as an illegal trade enforcement tool?

The discipline of wildlife forensics focuses on using scientific techniques to help address illegality in relation to national laws or international wildlife conventions. Although many different scientific techniques help address aspects of wildlife crime, DNA analysis is by far the most commonly used technique owing to its ability to resolve most of the important common questions; the generic accessibility of the technique through established academic or government laboratories, and the prior legal precedent for accepting DNA evidence in courts.

“Forensics” as defined, relates solely to the application of a scientific technique to a legal case. Commonly, scientists working in the wildlife field are generally applying this discipline in three different, but not mutually exclusive areas, either directly in casework; or indirectly in traceability and intelligence gathering.

“Casework” is the use of DNA analysis to address a specific question relating to a criminal investigation or “case”. As this area of work is supporting, or refuting, a legal matter, it therefore requires the highest degree of assurance

that any DNA analysis is fit for legal purpose and that the interpretation of any result is measured and fairly presented for the benefit of the court. Similar to human DNA forensics, wildlife DNA forensic evidence can result in a criminal conviction and a loss of liberty and therefore the process is not to be undertaken lightly or with pretence that wildlife crime requires less stringency in the production of data or scrutiny of those data.



DNP THAILAND

Wildlife DNA forensics as a casework tool commonly goes underreported in the media as the DNA analysis tends to be a component of a larger evidence base for a wildlife prosecution, which is often lost in media reporting and typically the time period between analysis and any judgement often means the laboratories undertaking the work are themselves unsure of the outcome and too busy to self promote, despite the benefits of quantifying the use and success of DNA testing in this field.

The most frequently used DNA test for casework addresses questions of the identification of a species when the normal morphological characters are absent. Only by first categorically identifying the species of a wildlife specimen can enforcement action based on the legal status of that species and/or its trade be initiated. As DNA analysis for protected species identification has been technically feasible for some time (e.g. Baker and Palumbi, 1996), it does not attract large amounts of research or international collaborative interest, despite a continued need for this, and when this does occur, it is often well intentioned but with limited utility. However, at a forensic rhinoceros DNA workshop, held in July 2016 in South Africa (TRAFFIC, 2016), where discussions were focused around testing the benefits of the individualization of rhinoceros, it was the absence of a standardized DNA species identification test for rhinoceros that was identified as the most immediate and useful casework requirement from an international perspective. Similarly, various research groups are working on methods to identify the geographical provenance of illegally traded species. Although this information is important, the most pressing enforcement tool from a casework perspective may simply be the ability to identify the species from the parts or derivatives in trade. The pangolin trade is a useful example of where the immediate casework requirement is a species DNA test to identify robustly all pangolin species from scales, something currently hampered by a lack of suitable and trustworthy reference DNA data. The rush to tackle more academically interesting research orientated projects such as pangolin geographical origin, often shows a disconnect between the immediate requirements of law enforcement and the well meaning direction of academic researchers.

“Intelligence” or information-gathering from DNA testing of wildlife products is the most commonly reported area of wildlife forensics as it can produce results in a manner and timeframe suitable for enforcement action, and media attention without any issues around the *sub judice* of reporting casework. The aim is to provide information to direct enforcement investigations or inform policy in relation to illegal trade of wildlife.

The most comprehensive system for gathering information on illegal wildlife trade is the geographical provenance DNA testing of African Elephant *Loxodonta africana* ivory developed by Professor Sam Wasser at

the University of Washington (Wasser *et al.*, 2004). At the direction of CITES, ivory seizures greater than 500 kg are required to be geographically sourced (CoP16 Decision 16.83) and although other methods to establish this exist (Ziegler *et al.*, 2012), generally sub samples from large seizures are physically transferred to the USA, and the DNA tested to identify its likely African country of origin. As DNA data for this purpose are not intended for prosecutions, the data can be interrogated in a more general way to identify trends.

However, to be effective as an enforcement tool, intelligence about wildlife trade or illegality in the wildlife trade needs to be current to initiate a meaningful counter response or a subsequent criminal investigation. The testing of DNA to establish the provenance of African ivory has resulted in useful high profile research publications (e.g. Wasser *et al.*, 2007; Wasser *et al.*, 2015) and policy discussion, but perhaps future developments should centre around expanding the technical capacity to undertake this DNA testing in transit/consumer countries, therefore ensuring results are generated in a timescale suitable for interventions at the earliest opportunity to support enforcement and prosecution, as urged by CITES (Resolution Conf. 10.10 (Rev. CoP16)).

Similarly, the Rhino DNA Index System (or RhODIS) DNA database system (Harper *et al.*, 2013) used to individually identify Black and White Rhinoceroses *Diceros bicornis* and *Ceratotherium simum* in Africa also has a function in providing information on trade routes for rhinoceros horn, in addition to its core focus of providing evidence for national casework in South Africa linking seized rhinoceros horn with poached rhinoceros carcasses. Again, DNA samples from seizures in transit/consumer countries are requested, and urged by CITES (Doc. 54.2, CoP16), to be analysed in South Africa. However, the international transfer of rhinoceros horn samples back to South Africa for the RhODIS system to be used to its full potential has not been well co-ordinated to date, with considerable time lags experienced and delays in reporting, and also a lack of enforcement agencies identified to interrogate the data from an international perspective to justify the exercise meaningfully.

The third area for wildlife DNA forensics is the use of DNA testing for the “traceability” of illegality associated with wildlife or derived products, such as DNA registration schemes of wildlife or wildlife products. This area is probably the most underused but arguably the most useful, wildlife DNA forensics technique. The ability to demonstrate legal, and illegal, trade of wildlife products such as ivory, rhinoceros horn, Tiger derivatives or captive-bred animals using DNA tests to monitor or register large populations has generally been deemed too financially expensive to initiate. However, advances in DNA profiling technology now makes such DNA registration and monitoring schemes affordable and deliverable and therefore of great utility in addressing trade issues. Recent examples of this kind of system are the DNA registration scheme on trial by Thailand’s Department of National Parks for domestic elephants, with the aim of ensuring wild elephants are not laundered into the legal trade for domestic elephants, and the DNA registration schemes being tested for captive Tigers in

◀▲ **Wildlife DNA forensic capacity building in Gabon** (top, left); **Malaysia’s National Wildlife Forensic Laboratory developing Tiger identification techniques** (top, right).

◀ **Collaborating on ivory DNA identification in Thailand.**

both Malaysia and Thailand to prevent the laundering of Tigers or their parts into the illegal trade. Both of these projects were driven by enforcement needs identified by TRAFFIC (Nijman, 2014) and CITES (SC66 44.2) respectively. This needs-based approach is key to delivering tangible results from wildlife DNA forensics testing. The current approach however, seems to involve academic researchers developing, or being encouraged to develop new techniques (<https://wildlifecrimetech.org/>), with a greater emphasis needed to understand the intricacies and limitations of wildlife crime investigation and legal reporting.

In order to develop DNA testing into the wildlife forensic technique it should be, networks of like-minded individuals need to be created and should comprise: the non-governmental organizations (NGOs), enforcement officers and prosecutors identifying the drivers for developing new DNA tests, the academic researchers developing these new tools and technologies based on the needs, and the scientists tasked with undertaking forensic DNA testing ensuring the tests are run within their identified limits and reported without bias in a neutral evidential way. There are membership organizations such as the Society for Wildlife Forensic Science and International Society of Forensic Genetics with a remit to promote such networks. Historically these organizations predominantly comprised scientists from developed countries, but more concerted efforts have been made to include members from emerging laboratories in Africa and Asia in recent years.

As part of a joint initiative between the USAID-funded Wildlife TRAPS (Wildlife Trafficking, Response, Assessment and Priority Setting) project, implemented by TRAFFIC, and the UK Government-funded TRACE Wildlife Forensics Network organization, a process of engaging scientists in key developing countries from range, transit and consumer countries with an interest in this field has begun. The recent RhODIS Scientific Workshop funded by the USAID Wildlife TRAPS Project and WWF, in partnership with the University of Pretoria Veterinary Genetics Lab (VGL) and TRACE Wildlife Forensics Network in South Africa, epitomises this approach, bringing together key scientists and enforcement officers from across the world to identify fully the wildlife enforcement issues and challenges

and develop a range of DNA testing outputs to address shortfalls in the current suite of tools. Only this needs-based, collaborative approach will fully develop the field of wildlife DNA forensics into an applied and useful enforcement tool to disrupt the illegal trade in wildlife products and prosecute those involved.

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TRACE WFN

Advances in DNA profiling technology allow for DNA registration schemes to be tested for captive Tigers.

IUCN 13th International Otter Congress: An update of relevance to wildlife trade

Wild otter populations in Asia are in trouble due to increasing loss and degradation of their wetland habitat and to human-otter conflicts over aquatic species targeted for food. A further, significant threat to their survival is the black market demand for their skins and increasingly as exotic pets. This threat has only recently come to light after quantities of otter skins were discovered in trade during an investigation into the illegal big cat skin trade in China in 2006 (Banks *et al.*, 2006).

Whilst plenty of past work has helped to gain an understanding of the dynamics of trade in otter skins in the northern hemisphere (Foster-Turley and Santiapillai, 1990), very little effort has been made to understand and tackle the illegal trade in otters in Asia, largely due to ignorance of the situation and an overall lack of concern for low-profile species.

In light of this rising threat to otter populations, otter specialists and experts met in Singapore in July 2016 for the IUCN 13th International Otter Congress to discuss—amongst other conservation issues—ways to mitigate the threat of illegal trade. The Congress was organized by the International Union for Conservation of Nature Species Survival Commission (IUCN-SSC) Otter Specialist Group (OSG), and hosted at the Singapore Zoo by Wildlife Reserves Singapore (WRS). The event brought together over 100 researchers, specialists, biologists, conservationists, students, members of the OSG, and others from over 20 countries to discuss the status of otters in Asia and their conservation needs.

TRAFFIC facilitated and presented during the trade segment of the Congress, highlighting the scale of illegal wildlife trade in South-east Asia and, more specifically, the illegal trade in selected Asian otter species. This was based on a report jointly undertaken by TRAFFIC and the OSG, *Illegal Otter Trade: An Analysis of Seizures in Selected Asian Countries (1980–2015)* (Gomez *et al.*, 2016), which was launched at the Congress. The study was initiated to raise the profile of four Asian otter species encountered in trade i.e. the Eurasian Otter *Lutra lutra* (listed as Near Threatened on the *IUCN Red List of Threatened Species*), Hairy-nosed Otter *Lutra sumatrana* (Endangered), Small-clawed Otter *Aonyx cinereus* (Vulnerable), and the Smooth-coated Otter *Lutrogale perspicillata* (Vulnerable).

All four species assessed in the study were encountered in illegal trade, with 161 recorded otter seizures across 15 countries in Asia between 1980 and 2015 involving an estimated 5881 individuals. The majority of the seizures were of otter skins, particularly in India, Nepal and China. Judging by the large numbers of skins recorded in some seizures, it is likely to be taking a toll on wild otter populations. This trade seems mostly to involve the Eurasian Otter and Smooth-coated Otter, although it must be noted that in general a large number of seized skins were not identified to species level owing to the difficulty of distinguishing between the skins of the different species. While the seizures of otter skins has increased over the years in terms of frequency, the quantities seized have decreased. This could be attributed to an increase in undetected trade, or more worryingly, to declining otter populations.

Another new finding is a rising demand for otter pups for the pet trade. In countries like Indonesia, Malaysia, Thailand and Viet Nam, otters are hunted to supply a growing pet trade that appears to be mostly domestic, in which the Small-clawed Otter and the Smooth-coated Otter are evidently popular. The emerging trend of otters being used as pets is further hinted at

through preliminary scans of social media websites and trade fora, in which a flourishing online pet trade has been discovered (e.g. in Indonesia and Viet Nam), in addition to an increasing number of seizures involving live individuals since the early 2000s.

The Hairy-nosed Otter was by far the least encountered species in this study, with only six individuals seized between 2002 and 2008 in five separate incidents. All the seizures of this species, three of which involved skins and three of which involved live individuals, occurred in Cambodia. Considering that this species is already under severe pressure, any level of trade is likely to pose a significant risk to its survival.

The report, while providing a preliminary understanding of the issues endangering otter populations in selected parts of Asia, also highlighted significant gaps that need to be addressed in order to mitigate these threats. First, the true extent of the trade remains unknown due to its inherently covert nature, and the estimates in the report are likely to under-represent the magnitude of the trade. Second, little is known about the status of the four Asian species—uncertainty on population sizes, reproduction rates and in some cases distribution makes it difficult to determine each species's resilience in the face of exploitation. Third, in most seizure case studies, otters were not identified to species level, a factor that clearly poses an obstacle to estimating the impacts of the trade on otters at the species level, further complicating the task of prioritizing species of concern for conservation action.

TRAFFIC, in partnership with the OSG, hopes to address these trade-related gaps and aims to contribute to improved otter conservation. Participants at the Congress were urged to start publishing observations on trade, or to report incidents of trade to TRAFFIC, using tools like TRAFFIC's Wildlife Witness App¹. Reports can then be analysed and used to support law enforcement efforts as well as further our understanding of the trade dynamics that are threatening otter species in Asia.

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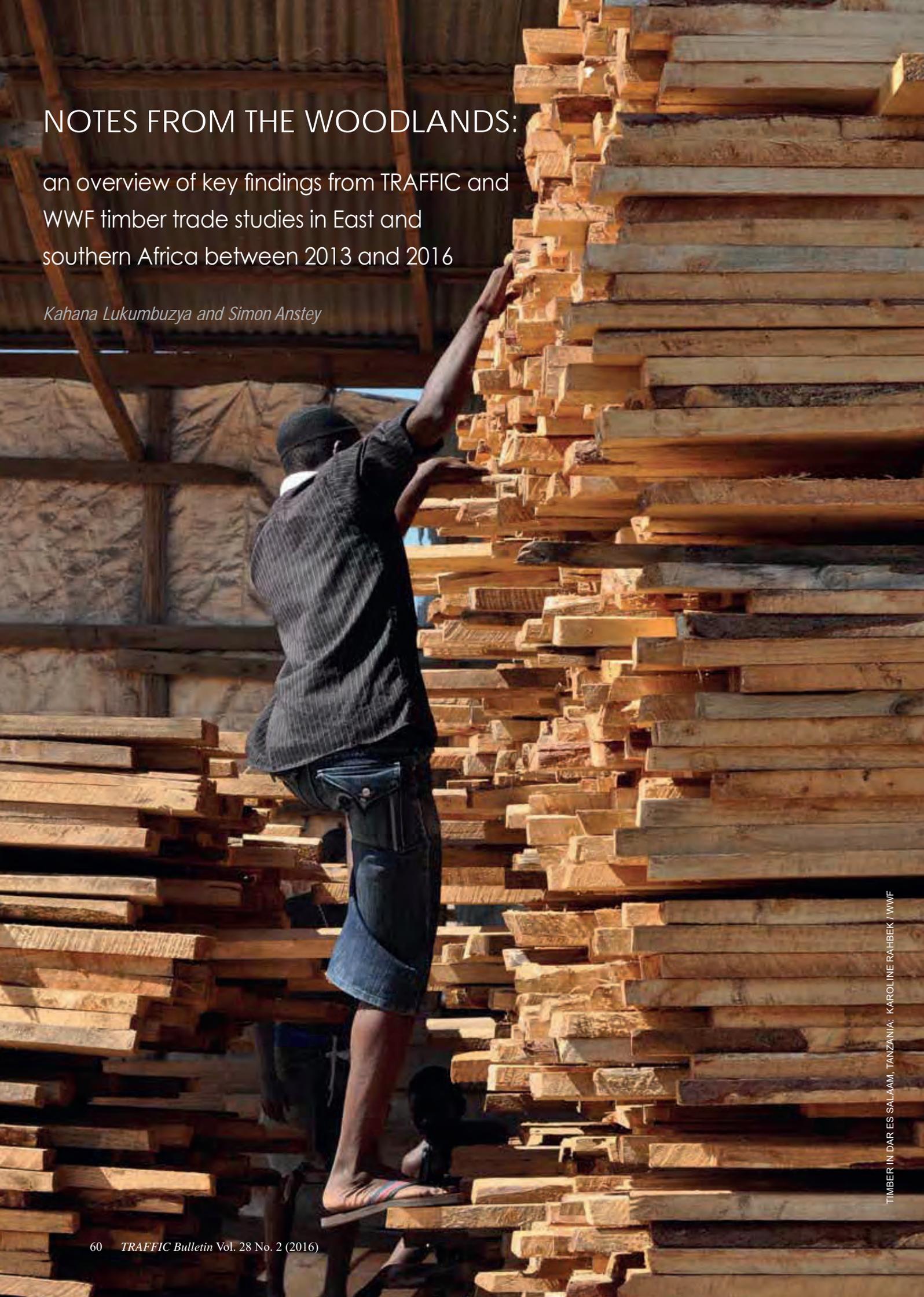
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¹The "Wildlife Witness" App, developed by the Taronga Conservation Society Australia, in partnership with TRAFFIC, enables users to report suspected illegal-trade in wildlife in South-east Asia easily and quickly by taking a photo, pinning the exact location of an incident and sending these details to TRAFFIC. Wildlife Witness is free to download at <https://itunes.apple.com/us/app/wildlife-witness/id738897823?mt=8>

NOTES FROM THE WOODLANDS:

an overview of key findings from TRAFFIC and
WWF timber trade studies in East and
southern Africa between 2013 and 2016

Kahana Lukumbuzya and Simon Anstey



INTRODUCTION

Over the past three to four years there has been a growing number of studies on timber trade dynamics in East and southern Africa, covering the Democratic Republic of Congo (DRC), Kenya, Mozambique, Tanzania, Uganda and Zambia. TRAFFIC and WWF have led several of these with the aim of providing information to advise action by policy- and decision-makers and key stakeholders. These studies (see Fig. 1) share significant lessons to be learnt across the region, as well as between countries sharing similar profiles with respect to their roles in the trade of timber.

Since 2012, intra-regional trade in natural forest timber and in softwoods from plantations, as well as domestic timber consumption, has been increasing and in some cases is now exceeding exports. Governments have entered into bilateral Memoranda of Understandings (MOUs) and regional declarations or protocols to increase opportunities for applied actions and to enable a sustainable timber trade by regional and national actors.

This paper presents an overview of the findings and trends identified during the course of these studies (e.g. Chenga and Mgaza, 2016; Lukumbuzya and Sianga, 2016a,b), using data from forestry services, Customs and revenue authorities in the region and the United Nations Commodity Trade Statistics Database (UN Comtrade), and at fora organized by TRAFFIC and WWF since 2013 (Davie and Sulle, 2013; Masuka *et al.*, 2015; Revenaz, 2016). This work forms part of TRAFFIC's strategy to tackle illegal timber trade in Africa (e.g. Anon., 2015a,b).

The usefulness of these data is nevertheless limited by the unreliability of export data from the Customs departments in the region. In such cases, discrepancy analyses using various data sources, e.g. UN Comtrade, while not perfect, are required, especially for import data from countries in the region.

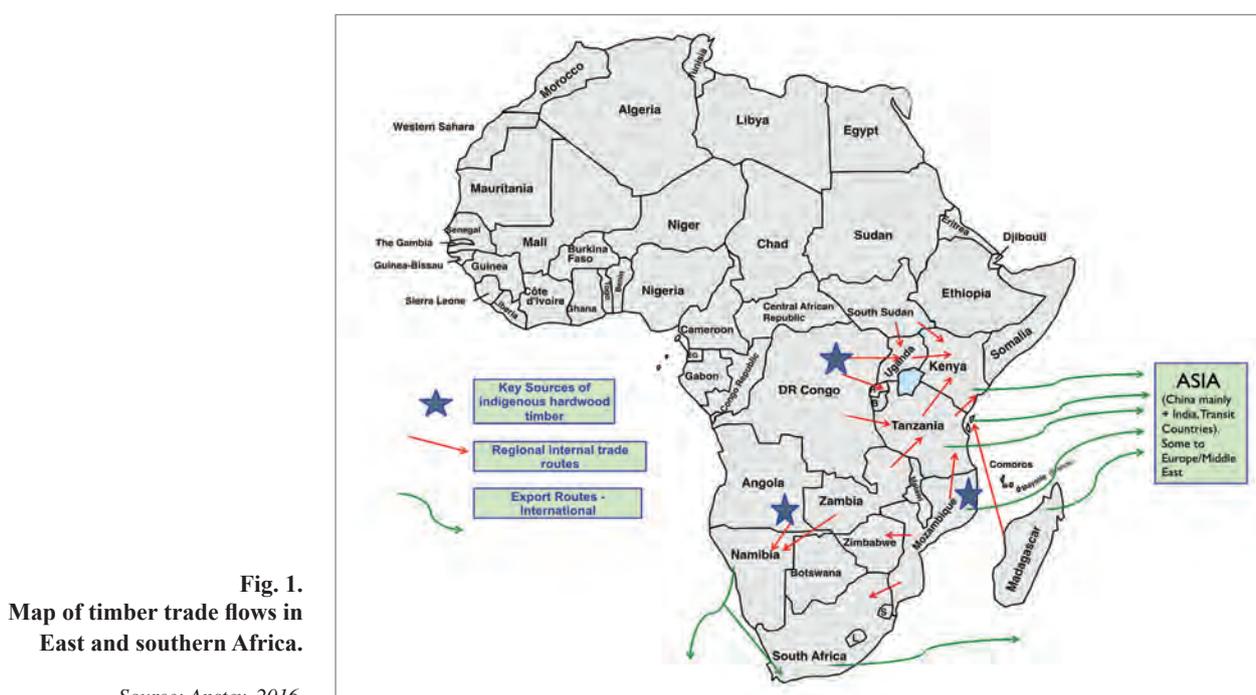
THE ISSUES

Regional natural forest context

Forests in East and southern Africa are declining by about 1% per year (Lukumbuzya and Sianga, 2016a). However, reliable figures are difficult to obtain because forest inventories are either outdated, unavailable or lack sufficient detail (e.g. Anon., 2010), which limits their value in determining sound forest management plans. Despite institutional reforms in the forestry sector of the different countries of the region to tackle high deforestation rates and weak revenue capture, the domestic laws are weak and regional protocols are not fully adhered to, and enforcement efforts have proved to be inadequate (Lukumbuzya and Sianga, 2016a).

Trade flows

Trade in natural forest timber is increasing overall in the region, fetching hundreds of millions of US dollars over the last 10 years (Anon., 2016). A typical northern timber trade route begins in the forests of the eastern DRC, supplying timber to Uganda, Kenya, Tanzania, and international markets through Mombasa Port (e.g. Chevallier and du Preez, 2012). A southern trade route usually centres on the port of Dar es Salaam, with timber coming from Northern Province in Zambia, and Niassa and Cabo Delgado Provinces in Mozambique (e.g. Hall, 2014). Zambian natural forest timber also crosses the border into Mozambique for onward transport to China, through the Port of Beira. There is also anecdotal evidence and information that natural forest timber from the DRC, Zambia and Mozambique is exported in significant volumes to South Africa (Fig. 1).



Trade flows exports and import

Customs in the region generally lack the capacity to administer, monitor and control timber trade and such action in this respect is not a priority (Weng *et al.*, 2014). This facilitates smuggling, misdeclaration of products and falsification of supporting documents. Moreover, export data from the Customs departments are generally unreliable, and show discrepancies with other data sources, e.g. UN Comtrade (Lukumbuzya and Sianga, 2016a). This prevents sound analyses of trends in forest trade.

Exports to China

Exports of timber to China have been increasing rapidly over the past recent years, with species featured in China's National Rosewood Standard and valued for use in high-end furniture *Swartzia madagascariensis*, *Baphia kirkii*, *Millettia stuhlmannii*, and *Pterocarpus tinctorius* (Sun, 2014; Lukumbuzya and Sianga, 2016a). Mozambique, Africa's fourth-largest timber exporting country to China, has increased by seven times its exports to China over the last ten years, mainly in the form of logs and sawn wood (Anon., 2014a), though since a ban imposed in 2015 on the export of logs from Mozambique and economic changes in China, this has shown a recent downward trend.

Exports within the region

Within the region, Mozambique has been the largest timber exporter in the time period covered here (2013-2016). Zambia exports mainly to DRC and South Africa (Anon., 2014b). The eastern region of DRC exports nearly 90% of its production to countries within East Africa, particularly to Kenya, South Sudan and Uganda (Anon., 2012). Tanzanian imports of DRC timber have risen tenfold in the last five years (Lukumbuzya and Sianga, 2016a). Kenya exports significant volumes of its manufactured wood products based on plantation softwoods to Tanzania and Uganda, and is a significant importer of natural forest timber from Tanzania. Some of these imports are part of a transit trade that centres on the port of Dar es Salaam, with some being shipped in dhows from illegal or informal ports on Tanzania's Indian Ocean coast to Zanzibar, where international timber trade is often illegal and difficult to investigate (Chenga and Mgaza, 2016).

Domestic consumption

The domestic consumption of natural forest timber in the region, while not properly monitored, and in some cases not monitored at all, is estimated to amount to more than ten times by volume the amount of timber that is exported internationally (Lukumbuzya and Sianga, 2016a). Species such as *Pterocarpus angolensis*, *Khaya anthotheca*, *Entandrophragma cylindricum*, and *Azelia quanzensis* dominate the domestic markets in the region. Coniferous sawn timber and eucalyptus electricity poles make up the majority of these regional/domestic forest product imports in terms of volume. Almost all of the countries in the region have invested in the establishment of softwood and eucalyptus plantations. However, the

major sources of the products derived from this timber are South Africa, Malawi, Uganda and Tanzania. Most of the countries in the region, but especially Kenya and South Africa, also import from within the region processed forest products, mostly paper, plywood and fibreboards, furniture, doors, fittings and joinery. China and India are major providers of these products for the region.

Private sector views

Harvesting and processing in the region is largely unregulated and fragmented. This challenges authorities on how best to ensure sustainability. Most forestry departments in the region do not routinely monitor the development of the private sector, and so records of the number of enterprises, the levels of employment, the volume of raw materials consumed, and the revenue turnover and taxes paid by forestry companies are largely unavailable. Within the private sector, there is widespread frustration with governments' management of the forestry sector, and increasing calls for the auctioning of harvesting licences to promote transparency, revenue capture and ultimately sustainability in the sector (e.g. Lukumbuzya and Sianga, 2016b)

RECOMMENDATIONS

Areas for intervention by the East African Community (EAC) and the Southern African Development Community (SADC)—International regulations and initiatives

Governance issues require the attention of stakeholders dealing with a broad range of topics including financial integrity, politics, corruption and ethics. Governments in the region should be encouraged to participate more fully in multilateral processes that can facilitate broader inter-, intra- and non-governmental participation in forest management.

For instance, the provisions of the EAC and SADC on forest management and forest products trade should be strengthened. The EAC and SADC Secretariats should develop reporting standards, establish a regional database, and make information publicly available.

Likewise, multilateral regulation through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) should be improved. Countries that are party to CITES could explore the pros and cons of listing the timber species traded internationally that are most at risk as a means to ensure sustainable trade and legality. Species that could be considered for such listing include *Millettia stuhlmannii*, *Swartzia madagascariensis*, *Baikiaea plurijuga*, *Baphia kirkii* and *Pterocarpus tinctorius*. Likewise, governments in the region should be encouraged to participate more fully in international policy developments such as the European Union's Forest Law Enforcement, Governance and Trade (EU-FLEGT) Action Plan (Anon., 2014c), or the China—Africa Forest Governance Learning Programme (Anon., 2015c).

Governments should be encouraged to advise their Customs agencies to accept the official export declaration forms issued by Customs of the exporting

country as supporting documents to be verified during importation of timber products in cross-border trade and the international timber trade.

Recommendations to forest agencies

Improving transparency

Transparency could be improved through the mandatory disclosure to the general public of documents and data related to the status of threatened trees species, forest condition, forest harvest, trade to the public, and companies that have committed illegal acts and been fined, such as via websites that are accessible to the general public. In addition, the holding of public hearings by forest agencies should be promoted.

Assessment of forest governance indicators

Assessments of forest governance should be carried out by all forestry stakeholders and civil society. The World Bank PROFOR/FAO forest governance indicators framework (Anon., 2011) could be used for engagement with all forestry stakeholders in the countries of the region, to get better buy-in on governance, measurement of indicators, and reforms as needed.

Supporting private sector initiatives

Governments should support private sector initiatives, for instance by encouraging value-added processing before export with tax incentives, credit facilities, preferential access to raw materials, or by giving preference in the allocation of harvesting permits to companies abiding by voluntary best practices codes of conduct.

Recommendations to research institutes and civil society organizations (CSOs)

Forest trade monitoring

Research institutes and non-governmental organizations should recruit interns and research assistants to monitor and record the flow of forest trade at major bottlenecks and border posts in co-ordination with all six of the aforementioned countries. The results could then be compared with official data, and used to improve government protocols as necessary.

CONCLUSIONS

A significant illegal and unsustainable trade in timber is taking place within East and southern Africa and for export beyond. The dynamics of this trade are changing fast and action to improve forestry sector initiatives outlined above is therefore imperative if stakeholders are to have any impact on reducing destructive trade practices. Governments and non-governmental organizations working to address illegal timber trade should assess whether a shift in analysis and focus is required, such as from largely the timber trade only to cover wider forest products in trade and use in order to address deforestation plus the degradation of forests and their very high ecosystem values to local, national and regional economies.

The establishment since 2013 of bilateral and multi-lateral MOUs regionally (such as the Zanzibar Declaration) together with multi-agency fora (including the East Africa Timber Forum operational since 2013), in conjunction with the studies summarized here, has facilitated ways in which to tackle these emerging issues in new and more collaborative ways.

DOMESTIC CONSUMPTION OF NATURAL FOREST TIMBER IN THE REGION IS ESTIMATED TO AMOUNT TO MORE THAN TEN TIMES BY VOLUME THE AMOUNT OF TIMBER EXPORTED INTERNATIONALLY



Seized planks of *Pterocarpus angolensis* and *Afzelia quanzensis*, suspected of being illegally imported from Mozambique. Tanzania Revenue Authority border post at Mtambaswala, Mtwara Region, September 2015.

KAHANA LUKUMBUTYA

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POWERS OF PERSUASION?

Conservation Communications, Behavioural Change and Reducing Demand for Illegal Wildlife Products

Gayle Burgess

In recent years, the conservation sector has begun to embrace the powerful potential for behavioural science to help change wildlife product consumer choice (TRAFFIC, 2012). A common question arising is: “How can we change people’s behaviour so they just care about [threatened] animals and stop consuming their products?” This suggests a dichotomy between how the sector is perceiving the opportunity and what it is in reality. In order to influence buyer behaviour, conservationists need to understand what consumers seek and work with that—not focus on what they don’t and try to change it¹ (TRAFFIC, 2016a; TRAFFIC, 2016b; Hesselink, 2016).

This paper aims to promote and support reflection around such considerations, amongst those designing communications aiming to reduce demand for illegal wildlife products. It also seeks to introduce some of the core behavioural science concepts and theories that could form critical points of reference when creating messages and approaches to change consumer choice. In this manner it builds upon the dialogue between those in the demand reduction Community of Practice at the Changing Behaviour to Reduce Demand for Illegal Wildlife Products workshop (Hong Kong, 7–9 March 2016)².

Orientation and Overview

Behavioural science is a diverse discipline, encompassing aspects of sociology, psychology, economics, media, marketing and communications, amongst others. “Hybrid” fields informing insight into the determinants of behaviour and approaches to alter it, include social psychology, behavioural economics and social marketing. Application of concepts and strategic approaches from these fields is relatively new to conservation science (e.g. Veríssimo, 2013; Bennett and Roth, 2015) but due to the urgency of the poaching crisis facing some species, need to be understood and applied rapidly. Attempts to tackle wildlife trafficking and mitigate the markets driving it thus need to be exigent in their exploration of new areas of academic research and expert opinion (Zain, 2012). “Behavioural change” and “social marketing” are becoming commonplace terms in conservation parlance, but when assessed, current demand reduction communications rarely demonstrate adherence to relevant theories of change, benchmark criteria or quality assurance frameworks (Olmedo, 2015; Olmedo *et al.*, in prep.). What can be done to address this?

Relevant context for a response relates to consideration, from a behavioural science perspective, of two recent forces. The first: the strong political reaction to the poaching crisis, with government declarations of zero-tolerance and stockpile destruction. Since 2007, more than 226 tonnes of elephant ivory have been destroyed in 24 separate events in 20 countries (Milliken *et al.*, 2016). Media coverage has featured dramatic pictures of burning pyres, impassioned pleas and moving speeches appealing for the international community to help range States protect local livelihoods, national heritage and the global commons, by saving emblematic species such as elephants (Nuwer, 2016; Goldbaum, 2015). The second: the response of non-governmental organizations (NGOs) to the concern of their constituents, through communications calling for compassion for, for example, elephants and for consumers to stop buying, for example, ivory. Themes have included raising awareness that elephants die when their “teeth” are extracted and in great pain. Appeals emphasize thousands of animals affected annually, and reference the broader impacts of trafficking, plus punitive measures for those caught purchasing illegally.

Ultimately, these two forces combine to infer scarcity of raw material available to the market, whilst highlighting in a pervasive high-profile manner the threat of extinction to several species. Mass-media distribution of images of powerful animals, celebrating their majesty, highlighting their rarity, the dwindling supply of their products and appealing for empathy for their plight, is commonplace, but without consideration, from a behavioural science perspective, of the potential influence on the choices of wildlife consumers.



Changing Behaviour to Reduce Demand for Illegal Wildlife Products workshop, Hong Kong, 7–9 March 2016.

¹<https://www.iucn.org/commissions/commission-education-and-communication/our-work/love-not-loss>; ²Key aspects are considered further in the Wildlife Consumer Behaviour Change Toolkit (www.changewildlifeconsumers.org)

Research insight suggests some people are motivated to acquire wildlife products specifically because they are rare or precious (TRAFFIC, 2013; Kennaugh, 2016) and likely to hold or potentially increase in value as species become scarcer. Some people may see the illegal status of goods as making them more desirable, providing a perverse “social proof” that they are above the law. What if pictures of powerful animals encourage some people to consume products from them, to imbue such attributes/embody their virtues? And why should people care about animals with which they have little, if any, direct contact? What sort of communications should the conservation sector issue to reduce demand for their products then?

This paper considers such questions, whilst introducing some aspects of behavioural science that could help guide, shape and inform an impactful response.

Meaning and the Most Effective Mechanisms for Transformative, not Transient, Change

To provide a common foundation for other aspects of this paper, it is worth clarifying the scope and meaning first. Much recent discourse has been devoted to definitions of demand reduction. While there are clear frames of reference in relation to illicit drug consumption or economic trends, less are evident in conservation. For the purpose of this paper, demand reduction is considered a process and result; the process of reducing the expressed intent of potential consumers to purchase products, and the result of changing actual buyer behaviour: i.e. fewer illegal wildlife products bought.

To achieve this, an “enabling environment” of effective action to starve the supply of goods into the market (i.e. “supply reduction”) is critical³ (Burgess and Compton, 2013). Supply reduction encompasses effort to ensure effective enforcement in protected areas, range States and throughout the trade route (i.e. including in the market). The generation and provision of actionable information; technical support to identify major markets, trends and dynamics; and capacity building to enable relevant authorities to mitigate them, are all relevant. Most work to prevent poaching and trafficking aligns with this definition.

A strong legislative, regulatory and policy framework at international, regional and national levels, is also a requisite. Significant progress in this regard has occurred in recent years. Examples include the United Nations General Assembly (UNGA) Resolution 69/314, on “Tackling Illicit

Trafficking in Wildlife”. This landmark Resolution, attained after three years of diplomatic effort, was co-sponsored by 86 countries and adopted by all 193 UN Member States in May 2015. Clause 7 “Urges Member States to engage actively in efforts to raise awareness about, and address the problems and risks associated with, the supply and transit of, and demand for, illegal wildlife products, and to reduce the demand using targeted strategies in order to influence consumer behaviour” (United Nations, 2015; TRAFFIC, 2016c).

Previous examples of successful demand reduction (Kitade and Toko, 2016) reinforce that a “Twin-Track Approach” is a key mechanism through which to deliver against such imperatives (TRAFFIC, 2016b). Track One involves measures to impose a societal behavioural control (e.g. policies, legislation and regulation) or restrict consumer choice (e.g. retailers removing offers for sale). Track Two involves messaging, issued by messengers influential with target audiences, to shape individual motivation.

Behaviour Change Communications (BCC) demonstrate delivery against Track Two in particular, by using messaging and messengers that focus on influencing the individual determinants of choice. In some instances, they use social marketing criteria⁴. Social and Behavioural Change Communications (SBCC) are slightly broader in scope, and consider the “socio-ecological” determinants of choice. In simple terms, they encompass aspects such as advocacy, public engagement and community mobilization, alongside strategic and targeted communications. They originated in the development and public health arena, where it has been recognized that “Individuals and their immediate social relationships are dependent on the larger structural and environmental systems: gender, power, culture, community, organization, political and economic environments” (Manoff Group, 2016). The Twin-Tracks of measures to impose societal control and messaging to shape individual motivation, can in this manner relate to all.

The “Five Step Process” used by TRAFFIC (see Fig. 1) provides a conceptual framework for developing Behaviour Change Communications and Social and Behavioural Change Communications. It has been endorsed by the Global Tiger Recovery Programme and the Rhino Working Group established under CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora), as a valid approach for framing species-specific and systemic interventions (Burgess and Compton, 2013).

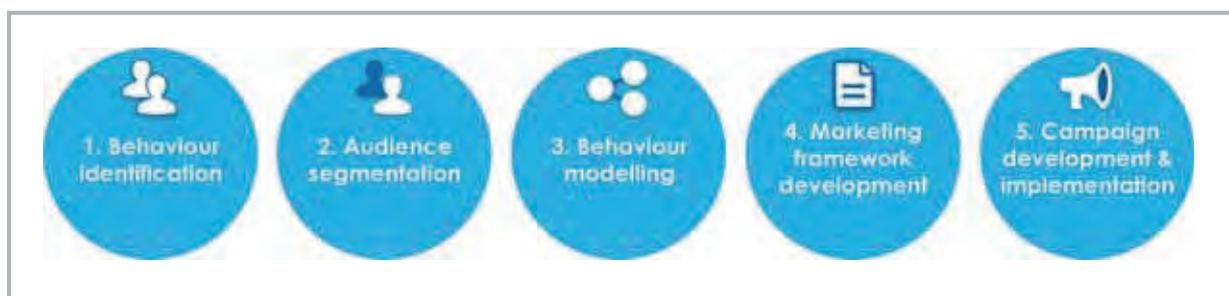


Fig. 1. The Five step process in relation to initiatives and communications to change behaviour.

³https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/281289/london-wildlife-conference-declaration-140213.pdf;

⁴NSMC ‘Benchmark Criteria’: <http://thensmc.com/sites/default/files/benchmark-criteria-090910.pdf>.

In Steps One and Two, research is conducted to identify the specific behaviour (Step One) and audience (Step Two) the communications should target. A foundational understanding usually arises through market research, which assesses various facets of trade dynamics. Metrics can include those around poaching, trafficking and seizure data, plus availability (and ideally price) of product in virtual and physical markets. Time-series data illuminating trends over time can also identify predictors for emerging markets and perhaps some of the pressure points to terminate them.

Media articles and anecdotal observations may disproportionately highlight sensational extremes, but where rigour is applied (i.e. in high-quality investigative journalism), may also generate contextual insights. A sense of how products are sold, where, for what price, in which circumstances, to whom, why, etc., may help to identify candidate areas for further investigation, if being unlikely to set future research direction.

Knowledge arising from market research is what typically informs the focus for survey design in subsequent consumer research. Consumer research may include observational, derived/stated preference, or self-reported qualitative and quantitative components. It will seek to identify the socio-economic determinants and psycho-demographic drivers for desire and behaviour. A “benefits and barriers” style analysis may also be conducted to inform a social marketing approach. A mix of methods is instrumental in securing robust insights and statistically significant data.

In Step Three, findings from both market research and consumer research are cross-referenced against behavioural change models, frameworks, flow-diagrams, decision trees and theories of change. The conservation community is fortunate in that a large number of these have already been tried and tested in fields such as public health, international development and sustainable lifestyles. An extensive literature and body of evidence has thus emerged and is available to inform decision-making around the most effective messages, messengers and mechanisms to employ when influencing changes in consumer intention and behaviour.

Step Four will utilize these findings and references to behaviour change theory, to inform intervention design. A (social) marketing framework will map how communications can erode or undermine motivations for the “bad” behaviour, and/or highlight the utility of the “good” or preferred behavioural alternative. Step Five will implement all, and assess impact through an iterative approach (in line with e.g. World Bank, 2015). Findings inform adaptive management of messaging, messengers and mechanisms.

In this manner, the Five Step Process is intended to provide a framework for designing and delivering demand reduction interventions that achieve transformative, rather than transient, behavioural change impact.

Mixing Methods: the Mesh between Awareness-raising and Communications to Change Behaviour

Within this context, conservation communications that raise awareness of key issues, are distinguished from those explicitly designed to change behaviour. Conservation NGOs have a compelling rationale for issuing awareness-raising communications. Some may share shocking statistics and present visceral imagery to promote public action and raise resources to stop species extinction.

Awareness-raising communications are typically distributed using multiple mass-media channels. Communications to change behaviour tend to be more targeted, placed in locations frequented by the intended audience, distributed by those believed to be influential with them and employing an evidence-based and insight-led approach to messaging. Awareness-raising communications impart information and increase the “Knowledge” of those exposed to them. Behaviour Change Communications attempt to change “Attitudes” and ultimately “Practice”. In this manner, they aim to move people through “stages” in a behaviour change journey (e.g. Valente *et al.*, 1998). This builds on several “composite models” of behavioural change, a notable example of which is the Trans-theoretical Model (Prochaska and Velicer, 1997).

This central tenet of behavioural science, also known as the “Stages of Change” Model, originates from the public health arena, and reinforces that behaviour change typically occurs incrementally through a series of steps in cognition and action. For example, through contemplation of stopping smoking or eating more healthily, preparation to do so mentally, and then commitment to action and doing so. Communications to change behaviour should relate to each of these steps. Relapse, reflection and refinement are recognized as integral to ensuring an enduring effect and lasting change in the longer term.

These sort of distinctions between awareness-raising and communications to change behaviour are not just definitional issues. Discussion with various experts in influencing consumer choice (TRAFFIC, 2012) has reinforced that while the conservation community has for many years relied on awareness-raising communications to protect species, the messaging used often speaks to the conservation community’s values rather than those of wildlife consumers. The escalating threat to species in spite of such communications would support this assertion, and suggest that a fresh approach, grounded in consumer insight and behavioural science, is required (Burgess and Compton, 2013).

On the one hand, illegal wildlife product consumers may not be persuaded by concerns for animals often far removed from them. On the other, even if they purport to be, behavioural science would suggest it would not be wise to rely on them to behave “rationally” as a result; i.e. they may be aware of something, even claim to care strongly about it, but not necessarily act accordingly. Many reasons for this are suggested in the literature. Social psychologists identify factors such as “social choreography”, peer pressure, “group-think”, human “herd behaviour” and “mimicry” (e.g. Bond, 2014). In simple terms, if you perceive everybody else around you is still buying e.g. ivory, despite awareness that e.g. elephants are dying, the desire to conform could override the one to stop. An additional consideration is that communications highlighting everybody is buying e.g. ivory, risks providing proof that such “bad” behaviour cannot really carry much in the way of negative personal consequence anyway.

Behavioural economists distinguish real “Humans” from purely rational “Econs” (e.g. Hollis and Nell, 1975; Thaler and Sunstein, 2009) due to consumption choices incongruous with individual values, and associated aspects of irrationality (Ariely, 2008). Environmental psychologists



STEVEN BROAD / TRAFFIC

A shopkeeper in Hoi An, Viet Nam, explaining the power of Tigers in traditional medicine.

have a corollary in the “Value-Action Gap” (Kollmuss and Agyeman, 2002); i.e. a recognition that survey respondents often report caring about the planet and living a sustainable lifestyle to protect it, but do not then save an adequate amount of water, waste and energy to do so.

When TRAFFIC commissioned Ipsos to conduct rhinoceros horn consumer research in Viet Nam (TRAFFIC, 2013), qualitative responses included: “It’s poachers who kill them not me, I only buy it”; and “If rhinos go extinct... it’s normal, dinosaurs went extinct”; finally “[These animals] live in the forest, we have never see them... so, nothing impacts our life” [sic]. Respondents indicated those concerned about such animals would issue this type of messaging, implying that communications carrying conservation NGO branding risk being dismissed as a result. The Chi initiative⁵ has developed its own brand and avoided overt association with conservation interests as a consequence.

More recent research by others—using a stated preference technique on the one hand, and regression analyses to test the integrity of self-reported opinion on the other—has revealed that while consumers may show support for legislation as a key mechanism to save threatened species, neither their awareness of the law nor their desire to avoid cruelty to animals is necessarily the most effective way to change buyer behaviour (Globescan/National Geographic, 2015; APCO/The Nature Conservancy, 2015).

From a behavioural science perspective, this may demonstrate Brehm’s “Reactance Theory” (Brehm, 1966), when an individual’s freedoms, i.e. the ability to buy ivory, is at risk of being restricted, they can react by defiantly “overcompensating” i.e. significantly increasing their motivation to reacquire the freedom. Thus it reinforces that a “Twin-Track Approach” to change is critical; i.e. that legislation and regulations must be accompanied by tailored, evidence-based, specific messaging in order to effect meaningful change.

⁵<http://suctaichi.com/>

A further study identified that of those who said they would buy rhinoceros horn in China as a luxury good, 65.8% said they would buy it specifically because it was rare, with 31.6% indicating they would prefer Asian horn over African as it was even rarer. From a behavioural science perspective, this is aligned with Cialdini’s Principle No. 6 “Scarcity” in “Principles of Persuasion” (Cialdini, 2006). Finally, “When questions about buying preferences were coupled with questions about rhinoceros population levels, the effect of population on potential buyers for rhinoceros horn as a luxury product, was not significant at any price.” (Kennaugh, 2016), thus illustrating less interest around conservation concerns.

Overall, this reinforces the value of considering a behavioural science perspective, and of applying communications and approaches to change buyer behaviour in order to reduce the demand for illegal wildlife products. The extent to which conservation communications that raise awareness should be a precursor for, or supporter of, Behavioural Change Communications and Social and Behavioural Change Communications, needs to be explored further. By setting the tone around what is and is not socially acceptable, awareness-raising may hold the potential to influence the socio-ecological determinants of decision-making, but little is actually known about the extent to which it does so, and further investigation around the value of mixing methods to maximize impact, would be useful. In the environmental education sector, much research has been conducted on what, if anything, triggers the transition from awareness to action. Interesting debate has occurred around the “Attitude-Behaviour-Context” (ABC) model (Stern, 2000) and in relation to the “Behaviour-Impact Gap” (Csutora, 2012). The demand reduction Community of Practice may find these a useful orientation in the first instance.

Motivational Clusters, and More Impactful Messaging and Messengers

Broadly speaking, the available market research and consumer research influencing current demand reduction initiatives, suggests diverse socio-economic determinants and psycho-social drivers for consumer intention and behaviour. Looking at the evidence through a behavioural science lens (i.e. rather than one focused on either taxonomies, commodities or geographies), the “Motivational Clusters” set out in Fig. 2 are, to a greater or lesser extent, apparent.

The Clusters are not mutually exclusive; overlap is inherent and reflects the reality of what drives consumer choice. A primary motivation (e.g. Reputational) may relate to a secondary one (e.g. Social), and changes over time can be expected. Some Clusters may be umbrella headings (e.g. Emotional and Functional) for others (e.g. Reputational, Social and Recreational, and; Financial, Medicinal and Nutritional, respectively); but the latter may be a specific facet of the former that is useful to distinguish when designing highly targeted messaging.

Research suggests that each Cluster is evident to varying extents for different taxonomies, commodities and geographies. From a behavioural science perspective, considering the “Motivational Cluster” first, but localizing messaging according to those geographies, may help to

1	Cultural	Behaviours that represent the purchase or use of products in recognition or celebration of a specific facet of cultural heritage or tradition
2	Emotional	Behaviours that represent the purchase or use of products to fulfil hedonistic pleasure—i.e. for personal adornment or household display
3	Financial	Behaviours that represent the purchase or use of products for investment purposes, as a financial security strategy or similar
4	Functional	Behaviours that represent the purchase or use of products to fulfil an everyday purpose or function
5	Nutritional	Behaviours that represent the purchase or use of products to fulfil a simple need for protein or food
6	Medicinal	Behaviours that represent the purchase or use of products for perceived treatment of illness or promotion of wellness (i.e. curative /preventative)
7	Recreational	Behaviours that represent the purchase or use of products as part of a leisure or pastime activity
8	Reputational	Behaviours that represent the purchase or use of products for reputational gain—or “face”; to gain currency in a business transaction perhaps
9	Social	Behaviours that represent the purchase or use of products for social gain—to impress a peer group with a newfound “status” or wealth
10	Spiritual	Behaviours that represent the purchase or use of products to bring “good luck” or good fortune in business or life

Fig. 2. Motivational Clusters.

maximize synergies. This is because consumers are driven primarily by the motivations their purchase/use fulfils; taxonomic and commodity considerations may be secondary, instead driving perceptions of the “utility” the product offers in meeting the motivation, as per evidence recounted previously. Alongside this, human behaviour is universal (e.g. J. Drummond pers comm., 2015). Both factors combine to suggest that messaging focused on eroding the motivations evident in a Cluster could be informed by a universal behavioural science theoretical foundation, but localized to benefit several taxonomies and commodities simultaneously.

For example, designing messaging to reduce the demand for illegal wildlife products used for the “Emotional” Cluster by the “new-wealthy” in urban centres in Viet Nam, may refer to several tried and trusted models in behavioural science (e.g. the aforementioned “Trans-theoretical Model”, but also the “Theory of Planned Behaviour” (Ajzen, 1985); “Diffusion of Innovations” (Rogers, 2003), and, “Needs, Opportunities and Abilities” (Vlek, 1997; 2000) models); and may impact consumption of commodities from elephants, rhinoceroses, Tigers, marine turtles, tortoises and “exotic” species used for ornamentation, display or (ostensibly) companionship. The potential for messaging, relating primarily to a Motivational Cluster rather than taxonomy or commodity, in helping to streamline demand reduction Community of Practice effort, could in this example be significant and thus should be considered and explored further.

In addition to adequate “localization”, another success factor for communications and approaches to change consumption choice is promoting a positive rather than too overtly negating a negative⁶, or as one recent commentator put it, replacing “demand” with “desire” (R. Lertzman, pers comm., 2015). The US health burden associated with poor dental care around the turn of the 20th century was substantial, despite availability at that time of fluoride toothpastes. It was not until *Pepsodent* put mint and citric oil in theirs that brushing teeth started to become a social

norm, and ultimately an habitual behaviour. This change was driven initially by a commercial interest that benefited the public good, but also tailored messaging and the fact that people liked the “tingle” and taste (Duhigg, 2012). A Water and Sanitation Program (WSP) handwashing case study in Viet Nam achieved similar change with young people, when prompts were provided and soap “smelled nice”⁷.

These examples illustrate the complex set of social, cultural and inter- and intra-personal values, attitudes, beliefs and desires, which may be beyond a conservation concern but nevertheless important to consider when creating messaging to change choice. Typically, countries have priorities around improving international image; collectivist cultures of enjoying new ways to celebrate common heritage; consumers of being “on-trend”; business leaders of managing reputational risk and improving brand visibility/integrity; and individuals wanting to do the best for themselves/loved ones when treating illness/promoting wellness. All of these interests therefore may offer useful initial “hooks” for approaches and messaging aiming to change behaviour.

Considerations around message “tone” and “framing” (i.e. positive/neutral/negative) are implicit. Common sense dictates a didactic, judgemental or imperious tone is more likely to insult than influence; i.e. in relation to teeth brushing and handwashing, people could just have been “told what to do” for better health. But evidence exists to suggest that messaging employing shocking claims, adopting a lecturing style, inferring a moralized commentary or seeking to alarm people into guilt for their “bad” behaviour, whilst questionable in general may also, from a behavioural science perspective, stimulate a counterproductive result (e.g. Brennan and Binney, 2010). Nobody likes being scolded or told off. For “emotional regulation” (Gross, 1998) people turn away as it is too upsetting, or because they feel that they are inherently a “good” person anyway and that the message cannot therefore relate to them. Avoiding this is therefore key.

⁶<https://www.iucn.org/commissions/commission-education-and-communication/our-work/love-not-loss>;

⁷*Water and Sanitation Programme: Improving Handwashing with Soap Behaviour Change Toolkit*: <https://www.wsp.org/hwss-toolkit/hwss-tk-home>.

Another result concerns the quality of the messenger. The target audience may dismiss the carrier of an “extreme” message (Chase and Do, 2012); i.e. assume it is somebody unqualified to comment, with inadequate credibility on the issue or too vested an interest in the result. This was evident in the WSP handwashing case study. In behavioural science there have been many studies conducted around the character traits and personality profiles that create the most influential messengers. Cialdini suggested Principle No. 4 “Liking” and No. 5 “Authority” as important (Cialdini, 2006). Celebrities often act as “Key Opinion Leaders” in campaigns and are critical in catalysing media interest and public profile. But reach is not resonance. Indeed, some studies (Feder and Savastano, 2006) suggest that “excessive socio-economic distance is shown to reduce the effectiveness of diffusion... People turn to seek advice from their peers, from individuals of the same background, interest and values”. In his celebrated book *The Tipping Point* (Gladwell, 2000), Gladwell posited several promising scenarios for promoting pro-social change through “Mavens”; “Connectors” and “Salespeople”. Subsequent research found that “Mavens” are easily mobilized as messengers, but that “Connectors” and “Salespeople” are also crucial (Fell *et al.*, 2009). Overall, much more research on the individual qualities that make influential messengers is required.

A final consideration around “tone” and “framing” of behaviour change messaging, arises from the “Twin-Track Approach”. Communications associated with Track One i.e. measures to impose a societal behavioural control, in simple terms reinforce the “sticks” in the rationale to change consumption choice. Messaging in Track Two can thus afford to focus more on the “carrots” shaping motivation. This mix of messaging, ensuring what is being advocated is in line with the EAST framework (Behavioural Insights Team, 2014) of Easy; Attractive; Social; and, Timely, and reaching the audience in eye-catching and engaging ways via multiple channels, is extremely powerful from a behavioural science perspective.

Moving Forward? Marketing “Suitable” Alternatives

A practical response for the demand reduction Community of Practice to these various factors could be to focus social and behaviour change communications and approaches on marketing a suitable alternative; i.e. one through which motivations or desires in a Cluster might still be met (CEPSM, 2016). Encouraging consumers to make a small shift from one commodity used for e.g. financial purposes to another, should be easier than stopping them from consuming any commodity fulfilling that motivation entirely (UK Government Communications Service, 2014). From a behavioural science perspective, it is one behaviour to change (i.e. purchase of that product specifically) rather than two (purchase of those products generally, plus that product specifically). High-value commodities such as elephant ivory, Tiger skins and rhinoceros horn are classed in a luxury product bracket (e.g. TRAFFIC, 2013; Sarchet, 2015; Kennaugh, 2016), thus, finding a “suitable” alternative with a similar utility from that bracket, could be fruitful from a behavioural science perspective.

Risks in identifying a “suitable” alternative are inherent. Those related to synthetic substitutes were explored in Broad and Burgess (2016). As outlined there “In economic terms,

substitute goods are products that a consumer perceives as similar or comparable, so that obtaining more of one product makes them desire less of the other product (or vice versa)”.

Beyond this however, sustainability appraisals or similar assessments of “suitability” have not commonly been conducted for commodities of equivalent utility to wildlife products. Further, some candidate commodities are already known to be unsuitable. As a material, jade may hold similar utility to elephant ivory for luxury product consumers driven by Financial and Social motivations—it has great value, is carved skilfully, holds aesthetic appeal, spiritual significance and conveys a rich cultural heritage. Human rights abuses are often reported in the jade extraction industry and supply chain, however; it could not therefore be marketed as a suitable alternative to elephant ivory unless those concerns were addressed.

More encouragingly, financial analysts have reported recently that the “super wealthy” are buying more experiences and fewer products (Adams, 2013). This is especially significant for illegal wildlife products consumed conspicuously to display new-found wealth—i.e. for motivations in the Social Cluster. From a behavioural science perspective, purchase of an experience rather than a product can lead to a lower peak for, but more lasting gain in, hedonistic pleasure. In simple terms, experiences can redefine us and generate happy memories for many years. By contrast, products eventually recede to become “a familiar part of the furniture”. This and aligned constructs were explored with the demand reduction Community of Practice in the “Creative Showcase” at the aforementioned Hong Kong workshop, and further ideas for “suitable” alternatives shared there are available in the Proceedings accordingly (TRAFFIC, 2016b).



FLICKR CREATIVE COMMONS, JOE WU

While jade may offer an equivalent utility for consumers to elephant ivory, it could not be marketed as a “suitable” alternative owing to alleged human rights abuses in the extraction industry.

- **An analysis of behaviours**

There are various behavioural “domains” and identifying which the “bad” behaviour being changed sits in, can be helpful in determining the most appropriate mechanisms through which to do so. For example:

1. Consumption behaviours relevant to illegal wildlife trade may span domains between “habitual” and “one-off” and “opportunistic” and “deterministic”. The storability of products and whether they are consumed through a “destructive” or “durable” form of consumption relates:

- » Commodities consumed regularly and thus that need replenishing over time, would logically involve behaviours in the “habitual” domain—i.e. illegal wildlife products ingested for “Medicinal” use, to treat illness or promote wellness. Sometimes habitual behaviours are so routine and ingrained, people do not realise they are making a conscious choice to undertake them; “Lewin’s Change Theory” can be applied to raise the level of cognition and catalyse reflection and “revision” accordingly.
- » Commodities consumed less frequently, could involve behaviours in the “one-off” domain—i.e. illegal wildlife products purchased perhaps as a gift, to secure a lucrative business deal for “Reputational” reasons. These behaviours may be easier to change through e.g. “Social Network Theory” with consideration of “Dunbar’s Number” and the aforementioned EAST Framework alongside this.
- » “Opportunistic” purchasing choices might benefit from an emphasis on “Track One” Approaches: i.e. as people purchase when they come across products in a physical or virtual market, removing them from that market through measures to impose societal control, will change the purchase behaviour by default. “Deterministic” purchasing choices meanwhile are more likely to benefit from additional emphasis on “Track Two” Approaches: i.e. communications and approaches that aim to shape individual motivation. Kahneman’s “Fast” and “Slow” Thinking, offer a useful corollary and plentiful point of reference here.

2. Little is known currently about what the “entry/gateway” and “catalyst” behaviours are that trigger more established patterns of consuming illegal wildlife products. Consumer research provides some insight into what prompts initial purchase choice, but this is simplistic and not the same. Often “entry/gateway” behaviours are useful to know as they are easier to change—more malleable and in simple terms, less “sticky”, i.e. not a fully-fledged part of the consumer’s “psyche” yet. Further research is thus recommended.

3. Finally, it is worth considering how consumption behaviours in different “Motivational Clusters” relate to the layers in Maslow’s “Need Hierarchy”. Those in the more basal layers of the hierarchy (i.e. those fulfilling “Nutritional” motivations, which may relate to the “physiological” layer) may require more thoughtful approaches and sensitive messaging, to accommodate ethical considerations and avoid a counterproductive effect.

- **An analysis of commodities**

It would be interesting to identify which commodity carries the greatest potential for conservation impact. For example, in relation to Tiger products—would it be skins, claws, teeth or bone pastes, glues, wines or jewellery? The answer would be determined by a complex mesh of considering:

- » How frequently the commodity is purchased (associated with the previous point about “durable” and “destructive” types of consumption, but also potentially price, and perceptions of future supply);
- » How much raw material is involved in production; and
- » How durable/storable the product is.

If certain commodities appear to have a much higher potential for conservation impact than others, identifying a suite of associated “Headline Behaviours” to focus demand reduction Community of Practice effort around changing, may be useful.

- **An analysis of the target audience according to attitude**

Current target audience segmentation for demand reduction messaging focuses on a mix of socio-economic status; occupation; age; gender and location. Attitudinal segmentation (i.e. according to those who are most “willing” and “able” to act) can, alternatively, be an extremely powerful way of catalysing behaviour change. Only one consumer research study so far (regarding one commodity from one taxonomy in one geography), has identified who the “Persuadables” are and whether emotional or logical arguments work best with them in changing choice. Others have identified “Likely Buyers” and may be adapted.

- **Whether there would be a “Rebound-effect”**

The so-called “Rebound-effect” is well established in relation to climate change campaigns; i.e. when carbon savings made through one type of behavioural change are offset by gains in another. A simple illustration is somebody who spends a year saving carbon and money by switching off electrical appliances when they are not in the room, and takes a long-haul flight to reward themselves. It is unclear whether this could be something the conservation community may have to consider in due course, but closely relates to the “suitability” of alternatives being marketed through behavioural change messaging instead, and potentially also the analysis of aforementioned commodities.

- **Whether there are existing successful messages that social and behaviour change communications and approaches could be aligned more closely with**

Messaging can often be aligned with other successful messages, provided there is adequate lateral thinking and an appetite for creative approaches. Examples could include messaging that emphasizes making the “right” consumption choice (i.e. selecting the “suitable” alternative) is part of e.g. civic pride; good health; a patriotic act; Corporate Social Responsibility commitments or; living a more sophisticated lifestyle. If message alignment is seamless enough, this may pave the way for “piggybacking” behavioural change communications on these themes, thus achieving a “multiplier effect”, mainstreaming action and maximizing impact.

Fig. 3. Aspects to consider and discuss further amongst the demand reduction Community of Practice.

Based on information influencing the design of behaviour change communications and social and behavioural change communications and approaches in the public health, international development and sustainable lifestyles arenas, the above are noted as opportunities for future demand reduction Community of Practice investigation.

Other success factors for Behaviour Change Communications and Social and Behavioural Change Communications messaging include appealing to the heart as well as the head (i.e. using emotional and logical arguments); recognizing and rewarding the “good” behaviour once it has been conducted; and playing to our natural tendencies towards loss aversion, cognitive biases and heuristics. Consideration of these is beyond the space available in this paper, but included in the Wildlife Consumer Behaviour Change Toolkit⁸ created to support the Community of Practice working on changing behaviour to reduce consumer demand for illegal wildlife products.

Final factors worth featuring here are that messaging should avoid reinforcing the utility of the illegal wildlife product in question (for example, by showing high-quality visuals of it in a processed state), and implying the current “bad” behaviour of purchasing it is a social norm; i.e. commonplace, with many displaying it without consequence. This arises inadvertently from broader media coverage of markets driving the poaching crisis; but it is recommended that those designing messaging to change behaviour messaging are mindful as a result, to ensure real and rapid impact in reducing the demand for illegal wildlife products.

More Information

This paper considers some of the challenging questions facing the conservation community in relation to communications raising awareness of the escalating threats to endangered species and those aiming to reduce some of those threats, by changing consumer behaviour. It introduces some of the behavioural science principles that could help guide, shape and inform an impactful response, but also seeks to stimulate further discussion by all those with a stake, passion, interest or mandate in reducing demand for illegal wildlife products, i.e. the demand reduction Community of Practice. This discussion will be continued through the Wildlife Consumer Behaviour Change Toolkit⁸, and other aspects of follow-up to the *Changing Behaviour to Reduce Demand for Illegal Wildlife Products Workshop* held in Hong Kong, 7–9 March 2016. Further information will be made available in due course on: www.changewildlifeconsumers.org.

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⁸(www.changewildlifeconsumers.org)

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THE TRAFFIC BULLETIN SEIZURES AND PROSECUTIONS SECTION IS SPONSORED BY THE FORESTRY BUREAU, COUNCIL OF AGRICULTURE, TAIWAN: COMMITTED TO SUPPORTING CITES ENFORCEMENT

The following section features a selection of seizures and prosecutions reported between April and October 2016. Sources are cited at the end of each country section. Readers are referred to the TRAFFIC website (www.traffic.org/media-reports/) for regular updates on cases reported from around the world.

Note that all cases reported here took place prior to the seventeenth meeting of the Conference of the Parties to CITES and/or before any resulting listing amendments/adoptions take effect.

ELEPHANTS

The African Elephant *Loxodonta africana* is listed in CITES Appendix I (except the populations of Botswana, Namibia, South Africa and Zimbabwe, which are included in Appendix II); the Asian Elephant *Elephas maximus* is listed in Appendix I.

CAMBODIA: On 5 August 2016, Customs officers seized more than 600 kg of ivory from a container packed with corn that had languished unclaimed at Sihanoukville port for two years after being shipped by sea from Africa (country unknown). The ivory was destined for a third, undisclosed, destination.

Dunya News: <http://bit.ly/2dKusLL>, 5 August 2016

CHINA: Reports of a recent seizure of 421 kg of elephant hide in south-west China.

Mailonline (UK): <http://dailym.ai/2e5j40v>, 24 September 2016

FRANCE: On 25 May 2016, investigations ensuing from the discovery by Customs agents of four elephant tusks in a car led authorities to a French-Vietnamese businessman in Paris who was found to have 212 kg of tusks hidden in wooden pallets in his office. The suspect's company dealt in cosmetics and antiques which he reportedly used to organize the trafficking of ivory.

On 1 June 2016, Customs officials at Charles de Gaulle Airport, Paris, intercepted a man on his way from Angola to Viet Nam with 26 elephant tusks (142 kg) in his luggage. He was sentenced to 18 months in gaol and fined EUR140 000 (USD160 000).

<http://bit.ly/1XdlwPU>, 8 June 2016

GERMANY: On 20 May 2016, 625 kg of African Elephant *Loxodonta africana* ivory was detected at Berlin Schönefeld Airport packed in 11 cases. A company from Berlin trying to ship

the boxes to Hanoi, Viet Nam, declared as wall clocks, is now under investigation. This case led authorities, on 25 August 2016, to an industrial building near Koblenz, Rheinland-Pfalz, where a further 570 kg of whole and cut tusks and processed ivory was uncovered. Grinders, milling machines, lathes and drills were also seized. Two Vietnamese nationals were apprehended at the site during the course of processing the ivory into pearls and figurines. The provenance of the ivory is being investigated.

ZOLL: <http://bit.ly/2dR8gQA>, 30 May 2016;
Staatsanwaltschaft Cottbus Press release:
<http://bit.ly/2e5jZOH>, 6 September 2016

INDONESIA: On 21 May 2016, Customs officers at Soekarno-Hatta Airport seized 377 pieces (weight not reported) of raw elephant ivory from two Chinese nationals travelling from Lagos, Nigeria, via Abu Dhabi, United Arab Emirates, to Tangerang, Banten.

Tangerang online: <http://bit.ly/2dvK9oi>, 26 May 2016

KENYA: On 22 July 2016, Feisal Mohamed Ali was sentenced to 20 years' imprisonment and fined KES20 million (USD197 000); other suspects were acquitted for lack of evidence. The case relates to the seizure from a warehouse in Mombasa in June 2014 of over 2000 kg of ivory (228 elephant tusks and 74 ivory pieces).

Daily Nation (Kenya): <http://bit.ly/2aBdEVh>, 22 July 2016

MALAYSIA: On 21 July 2016, at Kuala Lumpur International Airport, Customs officials foiled an attempt to smuggle 1001 kg of raw ivory arriving from N'djili International Airport, Kinshasa, Democratic Republic of Congo, via Ataturk Airport, Turkey, believed to be bound for China, Thailand and Viet Nam. The 23

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) establishes international controls over trade in wild plants and animals, or related products, of species that have been, or may be, threatened due to excessive commercial exploitation. Parties have their own legislative instrument by which to meet their obligations under CITES. The species covered by CITES are listed in three Appendices, according to the degree of protection they need:

APPENDIX I includes species threatened with extinction which are or may be threatened by trade. Trade in specimens of these species is permitted only in exceptional circumstances. An export permit from the country of origin (or a re-export certificate from other exporting countries) and an import permit from the country of importation are required.

APPENDIX II includes species not necessarily yet threatened, but which could become so if trade is not strictly controlled. Species are also included in Appendix II if they are difficult to distinguish from other species in Appendix II, in order to make it more difficult for illegal trade to take place through misidentification or mislabelling. An export permit from the country of origin (or a re-export certificate from other exporting countries) is required, but not an import permit.

APPENDIX III includes species that any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and as needing the co-operation of other Parties in the control of trade. Imports require a certificate of origin and, if the importation is from the State that has included the species in Appendix III, an export permit is required.

All imports into the European Union of CITES Appendix II-listed species require both an export permit/re-export certificate and an import permit.

packages, declared as baked clay and wooden samples, were addressed to two recipients whose addresses in Selangor and Johor were found to be fictitious.

Malay Mail online: <http://bit.ly/2aGoc8w>, 1 August 2016

SOUTH SUDAN: In June 2016, at Juba International Airport, authorities recovered 1200 kg of ivory being smuggled from Entebbe, Uganda, from 25 boxes declared as food items, believed to be bound for Egypt and later Malaysia. Four suspects were arrested, including a South Sudanese national and a person from Uganda.

Radio Tamazuj: <http://bit.ly/1tujqQj>, 17 June 2016

SPAIN: In May 2016 it was reported that the Nature Protection Service (SEPRONA) of the Spanish Civil Guard, following an investigation in collaboration with Mozambique, had seized 74 elephant tusks (744 kg) from a man in Colmenar de Oreja, south-west of Madrid, who was allegedly trying to sell the pieces using a doctored hunting licence issued in 1970 in Mozambique. The hunting licence allowed for one elephant to be killed, not 37 as the amended version of the document claimed.

NEWS 24: <http://bit.ly/1XWqqRQ>, 26 May 2016;
The Local (Spain): <http://bit.ly/2d79jOF>, 26 May 2016

TANZANIA: On 3 June 2016, at Manyoni District Court, Juma Kitwanga and Nsalamba Katuku Nsalambae were each sentenced to 40 years in gaol and both fined TZS166 500 000 (USD76 000) after being convicted of two counts of unlawful dealing in government trophies (two elephant tusks and nine elephant tails). Ramadhani Shaban and Yusto Paul were gaoled for 20 years each, plus four years in gaol or a fine of TZS1 million, after being convicted of two offences of unlawful possession of

firearms; Hamidu Nsolezi received a one year suspended gaol sentence. The offences took place between 1–4 April 2016.

Between 26 and 30 June 2016, police seized more than 666 (1200 kg) elephant tusks and arrested nine suspects during a countrywide operation to eradicate crime. The operation was conducted with the collaboration of INTERPOL in Zimbabwe and Kenya and government officials, which led to hundreds of arrests for various offences.

On 8 August 2016, at Kigoma Resident Magistrates' Court, Edward Ibrahim of Kasulu District, Kigoma Region, was sentenced to 20 years in gaol after being convicted of illegal possession of six pieces of elephant tusks. The judge said that the court had delivered the severe punishment as a lesson to the public. Acting on information, wildlife officers pretended to be ivory buyers and arrested Ibrahim after he turned up with six pieces of elephant tusks that he had agreed to deliver to them.

Daily News (Tanzania): <http://bit.ly/2e71hRe>, 6 June 2016; <http://bit.ly/2d78ULo>, 6 June 2016
<http://dailynews.co.tz/index.php/home-news/51575-9-arrested-4-6-billion-trophies-seized-in-police-interpol-operation>, 12 July 2016; <http://allafrica.com/stories/201607120116.html>, 12 July 2016
<http://bit.ly/2dVXVII>, 9 August 2016

VIET NAM: On 21 May 2016, police in Bac Giang province arrested a lorry driver transporting 553 kg of elephant tusks from Hanoi to Lang Son Province after he failed to present documents verifying their origin. Police officers also accused the driver of offering to pay them a bribe of VND500 million (USD22 400) to evade arrest.

On 1 October 2016, Customs officials at Noi Bai International Airport, Hanoi, seized 309 kg of ivory originating from Nigeria, falsely declared as glass.

On 6 October 2016, Customs officials at Cat Lai Port, Ho Chi Minh City, inspected a shipment arriving from Mozambique declared as "Sapele wood". Upon investigation they found 569 pieces of ivory (2052 kg) concealed inside 12 hollowed-out blocks of wood. Tests on the ivory by the Ecology and Biodiversity Resources indicated that it derived from African Elephants *Loxodonta africana* from various countries, including Mozambique and Angola. The Customs declaration form indicated that the owner of the cargo was a company in Tan Binh, Ho Chi Minh City. The case is under investigation.

Thanhniennews: <http://bit.ly/2dLFUKR>, 22 May 2016; <http://bit.ly/2d8Ynv8>, 2 October 2016; <http://bit.ly/2dZEkmU>, 9 October 2016; <http://customsnews.vn/prosecute-the-smuggling-case-of-more-than-2-tons-of-ivory-through-cat-lai-1376.html>, 20 October 2016

ZAMBIA: On 14 July 2016, at Nakonde Magistrates' Court, Kizito Sikazwe and Andrew Nelson Simunde were each sentenced to five years' imprisonment after being found guilty of the illegal possession of two pieces of ivory (17 kg).

Mwebantu: <http://bit.ly/2efLpkj>, 20 July 2016

MARINE

AUSTRALIA: On 12 April 2016, Van Nguyen of Cairnlea, Victoria, was gaoled for two years and eight months for his lead role in an illegal abalone poaching network. He must serve 16 months before he is eligible for parole. He was described in court as the top of one of two co-existing pyramids of abalone poachers, who would dive with associates near Warrnambool, buy his colleagues' catches and then sell his yield in Melbourne's western suburbs. Thirteen people involved in the two syndicates have been prosecuted in Victorian courts this year; the other group's head, Phong Hoai Thuy Nguyen [no relation], was gaoled for two years earlier in the year.

The Age (Australia): <http://bit.ly/1V49FE2>, 12 April 2016

CHINA: On 9 April 2016, about 100 juvenile Scalloped Hammerhead Sharks *Sphyrna lewini* (CITES II) were on sale in Sanya fish market, Hainan province. A Sanya Ocean and Fisheries Bureau (SOFB) representative confiscated a total of about 600 kg of hammerhead shark meat on sale in the market that was alleged to be bycatch. The incident is under investigation.

<http://on.china.cn/2es1Bye>; 12 April 2016;
<http://bit.ly/2e1xtWZ>, 12 April 2016

HONG KONG SPECIAL

ADMINISTRATIVE REGION: On 4 July 2016, at Kwai Chung Customshouse, authorities seized a shipment of dried shark fins (880 kg) of suspected Scalloped Hammerhead Sharks *Sphyrna lewini* (CITES II) arriving from Panama without permits.

News.gov.hk: <http://bit.ly/29ncufG>, 5 July 2016

PERU: On 7 June 2016, authorities at the Port of Callao seized some eight million dried seahorses *Hippocampus* (CITES II) from the hold of a Chinese-flagged ship bound for Asia. The Chinese captain of the ship was arrested.

Channel News Asia: www.channelnewsasia.com/news/world/peru-seizes-8-million/2892524.html, 21 June 2016

SOUTH AFRICA: On 28 April 2016, Western Cape police near Caledon arrested a man driving a heavily loaded vehicle which was found to be loaded with 14 432 of Abalones, or Perlemoen, *Haliotis midae*.

On 12 May 2016, police acting on information seized bags containing 2858 Abalones *Haliotis midae* and diving equipment from a vessel

entering Hout Bay harbour. The crew and divers on board the vessel evaded arrest by jumping onto the quayside and disappearing.

On 30 May 2016, at Khayelitsha Regional Court, Chinese nationals Jiam Liang Hong and Guohui-Li were gaoled for a year after being found guilty of contravening the *Marine Living Resource Act* in connection with the poaching and illegal processing of Abalone *Haliotis midae*. They were arrested on 9 May in Genadendal, Caledon, in Overberg District, Western Cape. They admitted operating an illegal fish processing establishment and possession of Abalones without the necessary permit. Some 25 679 dried Abalones were seized from a property.

www.iol.co.za/news/crime-courts/caledon-cops-bust-man-with-abalone-worth-r2m-2015960, 29 April 2016; *Times Live:* <http://bit.ly/2dWvOml>, 13 May 2016; *Network 24:* <http://bit.ly/2dLODLb>, 6 June 2016; *Times Live:* <http://bit.ly/1POu8T5>, 31 May 2016

PANGOLINS

All cases reported here took place prior to the adoption of proposals to transfer all pangolin species from Appendix II to I at the seventeenth meeting of the Conference of the Parties to CITES.

CAMEROON: On 30 August 2016, two people were arrested for illegal possession of 128 kg of Giant Pangolin *Manis gigantea* scales which had reportedly been transported from Tibati to Ngaoundal, where they were to be sold. A receipt recovered from one of the suspects indicated a payment for a previous wildlife trafficking offence, with subsequent investigations revealing his part in a network of pangolin traffickers.

AllAfrica: <http://bit.ly/2eSfypC>, 8 September 2016

CHINA: On 10 April 2016, authorities in waters off Zhongshan city, Guangdong province, seized 1600 kg of pangolin *Manis* scales from a speedboat. One arrest.

<http://bit.ly/1VzzRan>, 16 April 2016

HONG KONG SPECIAL

ADMINISTRATIVE REGION: On 12 May 2016, 130 kg of pangolin scales and 310 kg of animal furs [species not reported] were seized from a speedboat in Lau Fau Shan after Customs officers detected suspects loading goods onto the vessel.

On 23 June 2016, Hong Kong Customs at the Kwai Chung Customhouse Cargo Examination Compound undertaking a risk assessment seized 201 bags containing 4000 kg of suspected pangolin scales after selecting for inspection a shipment arriving from Cameroon declared as 1260 bags of sliced plastics.

On 19 July 2016, Customs officers, again undertaking a risk assessment procedure at the Compound, selected for inspection a shipment arriving from Nigeria declared as recycled plastic particles. They found 259 bags containing 7300 kg of suspected pangolin scales. As they had not been declared on the manifest, the scales were seized by Customs officers for further investigation.

The Standard: <http://bit.ly/2e9yjBK>, 12 May 2016; *Hong Kong Customs press release*: <http://bit.ly/28Ylvej>, 23 June 2016; *The Government of the Hong Kong Special Administrative Region press release*: <http://bit.ly/29RMzcr>, 19 July 2016

INDONESIA: On 15 August 2016, authorities in East Java raided a house in Jombang district and seized 657 Sunda Pangolins *Manis javanica* from freezers; one person was arrested.

The Guardian (UK): <http://bit.ly/2dXy3Yx>, 26 August 2016

KENYA: On 8 June 2016, authorities at Jomo Kenyatta International Airport (JKIA) seized 500 kg of pangolin *Manis* scales from an unaccompanied consignment bearing fake documents that had originated in Conakry, Guinea, destined for Lao PDR.

Kenya Wildlife Service: <http://bit.ly/2dczGgA>, 10 June 2016

VIET NAM: On 6 June 2016, at a court in Ho Chi Minh City, Vo Ta Dung was sentenced to one and half years in gaol after being caught in December 2015 transporting three Sunda Pangolins *Manis javanica*; two accomplices received gaol sentences of five months and 11 days, a period they had already spent in detention and they were released after the trial. Another person received a suspended sentence of one year. Dung had reportedly hired the three to transport pangolins bought from hunters in Ho Chi Minh City to a storage facility in neighbouring Binh Duong Province from where they had delivered at least 12 pangolins to buyers in northern Viet Nam.

ThanhNien News: <http://bit.ly/2dww4Wk>, 6 June 2016

ZAMBIA: On 2 July 2016, Cephas Zulu and Mayungano Musheke were sentenced to five years' imprisonment with hard labour for unlawful possession of a pangolin *Manis*. Three others were acquitted. The duo was arrested by police in Monze in November in 2015 in possession of a live pangolin without the necessary documentation.

ZNBC: www.znbc.co.zm/?p=40938, 8 July 2016

ZIMBABWE: Zimbabwe imposes a nine-year minimum mandatory gaol sentence for pangolin trade offences.

On 20 April 2016, at a court in Harare, Henry Makunde of Mbare was sentenced to nine years' imprisonment after a dead pangolin *Manis* was seized from a refrigerator at his home. Makunde's nephew, Desire Murire had reportedly found the live animal in the wild and,

with the assistance of his uncle, transported the pangolin to the latter's home. The nephew, aged 19, was considered a special circumstance on account of his age and was given a lesser sentence of two years.

New Zimbabwe: <http://bit.ly/2e7MhT4>, 20 April 2016

REPTILES

BANGLADESH: On 6 September 2016, authorities in Chittagong seized 4000 kg of shells of *Batagur* turtles (II), *Elongated Tortoises* *Indotestudo elongata* (CITES II) and Trionychidae spp. stored in sacks in a building in Khulshi. No arrests. The shipment, which had been declared as dry fish, had been destined for Hong Kong.

The Daily Star (Bangladesh): <http://bit.ly/2e1zP8q>, 8 September 2016

CHINA: On 26 July 2016, at Guangzhou Intermediate People's Court, a gang found guilty of attempting to smuggle tortoises into the country from Madagascar was gaoled for between one and 11 years. Tortoises seized at Guangzhou Baiyun Airport and at various residences included 91 Leopard Tortoises *Stigmochelys pardalis* (CITES II) and 39 Radiated Tortoises *Astrochelys radiata* (CITES I). The defendants had bought off an airport staff member (Chen Junyi) so that they were able to make use of his pass to evade Customs. The gang was arrested in April/May 2015: Chen Junyi was sentenced to five years in gaol and fined CNY50 000 (USD7500); Huang Weizhe (11-years in gaol and CNY50 000 worth of property forfeited); five others were gaoled for between one year and nine months, and seven years. The tortoises had been packed in tinfoil and placed in canvas sacks in Madagascar; Chen Junyi was arrested at the airport during a routine inspection; he was carrying two backpacks containing 316 tortoises; later that day Huang Weizhe was arrested as he arrived at the airport to collect the consignment.

<http://bit.ly/2e5VDEJ>, 28 July 2016

INDONESIA: On 6 April 2016, 40 Green Turtles *Chelonia mydas* (CITES I) were confiscated in Karangasem, Bali, during a routine patrol. The turtles had their flippers tied; one perished but the others were being observed at Serangan Center with a view to being released. Three fishermen from Madura were taken into custody.

On 16 April 2016, 70 Green Turtles *Chelonia mydas* (CITES I) (one perished) were recovered from a boat in Padei Village, Menui Island, central Sulawesi, destined for Bali, reportedly to be sold as meat.

On 30 August 2016, authorities in West Java foiled an attempt to smuggle 2000 python (CITES I/II) skins from Palembang, South Sumatra to Surabaya, East Java, by courier. Officers stopped the lorry holding the skins in

Cikupa toll road, Tangerang, Banten. Some 800 skins of monitor lizards *Varanus* (CITES I/II) (and dozens of live bonytongue fish) were also seized. No permit accompanied the shipment.

www.facebook.com/176585509072713/videos/1163501477047773/, 7 April 2016; *Metroballi*: <http://bit.ly/2dJGCFZ>, 7 April 2016; *Kontan.co.id*: <http://bit.ly/2dL7d48>, 18 April 2016; <http://bit.ly/2e9Br08>, 29 August 2016; <http://bit.ly/2dRVOA9>, 30 August 2016

MALAYSIA: On 12 May 2016, at Kuala Lumpur International Airport, two Customs officers were detained by officials after 55 Black Pond Turtles *Geoclemys hamiltonii* (CITES I) wrapped in tape were found in bags arriving on a flight from Dhaka, Bangladesh.

On 2 June 2016, Royal Malaysian Customs officers at Port Klang seized a shipment of 508 Black Pond Turtles *Geoclemys hamiltonii* (CITES I) that had been placed in 76 sacks with a cargo of potatoes. The consignment had come from Karachi, Pakistan, via Myanmar, and was reportedly destined for the restaurant trade.

On 1 August 2016, in Kuala Lumpur, Indian nationals Nagoor Kani Kamal Basha and Nizamudeen Shamsudeen were each gaoled for 24 months on three counts of keeping 36 Black Pond Turtles *Geoclemys hamiltonii* (CITES I) without a permit and causing pain to the reptiles.

<http://bit.ly/2dcD3nN>, 12 May 2016; *www.bharian.com.my/node/160497*, 3 June 2016; *Royal Malaysian Customs pers comm. to TRAFFIC*, 13 June 2016; *The Star*: <http://bit.ly/2dXAyKl>, 1 August 2016

PAKISTAN: On 9 September 2016, 780 live Spotted Turtles *Clemmys guttata* (CITES II) were seized during a raid on a house in Karachi. Six Pakistani suspects were granted bail on the surety of Rs50 000 (USD750) each on condition that they deposit the amount the same day; three Chinese nationals and three Pakistanis were also taken into custody during the raid for allegedly illegally trapping and trading the wild animals. The Sindh Wildlife Department has been ordered by a court to release the turtles at specified locations in the Indus River.

The Express Tribune: <http://bit.ly/2egaQIL>, 10 September 2016

UGANDA: On 16 May 2016, the Uganda Revenue Authority (URA) impounded 152 Leopard Tortoises *Stigmochelys pardalis* (CITES II) from a vehicle in the Eastern Uganda district of Mbale; the specimens were handed over to the Uganda Wildlife Authority (UWA) with the aim of returning them to Nakapiririt where the smugglers were alleged to have sourced the reptiles.

AllAfrica: <http://allafrica.com/stories/201605180222.html>, 17 May 2016; *The Insider*: www.theinsider.ug/two-arrested-for-smuggling-152-tortoises, 17 May 2016

USA: On 13 April 2016, at the US District Court for Eastern District of Michigan, Kai Xu, a Canadian citizen of Chinese origin, was sentenced to almost five years in gaol for smuggling turtles to China, including Eastern Box Turtles *Terrapene carolina*, Diamondback Terrapins *Malaclemys terrapin* and Spotted Turtles *Clemmys guttata* (all CITES II), as well as Red-eared Sliders *Trachemys scripta elegans*, one of the world's most invasive species. Xu had smuggled the turtles out of the country using three methods: repackaged and shipped directly to China, concealed in snow boots; on one occasion with 51 live turtles taped to his legs and groin; and, on the day of his arrest in September 2014 at Detroit Metropolitan Airport, 1000 turtles had been packed in boots and cereal boxes inside suitcases that he sent with a runner he had hired to fly directly from Detroit to Shanghai. As part of his sentence, he was ordered to pay USD17 000 in restitution for the care of the turtles, which were placed with Detroit Zoo.

On 6 May 2016, Olga Jimenez and her husband Luis Jimenez of southern California were each sentenced to six months' imprisonment for smuggling more than 900 eggs of Olive Ridley Turtles *Lepidochelys olivacea* and Kemp's Ridley Turtles *L. kempii* (both CITES I) across the border from Nayarit, Mexico, in November 2014. The couple intended to sell the eggs on the black market for use in Asian delicacies. They were also ordered to pay USD9000 in restitution to the Mexican government for stealing its natural resources and were placed on probation for three years.

US Department of Justice media release: <http://bit.ly/2e7Mfe5>, 13 April 2016; Detroit News: <http://detne.ws/2dL5Cvn>; 26 September 2014; <http://bit.ly/1oBcSNW>, 20 February 2016; Courthouse News Service: <http://bit.ly/2dkMTYb>, 6 May 2016

RHINOCEROSES

All species of Rhinocerotidae are listed in CITES Appendix I except the South African and Swaziland populations of *Ceratotherium simum simum*, which are listed in Appendix II.

CAMBODIA: On 17 August 2016, at Phnom Penh International Airport, the luggage of a Chinese man travelling from Namibia via Doha,

Qatar, was found to contain eight pieces of rhinoceros horns (4.38 kg).

The Cambodia Daily: <http://bit.ly/2dL8ZT4>, 17 August 2016

HONG KONG SPECIAL

ADMINISTRATIVE REGION: On 14 May 2016, at Hong Kong International Airport, Customs officials seized five pieces of suspected rhinoceros horn (10 kg) from an express air parcel that had been declared as "resin crafts" originating from South Africa. Suspicious images of the cargo were found during X-ray inspection. One person was arrested and released on bail pending further investigation.

Hong Kong information service press release: <http://bit.ly/2e7MKF4>, 17 May 2016

MOZAMBIQUE: On 2 May 2016, at Maputo International Airport, authorities arrested a Vietnamese citizen, bound for Nairobi, who was found to have in his luggage 11 White Rhinoceros *Ceratotherium simum* horns (total of 22 kg) and rhinoceros horn pieces disguised as cylinders.

<http://bit.ly/2dcCWJ3>, 8 May 2016

SOUTH AFRICA: In May 2016, at Bushbuckridge Magistrates' Court, Mpumalanga, two Mozambican nationals were sentenced to 21 years in gaol for a range of crimes, including trespassing in Kruger National Park (KNP), possession of an unlicensed firearm, possession of ammunition and conspiring to poach. They had been arrested in April in Mkhuhlu, near KNP. The police were acting on information that the suspects were planning to poach rhinoceroses.

SABC: <http://bit.ly/2dwqnJE>, 7 May 2016

FLORA

BRAZIL: On 30 June 2016 authorities reportedly dismantled the country's largest illegal logging and land-grabbing organization. Twenty-four arrest warrants were issued as part of a three-year investigation into the country's largest illegal logging ring, which authorities believe is responsible for the deforestation of around 10 000 hectares of Amazon forest over a two-year period. The

syndicate allegedly operated as a business through the use of sophisticated technology and companies to launder the money generated from the illegal logging operation. The person accused of leading the operation's financial division is being sought.

Meanwhile, law enforcement officials discovered new methods of deforestation that logged the forest from beneath the tree canopy and left a vegetation cover that eluded satellite surveillance. It is reported that among the gang members were experts with satellite monitoring knowledge who would review data to plan their logging activities.

Telesur: <http://bit.ly/29hb2x3>, 2 July 2016

CAMBODIA: On 19 July 2016, forestry officials in Preah Vihear province confiscated more than 1100 kg of rosewood *Dalbergia* (CITES I/II/III/NC) from two cars which had failed to stop when forestry officials attempted to pull the drivers over in Choam Ksan district.

The Cambodia Daily: <http://bit.ly/2dcDvma/>, 20 July 2016

INDIA: On 14 April 2016, police acting on information seized nearly 1500 kg of smuggled Red Sanders *Pterocarpus santalinus* (CITES II) at Katigundenahalli in Hosakote taluk where it had been stored in the garden of three houses. The offenders, who were known to police but had fled, were reportedly using the village as a transit point.

On 16 April 2016, Kadapa police arrested four forest officials and 12 others and seized 2500 kg of logs in two incidents in the district. The officials were charged with having links with inter-State Red Sanders smugglers in Karnataka, receiving bribes and facilitating smuggling of nearly 300 000 kg of Red Sanders logs in the last four to five years by guiding woodcutters of Tamil Nadu, piloting their vehicles, providing police clearance and extending logistic support.

On 20 April 2016, Customs officials at Mundra port, Ahmedabad, recovered 17 500 kg of Red Sanders logs concealed in bags of maize from a vessel that had already started on its journey to Sharjah. The container had been loaded in Delhi under Central Excise supervision and transported to Mundra by rail. As it had already been cleared in Delhi, it was loaded directly onto the vessel.



Five pieces declared as "resin crafts" arriving at Hong Kong International Airport by air from South Africa were found to be suspected rhinoceros horn.

On 29 April 2016, 5000 kg of Red Sanders logs were seized in the Mamanduru forest in Seshachalam hills. After questioning, one led forest personnel to the 100 logs. Another person escaped.

On 30 May 2016, police on night patrol in Kancheepuram district, Chennai, seized 1000 kg of Red Sanders logs from an abandoned lorry.

On 29 June 2016, four inter-State smugglers and 24 local operatives were arrested in two incidents in Vurlagaddapodu of Railway Kodur mandal and Gadela ST Colony of Obulavaripalle mandal in Kadapa district. A total of 58 Red Sanders logs weighing 1516 kg was seized.

On 30 June 2016, police in Chennai seized 237 Red Sanders logs (7000 kg), plus weighing machines and woodcutting instruments. This action follows the arrest of a smuggler in May and to the arrest of a further two alleged smugglers in Chennai who had purchased the logs from smugglers. Another person was arrested on 14 June.

In early July 2016, at Chennai port, authorities seized a container holding 36 000 kg of Red Sanders (652 logs) being loaded onto a ship bound for United Arab Emirates (UAE). Further information led them to more logs (amount unreported) being stored at Vanagaram. A number of arrests.

On 11 August 2016, Red Sanders Anti-Smuggling Task Force (RSASTF) personnel recovered 58 Red Sanders logs (2000 kg) in forest 25 km from Tirupati. Three persons were arrested in Mamanduru forest area.

On 31 August 2016, Tirupati police seized 9586 kg of Red Sanders logs in Ponduru village in Kanchipuram district, Tamil Nadu, plus a lorry, weighing and woodcutting machines, following interrogation of suspects arrested on 19 August.

The Hindu: <http://bit.ly/2dkTaDm>, 15 April 2016; *The Hindu*: <http://bit.ly/2dJMzSY>, 17 April 2016; *The Times of India*: <http://bit.ly/2dkUrtX>, 21 April 2016; *Business Standard*: <http://bit.ly/2dJOLdJ>, 30 April 2016; *Times of India*: <http://timesofindia.indiatimes.com/city/chennai/1-tonne-red-sanders-seized-on-GST-Road/arclshow/52530080.cms>, 1 June 2016; *The Hindu*: <http://bit.ly/2e9Id65>, 30 June 2016; *The Hans India*: <http://bit.ly/2dkUi9U>, 2 July 2016; *New Indian Express*: <http://bit.ly/2dJOoJg>, 10 July 2016; *The Hans India*: <http://bit.ly/2dXLEz2>, 11 August 2016; *The Hans, India*: <http://bit.ly/2ZesiGzI>, 1 September 2016

INDONESIA: On 8 August 2016, at Supadio Airport, Pontianak, West Kalimantan, authorities seized 712 nationally protected *Nepenthes* (CITES I/II) plant parts, arriving from Singkawang, West Kalimantan, reportedly en route to Jakarta.

www.pontianakpost.com/bksda-kalbar-gagalkan-penyelundupan-712-kantong-semar, 9 August 2016

PERU: On 22 April 2016, 19 members of an illegal logging gang were arrested in Ucuyali, in the Amazon rainforest, including two police officers and two regional forestry officials. The gang was characterized as the "mafia of illegal logging." Two lorries and a trailer loaded with timber and money were seized. The principal destination for the logs had been China, Mexico and the USA. Prosecutors estimated that the illegal logging ring was exporting about 300 cubic metres of illegal timber per month for the past six years. The gang's main target was *Dipteryx micrantha*.

The Peruvian Government's Independent Forest Sector Oversight Agency (OSINFOR) is reported to have found evidence of illegal practices in 93.75% of logging operations it audited.

<http://bit.ly/1pWjZ3p>, 27 April 2016

THAILAND: In April 2016, authorities seized 3153 logs in separate raids in several provinces; at one timber processing plant in Nakhon Pathom province they seized Siam Rosewood *Dalbergia cochinchinensis* (CITES II) and *D. olivieri*; the plant's two owners were taken into custody. Their company has allegedly been exporting processed wood to foreign markets such as China. Subsequent raids seized wood in Samut Prakan, Chanthaburi and Pathum Thani, all with links to the timber seized in Nakhon Pathom. Nine people were arrested. The combined task force seized a total of 188 pieces of Siam Rosewood, 2950 pieces of *Dalbergia olivieri* wood and 15 pieces of teak *Tectona grandis*.

Environmental Investigation Agency: www.facebook.com/environmentalinvestigationagency/19330647110156729695385648/?type=3

OTHER / MULTI-SEIZURES

CAMEROON: On 9 June 2016, two people were arrested by the Upper Nyong Divisional Delegation of Forestry and Wildlife and police in Abong Mbang in possession of 9 Chimpanzee *Pan troglodytes* (CITES I) skulls. The couple had travelled from Somalomo, near Dja Faunal Reserve. It was discovered that the group (which included one other who evaded capture on this occasion), regularly ferried Chimpanzee meat from Somalomo to Abong Mbang and Yaoundé for sale.

Camer.be: <http://bit.ly/2d7KHVh>

CHINA: On 5 May 2016, a liquor manufacturer in Zengcheng District of Guangzhou, Guangdong Province (surnamed Liang) was sentenced to 10 years and six months in gaol/ fined CNY50 000 (USD7690) for making alcoholic drinks containing derivatives from animals such as Water Monitor *Varanus salvator* (CITES II), Tokay Gecko *Gekko gekko* and Greater Coucal *Centropus sinensis*, all species under State protection. Police seized 24 bottles of the illegal liquor during an investigation into

the company in January 2015. Liang surrendered to police months later.

On 23 May 2016, Yang Xiaoxiao was sentenced to 10 years in prison and fined CNY10 000 (USD1500). This prosecution relates to a case from July 2014, when police in Putian City, Fujian Province discovered a group selling wildlife products to buyers in China via social media, including rhinoceros horn carved cups, ivory carvings, and casques of Helmeted Hornbills *Rhinoplax vigil* (all from CITES I species). Sichuan forest police arrested 11 people and seized 1200 pieces of wild animal products in what is reported to be the largest haul of illegal wildlife seized in the province in recent years.

On 7 June 2016, at Yongjia County People's Court, Zhejiang Province, 32 people from 10 provinces and cities were gaolled for illegal trade in wildlife, including pangolins *Manis*, bear claws and salamanders. One person, surnamed Kan, was gaolled for 13 years and fined CNY130 000 (USD19 500). Four were sentenced to over 10 years in prison and Kan's wife to six years. Others received suspended gaol terms of between four months and three years. More than 10 of the defendants are owners of restaurants and clubs who bought the animal parts and processed them as food.

ECNS Wire: www.ecns.cn/cns-wire/2016/05-05/209392.shtml, 5 May 2016; *China Wildlife Conservation Association*: <http://bit.ly/2eglyPM>, 16 January 2016; <http://bit.ly/2esjEEy>, 27 May 2016; *China.org.cn*: www.china.org.cn/environment/2016-06/08/content_38625076.htm, 8 June 2016

HONG KONG SPECIAL

ADMINISTRATIVE REGION: On 22 June 2016, at Tuen Mun Magistrates' Courts, a man was sentenced to two months in gaol and fined HKD5000 (USD645) for smuggling 99 kg of ivory (CITES I), seven kg of casques of Helmeted Hornbills *Rhinoplax vigil* (CITES I) and two kg of agarwood *Aquilaria* (CITES II) in his luggage. He was arrested in his car on 19 May at Shenzhen Bay Control Point, en route to mainland China.

<http://hongkong.coconuts.co/2016/06/24/man-jailed-2-months-fined-hkd5000-smuggling-hkd-1-million-worth-ivory-hornbill-and>, 24 June 2016

KUWAIT: In early September 2016, coastguards inspecting foreign ships that were heading to Doha Port, Qatar, intercepted an Iranian-registered vessel that was found to be transporting a consignment of 100 Asian Houbara *Chlamydotis macqueenii* (CITES I and IUCN: Vulnerable). The species is in demand in the region for use as live prey in falconry training. Also seized were 16 falcons of various species, mostly Peregrine Falcon *Falco peregrinus* (CITES I). Kuwait Environment Protection Society investigated the case and confirmed that all the birds on board had been poached from the wild and transported without legal documents. The offenders were taken into custody.

BirdLife International: <http://bit.ly/2e9MLtr>, 8 September 2016



TRAFFIC

IN FIVE SEPARATE OPERATIONS OVER A FIVE-DAY PERIOD IN AUGUST, AUTHORITIES IN PENINSULAR MALAYSIA SEIZED HUNDREDS OF PIECES OF ELEPHANT IVORY, PANGOLIN SCALES, TWO TIGER SKINS, BONES OF A BIG CAT, BEAR AND TIGER TEETH AND CLAWS, GALLBLADDERS AND AT LEAST 45 TIPS OF HORNBILL BEAKS (ILLUSTRATED).

MALAYSIA: During a five-day period in August 2016, Peninsular Malaysia's Department of Wildlife and National Parks (Perhilitan) seized animal parts including elephant ivory (CITES I), pangolin *Manis* (CITES II) scales, two Tiger *Panthera tigris* (CITES I) skins, bones of a big cat, bear and Tiger teeth and claws, gallbladders, the casque of a Helmeted Hornbill *Rhinoplax vigil* (CITES I) and at least 45 tips of hornbill beaks. Two Malaysians, two Chinese and eight Vietnamese nationals were arrested at five locations near Kuala Lumpur. The provenance of the seized items is not known. Perhilitan's forensics lab were to conduct DNA tests on the items.

TRAFFIC: <http://bit.ly/2bW5w0O>, 2 September 2016

NETHERLANDS: On 17 August 2016, authorities seized over 2000 kg of coral and animals parts from an office building and five warehouses in Brabant. The find was made during an investigation launched after 345 kg of coral was recovered from a shipping container arriving from China at the Port of Rotterdam without an accompanying permit. According to an environmental police spokesperson, the coral alone represents a complete coral reef, with some pieces over 100 years old. It took the authorities three days to search through the haul, which also included snake and lizard skins, skulls of turtles and monkeys, swordfish horns, mounted crocodiles, bones of several different animals and ivory (CITES I/II) jewellery.

DutchNews.nl: <http://bit.ly/2esmxoI>, 29 August 2016; <http://bit.ly/2dMsZC5>, 29 August 2016

NIGERIA: On 10 June 2016, at Murtala Muhammed International Airport, Lagos, Customs officials arrested two Chinese nationals for attempting to smuggle out of the country 678 pieces of raw and processed elephant tusks (CITES I) and 381 kg of pangolin *Manis* (CITES II) scales.

The Guardian: <http://bit.ly/2dkX0w6>, 11 June 2016

RUSSIA: On 27 July 2016, some 525 bear paws were seized by authorities from a local resident in the Khabarovsk Region. The body parts—later confirmed as coming from both Brown Bear *Ursus arctos* (CITES I/II) and Himalayan Black Bear *U. thibetanus* (CITES I)—were due to be shipped to Tongjiang city in the Heilongjiang province of China (also seized were 3978 mustelid skins).

The Siberian Times: <http://bit.ly/2ahqeNM>, 27 July 2016

THAILAND: On 1 June 2016, at least 40 dead Tiger *Panthera tigris* (CITES I) cubs were discovered in a freezer inside a temple in Kanchanaburi province west of Bangkok on the third day of an operation by wildlife authorities to remove 147 Tigers from the temple. The management of the temple had repeatedly resisted efforts by the Department of National Parks to remove the Tigers and only relented when officials issued a court order. The temple promoted itself as a wildlife sanctuary, but in recent years had been investigated for suspected links to wildlife trafficking and animal abuse. Wildlife activists have accused the temple's monks of illegally breeding tigers, while some visitors have said the animals appeared to be sedated. The temple denies the accusations. It was reported that the animals would be sent to State-owned sanctuaries.

<http://bit.ly/2e80yPZ/>, 1 June 2016

USA: On 24 June 2016, Joseph Chait was sentenced in Manhattan to one year and one day in gaol, three years of supervised release, and fined USD10 000 after pleading guilty to conspiring to smuggle wildlife products that included rhinoceros horn, elephant ivory, hornbill products and coral between 2008 and 2013.

United States District Court Southern District of New York: <http://bit.ly/2d7LmWJ>; Reuters: <http://reut.rs/28NsAxQ>, 22 June 2016; iThink: <http://bit.ly/2e9NOcG>, 24 June 2016

VIET NAM: On 10 May 2016, 680 suspected Tiger *Panthera tigris* (CITES I) claws were seized from a house in Dien Chau district, Nghe An province. The owner stated that he had purchased the claws in Lao PDR, and transported them across the border to Viet Nam; they were intended to be carved into trinkets.

A forensic analysis of the claws was to be carried out, but it is reported that the authorities suspect they are from Tigers and that they derive from an estimated 34 animals.

On 8 June 2016, police in Mong Cai town seized 32 bear (CITES I/II) paws (58 kg) from a sack being carried by a man on a motorbike. The suspect confessed that he had been hired by a Chinese national to transport the cargo to a location near the Chinese border.

The paws were to be sent for scientific testing.

On 26 July 2016, a bag containing 18 legs of Sun Bear *Helarctos malayanus* (CITES I) (38 kg) was seized in Thanh Hoa province from a bus travelling from Lao PDR. The destination of the cargo was unknown.

VN Express: <http://bit.ly/2dLgQ36>, 11 May 2016; <http://bit.ly/2dMxJxW>, 10 May 2016; The Nation: <http://bit.ly/2dwxwtu>, 9 June 2016; Nature World News: <http://www.natureworldnews.com/articles/26136/20160802/sun-bear-legs-found-bus-vietnam.htm>, 2 August 2016

ENHANCING REGULATORY TOOLS TO LEGAL TRADE IN TIMBER AND NON-



CUONG NGUYEN / TRAFFIC

An effective, enabling and needs-tailored policy and regulatory environment provides the backbone to incentivizing sustainable and legal trade in wild plants, both timber and non-timber products. Combined with an adequate capacity for implementation at the national level, the enforcement of such policy and regulatory environments serves to discourage illegal and unsustainable trade both in the countries of origin and in transit, and encourages the responsible consumption of wild plants. Policy and regulatory frameworks addressing wildlife trade interact with a number of other approaches, voluntary actions by businesses and interplay with voluntary certification standards and with local governance systems supporting responsible production. This article sets the context of trade in wild plants and the existing regulatory and policy environment, provides examples of tools and approaches to ensure that current systems facilitate responsible trade, and provides ideas for further research and action.

Context of trade

Timber: Over the past three decades, the rate of deforestation around the world has been alarmingly high. Between 1990 and 1995, it is estimated that the net deforestation rate was 13.7 million ha per year in natural forests in developing countries and in the last decade, the average net loss was 5.2 million ha per year (FAO, 2012). Wood removals globally have been valued at about USD100 billion annually between 2003 and 2007 (FAO, 2010). The wood trade globally, including value-added timber products such as door panels, flooring, furniture, is more significant, one quote measuring it at USD327 billion annually (Nellemann, 2012). Timber trade contributes to national economies through royalties and fees, and the taxation of timber industry revenue. Due to its economic contribution, much of the international focus has been on illegal logging and timber trade. The annual loss of revenue and tax income caused by illicit timber trade has been estimated at USD30 to USD100 billion (Nellemann, 2012), however the nature of illegal trade means that estimates are unreliable. A comparison of Customs data can demonstrate major unauthorized flows of timber. For example, TRAFFIC's studies of Indonesia's timber trade flows to Japan and other major markets showed major discrepancies, despite the bans on exports of logs and rough sawn timber (Chen, 2008). Political will, corruption and closed door policies have continued to hamper efforts to address the challenges of illegality.

▲ Processing *Jiaogulan Gynostemma pentaphyllum*, Nam Xuan Lac collector co-operative, Bac Kan province, Viet Nam, May 2016.

SUPPORT SUSTAINABLE AND TIMBER PLANT PRODUCTS

Non-timber forest products (NTFPs): Wild plants, fungi, and lichen are a significant source of ingredients used in the pharmaceuticals, cosmetics and food industries, and in local medicines and other products supporting health and livelihoods. Such wild resources are often referred to collectively as non-timber forest products (NTFPs), but may come from many types of ecosystems and habitats beyond forests. Trade chains are typically long and complex, and end users may be unaware that materials have been collected in the wild or of their country of origin. As much of the trade is unreported and/or unregulated, estimating the scale of wild harvest is difficult. Species are traded in different forms (raw, processed), and are often aggregated in export codes, making the comprehensive trade monitoring or separation by species or origin (wild/cultivated) close to impossible (Shanley *et al.*, 2015). The global value of non-wood forest products of plant and animal origin was estimated at USD20.6 billion in 2010 (FAO, 2015), likely a substantial underestimate as these products are rarely captured in national statistics (Shackleton and Pandey, 2014). Estimates of the scale of trade are dependent on Customs codes, which can be challenging to include comprehensively given the variety of species involved and the difference between how they are captured in national reporting. A recent study estimates the export of medicinal and aromatic plants (both wild-collected and cultivated) from China at over 1.3 million tonnes, with a reported Customs value of over USD5 billion (International Trade Centre, 2016). The global reported trade in plants for medicinal purposes alone (Customs code HS1211, a subset of those analysed in the International Trade Centre study) was valued at over USD3.4 billion in 2014¹, and is increasing. Pressures on wild resources pose major ecological and socio-economic challenges to traded species, other plants and animals, and the livelihoods of those depending on harvests and trade, and growing market demand is an important factor in increased harvesting pressure.

EXISTING REGULATIONS AND CONTROLS

Timber: There is a growing understanding and acceptance of sustainable production, supply chain development, and consumption among industry and consumers alike. Transparent forest governance based on legality and sustainability is also a critical element of efforts to reduce the contribution of forest loss and degradation to climate change. Although only used for a handful of species, internationally, CITES (Convention

on International Trade in Endangered Species of Wild Fauna and Flora) remains the main mechanism used to address the illegal and unsustainable logging and trade in timber.

National legal measures for trade in timber that have international reach include the US *Lacey Act*, the EU *Timber Regulation* (EUTR), and Australia's *Illegal Logging Prohibition Act*. They provide a legal basis to action if the imported products can be proven to have violated the laws in the country of export. Such far-reaching authority to defend the regulation of another country is rare. Strong policies are critically important for bringing responsible forestry and trade into the mainstream, however there is often a gap between the development and implementation of market-based legislations and the ability of companies to understand these requirements. Here, the lack of legal harmonization in government forestry management structures and a variety of regulations covering timber trade in the countries of processing and origin makes it difficult for exporters to provide and prove the supplies of legal timber.

Customs approval is required for imports and exports in international trade. A TRAFFIC review uncovered an important gap in the verification of shipments: while it is mandatory for declaration forms to accompany all exports, these are not being submitted for verification in the importing countries and Customs are verifying incoming shipments on the basis of accompanying business documents (invoices) or shipping documents (e.g. bills of lading) (Chen, 2008).

Customs forms data, based usually on business documents, are used to compile national statistics, however there are occasional discrepancies in trade data reported in national statistics of exporting and importing countries. These discrepancies are frequently too significant to be accounted for by legitimate reasons: they are also typically due to smuggling, laundering and mis-specification at the border.

NTFPs: Traditionally an economic activity with little regulation or informal controls, over the past few decades regulation of the harvest and trade of NTFPs has become much better incorporated into legislation, e.g. through the expansion of forestry law. There is generally less control of legality and sustainability in comparison to timber trade, and a lack of management planning for the majority of harvested species (Laird *et al.*, 2009). At the subnational level, customary law and traditional use systems for resource management are important in governing use. While they often prove very effective in managing local harvests, without formal legal status they may be overwhelmed by sudden increases in demand. Traditional systems are vulnerable to knowledge loss and weakening of local institutions and customary management/controls through the high levels of rural-urban migration.

¹UN Comtrade database, accessed 14 March 2016 (<http://comtrade.un.org/db/>). Export value of products reported in code HS1211 in 2014.

CITES and the CBD (Convention on Biological Diversity) provide entry points to regulating trade in NTFPs and the development of national policy and regulatory mechanisms. For many plant species, controls under CITES provide the key legal instrument to address the sustainability and legality of international trade, including the Non-Detriment Finding (NDF)² determination for Appendix II species before they are permitted to be exported. Within the CBD, the Nagoya Protocol on Access and Benefit Sharing (UNEP, 2010) is being enacted through national legislation, while the Global Strategy for Plant Conservation provides an important set of targets (including on trade and sourcing). The contribution of wild plants to biodiversity conservation and human health is referenced in the Guidelines on Conservation of Medicinal Plants (WHO, IUCN and WWF, 1993).

At the national level, control of use and trade is often characterized by overlapping legislative requirements, reflecting the responsibilities and objectives of different ministries, and commitments made under international agreements. As the economic importance of wild plants, their contribution to rural livelihoods and healthcare systems, and their conservation value are typically being under-recognized, the regulatory framework is often inadequate. Measures in place to regulate trade in NTFPs may separately be covering, for example, the establishment of access and resource use regimes; the protection of species and habitats; consumer protection standards (e.g. for traditional medicinal products); and the establishment of intellectual property regimes.

Where regulations on use and trade of wild plants are in place, they often lack clarity on governmental responsibilities for implementation and enforcement, as well as having a poor scientific basis. If developed without stakeholder consultation and reference to existing customary laws and institutions, as well as industry practice, the broader support necessary for implementation may be lacking. As with any other area of policy implementation, enforcement is often recognized as a bottleneck to effective implementation of even well-designed regulations.

Poorly designed and/or implemented regulations can exacerbate levels of unsustainable harvesting, and potentially result in increased levels of inequity in resource access (Wynberg *et al.*, 2015; Mulliken and Crofton, 2008). New incentives and systems can be established that undermine effective local institutions and traditional controls on access and use, taking ownership away from communities. In some cases, resource management and permit systems designed for timber have been extended to NTFPs without consideration of feasibility and appropriateness and whether sufficient resources are available for implementation (Shanley *et al.*, 2015). The result can be a highly bureaucratic and ineffective system, creating new bottlenecks, opportunities for corruption and incentives to bypass the law.

EXAMPLES OF TOOLS TO ENABLE BETTER REGULATIONS AND POLICIES

Timber: Common Legality Framework and Customs Export Declaration Guidance. In order to support the development of timber trade policy and the effective implementation of existing laws, TRAFFIC and WWF's Global Forest and Trade Network (GFTN) developed the Common Framework for Assessing Legality of Forestry Operations, Timber Processing and Trade, known as the Common Legality Framework. This framework enables governments and companies to access and understand relevant aspects of laws, regulations, administrative circulars and contractual obligations that affect forestry operations, timber processing and trade. Applied to a specific country, the framework is known as a National Legality Framework. It allows for harmonization of the way in which legislations can be viewed, compiled, analysed and clarified. This tool should be able to assist stakeholders to understand what it means to be legal and to verify the legality in their supply chain. To date, the Common Legality Framework has been enshrined in national laws in 16 countries. In practical terms, the application of the Common Legality Framework has been used to help regulators and companies understand what is legal (both in exporting and importing countries). In Tanzania, the framework was used to develop the government audit checklist along the supply chain. In Namibia, the Framework is used to evaluate and assess the relevant national legislation and supply chains. In Malaysia, the Forest Stewardship Council (FSC) national Steering Committee considers the use of the National Legality Framework as a foundation for national standard-setting. In Viet Nam, the national legality framework was used as the key reference in developing the Forest Law Enforcement, Governance and Trade (FLEGT) legality definition.

The proposed Customs export declaration guidance has been piloted for use by Customs border co-operation between Kenya and Tanzania under the East Africa Zanzibar declaration umbrella of activities to combat illegal timber trade among East African countries.

NTFPs: The FairWild Standard and wild plant resources use and trade. The FairWild Standard (FWS) was developed through a multi-stakeholder consultation process with the aim to support improved governance and management of wild plants in trade (FairWild Foundation, 2010). It provides best practice guidance for sustainable harvest and equitable trade of wild plants, fungi and lichen. It comprehensively covers social, environmental and economic issues. Recognizing the difficulties in establishing effective regulations, the FWS was intended to play an important role in managing the sustainability of harvest and trade through voluntary compliance mechanisms, and supporting implementation of existing laws.

²An NDF decision is a science-based assessment to ensure that export of a species will not be detrimental to its survival. Guidance on NDFs is provided through CITES Resolution Conf. 16.7, although each Party may decide their own methodology. The German CITES Scientific Authority (Bundesamt für Naturschutz, BfN), TRAFFIC and WWF Germany have developed a nine step process for NDFs for perennial plants http://www.bfn.de/0302_ndf+M52087573ab0.html. These steps include evaluating both conservation concerns and management measures that may be in place to mitigate identified risks. Draft guidance for timber NDFs is also under development.

The FairWild Standard principles are not aligned to any specific national laws. It is a private standard, the content of which is not subject to regulation. However, compliance with laws, regulations and agreements is its core feature. In addition to compliance with requirements relevant to wild collection and trade, references to legislative and regulatory frameworks is made throughout other parts of the FWS, e.g. under social and economic criteria on labour rights, health and safety, minimum wage, etc. Compliance is not limited to those rules established by the State. FairWild also includes requirements of respecting traditional uses, practices and customary rights, whether or not these are enshrined in national law.

FairWild has informed the development of resource management systems at local, regional and national levels, and supported other voluntary actions on sustainable sourcing by industry. It was used to inform the resource management systems on a species or area basis, for example the development of sub-national regulations on NTFPs use in Bosnia and Herzegovina (Timoshyna, 2010; TRAFFIC, 2015), and also in South Africa and Lesotho with the development of the *Pelargonium sidoides* Biodiversity Management Plan (Government of South Africa, 2013; Newton and Timoshyna, 2012). Similar efforts are taking place in the Bac Kan province of Viet Nam in the context of a UK-government funded Darwin Initiative project, which aims to support the development of a provincial-level strategy focusing on the sustainable harvesting of plant resources, such as Jiaogulan *Gynostemma pentaphyllum*, the dried leaves of which are traditionally taken as a medicinal tea, and CITES Appendix II-listed *Cibotium barometz*. In the broader context of the sustainable use approaches to NTFPs, several countries integrated the implementation of the FWS in their policies translating the global commitments under the Global Strategy for Plant Conservation, including Japan and Mexico. In China, where government oversight and approval is needed for international standard schemes to operate, introduction of FairWild as a voluntary certification standard required analysis of the regulatory landscape. This was completed within a project with the traditional Chinese medicine (TCM) sector in China (Timoshyna *et al.*, 2015), and follow-up through TRAFFIC's programme in China now seeks the approval of the FWS implementation, together with local partners.

PRIORITIES FOR RESEARCH AND ACTION

Looking to the future, there are multiple opportunities where tools, including the GFTN/TRAFFIC Timber Legality Framework and the FairWild Standard, may be used to support the development and implementation of laws, regulations and policies. Often viewed and addressed separately, timber and NTFP trade systems and approaches may provide a useful overlap and synergies when implemented jointly. Some of the opportunities and important research and actions in this area include:

- A need for clear overviews of existing laws and policies covering harvest and trade in wild plant resources in order to support the implementation of the FWS, classify the boundaries of the “legality” of trade in wildlife, as well as to identify potential gaps or loopholes in the existing regulatory and policy frameworks. The implementation of the WWF-TRAFFIC-GFTN Common Legality Framework for all exporting countries, and the adaptation of the Framework to NTFPs (as well as, potentially, other wildlife resources in trade) is an opportunity to address this need.
- There is a need for greater efforts in developing new, and improving existing, laws and policies covering timber and NTFPs trade, including via the participation of multiple stakeholders, and through the integration of incentives for legal and sustainable harvesting and trade practice.
- A collection of available good practices and approaches as relevant to timber and NTFPs policy and regulations would provide a valuable resource to government agencies, resource managers and users. Such collection of good practices and approaches could form the basis of the “good practices toolkit” on developing and implementing better policies and regulations in timber and NTFPs trade, and supporting governments in implementing the CBD and CITES commitments.
- The issues of the sustainability of NTFPs harvest, management and trade should be included more explicitly under the umbrella of the sustainable forestry management (SFM) approaches and systems, providing an opportunity to increase the visibility of this important sector and contributing to conservation and livelihoods. The FWS framework can be piloted to demonstrate the usefulness of the approach for ensuring the sustainability of the target NTFPs harvest and trade, while ensuring landscape-level conservation.
- There is a need for increased visibility of NTFPs trade and better reporting of timber trade, including by encouraging the use of species-specific Customs codes in reporting (in particular for the priority NTFPs species in trade), as well as reporting via national statistics.
- Further uptake of the FWS via certification and development of effective regulation of sustainable wild harvest is needed to improve the status of wild-harvested NTFPs in trade.
- While most FWS certification pilots to date have been with lower-risk species, usually without legal protection, the certification can also support management of threatened and protected species. Certification of CITES-listed species would make a relevant and useful pilot, complementing existing CITES processes, such as NDFs.
- The FWS could also be used as a reference framework to verify compliance with public procurement policies on sustainable and legal sourcing of NTFPs, such as those increasingly being used to promote the use of legal and sustainable timber.



The launch of a UK-government funded Darwin Initiative project that is focusing on the sustainable harvesting of plant resources in Bac Kan province, Viet Nam.

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Distribution and Status. Information relating to a description of the species under discussion.

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| <input type="checkbox"/> international government organization | <input type="checkbox"/> other <i>Please specify</i> _____ |

Please specify area of interest (type "X" in square brackets):

- | | |
|--|--|
| <input type="checkbox"/> mammals | <input type="checkbox"/> fish and fisheries |
| <input type="checkbox"/> primates | <input type="checkbox"/> plants |
| <input type="checkbox"/> invertebrates | <input type="checkbox"/> forestry |
| <input type="checkbox"/> big cats | <input type="checkbox"/> medicinal (fauna and flora) |
| <input type="checkbox"/> birds | <input type="checkbox"/> general topics |
| <input type="checkbox"/> reptiles and amphibians | <input type="checkbox"/> other <i>Please specify</i> _____ |

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TRAFFIC, the wildlife trade monitoring network, is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

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