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Questions spécifiques aux espèces

Lion d'Afrique (*Panthera leo*)

RAPPORT DU SECRÉTARIAT ET DU COMITÉ POUR LES ANIMAUX

1. Le présent document a été préparé par le Secrétariat après consultation du président du Comité pour les animaux*.

Historique

2. À sa 17^e session (CoP17, Johannesburg, 2016), la Conférence des Parties a adopté les décisions suivantes sur le lion d'Afrique (*Panthera leo*) :

À l'adresse du Secrétariat

17.241 *Sous réserve de financements externes, le Secrétariat, en collaboration avec les États de l'aire de répartition du lion d'Afrique, la Convention sur la conservation des espèces migratrices appartenant à la faune sauvage (CMS), et l'Union internationale pour la conservation de la nature (UICN):*

- a) *recherche des mécanismes potentiels pour développer et soutenir l'application de plans d'actions et de stratégies conjoints pour la conservation du lion d'Afrique, prenant en considération les plans et stratégies existants sur la conservation du lion d'Afrique;*
- b) *développe un inventaire des populations du lion d'Afrique à travers son aire de répartition, prenant en considération les inventaires existants développés par les États de l'aire de répartition du lion d'Afrique;*
- c) *soutient le développement de bases de données pertinentes par les États de l'aire de répartition du lion d'Afrique;*
- d) *développe des stratégies pour renforcer la coopération internationale sur la gestion des lions;*
- e) *entreprind des études sur le commerce légal et illégal des lions, y compris des os de lion et d'autres parties et produits, afin de déterminer leur origine et les itinéraires de contrebande, en collaboration avec TRAFFIC et/ou d'autres organisations compétentes;*

* Les appellations géographiques employées dans ce document n'impliquent de la part du Secrétariat CITES (ou du Programme des Nations Unies pour l'environnement) aucune prise de position quant au statut juridique des pays, territoires ou zones, ni quant à leurs frontières ou limites. La responsabilité du contenu du document incombe exclusivement à son auteur.

- f) *entreprend une étude comparative des tendances des populations de lion et des pratiques de conservation et de gestion, telles que la chasse du lion, dans les pays et entre eux, y compris le rôle du commerce international, le cas échéant;*
- g) *soutient le renforcement des capacités en matière de conservation et de gestion du lion d'Afrique, y compris, le cas échéant, l'élaboration d'avis de commerce non préjudiciable lorsqu'un État de l'aire de répartition le demande;*
- h) *soutient des programmes de sensibilisation du public et d'éducation dans les États de l'aire de répartition du lion d'Afrique, afin de soutenir la coexistence entre les hommes et les lions et de promouvoir des mesures pour la conservation et le rétablissement des populations de lion d'Afrique;*
- i) *promeut la collecte de fonds, dans le cadre de ses initiatives globales de collecte de fonds pour soutenir la mise en œuvre efficace des plans et stratégies pour la conservation et la gestion du lion d'Afrique, ainsi qu'une équipe spéciale CITES sur le lion d'Afrique;*
- j) *crée un portail sur le site Web de la CITES notamment pour permettre la mise en ligne et le partage des informations et des orientations volontaires sur l'élaboration d'avis de commerce non préjudiciable pour le lion d'Afrique; et*
- k) *fait rapport sur les progrès concernant les paragraphes a) à j) aux 29^e et 30^e sessions du Comité pour les animaux.*

À l'adresse du Comité pour les animaux

17.242 *Le Comité pour les animaux examine le rapport du Secrétariat et soumet des recommandations aux 69^e et 70^e sessions du Comité permanent ainsi qu'aux États de l'aire de répartition du lion d'Afrique, comme approprié.*

À l'adresse du Comité permanent

17.243 *Le Comité permanent, à ses 69^e et 70^e sessions:*

- a) *revoit les rapports soumis par le Comité pour les animaux en application de la décision 17.242;*
- b) *recommande que des mesures supplémentaires soient prises, notamment par rapport à l'éventuelle nécessité de développer une résolution sur la conservation du lion d'Afrique;*
- c) *établit une équipe spéciale CITES sur le lion d'Afrique, en invitant à la participation de tous les États de l'aire de répartition du lion, les États de consommation de parties et produits de lion, et les organismes de lutte contre la fraude pertinents, y compris les membres de l'équipe spéciale du Consortium international de lutte contre la criminalité liée aux espèces sauvages (ICCWC);*
- d) *fournit un mandat et un mode opératoire à cette équipe spéciale; et*
- e) *envisage la création d'un fonds d'affectation spéciale technique pluridonateurs pour attirer des fonds et des ressources directes pour le travail de l'équipe spéciale CITES sur le lion d'Afrique, et soutenir la mise en œuvre effective des plans et stratégies pour la conservation et la gestion du lion d'Afrique.*

À l'adresse des États de l'aire de répartition

17.244 *Les États de l'aire de répartition du lion d'Afrique sont encouragés à collaborer à la mise en œuvre des décisions des paragraphes a) à j) de la décision 17.241 et du paragraphe c) de la décision 17.243.*

À l'adresse de toutes les Parties, organisations gouvernementales, intergouvernementales et non gouvernementales, donateurs et autres entités

17.245 Toutes les Parties, organisations gouvernementales, intergouvernementales et non gouvernementales, donateurs et autres entités sont encouragés à soutenir les États de l'aire de répartition du lion d'Afrique et le Secrétariat:

- a) dans leurs efforts pour conserver et restaurer cette espèce emblématique à travers le continent africain, en tenant compte de l'existence des pratiques d'utilisation des terres; et
- b) dans l'application des décisions figurant dans les paragraphes a) à j) de la décision 17.241.

3. Le Secrétariat a présenté au Comité permanent, à sa 69^e session (SCC69, Genève, novembre 2017), une mise à jour sur la mise en œuvre de la décision 17.241 qui figure dans le document SC69 Doc. 58. Le Comité permanent a pris bonne note du document et créé un groupe de travail intersessions sur le lion d'Afrique dont la composition et le mandat figurent dans le document SC69 SR.
4. Les résultats des travaux du groupe de travail intersessions du Comité permanent sur le lion d'Afrique sont présentés au point 54.2 de l'ordre du jour.
5. Le mandat de ce groupe de travail intersessions est notamment de :
 - b) examiner, avant la 70^e session du Comité permanent, l'étude menée conformément au paragraphe e) de la décision 17.241 et les recommandations du Comité pour les animaux, et rédiger des recommandations pour examen par le Comité permanent;
6. Vu le peu de temps séparant la clôture de la 30^e session du Comité pour les animaux (AC30, Genève, juillet 2018) de la date limite de soumission des documents pour examen à la 70^e session du Comité permanent (SC70), le groupe de travail intersessions du Comité permanent peut ne pas avoir disposé d'assez de temps pour examiner en profondeur l'étude menée en application de la décision 17.241, paragraphe e), ou les recommandations du Comité pour les animaux émanant de l'AC30.

Mise en œuvre de la décision 17.2442

7. À l'AC30, le Comité pour les animaux a examiné le rapport du Secrétariat sur le lion d'Afrique (*Panthera leo*) présenté dans le document AC30 Doc. 25, qui décrit la mise en œuvre par le Secrétariat des diverses actions prévues dans la décision 17.241, en collaboration avec les États de l'aire de répartition du lion d'Afrique, la Convention sur les espèces migratrices (CMS) et l'Union internationale pour la conservation de la nature (UICN). Il a formulé des recommandations à l'adresse du Comité permanent et des États de l'aire de répartition du lion d'Afrique.

Rapport d'étape sur la mise en œuvre de la décision 17.241 [paragraphes a) à d), et f) à j)]

8. Le Comité pour les animaux a pris bonne note du rapport d'étape préparé par le Secrétariat sur la mise en œuvre des actions prévues dans la décision 17.241 et a été informé des détails de l'atelier sur l'initiative conjointe CMS/CITES pour les carnivores africains (avec une deuxième réunion des États de l'aire de répartition du lion d'Afrique) prévu pour novembre 2018 à Bonn, en Allemagne, ainsi que sur la portée et le calendrier du cadre pour la conservation du lion d'Afrique en cours d'élaboration à l'UICN.

Étude sur le commerce légal et illégal des lions d'Afrique, Panthera leo [Décision 17.241, paragraphe e)]

9. L'ébauche de l'étude sur le commerce légal et illégal des lions d'Afrique prévue dans la décision 17.241, paragraphe e), a été présentée en annexe du document AC30 Doc.25 et est disponible pour consultation depuis le 17 mai 2018. La version enrichie et mise à jour de l'étude peut être consultée sur le site web de la CITES depuis le 10 juillet 2018 dans le document AC30 Inf. 15.
10. S'agissant de l'ébauche de l'étude sur le commerce des lions d'Afrique, le Comité pour les animaux a recommandé que les auteurs (TRAFFIC) incluent dans le texte final les informations fournies à l'AC30 et, au cas où émergeraient de nouvelles informations, que celle-ci soient communiquées à TRAFFIC

(willow.outhwaite@traffic.org), au plus tard le 27 juillet 2018. La version finale de l'étude est jointe en annexe au présent document.

11. Le Comité pour les animaux a par ailleurs convenu de soumettre les recommandations suivantes au Comité permanent à sa 70^e session :
 - i) Les données sur les populations, les abattages illégaux et le commerce illégal de tous les grands félins doivent être partagées entre toutes les Parties, ce qui permettrait de repérer les tendances et les problématiques communes, ainsi que de détecter d'éventuelles connexions entre celles-ci.
 - ii) Les Parties doivent être encouragées, lorsqu'elles recueillent et transmettent les données sur les abattages illégaux et le commerce illégal des lions et autres grands félins, à recueillir des précisions sur les parties prélevées ou détectées dans le commerce illégal.
 - iii) Pour améliorer la traçabilité, les Parties qui importent des spécimens de lions en provenance d'Afrique du Sud sont encouragées à utiliser les informations générées par le projet sud-africain de code barre pour les espèces sauvages élaboré par l'Afrique du Sud pour les espèces CITES prioritaires, dont les lions, et en incluant les analyses ADN des lions reproduits en captivité et exportés sous forme de squelettes.
12. S'agissant des recommandations formulées par le Comité pour les animaux, mentionnées au paragraphe 11, le Secrétariat formule les observations et suggestions suivantes : sur les obligations de déclaration concernant les lions d'Afrique, il pourrait y avoir des chevauchements ou doubles emplois avec d'autres obligations existantes, par exemple les rapports annuels sur le commerce et les rapports annuels sur le commerce illégal. S'agissant des données relatives aux populations, aux abattages illégaux et au commerce illégal des grands félins, les Parties pourraient examiner l'étude sur le commerce et la conservation des grands félins d'Asie figurant dans le document SC70 Doc.51 qui traite également des lions, et s'en inspirer. Pour ce qui concerne le suivi des abattages illégaux des lions d'Afrique, l'une des solutions serait de demander au Secrétariat s'il serait possible de recueillir ces données par le biais des sites du réseau MIKE (Suivi des abattages illégaux d'éléphants) en Afrique.
13. Le Secrétariat est d'avis que, sur la base de l'étude sur le commerce légal et illégal des lions d'Afrique, plusieurs nouvelles recommandations pourraient être élaborées sous forme de projets de décisions. Celles-ci pourraient concerner :

À l'adresse des États de l'aire de répartition et des pays consommateurs de lions d'Afrique :

- a) Encourager les États de l'aire de répartition du lion d'Afrique et les pays consommateurs à accroître leurs efforts de lutte contre la fraude pour détecter le commerce illégal, non déclaré ou incorrectement déclaré de spécimens de lions ;

À l'adresse du Secrétariat, sous réserve de fonds externes disponibles :

- b) Élaborer une définition pratique des « grands félins » et analyser plus avant les tendances du commerce légal et illégal des grands félins ;
- c) Explorer les possibles connexions entre le commerce de spécimens de différentes espèces de grands félins, en tenant compte des mesures mises en place par la CITES qui régissent le commerce des grands félins ;
- d) Après avoir consulté les spécialistes concernés, élaborer des techniques de type médico-légal et en faciliter l'utilisation dans l'identification des lions (et autres espèces de grands félins) présents dans le commerce, notamment dans les produits hautement transformés ;
- e) Encourager les recherches permettant de comprendre quelles sont les marchandises (colle, vin, etc.) contenant du lion ou affirmant en contenir ;
- f) Élaborer des documents d'orientation permettant d'identifier les produits et parties de lions présents dans le commerce (et permettant de les différencier des autres grands félins) ; et
- g) Examiner l'utilisation du code de but « H » pour savoir si le commerce de spécimens de lions déclarés selon ce code de source est conforme aux orientations figurant dans la résolution Conf. 12.3,

paragraphe 3 h), et déterminer s'il serait besoin de préciser d'autres descriptions de spécimens et d'autres unités de quantités pour couvrir l'ensemble du commerce des lions et autres grands félins (et le cas échéant de les inclure dans les « Lignes directrices pour la préparation et la soumission des rapports annuels CITES » et les « Lignes directrices pour la préparation et la soumission des rapports annuels CITES sur le commerce illégal »).

14. Les recommandations et observations mentionnées plus haut pourraient être examinées à la deuxième réunion des États de l'aire de répartition du lion d'Afrique prévue à Bonn, en Allemagne, en novembre 2018. Ainsi qu'il est dit aux paragraphes 15 et 16 ci-dessous, le Secrétariat propose de rendre compte à la 18^e session de la Conférence des Parties (CoP18) du bilan de cette réunion, y compris des projets de décisions qui en résulteront.

Compte rendu à la CoP18

15. Le Secrétariat a indiqué dans le document AC30 Doc.25 que les décisions 17.241 à 17.245 sur le *Lion d'Afrique* ne précisait aucun délai pour leur mise en œuvre et qu'il n'y est pas précisé que celle-ci devait faire l'objet d'un rapport d'avancement à la CoP18. Le Secrétariat a noté que les actions prévues dans les décisions ne pourraient sans doute pas être mises en œuvre avant la CoP18 et que les propositions de projets, nouveaux ou enrichis, de décisions devraient être élaborées en coordination entre le Secrétariat, le Comité pour les animaux et le Comité permanent, en étroite collaboration avec les États de l'aire de répartition du lion d'Afrique. À cet égard, le Secrétariat a proposé de préparer un document sur le lion d'Afrique pour la CoP18, après la deuxième réunion des États de l'aire de répartition du lion d'Afrique, document qui traiterait des avancées dans la mise en œuvre des décisions 17.241 à 17.245, des conclusions des délibérations du Comité pour les animaux et du Comité permanent, des résultats de la réunion des États de l'aire de répartition du lion d'Afrique et, le cas échéant, de toute recommandation ou projet de décision sur le lion d'Afrique pour examen à la CoP18.
16. Le Comité pour les animaux a approuvé la proposition du Secrétariat figurant au paragraphe 15 ci-dessus, et suggéré que le Secrétariat travaille avec les présidents du Comité pour les animaux et du Comité permanent à la finalisation de son rapport à la CoP18.

Recommandations

17. Conformément aux dispositions de la décision 17.243, paragraphe a), le Comité permanent est invité à ;
 - a) examiner les recommandations du Comité pour les animaux figurant au paragraphe 11 et les observations du Secrétariat figurant aux paragraphes 12 à 14 ; et
 - b) accepter la proposition figurant au paragraphe 16 relative au rapport sur la mise en œuvre des décisions 17.241 à 17.245 sur le *Lion d'Afrique* à la 18^e session de la Conférence des Parties.

The Legal and Illegal Trade in African Lions

A study in support of Decision 17.241 e)

Final Study

2nd August 2018

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the wildlife trade monitoring network

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The author would also like to thank the Oxford Martin Programme on Illegal Wildlife Trade for their invitation to a timely workshop (April 2018) held to consider the conservation impacts of legal trade in lion body parts which brought together a number of stakeholders who have been key to writing this study. Attendance was partially covered by a project established to *Reduce Trade Threats to Africa's Wild Species and Ecosystems Through Strengthened Knowledge and Action in Africa and Beyond* funded by Arcadia—a charitable fund of Lisbet Rausing and Peter Baldwin, and the author is grateful for this support.

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Executive Summary

The Lion (*Panthera leo*) has been assessed by IUCN as Vulnerable with estimates of between 23,000 to 39,000 mature wild lions remaining in Africa (Bauer *et al.*, 2016). The number of mature adults in the West African sub-population is thought to number less than 250 (Henschel *et al.*, 2015). The lion has been listed in CITES Appendix II since 1977 with the Asiatic subspecies (*Panthera leo persica*) listed in Appendix I. The CITES-listing was annotated at the 17th Conference of the Parties (2016) meaning that a *zero annual export quota is established for specimens of bones, bone pieces, bone products, claws, skeletons, skulls and teeth removed from the wild and traded for commercial purposes. Annual export quotas for trade in the aforementioned commodities for commercial purposes, derived from captive breeding operations in South Africa, will be established and communicated annually to the CITES Secretariat*: to ease implementation of this quota South Africa has decided only to issue export permits for skeletons (with or without skull). Note that the annotation does not make reference to other products observed in trade (e.g. bodies) or live lions. Trophy hunting from wild and captive lions from all countries is still permitted as this is not considered commercial trade.

Between 2007 and 2016 South Africa was the main legal exporter of lion products, with smaller amounts reported by other range States such as Zimbabwe, United Republic of Tanzania (hereafter “Tanzania”), Namibia and Zambia.

Until 2011 the majority of exports of lion products reported in legal trade were trophies, with the USA traditionally being the biggest market for trophy imports (followed by Spain and France). From 2009 onwards, significant exports of bone items (bones, skeletons, bodies) were observed in the CITES trade data, predominantly being exported to Lao People’s Democratic Republic (hereafter “Lao PDR”) and Viet Nam, although these were mainly based on reports by countries of export and errors have been noted*. Although according to trade data the majority of the bone items in legal trade appeared to be from captive sources, and potentially at least some could be “byproducts” of the South African trophy industry, there are concerns that the apparent recent demand for lion bone items in Asia may also have an impact on the wild lion population across its range. Seizures in Mozambique, Zambia, South Africa and Tanzania showed that some illegal trade in lion products has taken place with reports of poaching of wild lions, and there have been suggestions that bones (and other products) also came from lions killed legally or sometimes illegally as problem animals that threaten humans or livestock.

There has been a steady decline in the percentage of lion trophies coming from wild lions: from 90% in 2000 to 7% in 2015, even though the total number of trophies exported over that period has more than doubled. There are estimated to be 8,000 captive lions in South Africa (Moorhouse *et al.*, 2017 In Bauer *et al.*, (2018)) primarily kept for the purpose of hunting, and trophies from captive-bred lions from South Africa increasingly dominated trophy exports in the past decade. The CITES listing-annotation which came into effect in January 2017 still permits the export of lion trophies from wild and captive sources from all countries when exported for the purpose of hunting rather than commercial, although some range States have restrictions in place to prevent bones from trophy lions entering trade. Lions are bred in captivity in non-range States in Asia but the captive-population is unknown.

Traditionally the use of lion products in Africa has been for medicinal purposes, ceremonies, rituals, and as decorations and talismans. Lions continue to be used throughout Africa; demand in some countries is likely met with lions from domestic populations (especially in countries with large wild or captive populations) but there also appears to be illegal/ unreported cross-border trade. It is not clear how much current

* Errors have occurred in the transition of data from South African permit applications to CITES annual reports which have caused exports to Lao PDR to be mislabelled as Viet Nam and vice versa (Williams *et al.*, 2015). Williams *et al.* (2015) speculated that this could have been caused by confusion over the name of the city Vientiane in Lao PDR sounding similar to Viet Nam.

consumption within Africa is by African nationals and how much is by travellers/workers originating from outside of Africa.

The substantial quantities of lion products exported legally to Asia in recent years (most notably Lao PDR, Viet Nam, and to a lesser extent China and Thailand) indicate the major demand is for bone items. Significant seizures of lion parts in Viet Nam and China support this. While the use of tiger bones for medicine and “health tonics” in Asia is well documented, lion products have not traditionally appeared in use in Asia and lion is not included in the traditional Chinese medicine (TCM) pharmacopeia. This study found a limited amount of lion products openly for sale in Asia (products advertised as tiger were more commonly observed), some large-scale seizures of lion products indicate that those involved believed they were smuggling tiger products, and significant effort is taken to market lion bone wine in China to imply it contains tiger bone. Based on this, and discussions with stakeholders and published literature, it seems likely that the majority of imported lion parts are being used as a substitute for products that would have traditionally contained tiger. It is not clear who in the trade chain is aware of the substitution, as there is the potential for mis-selling of lion as tiger at each stage from source to consumer. It has been speculated that there is not a sufficient supply of tiger bones within Southeast Asia to meet demand, and lion bone can be used as a cheaper more readily available substitute. However, this study found no direct evidence of this and it is important to note that potential illegal supply from captive tiger populations in market countries could be significant. An alternative theory is that lion bone is acting as a supplement rather than a substitute for tiger bone. Further extended research is needed, including conducting random testing of “tiger” bone and wine products to ascertain if it contains derivatives of lion (or other species).

There is little information available on the roles of Asian countries in the international trade and the movement of lion products between neighbouring Asian countries (but see below). Very limited legal trade was reported between these countries, although seizures show illegal cross-border trade is occurring (e.g. of skeletons, claws). This presents the potential scenario of lion bone items being imported legally into the region, but then re-exported (either in the raw form or as processed products) in contravention of CITES controls to neighbouring countries. There remains a lack of clarity regarding the trade between key countries in Asia, and more in-depth research is required to better understand connections between the countries, and to understand if CITES controls are being circumvented.

- **Lao PDR** – The role that Lao PDR plays is unclear. According to South African export data, Lao PDR has been one of the major legal importers of lion bones, and it has been suggested that Lao-based companies have been issued import/export quotas for importing lion and tiger products although this could not be verified. However, Lao PDR itself has not reported the import/export of any lion products to CITES and the Lao PDR Scientific Authority stated there have not been any imports/exports of lions and that no lion farming takes place. It is important that clarity is provided by the Lao PDR and South African Governments regarding the true nature of trade between the two countries.

Our research has found little evidence for consumption within the country, but instead Lao PDR appears to be acting mainly as a transit location for lion bone products destined for Viet Nam or China. It seems likely that some of the lion bones are being processed into “cake”[†] or wine before export, and it is speculated that this may take place at tiger farms – however without access to farms it was not possible to confirm this. Re-exports of unprocessed lion bones to Viet Nam or China may also be taking place but no direct evidence was found for this.

- **Viet Nam** – Trade data show that during the period 2007 to 2016, a total of 2,948 items (plus 739 kg) of lion products were exported to Viet Nam: most of which were bones or skeletons. It also seems

[†]Tiger ‘jelly’/‘cake’/‘glue’ (*Cao* in Vietnamese) is made by boiling cleaned bones for several days to condensing down the gelatine. The bone pieces are removed, and the remaining liquid is gradually reduced to a glue-like consistency which hardens into an odourless cake. It is normally cut into squares for sale and generally consumed by dissolving small pieces into medicinal wine (Nowell, 2000).

that lion products are being imported from Lao PDR but not reported to CITES. One of the main uses for lion bone items in Viet Nam is hypothesised to be for “cake” which is difficult to distinguish from tiger “cake”, a product consumed in Viet Nam where it is considered desirable.

Surveys conducted for this study found no evidence of lion or tiger “cake” (or other lion products) openly for sale in outlets in Viet Nam, but information from other sources suggests sales take place within existing networks behind closed doors. Further research is required to understand the substitution of tiger bone with lion bones, and to determine if consumers or traders are aware of the true content of the product. While it is possible that most of the lion bone is being used as a substitute for tiger bone, there was some evidence of limited differentiated demand specifically for lion products in Viet Nam, and it has been suggested anecdotally that this may be increasing.

- **China** – According to trade data, fewer lion products were exported to China compared with Lao PDR and Viet Nam: between 2007 and 2011 1813 items were exported to China, 46 of which were bodies/skeletons. However, seizures in China or en route to China nearly doubled this. There are also indications that Chinese nationals are travelling to neighbouring countries and purchasing lion products and taking them back to China. This cross-border trade does not appear in the CITES Trade Database, if trade is occurring then it is important to clarify why it is not included in each of the countries’ annual report. Also, it is not clear if the people were aware of the true contents of the products or if they believed they had instead bought products containing tiger. Research in online and physical markets for this study found that there does not appear to be much of a demand specifically for lion products currently in China, so consumers may not be aware that the products they purchase actually contain lion. The predominant known use is in lion skeletons which are made into wine; often packaged and advertised to imply the contents include tiger bone. The true contents of this wine are unknown. Lion claws/teeth were also exported to China and were observed for sale online.

Captive lions are present in China, including at facilities holding other species such as tigers, which could be the source of the lion skeletons used in the wine. If at least some of the demand for lion products in China is being met through domestic captive lions, then this would explain why far fewer bone items were exported to China compared with Viet Nam and Lao PDR. Alternatively, the wine labelled as containing lion may actually contain tiger bones (or other species), or demand may be being partially met by wine smuggled from Lao PDR or Viet Nam. Forensic-type testing of wine is needed to better understand the dynamics of this trade.

- **Thailand** – Compared with Lao PDR and Viet Nam, the amount of bone product reported as exported to Thailand was relatively small. However, Thai nationals have been arrested in South Africa for their involvement in the rhino horn and lion bone trade. There are also indications that Thai-based companies involved in wildlife trade are linked with companies in Lao PDR, although further research is required to better understand these links. Thailand’s main legal imports were of live lions which likely enter the tourism industry. It is possible that these lions are subsequently sold for their parts, as was seen with tigers in Thailand, but there is currently no available evidence for this.

It would seem that at least some of the poaching and trafficking involves organised criminal groups, and seizures alongside other commodities indicate that these groups are dealing in multiple species. Indications from Mozambique, in particular, are that there is some poaching of lions specifically for international trade, and that lion products are being trafficked out of the country alongside ivory and rhino horn. It seems that there may be an element of opportunistic poaching by hunters who have heard that lions are now valuable so will take one where possible— the apparent ease of poisoning lions makes it a relatively low risk activity as there are no gunshots fired to alert rangers.

It is assumed that a significant proportion of demand in Asia is for processed lion products (e.g. cake, wine) (either being processed in Africa or Asia), and there are indications that cargo ships/diplomatic connections are used for some of the smuggling from Africa to Asia: these dynamics could reduce the likelihood of detection by law enforcement. An additional complexity is the more than 280 captive tigers in South Africa; there are concerns that tiger bones from South Africa are being laundered as lion bones. Vietnamese Customs have reported they face challenges when attempting to differentiate between legal and illegal products in trade. Efforts should be made to ensure that DNA or similar testing techniques are available where needed to identify which cat species are present in trade, including in highly processed products.

Overall, retaliatory or pre-emptive killing in defence of human life and livestock, habitat loss and prey base depletion are currently considered to be the largest threats to wild lions. Poorly managed trophy hunting is also considered a risk. The trade in bones and other body parts for traditional medicine, both within Africa and Asia, was identified as an emerging threat in 2014. The threat from illegal trade in body parts is magnified when the sub-population is small and located in a region where demand is high for lion products (e.g. West Africa) or in areas where established criminal networks are already poaching other species for international trade (e.g. rhino/elephant in Mozambique). There are concerns that a perception of increasing value and demand in Asia is going to lead to increased illegal poaching.

Based on the available information, there seemed to be a difference in the predominant commodities in illegal trade in East-Southern Africa (claws, teeth, bone items) compared with West Africa (skins), potentially indicating different sub-regional trade dynamics. However, this may reflect a bias in the available data and requires further detailed research.

The recent lion trade is in a state of change caused, at least in part, by the amended CITES-listing listing and various national trade bans[‡]. Uncertainty regarding the permanence of these bans, or the potential adoption of bans by other major importers, is already causing changes in the captive-breeding industry in South Africa. Lion farming may increase in consumer countries, and some South African farmers appear willing to export live lions to these countries which would help establish/increase farming. As live lions are not explicitly detailed in the CITES listing-annotation it is not clear how this will be addressed, although the South African CITES Scientific Authority is treating permit applications for live lions with caution in case they are acting as a proxy for skeleton exports. How all of this influences the trade dynamics and pressures on wild populations remains to be seen. Potential changes which could influence demand, such as increased wealth in consumer countries, emergence of demand specifically for lion products, and changes to tiger trade regulation, are complex but could significantly increase the demand for lion products.

In addition to the present study, research is ongoing to understand the lion trade better (particularly in Africa) by a number of stakeholders, for example to understand better the relationship with the tiger trade and whether there is a differentiated demand for products made from lions or other big cats, and to determine if consumers have a preference for wild versus captive-bred lion products (Andrew Loveridge (WildCRU), *in litt.*, April 2018). The South African government is currently undertaking a major project to understand, *inter alia*, the captive-breeding industry and the trade in lions, how trade under a quota will affect wild populations and to gain a better understanding of potential linkages between markets for lion parts and other large cats (South African National Biodiversity Institute, *in litt.*, May 2018). The results of current and future research will help illuminate the dynamics of the legal and illegal trade in lion parts

[‡]For example:

USA: The USA announced a ban in October 2016 on the import of trophies taken from captive-bred lions in South Africa. In March 2018 the ban was withdrawn, and applications will now be considered on a case-by-case basis.

Australia: Australia issued a total ban in 2015 on all African Lion trophy imports.

France: In 2015 France stopped issuing permits for lion trophies four months after Cecil the Lion was killed.

The Netherlands: In 2016 the Netherlands said they would no longer allow the import of hunting trophies from a large number of species (including lion)

Introduction

At the 17th CITES Conference of the Parties (CoP) in 2016, nine African countries⁵ proposed the African Lion *Panthera leo* (hereafter 'lion') be transferred from Appendix II to Appendix I due to concerns that the species' wild population was declining and the international trade increasing (CITES, 2016). Not all range States supported the proposal, but Parties worked constructively to reach a compromise which consisted of retaining the lion in Appendix II with an annotation (Figure 1).

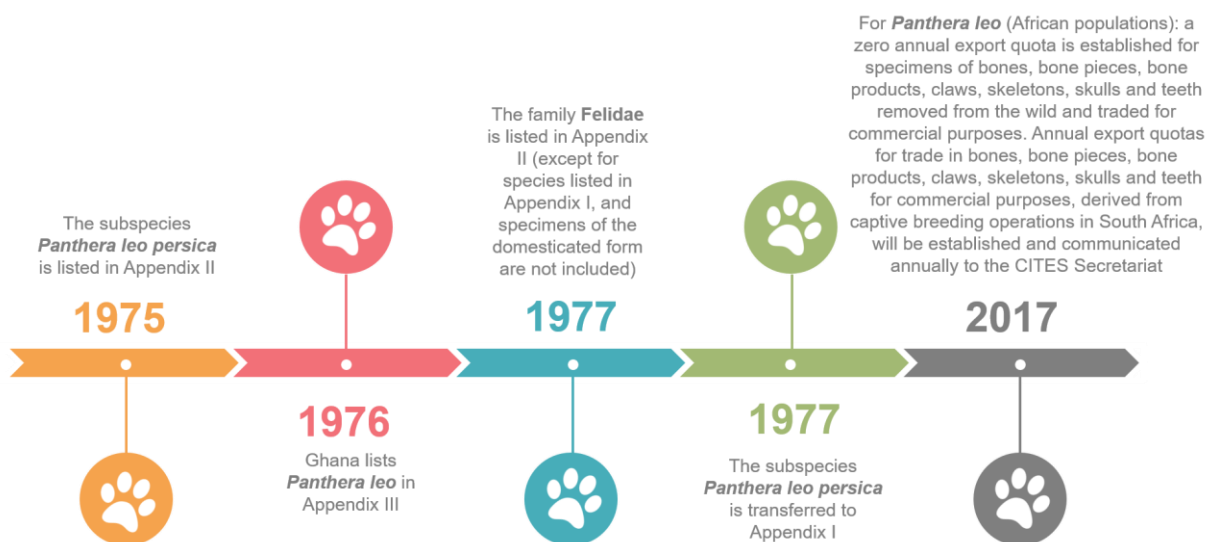


Figure 1 History of the lion within CITES

In addition, a number of related Decisions were adopted at CoP17 (17.241 – 17.245). Decision 17.241 e) directed the Secretariat to undertake studies on legal and illegal trade in lions, including lion bones and other parts and derivatives, to ascertain the origin and smuggling routes, in collaboration with TRAFFIC and/or other relevant organisations. The present study is the outcome of that Decision.

TRAFFIC was requested to submit a draft study by 16th May 2018, and a revised and extended draft study by 29th June 2018 which was subsequently discussed at the 30th Animals Committee (AC30) (16-21st July 2018). The present study is the final version which takes into account input received at AC30.

Data Sources

The full method used within this study can be found in Annex 1, but in brief the following data sources were used:

CITES Trade Data

Data for all lion commodities were downloaded from the CITES Trade Database in February 2018 covering the period 2007 to 2016. Reports from exporters are used throughout this study but major discrepancies are noted. Data reported in the CITES Trade Database are assumed to be predominantly legal.

Trade in Asiatic Lion *Panthera leo persica* (Appendix I) (which amounted to 36 live lions, (scientific) specimens and one body between 2007 and 2016) was considered outside the scope of this study so is not discussed any further. However, it should be noted that there is evidence that Asiatic Lions are being

⁵ Chad, Côte d'Ivoire, Gabon, Guinea, Mali, Mauritania, Niger, Nigeria and Togo

poached and subsequently traded as tiger in Asia (Williams *et al.*, 2015), which due to the very small wild population of the subspecies is of serious concern.

The analysis of this study focuses on direct exports. Reported re-exports from key importing countries identified in this study were relatively minor (199 reported by re-exporting countries/288 reported by importing countries) but an analysis of this is included in Annex 2.

Illegal Trade Data

Information on seizures of lion were obtained from the three sources listed below and combined into one dataset.

CITES Annual Illegal Trade Reports

Since 2017, Parties have been asked to submit an annual report of known instances of illegal trade of all CITES-listed species to the CITES Secretariat. As of March 2018, information for 2015 had been received by three countries, for 2016 by 41 countries and the European Union (some European countries also reported to the Secretariat separately), and three countries for 2017 (Lauren Lopes (CITES), *in litt.*, March 2018).

UNODC WorldWISE Database

The United Nations Office on Drugs and Crime (UNODC) have compiled a global database of seizures into the World Wildlife Seizures (WorldWISE) Database. Data come from a number of sources including CITES Annual and Biennial Reports, WCO-CEN^{**}, EU-TWIX^{††} and national databases. UNODC extracted instances involving lions for the purpose of this study, which dated from 1999 to 2015.

TRAFFIC

TRAFFIC collects information on illegal trade in species including lions on an ongoing basis to monitor patterns of trade. Most data are from open sources such as media reports, publications or court records. During the course of this study, stakeholders provided information on additional seizures which were incorporated into this dataset where possible. The year range for this dataset was 1999 to 2018.

Literature Review

Published and grey literature were consulted to obtain an understanding of the legal and illegal trade in lions. Literature were consulted in the following languages: English, French, Chinese, Vietnamese and Laotian. Literature was predominantly obtained by online searches of key words, but some literature was also shared by stakeholders.

Stakeholder Consultation

Over 200 stakeholders were consulted between February and May 2018, representing national CITES authorities, government departments, researchers, industry and national and international NGOs. Stakeholders represented a wide geographic area.

Online Surveys

Online surveys were conducted to assess the availability of lion products for sale in three countries:

^{**} World Customs Organisation - Customs Enforcement Network

^{††} European Union Trade in Wildlife Information eXchange

Viet Nam –An online survey was conducted of three social media websites and four e-commerce websites, all of which were open access. The survey was conducted in May 2018 using key words in Vietnamese.

Lao PDR –In April 2018 32 WeChat^{‡‡} accounts where wildlife products could be viewed and purchased were identified (one based in Vang Vieng, 12 in Vientiane and 19 in Luang Prabang). Of these accounts, only seven accepted contact requests and engaged in conversation.

China –An online survey was undertaken in March 2018 of websites in China. Searches of key words in Chinese using the China National Knowledge Infrastructure tool, Google Scholar and Baidu Xueshu were made.

Physical Surveys

Surveys of physical markets were conducted in three countries:

Viet Nam –A total of 129 outlets were surveyed in three locations: Hanoi (36), Ho Chi Minh City (75) and Quang Ninh Province (18) in April – May 2018.

Lao PDR –Surveys were conducted in Luang Prabang, Vientiane and Vang Vieng (a town north of Vientiane) in October 2017, and April 2018 (a total of 40 shops).

China – Surveys of Beijing, Tianjin, Zheng Zhou, Nanjing, Chengdu, Chongqing, Nanning, Dongxing, Pingxiang, Shijiazhuang, Tangshan, Dalian, Shenyang, Harbin, Hangzhou and Xi'an were undertaken for this study, and other recent studies conducted by TRAFFIC, between January and May 2018.

^{‡‡}WeChat (Weixin) is a multi-purpose messaging/social/mobile payment app.

Results

Where are lion products going and why?

Traditionally the use of lion products in Africa has been for medicinal purposes, ceremonies, rituals, decorations and talismans (Funston *et al.*, 2016). While lion products have not traditionally appeared in use in Asia and lion is not included in the TCM pharmacopeia, it has been suggested that lion bones are being used as cheaper, and often legal, substitute for products that would have traditionally contained tiger bone (e.g. Williams *et al.*, 2017). Recent large exports of bone items to Asia indicate this could be the case. There does also seem to be some limited demand for lion-specific products in Viet Nam, although no products advertised as being made from lion were observed during surveys in Viet Nam. Currently trophy hunting is the most common use of lions, and while hunters will likely keep some parts of the lions, other parts may enter domestic and international trade. These dynamics and the use of different lion parts in consumer countries are discussed in more detail below. According to World Animal Protection, growing demand in other countries including in eastern Europe (Russia, Poland), Japan and Republic of Korea has been noted, as well as products containing lion being sold in western countries (such as UK, USA) (Amanda Mayhew (World Animal Protection), *in litt.*, July 2018). These countries were not the focus of this study and therefore no evidence to substantiate this was gathered.

According to CITES trade data, trophies dominated the number of individual items in international trade (9,140). Exports of bones (3,977 plus 1,096 kg) and skeletons (3,469 plus 480 kg) were also significant (Figures 2A and 2B). When exports of bodies and skeletons⁵⁵ are combined these equate to an estimated 4,583 lions, many of which are likely “byproducts” of the trophies. Data were provided for this study by the major exporter, South Africa, which summarised that permits were issued for the export of 787 skeletons in 2017.

⁵⁵ Includes 480 kg of skeletons converted using the average mass of a lion skeleton calculated by Williams *et al.* (2015) (8.95 kg)

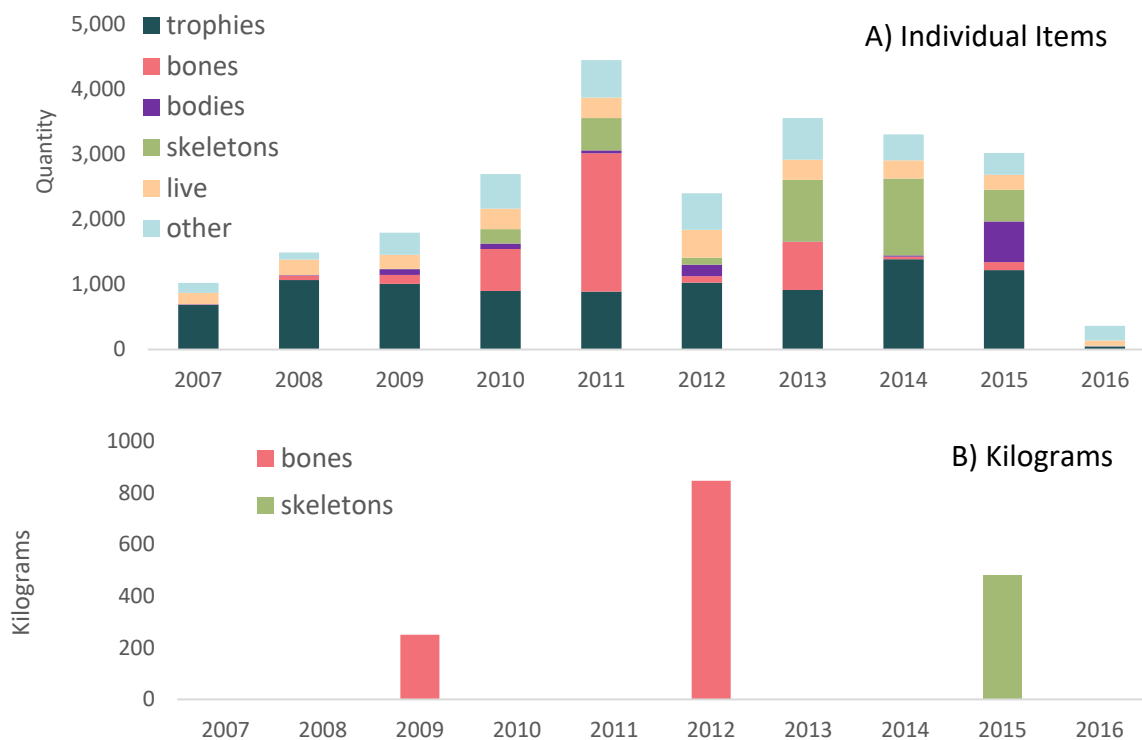


Figure 2 Annual exports of lion products (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. Excludes exports of (scientific) specimens. Source: CITES Trade Database

Major Importers of Lion Parts

Based on CITES trade data, while most trophies were exported to North America, the majority of exports of bodies^{***}, bones, skeletons (considered in this analysis to all be used predominantly for their bones) and live lions were destined for Asia (Figures 3A-E).

Lao PDR and Viet Nam were the most common Asian destinations for reported trade in bodies/skeletons, and along with the USA, the largest importers of bones. Caution should be used when interpreting these figures as is known that errors have occurred causing exports to Lao PDR to be mislabelled as Viet Nam and vice versa (Williams *et al.*, 2015). Williams *et al.* (2015) speculated that this could have been caused by confusion over the name of the city Vientiane in Lao PDR sounding similar to Viet Nam.

While most bones exported to the USA were done so using the purpose code of hunting, bones to Lao PDR and Viet Nam were reported as a mixture of commercial and hunting purposes codes. As Resolution Conference 12.3⁺⁺⁺ states that the purpose code for hunting (“H”) should be used when the specimen is “being imported, exported or re-exported by or on behalf of the hunter, as part of the transfer from its country of origin, ultimately to the hunter’s State of usual residence” it is not clear whether the correct source code is being applied to exports to Asia, or whether commercial (“T”) would be more appropriate.

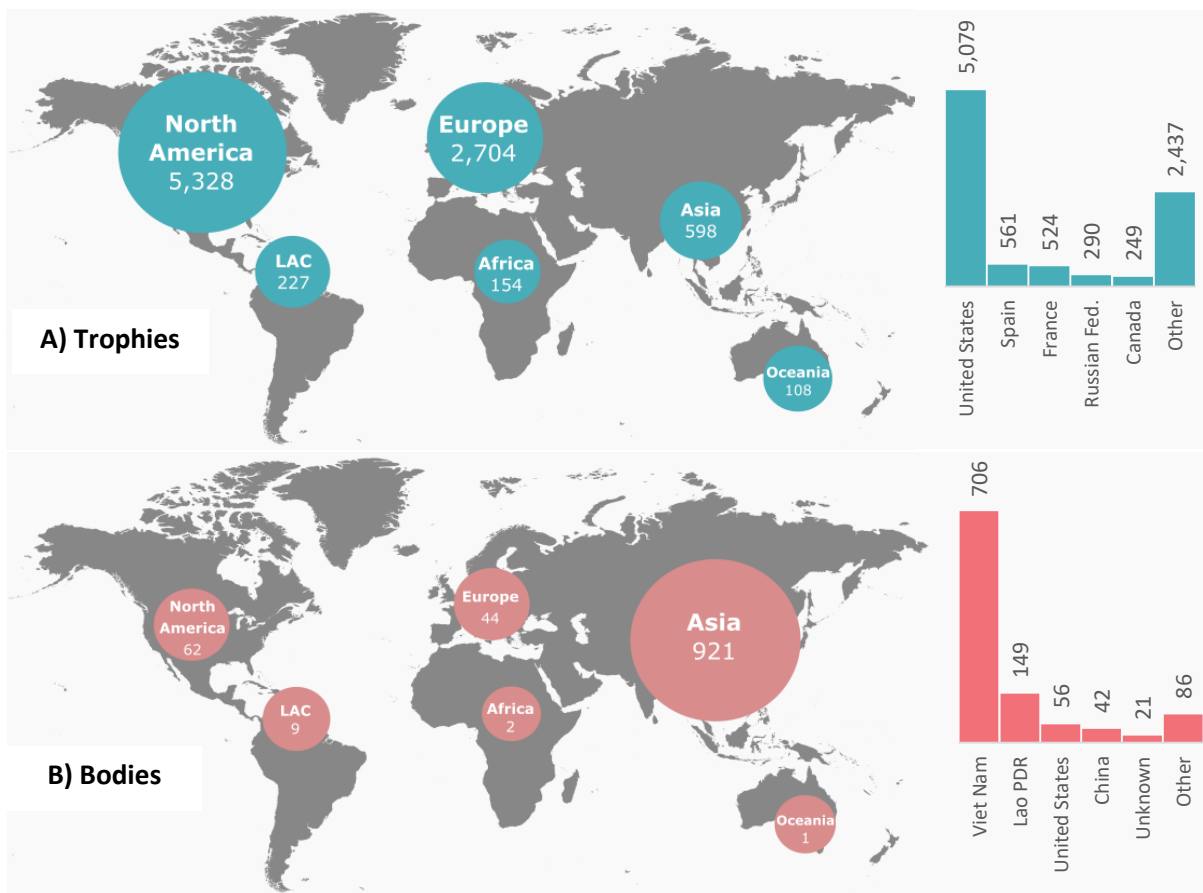
Based on the CITES Trade Database, it is not possible to calculate the number of individual lions that trade equates to⁺⁺⁺. The hunting for trophies may lead to “byproducts” (e.g. skeletons, skins) that enter

^{***} In their comprehensive analysis, Williams *et al.* (2015) converted most exports to East and Southeast Asia reported in the CITES Trade Database as “bodies” to “skeletons”, due to inconsistencies in how the term ‘carcass’ (used on South African export permits) had been interpreted. Therefore, this study has followed this approach and considers that bodies are primarily exported to Asia for their skeletons.

⁺⁺⁺ Resolution Conference 12.3 (Rev. CoP17) Permits and Certificates <https://www.cites.org/sites/default/files/document/E-Res-12-03-R17.pdf>

⁺⁺⁺ Within the CITES Trade Database, “Trophy” should refer to all the trophy parts of one animal if they are exported together on one permit. Similarly, if, for example, only two trophy parts (e.g. the skull and skin) of an animal are exported, then these items together should also be recorded as one trophy. If only one trophy part is traded then this should be recorded under the most descriptive term (e.g. skin) (CITES, 2018).

international trade separately from the “trophy”. If each reported trophy equates to one lion⁵⁵⁵, then the trophy hunting industry would appear to have sufficient hunted lions to be able to supply the quantity of other commodities observed in trade^{****} although trade dynamics may prevent this from occurring in reality. However, it may be the case that these non-trophy products reported in trade may not all be “byproducts” of lions hunted as trophies or the captive-trophy industry in general (e.g. females used for breeding), for example they may be derived from culled problem animals. Furthermore, it is likely that not all items derived from trophy hunted lions are entering international trade (e.g. they may be used domestically). EMS (2018) noted that the majority of skeletons exported from South Africa in 2017 included the skull, which would typically have been taken by a trophy hunter, which they believed raised doubts over whether skeletons were truly “byproducts”. A fuller discussion wild and captive sources of lions in Africa can be found in the section Availability of Lions in Africa.



⁵⁵⁵ Williams *et al.* (2015) stated that trophy hunters would typically take the teeth, skull and sometimes the floating bones (pair of clavicles).

^{****} A total of 9,140 trophies were reported as exported between 2007 and 2016, and 4,580 bodies/skeletons were reportedly exported in the same time period. The terms bodies/skeletons were used as they can be easily converted to individual lions.

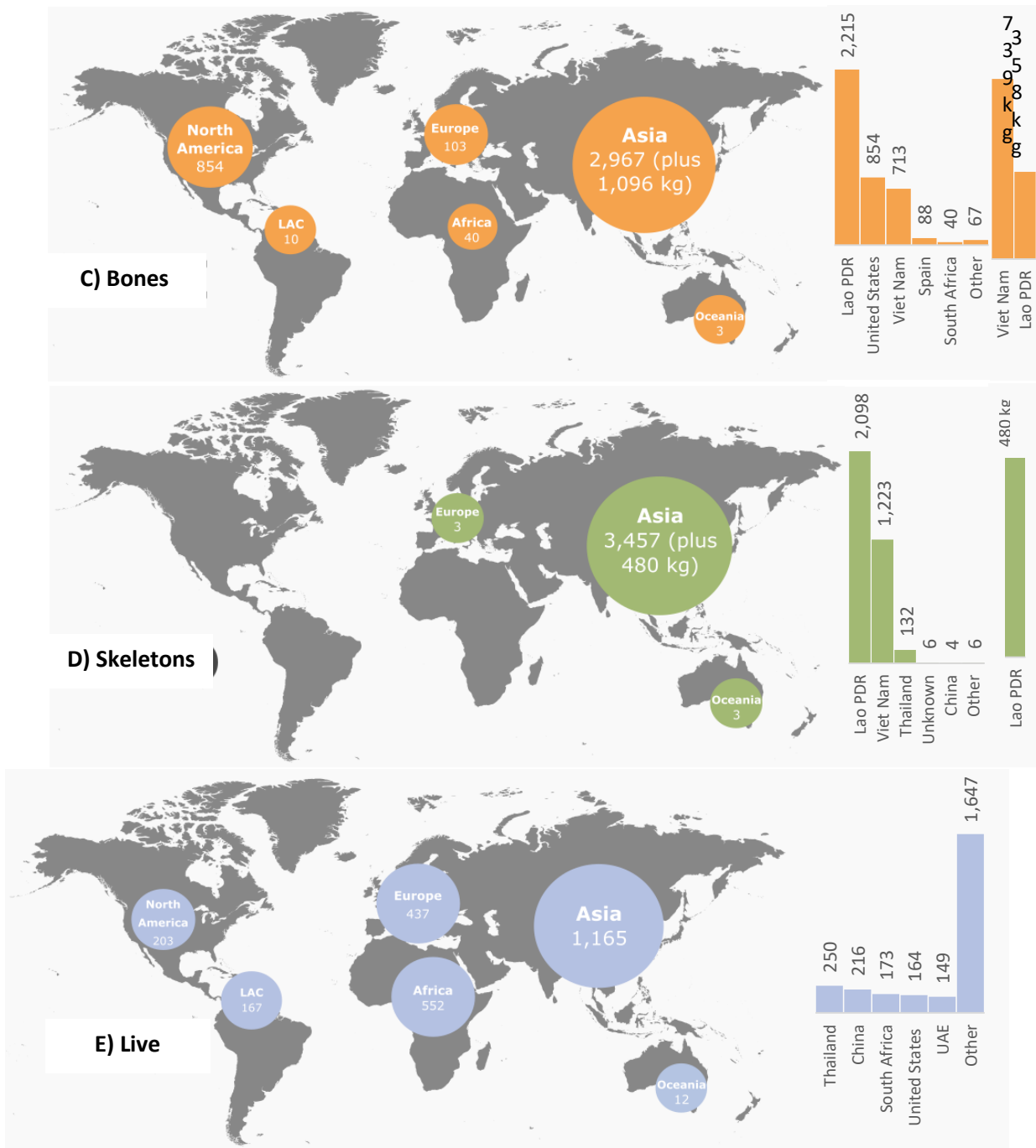


Figure 3 Number of lion (A) trophies, (B) bodies, (C) bones, (D) skeletons and (E) live exported to different regions – bar graph depicts countries exported to in the highest quantities (reported as number of individuals or kilograms, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Table 1 highlights significant discrepancies in trade reported by importing and exporting countries: for example, Lao PDR did not report any imports whereas exporters reported exporting significant quantities to Lao PDR.

In addition, based on the data provided for this study by the major exporter South Africa, permits were issued for exports of 787 skeletons in 2017: the destinations for these skeletons were recorded as Viet Nam (422), Lao PDR (278) or Thailand (87).

Table 1 Nine lion products exported in the highest quantities and the major importing countries 2007–2016 (reported as number of individuals or kilograms, reported by exporting and importing country, direct exports only). Excludes exports of (scientific) specimens. Source: CITES Trade Database

Commodity	Top Importers	Quantity* (% of global imports)				Estimated Number of Individual Lions Trade Equates To			
		Exporters		Importers		Exporters		Importers	
		Number individual items	kg	Number individual items	kg	Based on number individual items	Based on kg	Based on number individual items	Based on kg
Trophies ****	USA	5,079 (56%)	-	5,670 (71%)	-	5,079	-	5,670	-
	Spain	561 (6%)	-	556 (7%)	-	561	-	556	-
	France	524 (6%)	-	41 (1%)	-	524	-	41	-
	Total All	9,140	-	7,965	-	9,140	-	7,965	-
Bones	Lao PDR	2,215 (56%)	358	-	-	<i>Not possible to calculate as it is unknown which bones this refers to.</i>			
	USA	854 (21%)	-	159 (23%)	-				
	Viet Nam	713 (18%)	739	8 (1%)	1,198				
	Total All	3,977	1,096	697	1,198				
Skeletons ****	Lao PDR	2,098 (60%)	480	-	-	2,098	54 ^{§§§§}	-	-
	Viet Nam	1,223 (35%)	-	1,780 (38%)	1,080	1,223	-	1,780	121
	Thailand	132 (4%)	-	2,958 (62%)	-	132	-	2,958	-
	Total All	3,469	480	4,740	1,080	3,469	54	4,740	121
Live	Thailand	250 (10%)	-	144 (9%)	-	250	-	144	-
	China	216 (8%)	-	175 (10%)	-	216	-	175	-
	South Africa	173 (7%)	-	255 (15%)	-	173	-	255	-
	Total All	2,599	-	1,680	-	2,599	-	1,680	-
Claws ^{*****}	USA	601 (48%)	-	764 (66%)	-	30	-	38	-
	China	183 (15%)	-	-	-	9	-	-	-
	Viet Nam	182 (15%)	-	182 (16%)	-	9	-	9	-
	Total All	1,240	-	1,152	-	62	-	58	-
Bodies	Viet Nam	706 (67%)	-	1,007 (85%)	-	706	-	1,007	-
	Lao PDR	149 (14%)	-	-	-	149	-	-	-
	USA	56 (5%)	-	6 (1%)	-	56	-	6	-
	Total All	1,060	-	1,187	-	1,060	-	1,187	-
Skins	USA	364 (35%)	-	24 (3%)	-	364	-	24	-
	South Africa	141 (14%)	-	458 (53%)	-	141	-	458	-
	China	77 (7%)	-	84 (10%)	-	77	-	84	-

**** Trophy should refer to all the trophy parts of one animal if they are exported together on one permit. Similarly, if, for example, only two trophy parts (e.g. the skull and skin) of an animal are exported, then these items together should also be recorded as one trophy. If only one trophy part is traded then this should be recorded under the most descriptive term (e.g. skin) (CITES, 2018).

**** Skeletons may be exported with or without the skull

§§§§ Williams *et al.* (2015) calculated the average mass of a lion skeleton to be 8.95 kg

***** Based on the assumption that all 20 claws obtained from each lion are exported, which is likely an over-estimate.

	Total All	1,044		869	-	1,044		869	-
Skulls	USA	459 (44%)	-	116 (31%)	1	459	-	116	1 ⁺⁺⁺⁺
	Spain	68 (7%)	-	4 (1%)	-	68	-	4	-
	Lao PDR	67 (6%)	-	-	-	67	-	-	-
	Total All	1,033	-	377	1	1,033	-	377	1
Teeth⁺⁺⁺⁺	China	97 (37%)	-	-	-	24	-	-	-
	Lao PDR	90 (35%)	-	-	-	23	-	-	-
	USA	59 (23%)	-	70 (61%)	-	15	-	18	-
	Total All	259	-	114	-	65	-	29	-

* Known errors exist in the CITES Trade Database for exports from South Africa (see Williams et al., 2017)

Use and trade of lion parts: USA

Between 2007 and 2016, the USA was the largest global importer of lion trophies (Table 2), claws, and the second largest importer of lion bones (after Lao PDR).

Trophies were the commodity exported to the USA in the highest quantity by a significant margin (Table 2). According to exporters (the largest by far being South Africa), trophy exports to the USA had been increasing generally in recent years: from 407 in 2010 to 741 in 2015 (Figure 4). Export data for 2016 were not available for South Africa, but the USA reported importing 470 trophies that year. The USA was the largest destination for trophies: the vast majority of trophies exported to the USA were from captive-bred lions exported by South Africa (89%). Almost all (99%) trophies were exported to the USA using the hunting purpose code.

In January 2016 a ban came into force meaning that US hunters could no longer import trophies from captive-bred lions, prior to the ban US nationals were estimated to represent approximately 50% of foreign hunters in South Africa (Williams *et al.*, 2017). In March 2018, the US Fish & Wildlife Service withdrew the ban with the intention of now making imports on an application-by-application basis (USFWS, 2018).

As well as a significant legal trade, there was also evidence of an illegal trade involving the USA: 664 items were seized in the USA (Table 2) based on the available data the USA seized the third highest quantity (after Viet Nam and Tanzania). However, the dataset of seizures used in this study is skewed towards countries that report seizures to CITES, share seizures data with UNODC (for inclusion in WorldWISE) and/or who publicise seizures in the media: the USA does all three. Therefore, it cannot be concluded that the USA has the third largest market for illegal products.

Table 2 Lion products exported to USA 2007–2016 (reported as number of individuals or kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to the USA (1999–2018). Sources: (CITES Trade Database – reported trade), (UNODC WorldWISE, CITES Illegal Trade Reports, TRAFFIC – seizures)

⁺⁺⁺⁺ The mean skull mass for a wild lion was calculated at 1.3 +/- 0.4 kg (Williams *et al.*, 2015a).

⁺⁺⁺⁺ Based on the assumption that only the four canine teeth are exported.

	Reported trade (assumed legal) (2007-2016)				Seized (1999-2018)			
	Reported by Exporter		Reported by USA		In USA		En Route to USA	
	Individual items	kg	Individual items	kg	Individual items	kg	Individual items	kg
Trophies	5,079	-	5,670	-	31	-	-	-
Specimens	1,202	-	1,655	1	134	1	-	-
Bones	854	-	159	-	17	-	-	-
Claws	601	-	764	-	139	-	-	-
Skulls	459	-	116	1	8	-	-	-
Skins	364	-	24	-	17	-	1	-
Live	164	-	121	-	-	-	1	-
Teeth	59	-	70	-	71	-	-	-
Bodies	56	-	6	-	6	-	1	-
Hair	22	1	173	<1	1	1	-	-
Feet	13	-	2	-	-	-	-	-
Derivatives	7	-	4	-	-	-	-	-
leather products (small)	6	-	-	-	2	-	-	-
Plates	2	-	7	-	1	-	-	-
Skin pieces	2	-	5	-	5	-	-	-
Tails	2	-	2	-	-	-	-	-
Garments	1	-	15	-	-	-	-	-
leather products (large)	1	-	-	-	-	-	-	-
Bone pieces	-	-	19	-	8	-	-	-
Carvings	-	-	42	-	-	-	-	-
Jewellery	-	-	5	-	-	-	-	-
Rug	-	-	3	-	3	-	-	-
Bone carvings	-	-	3	-	-	-	-	-
Medicine	-	-	-	-	221	-	-	-
Total	8,894	1	8,865	2	664	2	3	-

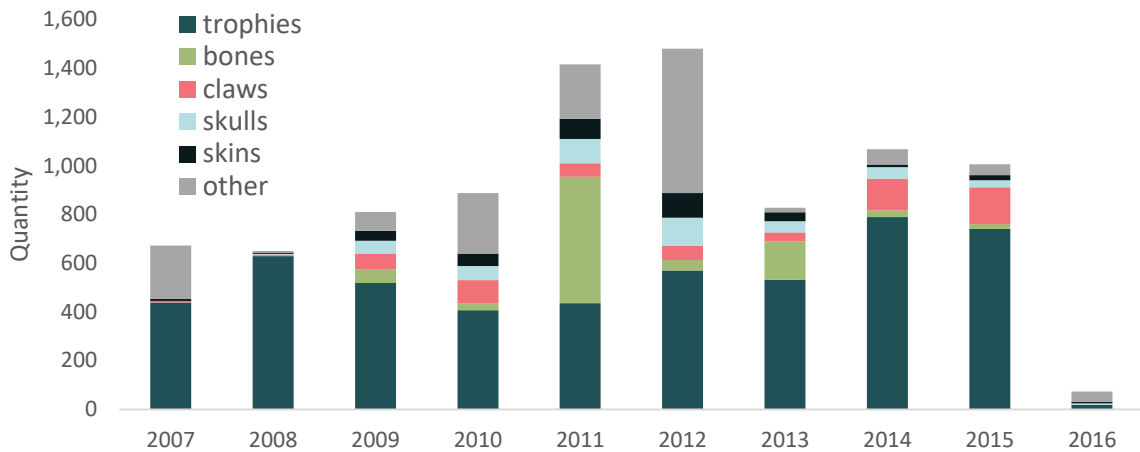


Figure 4 Number of lion products exported to USA 2007–2016 (reported by exporting country, direct exports only)
 Source: CITES Trade Database

Legally imported lion products in the USA are used in different ways. Most of the **trophies** are probably kept as a memento by hunters, but it is likely there is also a re-sale market (although this will be restricted by national legislation such as the Lacey Act). Most bones and claws were imported using the hunting purpose code, which could mean they are trophies from hunted lions exported in their individual parts, either to be used by the hunter or another individual.

Live lions are popular in American zoos, for example lions can be seen at San Diego Zoo, Bronx Zoo and Indianapolis Zoo.

Use and trade of lion parts: Asia

In 2014 concerns were raised that there appeared to be a growing interest in the use of lion bone in Asia as a substitute for products that contain tiger bone, such as wine, even though lions do not have a history of use within Asia (Bauer *et al.*, 2016). A survey of tiger product consumption in China determined that over half of consumers would use tiger-bone substitutes (Gratwicke *et al.*, 2008).

Tiger is used for a variety of medicinal purposes in Asia (Table 3). There are similarities between uses of lions in Africa and tigers in Asia: for example, lion bones are used to treat bone conditions such as rheumatism in Africa, as are tiger bones in Asia.

Table 3 Tiger body parts utilized for healing and preventive medicine (Coggins, 2003; Gratwicke *et al.*, 2008; Mills & Jackson, 1994; Nowell, 2000; Nguyen & Nguyen, 2008; Nguoi Viet Online, 2012)

Tiger Derivative	Example Uses
Bone plasters	Aches and pain, bone and joint conditions (e.g. arthritis, rheumatism), replenish calcium, anti-inflammatory, treat osteoporosis
Bone wine	Aches and pain, bone and joint conditions (e.g. arthritis, rheumatism), replenish calcium, anti-inflammatory, treat osteoporosis, increase sexual capacity, paralysis
Bone gelatine "cake" / "glue" ^{§§§§§} (<i>cao</i> in Viet Nam)	Give strength, arthritis
Penis	Increase sexual performance, treat impotence
Fat	Vomiting, dog bites, bleeding haemorrhoids, scalp ailments in children
Skins	Clothing, magical amulet, trophies, decoration, treat mental illness
Claws	Magical amulet, jewellery to ward off common cold
Teeth	Magical amulet, rabies, asthma, sores on the penis, diabetes
Whiskers	Tooth ache
Eyeballs	Epilepsy, malaria, nervousness or fevers in children, convulsions, cataracts
Nose	Epilepsy, children's convulsions
Tail	Skin disease
Brain	Decrease laziness, heal pimples
Lung	Relieve cancer
Testes	Tuberculosis of lymph nodes
Blood	Strengthening the constitution and willpower
Bile	Convulsions in children
Stomach	Calming upset stomachs
Gallstones	Weak or watering eyes, abscesses on the hand
Meat	Nausea, malaria, improving vitality, tonifying the stomach and spleen
Paws	Arthritis, improve general health
Hair	Drives away centipedes when burnt

According to CITES trade data, Asian countries were not large importers of lion trophies between 2007 and 2016, which is not surprising as Asian countries historically do not share this tradition with European and

^{§§§§§}Tiger 'jelly'/'cake'/'glue' (*Cao* in Vietnamese) is made by boiling cleaned bones for several days to condensing down the gelatine. The bone pieces are removed, and the remaining liquid is gradually reduced to a glue-like consistency which hardens into an odourless cake. It is normally cut into squares for sale and generally consumed by dissolving small pieces into medicinal wine (Nowell, 2000). Additional ingredients such as gall bladder may be added (Anon, *pers. comm.*, April 2018)

American nationals, although this may be changing as wealth increases in non-Western countries. As the lion was listed in Appendix II without the annotation between 2007 and 2016, there should have been no reason for “pseudo-hunts” to occur like those identified for rhinos (Vietnamese and Thai nationals hunted rhinos in South Africa under the guise of trophy hunting when in fact trading the rhino horn commercially was the true purpose which is prohibited for the Appendix I-listed species) (Milliken & Shaw, 2012).

Viet Nam

According to the CITES Trade Database, skeletons, bones and bodies were the commodities exported to Viet Nam in the greatest quantity between 2007 and 2016 (Table 4). Combining the number of skeletons, bodies and live lions equates to 1,995 lions, in addition to trophies which may have been derived from the same lions as the skeletons/bodies.

There were notable discrepancies between the quantities reported by exporting countries (the largest exporter by far was South Africa) and Viet Nam (Table 4). Most significant is 1,080 kg of skeletons (could equate to approximately 121 skeletons^{*****}) reported by Viet Nam in 2016. At the time of writing, South Africa had submitted its annual report for 2016 but the data were not yet available in the CITES Trade Database. No re-exports from Viet Nam have been recorded in the CITES Trade Database between 2007 to 2016.

Exports of skeletons to Viet Nam peaked in 2014 (Figure 5), and bone exports were highest in 2012 (739 kg) and 2013 (533 individual bones). It has been speculated that in this period exports that previously would have entered Lao PDR were instead exported to Viet Nam, potentially influenced by several factors including a major importing Lao PDR-based company losing its licence in 2014 (Xaysavang company) and Lao PDR being subject to a seven-month commercial trade suspension for all CITES-listed species between March–September 2015 due to its failure to submit a National Ivory Action Plan (CITES, 2015).

A significant quantity of products were reported as seized in or en route to Viet Nam, including a total of 1,127 claws (Table 4) which could equate to 56 lions⁺⁺⁺⁺⁺. Vietnamese Customs have reported they face challenges when attempting to differentiate between legal and illegal products in trade due to a lack of available testing techniques (Mahn Vuong Tien, (Viet Nam Management Authority), *pers. comms.*, July 2018).

Some of the types of commodities seized in Viet Nam (e.g. bones, claws) were also legally imported, indicating parallel legal and illegal trade in the same commodity types.

Table 4 Lion products exported to Viet Nam 2007–2016 (reported as number of individuals or kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to the Viet Nam (2011–2018). Text in red font is number of skeletons for which export permits were issued in South Africa in 2017. Sources: (CITES Trade Database – reported trade), (UNODC WorldWISE, CITES Illegal Trade Reports, TRAFFIC – seizures) (2017 South Africa permits – Department of Environmental Affairs, South Africa)

***** Williams *et al.* (2015) calculated the average mass of a lion skeleton to be 8.95 kg, although there is room for error with the present dataset (for example, because it is unknown whether the skeletons included the skulls)

+++++ Based on 20 claws per lion (including dewclaws)

	Reported Trade (assumed legal) (2007-2016)				Seized (2011-2018)			
	Reported by Exporter		Reported by Viet Nam		In Viet Nam		En route to Viet Nam	
	Individual items	kg	Individual items	kg	Individual items	kg	Individual items	kg
skeletons	1,223(+ 422)		1,780	1,080	6			
bones	713	739	8	1,198		47.4		
bodies	706		1,007					
claws	182		182		680		447	
live	66		100					
trophies	42		3					
skin pieces	16							
skulls			4					
Teeth					66		65	
Skins					4			
Total	2,948	739	3,080	2,278	756	47.4	578	-

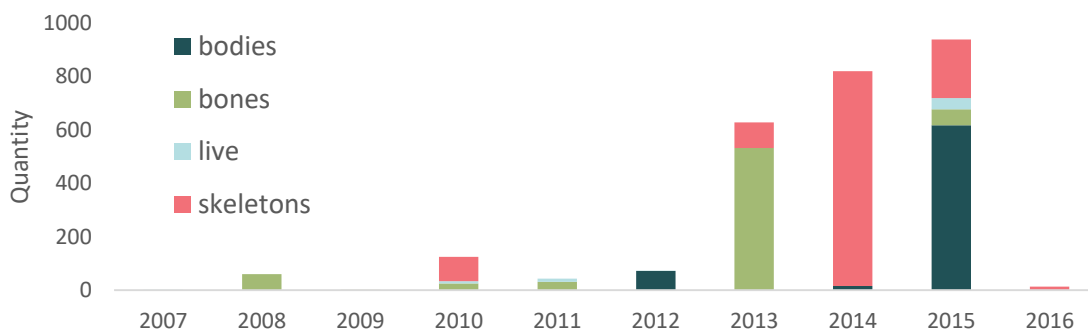


Figure 5 Annual exports of lion bones / bodies / skeletons / live to Viet Nam (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Lion products are used in a variety of ways in Viet Nam (see below). Market observations (physical and online) found there appears to be very limited demand explicitly for lion products. Based on discussion with various stakeholders and published information (e.g. Williams *et al.*, 2017) there is a strong belief that lion products are being substituted for products traditionally containing tiger such as cake. Alternatively, lion bone could be acting as a supplement to tiger bone rather than as a substitute. DNA analysis and differential price data would be required to test these theories.

- 25 outlets in Hanoi were surveyed for this study in April 2018 and no lion products were found openly for sale. Three outlets were selling products claimed to be from tigers (a total of 24 **claws** and five **teeth**), all of which were said to be from wild tigers. Similarly, a total of four **teeth** and two **claws** advertised as from tiger were observed in Ho Chi Minh City but no products advertised as being from lion. No testing was undertaken to determine if the products were genuinely from tigers; lion products of this nature would be difficult to differentiate from tiger on appearance. No products from big cats were observed in Quang Ninh.
- No lion products were found for sale online in May 2018 in a survey conducted for this study. However, on at least one occasion a seller agreed to meet to further discuss lion products but did

not provide any evidence of having the products in their possession. It is important to keep in mind that the surveys for this study were for products being openly sold as lion, not for products being advertised as another species (i.e. tiger) but actually derived from lions.

- **Bone “cake”/“glue”/ (“cao”)** is said to be consumed within Viet Nam and while presently the main demand is apparently for tiger bone cake, one stakeholder anticipated that the trade for lion bone cake will grow and that some sellers are now openly telling consumers that the cake contains lion (bones and gall bladder) and consumers are specifically requesting lion products (Anon A, *pers comm.*, April 2018). However, indications are currently that most lion bone cake is being mis-sold as containing tiger bone. No evidence of cake advertised as either from tiger or lion was observed during surveys, suggesting that if it is being sold then it is not being done so openly. According to Ammann (2013), lion skeletons are mixed with other ingredients (turtle shell, deer antler, monkey bone) then boiled slowly to make the cake. Like most processed products, it is very difficult, if not impossible, to differentiate from tiger bone cake.
- **Lion balm** (cooked lion bone) was observed for sale in Viet Nam in 2017 and advertised as coming from South Africa (Trang Nguyen (FFI), *in litt.*, April 2018).
- Interviews with people who wear lion **claws** and **teeth** as amulets found that wearers believed it would bring them luck, and attract money and prosperity, as well as showing off wealth and high-ranking status (Viet Online, 2012). Accordingly, the demand is apparently so high the market has been flooded with fake lion products such as plastic claws. The same interviews found people would use lion lung to treat cancer. In May 2016 a Vietnamese man was stopped in the Nghe An Province carrying what he believed were 680 tiger claws he had purchased in Lao PDR for USD22 each (which would total nearly USD15, 000), however DNA analysis revealed that the claws were actually lion (equivalent to 34 lions) (Tienphong, 2016).
- There is said to be demand for lion **skulls** and **teeth** which are used as a symbol of masculinity and male consumers are said to like to have a full set of lion skull / teeth, tiger skull and rhino horn as a status symbol for display (Anon A, *in litt.*, April 2018).

Lao PDR

There is disagreement regarding the role of Lao PDR in the lion trade. All reported exports were from South Africa, who reported exporting a significant amount of trade in bones and skeletons to Lao PDR between 2007 and 2016, although no imports of lion products have been reported by Lao PDR in the CITES Trade Database (Table 5). The Lao PDR Scientific Authority stated there had been no legal imports or exports of lions (Dr Souriodong Sundara (Lao PDR Scientific Authority), *in litt.*, May 2018). Research undertaken as part of this study indicates that Lao PDR is seemingly acting as a transit point for lion products destined for Viet Nam and China (see Intra-Asian Trade section for further details).

Exports to Lao PDR were first reported in 2009 (most significantly 250 kg bones plus 80 bodies) and increased to 837 skeletons in 2013 (Figure 6). Exports to Lao PDR in 2015 included 480 kg of skeletons (estimated to equate to ~50 lions^{*****}) plus 148 individual skeletons, despite a trade suspension being in place for seven months of that year.

It is believed that errors have occurred in the transfer of data from South African permit applications to CITES annual reports which have caused exports to Lao PDR to be mislabelled as Viet Nam and vice versa

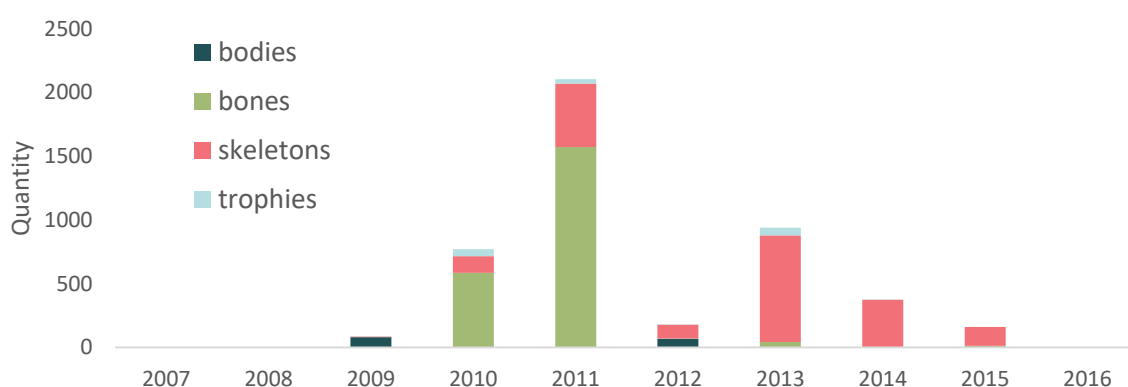
***** Williams *et al.* (2015) calculated the average mass of a lion skeleton to be 8.95 kg, although there is room for error with the present dataset (for example, because it is unknown whether the skeletons included the skulls)

(Williams *et al.*, 2015). Williams *et al.* (2015) speculated that this could have been caused by confusion over the name of the city Vientiane in Lao PDR sounding similar to Viet Nam.

No seizures are known to have taken place within or en route to Lao PDR (Table 5), although 680 claws were seized in Viet Nam in 2016 apparently having come from Lao PDR. Williams *et al.* (2017) found evidence on airway bills of 116 kg of bones exported from Uganda in 2016, this was not reported by either Lao PDR or Uganda in their annual reports for that year. The exporting company recorded on the airway bill has also been involved in exports of pangolin scales from Uganda (Vivienne Williams, *in litt.*, April 2018).

Table 5 Number of products exported to Lao PDR 2007–2016 (reported by exporting country and Lao PDR, direct exports only) and number of products seized in Lao PDR. Text in red font is number of skeletons for which export permits were issued in South Africa in 2017 Sources: (CITES Trade Database – reported trade), (UNODC WorldWise, CITES Illegal Trade Reports, TRAFFIC – seizures) (2017 South Africa permits – Department of Environmental Affairs, South Africa)

	Reported Trade (assumed legal) (2007-2016)				Seized			
	Reported by Exporter		Reported by Lao PDR		In Lao PDR		En route to Lao PDR	
	Individual items	kg	Individual items	kg	Individual items	kg	Individual items	kg
bones	2,215	358	-	-	-	-	-	-
skeletons	2,098(+278)	480	-	-	-	-	-	-
trophies	155		-	-	-	-	-	-
bodies	149		-	-	-	-	-	-
teeth	90		-	-	-	-	-	-
skulls	67		-	-	-	-	-	-
claws	54		-	-	-	-	-	-
Total	4,828	838	-	-	-	-	-	-



Figure

6 Annual exports of lion bones / bodies / skeletons / trophies exported to Lao PDR (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

Traditionally large quantities of wildlife commodities could be found for sale in Luang Prabang and the capital Vientiane, including ivory, rhino horn products, tiger teeth, Hawksbill Turtle products, and Helmeted Hornbill casques (EIA, 2015; Krishnasamy *et al.*, 2016; Vigne and Martin, 2017), although lower quantities are now observed (Kanitha Krishnasamy (TRAFFIC), *in litt.*, May 2018). In May 2018, the Lao PDR Government issued Prime Ministers Order No. 05 to enable Lao PDR to fulfil its obligations under CITES of all listed species, and to promote the protection of endangered, threatened and exploited species to further enhance the survival of those species. This includes a prohibition on hunting of wild animals,

import, transit, export and trade of wildlife and directs action be taken by wildlife law enforcement and for those found trading prohibited wildlife to be investigated and prosecuted. Furthermore, it prohibits the establishment of wildlife farms and recommends turning existing farms into safari or zoos for conservation, tourism or scientific purposes (WWF, 2018). Some are concerned that this recommendation could be used as a loophole if the safari/zoo operations are able to operate without specific controls to prevent laundering and other illegal activities. In addition, in recent months the Specific Economic Zone (SEZ) in Bokeo was issued with sanctions by the US Treasury for engaging in illicit activities including illegal wildlife trafficking (the END Wildlife Trafficking Act^{§§§§§§} listed Lao PDR as a country of concern). A law enforcement campaign, commenced by the Government of Lao PDR in January 2018, targeting traders openly selling wildlife resulted in products being removed from display and traders being much more cautious. An exception appeared to be for tiger wine (and bear bile) which is still offered openly. Confidential sources reported that Chinese tourists were routinely seen being taken into private rooms where ivory and other wildlife products were being sold.

Market surveys in Lao PDR conducted for this study did not find any open trade in lion bone products in any of the three locations surveyed, and traders reported they were not sold in Lao PDR. Big cat products observed for sale were always referred to as being from tigers. Based on surveys conducted for this study and other past studies (e.g EIA, 2015), trade in products advertised as tigeris evident in Vientiane, Luang Prabang, Vang Vieng, the SEZ in Bokeo and on numerous online platforms (see detailed results from this study below). Only the application of forensic-type techniques would be able to confirm if there were genuine tiger products or from other species such as lion. The majority of the traders observed were Chinese nationals, but a small number of Vietnamese and Lao PDR nationals were also observed.

Vientiane

Four international hotels containing souvenir shops selling wildlife products, were visited. Three of these hotels displayed items advertised as large cat canines, tiger wine and cake. Two of these hotels appeared to have more than one trader operating in the premises.

Sixteen additional locations were visited in Vientiane. The majority of the traders present were situated in or around the Chinese San Jiang Market, and all of the traders in the vicinity of the market were Chinese nationals. One trader in Vientiane city centre was Laotian. Big cat products (sold as tiger) were found in seven locations and were mostly canine teeth, claws and wine. A range of carved bone products, claimed to be tiger, were also offered in one shop. Another large trader displayed 20 big cat claws: the claws had tiger fur attached to the base to give the appearance of tiger but appeared to have been manipulated. The claws appeared genuine, but the fur pattern did not appear to be more consistent with the typical markings of a tiger's paw, however it was not possible to confirm the actual species that the claws were obtained from.

Luang Prabang

Sixteen shops were surveyed in Luang Prabang. Five traders offered tiger teeth and claws for sale but it is unknown if they were genuinely from tigers.

One location, known to trade wildlife products, had erected a gate and placed a security guard in response to the recent law enforcement efforts.

Vang Vieng

Four shops were found to be selling wildlife products. One shop, belonging to a chain of two shops in Vientiane, openly sold tiger wine claimed to have been produced in North Korea and Lao PDR. The trader stated that they were commonly bought by Korean and Chinese tourists to take home as presents. Another shop displayed tiger glue and a large tiger canine.

^{§§§§§§} The Eliminate, Neutralize, and Disrupt (END) Wildlife Trafficking Act of 2016

Online Surveys

The survey found that the majority of physical shops in Luang Prabang trading wildlife products also offered online trade via social media groups using WeChat, an app used by over one billion users (the majority of whom are in China (BBC, 2018)). Upon joining WeChat groups, potential customers are able to view products online and purchases are either delivered to the customer's hotel or else delivered to an address by a logistics company. Items can be ordered directly from China for delivery. This logistical set up is similar to the system noted by Ammann (2018) in Luang Prabang. This information indicates cross-border trade with China may be occurring.

A total of 32 WeChat groups were identified, and of the seven traders that accepted contact requests to join their groups, none offered lion products for sale although one reported having tiger products for sale at the time (no tiger was seen during the survey of the physical shop linked with the WeChat account). This trader in Luang Prabang (owner of four shops selling wildlife products on the main tourist street) advertised approximately 220 individual items (decorative items, bones, name seals and individual pieces), claimed to be made of tiger bone.

China

Live lions were the commodity most frequently imported into China according to the CITES Trade Database, followed by trophies and claws (Table 6). Ten countries reported exporting lion products to China: with most being exported from South Africa (539 individual items including 188 trophies and 118 live lions) or Botswana (133 individual items, mainly claws (126)). China exported nine live lions to other Asian countries between 2007 and 2016.

Exports of live lions and trophies to China peaked in 2014, whereas all exports of claws occurred in 2013 (Figure 7). Of the 216 live lions exported to China, nearly half (106) were reported as being done so for the zoological purpose, and a further 70 were for commercial trade. Most of the 183 claws were also exported for commercial purposes (126).

A range of commodities were seized in or en route to China, mainly claws, bones and skeletons (Table 6). For some commodities the quantity seized was comparable with the quantity reported in the CITES Trade Database, or larger. For example, 344 claws were seized (all in 2014) compared with exports to China of 183 claws reported in the CITES Trade Database (all in 2013). One man arrested and convicted in China for smuggling 11 lion skeletons purchased in Viet Nam (plus an additional seven tiger skeletons and 20 skeletons of unspecified big cats) said he believed all 38 skeletons to belong to tiger and would not have bought the lion skeletons if he had known the truth (Xiao Yu (TRAFFIC), *in litt.*, May 2018). A recent compilation of seizures in China between 2011-2017 indicates that the mis-selling of lion as tiger is not unusual: of 23 seizures, eight involved lion apparently being sold as tiger (EIA, 2018). It is not clear who in the trade chain is aware of the truth and who is being deceived. EIA also noted that according to court records, the price per kilogram for lion bone (origin unknown) in China was 2-3 times higher than for wild-sourced tiger bone. However, it is not clear how comprehensive the dataset was that this analysis was based on.

As mentioned above, research in Luang Prabang (Lao PDR) suggests a cross-border trade with China, but if it occurred between 2007 and 2016 it would have presumably been without CITES permits as it was not reported in the CITES Trade Database. Lao PDR and Viet Nam do not appear to have reported having exemptions to the need for export permits for personal and household effects (Res. Conf. 13.7 (Rev. CoP17) (CITES, 2018)).

A recent investigation by World Animal Protection noted that one source involved in lion breeding in South Africa believed the main demand for processed lion (and tiger) products was China, and that Hong Kong

SAR was a major sales hub (Amanda Mayhew (World Animal Protection), *in litt.*, July 2018). The same investigation stated that lion and tiger products were being re-exported from Hong Kong SAR to Chinese health shops in the UK, USA and other Western countries, and that Japan and Republic of Korea were growing as markets for lion bone. It is not clear from these investigations whether the consumers are aware they are purchasing lion or if they believe the products contain a different species, or where the lion products originated from and were processed.

Table 6 Lion products exported to China 2007–2016 (reported as number of individuals or kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to China (2005–2018). Sources: (CITES Trade Database – reported trade), (UNODC WorldWise, CITES Illegal Trade Reports, TRAFFIC – seizures, EIA (2018))

	Reported Trade (assumed legal) (2007-2016)		Seized (2005-2018)			
	Reported by Exporter	Reported by China	In China		En Route to China	
	Individual items	Individual items	Individual items	kg	Individual items	kg
live	216	175	-	-	-	-
trophies	194	106	-	-	-	-
claws	183	-	344	-	38	-
teeth	97	-	36	0.19	46	-
skins	77	84	5	-	-	-
bodies	42	52	3	-	-	-
skeletons	4	-	42	20	-	-
bones	-	48	123	7.92	-	-
garments	-	8	-	-	-	-
rug	-	24	-	-	-	-
skin pieces	-	2	-	-	-	-
skulls	-	12	-	-	1	-
specimens	-	102	-	-	-	-
genitals	-	-	-	-	14	-
Total	813	613	553	28.11	99	-

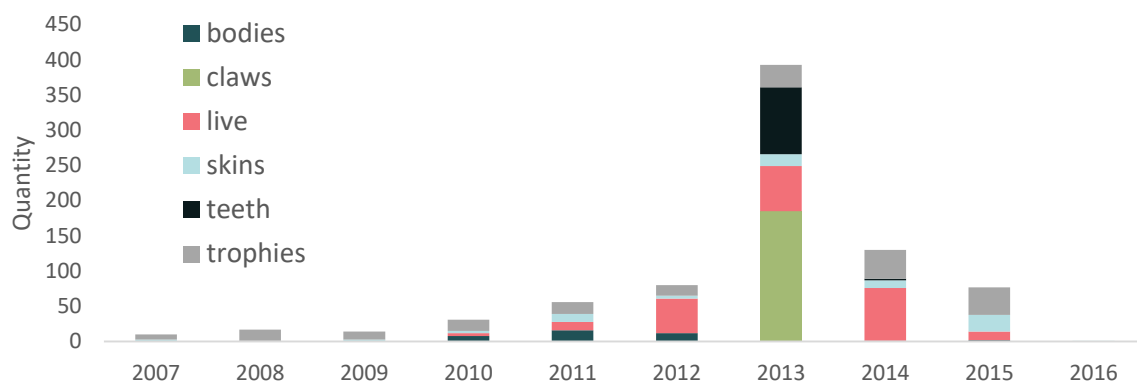


Figure 7 Annual exports of lion bodies / claws / live / skins / teeth / trophies to China (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Lion products are known to be consumed within China:

- A report to the 65th Standing Committee stated that the two largest captive tiger facilities in China were granted permission to manufacture **bone wine** from lion bone (Nowell & Pervushina, 2014). Lion products have been observed for sale in China:
 - o Permission was granted in 2005 to produce 400,000 bottles of “**bone strengthening wine**” (which sounds similar to “tiger bone wine” in Chinese). The wine was packaged in tiger-shaped bottles and sold by the Xionsen Wine Producing Ltd. Company for aphrodisiac qualities in addition to rheumatic curative potential and sold in gift shops in cities and airports. *Panthera leo* was listed on the label (rather than using the word “lion”) and the assumption is that most consumers would not know that *Panthera leo* was the scientific name for lion. This led to concerns that either consumers may believe they are buying genuine tiger bone wine or that in fact the wine does contain tiger and is mislabelled (Nowell and Xu 2007, EIA, 2017).
 - o The CITES Secretariat visited the Guilin Xionsen Tigers and Bears Mountain Village in 2007, a large facility housing tigers, bears and lions that was registered to engage in breeding, research and public performance (CITES, 2007). This facility is apparently the source of the lion bone wine mentioned above, and the wine was sold in the shop for CNY480–1,200 (USD62–155^{*****}) depending on length of fermentation (lion **meat wine** was also available for sale at a lower price (CNY150 (USD19))). When asked why the wine was sold in a tiger-shaped bottle, the owner replied that the product was intended to be a substitute for tiger bone wine (CITES, 2007). During recent surveys, TRAFFIC observed the bone wine still available for sale in 2017 (price ranged from CNY320–1,380 (USD48–209⁺⁺⁺⁺⁺)). The CITES Secretariat observed the bone strengthening wine for sale in the hotel it stayed in 2007 and were told by the sales assistant that it contained tiger bone (not lion). The sale of wine in a hotel used by international tourists suggests some of the wine may be exported from China, though China does not appear to have reported such trade in its annual reports if it does occur. China has reported that no exception is in place for exports of personal and

^{*****} Currency converted using rate on 07/04/2007 (last day of mission) using www.oanda.com

⁺⁺⁺⁺⁺ Currency converted using rate on 01/12/2017 using oanda.com

household effects, and as such an export permit is still required for the movement of personal effects containing lion (CITES, 2018a). Offers for sale online can be observed^{*****}; the online adverts display images of wine in tiger-shaped bottles and there is no mention of lion bone in the advert text (although it is listed as an ingredient displayed in one of the pictures) indicating the traders are not selling it based on its lion content.

- An online survey for this study conducted found a variety of **claw** and **teeth** products for sale online in China, including individual teeth/claws and jewellery such as a lion teeth necklace described to also contain rose-gold and diamonds (CNY16,800 (USD2,735^{§§§§§§§§})) (Table 7).
- 16 towns/cities (Beijing, Tianjin, Zheng Zhou, Nanjing, Chengdu, Chongqing, Nanning, Dongxing, Pingxiang, Shijiazhuang, Tangshan, Dalian, Shenyang, Harbin, Hangzhou, Xi'an) were surveyed for this study and other recent surveys conducted by TRAFFIC, and no lion parts were observed. Twelve big cat body parts (bones, teeth, paws) were observed which were advertised as being from tiger.

Table 7 Lion products observed for sale online in China during a five-day survey (Source: TRAFFIC survey February 2018. Includes items combined with other goods such as diamonds, includes adverts which had expired)

Commodity	Total quantity	Price range per item
Claws	28	CNY380–1,600 (USD56–251 ^{*****})
Teeth	13	CNY7,000–16,800 (USD2,000–106,932 ^{*****})

Thailand

Exporters reported that live lions were exported to Thailand in the greatest quantity followed by skeletons (Table 8). The large discrepancy between the number of skeletons reported as exported to Thailand and imported to Thailand (Table 8) may be an error in the data: in 2013 South Africa reported exporting 14 skeletons with a comment noting this involved 2,910 bones, whereas Thailand reported 2,910 skeletons (UNEP-WCMC, *in litt.*, April 2018). The issue of mistakes in the database of this nature between South Africa and a range of lion importing countries is explored in detail in Williams *et al.* (2015).

Exports of skeletons predominantly took place in 2015 (118 skeletons from South Africa), and all bones were exported that same year (30 again from South Africa (Figure 8)).

Table 8 Lion products exported to Thailand 2007–2016 (reported as number of individuals or kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to the Thailand (2012–2018). Text in red font is number of skeletons for which export permits were issued in South Africa in 2017 Sources: (CITES Trade Database – reported trade), (UNODC WorldWise, CITES Illegal Trade Reports, TRAFFIC – seizures) (2017 South Africa permits – Department of Environmental Affairs, South Africa)

	Reported Trade (assumed legal) (2007-2016)		Seized (2012-2018)	
	Reported by Exporter	Reported by Thailand	In Thailand	En Route to Thailand
	Individual items	Individual items	Individual items	Individual items
Live	250	144	27	
Skeletons	132(+87)	2,958		
Bones	30	153		

***** E.g. <https://item.taobao.com/item.htm?spm=a230r.1.14.122.78b6310cHxRyv1&id=564706383171&ns=1&abucket=7#detail>

§§§§§§§§ Currency converted using rate on 18/11/2014 (date item was released on) using oanda.com

***** Currency converted using rate on 03/05/2018 using oanda.com

***** Currency converted using rate on 03/05/2018 using oanda.com

Trophies	15			
Bodies		4		
Large leather product		1		
Teeth				2
Total	427	3,260	27	2

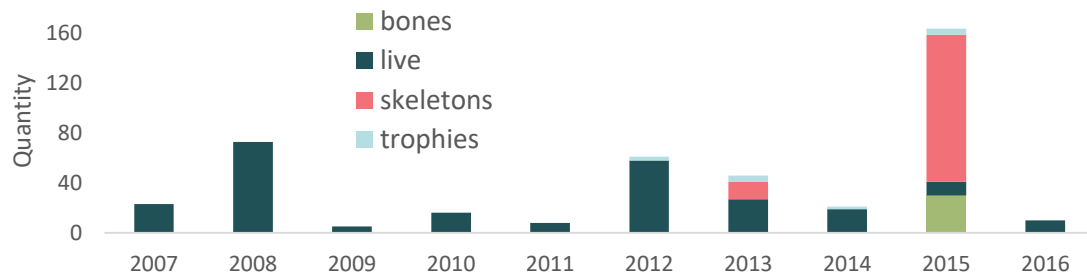


Figure 8 Annual exports of lion bones / live / skeletons / trophies to Thailand (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Live lions are kept in zoos in Thailand, and facilities where tourists can physically interact with wildlife including lions (and tigers) are not unusual^{*****}: including the Tiger Temple which has been accused of trafficking in tigers (EIA, 2017). While the Tiger Temple is now closed to the public, concerns have been raised that a linked company (Golden Tiger) have been given permission to open a similar facility (EIA, 2017). Twenty-seven live lions were reported as seized prior to this in 2012-2013 in various locations in Thailand, in addition to two teeth (Table 8).

Thai nationals were arrested in South Africa in 2011 suspected of being involved in rhino horn smuggling and the purchase of lion bones. In court records from this case, the connections of the Xaysavang Trading Export-Import company in Bolikhamxay Province, Lao PDR were revealed including their trading in **lion bone, teeth and claws**, as well as rhino horn (Williams *et al.*, 2015).

Use and trade of lion parts: Africa

The CITES Trade Database contains relatively little trade between African countries between 2007 and 2016 (1,011 individual products): most notably 366 live lions, 187 specimens, 167 skins and 154 trophies. South Africa (403) and Botswana (191) were the largest exporters, and South Africa (568) and Zambia (76) the largest importers.

However, it is known that a wide variety of lion products are used in many African countries for medicine, ceremonies, rituals, decorations and talismans (Funston *et al.*, 2016). While detailed information on use types in countries is patchy and dependent on where research has been conducted, it can be very helpful in illuminating the range of uses and trade of lions, for example:

- In three provinces in Nigeria alone, people were found to use 22 different lion parts for an array of health issues including healing broken bones, whooping cough and spiritual protection (Table 9), and most of the 200+ people questioned in the area has used lion parts in the past (Born Free, 2008).

***** E.g. Safari Volunteer www.safarivolunteer.com, Tiger Kingdom www.tigerkingdom.com, Tiger Temple www.tigertemplethailand.com

- Williams *et al.* (2015) details lion products recorded in “muthi”^{§§§§§§§§§§} markets in South Africa since the 1980s, the most prevalent product being fat, although a multitude of other products such as bones, skins and skulls have also been observed—strength or invoking fear in others was cited as a reason for consumption of lion products by some. Traditional healers often use pairs of lion bones (usually the phalanges) as instruments of divination, but it is unknown how often new pairs must be obtained to meet this demand (Williams *et al.*, 2015).
- Surveys of 30+ markets in Benin in 2017 found lion fat, skin products and bones regularly for sale, as well as leopard, elephant and pangolin products (ZSL, *in prep*, 2018). A previous study in Benin found lion parts were used to treat a range of problems such as fatigue, joint pain and eye problems (Table 9) (Sogbohossou 2006). In the past, DNA mitochondrial analyses on some products found in Benin claimed to be derived from lion revealed them to be imitation (Sogbohossou 2006a) which may indicate demand is higher than supply.
- In Burkina Faso, there seems to be a demand for lion body parts, bones, fat, claws, for traditional medico-magical use, although no quantitative information is available (Born Free unpublished results, Pellerin *et al.*, 2010).

The most comprehensive and up to date information on perceived use in Africa comes from Williams *et al.* (2017a) who conducted a questionnaire and literature survey across current and former range States to document informed opinion and evidence for the occurrence of domestic and international trade and consumption in lion products. According to this study, the main reason for the use/trade in Africa of lion parts was for “zootherapeutic” practices (such as traditional medicine, magic, “witchcraft”, rituals), and the lion parts said to be used most frequently for such practices were claws, fat, skin, and teeth. Interestingly, respondents to the questionnaire were more aware of domestic use of lions, rather than international use (Figure 9). Respondents were aware of a variety of products being used in all of the regions of Africa including skin, claws, teeth, fat and bones (Figure 10).

A number of the range States permit trophy hunting, and while information regarding the nationalities of hunters could not be obtained, it is likely that at least some will be nationals. For example, Williams *et al.* (2017) noted that the domestic market in South Africa had allegedly expanded after the number of American trophy hunters declined following the 2016 ban on imports of captive-bred lion trophies. Currently it is not known how many USA-nationals continue to hunt a captive-lion but not take the trophy home with them. According to data in the CITES Trade Database, 154 trophies were exported from one African country to another between 2007 and 2016: the main exporters being South Africa (53 – the largest importer being Namibia (13)) and Mozambique (37 – mostly to South Africa (32)).

Little information was found on the consumption of lion in Africa by workers/travellers originating from outside of the continent. While it is possible that non-nationals residing in African countries may be consuming lion, evidence is currently limited to sporadic anecdotal information, and further research is needed on this.

Table 9 Lion body parts utilized for healing and preventive medicine from: Nigeria (semi-structured interviews in three provinces surrounding Yankari Game Reserve (Born Free 2008)) and Benin (Sogbohossou 2006).

Lion Derivative	Main uses (Nigeria)	Main uses (Benin)
Fat	Dislocation, fracture, broken bone, back pain, rheumatism, joint pain, bone marrow pain, protection against spiritual attack	Fatigue, breathlessness, joint pain, bone fractures, protect against witchery
Skin unspecified	Protection from evil spirits, cough, whooping, self-empowerment, child protection from convulsions	Be invisible against danger, protection from evil
Bone	Rheumatism, joint pain, bone marrow pain, bone fractures, back pain	Rheumatism, to give strength
Meat	Nutrition, increase general health	
Teeth	Protection of children's teeth during teething, teeth gum infections, migraine.	
Lungs	Whooping cough, protection.	
Forehead skin	Protection/ immunity against evil spirits/enemy, empowerment	To inspire fear, to get consideration
Vein	Spiritual protection, erectile dysfunction	
Throat Parts	Whooping cough, spiritual protection, asthma, increase sound of voice	
Eyes	Protection from evil spirits, empowerment.	
Dung	Spiritual protection, empowerment, night fever and ear problems	Eye problems
Heart	Spiritual guidance, protection of crops, ceremonies	
Liver	Spiritual protection, headache, temper heart	
Claws	Spiritual protection, ear problem	
Whiskers	Spiritual protection	
Penis	Spiritual protection, erectile dysfunction	
Leg	Joint pain	
Breast	Breast feeding mothers trouble feeding	
Nose	Stomach problem	
Blood	Spiritual empowerment	
Saliva	Ear problem	
Brain	Back pain and rheumatism	
Skull		To inspire fear
Milk		To make fearless

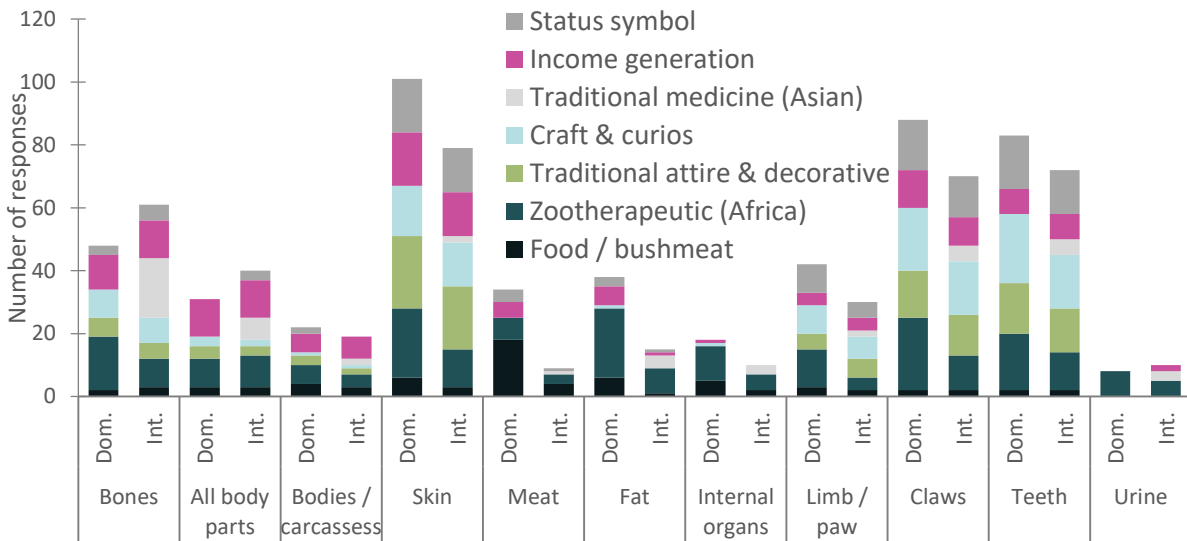


Figure 9 Respondent opinion of why various lion products are sold/used either locally/domestically or internationally. Derived from the results of a questionnaire covering former and current lion range States (2014/2015) (Williams *et al.*, 2017a)

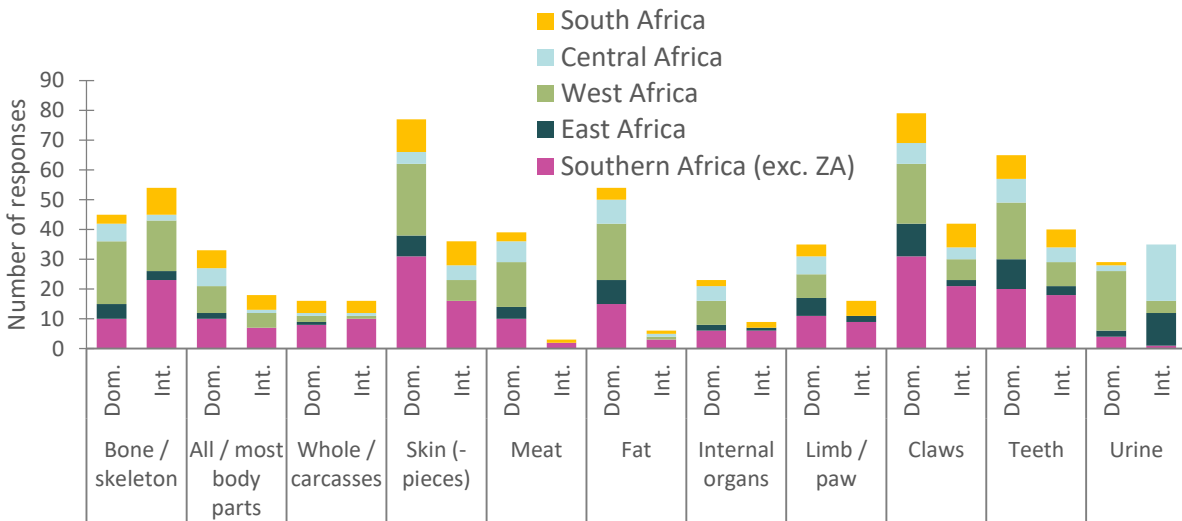


Figure 10 Respondent awareness in African sub-regions of use/trade in lion products either locally/domestically or internationally. Derived from the results of a questionnaire covering former and current lion range States (2014/2015) (Williams *et al.*, 2017a)

There is anecdotal information suggesting Asian nationals living in Africa are buying lion products but this could not be accurately quantified.

Where are lion parts exported from?

Availability of lions in Africa

Products in trade can be derived from wild or captive-bred lions in Africa; both sources are used in the legal and illegal trade. Currently there is little evidence that wild lion products are more desired than those of captive-bred lions (or vice versa), further research is needed to understand better the consumers and whether provenance is a consideration. Williams *et al.* (2015) noted that the proportion of lion products from captive-bred animals was likely actually to be higher than that reported in the CITES Trade Database, as until 2012 some permit issuing authorities in South Africa classified lions that had been raised in captivity but released for a specified period of time before being shot³³ as wild.

South Africa's large captive-breeding industry has attracted much attention in recent years. The CITES-listing amendment adopted in 2016 means that exports of a number of parts³⁴ traded internationally for commercial purposes from South African captive-bred lions are subject to an export quota. Trophy hunting from wild and captive lions from all countries is still permitted as this is not considered commercial trade.

Sources of lions from Africa

Lion products can enter trade in a variety of ways:

Trophy Hunting

According to CITES trade data, between 2007 and 2016 a total of 9,140 trophies were exported: the majority of which were from captive-lions exported from South Africa (Figure 11). It should be noted that there can be a lag time between a lion being hunted and the trophy being exported. There are distinct markets for hunters of captive versus wild lions: the total minimum cost for hunting a wild lion outside of South Africa has been estimated to range from USD37,000 (Cameroon) to USD76,000 (Tanzania), whereas hunting in South Africa estimates were cheaper (approximately USD20,000) (Lindsey *et al.*, 2012). Lindsey *et al.* (2012) found the nationality of the hunter influenced preference (55% of German clients' last lion hunts were captive-bred compared with 17% of US clients), although according to CITES trade data, the USA imported 59% of all trophies from captive-bred lions, and 46% of those from wild lions.

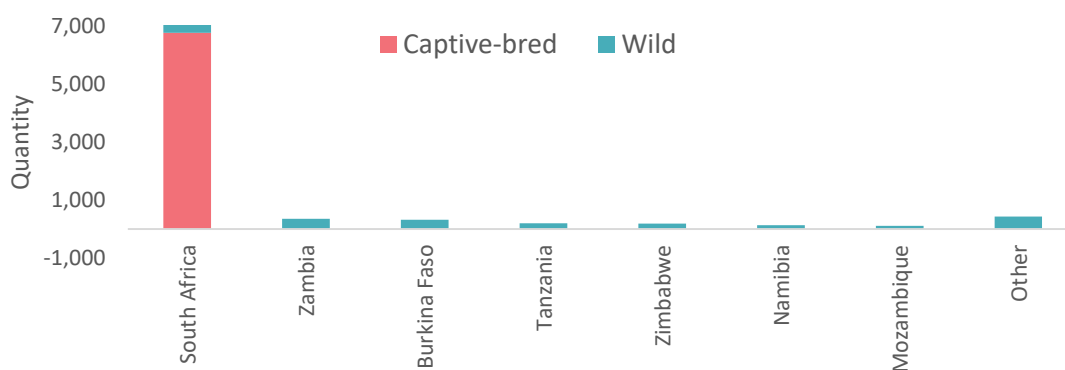


Figure 11 Source of exported lion trophies (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

³³ The period varies by province but can be as little as 96 hours (North West Province (Williams *et al.*, 2015).

³⁴ Bones, bone pieces, bone products, claws, skeletons, skulls and teeth

Trophy Hunting of Wild Lions

Many African countries permit trophy hunting of wild lions³⁵, although the number of wild trophies being exported has declined since 2000, and exports of trophies from South Africa’s captive-bred lions now dominate the trophy trade (Figure 12). In 2000, 90% of all trophies exported were wild (448 trophies – mainly from Tanzania (246) or South Africa (93)), but in 2015 this had declined to 7% (87 trophies – again with Tanzania as the largest exporter (53)). The decline in the trophy hunting quota in Tanzania from 165 lions in 2008 to 39 lions in 2015 (Benyr *et al.*, 2017) is likely to have contributed to the decline in overall wild exports. The decrease in the number of lions hunted for trophies in Tanzania declined from 52 in 2012 to 27 in 2017 (annual average: 40 lions) which has been attributed to restrictions on the age of lions that can be hunted and regulatory changes in major importing destinations, namely the USA (58% of lion trophy hunters are American) and the EU (Fredrick Ligate, Tanzania Management Authority, *in litt.*, July 2018).

In West Africa, trophy hunting is allowed in Benin, Burkina Faso and Senegal (Chardonnet *et al.*, 2005): the annual average harvested in the W-Arly-Pendjari (WAP) ecosystem by Benin and Burkina Faso was approximately 15 lions between 1999 and 2014 (Bouché *et al.*, 2016). The wild population in Senegal, estimated to be 16 lions (Henschel *et al.*, 2014), is not considered large enough to support trophy hunting (Christine Breitenmoser (IUCN Cat Specialist Group), *pers. comm.*, July 2018) In Central Africa, trophy hunting is permitted in Cameroon, Central African Republic and Chad, and each year trophy hunters harvest on average 17 adult lions (Chardonnet *et al.*, 2005, Mésochina *et al.*, 2010). Trophy hunters in West and Central Africa are mostly European, and take home many of the body parts (skull, bones, skin, teeth, claws) although local buyers are known to purchase lion products directly from professional hunters and trackers for local uses, e.g. in Benin (Sogbohossou, 2006; William Crosmar (TRAFFIC), *in litt.*, May 2018).

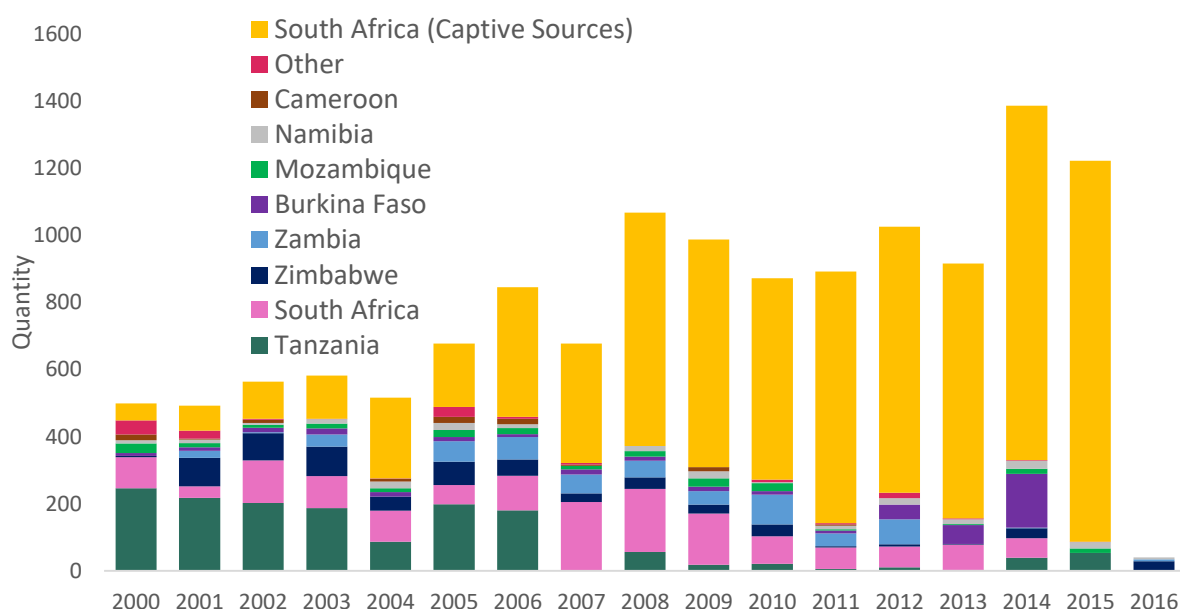


Figure 12 Exporters of lion trophies (reported as number of individual items, reported by exporting country, direct exports only) from the wild unless otherwise stated, 2000–2016. Source: CITES Trade Database

³⁵ Including (but not limited to) Burkina Faso, Benin, Cameroon, Central African Republic, Ethiopia, Mozambique, Namibia, South Africa, Tanzania, Zambia, Zimbabwe (Chardonnet *et al.*, 2005; Pellerin *et al.*, 2009, 2010, Bouché *et al.*, 2016, Lindsey *et al.*, 2013, Species+, 2018).

According to the International Professional Hunting Association, it is common practice to destroy any parts of the lion carcass that are not to be taken as a trophy (including bones) in the field (Matthew Boguslawski, International Professional Hunters Association, *pers. comm.*, July 2018). Some countries have requirements for dealing with the body parts that are not exported, for example in Zambia the bones are supposed to be destroyed by burning (Kerri Rademeyer (Wildlife Crime Prevention Project (Zambia)), *in. litt.*, April 2018). In Tanzania, tour operators are meant to conduct inventories of lion (and leopard) bones so they do not enter illegal trade (Dennis Ikanda (Tanzania Wildlife Research Institute), *in. litt.*, April 2018), and in Zimbabwe everything should be destroyed except the skin (Roseline Mandisodza (Scientific Authority of Zimbabwe), *pers. comm.*, July 2018). It is possible that such “byproducts” of wild hunts could enter domestic or international trade, Williams *et al.*, (2017a) reported that 21% of questionnaire respondents stated that wild trophy-hunted lions were a source of bones in trade. The present study was not able to determine how significant a contribution this source made specifically to the international trade.

It has not been possible to calculate how many wild lions that were trophy hunted were subsequently exported as there is no central database of hunting trophies for all range States. Even where data do exist, the situation is not clear. For example, it is estimated that approximately 50 lions are hunted annually as trophies in Tanzania (Dennis Ikanda (Tanzania Wildlife Research Institute), *in. litt.*, April 2018). This would equate to ~500 trophies available for export between 2007 and 2016. According to CITES Trade Data, Tanzania reported exporting 206 trophies during that period (although importing countries reported importing 674 from Tanzania).

The matter is further complicated in that exports of individual parts of one trophy-hunted lion (e.g. head, skin) could be reported to the CITES Trade Database using those terms rather than “trophy”. Guidance for the preparation and submission of annual reports advises that Parties should report all the trophy parts of one animal as one trophy if they are exported together on the same permit. If only one trophy part is traded then this should be recorded under the most descriptive term (e.g. skin).

Trophy Hunting of Captive Lions

South Africa is the only range State known to have significant commercial breeding facilities. While lions are kept in captivity for a variety of reasons (including breeding, hunting, petting tourism and walking with lions (Funston & Levendal, 2014)), it is income derived from live sales for trophy hunting and actual hunting that drives the industry, with sales from lion parts a secondary income stream (Table 10). CITES trade data support this: trophies from captive lions were exported in the largest quantity from South Africa (6,749) with skeletons/bodies totalling 4,182 (although skeletons/bodies may be derived from the trophy hunted lions).

Table 10 Estimated annual mean value of sales per facility of 14 facilities in South Africa. Data source: Williams & t' Sas-Rolfes (2017)

Income Stream	2012	2013	2014	2015	2016*
Bone sales	R595,000 (USD72,439 ³⁶)	R519,000 (USD52,464)	R650,000 (USD61,253)	R809,000 (USD66,164)	R505,000 (USD34,136)
Live sales for trophy hunting	R1.47 million (USD178,967)	R1.5 million (USD151,629)	R1.61 million (USD151,719)	R1.47 million (USD120,224)	R508,000 (USD34,338)
Trophy hunting on property: foreign clients	R1.6 million (USD194,794)	R1.8 million (USD181,955)	R2.4 million (USD226,165)	R2.2 million (USD179,927)	R650,000 (USD43,937)

* Note that the in Table 10 values for 2016 are thought to be anomalous due to potential lag effects from carried over hunts/sales from 2015, plus strategic behaviour in response to the CITES-listing amendment and the US ban (Williams & t' Sas-Rolfes, 2017).

Much has been written about the captive-breeding industry in South Africa which is not repeated here (but see Williams *et al.*, 2015), the following points summarise captive breeding of lions in South Africa:

- South Africa's 2014 lion Biodiversity Management Plan estimated that there were around 6,000 captive lions in South Africa housed in at least 200 facilities: a significant increase on the estimated 3,596 lions in 174 facilities in 2008 (Funston & Levendal, 2014). A more recent paper estimated there to be 8,000 captive lions (Moorhouse *et al.*, 2017 In Bauer *et al.*, (2018). The current captive population is said to still be growing, but this may stop due to changes in regulation (Carla van der Vyver (CVV ENVIRO), *in litt.*, May 2018) such as the US import ban.
- An ongoing survey of captive-breeding facilities found that facilities kept lions for live sales (62%), hunting (56%) and to export skeletons/bones to Asia (26%) (Williams & t' Sas-Rolfes, 2017). Hunters will likely combine their lion hunt with the hunting of a variety of other species (Carla van der Vyver (CVV ENVIRO), *in litt.*, May 2018).
- The introduction of wild lions into South Africa's captive population is prohibited due to concerns over reducing genetic diversity and introducing disease, and the regulated captive lion industry requires DNA profiling of all lions (Carla van der Vyver (CVV ENVIRO), *in litt.*, May 2018). However, concerns have been raised that wild lion cubs are being smuggled across the border from Botswana by sophisticated criminal syndicates to farms in South Africa, and that smuggling is escalating (Amanda Mayhew (World Animal Protection), *in litt.*, July 2018). The full scale of such smuggling could not be determined by the present study, nor the impacts on the practice from recent changes to the South African trophy hunting industry.

³⁶ Currency conversion made using rate of 1st July of the relevant year (www.oanda.com)

- The quota for exports of lion products for 2017 was set at 800 skeletons (with or without the skull) derived from captive-breeding facilities. There were 14 applicants for the lion bone quota (four of which had previously exported lion bones to Asia) and the quota was filled in less than two months (Williams & t' Sas-Rolfes, 2017). It is not known how many of the 14 permit applicants were successful. At the time of writing, South Africa had just announced that the quota for 2018 was 1,500 skeletons (with or without skull).
- The quota of 800 for 2017 was established following an “*extensive stakeholder consultation process during which the Department [of Environment Affairs] considered all variables*” (Department of Environmental Affairs, 2017). However, there have been concerns that the quota was too low to meet the supply and demand (in 2015 South Africa exported 1,097 skeletons/bodies). This constriction of the legal trade could lead to an illegal trade sourced both from South Africa’s captive population and from wild lions across the continent (Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018). The quota for 2018 has been set at 1,500 skeletons. Some are concerned that allowing a legal trade to continue in captive lion parts provides a cover for the illegal trade in lions and the illegal trade in tiger parts which are not easily differentiated from lion without testing using forensic techniques (EIA, 2017; Born Free, 2018)
- A DNA sample is taken of each skeleton to confirm it is from lion. However, some are concerned that the DNA sample is taken before the skeleton is packed for shipment, and as such the genuine lion skeletons could subsequently be replaced with tiger skeletons (EMS, 2018).
- According to Williams *et al.* (2015) trophy hunters usually take the teeth, skull and sometimes the floating bones (pair of clavicles). Therefore, “byproducts” from trophy hunting such as skeletons, skins, bones etc. may enter legal trade (although some countries prohibit them from entering trade in this way). Williams *et al.* (2015) calculated that a lion has up to 309 bones. Female lions were said to be of little value for trophy hunting³⁷ (except for breeding). While selling females for their parts could be a potential strategy, Williams *et al.* (2015) determine that the selling of females (and juveniles) was in the minority— however this may have changed in recent years as the market has adapted to the CITES-listing amendment and various national import bans on trophies (e.g. USA, Australia, France, Netherlands). EMS (2018) noted that the majority of skeletons exported from South Africa in 2017 included the skull (typically taken by a trophy hunter) which they believed raised doubts over whether skeletons were truly “byproducts”.
- The captive-breeding industry is currently in a state of flux due to the uncertainty caused by the amendment to the CITES-listing proposal and various national import bans of trophies (e.g. USA, Australia, France, Netherlands). Early indications from the ongoing survey of facilities by Williams & t' Sas-Rolfes (2017) have detected that facilities have responded to the USA import ban by scaling down breeding (82%), reducing workforce (61%), selling off live stock (46%), euthanizing lions (29%) and focusing on lion bone trade (21%). There have been reports of farmers burning/burying carcasses of euthanised lions as they cannot afford to keep them any longer (Carla van der Vyver (CVV ENVIRO), *in litt.*, May 2018). If the USA ban continues, 52% said they will focus on trading lion bones and 29% that they will

³⁷ According to Williams *et al.* (2015), hunters would pay USD16,800–USD17,900 per male and USD3,150–USD4,200 per female

ethanize all stock (Williams & t' Sas-Rolfes, 2017). Some professional hunters and outfitters in South Africa have indicated they are attempting to attract hunters from new markets such as Russia and Middle Eastern countries (Mike Cadman (journalist), *in litt.*, May 2018).

- The price of a lion skeleton in 2013 paid to the farmer was quoted as USD1,260 to 2,100³⁸ (Williams *et al.*, 2015): while this price information is likely out of date, it suggests that the price is probably not high enough to justify raising lions purely for their skeletons. The average cost of maintaining one lion for a year is R15,000 to R20,000 (USD1,218 to 1,624)³⁹(Carla van der Vyver (CVV ENVIRO), *in litt.*, May 2018), and carcasses sold for their bones are typically from lions aged three to five years old (Williams & t' Sas-Rolfes, 2017): therefore a lion farmer would need to sell skeletons for around USD5,700 to cover the cost of raising the lion.
- Significant legal stockpiles of lion parts are building up in South Africa with owners keen to sell (Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018).
- Some South African breeders are keen to sell live lions to Chinese importers in higher quantities than is typical for zoo imports, and the South African CITES Scientific Authority is treating permit applications with caution in case they are acting as a proxy for skeleton exports (Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018), or perhaps for farming within China itself.

The exact number of lions held in captivity in other range States is not known but assumed to be lower than South Africa's captive population.

Poaching of Wild and Captive lions

Poaching of Captive Lions

Many of the seizures reported in the media are from captive lions found with their heads and feet removed⁴⁰ (most likely to obtain teeth, and carpal/metacarpal bones and claws (Michael t' Sas-Rolfes (University of Oxford)), *in litt.*, May 2018)). According to media reports collected by Animal Defenders International (2018), 60 captive lions and five tigers were poached in South Africa since 2016 plus there were attempts to poach at least five more. Reported poaching and poaching attempts increased from 22 lions and tigers (2016), to 27 (2017) and 21 in the first half of 2018. Following an investigation, World Animal Protection noted that criminal syndicates were involved in the poaching of captive (and wild) lions in South Africa, who allegedly recruited facility workers (or people living near to reserves) to provide information (Amanda Mayhew (World Animal Protection), *in litt.*, July 2018).

There is currently little evidence that the poaching of captive lions in South Africa and subsequent removal of paws/skulls is for the international trade: several experts believe these are destined for the traditional African medicine ("*muthi*") markets within South Africa (Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018). Others however are concerned that an apparent increase

³⁸ Depending on size of skeleton, and whether the skull was included.

³⁹ Converted on 14th May 2018 using www.oanda.com

⁴⁰ E.g. <http://www.traveller24.com/Explore/Green/shockwildlifetruths-horrific-lion-poaching-exposed-as-deas-legal-exportation-quota-looms-20170130>

<https://news.nationalgeographic.com/2017/10/wildlife-watch-poachers-south-africa-target-captive-lions/>

in poaching cannot fully be attributed to this, as there does not appear to have been a rise in demand for *muthibut* there has been a rise in international demand for lion parts (Amanda Mayhew (World Animal Protection), *in litt.*, July 2018). Further research is being conducted on this.

Poaching of Wild Lions

The poaching of wild lions has been recorded across the African continent. Recent examples can be found in Table 11 and illustrate that poaching likely has multiple drivers, including retaliatory killings as well as trade.

There are instances in which body parts have been removed from carcasses, notably skulls and paws (Table 11), although in some areas there are also reports of entire skeletons being removed after illegal killings (e.g. Niassa, Mozambique) (Colleen Begg *in pers. comm* to Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018) and in Kruger National Park (South Africa). Based on information being gathered in Niassa, poaching of lions for the international trade was first detected around three years ago, and large amounts of money is currently being offered to poachers for full sets of teeth/claws and for carcasses for international trade: ongoing research has found that lions are now the third most preferred species to hunt (Colleen Begg (Niassa Carnivore Project) *in litt.*, May 2018). In 2017 two lions were killed for their teeth/claws: in one incident the poachers were Tanzanian and also in possession of 30 ivory tusks and elephant tails. In other incidents lion parts have been seized in Maputo en route to Asia along with shipments of rhino horn and ivory (Colleen Begg (Niassa Carnivore Project) *in litt.*, May 2018). This information indicates that at least some of the trade is international and conducted by organised groups moving other high value wildlife products. However, it is unknown how common it is for the same poaching groups to target multiple species – due to the level of effort required to poach elephants/rhinos (and the potential high level financial gain) poaching groups have different modus operandi in different places for different species (Jo Shaw (WWF) *in litt.*, May 2018). Some professional hunters in Mozambique believe that wild lions are being targeted with poison by poachers hoping to sell the bones internationally (Mike Cadman (journalist), *in litt.*, May 2018).

The Zambian Government is said to believe that some lions are being poached for the international bone trade (Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018), and while one stakeholder noted that currently there is not a very large illegal trade in lion parts in Zambia (leopard skins are more of a concern) they do expect it to become an issue in the near future based on what is happening in Mozambique (Kerri Rademeyer (Wildlife Crime Prevention Project (Zambia)), *in litt.*, April 2018). Seizures of lion skins in Zambia are said to be increasing, and there have been instances of lions poached and their paws/skulls removed but it is not clear what is driving the trade (Matthew Becker (Zambian Carnivore Programme), *in litt.*, May 2018).

There is no comprehensive dataset available on the number of lions poached for trade or impact that this may be having on wild lions. The most recent IUCN Red List Assessment conducted in 2014 considered the largest threats to lions to be indiscriminate killing (primarily as a result of retaliatory or pre-emptive killing to protect human life and livestock) and prey base depletion (Bauer *et al.*, 2016). The assessment also states that habitat loss and conversion have led to a number of sub-populations becoming small and isolated, and that trophy hunting has led to declines in some countries. The trade in bones and other body parts for traditional medicine, both within Africa and Asia, was identified as an emerging threat in 2014, and the threat from illegal trade in body parts is magnified when the sub-population is small (Bauer *et al.*, 2016). Range State consultation for the CoP17 proposal found that experts believed the trade in lions was a threat in some regions (e.g. for skins in West Africa) (CITES, 2016).

Table 11 Examples of recent lion poaching and human-wildlife conflict events

Location	Year	Description
Tanzania	2018	Six lions killed close to Ruaha National Park after eating a poisoned cattle carcass apparently left by locals in response to an attack on livestock. 74 vultures were also killed ⁴¹
Uganda	2018	Three lionesses and eight cubs killed after being poisoned, apparently by villagers who blamed lions for killing a cow ⁴²
Mozambique	2016	The remains of two lions found close to the border of Kruger National Park. The lion's bones had been removed, but the skins, fat and intestines left. Lion prey had been laced with poison, and 56 birds also died from the poison including 51 vultures found with their heads removed ⁴³
Benin	~2013	In the 'W' Region Biosphere Reserve a five years ago a poacher was paid to obtain lion body parts (mainly claws) for magical use ⁴⁴ .
Cameroon	Last 5 years	Three poachers arrested for killing two lions with poison in Faro National Park and Bouba Ndjida National Park. Two lion skins were seized. One lion was killed in Waza National Park, and claws, forehead and skin were taken for medico-magical purposes to Nigeria. According to the Park's conservator, Boko Haram could be involved in this trade ⁴⁵ .

Culling of Wild Problem Animals

The majority of Sub-Saharan African countries allow for the legal killing of wild lions which attack people or their property (such as livestock) (Chardonnet *et al.*, 2005). While the overall number of lions killed this way is unknown, it is thought in some countries to be significant. For example, 200 lions are estimated to be killed annually in Tanzania for this reason but there are concerns that there may be other motivations for these killings making them illegal—in some cases valuable parts of the lions such as claws, teeth and other body parts (heart, fat etc) are taken (Dennis Ikanda (Tanzania Wildlife Research Institute), *in litt.*, April 2018). The motivations for killings of these types across the species range are complex and variable, but the culled lions could be acting as a source for the domestic or international trade. Williams *et al.* (2017a) reported that 20% of questionnaire respondents believed lions killed due to human-lion conflict were a source of bones in trade, and 23% believed it was a source of other body parts (noting regional variations).

Illegal cross-border trade

While lion products are often sourced domestically from wild or captive populations, indications are that there is illegal trade between African countries (Figure 13).

⁴¹ <https://africageographic.com/blog/mass-poisoning-leaves-lions-vultures-dead-ruaha/>

⁴² <https://www.independent.co.uk/news/world/africa/uganda-lions-killed-poisoning-queen-elizabeth-national-park-wildlife-protection-investigation-a8302606.html>

⁴³ www.earthtouchnews.com/environmental-crime/poaching/days-after-the-cites-wildlife-summit-a-mass-poisoning-in-mozambique/

⁴⁴ Etotépé Sogbohossou (University of Abomey-Calavi), *in litt.*, March 2018

⁴⁵ Saleh Adam (Ministry of forestry and Wildlife), *in litt.*, March 2018

West Africa

Inputs from multiple stakeholders in West Africa highlight the possible role of Guinea, Senegal and Côte d'Ivoire as significant trafficking countries for big cat skins (including lions). Investigations in Guinea between 2009–2012 identified 14 sites with 42 sellers offering 67 lion skins (plus 227 leopard skins) openly for sale (WARA Conservation Fund, date unknown). The lion is considered possibly extinct in Côte d'Ivoire and Guinea (Bauer *et al.*, 2016) suggesting cross-border trade from other range States. It has been said skins offered for sale in Guinea are part of a regional and international lucrative trade with big cat skins sourced from all over the sub-region, and transiting through Conakry (Guinea) before moving to other African and international destinations, particularly in the United States and Europe

The movement of lion products between West African countries is complicated. Williams *et al.* (2017a) found that intra-African trade was often stated to occur between current and former range States (or those with low wild populations) in West Africa: for example

-> Benin was a source for Niger, Nigeria, Gabon, Cote d'Ivoire, Senegal and Guinea

-> Burkina Faso was a source for Benin, Cote d'Ivoire, Senegal and Guinea.

The diversity and availability of lion products is said to be greater in markets in Nigeria and in Niger, and due to increased law enforcement in Benin it is now more difficult to find Benin-origin lion products and traders must instead buy in Burkina Faso, Nigeria, Chad, Cameroon, and Niger (Sogbohossou 2006, Chabi N'Diaye 2014). No trade was reported in the CITES Trade Database between 2007 and 2016 from Benin to any African countries except one trophy to South Africa, and no trade was reported from Burkina Faso to any other African countries. Therefore, if this trade did take place then it is presumably illegal.

Central Africa

Regarding Central Africa, Williams *et al.* (2017a) found that Cameroon was thought to be the origin of lion products found in Benin, Nigeria, and Gabon. No evidence of these trade routes was found in the CITES Trade Database (2007 to 2016). In Cameroon, trade in lion skins is thought to occur mostly in the Northern part of the country: skins are brought from Chad, added to those from Northern Cameroon and then trafficked to Nigeria, and dealers may be connected to other non-wildlife criminal activities e.g. locally manufactured guns (LAGA 2006, 2007, 2008, 2009).

East and Southern Africa

Less data were available on trade between countries in East and Southern Africa, which Williams *et al.* (2017a) speculated was because lion populations in these regions are larger so can supply the domestic markets. Nomadic herders are thought to be involved in cross border trafficking of ivory and big cat skins to South Sudan and Uganda from Central African Republic (Ondoua *et al.*, 2017). East and Southern Africa were also believed to be more likely than other regions to supply lion products to Asian nationals living within Africa (e.g. Chinese nationals living in Zimbabwe, Zambia and Uganda) (Williams *et al.*, 2017).

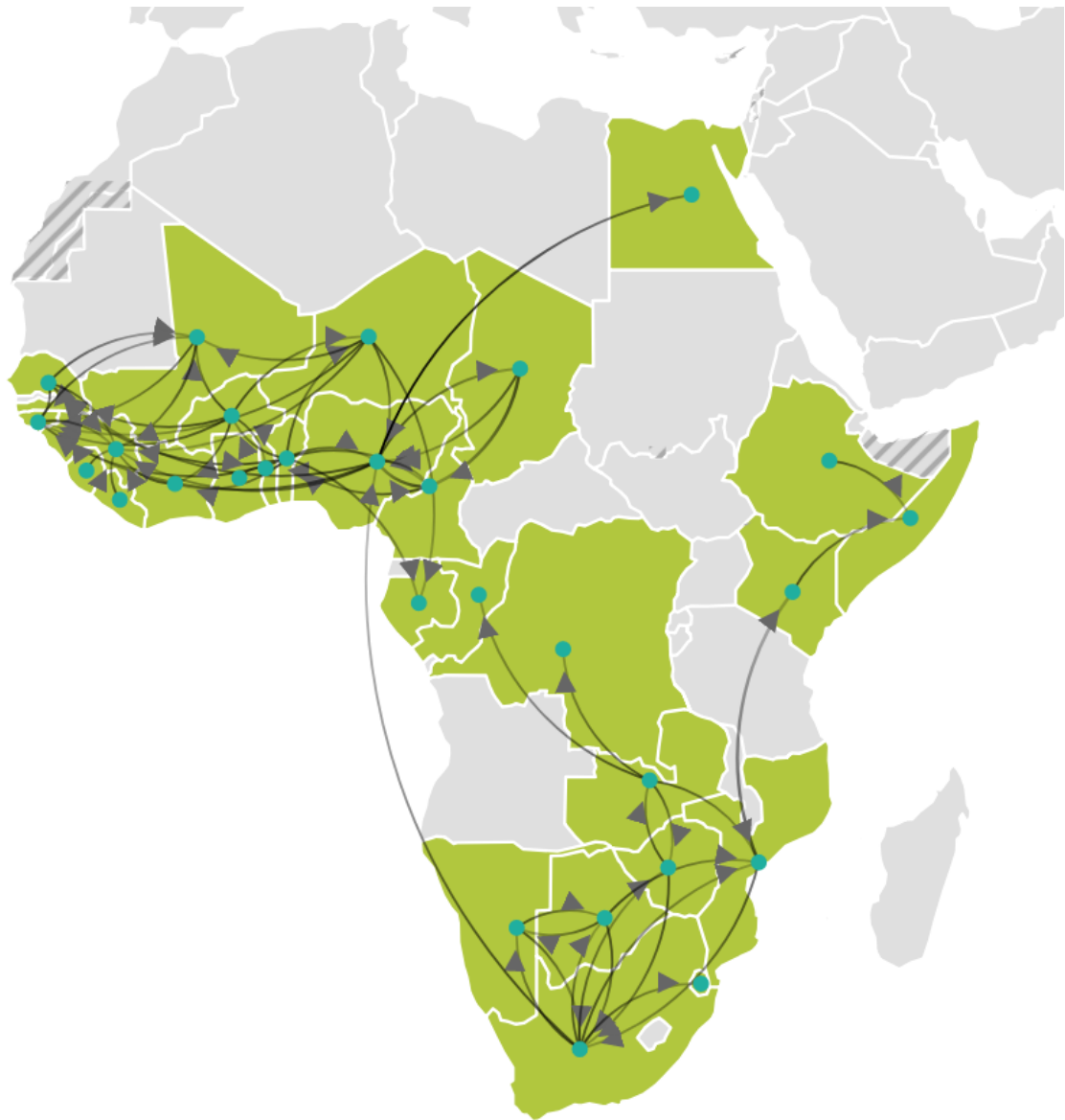
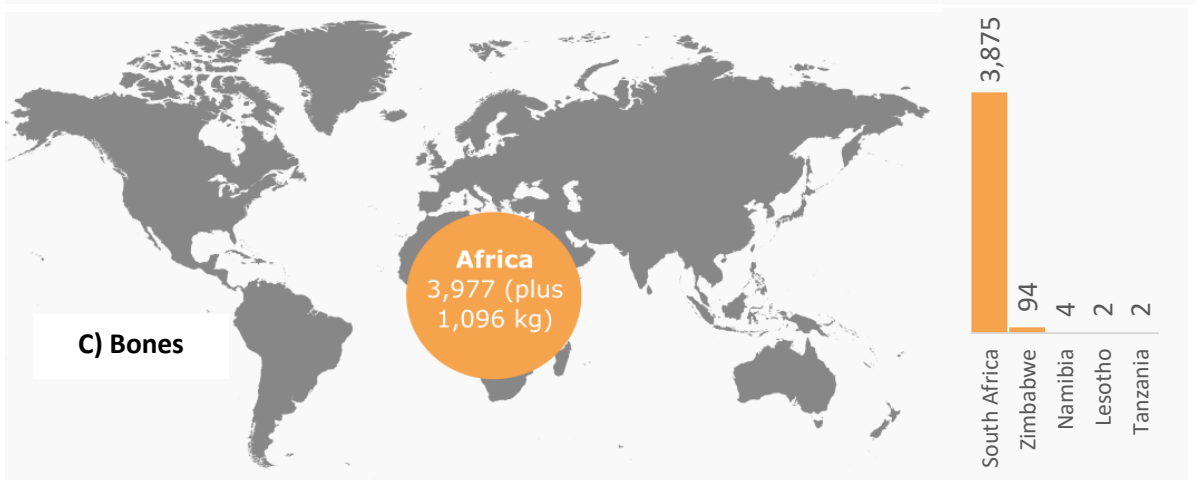
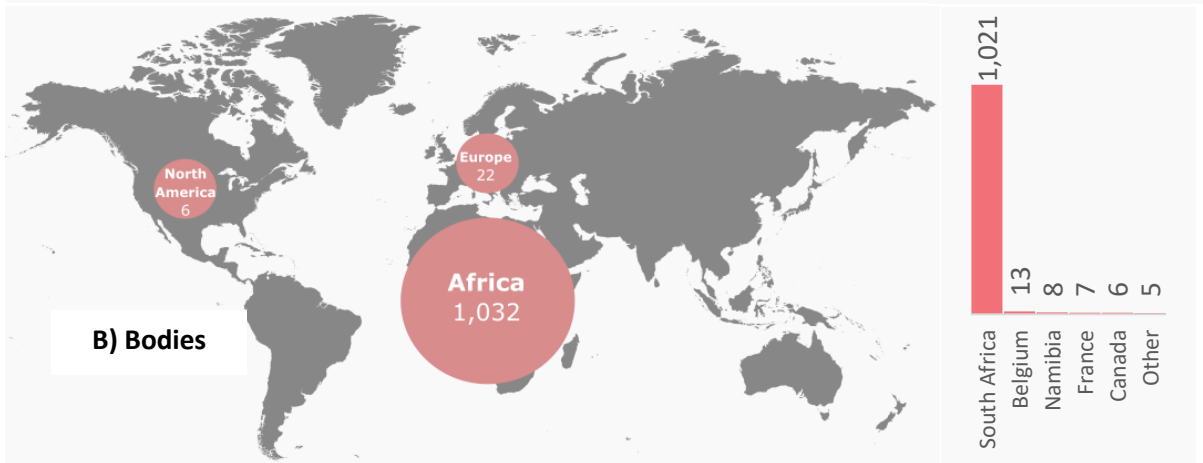


Figure 13 Suspected illegal trade routes for lion products within Africa. *Data sources: Williams et al. (2017a) (date range of data unknown), CITES Illegal Trade Reports, UNODC WorldWISE Database, TRAFFIC (1999–2018).* Trade routes may continue outside of Africa

Exporters of lion products

According to CITES trade data, the global lion trade is incredibly diverse (a total of 83 countries reported directly exporting lion commodities to 140 countries), although most trophies, bones, skeletons, bodies and live lions were exported from Africa: with South Africa being the largest exporter by far (Figures 14A-E).



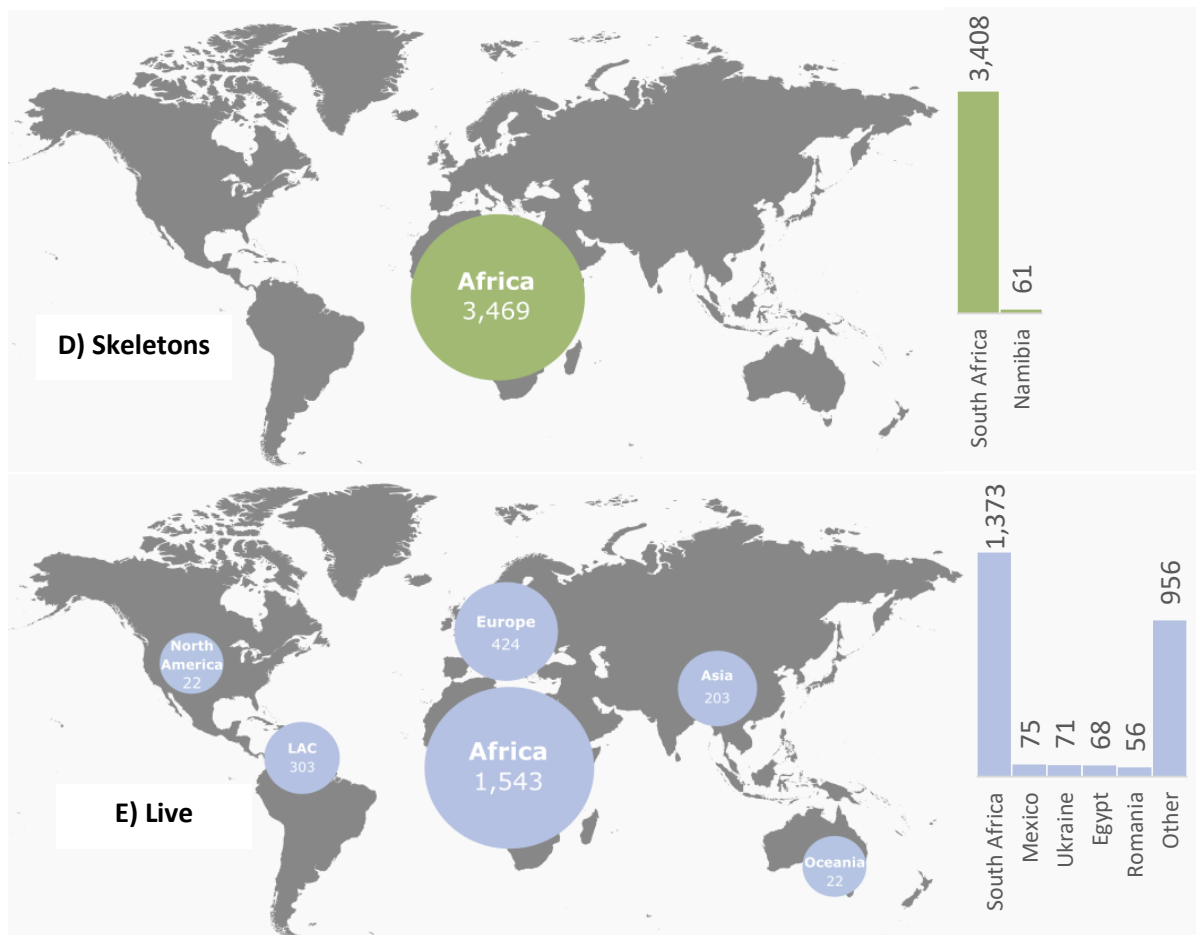


Figure 14 Number of lion (A) trophies, (B) bodies, (C) bones, (D) skeletons and (E) live exported by different regions – bar graph depicts countries exported from in the highest quantities (reported as number of individuals or kilograms, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

While South Africa exports dominated trade between 2007 and 2016, there were still exports from other range States such as Zambia, Tanzania and Burkina Faso (Table 12). Exports from Burkina Faso over the 10 year period totalled 318 trophies: incredibly high considering the West African sub-population is only around 400 lions (Henschel *et al.*, 2015). The actual number of lions said to be hunted in Burkina Faso is around 12 per year (Pellerin *et al.*, 2010), so the reports in the CITES Trade Database may be multiple body parts belonging to the same lion but being exported separately (note that importing countries only reported importing 14 trophies from Burkina Faso in that time period).

When considering trade to the top importers of the USA, Viet Nam, Lao PDR, China, and Thailand, most African exporters were in East/Southern Africa, with some exceptions (Figure 15)

Table 12 Nine lion products exported in the highest quantities and the major exporting countries 2007–2016 (reported as number of individuals, reported by exporting and importing country (% difference given in red), direct exports only). Excludes exports of (scientific) specimens. *Source: CITES Trade Database*

Commodity	Top Exporters (based on exporter's reports)	Quantity* (% of global exports)	
		Reported by Exporters	Reported by Importers
Trophies	South Africa	7,712 (84%)	6,172 (77%)
	Zambia	356 (4%)	276 (3%)
	Burkina Faso	318 (3%)	14 (<1%)
	Tanzania	206 (2%)	674 (8%)
	Total All	9,140	7,965 (-13%)
Bones	South Africa	3,875 (97%)	501 (72%)
	Zimbabwe	94 (2%)	14 (2%)
	Namibia	4 (<1%)	-
	Total All	3,977	697 (-82%)
Skeletons	South Africa	3,408 (98%)	4,679 (99%)
	Namibia	61 (2%)	61 (1%)
	Total All	3,469	4,740 (37%)
Live	South Africa	1,373 (53%)	689 (41%)
	Mexico	75 (3%)	34 (2%)
	Ukraine	71 (3%)	54 (3%)
	Total All	2,599	1,680 (-35%)
Claws	South Africa	813 (66%)	928 (81%)
	Namibia	207 (17%)	197 (17%)
	Botswana	126 (10%)	-
	Total All	1,240	1,152 (-7%)
Bodies	South Africa	1,021 (96%)	1,145 (96%)
	Belgium	13 (1%)	22 (2%)
	Namibia	8 (1%)	5 (<1%)
	Total All	1,060	1,187 (12%)
Skins	South Africa	430 (41%)	301 (34%)
	Zimbabwe	143 (14%)	57 (7%)
	Tanzania	139 (13%)	27 (3%)
	Mozambique	123 (12%)	6 (1%)
	Total All	1,044	869 (-17%)
Skulls	South Africa	553 (54%)	227 (60%)
	Zimbabwe	159 (15%)	50 (13%)
	Tanzania	142 (14%)	36 (10%)
	Mozambique	129 (12%)	19 (5%)
	Total All	1,033	377 (-64%)
Teeth	South Africa	206 (80%)	44 (39%)
	Botswana	49 (19%)	44 (39%)
	Total All	259	114 (-56%)

* Known errors exist in the CITES Trade Database for exports from South Africa (see Williams et al., 2017)

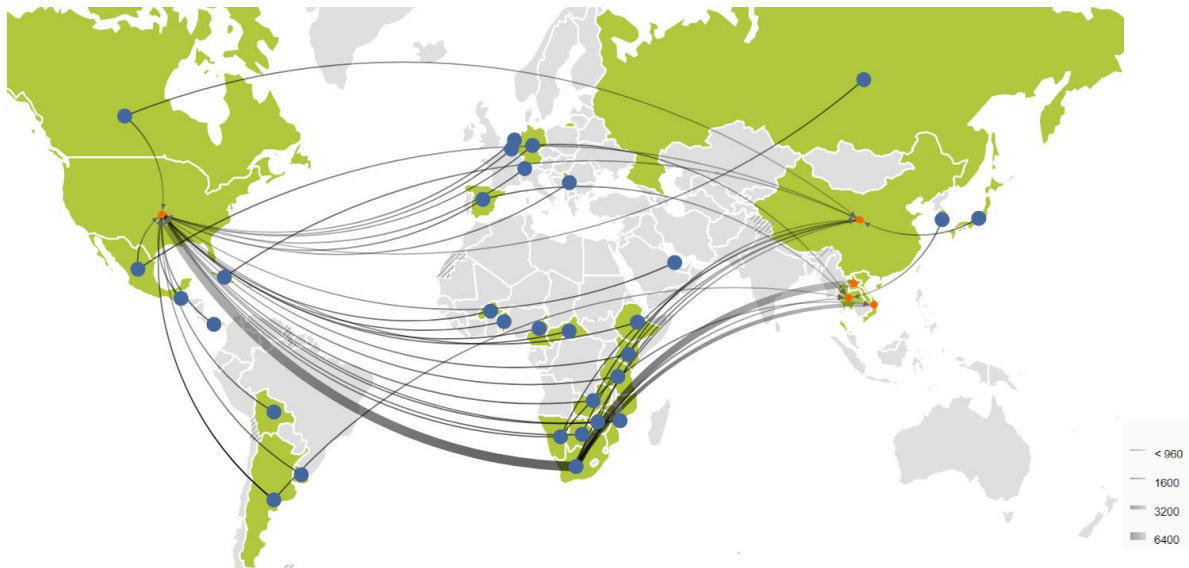


Figure 15 Trade of selected lion products (bodies, bones, claws, live, skeletons, skins, skulls, teeth and trophies) to key importing countries (China, Lao PDR, Thailand, Viet Nam and the USA) (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Blue circles– exporting country, orange circle = importing country. *Source: CITES Trade Database*

Intra-African Trade

Lions are used within many Africa countries for a variety of reasons including for medicine, ceremonies, rituals, decorations and talismans (Funston *et al.*, 2016) (see section on use of lion products for further detail).

There were some records in the CITES Trade Database for intra-Africa trade (Figure 16) which involved 32 countries. This totalled exports of 1,011 individual items: most numerous were live lions (366), skins (167) and trophies (154). South Africa exported the most (403: mainly live) followed by Botswana (191). South Africa also imported the most lion products (568) followed by Zambia (76). Exports to South Africa were predominantly skins (141), trophies (91) skulls (55) and bones (40), as well as scientific specimens (187), and it is possible they were being exported to South Africa due to the high quality of taxidermy performed there.

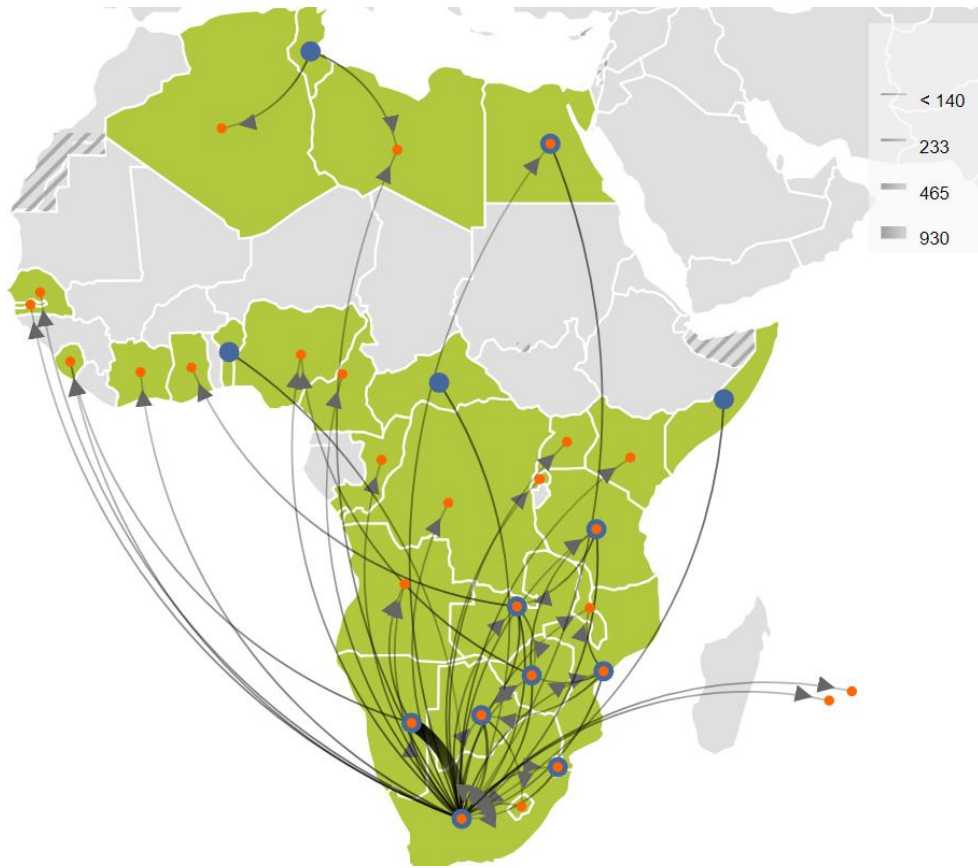


Figure 16 Trade routes for lion products within Africa (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Blue circle= exporting country, orange circle = importing country. *Source: CITES Trade Database*

The Role of Asia

Availability of Lions within Asia

According to CITES trade data, 1,165 live lions were exported to Asia between 2007 and 2016: the most common destinations being Thailand (250) and China (216). Therefore, there is the potential that some Asian countries may have established their own breeding facilities to supply the lion product market from these lions, or lions imported before this period. For example, the Guilin Xionsen Tigers and Bears Mountain Village in **China** was estimated to have 210 lions in 2007; carcasses of lions were used to produce “bone-strengthening wine” (CITES, 2007), however only a few lions were seen by visitors to the facility in that year (Nowell and Xu 2007). Farms are already said to exist in **Viet Nam** (Anon A, *in litt.*, April 2018). However, the number of lions held in captivity in Asia is currently unknown.

Intra-Asian Trade

Research for this study including interviews with stakeholders, seizures and a review of airway bills and bill of lading data suggests that most lion products enter Asia from Africa in one of two ways:

- lion products are imported into Lao PDR, where they are either processed into other products (e.g. glue/cake) before re-export seemingly without official CITES permits, or the products are re-exported unprocessed again without official CITES permits. It appears that a relatively small amount is consumed in Lao PDR, with Viet Nam and China being the main destinations for consumption. Imports to Lao PDR often come via Thailand due to Thailand’s superior air travel connections.
- lion products are imported directly into Viet Nam to be processed if necessary, and consumed or re-exported to China (although demand specifically for lion products in both countries remains unclear).

CITES and shipment records indicate that the majority of lion skeletons arrive in **Lao PDR** by air cargo via Bangkok, **Thailand**. In general imports of various commodities to Lao PDR come via Thailand due to Thailand’s excellent global air travel connections. It is also likely (but not proven) that Thai importers frequently use road transport to move lion products into **Lao PDR**: the usual route to transport wildlife products in general into **Lao PDR** from Bangkok is via the Number 3 Friendship Bridge Nakhom Phanom- Thakek. This is the most practical route from Bangkok and the closest route to **Viet Nam**. However as aforementioned, no trade in lion products between these countries was reported in the CITES Trade Database.

The major onward destination from **Lao PDR** appears to be **Viet Nam**. Initial research suggests Vietnamese clients are collecting lion bones from suppliers in Lao PDR that are then transported back to Viet Nam. The Nam Phao –Cau Tre border crossing between Bolikhamxay and Ha Tinh is locally known to a common entry point between **Lao PDR** and **Viet Nam** and it is therefore presumed that this could be a commonly used route to transport wildlife by land from **Lao PDR** into **Viet Nam**. No evidence was found that lion products are moved using this route.

Boten, a Specific Economic Zone (SEZ) in the Luang Namtha Province of **Lao PDR**, is located one kilometre from the border with **China**. Over 250,000 Chinese nationals crossed this border in 2014 and small businesses are reported to be mainly operated by Chinese nationals (Krishnasamy *et al.*, 2018). Chinese traders often use the Boten –Mohan border to move wildlife products legally and illegally into **China** from **Lao PDR** (see Livingstone *et al.*, 2018; Krishnasamy *et al.*, 2018), but it is unknown if lion products are moved in this way, wine advertised as containing tiger has previously

been observed for sale (Krishnasamy *et al.*, 2018). Research found that Chinese customers are advised to wear wildlife products on their person for easy customs clearance. Customs procedures in SEZs vary and it is not clear what the situation is in Boten. The urgent need for the adoption of clear guidelines in Lao PDR regarding the operation of SEZs in relation to trade in CITES-listed species (as well as the farming and consumption there of listed species) has previously been recommended by the CITES Secretariat, along with clear guidance on how to proceed in cases of alleged illicit trafficking occurring in these zones (CITES, 2016a)

A limited amount of trade within Asia between 2007 and 2016 was reported in the CITES Trade Database, amounting to 183 individual items (180 of which were live lions) plus 12 kg of specimens exported for educational purposes. Twenty nine Asian countries were involved in the intra-Asian trade (Figure 17), with Republic of Korea exporting the most (41 live lions) and Thailand importing the most (40 live lions). The 40 lions traded from Republic of Korea to Thailand were reported as captive and traded using the “zoo” purpose code. The data held in the CITES Trade Database do not appear to include the movement between Asian countries (particularly Lao PDR, Viet Nam, Thailand and China); no significant re-exports are reported between these countries.

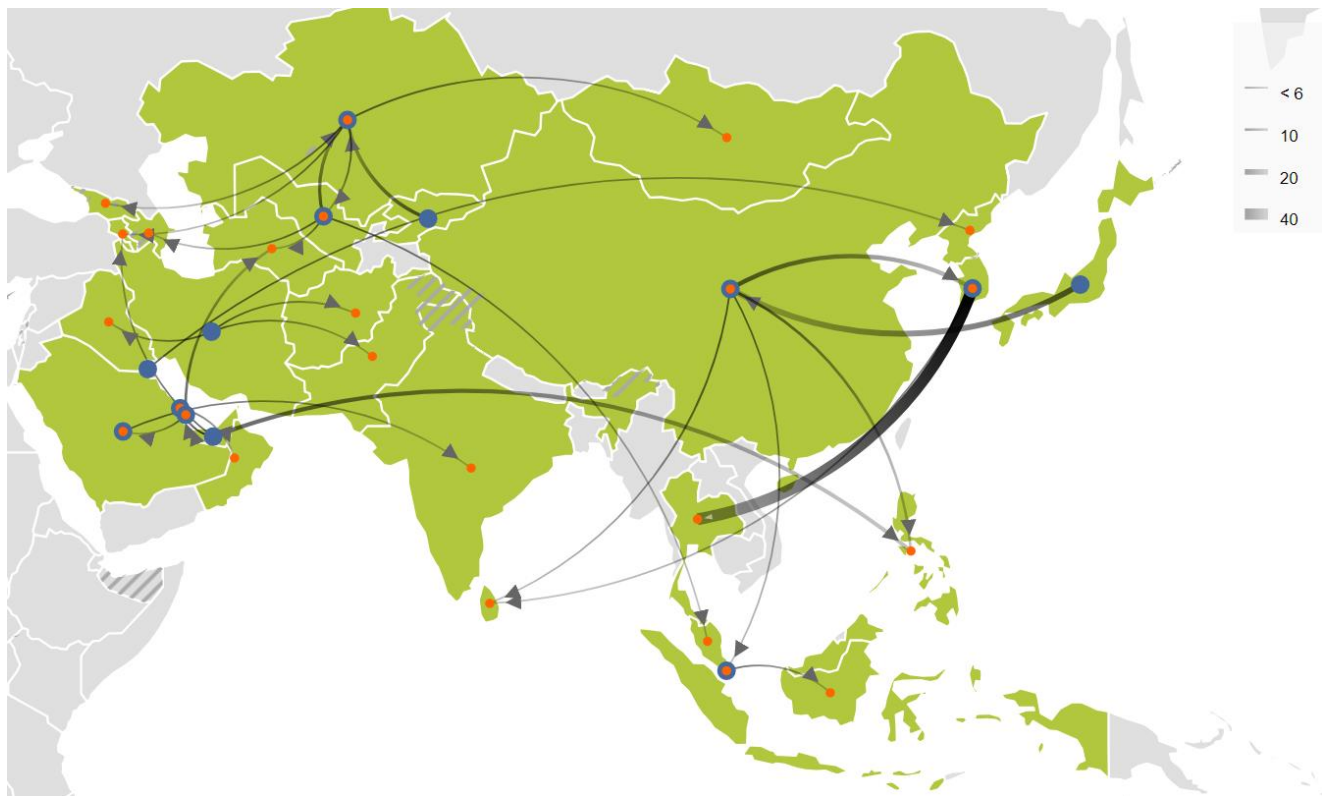


Figure 17 Trade routes for lion products within Asia (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Blue circles= exporting country, orange circle = importing country. Source: CITES Trade Database

Asian Importing Companies

Lao PDR

An investigation by a UK-based newspaper (Davies and Holmes, 2016 and 2016a), identified two companies trading significant amounts of wildlife, including lion bone, in Lao PDR. Davies and Holmes (2016 and 2016a) made a number of allegations including that the companies had been issued with

official quotas to import large amounts of lion bone (and other wildlife e.g. elephant ivory, rhino horn, pangolin and tiger products) despite the companies having been involved in wildlife crime, and that although government inspections of the farms have reported illegal activities (such as the provision of dead tigers for sale in Viet Nam and China) the Lao PDR government had still granted permission to the farm to sell up to 100 tigers annually. Another company refused inspectors access to their farm. The results of these investigations could not be verified by this study and require further in-depth research to better understand the role of tiger farms in Lao PDR, including their involvement with the lion bone trade. The present study found that false company names/addresses were being used for imports of lions to Lao PDR.

Thailand

Thai nationals were arrested in South Africa in 2011 suspected of being involved in rhino horn smuggling and the purchase of lion bones. In court records from this case, the connections of the Xaysavang Trading Export-Import company in Bolikhamxay Province, Lao PDR were revealed including their trading in **lion bone, teeth and claws**, as well as rhino horn (Williams *et al.*, 2015). A full description of the linkages between the lion and rhino trade can be found in Williams *et al.* (2015), including the theory that the company's involvement in rhino horn smuggling was stimulated by their initial involvement in the lion bone trade in 2007 or earlier (before the current rhino poaching crisis began). Williams *et al.* (2015) noted the first export of bones to Lao PDR from South Africa occurred in 2008 but was incorrectly recorded as destined for Viet Nam in South Africa's annual report (and therefore in the CITES Trade Database).

Research for this study found three Thai-based traders have previously been reported to be linked to the lion bone trade, one of which was publicized in 2016 (Davies and Holmes, 2016). Research indicate that at least two are still operating and are involved in wildlife trade (although it is unknown if this involves lion products specifically) and have connections to Lao-based companies. Further detailed research is required to understand their roles in any cross-border wildlife trade.

Linkages with the Tiger Trade

The lion bone trade is considered to be closely linked to the farming and trade of tigers. Some stakeholders considered that it is likely that lion bone is being used as a substitute for tiger bone, providing a cheaper, relatively plentiful and often legal supply. A number of seizures have been identified where lion bone appears to be traded as tiger (EIA, 2017a). Little direct evidence could be found for this during the course of this study. An alternative theory is that lion bone is acting as a supplement to tiger bone rather than as a substitute. Future research should aim to access target farms to observe if lion bones are being processed within tiger farms, to undertake DNA or similar testing of products claimed to be from lion or tiger, and to analyse differential price data to better understand the relationship between the trade in lion and tiger.

Research for this study indicates that companies in Lao PDR are believed to manufacture tiger bone glue/cake on site in tiger farms. The glue can reportedly be easily concealed and exported from Lao PDR to Viet Nam where it is in demand: according to a previous analysis, at least 50% of known tiger seizures in Viet Nam between 2012–2015 were related to the production of tiger bone glue (Stoner and Krishnasamy, 2016). Ethnic Chinese wildlife traders in Lao PDR, mostly located in Vientiane and Luang Prabang, sell a wide range of wildlife products advertised to be from tiger (including wine and bone jewellery) (see EIA, 2015; Krishnasamy *et al.*, 2016; Vigne and Martin, 2017; Livingstone *et al.*, 2018; Krishnasamy *et al.*, 2018). Some of this wine is claimed to be manufactured in Lao PDR and therefore may contain imported lion bones, possibly mixed with bones from farmed tigers.

It is extremely difficult to differentiate lion from tiger products without the use of forensic-type testing (e.g. DNA testing), so it is likely that many consumers are not aware that the “tiger” product they are buying in fact contains bones from lions or other species. Traders selling “tiger” products may not necessarily be aware that the products they are selling may be derived from lion or other species.

Tiger farms create an environment suitable for laundering lion bone products as being from tiger, as clients would believe that a product coming from the farm would be tiger. This may also help partially explain the apparent use of false company names when importing lion bones which are most likely legally obtained, to protect the company and product reputation. The population of captive tigers is unknown but was recently estimated to be relatively low in Lao PDR (~380) and Viet Nam (~199) compared with China (5,000-6,000) and Thailand (1,450 – 2,500) (EIA, 2017). It is thought by some that there are simply not enough farmed tigers in Lao PDR and Viet Nam to meet demand, and lion bones can be used instead to meet the demand without most consumers being aware (Kanitha Krishnasamy (TRAFFIC), *in litt.*, June 2018). This creates an interesting dynamic of lion bones, which were likely legally obtained, entering the illegal trade. However, it cannot be confirmed that the demand for lion bone in Asia is being met fully by legally obtained bones.

Further information on captive tigers in Africa can be found in the section Characteristics of Illegal Trade.

Characteristics of Illegal trade

The nature of illegal trade makes it difficult to quantify and one cannot be certain how much of the entire illegal trade one is aware of. It should also be noted that just because countries report the most seizures, it does not necessarily follow that they have the most illegal trade: it could be that the country has effective law enforcement which seize a high percentage of illegal trade, or the country is efficient at publicising/sharing seizures data so it can be included in datasets such as the ones used for the present study.

Discussions with stakeholders revealed some insights into the illegal poaching of lions in Africa for international trade, and the trafficking specifically into Asia (Box 1).

Box 1 Smuggling of lions from Africa to Asia

Stakeholders that provided this information included a South African-based source with an intimate knowledge of the lion industry (predominantly trade from South Africa to Viet Nam but not exclusively), the Wildlife Crime Prevention Project (Zambia) and two PhD Students from (Nelson Mandela Metropolitan University (South Africa), and the University of Oxford (UK).

Currently the price of lion parts is relatively low, so it is not the primary reason that hunters will go into the bush. The hunters will be looking for rhino and elephants primarily but will opportunistically take other species they believe have value. Increased lion poaching in Limpopo National Park and Niassa (Mozambique) appears to have occurred earlier than elsewhere in Southern Africa (2013–2015) and it has been speculated that this is because organised groups already operated in this park trafficking ivory and rhino horn, so logistics are already in place. A paper is currently in preparation that will elaborate further on this. In Zambia, poachers are known to poach wildlife opportunistically if they believe they can sell it at some point in the future, and there are concerns that lions will soon be added to the list of such desired species.

A typical organised poaching group in South Africa is normally made up of a local guide, a local with a car/gun for security, and a poacher (often from Zimbabwe or Mozambique) who will kill the lion and prepare it for transport.

The poachers will pass the lion parts onto the next level in the trade chain—but will have no physical contact with them. Money and lion parts will be left in pre-arranged locations coordinated using “burner” phones, indicating a level of sophistication. This next level in the trade chain are Asian nationals and are also involved in other legal/illegal trade types e.g. diamonds.

International Trade

The middle men buying lion products from the poachers will buy trade in a variety of wildlife products (e.g. rhino horn, tiger “jelly”/“cake”¹ (from African captive tigers¹)), Based on anecdotal reports, it is understood that lion products (such as teeth and claws) are illegally exported to Asia along with higher value products (elephant ivory, pangolin scales, rhino horn). One stakeholder explained that tiger and lion products are primarily shipped out in cargo ships but a smaller proportion is also smuggled out using military/diplomatic connections to carry it in their luggage. In the past it used to be that tiger bones (the stakeholder presumed it would be the same for lion bones as a substitute) were shipped out, but there has been a recent switch to processing the bones into “cake” in the African countries of origin for export¹. There is less chance of processed products being detected and additional profit can be made this way. Typically the processors are junior Vietnamese nationals watched over by high level Vietnamese nationals who ensure that the product being made contains genuine ingredients. Once in Viet Nam, the tiger (and therefore assumed lion) products are sold behind closed doors within existing networks. The trade chain in Viet Nam is very short with few/no middle men.

Box 1 raises the issue of captive tigers being bred in Africa. Williams *et al.* (2015) estimated there to be more than 280 tigers (mainly Bengal Tigers) in at least 44 facilities in South Africa but presumed there to be more. Tigers are considered either an ‘exotic’ species or ‘endangered wild animal’ in South Africa (depending on province) and therefore the ability to hunt tigers varies by province (see Williams *et al.*, 2015 for a break down). Tigers have been observed being kept alongside lions in the same farms, in addition to other big cat species such as jaguars and pumas, and tiger/lion hybrids (Mike Cadman (journalist), *in litt.*, May 2018). This has raised concerns about the possibility of tiger bones being mis-labelled and exported as lion bones, or simply being hidden within shipments of lion bones. A recent investigation reported that the average weight of an individual lion skeleton (11-30 kg) exported in 2017 from South Africa exceeded the mean average lion skeleton

weight(6.5-13 kg with skull) reported by Williams *et al.* (2015)(EMS, 2018). The authors of the 2018 report based this information on 10 skeleton shipments they examined, which led them to conclude that it could mean that some traders were mis-declaring quantities or species (EMS, 2018).

A seizure was made in South Africa in 2017 of seven tiger skins hidden among 800 donkey skins, likely destined for China, (National Geographic, 2017) indicating that there is some smuggling of tigers from South Africa. DNA testing of skeletons reported to be lion was undertaken in 2017 for exports from South Africa, and no tiger DNA was found (Michele Pfab (South Africa Scientific Authority), *pers. comm.*, July 2018).

According to the CITES Trade Database, a total of 300 tiger products were exported by South Africa, most of which were live (248), skins (25) or trophies (22). Most live tigers were exported to the United Arab Emirates (43), Thailand (34) or Viet Nam (28). Thirty-one products (mainly live and skins) were exported for commercial purposes using purpose code "T". No operations reported as breeding tigers in South Africa are currently listed on the CITES website which is a requirement under Resolution Conference 12.10 (Rev. CoP15)⁴⁶. Decision 14.69 also directs Parties with intensive operations breeding tigers on a commercial scale to implement measures to restrict the captive population to a level supportive only to conserving wild tigers; tigers should not be bred for trade in their parts and derivatives.

Commodities in Illegal Trade

Illegal trade in key countries is discussed above. Regarding illegal trade of lions in general, based on the data available, between 1999 and March 2018 there were 355 seizures that involved lions or their parts. Information was available for seizures which totalled 3,283 individual lion parts, 63 kg and smaller amounts reported in other units between 1999 and 2018 (Table 13). Claws were the commodity seized in the highest number overall followed by teeth and medicine. As claws/teeth are small, smuggling them on a person is relatively easy, and the higher quantity seized could reflect increased enforcement of passengers compared with cargo. A full analysis of seizures data can be found in Annex 3.

Table 13 Summary of reported seizures of lion products (reported as number of individual items or kilograms) 1998 – 2018. *Data sources: WorldWISE Database, CITES Illegal Trade Reports, TRAFFIC*

⁴⁶ Registration of operations that breed Appendix-I animal species in captivity for commercial purposes <https://www.cites.org/eng/res/12/12-10R15.php>

Commodity	Number of individual items	Kilogram*
Claws	1,601	3
Teeth	748	3
Medicine	221	-
Live	184	7
Bones	90	47
Skins	62	-
Bodies	50	-
Trophies	44	-
Other	283	2
Total	3,283	63

* Rounding means the total does not equate to the sum of the individual lines in the table

Characteristics of Illegal Trade

A variety of seizures reported in the media in recent years are included in Table 14 to illustrate the diversity of places involved and types of illegal trade. It is clear from some of these examples that at least some of the illegal trade is highly organised; trafficking gangs are transporting multiple goods (e.g. rhino horn, tiger bones, ivory) along with lion products.

Some of the arrests have involved non-nationals, for example the arrest of a Vietnamese in Tanzania, a Gulf national in Egypt and three Chinese nationals in South Africa, indicating global involvement in illegal trade. Tanzanian nationals were implicated in the Niassa (Mozambique) lion poaching incidents which also targeted a range of other species (notably elephants) (Michael t' Sas-Rolfes (University of Oxford), *in litt.*, May 2018).

Table 14 Examples of seizures of lions reported in the media Data source: *TRAFFIC* (see footnotes for media links)

Seizure #	Country of seizure	Year	Description
1	Viet Nam	2017	Three alleged members of a wildlife trafficking ring arrested in Hanoi in possession of 36 kg of rhino horn, two frozen tiger cubs, four lion pelts and many ivory products. The suspects claimed they had bought the wildlife products from Africa, before moving them by air to Malaysia, Thailand and Cambodia. From these countries, the products were brought by ship and train to Vietnam to avoid detection ⁴⁷
2	South Africa	2017	Fifty one lion claws, 19 lion teeth and one rhino horn discovered by Customs at OR Tambo Airport who searched a parcel en route to Nigeria ⁴⁸ .
3	Mexico	2017	One white lion being kept in poor conditions seized from an abandoned farm after the authorities

⁴⁷ <https://e.vnexpress.net/news/news/vietnam-busts-major-wildlife-trafficking-ring-3577958.html>

⁴⁸ <https://kemptonexpress.co.za/161469/lion-rhino-parts-found-at-airport/>

			inspected the lion and found it to have no food, water and no one was able to present the correct documentation proving legal provenance ⁴⁹ .
4	South Africa	2017	Rhino horn with an estimated street value of about R500 000 (USD 38,278 ⁵⁰) and other items including lion bone, amounting to a total of R2.5-million (USD 191,391) seized from a house. Three Chinese citizens were found in the house at the time of the raid. A lab containing equipment for polishing/carving rhino horn was also discovered ⁵¹ .
5	Egypt	2017	Customs intercepted a passenger (Gulf national) trying to smuggle two lion cubs out of Egypt. The passenger initially claimed they were domestic kittens, but later admitted he had bought the cubs from a lion tamer at a local circus ⁵² .
6	Mozambique	2016	Three Mozambique nationals found in possession of two heads and eight paws from two white lions. They are believed to have belonged to two lions found dead from suspected poisoning on a farm missing heads and paws. ⁵³
7	China	2016	One male passenger arrested at Qingdao Liuting Airport having flown from Johannesburg, South Africa via Hong Kong. Customs checked the luggage after the man seemed uneasy, and found 32 ivory products, 2 lion teeth and 80 pangolin scales ⁵⁴ .
8	Viet Nam	2016	A Vietnamese national arrested at his home for being in illegal possession 680 suspected tiger claws brought from Lao PDR to Vietnam. DNA analysis determine the claws to be lion ⁵⁵ .
9	Viet Nam	2016	A total of 22.1 kg of bones from lion, Serow and bear seized from a bus passenger after a tip off from the public ⁵⁶ .
10	Mozambique	2016	The remains of two lions found close to the border of Kruger National Park. The lion's bones had been removed, but the skins, fat and intestines left. Lion prey had been laced with poison, and 56 birds also died from the poison including 51 vultures found with their heads removed.
11	Viet Nam	2014	A seizure made of 40 kg of animal bones initially suspected to be tiger, but after testing found to be lion, at Noi Bai International Airport. The bones

⁴⁹<https://www.gob.mx/profepa/es/prensa/asegura-profepa-ejemplar-de-leona-africana-blanca-en-jalisco?idiom=es>

⁵⁰ Converted using rate for 01/07/2017 www.oanda.com

⁵¹ <http://germistoncitynews.co.za/154695/rhino-horn-lion-bones-found-at-house-in-wychwood/>

⁵² <http://www.egyptindependent.com/cairo-airport-foils-smuggling-attempt-two-lion-cubs/>

⁵³ <https://citizen.co.za/news/south-africa/1141259/suspects-nabbed-with-lion-body-parts/>

⁵⁴ <http://www.customs.gov.cn/publish/portal105/tab63068/info832568.htm>

⁵⁵ <https://www.tienphong.vn/content/ODcxMTk3.tpo>

⁵⁶ <https://web.archive.org/web/20160406070037/http://www.baohaiquan.vn/Pages/Van-chuyen-thue-xuong-dong-vat-hoang-da-de-nhan-3-trieu-dong.aspx>

			were packaged in a foam box on a flight from Russia ⁵⁷ .
12	China	2014	Eight men sentenced to prison (6–12.5 years) for illegally trading wildlife, including six ivory tusks, and seven tiger and 11 lion skeletons (plus an additional 20 skeletons of unspecified big cats) ⁵⁸ . The man caught smuggling the skeletons, apparently from Viet Nam, believed all 38 skeletons were tiger (Xiao Yu (TRAFFIC), <i>in litt.</i> , May 2018).
13	Viet Nam	2014	Two suspects arrested while transporting a tiger skull and lion skeleton a motorbike ⁵⁹ .
14	Tanzania	2014	A Vietnamese national arrested at a border post with Kenya with 12 elephant tusks, 30 lion claws and 20 lion teeth. The man was travelling from Tanzania to Nairobi ⁶⁰ .

Illegal Trade within Africa

While it seems there is significant demand for lion products within Africa, it is unknown how much of the intra-African trade is illegal, and there are potentially different types of illegality that may occur: for example, lions may be hunted legally as a trophy and the body parts cross borders without the correct CITES permits to be sold in other countries. Alternatively, a lion could be killed illegally under the guise of problem animal control, and the body parts exported with CITES permits.

Williams *et al.* (2017a) obtained information on suspected illegal trade routes within Africa from a questionnaire and literature, which has been combined with information on routes of seized lion products (see Figure 13) but further research is required to confirm these routes. Trade routes within Africa identified by Williams *et al.* (2017a) were not supported by data in the CITES Trade Database, therefore if trade is occurring it is likely not be doing done with CITES permits.

Illegal Trade Routes within Asia

See Intra-Asian Trade section for details of intra-Asian trade routes.

⁵⁷ <https://thanhvien.vn/thoi-su/40-kg-xuong-dong-vat-ve-tu-nga-la-xuong-su-tu-458298.html>

⁵⁸ http://www.xinhuanet.com/legal/2015-05/27/c_127845426.htm

⁵⁹ <http://anninhthudo.vn/an-ninh-doi-song/khoi-to-2-doi-tuong-van-chuyen-so-ho-xuong-su-tu/537449.antd>

⁶⁰ <https://www.nation.co.ke/counties/kajiado/Vietnamese-arrested-with-ivory-30-lions-claws-namanga/3444852-2345552-115p14n/index.html>

All accessed 27th April 2018

Findings

Between 2007 and 2016 South Africa was the main exporter of lion products, with smaller amounts reported by other range States such as Zimbabwe, Tanzania, Namibia and Zambia.

Until 2011 the majority of lion products reported in trade were of trophies, with the USA traditionally being the biggest market for trophy exports (followed by Spain and France). From 2009 onwards, significant exports of bone items (bones, skeletons, bodies) were observed in the CITES trade data, predominantly being exported to Lao PDR and Viet Nam, although these were mainly based on reports from countries of export and errors have been noted⁶¹. Seizures in African countries such as Mozambique, Zambia, Tanzania and South Africa showed that some illegal trade in lion products has taken place with reports of poaching of wild lions.

There has been a steady decline in the percentage of lion trophies coming from wild lions: from 90% in 2000 to 7% in 2015, even though the total number of trophies exported over that period has more than doubled. There are estimated to be 8,000 captive lions in South Africa (Moorhouse *et al.*, 2017 In Bauer *et al.*, (2018)) primarily kept for the purpose of hunting, and trophies from South Africa increasingly dominated trophy exports in the past decade.

Traditionally the use of lion products in Africa has been for medicinal purposes, ceremonies, rituals, and as decorations and talismans. Lions continue to be used throughout Africa; demand in some countries is likely met with lions from domestic populations (especially in countries with large wild or captive populations) but there also appears to be illegal/unreported cross-border trade. It is not clear how much current consumption within Africa is by African nationals and how much is by travellers/workers originating from outside of Africa.

The substantial quantities of lion products exported legally to Asia in recent years (Lao PDR, Viet Nam, and to a lesser extent China and Thailand) indicate the major trade is in bone items. Significant seizures in China and Viet Nam support this. However, this study found there to be little demand specifically for lion products in Asia: only a small number of claws/teeth were found openly for sale (products advertised as tiger were more commonly observed), some large-scale seizures of lion products indicate that those involved believed they were smuggling tiger products, and significant effort is taken to market lion bone wine in China to imply it contains tiger bone. Based on this, it seems possible that the majority of imported lion parts are instead being used as a substitute for products that would have traditionally contained tiger. It is not clear who in the trade chain is aware of the substitution, as there is the potential for mis-selling of lion as tiger at each stage from source to consumer. It has been speculated that there is not a sufficient supply of tiger bones within Southeast Asia to meet demand, and lion bone can be used as a cheaper more readily available substitute. However, this study found no direct evidence of this. An alternative theory is that lion bone is acting as a supplement to tiger bone rather than a substitute. It is important to note that potential illegal supply from captive tiger populations in market countries could be significant. Further extended research is needed, including conducting random DNA testing (or another technique) of tiger bone products to ascertain if it contains derivatives of lion bone, as well as the analysis of differential price data to better understand the relationship between the two species.

⁶¹ Errors have occurred in the transition of data from South African permit applications to CITES annual reports which have caused exports to Lao PDR to be mislabelled as Viet Nam and vice versa (Williams *et al.*, 2015). Williams *et al.* (2015) speculated that this could have been caused by confusion over the name of the city Vientiane in Lao PDR sounding similar to Viet Nam.

There is little information available on the roles of Asian countries in the international trade and the movement of lion products between neighbouring countries once it enters Asia (see below). Very little legal trade was reported between these countries, although seizures show illegal cross-border trade is occurring (e.g. of skeletons, claws). This presents the potential scenario of lion bone items being imported legally into the region, but then re-exported (either in the raw form or as processed products) illegally to neighbouring countries. There remains a lack of clarity regarding the trade between key countries in Asia, and more in-depth research is required to better understand connections between the countries, and to understand if CITES controls are being circumvented.

- **Lao PDR** – The role that Lao PDR plays is unclear. According to South African export data, Lao PDR has been one of the major legal importers of lion bones, and it has been suggested that Lao-based companies have been issued import/export quotas for importing lion and tiger products, although this could not be verified during this study. Lao PDR itself has not reported the import/export of any lion products to CITES and the Lao PDR Scientific Authority stated there have not been any imports/exports of lions and that no lion farming takes place. It is important that clarity is provided by the Lao PDR and South African Governments regarding the true nature of trade between the two countries.

Our research has found little evidence for consumption within the country, but instead Lao PDR appears to be acting mainly as a transit location for lion bone products destined for Viet Nam or China. It seems likely that some of the lion bones are being processed into “cake” or wine before export, and it is speculated that this may take place at tiger farms – however without access to farms it was not possible to confirm this. Re-exports of unprocessed lion bones to Viet Nam or China may also be taking place but no evidence was found for this.

A small number of live lions have been observed on a farm. The new Prime Ministers Order issued in May 2018 has the potential to enhance regulation of trade in lions and other wildlife, but concerns have been raised regarding a potential loophole if the safari/zoo operations are able to operate without specific controls to prevent laundering and other illegal activities.

Viet Nam – Trade data show that during the period 2007 to 2016, a total of 2,948 items (plus 739 kg) of lion products were exported to Viet Nam: most of which were bones or skeletons. It also seems that lion products are being imported from Lao PDR but not reported to CITES. One of the main uses for lion bone items in Viet Nam is hypothesised to be for “cake” which is difficult to distinguish from tiger “cake” apparently a desirable product consumed in Viet Nam.

Surveys conducted for this study found no evidence of lion or tiger “cake” (or other lion products) openly for sale in outlets in Viet Nam, but information from other sources suggests sales take place within existing networks behind closed doors. Further research is required to understand the substitution of tiger bone with lion bones, and to determine if consumers or traders are aware of the true content of the product. While it is possible that most of the lion bone is being used as a substitute for tiger bone, there was some evidence of limited differentiated demand specifically for lion products in Viet Nam, and it has been suggested anecdotally that this may be increasing. It has been proposed that there are already lion farms in Viet Nam, and while the captive-population is unknown live imports have totalled 66 lions in the past 10 years.

- **China**—According to trade data, fewer lion products were exported to China compared with Lao PDR and Viet Nam: between 2007 and 2011 1813 items were exported to China, 46 of which were bodies/skeletons. Seizures in, or en route to, China almost doubled this. There are indications that Chinese nationals are travelling to neighbouring countries and purchasing lion products and taking them back to China. This cross-border trade does not appear in the CITES Trade Database, and it is unknown if the people are aware of the true contents of the product or if they instead believe they contain tiger. Research in online and physical markets for this study found that there does not appear to be much of a demand specifically for lion products currently in China, so consumers may not be aware of the true contents of the product. The predominant known use is in lion skeletons which are made into wine; often packaged and advertised to imply the contents include tiger bone. The true contents of this wine are unknown. Lion claws/teeth were also exported to China and were observed for sale online.

Captive lions are present in China, including at facilities holding other species such as tigers, which could be the source of the lion skeletons used in the wine. If at least some of the demand for lion products in China is being met through domestic captive lions then this would explain why far fewer bone items were exported to China compared with Viet Nam and Lao PDR. Alternatively, the wine labelled as containing lion may actually contain tiger bones (or those of other species), or demand may be being partially met by wine being smuggled from Lao PDR or Viet Nam. Forensic testing of wine is needed to better understand this.

- **Thailand** – Compared with Lao PDR and Viet Nam, the amount of bone product reported as exported to Thailand was relatively small. However, Thai nationals have been arrested in South Africa for their involvement in the rhino horn and lion bone trade. There are also indications that Thai-based companies involved in wildlife trade are linked with companies in Lao PDR, although further research is required to better understand these links. Thailand's main legal imports were of live lions which likely enter the tourism industry. It is possible that these lions are subsequently sold for their parts, as was seen with tigers in Thailand, but there is currently no available evidence for this.

It would seem that at least some of the poaching and trafficking involves organised criminal groups, and seizures alongside other commodities such as rhino horn indicate that these groups are dealing in multiple species. Indications from Mozambique in particular are that there is some poaching of lions specifically for international trade, and that lion products are being trafficked out of the country alongside ivory and rhino horn. There are concerns that poaching will increase based on the real or perceived notion that lions are valuable or increasingly valuable in international trade. It seems that there may be an element of opportunistic poaching by hunters who have heard that lions are now valuable so will take one where possible—the apparent ease of poisoning of lions makes it a relatively low risk activity as there are no shots fired to alert rangers. It is assumed that a significant proportion of demand in Asia is for processed lion products (e.g. cake, wine) (either being processed in Africa or Asia), and there are indications that cargo ships/diplomatic connections are sometimes used for smuggling from Africa to Asia: these dynamics could reduce the likelihood of detection by law enforcement. An additional complexity is the more than 280 captive tigers in South Africa; there are concerns that tiger bones from South Africa are being laundered as lion bones. Vietnamese Customs have reported they face challenges when attempting to differentiate between legal and illegal products in trade.

Based on the available information, there seemed to be a difference in the predominant commodities in illegal trade in East-Southern Africa (claws, teeth, bone items) compared with West Africa (skins), potentially indicating different sub-regional trade dynamics. However, this may reflect a bias in the available data and requires further detailed research.

Overall, retaliatory or pre-emptive killing in defence of human life and livestock, habitat loss and prey base depletion are currently considered to be the largest threats to wild lions. Poorly managed trophy hunting is also considered a risk. The trade in bones and other body parts for traditional medicine, both within Africa and Asia, was identified as an emerging threat in 2014. The threat from illegal trade in body parts is magnified when the sub-population is small and located in a region where demand is high for lion products (e.g. West Africa) or in areas where established criminal networks are already poaching other species for international trade (e.g. rhino/elephant in Mozambique). There are concerns that a perception of increasing value and demand in Asia is going to lead to increased illegal poaching.

The recent lion trade is in a state of change caused, at least in part, by the amended CITES-listing listing and various national trade bans⁶². Uncertainty regarding the permanence of these bans, or the potential adoption of bans by other major importers, is already causing changes in the captive-breeding industry in South Africa. Lion farming may increase in consumer countries, and some South African farmers appear willing to export live lions to these countries which would help establish/increase farming. As live lions are not explicitly detailed in the CITES listing-annotation it is not clear how this will be addressed, although the South African CITES Scientific Authority is treating permit applications for live lions with caution in case they are acting as a proxy for skeleton exports. How all of this influences the trade dynamics and pressures on wild populations remains to be seen. Potential changes which could influence demand, such as increased wealth in consumer countries, emergence of demand specifically for lion products, and changes to tiger trade regulation, are complex but could significantly increase the demand for lion products.

⁶²For example: USA: The USA announced a ban in October 2016 on the import of trophies taken from captive-bred lions in South Africa. In March 2018 the ban was withdrawn, and applications will now be considered on a case-by-case basis. Australia: Australia issued a total ban in 2015 on all African lion trophy imports. France: In 2015 France stopped issuing permits for lion trophies four months after Cecil the Lion was killed. The Netherlands: In 2016 the Netherlands said they would no longer allow the import of hunting trophies from a large number of species (including lion)

Annex 1: Full Method

The following data sources were used in this study:

CITES Trade Data

Data for all lion commodities were downloaded from the CITES Trade Database in February 2018. Data for 2007–2016 were used, although it is recognised that a number of countries had not yet submitted annual reports for 2016.

A comparison was made of data reported by importing and exporting countries (using terms “blank” and kg). There was no consistent pattern regarding whether reported quantities were always high/lower from importers or exporters. Therefore, reports from exporters are used throughout this study but major discrepancies are noted.

All source codes, purpose codes, commodities and units were used for this analysis. Conversions between units were made where possible (e.g. grams to kilograms).

Trade in Asiatic Lion *Panthera leo persica* (Appendix I) which amounted to 36 live lions, six (scientific) specimens and one body between 2007 and 2016) was considered outside the scope of this study so is not discussed any further.

The analysis of this study focuses on direct exports. Reported re-exports from key importing countries identified in this study were relatively minor (199 reported by re-exporting countries/288 reported by importing countries).

Data reported in the CITES Trade Database are assumed to be predominantly legal, although they do contain some records of seized/confiscated products (source code “I”) which may or may not have subsequently entered legal trade after being seized. There may also be cases of incorrectly declared (“laundered”) trade but it is anticipated that this is relatively small. It is also recognised that the trade reported to CITES may not be a true representation of the actual trade for a number of reasons (e.g. countries have reported based on permits issued rather than actual trade (Robinson & Sinovas, 2018)).

Williams *et al.* (2017) highlighted serious errors in the CITES Trade Database caused by the mis-interpretation of trade terms for exports from South Africa. For example, bones, skeletons and bodies were inconsistently classified in South Africa’s annual reports which led to errors such as trade in skeletons being mis-classified as trade in individual bones. Cases where the country of import was incorrectly recorded were also found. Because the mandate of this study was to analyse trade based on data contained in the CITES Trade Database and because South Africa’s original annual report is not publicly available, no attempt has been made to fix the errors in the present study (aside from contacting UNEP-WCMC to make them aware of specific errors).

Illegal Trade Data

Information on seizures of lion were sourced from three sources:

CITES Annual Illegal Trade Reports

Parties have been asked to submit an annual report of known instances of illegal trade of all CITES-listed species to the CITES Secretariat since 2017. As of March 2018, information for 2015 had been received by three countries, for 2016 by 41 countries and the European Union (some European

countries also reported to the Secretariat separately), and three countries for 2017 (Lauren Lopes (CITES), *in litt.*, March 2018). The CITES Secretariat extracted instances involving lions from these reports and shared them with TRAFFIC for the purpose of this study (in total lion seizures were reported in the reports of nine countries).

UNODC WorldWISE Database

The United Nations Office on Drugs and Crime (UNODC) have compiled a global database of seizures into the World Wildlife Seizures (WorldWISE) Database. Data come from a number of sources including CITES Annual and Biennial Reports, WCO-CEN⁶³, EU-TWIX⁶⁴ and national databases. UNODC extracted instances involving lions for the purpose of this study, which dated from 1999 to 2015.

TRAFFIC

TRAFFIC collects information on illegal trade in species including lions on an ongoing basis to monitor patterns of trade. Most data are from open sources such as media reports, publications or court records. Some media reports combined the amount of lion product seized with that of other species (e.g. 22.1 kg of lion, Serow and bear bones combined was seized in Viet Nam in 2016⁶⁵). In this case, the total quantity was split evenly between the three species although it is recognised that this approach will likely lead to inaccuracies. During the course of this study, stakeholders provided information on additional seizures which were incorporated into this dataset where possible. The year range for this dataset was 1999 to 2018.

Some stakeholders also shared information on seizures for this study, which was incorporated into this dataset. On some occasions insufficient specific information was provided (and further online research did not find reference to the case(s)). Unfortunately such information could therefore not be included for the risk of creating duplicates. For example, summaries such as “35 lion skins were seized in country X in 2012” did not provide enough specific information to be able to cross-check with other seizures made that year in country X to identify duplicates.

The three datasets were re-formatted and combined into one dataset. Duplicates were removed where identified but as some seizures were lacking detailed information, there may still be a small number of duplicates.

Literature Review

Published and grey literature were consulted to obtain an understanding of the legal and illegal trade in lions. Literature was consulted in the following languages: English, French, Chinese, Vietnamese and Laotian. Literature was predominantly obtained by online searches of key words, but some literature was also shared by stakeholders.

Stakeholder Consultation

Over 200 stakeholders were consulted between February and May 2018, representing national CITES authorities, government departments, researchers, industry and national and international NGOs. Stakeholders represented a wide geographic area. Most stakeholders were contacted via email and asked to share information regarding the lion trade in their country/region, including uses of lion products, trade routes and relationship with trade in other species (e.g. tiger). Specific questions

⁶³ World Customs Organization - Customs Enforcement Network

⁶⁴ European Union Trade in Wildlife Information eXchange

⁶⁵ *Vận chuyển thuê xương động vật hoang dã để nhận 3 triệu đồng*

<https://web.archive.org/web/20160406070037/http://www.baohaiquan.vn/Pages/Van-chuyen-thue-xuong-dong-vat-hoang-da-de-nhan-3-trieu-dong.aspx>

were also asked for stakeholders believed to have a good knowledge of the lion trade. To date, the response rate was approximately 30%. Interviews with specific stakeholders were conducted in Viet Nam, China and Lao PDR. It has not always been possible to substantiate anecdotal reports from stakeholders within this study and therefore information provided cannot be confirmed as correct. However, based on the knowledge and experience of stakeholders consulted their input is deemed invaluable for understanding the hidden aspect of the lion trade.

Online Surveys

Online surveys were conducted to assess the availability of lion products for sale in three countries:

Viet Nam – An online survey was conducted of three social media websites and four e-commerce websites, all of which were open access. The survey was conducted in May 2018 using key words in Vietnamese.

Lao PDR – In April 2018 32 WeChat⁶⁶ accounts where wildlife products could be viewed and purchased were identified (one based in Vang Vieng, 12 in Vientiane and 19 in Luang Prabang). Of these accounts, only seven excepted contact requests and engaged in conversation.

China – An online survey was undertaken in March 2018 of websites in China. Searches of key words in Chinese using the China National Knowledge Infrastructure tool, Google Scholar and Baidu Xueshu were made.

Physical Surveys

Surveys of physical markets were conducted in three countries using the following approaches:

Viet Nam – Surveys were conducted in three locations in Viet Nam: Ha Noi, Ho Chi Minh City and the province of Quang Ninh. These locations were chosen as previous surveys had found there to be wildlife markets present. Each location was surveyed for five days in April/May 2018.

Lao PDR – Market surveys were conducted in Luang Prabang, Vientiane and Vang Vieng (a town north of Vientiane). These locations were selected as wildlife has previously been observed for sale in Luang Prabang and Vientiane, and all three locations are important tourist destinations. One day was spent in each location and a total of 39 shops that were open for business were surveyed (20 in Luang Prabang, 16 in Vientiane and three in Vang Vieng).

China – Surveys of Beijing, Tianjin, Zheng Zhou, Nanjing, Chengdu, Chongqing, Nanning, Dongxing, Pingxiang, Shijiazhuang, Tangshan, Dalian, Shenyang, Harbin, Hangzhou and Xi'an were undertaken by TRAFFIC for this study and previous recent studies between January and May 2018.

⁶⁶WeChat (Weixin) is a multi-purpose messaging/social/mobile payment app.

Annex 2: Full Analysis of CITES Trade Data

Exporting countries reported exports of 22 different commodities using four different units between 2007 and 2016. According to transaction data from the CITES Trade Database, 2,456 transactions took place between 2007 and 2016 involving lion products.

Commodities

Trophies dominated the number of individual items (9,140) followed by bones (3,977), specimens (3,871) and skeletons (3,469) (Table 01 and Figure 01A), whereas trade reported in kilograms was nearly all bones (1,096 kg) or skeletons (480 kg) (Table 01 and Figure 01B). While the trade in specimens appears significant, it is not possible to know exactly the type of specimen (e.g. drop of blood, sample of hair etc.) and thus estimate how many lions this may equate to and whether obtaining the specimens was lethal to the lion. For these reasons, specimens are not discussed in more detail.

Table 01 Lion products reported in global trade 2007–2016 (reported by exporting and importing country, direct exports only). *Source: CITES Trade Database*

Unit	Commodity	Quantity reported by exporter	Quantity reported by importer	% Difference
flasks	specimens	35	-	NA
	Total	35	-	NA
Kilograms	bones	1,096	1,198	9%
	skeletons	480	1,080	125%
	specimens	12	2	-86%
	hair	1	<1	-95%
	skins	<1	-	NA
	claws	-	<1	NA
	skulls	-	1	NA
	TOTAL	1,590	2,281	43%
Millilitres	specimens	1,242	351	-72%
	skins	6	-	NA
	TOTAL	1,248	351	-72%
Number of individual items	trophies	9,140	7,965	-13%
	Bones	3,977	697	-82%
	specimens	3,871	4,015	4%
	skeletons	3,469	4,740	37%
	Live	2,599	1,680	-35%
	Claws	1,240	1,152	-7%
	Bodies	1,060	1,187	12%
	Skins	1,044	869	-17%
	Skulls	1,033	378	-63%
	Teeth	259	114	-56%
	hair	199	189	-5%
	skin pieces	33	7	-79%

derivatives	27	25	-7%
feet	22	11	-50%
leather products (small)	6	-	NA
plates	2	7	250%
tails	2	4	100%
bone pieces	1	59	5800%
carvings	1	43	4200%
garments	1	27	2600%
unspecified	1	5	400%
leather products (large)	1	1	0%
rug	-	27	NA
jewellery	-	5	NA
bone carvings	-	3	NA
TOTAL	27,988	23,208	-17%

While overall the total number of lion products peaked in 2011 at 4,694 individual items (Figure 01A), exports of certain commodities have shown an increase in recent years.

Annual exports of trophies remained relatively steady between 2008 and 2013 (averaging approximately 970 trophies per year), while exports in 2014 and 2015 were higher (averaging 1,300 per year) (Figure 01A) Exports for 2016 were excluded due to lack of annual reports, but based on reports submitted by importers to date, 646 trophies were imported in 2016.

Exports of skeletons increased from zero in 2007 to a peak of 1,181 in 2014 (Figure 01A). In addition, 480kg of skeletons were exported in 2015 (Figure 01B). Williams *et al.* (2015) calculated the average mass of a lion skeleton to be 8.95 kg, and while this cannot be used with any real accuracy with the present dataset (for example, because it is unknown whether the skeletons included the skulls), 480 kg could equate to approximately 50 lions.

Williams *et al.* (2017) noted that there are errors in the CITES Trade Database caused during the transmission of South African permit application data to CITES Annual Reports by the term “carcass” being incorrectly converted to body when skeleton would have been more appropriate. The export of bodies leapt from an annual average of around 50 between 2007 to 2014, to 623 bodies in 2015, and 855 bodies in 2016 (according to importing countries)

The export of bones showed large peaks of varying size in 2009 (142 plus 250 kg), 2010 (645), 2011 (2,126), 2012 (101 plus 846 kg) and 2013 (736) (Figures 01A and 01B). Importers reported importing 180 bones in 2016.

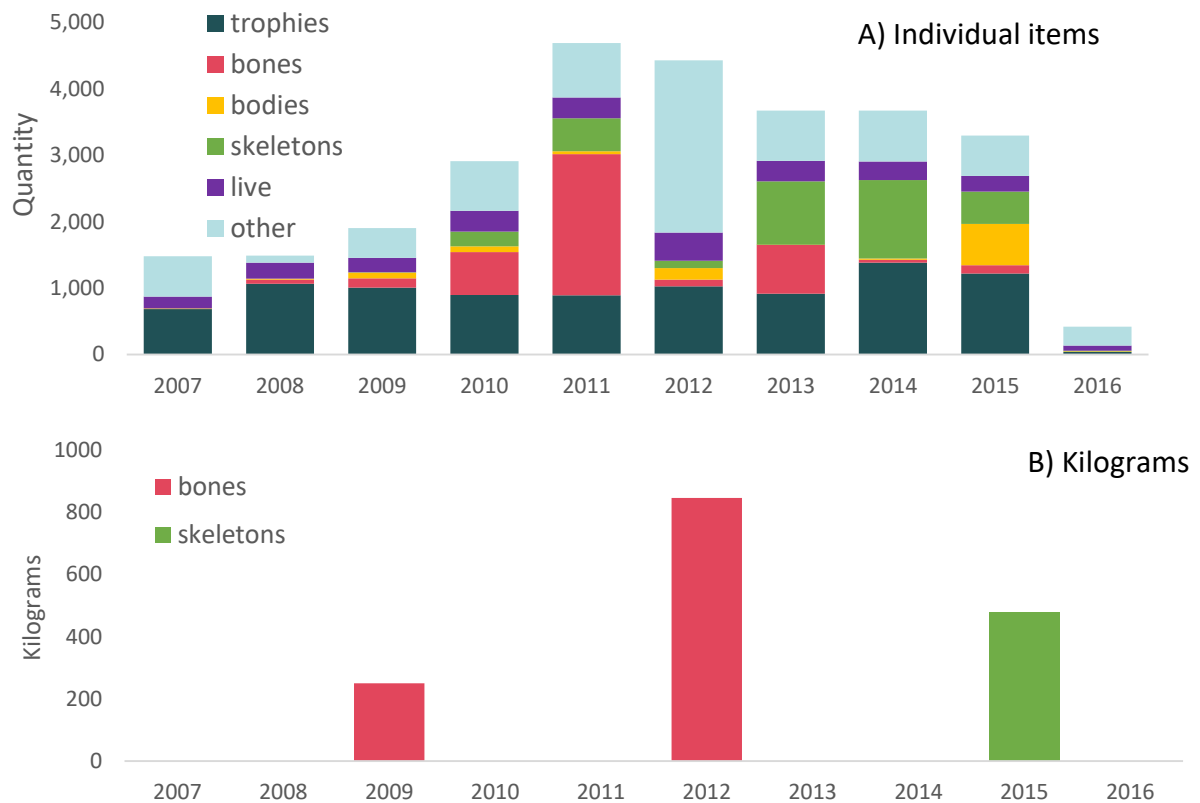


Figure 01 Annual exports of lion products (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Trade Routes – Major Importers and Exporters (2007–2016)

The global lion trade is incredibly diverse and in total of 83 countries reported exporting lion commodities to 140 countries. The trade in live lions involved the most countries (71 exporting countries → 109 importing countries).

Most trophies, bones, skeletons, bodies and live lions were exported from Africa: with South Africa being the largest exporter by far (Figure 14A-E).

While most trophies were exported to North America (the USA specifically), the majority of exports of bodies, bones, skeletons and live lions were destined for Asia. Lao PDR and Viet Nam were the most common Asian destinations for bones, bodies and skeletons (Figure 3 A-D), although it is known that errors have occurred in the transition of data from South African permit applications to CITES annual reports which have caused exports to Lao PDR to be mislabelled as Viet Nam and vice versa (Williams *et al.*, 2015). Williams *et al.* speculated that this could have been caused by confusion over the name of the city Vientiane in Lao PDR sounding similar to Viet Nam. Thailand and China were the key destinations for live lions (Figure 3 E).

Trade Routes –Changing Importers

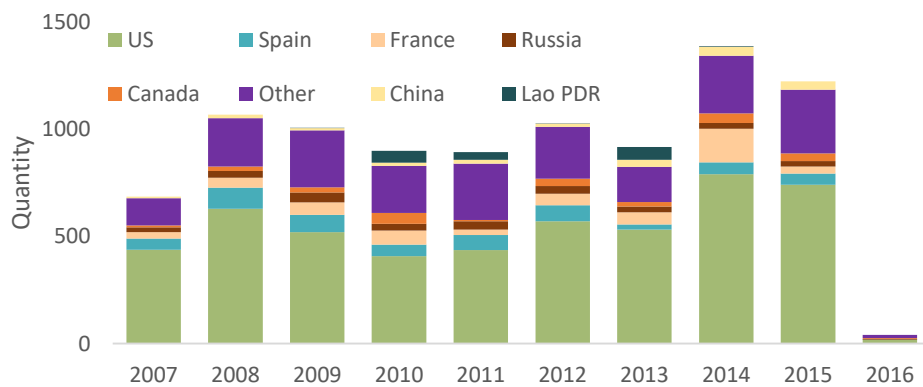
According to exporting countries, the US has consistency been the largest importer of trophies in the past 10 years (Figure 02 A). The largest five importers in that time period are all European or North American countries, although some Asian countries are emerging as destinations. For example, 41

trophies were exported to China in 2014 compared with seven in 2007. A total of 151 trophies were exported to Lao PDR between 2010 to 2013.

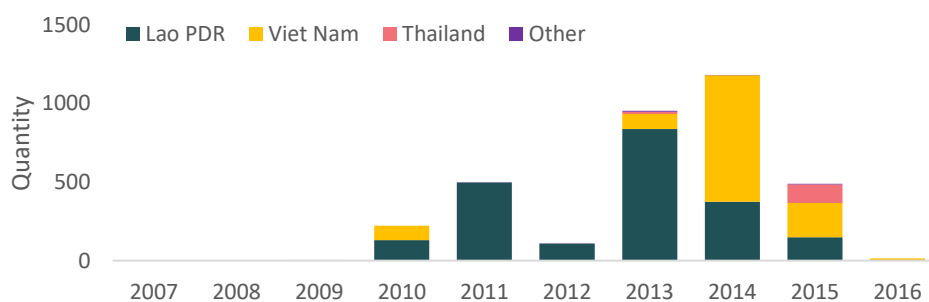
In 2014, Viet Nam became a major importer of skeletons and exports to Lao PDR reduced (Figure 02B). A similar pattern was shown for bones around 2011–2013. Exports of bodies to Viet Nam spiked in 2015 and Lao PDR appeared to lose some of its market share (even considering it imported 480 kg skeletons in 2015) (Figure 02C). Several factors may have contributed to this change, including a major importing company losing its licence that year (Lao PDR-based Xaysavang company) and Lao PDR being subject to a commercial trade suspension for all CITES-listed species in 2015 due to its failure to submit a National Ivory Action Plan (Williams *et al.*, 2017). Exports of bones to Lao PDR reduced significantly after importing 1,573 bones in 2011 (Figure 02D).

In 2015 118 skeletons were exported to Thailand, up from 14 in 2013 (Figure 02 B). The number of live lions exported to Thailand peaked at 58 in 2012 and then declined (Figure 02 E). Imports of live lions to China showed an increase in recent years (up from zero in 2007 to 75 in 2014), as did exports to Viet Nam (44 in 2015 compared with a total of 24 between 2007 and 2014).

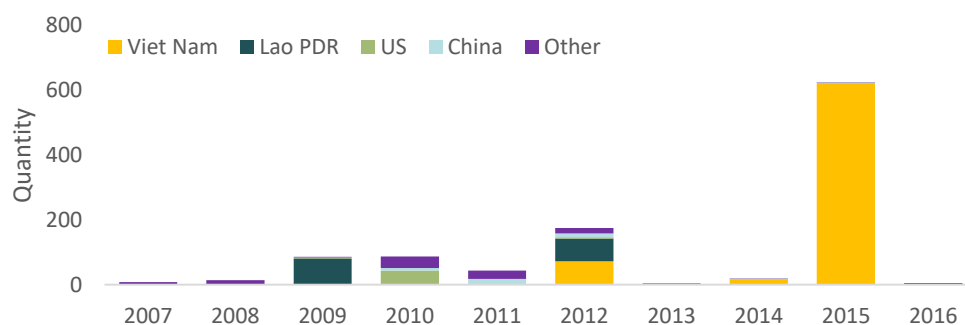
A) Trophies



B) Skeletons



C) Bodies



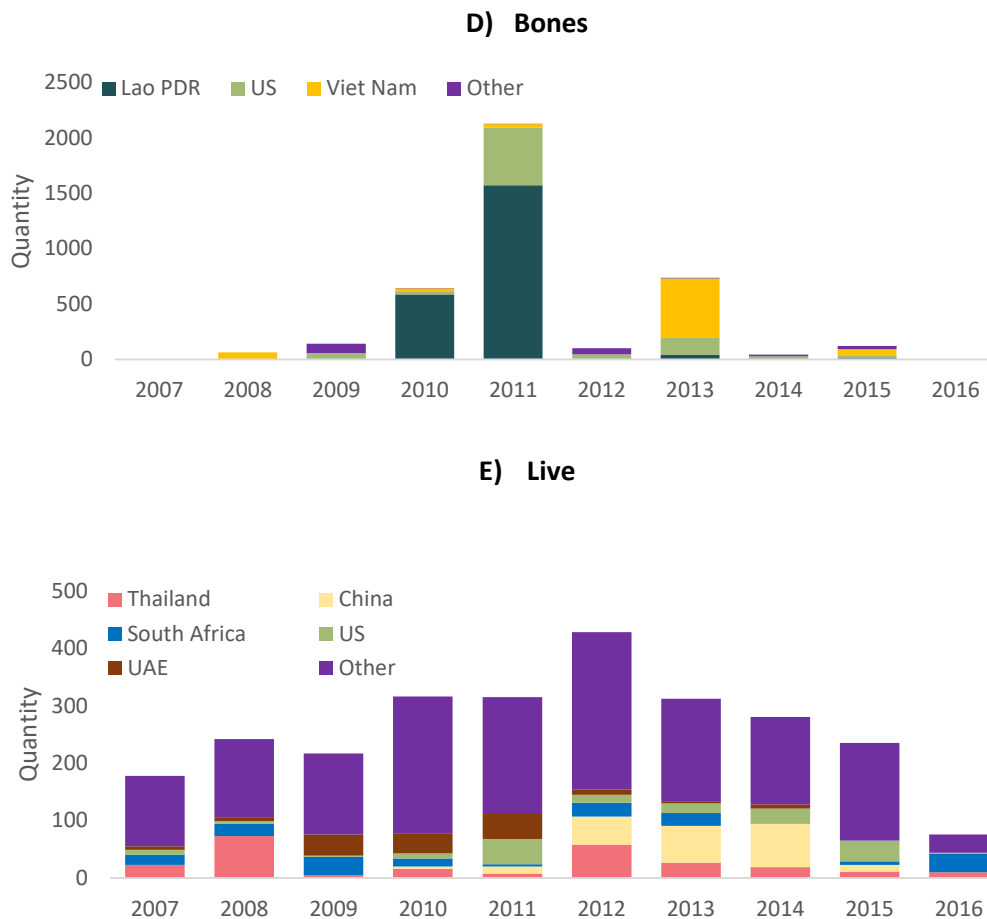


Figure 02 Importers of lion trophies, (A) skeletons (B), bodies (C), bones (D) and (E) live (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Purpose

The majority of exports were reported as hunting trophies (12,053 plus an additional 989 kg) or commercial purposes (8,358 plus an additional 588 kg) (Figure 03 A and B). As would be expected, most trophies were exported as hunting trophies (92%), whereas for trade reported in individual bones, trophies and skeletons commercial trade was the most significant (71%, 75% and 96% respectively (Figure 03 A)). Trade in bones reported as kilograms was however mainly hunting trophies (90%) (Figure 03 B). Most live lions were reportedly exported for the purpose of zoos (1,131) or circuses/travelling exhibitions (501) (Figure 03 A).

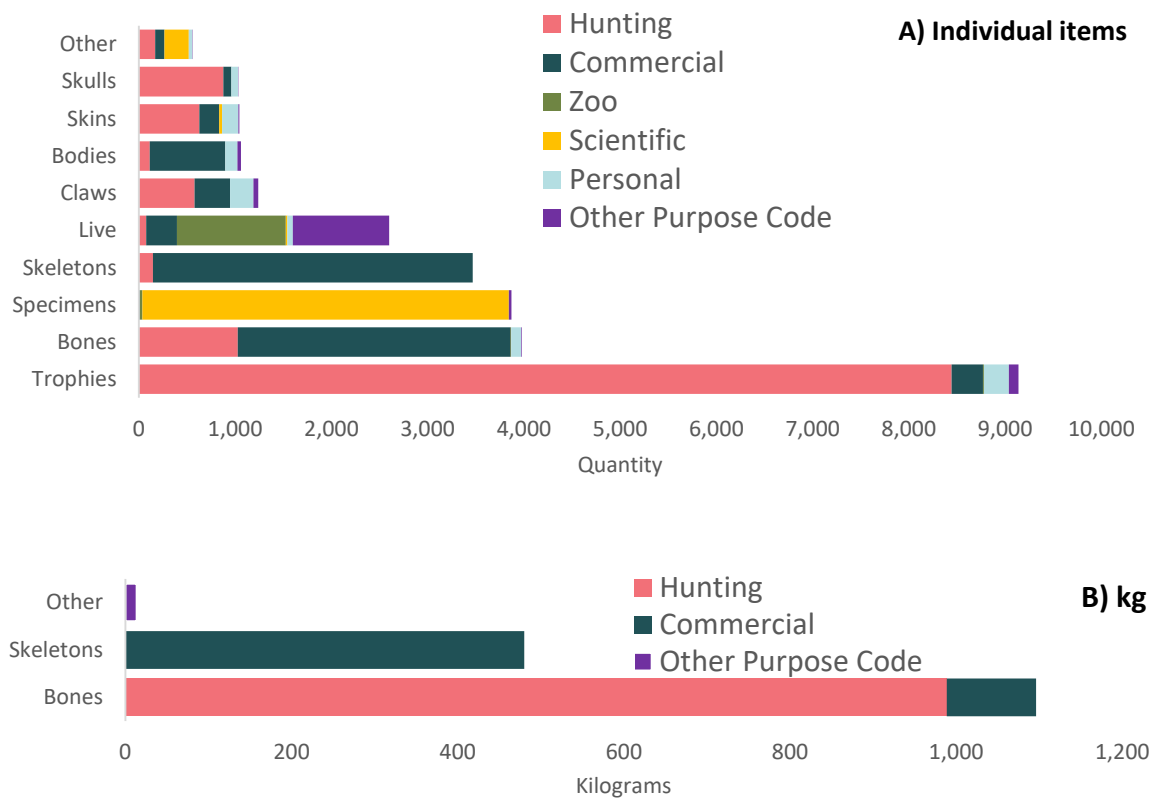


Figure 03 Purpose code of lion products by commodity type (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

Source

Overall most exports of individual commodities were reported as from captive-bred lions (18,628) followed by wild (8,738). However, there was significant variation between commodity types (Figures 04 A and B). For example, the majority of skeletons (93%), bodies (92%), bones (90%), live (89%) trophies (74%) were reported as from captive-bred lions, whereas specimens (83%) and skins (80%) were predominantly reported as from wild lions (Figure 04 A). Interestingly, while for bones reported as individual items 90% were from captive-bred lions, for bones reported in kilograms the figure was much lower (33%).

Williams *et al.* (2015) noted that the proportion of lion products from captive-bred animals was likely to actually be higher than that reported in the CITES Trade Database, as until 2012 some permit issuing authorities in South Africa incorrectly classified lions that had been raised in captivity but released for a specified period⁶⁷ of time before being shot as wild.

⁶⁷ The period varies by province but can be as little as 96 hours (North West Province (Williams *et al.*, 2015).

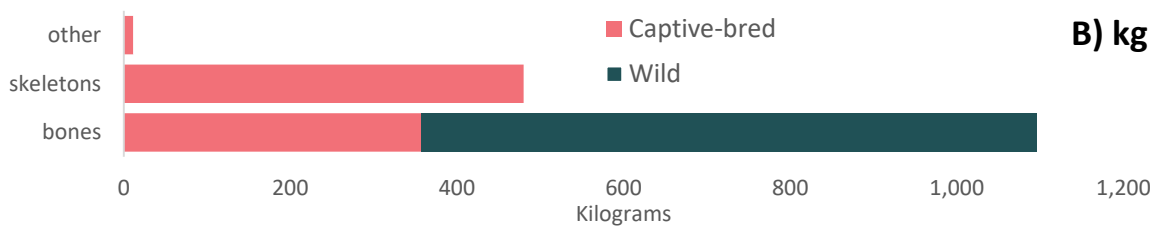
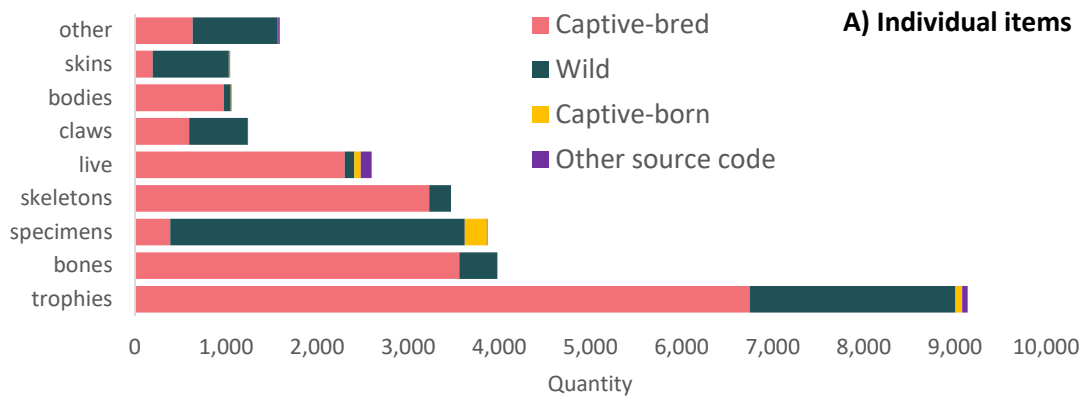


Figure 04 Source code of lion products by commodity type (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

When considering lion bodies, bones, live, skeletons and trophies together (16,819 individual items), South Africa was by far the largest exporter of captive-bred products (Figure 05 A). South Africa was also the largest exporter of the same products reportedly from wild animals, but other range States such as Zambia and Burkina Faso were also notable exporters (Figure 05 B). The percentage of individual products of these five commodities combined that were reportedly captive-bred ranged from 57% in 2007 to peaks of 94% in both 2011 and 2015.

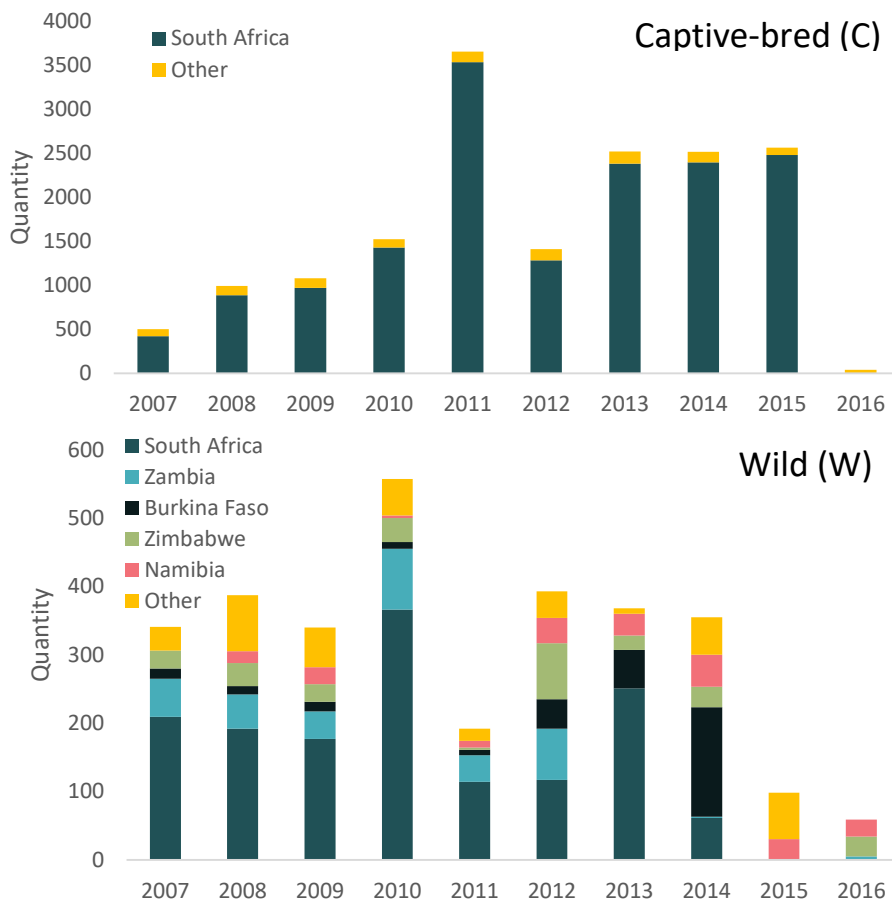


Figure 05 Exporters of lion bodies / bones / live / trophies / skeletons (combined) from captive-bred (A) or wild (B) lions (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

Re-exports

A total of 1,940 individual lion products were re-exported between 2007 and 2016 (Table 02), compared with 27,988 reported as direct exports. In contrast to direct exports, the commodity re-exported in the largest quantity was live lions (754) which accounted for 39% of all individual items re-exported. The purpose of re-export of 595 of the lions was for circuses/travelling exhibitions: many of these live lions were traded between countries in Eastern Europe / the Caucasus e.g. Ukraine and Russia and it is likely that the re-export figures contain less actual individual lions as it is probable that at least some of the lions have crossed back and forth several times in the circus.

Table 02 Lion products reported in global trade 2007–2016 (reported by re-exporting and importing country, re-exports only). *Source: CITES Trade Database*

Unit	Commodity	Quantity (Exporter)	Quantity (Importer)	% Difference
Millilitres	specimens	2	67	3,250%
	Total	2	67	3,250%
Number of individual items	live	754	248	-67%
	trophies	509	285	-44%
	specimens	231	267	16%
	skulls	125	36	-71%
	skins	117	132	13%
	bodies	69	32	-54%
	claws	43	42	-2%
	bones	34	26	-24%
	teeth	21	61	190%
	skin pieces	10	3	-70%
	derivatives	5	209	4,080%
	leather products (large)	5	-	NA
	leather products (small)	5	4	-20%
	hair	3	1	-67%
	carvings	3	3	0%
	feet	2	9	350%
	garments	2	1	-50%
	rug	2	4	100%
	medicine	-	1	NA
	plates	-	1	NA
unspecified	-	1	NA	
	Total	1,940	1,366	-30%

Reported re-exports from key importing countries identified in this study were relatively minor (199 reported by re-exporting countries/288 reported by importing countries) (Table 03).

Table 03 Re-exports of lion products from key importing countries (reported in individual items, reported by re-exporting country, re- exports only). *Source: CITES Trade Database*

Commodity	China	Lao PDR	Thailand	USA	Viet Nam
Trophies	-	-	-	72	-
Specimens	4	-	1	62	-
Live	11	-	-	6	-
Bodies	3	-	-	8	-
Bones	1	-	-	9	-
Teeth	-	-	-	9	-
Skulls	-	-	-	4	-
Claws	-	-	-	2	-
Other	-	-	-	7	-
Total	19	-	1	179	-

Commodities

In contrast to direct exports, the commodity re-exported in the largest quantity was live lions (754) which accounted for 39% of all individual items re-exported. Trophies were the second most common (509) followed by specimens (231 plus 2 ml) and skulls (125) (Figure 06). As with direct exports, specimens are not discussed any further here and analysis focused on commodities exported in the greatest numbers.

While re-exports of live lions appear to have decreased significantly in the last two years of the period, this can partly be explained by the top two re-exporters Ukraine and Russia having not yet submitted their annual reports for 2015/2016 and 2016 respectively. Re-exports of trophies ranged peaked at 83 in 2011, but again the top re-exporter, South Africa, has not submitted an annual report for 2016 so this number may appear artificially low.

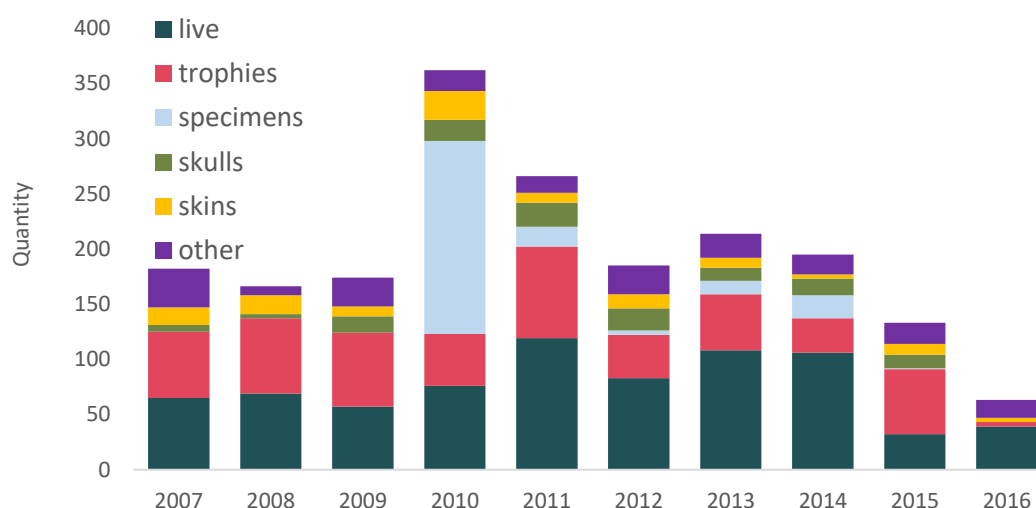


Figure 06 Annual exports of lion products (reported as number of individuals, reported by re-exporting country, re-exports only) 2007–2016. *Source: CITES Trade Database*

Purpose

The most common purpose for re-exporting lion commodities was for circuses/travelling exhibitions (618), of which most were live animals (595). The purpose of re-export of 595 of the lions was for circuses/travelling exhibitions: many of these live lions were traded between countries in Eastern Europe / the Caucasus e.g. Ukraine and Russia and it is likely that the re-export figures contain less actual individual lions as it is probable that at least some of the lions have crossed back and forth several times in the circus.

Most trophies were re-exported either for hunting trophies (227) or for personal use (183) (Figure 07).

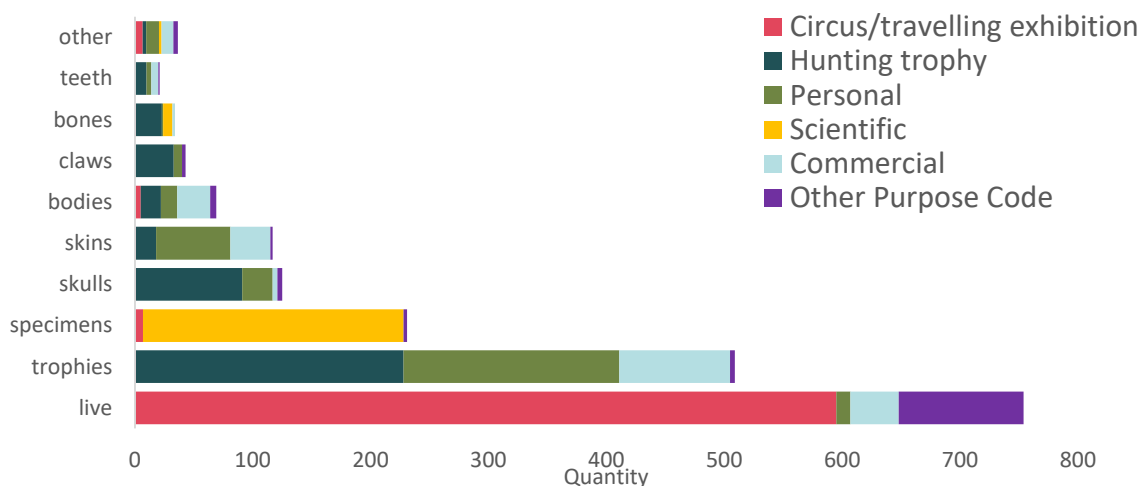


Figure 07 Purpose code of lion products by commodity type (reported as number of individuals, reported by re-exporting country, re-exports only) 2007–2016. *Source: CITES Trade Database*

Annex 3: Full Analysis of Illegal Trade (Seizures)

Commodities

Based on the data available, between 1999 and March 2018 there were 355 seizures that involved lions or their parts. Information was available for seizures which totalled 3,283 individual lion parts, 87 kg and smaller amounts reported in other units between 1999 and 2018 (Table 04). Claws were the commodity seized in the highest number overall (1,601, plus an additional estimated 3 kg⁶⁸), followed by teeth (748 (plus 3 kg) and medicine (221) (Table 04). For some of the most commonly seized products (medicine, scientific specimens) it is not possible to estimate how many lions these may have been derived from, so they are not spoken about in any further detail.

Although seizures information was available from 1999 onwards, the amount was much smaller compared with the most recent 10 years (Figure 08). This pattern could be explained by a number of factors e.g. the databases used for this analysis have focused on collecting more recent data and therefore missed older seizures, there were less products seized earlier in the time period, there were fewer media reports of seizures due to less public interest in wildlife trade etc. and therefore it is not reasonable to assume from these data alone that there has been an increase in illegal trade.

Table 04 Summary of reported seizures of lion products 1999–2018 (Data sources: WorldWISE Database, CITES Illegal Trade Reports, TRAFFIC)

Unit	Commodity	Quantity
Unknown	Claws	8
	Teeth	8
	Live	4
	Total	20
Kilogram	Bones	47
	Live	7
	Claws	3
	Teeth	3
	Hair	1
	Scientific specimens	1
	Total	63
Litre	Derivatives	1
	Total	1
Metre	Skin pieces	10
	Total	10
Number	Claws	1,601
	Teeth	748
	Medicine	221
	Live	184
	Scientific specimens	134

⁶⁸Six kilograms of lion teeth and claws were seized in at Maputo International Airport, Mozambique in 2016, along with 76.6 kg of rhino horn. The flight was destined for Kenya. It is not known exactly how much of the six kilograms was teeth vs. claws, so for the purpose of this analysis it has been split evenly. <http://clubofmozambique.com/news/mozambican-police-seize-76-kg-of-rhino-horn-worth-us4-6-million/>

	Bones	79
	Skins	62
	Bodies	50
	Trophies	44
	Unspecified	29
	Heads	21
	Skulls	18
	Feet	17
	Skeletons	17
	Genitals	14
	Ivory carvings	12
	Skin pieces	9
	Bone pieces	8
	Derivatives	3
	Rugs	3
	Small leather products	2
	Tails	2
	Hair	1
	Parts	1
	Plates	1
	Leather items	1
	Whole	1
	Total	3,283
Pieces	Trophies	4
	Total	4

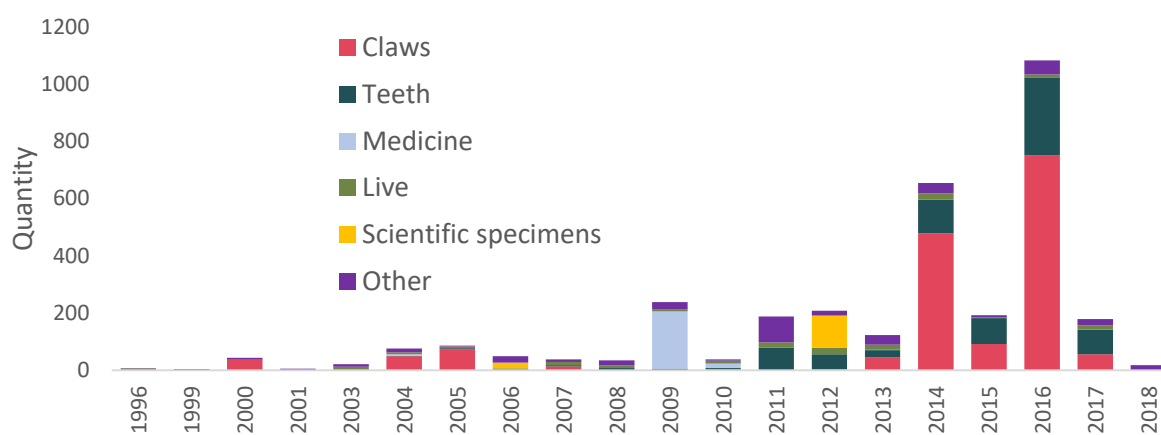


Figure 08 Annual seizures of lion products (reported as number of individual items), 1999–2018. *Data sources: WorldWISE Database, CITES Illegal Trade Reports, TRAFFIC*

Country of Seizure

South Africa seized the most bones (62) and bodies (27), while all seizures of skeletons took place in China (42) or Viet Nam (six) (Figure 09). The USA seized the most trophies (31) out of a total of 44.

Viet Nam (680) and Tanzania (560) seized the most individual claws by far, and Mozambique was responsible for seizing three kilograms of claws. Mozambique also seized the most teeth (296 plus 3 kg) followed by Tanzania (159).

Information was available on seizures totalling 184 live lions seized in 19 different countries, with Mexico seizing the most (45) followed by South Africa (39).

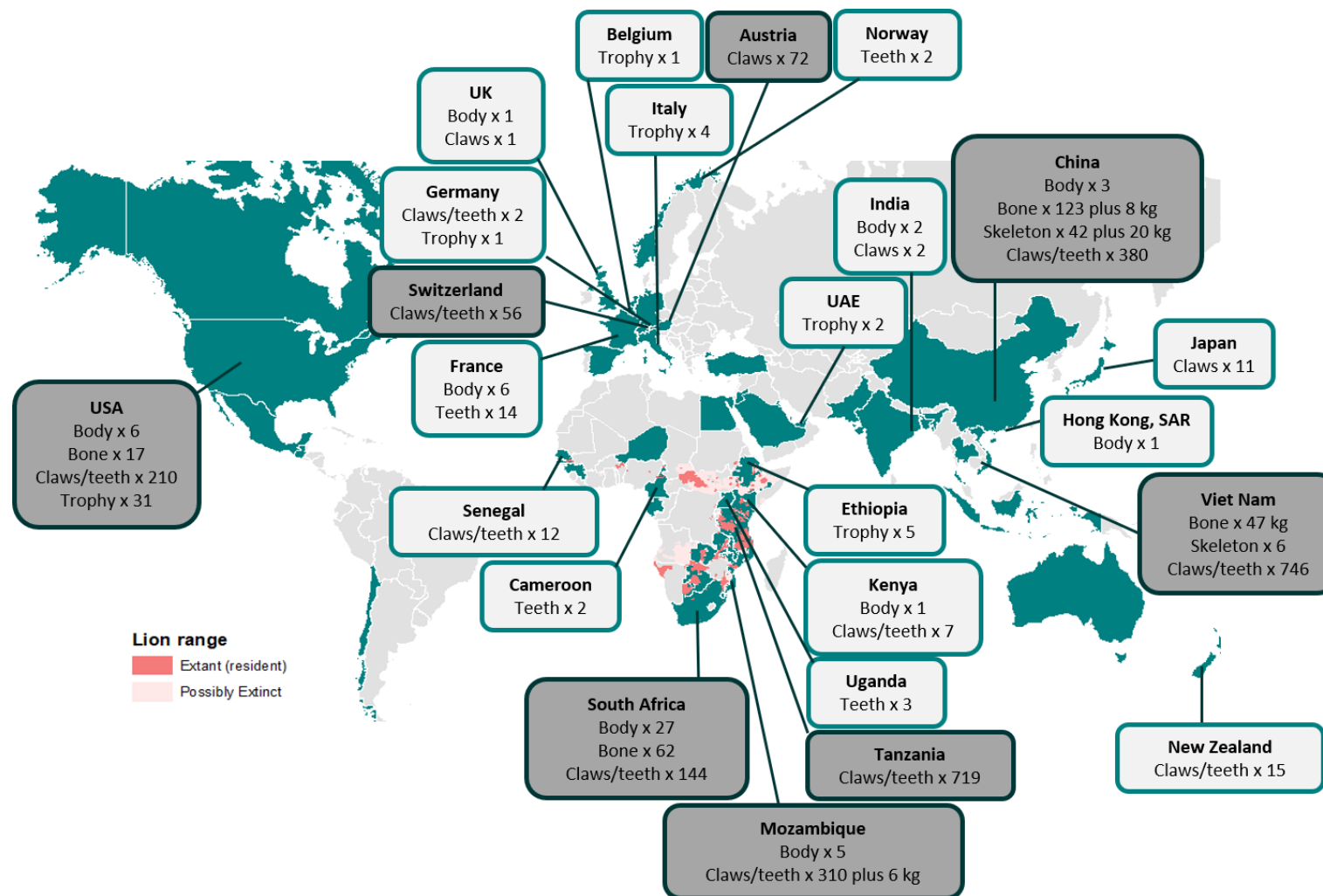


Figure 09 Locations of reported seizures of live lions or lion products 1999 - 2018 are coloured green. Quantities of key products (body/bone/claws/skeletons/teeth/trophy) are provided in boxes (dark grey boxes indicate 20+ key products were seized). Only information on specific seizures was included, general information on illegal trade or summaries of multiple seizures (e.g. annual totals) were not included. *Data sources: WorldWise Database, CITES Illegal Trade Reports, TRAFFIC, EIA (2018)*

Analysis of “I” Records in the CITES Trade Database

Trade reported in the CITES Trade Database using the source code “I” (confiscated or seized specimens) was analysed separately to data from the other three databases. This is because an unknown proportion of the records may refer to seized specimens which re-entered trade perfectly legally (e.g. items were resold or live animals exported to a zoo for housing). Also, there is likely to be duplication with the UNODC WorldWISE database.

Exporting countries reported a total of 61 live lions with the source code “I”, and seven hairs. Importing countries reported far more records (378) (Table 05). The majority of “I” trade was reported by the USA (349) who most frequently cited South Africa (130) or Tanzania (122) as the exporter.

Table 05 Trade in lion reported using the source code ‘I’ (reported as number of individual items, reported by importing country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Commodity	Number of Individual items
specimens	187
claws	57
trophies	50
teeth	22
carvings	20
bones	14
live	12
skulls	5
bone pieces	4
skins	3
garments	2
bone carvings	1
Derivatives	1
Total	378

Examples of Seizures of Lions

A variety of seizures reported in the media in recent years are included in Table 14 to illustrate the diversity of places involved and types of illegal trade. It is clear from some of these examples that at least some of the illegal trade is highly organised, and trafficking gangs are transporting multiple goods (e.g. rhino horn, tiger bones, ivory) along with lion products.

Some of the arrests have involved non-nationals, for example the arrest of a Vietnamese in Tanzania, a Gulf national in Egypt and three Chinese in South Africa, indicating the global nature of the illegal trade.

References

- Ammann, K. (2013) Of tiger and lion bones and the legalizing of the rhino horn trade. Available <http://www.karlamann.com/pdf/swara-tiger-rhino-piece.pdf>.
- Ammann, K. (2018) Is China's ivory moratorium all a window dressing exercise with trade continuing? Available <https://africasustainableconservation.com/2018/04/17/is-chinas-ivory-moratorium-all-a-window-dressing-exercise-with-trade-continuing/>
- Animal Defenders International (2018) Captive big cat poaching in South Africa A report on media accounts of incidences 2016-2018.
- Bauer, H., Packer, C., Funston, P.F., Henschel, P. & Nowell, K. (2016) *Panthera leo* (errata version published in 2017). The IUCN Red List of Threatened Species 2016: e.T15951A115130419. <http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T15951A107265605.en>.
- Benyr., G., Littlewood, A., Czirák, Z. (2017) Part 2: A Report to the EU CITES Scientific Review Group on the Experts Mission to Tanzania, 19–27 August 2016. <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=33600&no=48>.
- Born Free (2008) *Too much pressure to handle? Lion derivatives used in traditional medicine in Nigeria, West Africa*. Born Free Foundation, Horsham, UK.
- Born Free (2018) Cash before Conservation - An overview of the Breeding of lions for Hunting and bone trade. Born Free Foundation, Horsham, UK.
- Bouché, P., Crosmar, W., Kafando, P., Doamba, B., Kidjo, F.C., Vermeulen, C., et al. (2016). *Embargo on Lion Hunting Trophies from West Africa: An Effective Measure or a Threat to Lion Conservation?* PLoS ONE 11: e0155763. doi:10.1371/journal.pone.0155763.
- Chabi-N'Diaye (2014) *Exploitation et commerce des sous-produits de grands carnivores dans les communes proches de la Réserve de Biosphère de la Pendjari*. Rapport de fin de formation pour l'obtention du Diplôme de Licence Professionnelle. Université d'Abomey-Calavi, Benin.
- Chardonnet, P., Crosmar, W., Belemsobgo, U., Koulagna, D. and Nowell, K. (2005). *Direct and indirect influences on conservation of the lion in West Africa and Central Africa*. Background Paper. Workshop of Conservation of the Lion of West Africa and Central Africa, October 2005, Douala, Cameroon.
- CITES (2007) Report by the CITES Secretariat on its verification and assessment mission to China. 28 March–7 April 2007. CoP14 Doc. 52 Annex 7.
- CITES (2015) Notification to the Parties No. 2015/055. Lao People's Democratic Republic Withdrawal of a recommendation to suspend trade <https://www.cites.org/sites/default/files/notif/E-Notif-2015-055.pdf>.
- CITES (2016) Proposal to transfer all African populations of *Panthera leo* from Appendix II to Appendix I. CoP17 Prop. 4.
- CITES (2016a) Application of Article XIII in the Lao People's Democratic Republic. SC67 Doc. 12.1

CITES (2018) Guidelines for the preparation and submission of CITES annual reports. https://cites.org/sites/default/files/notif/E-Notif-2017-006-A_0.pdf.

CITES (2018a) Personal and household effects. <https://www.cites.org/eng/resources/reference.php#personal>

Coggins, C. (2003) *The Tiger and the Pangolin – Nature, Culture, and Conservation in China*. University of Hawaii Press, Honolulu.

Davies, N. and Holmes, O. (2016) The crime family at the centre of Asia's animal trafficking network. *The Guardian* (UK). 26 September: <https://www.theguardian.com/environment/2016/sep/26/bach-brothers-ivory-asias-animal-trafficking-network>

Davies, N. and Holmes, O. (2016a) Revealed: how senior Laos officials cut deals with animal traffickers. *The Guardian* (UK). 27 September: <https://www.theguardian.com/environment/2016/sep/27/revealed-how-senior-laos-officials-cut-deals-with-animal-traffickers>

Department for Environmental Affairs (2017) Lion export quota for 2017 communicated to the CITES Secretariat in line with CITES requirements. https://www.environment.gov.za/mediarelease/lionexportquota_communicatedtocitessecretariat.

EIA (2015) Sin City: Illegal wildlife trade in Laos' Golden Triangle Special Economic Zone. <https://eia-international.org/wp-content/uploads/EIA-Sin-City-FINAL-med-res.pdf>

EIA (2017) Cultivating Demand – the Growing Threat of Tiger Farms. <https://eia-international.org/wp-content/uploads/Cultivating-Demand-The-Growing-Threat-of-Tiger-Farms.pdf>.

EIA (2017a) The Lion's Share. South Africa's trade exacerbates demand for tiger parts and derivatives. <https://drive.google.com/viewerng/viewer?url=https://eia-international.org/wp-content/uploads/The-Lions-Share-FINAL-1.pdf>

EIA (2018) CITES AC30 Agenda Item 25: Supplementary Information On Lion Trade, July 2018. AC30 Inf. 24 <https://cites.org/sites/default/files/eng/com/ac/30/Inf/E-AC30-Inf-24.pdf>

EMS (2018) *The Extinction Business. South Africa's 'Lion' Bone Trade*. <http://emsfoundation.org.za/wp-content/uploads/THE-EXTINCTION-BUSINESS-South-Africas-lion-bone-trade.pdf>

Funston, P., Henschel, P., Hunter, L., Lindsey, P., Nowak, K., Vallianos, C. & Wood, K. (2016) *Beyond Cecil: Africa's Lions in Crisis*. Panthera/WildAid/WildCRU.

Funston, P.J. & Levendal, M. (2014) Biodiversity Management Plan for the Lion (*Panthera leo*) in South Africa). For the Department of Environmental Affairs, Republic of South Africa. https://conservationaction.co.za/wp-content/uploads/2015/04/nemba_africanlion_managementplan_gn351g38706.pdf.

Gratwicke, B., Mills, J., Dutton, A., Gabriel, G., Long, B., et al. (2008) Attitudes Toward Consumption and Conservation of Tigers in China. *PLOS ONE* 3: e2544. <https://doi.org/10.1371/journal.pone.0002544>

- Henschel, P., Bauer, H., Sogbohossou, E. & Nowell, K. (2015) *Panthera leo (West Africa subpopulation)*. The IUCN Red List of Threatened Species 2015: e.T68933833A54067639. <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T68933833A54067639.en>.
- Henschel, P., Coad, L., Burton, C., Chataigner, B., Dunn, A., Macdonald, D., Saidu, Y. & Hunter, L.T.B. (2014) The Lion in West Africa is Critically Endangered. *PLoS ONE* 9(1): e83500. doi:10.1371/journal.pone.0083500
- Krishnasamy, K., Leupen, B.T.C., and Or, O.C. (2016) Observations of the Helmeted Hornbill Trade in Lao PDR. TRAFFIC, Southeast Asia Regional Office, Petaling Jaya, Selangor, Malaysia.
- Krishnasamy, K., Shepherd, C.R. and Or, O.C. (2018) Observations of illegal wildlife trade in Boten, a border town with China in a Specific Economic Zone in northern Lao PDR. *Global Ecology and Conservation*. <https://doi.org/10.1016/j.gecco.2018.e00390>
- LAGA (2006) Annual Report January -December 2006. http://www.laga-enforcement.org/Portals/0/Documents/Activity%20reports%202006/LAGA_Annual_Report_2006.pdf.
- LAGA (2007) Annual Report January – December 2007. http://www.laga-enforcement.org/Portals/0/Documents/Activity%20reports%202007/LAGA_Annual_Report_2007.pdf.
- LAGA (2008) Annual Report January – December 2008. http://www.laga-enforcement.org/Portals/0/Documents/Activity%20reports%202008/LAGA_Annual_Report%202008.pdf.
- LAGA (2009) Annual Report January – December 2009. http://www.laga-enforcement.org/Portals/0/Documents/Activity%20reports%202009/LAGA_Annual_Report_2009.pdf.
- Lindsey, P., Alexander, R., Balme, G., Midlane, N. and Craig, J. (2012) Possible relationships between the South African captive-bred lion hunting industry and the hunting and conservation of lions elsewhere in Africa. *South African Journal of Wildlife Research* 42: 11–22.
- Lindsey, P.A., Balme, G.A., Funston, P., Henschel, P., Hunter, L., Madzikanda, H., et al. (2013) The Trophy Hunting of African Lions: Scale, Current Management Practices and Factors Undermining Sustainability. *PLoS ONE* 8: e73808. <https://doi.org/10.1371/journal.pone.0073808>.
- Livingstone, E., Gomez, L., Bouhuys, J. (2018) A review of bear farming and bear trade in Lao People's Democratic Republic. *Global Ecology and Conservation* 13.
- Mésouchina P., Mamang-Kanga, J.-B., Chardonnet, P., Mandjo, Y., Yaguémé, M. 2010. *Statut de conservation du lion (Panthera leo Linnaeus, 1758) en République Centrafricaine*. Fondation IGF & MEFCP, MDRA. Bangui, Central African Republic.
- Milliken, T., and Shaw, J. (2012). *The South Africa – Viet Nam Rhino Horn Trade Nexus: A deadly combination of institutional lapses, corrupt wildlife industry professionals and Asian crime syndicates*. TRAFFIC, Johannesburg, South Africa.
- Mills, J.A. & Jackson, P. (1994) *Killed for a cure: a review of the worldwide trade in tiger bone*. Traffic International, Cambridge, UK.

Moorhouse, T., D'Cruze, N.C., and Macdonald, D.W. (2017) Unethical use of wildlife in tourism: what's the problem, who is responsible, and what can be done? *Journal of Sustainable Tourism*, 25:4, 505-516, DOI: Referenced in Bauer, H., Nowell, K., Sillero-Zubiri, C. & Macdonald, D. W. (2018) Lions in the Modern Arena of CITES. *Conservation Letters*.

Nguoi Viet Online. *Người Việt Nam thích đeo móng, nanh sư tử lấy hên*(2012). Retrieved 18 April 2018, from <https://www.nguoi-viet.com/viet-nam/Nguoi-Viet-Nam-thich-deo-mong-nanh-su-tu-lay-hen-5220>.

Nguyen, D. N.V. & Nguyen T. (2008) *An overview of the use of plants and animals in traditional medicine systems in Vietnam*. TRAFFIC South East Asia, Malaysia.

Nowell, K. (2000). *Far from a Cure: the Tiger Trade Revisited*. TRAFFIC International, Cambridge, UK.

Nowell, K. and Xu, L. (2007). *Taming the tiger trade: China's markets for wild and captive tiger products since the 1993 domestic trade ban*. TRAFFIC East Asia, China.

Nowell, K and Pervushina, N. (2014) *Review of implementation of Resolution Conf. 12.5 (Rev. CoP16) on Conservation and trade in tigers and other Appendix-I Asian big cats*. IUCN and TRAFFIC report prepared for the CITES Secretariat, 65th meeting of the CITES Standing Committee, Geneva, 7-11 July. Geneva Available at: http://cites.org/sites/default/files/eng/com/sc/65/E-SC65-38-A01_0.pdf.

Ondoua Ondoua, G., Beodo Moundjim, E., Mambo Marindo, J.C., Jiagho, R., Usongo, L. and Williamson, L. (2017) *An assessment of poaching and wildlife trafficking in the Garamba-Bili-Chinko transboundary landscape*. TRAFFIC. Cambridge, UK.

Pellerin, M., Kidjo, F., Téhou, A., Sogbohossou, E.A., Ayégnon, D., and Chardonnet, P. (2009) *Statut de conservation du lion (Panthera leo Linnaeus, 1758) au Bénin*. Fondation IGF and CENAGREF, Cotonou.

Pellerin, M., Belemsobgo, U., Traoré, D. & Chardonnet, P. (2010). *Statut de conservation du lion (Panthera leo Linnaeus, 1758) au Burkina Faso*. Fondation IGF & DFC. Ouagadougou, Burkina Faso.

Robinson, J.E. & Sinovas, P. (2018) Challenges of analyzing the global trade in CITES-listed wildlife. *Conservation Biology*.doi:10.1111/cobi.13095.

Sogbohossou E. A. (2006). *Conservation des grands carnivores: la perception des grands carnivores par les populations et le commerce des produits des grands carnivores en Afrique de l'Ouest*. Rapport de recherche pour la Bourse WCS pour l'Afrique.

Sogbohossou, E.A. (2006a). *Phylogeny, morphology and ecology of West African lion (Panthera leo Linnaeus 1758) populations: preliminary genetic characterization of Beninese lions*. MSC thesis, University of Abomey-Calavi, Benin.

Species+ (2018) *Panthera leo* https://www.speciesplus.net/#/taxon_concepts/6353/legal

Stoner, S. and Krishnasamy, K. (2016). *Reduced to skin and bones re-examined : An analysis of Tiger seizures from 13 range countries from 200-2015*. Briefing paper. TRAFFIC, Southeast Asia Regional Office, Petaling Jaya, Selangor, Malaysia.

USFWS (2018) Memorandum: Withdrawal of Certain Findings for ESA-listed Species taken as Sport-hunted Trophies. <https://www.fws.gov/international/pdf/memo-withdrawal-of-certain-findings-ESA-listed-species-sport-hunted-trophies.pdf>.

Vigne, L. & Martin, E. (2017) *The ivory trade of Laos: Now the fastest growing in the world*. Save the Elephants, Nairobi.

WARA Conservation Fund, date unknown. *Nos projets*. <http://www.wara-enforcement.org/a-propos/nos-projets/>.

Williams, V. L., and t' Sas-Rolfes. M. (2017) *South African Lion Bone Trade – A Collaborative Lion Bone Research project*. Interim Report 1. Report for the South African National Biodiversity Institute.

Williams, V.L., Newton, D.J., Loveridge, A.J. and Macdonald, D.W. (2015). *Bones of Contention: An Assessment of the South African Trade in African Lion Panthera leo Bones and Other Body Parts*. TRAFFIC, Cambridge, UK & WildCRU, Oxford, UK.

Williams, V.L., Loveridge, A.J., Newton, D.J., Macdonald, D.W. (2015a) 'Skullduggery': Lions Align and Their Mandibles Rock! *PLoS ONE* 10: e0135144. <https://doi.org/10.1371/journal.pone.0135144>.

Williams, V.L., Loveridge, A.J., Newton, D.J., and Macdonald, D.W. (2017) A roaring trade? The legal trade in *Panthera leo* bones from Africa to East- Southeast Asia. *PLoS ONE* 12: e0185996. <https://doi.org/10.1371/journal.pone.0185996>.

Williams, V.L., Loveridge, A.J., Newton, D.J., and Macdonald, D.W. (2017a) Questionnaire survey of the pan-African trade in lion body parts. *PLoS ONE* 12: e0187060. <https://doi.org/10.1371/journal.pone.0187060>.

WWF (2018) Lao Prime Minister's Order Gives New Hope for Wildlife. <http://greatermekong.panda.org/news/?uNewsID=328772>

News items.

BBC (2018) WeChat hits one billion monthly users - are you one of them? <http://www.bbc.co.uk/news/business-43283690>.

National Geographic (2017) Rush for Donkey Skins in China Draws Wildlife Traffickers <https://news.nationalgeographic.com/2017/09/wildlife-watch-donkey-skins-china-wildlife-trafficking/>

Tienphong (2016) Vận chuyển trái phép 680 móng vuốt hổ <https://www.tienphong.vn/content/ODcxMTk3.tpo>

Viet Online (2012) Người Việt Nam thích đeo móng, nanh sư tử lấy hên - Nguoi <https://www.nguoi-viet.com/viet-nam/Nguoi-Viet-Nam-thich-deo-mong-nanh-su-tu-lay-hen-5220>