Investigating patterns of international wildlife trade in ASAP species

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AIM: Investigate and discuss patterns of international trade in ASAP species to unveil fraudulent claims of captive-breeding.

BACKGROUND: Unsustainable and illegal wildlife trade is one of the major challenges of South East Asia (SEA) and its rapid growth is threatening many CITES-listed species. An analysis of the CITES Trade database showed that over 35 million CITES listed animals have been exported from SEA between 1998 to 2007, with 4.5 million derived from captive-breeding facilities [1]. While trade in captive bred individuals can relieve pressure on wild populations, the high number of transactions of specimens claimed to be captive-bred raise concerns about the potential illegal laundering of wild caught animals declared as produced in captivity [2]. Successful breeding of threatened species on a commercial scale requires extensive knowledge in captive husbandry, good record keeping, and high standards of veterinary care. Moreover, establishing captive breeding populations capable of producing second-generation offspring takes considerable time and effort.

This is especially the case for species with slow life histories, i.e. species that mature late and produce few offspring, as for example the case in many turtles and tortoises; hence making captive-breeding unprofitable [3]. For example, the Critically Endangered Palawan Forest Turtle (Siebenrockiella leytensis) listed on CITES Appendix II, has been commercialized as captive bred, however this is unlikely, since up until 2015 it had never successfully reproduced in captivity [4]. The Palawan Forest Turtle is only one of currently 176 species in South East Asia that have been prioritized by the IUCN SSC's Asian Species Action Partnership (ASAP) focusing on critically endangered land or freshwater vertebrates occurring regularly in the region. Of these, 39 species are species listed on CITES Appendix I and 29 species are listed on Appendix II [5]. A major challenge for many countries to meet the requirements for trade in CITES-listed species to control the illegal laundering include corruption, weak law enforcement, insufficient capacity of the authorities and lack of knowledge on species captive breeding potential. In this workshop, we will work with data from the CITES Trade database to discuss and identify ASAP species at highest risk of unsustainable trade and identify species that may be illegally laundered as captive-bred to support authorities in their fight against illegal trade.

PROCESS:

1. General presentation of trade analytics of ASAP species and the CITES Trade database
2. Division into smaller working groups divided by taxa to discuss trade patterns, identify possible fraudulent claims of captive breeding and to prioritize ASAP species at highest risk of unsustainable or fraudulent trade
3. Presentation of main findings and discussion of follow up actions

RECOMMENDED READING:

Relevant definitions of CITES source codes: Captive breeding and ranching of CITES-listed animals: EU approaches to handling imports of C, F, and R specimens
http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=33543&no=40

An example of how to identify illegal laundering based on the species reproductive potential:
Nijman, V. and Shepherd, C.R. (2015). Adding up the numbers: an investigation into commercial breeding of Tokay Geckos in Indonesia. TRAFFIC.
https://www.traffic.org/site/assets/files/6060/adding-up-the-numbers.pdf

REFERENCES:

[1] Nijman, V. (2010). An overview of international wildlife trade from Southeast Asia. Biodiversity and conservation, 19(4), 1101-1114.

[2] Nijman, V., and Shepherd, C. (2009). Wildlife trade from ASEAN to the EU: Issues with the trade in captive-bred reptiles from Indonesia. TRAFFIC Europe Report for the European Commission, Brussels, Belgium. Available at: https://www.traffic.org/site/assets/files/9837/issues-with-the-trade-in-captive-bred-reptiles-from-indonesia.pdf

[3] Iverson, J. (1992). Correlates of Reproductive Output in Turtles (Order Testudines). Herpetological Monographs, 6, 25-42. doi:10.2307/1466960

[4] https://www.traffic.org/news/captive-breeding-claims-turned-turtle/

[5] CITES Appendices I, II, III https://cites.org/eng/app/appendices.php

UNEP-WCMC **technical report** no. SRG 79/5/1

Captive breeding and ranching of CITES-listed animals: EU approaches to handing imports of C, F and R specimens

Captive breeding and ranching of CITES-listed animals: EU approaches to handling imports of C, F and R specimens

Prepared for

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Introduction

Trade in commodities of CITES-listed species has seen a general shift from being predominately wild-sourced in the early years of the Convention, to being a mixture of wild and captive-bred/artificially propagated trade, with most taxonomic groups being predominantly captive-produced[1]. For animals that have been produced in captivity, there are four potential source codes that could be applied – C, D, F or R. Consistency in the application of source codes was considered by the fifteenth meeting of the Conference of the Parties in 2010. Decision 15.52 called for a guide to assist with determining source codes to be produced, which should incorporate review and feedback from the Animals and Plants Committees. IUCN were contracted by the CITES Secretariat to produce the draft guidance, and the outputs that were developed took the form of two different types of dichotomous keys. The guidance was finalised in 2017 and can be found on the CITES website[2]

The first draft of the guide was considered at AC28, and the Animals Committee recommended that more guidance was needed in cases where there is uncertainty as to whether provisions of the relevant resolutions had been met, and recommended that Parties propose ideas for case studies on species or types of production systems to support the guide. Particular areas identified in AC28 Com.7 as requiring more scrutiny related to:

- interpretation of source code F versus codes C or W, due to the ambiguity in the definition of source code F and the different ways Parties consider parental lineage when making a determination of the source;
- differences in the interpretation of source code R versus codes W or F, particularly for Appendix II species; and
- application of source code C and D, particularly in relation to questions over the purpose of production.

To complement the existing IUCN guide, this information document summarises approaches taken by EU Member States in determining the source codes to apply to CITES import applications for specimens that are derived from different captive production systems, with a focus on the three codes C, F and R. It provides the EU interpretation of source codes, as well as some case study examples that illustrate challenges in determining source codes. Specifically it includes:

- A summary of the text of the relevant EU and CITES provisions relating to captive breeding and ranching (as laid out in articles of the EU Wildlife Trade Regulations[3] and CITES Resolutions and definitions);
- A simple flow chart to summarise the key differences in production systems to assist with determining source codes relative to the definitions in the EU Wildlife Trade Regulations;
- Four case study examples that illustrate some of the challenges in determining source codes and the approaches the EU have taken.

[1] Harfoot *et al.*, submitted. *Unveiling the dynamics of the global trade in wildlife.*
[2] https://cites.org/eng/prog/captive-breeding
[3] EC Regulation No. 865/2006; EU Regulation No. 792/2012 and EU Regulation. No. 2015/57

Captive breeding: the EU context

It is important that the correct source code is applied to CITES permits to accurately describe the nature of the trade according to the definitions of the Convention and the EU Wildlife Trade Regulations. Applying the correct source code can ensure that accurate analyses of trade data can be undertaken, for example, to identify volumes, patterns, or determine the impact of the trade on wild populations. EU Member States are required to make a non-detriment finding and determine the correct source code to apply to all specimens of Appendix I and II imports.

Summary of relevant definitions

CITES Resolution 12.3 (Rev. CoP17) on *Permits and Certificates* provides the definitions for codes to indicate the source of specimens in trade. Regulation (EU) No. 792/2012 provides the corresponding definitions for all but one of these source codes in the EU context (Table 1), the definition of source code 'X' included in Regulation (EU) No. 2015/57. With the adoption of these Regulations, the CITES and EU definitions for the source of specimens in trade are consistent. Additional definitions for terms relevant to captive breeding and ranching, and the associated CITES and EU provisions, are provided in Table 2.

Table 1. Definition of codes for source of specimens in trade as outlined in CITES Res. Conf. 12.3 (Rev. CoP17) and Regulations (EU) No. 792/2012 and (EU) No. 2015/57.

Code	CITES Res. Conf. 12.3 (Rev. CoP17)	Regulation (EU) No. 792/2012 and Regulation (EU) No. 2015/57 (amending Reg. (EU) No. 792/2012)
A	Plants that are artificially propagated in accordance with Resolution Conf. 11.11 (Rev. CoP17), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5 (specimens of species included in Appendix I that have been propagated artificially for non-commercial purposes and specimens of species included in Appendices II and III);	Annex A plants artificially propagated for non-commercial purposes and Annexes B and C plants artificially propagated in accordance with Chapter XIII of Regulation (EC) No 865/2006, as well as parts and derivatives thereof
C	Animals bred in captivity in accordance with Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5.	Animals bred in captivity in accordance with Chapter XIII of Regulation (EC) No 865/2006, as well as parts and derivatives thereof
D	Appendix-I animals bred in captivity for commercial purposes in operations included in the Secretariat's Register, in accordance with Resolution Conf. 12.10 (Rev. CoP15), and Appendix-I plants artificially propagated for commercial purposes, as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 4, of the Convention.	Annex A animals bred in captivity for commercial purposes in operations included in the Register of the CITES Secretariat, in accordance with Resolution Conf. 12.10 (Rev. CoP15), and Annex A plants artificially propagated for commercial purposes in accordance with Chapter XIII of Regulation (EC) No 865/2006, as well as parts and derivatives thereof
F	Animals born in captivity (F1 or subsequent generations) that do not fulfil the definition of 'bred in captivity' in Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof;	Animals born in captivity, but for which the criteria of Chapter XIII of Regulation (EC) No 865/2006 are not met, as well as parts and derivatives thereof
I	Confiscated or seized specimens	Confiscated or seized specimens[4]
O	Pre-Convention specimens	Pre-Convention specimens[3]
R	Ranched specimens: specimens of animals reared in a controlled environment, taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood.	Specimens of animals reared in a controlled environment, taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood
U	Source unknown (**must be justified**)	Source unknown (must be justified)
W	Specimens taken from the wild	Specimens taken from the wild
X	Specimens taken in "the marine environment not under the jurisdiction of any State"	Specimens taken in the marine environment not under the jurisdiction of any State

[4] To be used only in conjunction with another source code.

Table 2. Relevant definitions relating to captive breeding and ranching based on articles of the EU Wildlife Trade Regulation and CITES Resolutions.

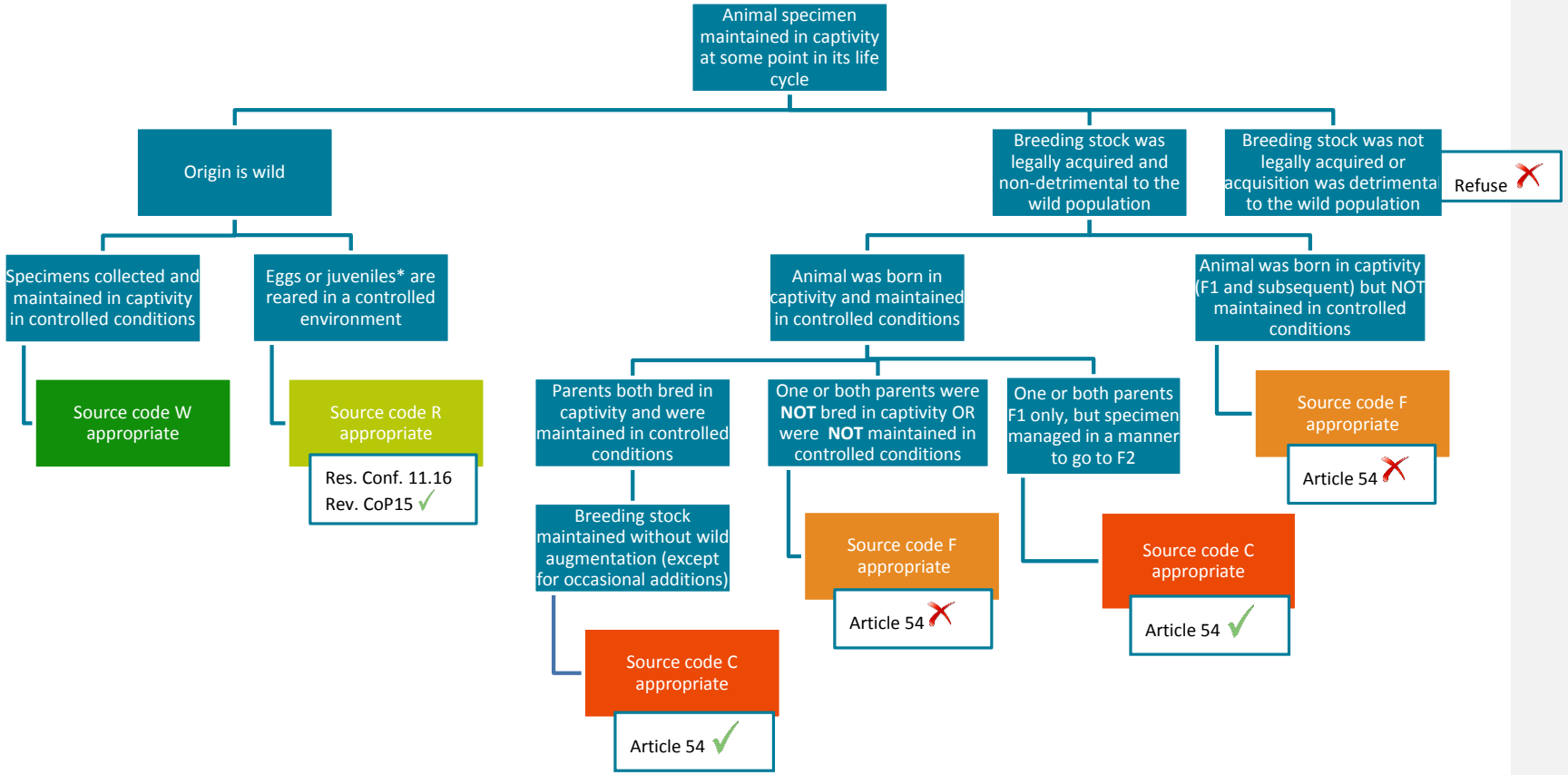
Description	Definition	Relevant provisions
Breeding stock	All the animals in a breeding operation that are used for reproduction.	Article 1 of Regulation (EC) No. 865/2006*
Controlled environment	An environment that is manipulated for the purpose of producing animals of a particular species, that has boundaries designed to prevent animals, eggs or gametes of the species from entering or leaving, and the general characteristics of which may include but are not limited to artificial housing, waste removal, health care, protection from predators and the artificial supply of food.	Article 1 of Regulation (EC) No. 865/2006*
Generation of offspring	'Second-generation offspring (F2)' and 'subsequent generation offspring (F3, F4, and so on)' means specimens produced in a controlled environment from parents that were also produced in a controlled environment, as distinct from specimens produced in a controlled environment from parents at least one of which was conceived in or taken from the wild (first-generation offspring (F1)).	Article 1 of Regulation (EC) No. 865/2006*
Ranching	The term 'ranching' means the rearing in a controlled environment of animals taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood. Note: Resolution Conf. 11.16 (Rev. CoP15) does indicate that a ranching programme must be primarily beneficial to the conservation of the local population (i.e., where applicable, contribute to its increase in the wild or promote protection of the species' habitat while maintaining a stable population); however this requirement appears to relate only to proposals to the transfer of populations from Appendix I to II for the purposes of ranching.	Resolution Conf. 11.16 (Rev. CoP15)
Specimens born and bred in captivity	Without prejudice to Article 55, a specimen of an animal species shall be considered to be born and bred in captivity only if a competent management authority, in consultation with a competent scientific authority of the Member State concerned, is satisfied that the following criteria are met: 1) the specimen is, or is derived from, the offspring born or otherwise produced in a controlled environment of either of the following: (a) parents that mated or had gametes otherwise transferred in a controlled environment, if reproduction is sexual; (b) parents that were in a controlled environment when development of the offspring began, if reproduction is asexual; (2) the breeding stock was established in accordance with the legal provisions applicable to it at the time of acquisition and in a manner not detrimental to the survival of the species concerned in the wild; (3) the breeding stock is maintained without the introduction of specimens from the wild, except for the occasional addition, in accordance with the legal provisions applicable and in a manner not detrimental to the survival of the species concerned in the wild, of animals, eggs or gametes exclusively for one or more of the following purposes: (a) to prevent or alleviate deleterious inbreeding, the magnitude of such addition being determined by the need for new genetic material; (b) to dispose of confiscated animals in accordance with Article 16(3) of Regulation (EC) No 338/97; (c) exceptionally, for use as breeding stock; (4) the breeding stock has itself produced second or subsequent generation offspring (F2, F3 and so on) in a controlled environment, or is managed in a manner that has been demonstrated to be capable of reliably producing second-generation offspring in a controlled environment. [see case study 2].	Chapter XIII, Article 54 of Regulation (EC) No. 865/2006*

*Note that definitions in Reg. (EC). No.865/2006 are consistent with those in Res. Conf. 10.16 (Rev.) on *Specimens of animal species bred in captivity*).

Flow chart for the determination of source codes

Figure 1 provides a flow chart to summarise how source codes can be determined based on the relevant CITES resolutions and definitions, and the provisions of the EU Wildlife Trade Regulations as described above in Tables 1 and 2. This flow chart provides a simple guide to aid decision-making in the EU; however, it must be noted that the considerations in Article 54 (3) and (4) that relate to whether the breeding stock is being maintained without augmentation of specimens from the wild, and whether it is being managed in a manner that is capable of producing second generation offspring [see 'Specimens born and bred in captivity' in Table 2 above], are taken into account **on a case-by-case basis**. Examples to illustrate how Article 54 (3) and (4) are applied in the EU can be found in case studies 1 and 2 respectively.

Figure 1. Flow chart for the determination of source codes based on articles of the EU Wildlife Trade Regulations and CITES definitions, with an indication of where the relevant provisions have been met (✓) or not met (✗). (* Refers to eggs or juveniles with high mortality life stages only).



Challenges to implementation: case studies

There are often factors which make determining source codes more complex, which might relate to, for example, a specific management regime for an individual species or taxonomic group. This section provides some case study examples to illustrate some of the challenges faced by EU Member States in determining the source code to apply when assessing import applications.

Case study 1. Ranching (R) vs. captive-born (source F) or captive-bred specimens (source C) – birdwing butterflies from Indonesia

Indonesia has established a number of ranching facilities for birdwing butterflies (predominantly *Ornithoptera* spp.) and has also successfully bred birdwings in captivity. The EU SRG has discussed the application of source codes on export permits for these specimens from the country. In relation to imports of *Ornithoptera croesus* and *O. rothschildi*[5], the SRG determined that in certain cases, wild specimens had been regularly added to the parental stock of the breeding facilities. The EU considers that source code F should be applied, as the production system that had been described did not appear to meet the definition of ranching outlined in Res. Conf. 11.16 (Rev. CoP15) or meet the requirements in Conf. Res. 10.16 (Rev.) or Article 54(3) of Regulation (EC) No. 865/2006 for source code C.

Whilst exports from these facilities are regularly in trade with source F, there are no general 'blanket' rules for source codes to apply on import permits for birdwings; EU Member States are required to scrutinise origin details to determine the most appropriate source code is applied on a case-by-case basis. Where facilities are breeding in controlled conditions, Member States consider whether or not there has been regular augmentation of the breeding stock with wild-taken individuals. If additional wild-taken specimens are added only very occasionally and are not comprising a large proportion of the breeding stock, then Article 54(3) could still be met and source code C may therefore be applied (assuming that all other aspects of Article 54 are met). How frequently augmentation can be considered as 'occasional' may be dependent on the reproductive capacity of the species and its rarity.

It is not the case that source code F is applied for species bred outside of the species range and source R is used for species bred inside the species range. Ranching facilities need to demonstrate that eggs or caterpillars collected from the wild in accordance with the definition in Res. Conf. 12.3 (Rev. CoP17) and Res. Conf. 11.16 (Rev. CoP15).

Case study 2: Interpretation of "*managed in a manner that has been demonstrated to be capable of reliably producing F2*" - Source code C or F?

Where an importing Member State has determined that an application for captive-bred specimens (source code C) does not met the criteria in Article 54, and the specimens are in fact only F1 generation captive-bred (source F), they may request that the export permit be changed to F to accurately reflect the actual source code. There is, however, a provision in Article 54 (and identical language in Res. Conf. 10.16 (Rev.) on *Specimens of animal species bred in captivity*) that indicates it is not necessary for a breeder to actually produce second generation offspring to meet Article 54 (and qualify for source code C). A competent authority should, however, be satisfied that the breeding stock is "*managed in a manner that has been demonstrated to be capable of reliably producing second-generation offspring in a controlled environment*."

[5] *Ornithoptera croesus* and *O. rothschildi* are considered in AC29 Doc 13.2 Annex 1 in relation to the Review of Significant Trade following CoP16

In document AC28 Doc 12, the Animals Committee concluded that additional guidance on what is meant by the language "[*managed in a manner…*]" was needed. The EU Scientific Authority guidelines[6] (in Attachment G) provide some guidance on this issue, indicating that each application should be assessed on its own merits on a case-by-case basis, taking into account a number of factors, such as:

- the number of individuals in the breeding stock
- access to unrelated F1 specimens
- genetic management (*i.e.* considering subspecies)
- previous breeding success
- sex ratio
- age at sexual maturity
- species rarity in captivity

An assessment against Article 54(4) therefore needs to include the details of the management of the current breeding group and the potential for breeding the species to F2 and beyond. It is possible that a breeder may not have previously demonstrated that they have bred the species in question to second-generation, but, for example, they are part of a coordinated breeding programme such as a European Endangered Species Programme (EEP) and the species is therefore being managed in a manner that has been demonstrated to be capable of reliably producing second-generation offspring in a controlled environment.

The assessment for an individual species/breeder can also change over time, dependent on breeding stock management practises. For example, in the early 2000's, EU Member States did not allow source code C for applications of first-generation *Haliaeetus albicilla* from Almaty Zoo in Kazakhstan. On the basis that Almaty Zoo's breeding stock was considered sufficiently large to be self-sustaining, the presence of unrelated pairs and the practise of retaining F1 offspring for future breeding, source code C was subsequently accepted for first-generation specimens of the species. However, it is considered that to be in a position to judge whether breeding is 'managed in a manner that has been demonstrated to be capable of reliably producing second-generation offspring in a controlled environment', a substantial amount of information is required about the breeding methods and the individual species concerned, and therefore this provision is used only in exceptional circumstances.

For the criterion "species rarity in captivity", the SRG consider that it would be useful to compile an index of Appendix II/Annex B species according to ease of captive breeding. This could be based on the volume of captive-bred specimens traded globally or within the EU, the reported ease of breeding success and recorded reproductive capacity for each species, with expert input as necessary. Developing a shared understanding of rarity of species in captivity may assist Member States and other Parties in determining whether it may be appropriate to use the provision "*managed in a manner that has been demonstrated to be capable of reliably producing second-generation offspring in a controlled environment*" in Article 54 of the EU Wildlife Trade Regulations as an exceptional case. Such an index could also assist the Animals Committee in prioritising species for consideration under Resolution Conf. 17.7 *'Review of trade in animal specimens reported as produced in captivity'*.

Commented [CM1]: SRG view is needed if retained

Case study 3: Non-range State exports of animals kept in wild or in controlled environments

Assessing imports of wild-taken hunting trophies from countries that are not range States for the species provides a challenge for EU Member States in determining the correct source code to apply. South Africa, for example, exports a number of non-native ungulate species that have been introduced to the country, including: *Oryx dammah* (extinct in the wild, with a former range of northern Africa only),

[6] *Duties of the CITES Scientific Authorities and Scientific Review Group under Regulations (EC) No. 338/97 and (EC) No. 865/2006.* http://ec.europa.eu/environment/cites/pdf/srg/guidelines.pdf

Ammotragus lervia (native to northern Africa only), and *Kobus leche*, which is found in South-Central Africa. These species are typically maintained on private ranches and are hunted and exported to the EU as trophies, yet various source codes are used for international exports. Trophies of *Oryx dammah* originating in South Africa and exported 2005-2014, for example, included sources C, F and W[7].

Where such animals are held with adequate fencing so that they cannot escape and are maintained with access to food when it is scarce and are treated by veterinarian surgeons where necessary, for example, source code F may be appropriate (or even C where the individuals meet the definition of captive-bred in accordance with Res. Conf. 10. 16. Rev. and Article 54). In contrast, some of the South African game ranches are extremely large and the animals are essentially in the wild, with no provision for food or care. Whilst source code W may not meet the definition of "wild" in the context of the actual range of the species, imports for source code W have been accepted by EU Member States based on the source code applied on the South African export permit (W), and as the import has been assessed to be non-detrimental to the conservation of the species in the wild. Similarly, *Ammotragus lervia* and *Antilope cervicapra* have also been imported to the EU from the United States as non-native hunting trophies with source code W from introduced populations. In these specific cases this approach has been taken by the EU.

Non-native species are recorded within the distribution section of Species+ as 'introduced' if the population is documented in the literature as introduced and as self-sustaining. Currently, this information has been located for *Kobus leche* in South Africa, and for *Ammotragus lervia* and *Antilope cervicapra* in the United States, and is reflected in Species+ as such.

Case study 4: Mixed production systems

For some taxa, breeders are simultaneously producing offspring that are:

- second generation captive bred (and therefore potentially could meet the criteria in Article 54 and Res. Conf. 10.16 (Rev.) for source code C);
- first generation captive-born individuals (source code F); and
- individuals through ranching methods (R).

If these production systems are not managed separately and resulting offspring are mixed, this presents a significant challenge for importers to determine the source code to apply. The EU has received import applications from a number of facilities that are breeding Appendix II species and are clearly not segregating individuals as F2/F1 etc. or marking individuals, as well as augmenting the breeding stock with individuals from the wild.

In cases where specimens from different production systems are mixed, one approach would be to apply the most restrictive and precautionary source code – in the case of mixed C, F and R sources this would be source code 'R'. Although in this case, some of the exported specimens would be given the incorrect code, any trade data analysis would then provide a "worst-case scenario" in terms of the impact of the trade on wild populations. However, this is not an especially satisfactory outcome, as exports to other non-EU Member States may continue using different source codes. Facilities that are not clearly segregating specimens derived from different production systems could be encouraged to improve their management to facilitate the accurate determination of CITES source codes. Resolution. Conf. 17.7 on '*Review of trade in animal specimens reported as produced in captivity*' adopted at CoP17 may assist with identifying and addressing such issues relating to mixed production systems.

[7] Source: CITES Trade Database; data downloaded 02/01/2017.

TRAFFIC

REPORT

ADDING UP THE NUMBERS

An investigation into commercial breeding of Tokay Geckos in Indonesia

OCTOBER 2015

Vincent Nijman and Chris R. Shepherd

TRAFFIC REPORT

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 .

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Front cover photograph: Portrait of a Tokay Gecko. Photo Credit: Mark Auliya/TRAFFIC

ADDING UP THE NUMBERS

An investigation into commercial breeding of Tokay Geckos in Indonesia

Vincent Nijman and Chris R. Shepherd

Portrait of a Tokay Gecko.

The Rufford Foundation
www.rufford.org

Tokay Geckos can easily be found for sale in markets in Indonesia, such as this one in Jogjakarta.

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ABBREVIATIONS AND ACRONYMS

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
BKSDA	Regional Natural Resource Management Office
PHKA	Forest Protection and Nature Conservation
USD	US Dollar

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EXECUTIVE SUMMARY

Commercial captive breeding of wildlife is sometimes viewed as a method to remove or reduce pressures of overexploitation on wild populations. But captive breeding can also be used as a mechanism to launder wild-caught specimens. This report provides evidence that laundering of wild-caught Tokay Geckos *Gekko gecko* through legally registered captive-breeding facilities in Indonesia is taking place on a large scale.

Although Tokay Geckos are not on Indonesia's list of protected species, trade in wild-caught specimens is subject to an annual harvest and export quota system. Commercial breeding of Tokay Geckos is also permitted in Indonesia and in March 2014 the Indonesian Ministry of Forestry announced that they had given permission to six companies to export a total of over three million live captive-bred Tokay Geckos for the pet trade.

The logistics involved in breeding millions of Tokay Geckos for the export market are considerable. In order to produce one million adult-sized geckos a facility would require 140 000 breeding females, 14 000 breeding males, 30 000 incubation containers in continuous use year-round, and some 112 000 rearing cages. Basic care of these Tokay Geckos would require hundreds of staff to be employed and a constant supply of food, all of which would have significant additional costs.

Of equal importance is that the exporting companies involved are not known to ever have bred this species in commercial numbers, and are known to supply the trade in wild-caught reptiles for the medicinal and meat trade, not for pets. It is therefore suspected that the majority of Tokay Geckos are intended to be exported dried and prepared for use in traditional medicines.

We argue that the investments in terms of infrastructure, space, financial commitments and staff are not matched by the amount of money that can be made from the export of Tokay Geckos, especially if they are indeed intended for use in traditional medicines. In the authors' view it is impossible to maintain and breed these animals year-round and make a profit.

The inescapable conclusion is that if the quantities reported in trade are accurate, they can only be sustained through the routine laundering of wild-caught individuals and their export as dead specimens, rather than live for the pet trade. There is no legal trade in dead Tokay Geckos from Indonesia.

Based on the findings of this report, TRAFFIC makes the following recommendations:

- Permission for commercial captive breeding of Tokay Geckos should not be issued, as such an enterprise is clearly not feasible or economically viable. Given that captive breeding permits are currently used to avoid quota restrictions on wild-caught geckos, current permits for breeding Tokay Geckos should be revoked to prevent further laundering.
- Methods to conduct Non-detriment Findings should be developed and carried out for Tokay Gecko to determine the current status of the species in the wild and to assist in determining realistic harvest and trade quotas that would not have a negative impact on the wild populations.
- There is a strong justification to include Tokay Geckos in Appendix II of CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora), which would allow the international trade to be regulated and monitored. We urge Indonesia to develop a proposal to list this species in CITES Appendix II in time for submission at the next CITES Conference of

the Parties.

- The Government of Indonesia is encouraged to list Tokay Gecko in Appendix III of CITES immediately, to allow for the international trade of this species to be better monitored through the co-operation of all CITES Parties. Such a move does not require a vote at a CITES Conference of the Parties.

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Although Tokay Geckos are commonly bred in captivity in Southeast Asia, captive breeding can also be used as a mechanism to launder wild-caught specimens.

INTRODUCTION

Regulating the trade in wildlife is one of the major challenges in contemporary conservation biology, and arguably nowhere more so than in Asia (McNeely *et al*., 2009). Captive breeding is sometimes perceived as a way to alleviate pressure on wild populations, by sourcing individuals from captive populations instead of directly from the wild. However, it has become clear that commercial captive breeding often has no conservation benefit and may even be counterproductive, being misused used as a laundering mechanism (Nijman and Shepherd, 2009; Lyons and Natusch, 2011; Shepherd *et al*., 2012; Nijman 2014). Many countries treat the export and/or import of captive-bred individuals differently than that of their wild counterparts, for instance by legalising trade in captive-bred individuals but not in their wild counterparts or by not including the number of captive-bred individuals in export quotas. This report shows that systems allowing trade in captive-bred species are being used to launder large volumes of wild-caught specimens.

Although Tokay Geckos *Gekko gecko* is not on Indonesia's list of protected species, trade in wild-caught specimens is subject to an annual quota system, which covers both harvest and export for non-protected species to supply both domestic and international markets (Shepherd and Nijman, 2007). The Indonesian Institute for Sciences, as the national CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Scientific Authority, is responsible for setting the quota, and the Directorate General of Forest Protection and Nature Conservation (PHKA), as the national CITES Management Authority, is responsible for the regulation and enforcement of the quota.

In an effort to relieve pressure on wild stocks, captive breeding of wildlife is encouraged by the PHKA in Indonesia. All breeders wishing to export wild-caught or captive-bred animals must be registered with PHKA. Breeders supplying exporters, but not themselves exporting, must be registered with the Regional Natural Resource Management Office (BKSDA) offices at a provincial level. Parent stock obtained by companies breeding wildlife for commercial purposes remains the property of the government, but offspring can be exported. The harvest and export quotas therefore do not include captive-bred specimens.

Large-scale illicit export of Tokay Geckos from Indonesia for purposes that were not stipulated on the permits (Nijman *et al*., 2012) has been reported in the past; with volumes of wild-caught specimens grossly exceeding agreed quota. Set quotas allowed 24 000 wild-caught Tokay Geckos to be exported only alive as pets annually from the island of Java. However, in 2006 three traders from the eastern part of the island exported an estimated 1.2 million wild-caught geckos, slaughtered and kiln-dried to be used in traditional Asian medicine (Auliya and Shepherd, 2007; Nijman *et al*., 2012). This figure of 1.2 million does not include numbers from two additional companies, which were not surveyed, and therefore actual volumes exported during this year would have been considerably higher.

Commercial captive breeding of Tokay Geckos

In March 2014 the Indonesian Ministry of Forestry announced that they had given permission to six companies to export a total of over three million live captive-bred Tokay Geckos (Partono, 2014). As clearly indicated on the announcement, the purpose of these captive-bred geckos was to supply the demand for the pet trade; trade for any other purposes (skins, meat, etc.) was not allowed under this permission (cf. Shepherd and Nijman, 2007). The four companies with the largest quotas were PT Manta Pratama Unggul Perkasa in Semarang, Central Java (1 000 000 geckos), UD Andira Alternatif in Probolinggo, East Java (980 000 geckos), CV Karya Abadi Reptil Mulia (750 000 geckos), and UD Karya Reptil Sentosa (250 000 geckos), the latter two both based in Sitoarjo, East Java. [1]

6	Biawak gouldi/Biawak coklat	*Varanus panoptes horni (Varanus panoptes gouldi)*	112														70	15	85	12
7	Biawak timor	*Varanus timorensis*	258															527	140	10
8	Biawak Kordensis (hijau)	*Varanus kordensis*																	89	2
9	Kura-kura Irian	*Carettochelys insculpta*																		2
MAMALIA																				
1	Tarsius	*Tarsius spectrum*	80																	
2	Jelarang hitam	*Ratufa bicolor**																23		
3	Kus-kus Totol	*Spilocuscus maculatus*	31																	
II. Dilindungi UU dan termasuk Non Appendix CITES																				
REPTIL																				
1	Soa-Soa Payung	*Chlamydosaurus kingii*	1.106							780							600	2.225	1.689	2.00
2	Kadal Panana	*Tiliqua gigas*								460							175	530	265	30
3	Kura leher panjang	*Chelodina novaeguineae*																153		
4	Soa ambon	*Hydrosaurus amboinensis*															40	476	192	50
5	Kura Beo Irian	*Elseya novaeguineae**	1.452															161	483	
MAMALIA																				
1	Bajing terbang merah	*Petaurista petaurista*	63																	
III. Tidak Dilindungi dan termasuk Appendix CITES																				
REPTIL																				
1	Ular Sanca biasa	*Broghammerus reticulatus (Python reticulatus)*	402								200	30		150				129	430	42
2	Ular Sanca coklat	*Leiopython albertisi*	209								10	6					45	122	71	7
3	Ular sanca patola	*Morelia amethystina*	255								15						50	82	101	10
4	Ular sanca air	*Liasis mackloti mackloti (Liasis mackloti)*	145															92	46	3
5	Ular sanca karpet	*Morelia spilota harrisoni (Morelia spilota variegata)*	315								20						150	163	128	4
6	Ular sanca bulan	*Morelia boeleni*	170														16	6	53	4
7	Ular sanca darah hitam	*Python curtus*	257											150					104	17

			Jayatama		Mandiri					Lestari		Fauna		Mulia	Unggul Perkasa					Alam Nusa	
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2
I. Dilindungi UU dan termasuk Appendix CITES																						
REPTIL																						
1	Ular sanca bodo	*Python bivittatus (Python molurus bivittatus)*	220								30							77	194			
2	Ular Sanca Hijau	*Morelia viridis*	4.129						875	100	90						350	1.068	1.137	2.000		1
3	Ular Sanca Timor	*Broghammerus timorensis (Python timorensis)*	51								10						6	171	61	50		
4	Biawak Hijau	*Varanus prasinus*	209														12	230	187	175		
5	Biawak indicus	*Varanus indicus*															30	406	152	25		
6	Biawak gouldi/Biawak coklat	*Varanus panoptes horni (Varanus panoptes gouldi)*	112														70	15	85	125		
7	Biawak timor	*Varanus timorensis*	258															527	140	100		
8	Biawak Kordensis (hijau)	*Varanus kordensis*																	89	25		
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3	Kura leher panjang	*Chelodina novaeguineae*																153				
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MAMALIA																						
1	Bajing terbang merah	*Petaurista petaurista*	63																			

Figure 1. Captive-breeding production plan for reptiles, amphibians and mammals for pets for the year 2014, as produced by the Ministry of Forestry, Jakarta. Pages 3 and 4 of the document confirming potential production of over three million Tokay Geckos from six companies, for export as live pets, signed by the Directorate General of PHKA, S. Partono, 2014.

The large-scale trade in Tokay Geckos outside of Indonesia's laws and regulations has been taking place for some time. Manta Pratama Unggal Perkasa was one of three companies included in an earlier study, conducted in 2006, when it was estimated that it exported some 390 000 wild-caught dried geckos a year, in violation of the agreed purpose (for pets only) and in violation of the national allocated quota of 50 000 wild-caught live geckos (Nijman *et al*., 2012). According to its website, viewed in 2014, it is a trading company specialising in the export of frozen snake meat, kiln-dried Tokay Geckos, snakes, tortoise and freshwater turtle shells and cardamom to mainland China, Hong Kong and Taiwan. In addition, it exports high-value wildlife derivatives such as ambergris, castoreum and civet bile. The other three companies were all registered as Tokay Gecko breeders with the East Java Regional Natural Resource Management Office in 2008 and have been involved in the large-scale export of dried geckos (Andira Alternatif and Karya Reptil Sentosa) and dried geckos and snakes (Karya Abadi Reptil Mulia) to mainland China. In 2013 it was reported that Andira Alternatif exported 300 000–400 000 dried Tokay Geckos per year; all said to be wild-caught with no mention made of breeding of Tokay Geckos (Anonymous, 2013). Given that in 2013 no quota was allocated for the export of dried Tokay Geckos this would have been in violation of the national quota system implemented by the PHKA. There are no indications that any of these four companies are, or have ever been, involved in the live pet trade.

Practicalities of breeding Tokay Geckos

What are the logistics involved in breeding such large quantities of Tokay Geckos for the export market? Based on Tokay Gecko breeders' manuals and forums, and on discussions with experts on captive breeding of Tokay Geckos, the following key reproductive parameters and housing conditions were extracted, selecting values that give the highest yields (youngest age for reproduction, maximum longevity, largest clutch sizes, etc.) at the lowest costs, ignoring any welfare issues, and assuming zero mortality of young:

- female Tokay Geckos become reproductively active after 18 months and here it is assumed that they remain reproductively active up until the age of 10 years;
- each clutch contains two eggs and females produce four clutches a year;
- eggs hatch after three months, assuming here that all eggs are successfully hatched;
- geckos grow to adult size in 18 months, but are large enough to be harvested after 12 months;
- males and females are housed in individual cages measuring 60 x 40 x 40 cm (length x height x width);
- males are introduced to females for short periods to allow mating;
- a male: female ratio of 1:10 is maintained for breeding;
- eggs are removed and put into incubation containers;
- once hatched, hatchlings are housed in groups of 10 in slightly larger rearing cages measuring 60 x 40 x 50 cm.

[1]PT = Perseroan Terbatas [Indonesian] = Limited Liability Company; UD = Usaha Dagang [Indonesian] = Trading Company; CV = Commanditaire Vennootschap [Dutch] = Limited Partnership.

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Although sometimes traded live as pets, the demand for Tokay Geckos in traditional Asian medicines is one of the greatest threats to this species.

The amount of staff time needed to maintain this operation is impressive: the geckos need to be fed hundreds of millions of crickets a year; if a feeding session takes just 15 seconds to complete, then some 50 people/staff need to be employed, working 10 hour non-stop shifts, without having a single day off. If the cages are cleaned once a month and the whole cleaning process, including temporary removal of the geckos, takes just 10 minutes, then some 150 people/staff need to be employed, working 10 hour non-stop shifts, without having a single day off.

Under this scenario, a breeding facility aiming to export 1 million Tokay Geckos would need to produce 1.12 million adult-sized geckos per year. This would require 140 000 breeding females, each producing eight fertile eggs a year, and 14 000 breeding males. To incubate these they need some 30 000 incubation containers, all in continuous use year-round, with a 100% hatchling survival rate. Once hatched the geckos would need to be housed in approximately 112 000 rearing cages.

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Wild-caught Tokay Geckos are traded in large volumes throughout Asia

The space requirements for these operations, if genuine, are impressive: Manta Pratama Unggul Perkasa's 266 000 breeding and rearing cages, if stacked in rows two metres high, would require a building with a floor space of some 35 000 m^2, or piled two metres high in height, the cages would stretch over a length of almost 24 km. This is the equivalent of almost five football pitches. The values for Andira Alternatif are similar – 248 000 cages covering 4.5 football pitches, or stretching 22 km – and those for Karya Abadi Reptil Mulia and Karya Reptil Sentosa are 195 000 cages, covering 3.5 football pitches, or 17 km, and 65 000 cages, covering more than a football pitch, or 6 km, respectively.

It is clear that if Tokay Geckos were genuinely bred in captivity in Java this would require a massive investment in terms of infrastructure, space, financial commitments and staff. This, however, is not matched by the amount of money that can be made by trade in Tokay Geckos. If the Tokay Geckos are indeed all exported as pets, the wholesale price for an adult individual is USD1.00 – 1.15 (2010 prices: Nijman *et al*., 2012) to USD2.30 (2014 price obtained from an anonymous Indonesian exporter). The permit to export live reptiles requires a payment of USD0.43 to the quarantine office, leaving less than USD1.90 to maintain and breed these animals year-round, and to pay for the cost of shipping and packing for the live export.

Profit margins are even smaller when the Tokay Geckos are (illegally) exported dried. Data from one export company indicate that they buy wild-caught geckos for USD0.16 and, assuming twenty individuals make up a kilogramme of dried gecko (Caillabet, 2013), they are exported to China for USD0.20 a piece once processed (Anonymous, 2009). Another source indicates that a wholesale dealer can sell a pair of dried Tokay Geckos in good condition for USD0.40, and half that for a damaged pair (Asprihanto, 2010). These profit margins are evidently sufficient when dealing with wild-caught geckos that need to be kept in storage for no longer than a week without the need to be fed or watered, after which they are killed and kiln- or sun-dried and prepared for export. It would, however, be impossible to maintain and breed these animals and generate a profit.

According to reptile traders in Indonesia that were questioned by Nijman *et al.* (2012), prices were far too low to make captive breeding an economically viable option as the investment and scale was far too large compared to the return, and therefore it is likely there is no commercial captive breeding of this species in Indonesia. In 2014, reptile traders in Indonesia, who wish to remain anonymous, stated that viable commercial captive breeding of this species in these volumes was not possible.

CONCLUSIONS AND RECOMMENDATIONS

In agreement with the Indonesian traders' statements above, it is concluded here that captive breeding of Tokay Geckos cannot take place in Indonesia on a sufficient scale to produce the numbers of animals for which quotas exist for live exports for the pet trade. Commercial captive breeding of Tokay Geckos would not make this an economically viable option. Clearly, the overwhelming majority of claims of captive breeding of Tokay Geckos are false. Instead, this analysis strongly suggests that captive-breeding permits are instead being used to launder wild-caught Tokay Geckos by the millions into trade, for illegal export as dried specimens.

In light of these findings, TRAFFIC makes the following recommendations:

- Permission for commercial captive breeding of Tokay Geckos should not be issued, as such an enterprise is clearly not feasible or economically viable. Given that captive breeding permits are currently used to avoid quota restrictions on wild-caught geckos, current permits for breeding Tokay Geckos should be revoked to prevent further laundering.
- Methods to conduct Non-detriment Findings should be developed and carried out for Tokay Gecko to determine the current status of the species in the wild and to assist in determining a realistic harvest and trade quotas that would not have a negative impact on the wild populations.
- There is a strong justification to include Tokay Geckos in Appendix II of CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora), which would allow the international trade to be regulated and monitored. We urge Indonesia to develop a proposal to list this species in CITES Appendix II in time for submission at the next CITES Conference of the Parties.
- The Government of Indonesia is encouraged to list Tokay Gecko in Appendix III of CITES immediately, to allow for the international trade of this species to be better monitored through the co-operation of all CITES Parties. Such a move does not require a vote at a CITES Conference of the Parties.

REFERENCES

Anon. (2009). Ekspor Tokek, mau? *Kompas*, 30 October 2009. http://bisniskeuangan.kompas.com/read/2009/10/30/08135657/Ekspor.Tokek.Mau.

Anon. (2013). Oleh-oleh dendeng Tokek dari Probolinggo. *Kompasiana*, 3 January 2013. http://wisata.kompasiana.com/jalan-jalan/2013/01/03/oleh-oleh-dendeng-tokek-dari-probolinggo-522011.html.

Asprihanto, H. (2010). Little lizards make big money for villagers. *Reuters*, 19 January 2010. http://www.reuters.com/article/2010/01/19/us-gecko-idUSTRE60I3XJ20100119.

Auliya, M. and Shepherd, C. R. (2007). Verhängnisvoll – der Ruf des Tokehs. *Terraria* 4:100-101

Caillabet, O. S. (2013). *The Trade in Tokay Geckos* Gekko gecko *in Southeast Asia: With a Case Study on Novel Medicine Claims in Peninsular Malaysia*. TRAFFIC, Petaling Jaya.

Lyons, J. A., and Natusch, D. J. (2011). Wildlife laundering through breeding farms: illegal harvest, population declines and a means of regulating the trade of green pythons *(Morelia viridis)* from Indonesia. *Biological Conservation* 144:3073-3081.

McNeely, J. A., Kapoor-Vijay, P., Zhi, L., Olsvig-Whittaker, L., Sheikh, K. M., and Smith, A.T. (2009). Conservation biology in Asia: the major policy challenges. *Conservation Biology* 23:805-810.

Nijman, V. (2014). Bogus captive breeding of oriental rat snakes. *Oryx* 48:483-484.

Nijman, V. and Shepherd, C. R. (2009). *Wildlife Trade from ASEAN to the EU: Issues with the Trade in Captive-bred Reptiles from Indonesia*. TRAFFIC Europe Report for the European Commission, Brussels.

Nijman, V., Shepherd, C. R., Mumpuni and Saunders, K. L. (2012). Over-exploitation and illegal trade of reptiles in Indonesia. *Herpetological Journal* 22:83–89.

Partono, S. (2014). *Rencana produksi reptile, amphibian dan mamalia (RAM) pet hasil penangkaran tahun 2014*. Ministry of Forestry, Jakarta.

Shepherd, C. R. and Nijman, V. (2007). *An Overview of the Regulation of the Freshwater Turtle and Tortoise Pet Trade in Jakarta, Indonesia*. TRAFFIC Southeast Asia, Petaling Jaya.

Shepherd, C. R., Stengel, C. and Nijman, V. (2012). *The Export and Re-export of CITES-listed Birds from the Solomon Islands*. TRAFFIC Southeast Asia, Petaling Jaya.

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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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