

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Thirtieth meeting of the Animals Committee
Geneva (Switzerland), 16-21 July 2018

Species specific matters

Terrestrial species

AFRICAN LION (*PANTHERA LEO*)

1. This document has been prepared by the Secretariat.
2. At its 17th meeting (CoP17, Johannesburg, 2016), the Conference of the Parties adopted the following Decisions on *African lion* (*Panthera leo*):

Directed to the Secretariat

17.241 *Subject to external funding, the Secretariat shall, in collaboration with African lion range States, the Convention on Migratory Species and the International Union for Conservation of Nature (IUCN):*

- a) investigate possible mechanisms to develop and support the implementation of joint lion conservation plans and strategies, taking into consideration existing lion conservation plans and strategies;*
- b) develop an inventory of African lion populations across its range, taking due consideration of existing inventories developed by African lion range States;*
- c) support the development of relevant databases by African lion range States;*
- d) develop strategies to reinforce international cooperation on the management of lions;*
- e) 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;*
- f) undertake a comparative study of lion population trends and conservation and management practices, such as lion hunting, within and between countries, including the role, if any, of international trade;*
- g) support capacity building in lion conservation and management, including where appropriate the making of non-detriment findings where a range State requests it;*
- h) support public awareness raising as well as education programmes in African lion range States, in order to support co-existence between humans and lions and to promote measures for the conservation and recovery of African lion populations;*

- i) *promote fundraising as part of its overall fundraising initiatives, to support the effective implementation of conservation and management plans and strategies for African lion and for a CITES Task Force on African lions;*
- j) *create a portal on the CITES website to permit, among other things, the posting and sharing of information and voluntary guidance on the making of non-detriment findings for African lion; and*
- k) *report on the progress relating to paragraph a) – j) to the 29th and 30th Animals Committee meetings.*

Directed to the Animals Committee

17.242 *The Animals Committee shall consider the report of the Secretariat and submit recommendations to the 69th and the 70th Standing Committee meetings and the African lion range States, as appropriate.*

Directed to the Standing Committee

17.243 *The Standing Committee shall, at its 69th and 70th meetings:*

- a) *consider the reports submitted by the Animals Committee in terms of Decision 17.242;*
- b) *recommend further actions to be taken; including the possible need for the development of a Resolution on the conservation of African lion;*
- c) *establish a CITES Task Force on African lions, inviting the participation of all African lion range States, consumer states for lion parts and derivatives, and relevant enforcement bodies, including the members of the Task Force of the International Consortium on Combating Wildlife Crime (ICWC);*
- d) *provide terms of reference and modus operandi for this Task Force; and*
- e) *consider the establishment of a multi-donor technical trust fund to attract funding and direct resources for the work of the CITES Task Force on African lions and to support the effective implementation of conservation and management plans and strategies for African lion.*

Directed to African range States

17.244 *African lion range States are encouraged to collaborate in implementing the decisions contained in Decisions 17.241 paragraphs a) - j) and 17.243 paragraph c).*

Directed to all Parties, governmental, intergovernmental, non-governmental organizations, donors and other entities

17.245 *All Parties, governmental, intergovernmental, non-governmental organizations, donors and other entities are encouraged to support the African lion range States and the Secretariat:*

- a) *in their efforts to conserve and restore this iconic species across the continent, taking into consideration existing land-use practices; and*
- b) *in implementing the decisions contained in Decision 17.241 paragraphs a) - j).*

Background

3. The background to the adoption of Decisions 17.241 to 17.245 at CoP17, the activities that the Animals Committee undertook prior to CoP17 to review the listing of *Panthera leo* in the CITES Appendices in the context of its Periodic Review of the Appendices for Felidae spp., and the outcomes of the discussions at CoP17 on documents [CoP17 Doc. 39.1](#) on *Hunting trophies of species listed in Appendix I or II* and [CoP17 Doc. 39.2](#) on *Trade in hunting trophies of species listed on Appendix II*, and proposal [CoP17 Prop. 4](#)

(Transfer of all African populations of *Panthera leo* from Appendix II to Appendix I) are described in documents [AC29 Doc. 29](#) and [SC69 Doc. 58](#).

4. At its 29th meeting (AC29, Geneva, July 2017), the Animals Committee noted document AC29 Doc. 29 and the comments made during the plenary. The Secretariat regretted that, because of the lack of adequate funding and resources, it had not been able to make substantial progress in implementing the activities indicated in paragraphs a) to i) of Decision 17.241. The Secretariat emphasized its collaboration with the Secretariat of the Convention on Migratory Species (CMS) and the development of a Joint CITES-CMS African Carnivores Initiative, with the support of the International Union for Conservation of Nature (IUCN). Under this Initiative, CITES and CMS were grouping the implementation of measures required from both CITES and CMS concerning the African lion (*Panthera leo*), leopard (*Panthera pardus*), African wild dog (*Lycaon pictus*) and cheetah (*Acinonyx jubatus*). This initiative has the advantages of pooling funds, expertise and resources, resulting in better coordination of the implementation of measures, and more effective conservation actions. On this occasion, the Animals Committee did not formulate recommendations for the Standing Committee and African lion range States, as envisaged in Decision 17.242.
5. At its 69th meeting (SC69, Geneva, November 2017), the Standing Committee noted document SC69 Doc. 58. In the context of the Standing Committee's implementation of Decision 17.243, it established an intersessional working group on African lion, the mandate and composition of which can be found in the [summary record of SC69](#).

Implementation of Decision 17.241

6. Since AC29, the Secretariat, in close collaboration with the CMS Secretariat and IUCN, continued to move the actions called for under Decision 17.241 forward, and seek the necessary resources to implement the considerable amount of work that is directed to it. Thanks to the generous support of the European Union and Switzerland, and commitments from, among others, Germany, progress can be reported in several, if not most, areas, recognizing that many activities are underway, and that the full implementation of the range of activities in Decision 17.241 may not be feasible by the 18th meeting of the Conference of the Parties (CoP18, Colombo, 2019).
7. With generous support from Switzerland, the CITES Secretariat is engaged in contracting IUCN to develop and, to the extent possible, implement, an African lion conservation framework that will bring together information, best practice guidance and know-how on lion conservation and management in Africa, and generate actions that will contribute to several aspects of Decision 17.241. Progress with the implementation of this work will be reported at the present meeting and the 70th meeting of the Standing Committee (SC70, Rosa Khutor, Sochi, October 2018).
8. The CITES and CMS Secretariats envisage to bring together the African lion range States prior to CoP18 to discuss progress with the implementation of Decision 17.241 and other decisions on African lions that were agreed by CITES and CMS. This second African lion range States meeting tentatively scheduled for November or December 2018 could offer opportunities to agree on further work on African lions that could be proposed for consideration at CoP18. In line with the Secretariat's wish to rationalize efforts under the joint CITES-CMS African Carnivores Initiative, this same meeting may also address CITES issues relating to leopards, African wild dog and cheetahs.

Decision 17.241, paragraph a): Support the implementation of joint lion conservation plans and strategies

9. In support of paragraph a), IUCN will develop an "African Lion Conservation Framework" based on lion conservation strategies for Eastern and Southern Africa, and West and Central Africa, and the review of the implementation of these strategies. The Framework will also address the CITES CoP17 and CMS COP12 decisions on African lions, and their implementation. This guiding document for the conservation of lions across sub-Saharan Africa is to be developed in consultation with African lion range States, and submitted to them for review and approval at the second meeting of African lion range States.

Decision 17.241, paragraph b): Develop an inventory of African lion populations

10. In the context of developing a conservation framework, IUCN will collate all relevant information on the distribution, conservation status and assessment of the lion in sub-Saharan Africa. Additionally, IUCN will identify and delineate meaningful and practical conservation units (meta-populations) for lions, and consider suitable mechanisms to monitor these. It will furthermore consider concepts and methods for ongoing monitoring of lions and their staple prey populations. IUCN plans to invite all lion range States to contribute

national or site-specific data, and combine this with providing support as needed for maintaining relevant databases (see paragraph c) below).

Decision 17.241, paragraph c): Support databases by African lion range States

11. These activities, to be initiated by IUCN, partially overlap with the actions envisaged under paragraph b), and will involve outreach to lion range States in Africa to inquire about existing relevant data bases; database and information needs; the capacity to develop or run databases; and resource implications.

Decisions 17.241, paragraph d): Develop strategies to reinforce international cooperation on lion management

12. The African Lion Conservation Framework, to be developed by IUCN and African lions range States, is expected to contain advice and strategies to reinforce international and intercontinental cooperation on the management of lions. Furthermore, specific conservation strategies for transboundary lion populations will be developed, an important consideration for CMS. Relevant proposals for such strategies are to be discussed at the second African lion range States meeting.
13. Further opportunities to reinforce the international cooperation on lion management and trade are likely to result from recommendations emanating from: the study on legal and illegal trade in African lions [see implementation of paragraph e)]; the work of the Standing Committee in the context of Decision 17. 241 (including through a CITES Task Force on African lions); and the capacity building activities described under the implementation of paragraph g), noting for example that Spain announced the organization of a second workshop on non-detriment findings for trade in trophies of African lions, to be held in an African country after CoP18.

Decision 17.241, paragraph e): Undertake studies on legal and illegal trade in lions

14. The study on legal and illegal trade in African lions, *Panthera leo*, was launched with the generous support from the European Union. The study, conducted by TRAFFIC, is ongoing. It analyses the CITES trade data, as well as seizure data from a number of sources, including the CITES annual illegal trade data submitted by Parties. The main focus of the study is on the Asian side of the trade chain, as less is understood of the dynamics at the consumer market end. Literature has been reviewed, including in Chinese, Vietnamese and Laotian. Surveys of online and physical market places have taken place, and researchers have attempted to gain further insights into the trade through discussions with experts and other stakeholders in China, Lao People's Democratic Republic and Viet Nam. Consultation has also taken place with experts in Africa, and a rapid review of French language literature was carried out to augment the information already compiled on the trade in lions in Africa.
15. The draft outputs of the study on the legal and illegal trade in African lions, including preliminary findings and conclusions, are presented in an annex to the present document. In June 2018, an extended draft study will be made available for circulation to the Standing Committee intersessional working group on the African lion, and for distribution at AC30. Any additional findings or recommendations than those contained in the Annex to this document will be orally introduced at AC30. The consultants would welcome further inputs from the Animals Committee, Parties and other stakeholders to further strengthen the findings.
16. Taking account of the discussions at AC30 and inputs provided by the Standing Committee's intersessional working group, TRAFFIC will finalize the study early in August 2018 so that it can be made available by the Secretariat as a working document for SC70.

Decision 17.241, paragraph f): Undertake a comparative study of lion conservation and management practices

17. As part of the African Lion Conservation Framework, IUCN will collate practical information and advice for the implementation of conservation and management measures for lions, identify needs for surveys and research, and gather materials on options for the sustainable management of lion populations, e.g. through trophy hunting. As such, it is expected that IUCN's study will contribute to the implementation of paragraph f).

Decision 17.241, paragraph g): Support capacity building in lion conservation and management, including non-detriment findings

18. By collecting and making available materials and research results concerning lion conservation and management, IUCN's consultancy will support capacity building among multiple stakeholders. The materials will address practical recommendations on: the conservation and management of lion habitats and prey

species; the sustainable management of lion populations; the detection, suppression and prevention of poaching and illegal trade; the coexistence of local people with lions to mitigate conflicts and provide conservation incentives; and advice on public awareness, training and capacity building.

19. Under agenda item 10.2, the European Union submitted the results of the International expert workshop on non-detriment findings for hunting trophies of certain African species included in Appendix I and II, which took place in Seville in April 2018, and was generously hosted and supported by Spain. The international workshop, in which the CITES and CMS Secretariats and IUCN took part, developed, among other things, guidance for the making of non-detriment findings for trade in hunting trophies of African lion. The Secretariat is of the opinion that the outcomes of the workshop, which include best hunting management practices and NDF guidance for trade in trophies of African lions, represent valuable capacity building tools for Parties and African lion range States and, as such, contribute substantially to the implementation of Decision 17.241, paragraph g).
20. The webportal that the CMS Secretariat is developing [(see paragraph j)] is expected to make available a significant number of capacity building materials to support lion management and conservation in Africa. It would allow, among other things, the posting and sharing of information and voluntary guidance on the making of non-detriment findings for trade in African lions.

Decision 17.241, paragraph h): Support public awareness raising and education in African lion range States

21. CMS is making an in-kind contribution to the implementation of paragraphs h) and j) of Decision 17.241 by developing a joint webportal with CITES and the Cat Specialist Group of the Species Survival Commission of IUCN, hosted on the CMS website, and maintained by these three bodies. The webportal will provide hands-on information for government representatives and stakeholders, such as: existing lion conservation and management strategies; lion population databases; capacity building tools, including guidance for the making of NDFs; fundraising opportunities; ongoing conservation and management projects; a lion conservation library; trade in lions; lion conservation planning tools; and relevant literature, studies and resources. The webportal is currently under development, and will be introduced to range State representatives at the anticipated second range State meeting in November or December 2018.

Decision 17.241, paragraph i): Promote fundraising

22. The Secretariat provided information on fundraising and the possible establishment of a multi-donor technical trust fund for African lions, including possible challenges, in document SC69 Doc. 58.
23. At the request of the Standing Committee, the Secretariat issued Notification to the Parties [No. 2018/042](#) of 30 April 2018 with information on existing funding opportunities for supporting African lion conservation activities, the implementation of relevant plans and strategies, and the actions outlined on Decision 17.241, paragraphs a) to j). In the same Notification, it reminded Parties and African lion range States of the contributions that intergovernmental (IGOs) and non-governmental organizations (NGOs) make towards African lion conservation, and the opportunities to collaborate with these IGOs and NGOs.
24. The information mentioned in paragraphs 23 and 24 above should also assist the Standing Committee's intersessional working group on the African lion, which is mandated to assess whether existing grants programmes and funding opportunities can support, or be strengthened to support, the effective implementation of conservation and management plans and strategies for African lions, as envisaged in Decision 17.243, paragraph e). Taking account this assessment, it should consider the need and challenges for establishing an additional multi-donor technical trust fund.

Decision 17.241, paragraph j): Create a dedicated portal on the CITES website

25. In the context of CITES Decision 17.241, the CMS Secretariat has been working on the development of a lion webportal, as indicated in paragraph 21 above. The Secretariat has provided feedback to CMS on the content and lay-out of this portal.

Discussion

26. While it has taken some time for the CITES Secretariat to acquire the necessary resources to initiate the tasks assigned to it in Decision 17.241, their implementation, in collaboration with African lion range States, the CMS Secretariat and IUCN, has been gaining momentum since AC29, as shown above. The Secretariat

is particularly grateful to all the Parties and organizations that are supporting these efforts, as per Decision 17.245.

27. Decisions 17.241 to 17.245 on the African lion have no noticeable deadlines for their implementation, and there is no clearly stated obligation to report on their status at CoP18. In their respective reports to CoP18, the Secretariat, and the Animals and Standing Committees, may nevertheless mention progress with the implementation of the African lion Decisions that were directed to them.
28. As it seems unlikely that all activities that are contained in these Decisions will be implemented by CoP18, it may be that extensions, revisions or new draft decisions on African lions are proposed at CoP18. The development of such recommendations for CoP18 is best done in coordination between the Secretariat, the Animals Committee and the Standing Committee, and would greatly benefit from close collaboration with the African lion range States. In this regard, the second African lion range States meeting (in November or December 2018) may offer opportunities to consolidate recommendations from the Animals and Standing Committees, as well as from the range States themselves.
29. If agreed, following the second range States meeting, the Secretariat could prepare a document on African lion for CoP18 to present the following: overall progress with the implementation of Decisions 17.241 to 17.245; the outcomes of the deliberations by the Animals and Standing Committees, and of the African lion range States meeting; and, as appropriate, any recommendations or draft decisions on African lions for consideration at CoP18.

Recommendation

30. The Animals Committee is invited to:
 - a) consider the Secretariat's progress report, as well as any further updates provided by the Secretariat, on its implementation of Decision 17.241;
 - b) consider the draft study on legal and illegal trade in African lions, *Panthera leo* in the annex to the present document, and any updates provided;
 - c) submit recommendations, as appropriate, to the 70th meeting of the Standing Committee meeting and the African lion range States; and
 - d) consider the suggestions by the Secretariat in paragraph 29 regarding reporting on African lion to CoP18.

The Legal and Illegal Trade in African Lions

A study in support of Decision 17.241 e)

Preliminary findings for AC30

16th May 2018

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Gratitude is extended to the large number of stakeholders that took the time to provide invaluable insights to advance our understanding of the trade in lions. A number of stakeholders generously shared their data on the legal and illegal trade: in particular the South African National Biodiversity Institute and the South African Department of Environmental Affairs, who along with Vivienne Williams and Michael 't Sas-Rolfes provided essential clarity regarding the role of South Africa in the global trade, and also the many Scientific/Management Authorities, NGOs including Education for Nature – Vietnam (ENV), and lion researchers who shared raw data and published reports.

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. Because of the annotation added to the CITES-listing at the 17th Conference of the Parties (2016), the only lion products permitted in international commercial trade from January 2017 onwards are parts from captive-bred lions from South Africa (subject to quota): 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 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 in lions products reported in 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 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 noted¹. 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 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

¹ 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.

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.

The significant 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. While the use of tiger bones in traditional Chinese medicine (TCM) and for “health tonics” in wine is well documented, 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 parts are being used as cheaper, and often legal, substitute for products that would have traditionally contained Tiger (*Panthera tigris*). While trade data confirm that lion products are being exported to Asia, there remains a scarcity of knowledge on the trade and demand dynamics for lion products once they enter Asia. This study aimed to address some of the knowledge gaps.

Preliminary results of our research show that although data are scarce, there does seem to be a difference in the consumption patterns in the four main importing countries (see below). It is acknowledged that it was not always been possible to substantiate information provided by stakeholders but based on their knowledge and experience their input was deemed invaluable.

- *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. One of the main uses for lion bone items in Viet Nam appears to be for “cake” (a highly processed product made by slowly boiling bones and mixing with other ingredients including from other species) which is difficult to distinguish from tiger “cake”, also produced and consumed in Viet Nam. Tiger “cake” is said to give strength to the consumer and used by people suffering with arthritis and is often mixed with wine for consumption. Surveys conducted for this study found no evidence of lion “cake” openly for sale in outlets in Viet Nam, but information suggests sale takes place within existing networks behind closed doors. While it is likely that at least some of the lion bone is being used as a substitute for tiger bone, there appears to be a differentiated demand specifically for lion products in Viet Nam, and anecdotally it appears this may be increasing. It has been suggested that there are already lion farms in Viet Nam, but the captive-population is unknown – live imports have totalled 66 lions in the past 10 years.
- *Lao PDR* – The role that Lao PDR plays is unclear. According to trade records Lao PDR has been one of the major importers of lion bones, although Lao PDR itself has not reported the import or export of any lion products. Our research has found little evidence for consumption within the country. Errors which mis-labelled exports from South Africa to Viet Nam as to Lao PDR may have inflated the total exports, but are unlikely to explain all of the trade. It remains unclear whether bone items that entered Lao PDR were consumed locally, processed for export to Viet Nam/China, processed and sold within Lao PDR to subsequently be taken to Viet Nam/China by consumers (e.g. tourists), or a combination of these. One stakeholder considered that Lao PDR was acting as a re-exporter of bone items from South Africa to Viet Nam. The Lao PDR Scientific Authority stated there have not been any imports or exports of lions, and no lion farming takes place. A small number of live lions have been observed on a farm.
- *China* – Between 2007 and 2011, 813 items were exported to China: 46 of which were bodies/skeletons. 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.

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. Captive lions are present in China, including at facilities holding other species such as tigers, which could be the source of the lion skeletons. If the need for lion products in China is met by lions bred within the country 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 *Panthera leo* may actually contain tiger bones or those from other species. Forensic testing of wine is needed to understand this better. Lion claws/teeth were also exported to China and observed for sale online.

- 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. 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.

No legal trade was reported between these countries, although seizures show illegal cross-border trade (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. Currently it is not clear which countries are acting as processors or consumers, and how the products are moving across borders. Little open trade was observed in the three countries surveyed, it appears that trade takes place through existing networks or is arranged via social media, making it very difficult to monitor. The current field research being undertaken for this study should help provide some further answers.

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. There also seems to be an element of opportunistic poaching by hunters who have heard that lions are now valuable so will take one where possible. It appears 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 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. Efforts should be made to ensure that forensic testing techniques are available where needed to identify which cat species are present, including in highly processed products.

Overall, currently the international trade in lion parts does not seem to be the largest threat facing wild lions: retaliatory killing and prey base depletion are of most concern, although poorly managed trophy hunting and use/trade are also identified as risks. The risk from use/trade is most likely 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). However, there are indications 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.

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 bans². 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 better trade (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

² 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 countries³ 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 restricting commercial trade to only parts from captive-bred lions from South Africa (subject to an annual quota) (Figure 1).

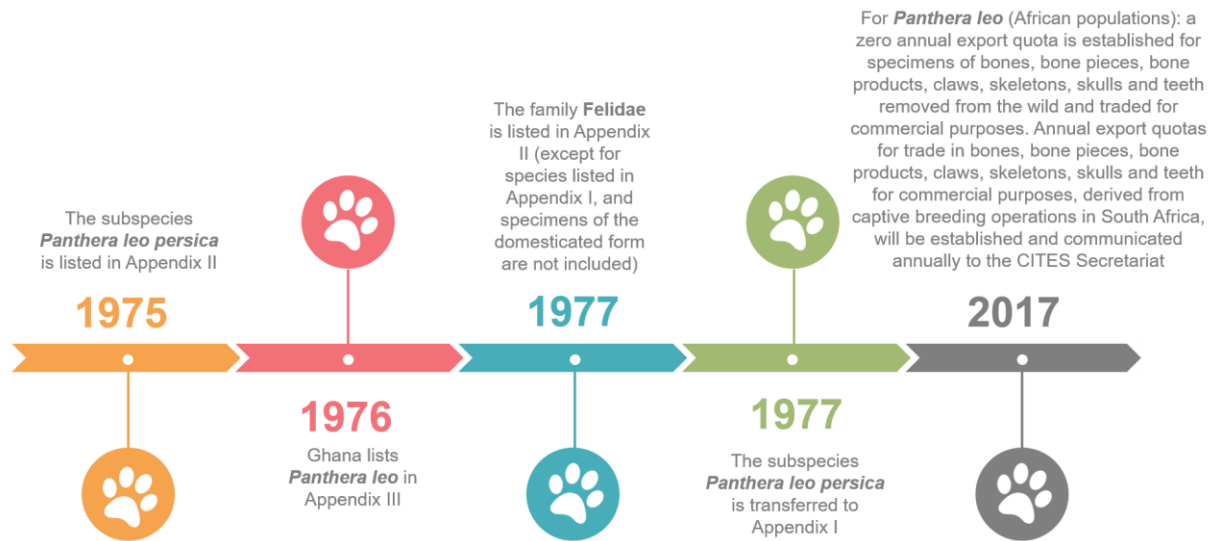


Figure 1 History of the lion within CITES

In addition, a number of related Decisions were adopted (17.241 – 17.245). Decision 17.241 e) directing 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 draft 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. The revised draft is expected to include the following amendments:

- The final results of market surveys and stakeholder interviews conducted in Viet Nam and Lao People's Democratic Republic (hereafter Lao PDR)
- Additional feedback received from stakeholders contacted in April/May 2018
- The results of research due to be published imminently
- The CITES Secretariat's comments on the draft study

The final study will be submitted to the CITES Secretariat on 2nd August 2018 as a document for the Standing Committee to consider, which will take into account discussions held at the 30th Animals Committee (16–21st July 2018) and inputs provided by the Standing Committee's Intersessional Working Group on lions.

³ Chad, Côte d'Ivoire, Gabon, Guinea, Mali, Mauritania, Niger, Nigeria and Togo

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.

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-CEN⁴, EU-TWIX⁵ 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.

⁴ World Customs Organisation - Customs Enforcement Network

⁵ European Union Trade in Wildlife Information eXchange

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 Lao. 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:

Viet Nam – An online survey was conducted of social media websites and traditional medicine websites. The survey was conducted in April 2018 using key words in Vietnamese.

Lao PDR – Surveys are ongoing and the final detail on the method used will be provided in the revised draft.

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 – Surveys took place in Hanoi, Ho Chi Minh City and the province of Quang Ninh (April/May 2018).

Lao PDR – Surveys were conducted in Luang Prabang, Vientiane and Vang Vieng (a town north of Vientiane) (April/May 2018).

China – Surveys of Beijing, Tianjin, Zheng Zhou, Nanjing, Chengdu, Chongqing, Nanning, Dongxing, Pingxiang, Shijiazhuang, Tangshan, Dalian, Shenyang, Harbin, Hangzhou and Xi'an were undertaken between March and May 2018.

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. Recent large exports of bone items to Asia indicate this could be the case. There does also seem to be demand in lion-specific products 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 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 skeletons⁶ are combined these equate to an estimated 4,583 lions, many of which are likely “byproducts” of the trophies.

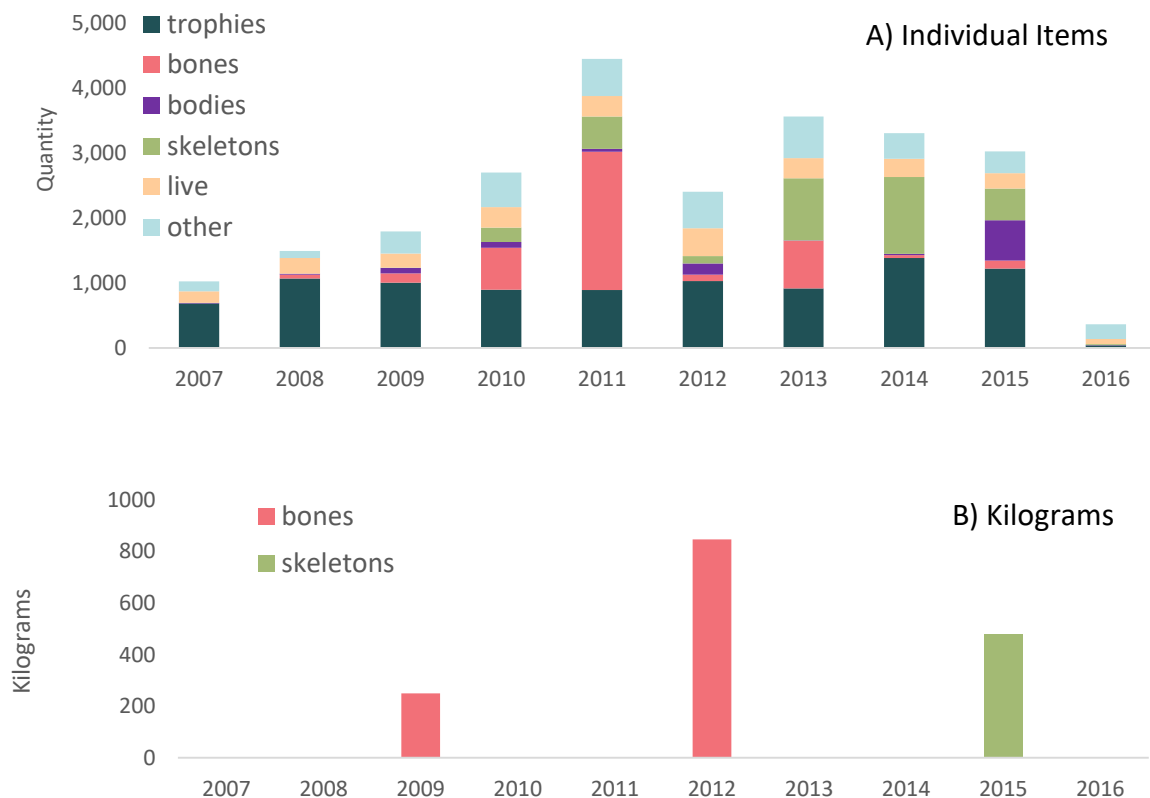


Figure 2 Annual exports of lion products (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. Excludes exports of (scientific) specimens. *Source: CITES Trade Database*

⁶ Includes 480 kg of skeletons converted using the average mass of a lion skeleton calculated by Williams *et al.* (2015) (8.95 kg)

Major Importers of Lion Parts

Based on CITES trade data, while most trophies were exported to North America, the majority of exports of bodies⁷, bones, skeletons (“bone-items”) 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). 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.

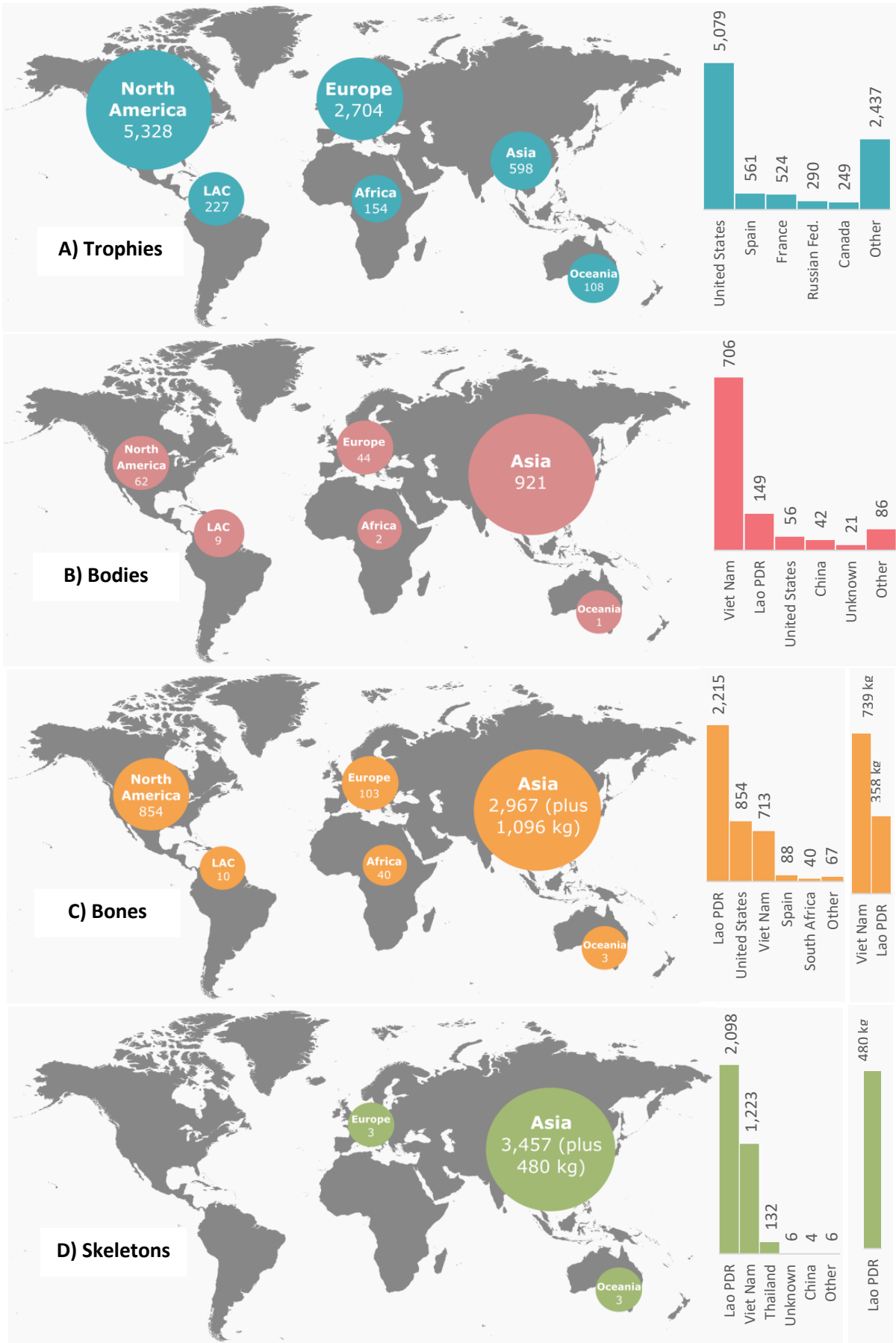
Based on the CITES Trade Database, it is not possible to calculate the number of individual lions that trade equates to⁸. The hunting for trophies may lead to “byproducts” (e.g. skeletons, skins) that enter international trade separately from the “trophy”. If each reported trophy equates to one lion⁹, then the trophy hunting industry would appear to have sufficient hunted lions to be able to supply the quantity of other commodities observed in trade¹⁰ 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 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).

⁷ 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.

⁸ 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).

⁹ Williams *et al.* (2015) stated that trophy hunters would typically take the teeth, skull and sometimes the floating bones (pair of clavicles).

¹⁰ 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.



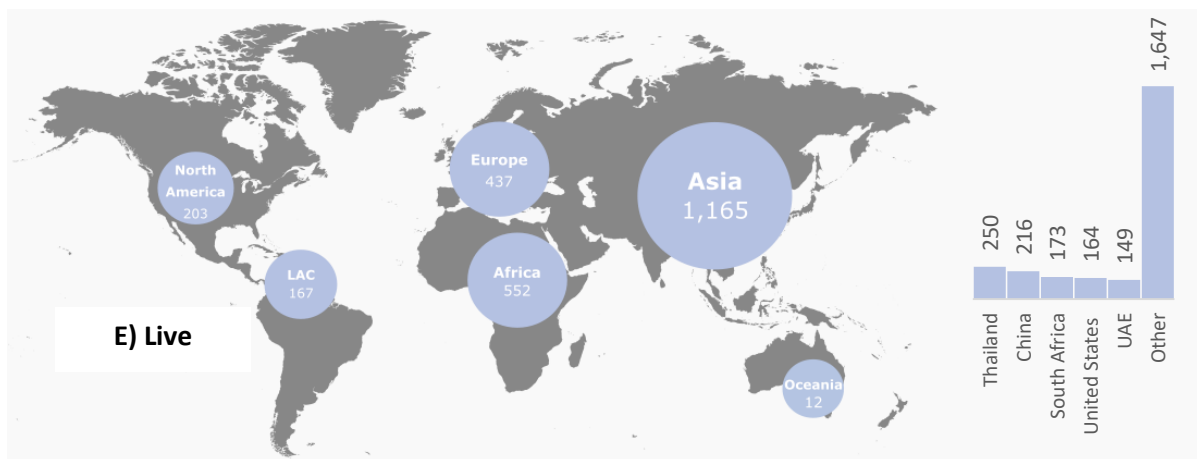


Figure 3 Number of lion (A) trophies, (B) bodies, (C) bones, (D) skeletons and (E) live exported to different regions – bar graph depicts countries exported to in the highest quantities (reported as number of individuals and kilograms, reported by exporting country, direct exports only) 2007–2016. *Source: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

Table 1 Nine lion products exported in the highest quantities and the major importing countries 2007–2016 (reported as number of individuals and 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 ¹¹	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				

¹¹ 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).

Skeletons¹²	Lao PDR	2,098 (60%)	480	-	-	2,098	54 ¹³	-	-
	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	-
Claws¹⁴	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	-
	Total All	1,044	-	869	-	1,044	-	869	-
Skulls	USA	459 (44%)	-	116 (31%)	1	459	-	116	1 ¹⁵
	Spain	68 (7%)	-	4 (1%)	-	68	-	4	-
	Lao PDR	67 (6%)	-	-	-	67	-	-	-
	Total All	1,033	-	377	1	1,033	-	377	1
Teeth¹⁶	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)

¹² Skeletons may be exported with or without the skull

¹³ Williams et al. (2015) calculated the average mass of a lion skeleton to be 8.95 kg

¹⁴ Based on the assumption that all 20 claws obtained from each lion are exported, which is likely an over-estimate.

¹⁵ The mean skull mass for a wild lion was calculated at 1.3 +/- 0.4 kg (Williams et al., 2015a).

¹⁶ Based on the assumption that only the four canine teeth are exported.

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%). Practically 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) meaning the USA seized the third most products (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.

Table 2 Lion products exported to USA 2007–2016 (reported as number of individuals and 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)

	Individual items				Seized			
	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	-

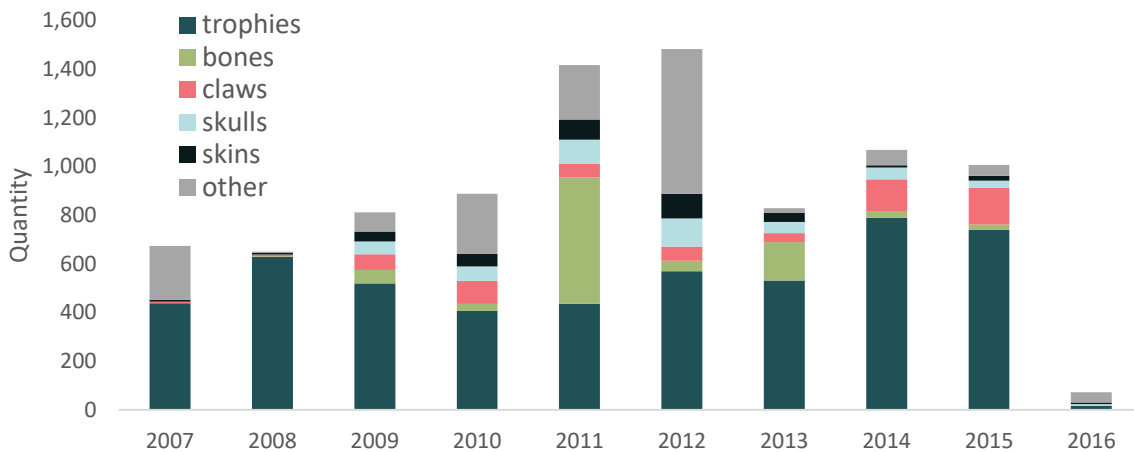


Figure 4 Number of lion products exported to USA 2007–2016 (reported by exporting country, direct exports only) *Source: CITES Trade Database*

Once lion products are imported into the USA they 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" ¹⁷ (<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

¹⁷ Tiger 'jelly'/'cake' (*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)

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 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 skeletons, bodies and live 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 skeletons¹⁸, reported by Viet Nam in 2016) but not yet by South Africa as they have not submitted an annual report for that year. No re-exports from Viet Nam were recorded in the CITES Trade Database between 2007 to 2016 indicating imports were either consumed within Viet Nam or smuggled out.

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 lions¹⁹. Some of the types of commodities seized in Viet Nam (e.g. bones, claws) were also legally imported, indicating parallel legal and illegal trades in the same commodity types.

¹⁸ 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)

¹⁹ Based on 20 claws per lion (including dewclaws)

Table 4 Lion products exported to Viet Nam 2007–2016 (reported as number of individuals and kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to the Viet Nam (1999–2018). Sources: (CITES Trade Database – reported trade), (UNODC WorldWise, CITES Illegal Trade Reports, TRAFFIC – seizures)

	Reported Trade (assumed legal)				Seized			
	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		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	-

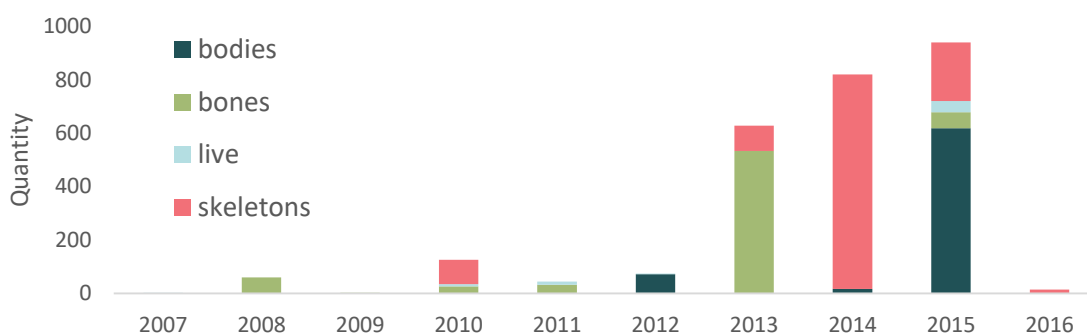


Figure 5 Annual exports of lion bones / bodies / skeletons / live to Viet Nam (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

Lion products are used in a variety of ways in Viet Nam:

- Lion **bone “cake”** (“cao”) is consumed within Viet Nam but no estimates of the quantity are known. 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. 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 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).

- **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 male 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 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).
- 25 outlets in Hanoi were surveyed for this study in April 2018 and no lion products were found 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. **Additional results will be made available in the revised draft.**
- No lion products were found for sale online in April 2018 in a survey conducted for this study. However, on at least one occasion a seller agreed to meet to further discuss lion products. **Additional results will be made available in the revised draft.**

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 were reported by Lao PDR in the CITES Trade Database (Table 5). The Lao PDR Scientific Authority stated there had been no imports or exports of lions (Dr Souriodong Sundara (Lao PDR Scientific Authority), *in litt.*, May 2018).

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 lions²⁰) 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). 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)

²⁰ 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)

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

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. Sources: (CITES Trade Database – reported trade), (UNODC WorldWise, CITES Illegal Trade Reports, TRAFFIC – seizures)

	Reported Trade (assumed legal)				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	480	-	-	-	-	-	-
trophies	155		-	-	-	-	-	-
bodies	149		-	-	-	-	-	-
teeth	90		-	-	-	-	-	-
skulls	67		-	-	-	-	-	-
claws	54		-	-	-	-	-	-
Total	4,828	838	-	-	-	-	-	-

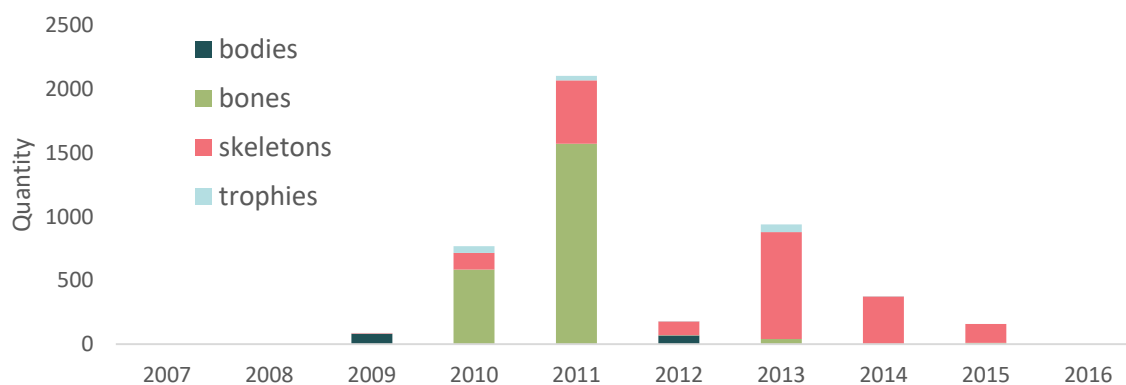


Figure 6 Annual exports of lion bones / bodies / skeletons / trophies exported to Lao PDR (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

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). 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. One trader in Luang Prabang (owner of four shops selling wildlife products in the main tourist street) advertised approximately 220 individual items (decorative items, bones, name seals and individual pieces), claimed to be made of tiger bone. Only the application of forensic techniques would be able to confirm if there were genuine tiger bone products or from other species.

The survey found that the majority of physical shops in Luang Prabang trading wildlife products also offered online trade via WeChat²¹, an app used by over one billion users (the majority of whom are in China (BBC, 2018)), typically offering goods such as ivory and tiger products, which were openly for sale in the shop. Customers are invited 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 from China directly from the on-line trading sites. 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.

Additional online and physical survey results will be made available in the revised draft.

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).

A range of commodities were seized in or en route to China, mainly teeth, claws and skeletons (Table 6). One man arrested and convicted 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). 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 illegal as it was not reported in the CITES Trade Database.

²¹ WeChat (Weixin) is a multi-purpose messaging/social/mobile payment app.

Table 6 Lion products exported to China 2007–2016 (reported as number of individuals and kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to China (1999–2018). Sources: (CITES Trade Database – reported trade), (UNODC WorldWISE, CITES Illegal Trade Reports, TRAFFIC – seizures)

	Individual items		Seized			
	Reported by Exporter	Reported by China	In China		En Route to China	
			Individual items	kg	Individual items	kg
live	216	175	-	-	-	-
trophies	194	106	-	-	-	-
claws	183	-	1	-	38	-
teeth	97	-	2	0.19	46	-
skins	77	84	2	-	-	-
bodies	42	52	1	-	-	-
skeletons	4	-	11	-	-	-
bones	-	48	-	-	-	-
garments	-	8	-	-	-	-
rug	-	24	-	-	-	-
skin pieces	-	2	-	-	-	-
skulls	-	12	-	-	1	-
specimens	-	102	-	-	-	-
Genitals	-	-	-	-	14	-
Total	813	613	17	0.19	99	-

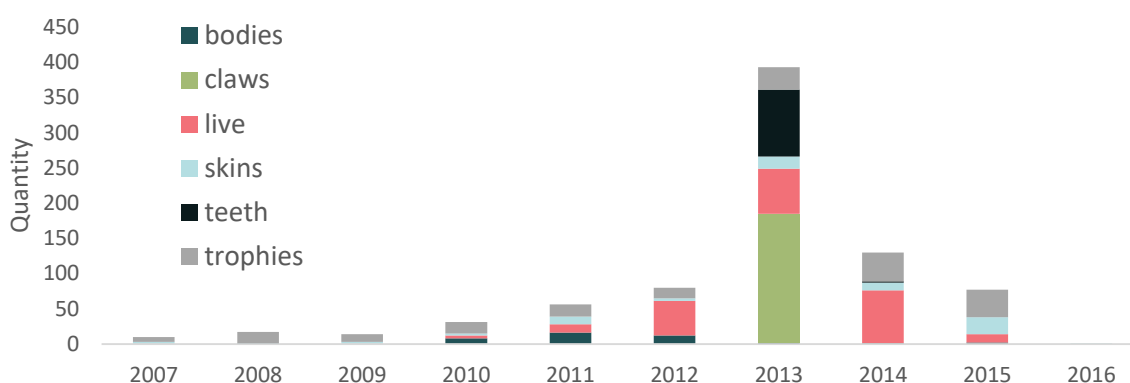


Figure 7 Annual exports of lion bodies / claws / live / skins / teeth / trophies to China (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Source: CITES Trade Database

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), although it is unclear if one of these facilities was granted permission explicitly for lion bone or “animal” bone more generally (Xiao Yu (TRAFFIC), *in litt.*, May 2018). Lion products have been observed for sale in China:

- 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).
- 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 is sold in the shop for CNY480–1,200 (USD62–155²²) 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. The CITES Secretariat observed the bone strengthening wine for sale in the hotel it stayed in 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 do not appear to have reported such trade in their annual reports if it does occur. TRAFFIC observed the bone wine still available for sale in 2017 and offers for sale online can be observed²³. 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 (USD2,735²⁴)) (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 no lion parts were observed. Twelve tiger parts (bones, teeth, paws) were seen for sale.

²² Currency converted using rate on 07/04/2007 (last day of mission) using www.oanda.com

²³ E.g. <https://item.taobao.com/item.htm?spm=a230r.1.14.122.78b6310cHxRyv1&id=564706383171&ns=1&abucket=7#detail>

²⁴ Currency converted using rate on 18/11/2014 (date item was released on) using oanda.com

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 ²⁵)
Teeth	13	CNY7,000–16,800 (USD2,000–106,932 ²⁶)

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 and kilograms, reported by exporting and importing country, direct exports only) and number of products seized in / en route to the Thailand (1999–2018). Sources: (CITES Trade Database – reported trade), (UNODC WorldWISE, CITES Illegal Trade Reports, TRAFFIC – seizures)

	Individual items		Seized	
	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	2,958		
Bones	30	153		
Trophies	15			
Bodies		4		
Large leather product		1		
Teeth				2
Total	427	3,260	27	2

²⁵ Currency converted using rate on 03/05/2018 using oanda.com

²⁶ Currency converted using rate on 03/05/2018 using oanda.com

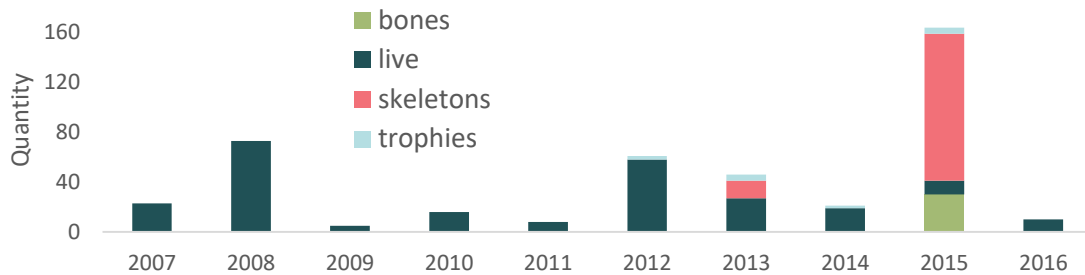


Figure 8 Annual exports of lion bones / live / skeletons / trophies to Thailand (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

Live lions are kept in zoos in Thailand, and facilities where tourists can physically interact with wildlife including lions (and tigers) are not unusual²⁷: 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 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).
- Williams *et al.* (2015) details lion products recorded in “muthi”²⁸ 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

²⁷ E.g. Safari Volunteer www.safarivolunteer.com, Tiger Kingdom www.tigerkingdom.com, Tiger Temple www.tigertemplethailand.com

²⁸ African traditional medicine

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 is. 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)).

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

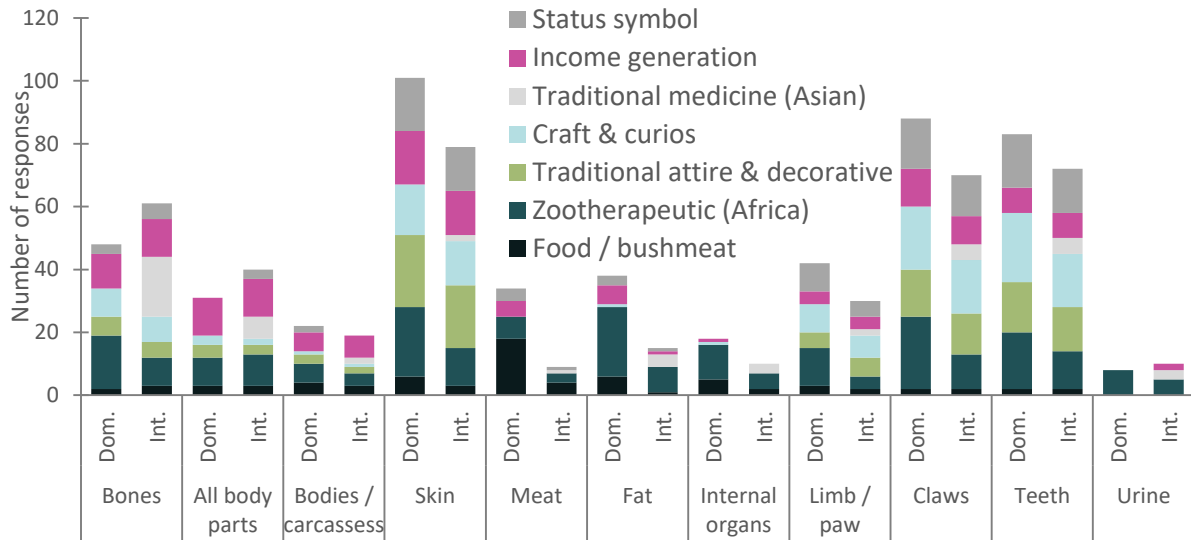


Figure 9 Respondent opinion of why various lion products are sold/used either locally/domestically or internationally. Derived from the results of a questionnaire covering former and current lion range States (2014/2015) (Williams *et al.*, 2017a)

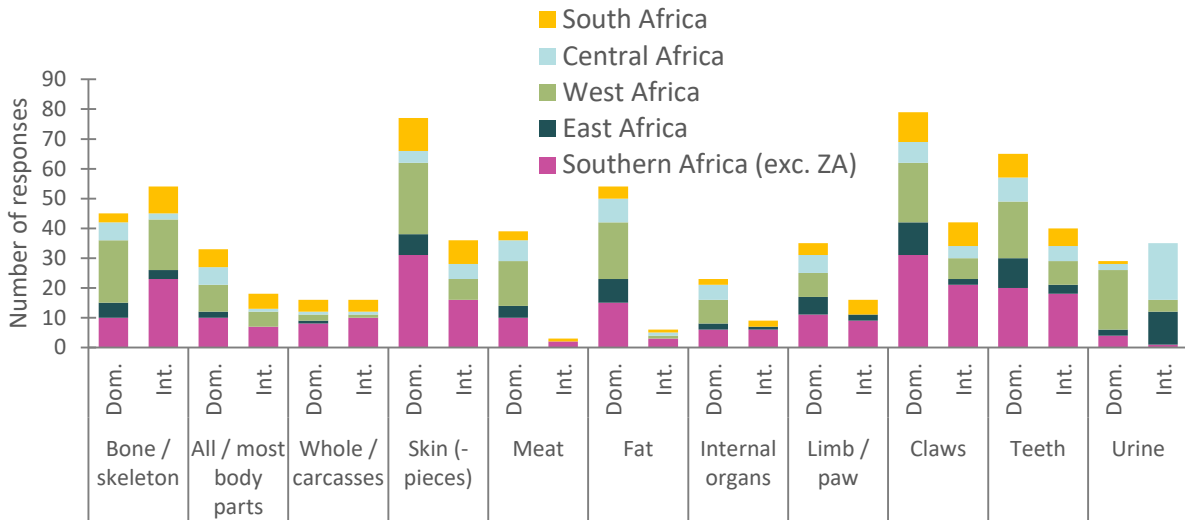


Figure 10 Respondent awareness in African sub-regions of use/trade in lion products either locally/domestically or internationally. Derived from the results of a questionnaire covering former and current lion range States (2014/2015) (Williams *et al.*, 2017a)

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 shot²⁹ as wild.

South Africa's captive-breeding industry has attracted much attention in recent years as the CITES-listing amendment adopted in 2016 means that currently the only lion products that can be traded internationally for commercial purposes are from South African captive-bred lions (under 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). 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.

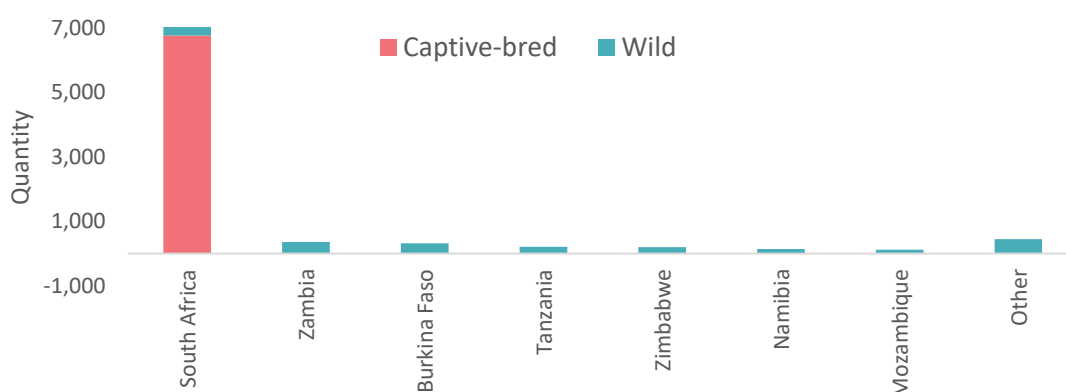


Figure 11 Source of exported lion trophies (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

²⁹ The period varies by province but can be as little as 96 hours (North West Province (Williams *et al.*, 2015).

Trophy Hunting of Wild Lions

Many African countries permit trophy hunting of wild lions³⁰, 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.

In West Africa, trophy hunting is allowed in Benin, Burkina Faso and Senegal (the annual average taken is 15 lions) (Chardonnet *et al.*, 2005, Pellerin *et al.*, 2009, 2010, Bouché *et al.*, 2016). 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).

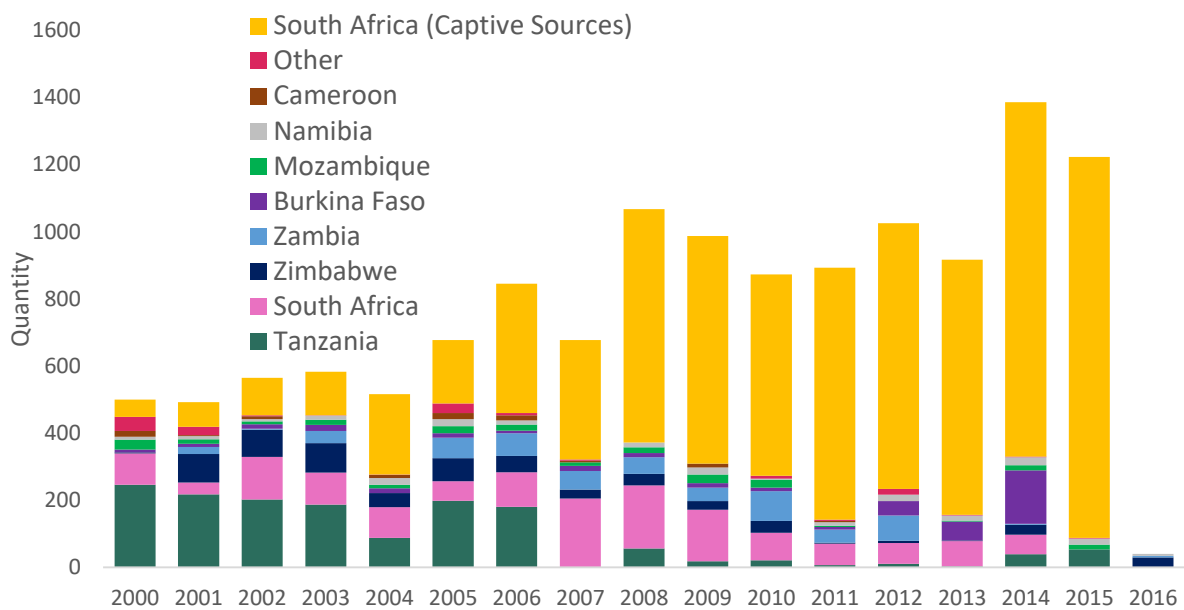


Figure 12 Exporters of lion trophies (reported as number of individual items, reported by exporting country, direct exports only) 2000–2016. *Source: CITES Trade Database*

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). It is possible that such “byproducts” of wild hunts could enter domestic or international trade.

³⁰ 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).

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 & Levensal, 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 ³¹)	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).

³¹ Currency conversion made using rate of 1st July of the relevant year (www.oanda.com)

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).
- 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 not yet released a quota for 2018.
- 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). Conversely, others 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).
- 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 hunting³² (except for breeding). While selling females for their parts could be a potential strategy, Williams *et*

³² According to Williams *et al.* (2015), hunters would pay USD16,800–USD17,900 per male and USD3,150–USD4,200 per female

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).

- 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 euthanize all stock (Williams & t' Sas-Rolfes, 2017).
- The price of a lion skeleton in 2013 paid to the farmer was quoted as USD1,260 to 2,100³³ (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)³⁴ (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. Zimbabwe is believed to have facilities which legally breed lions for the purpose of tourism or release to the wild, however concerns have been raised over the involvement of one breeding facility in Victoria Falls (Rae Kokes (Matusadona Lion Project), *in litt.*, April 2018).

³³ Depending on size of skeleton, and whether the skull was included.

³⁴ Converted on 14th May 2018 using www.oanda.com

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 removed³⁵ (most likely to obtain teeth, and carpal/metacarpal bones and claws (Michael t' Sas-Rolfes (University of Oxford)), *in litt.*, May 2018)). According to the Endangered Wildlife Trust, at least 22 captive lions were poached in 2017 (IOL, 2017).

There is apparently little evidence to suggest 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), 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). 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 considers the main 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 use of lion parts in Africa is considered a threat to sub-populations (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).

³⁵ 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/>

Table 11 Examples of recent lion poaching events

Location	Year	Description
Zimbabwe	2018	One lion caught in snare with canines removed, and paws and some bones missing ³⁶
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 ³⁷
Uganda	2017	Three lionesses and eight cubs killed after being poisoned, apparently by villagers who blamed lions for killing a cow ³⁸
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 ³⁹
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 ⁴⁰ .
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 ⁴¹ .

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). Similar concerns have been raised in Zimbabwe where tens of lions are killed every year under the label of “problem animal control” but it is unclear what happens to the parts of the lion once it has been killed—in one case it was reported that the meat was harvested for Chinese nationals working on the nearby Kariba Dam wall (Rae Kokes (Matusadona Lion Project), *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.

Illegal cross-border trade

³⁶ Rae Kokes (Matusadona Lion Project), *in litt.*, April 2018

³⁷ <https://africageographic.com/blog/mass-poisoning-leaves-lions-vultures-dead-ruaha/>

³⁸ <https://www.independent.co.uk/news/world/africa/uganda-lions-killed-poisoning-queen-elizabeth-national-park-wildlife-protection-investigation-a8302606.html>

³⁹ www.earthtouchnews.com/environmental-crime/poaching/days-after-the-cites-wildlife-summit-a-mass-poisoning-in-mozambique/

⁴⁰ Etotépé Sogbohossou (University of Abomey-Calavi), *in litt.*, March 2018

⁴¹ Saleh Adam (Ministry of forestry and Wildlife), *in litt.*, March 2018

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

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 Ondoua *et al.*, 2017). East and Southern Africa were also believed to be more likely than 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).

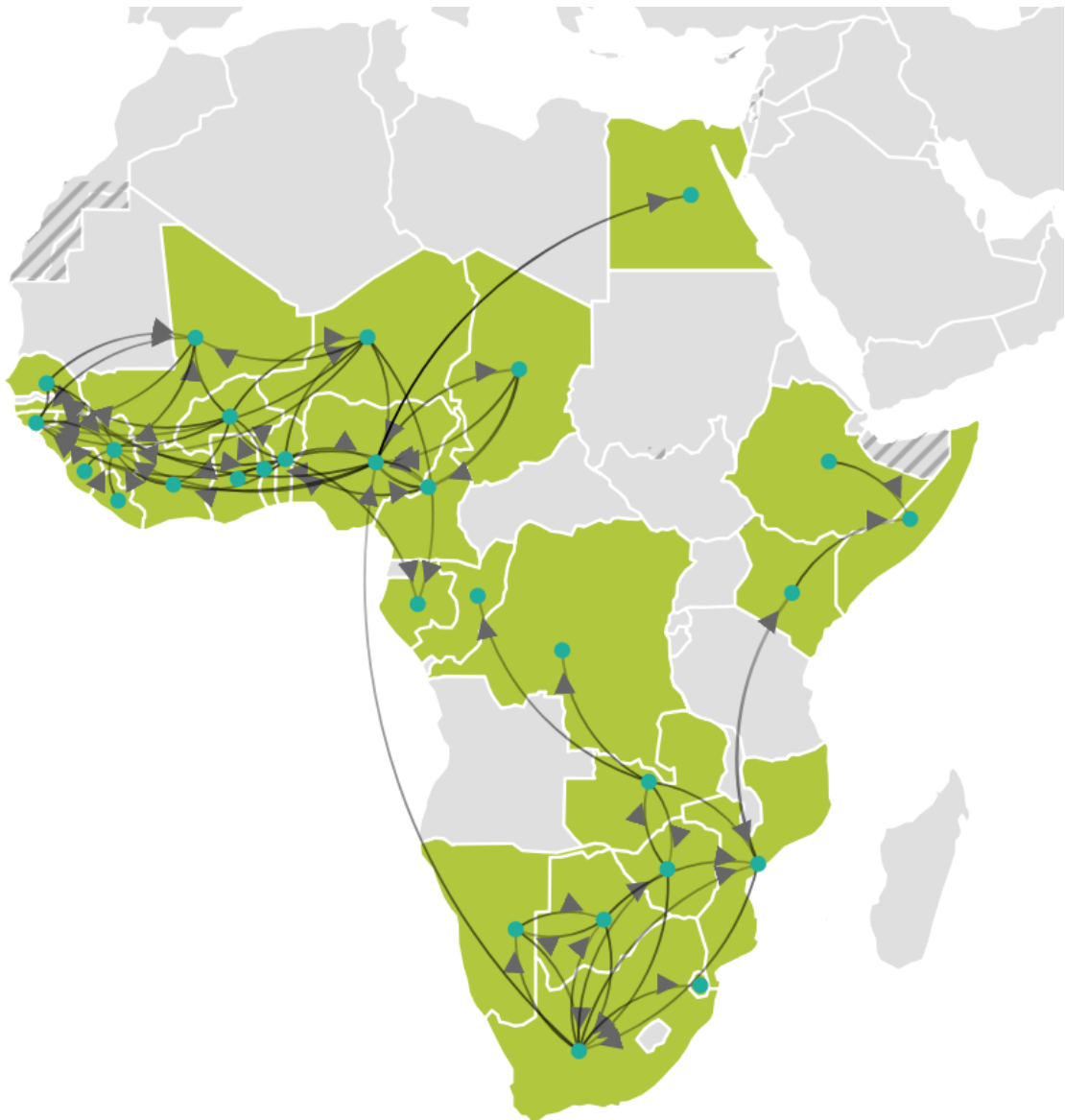
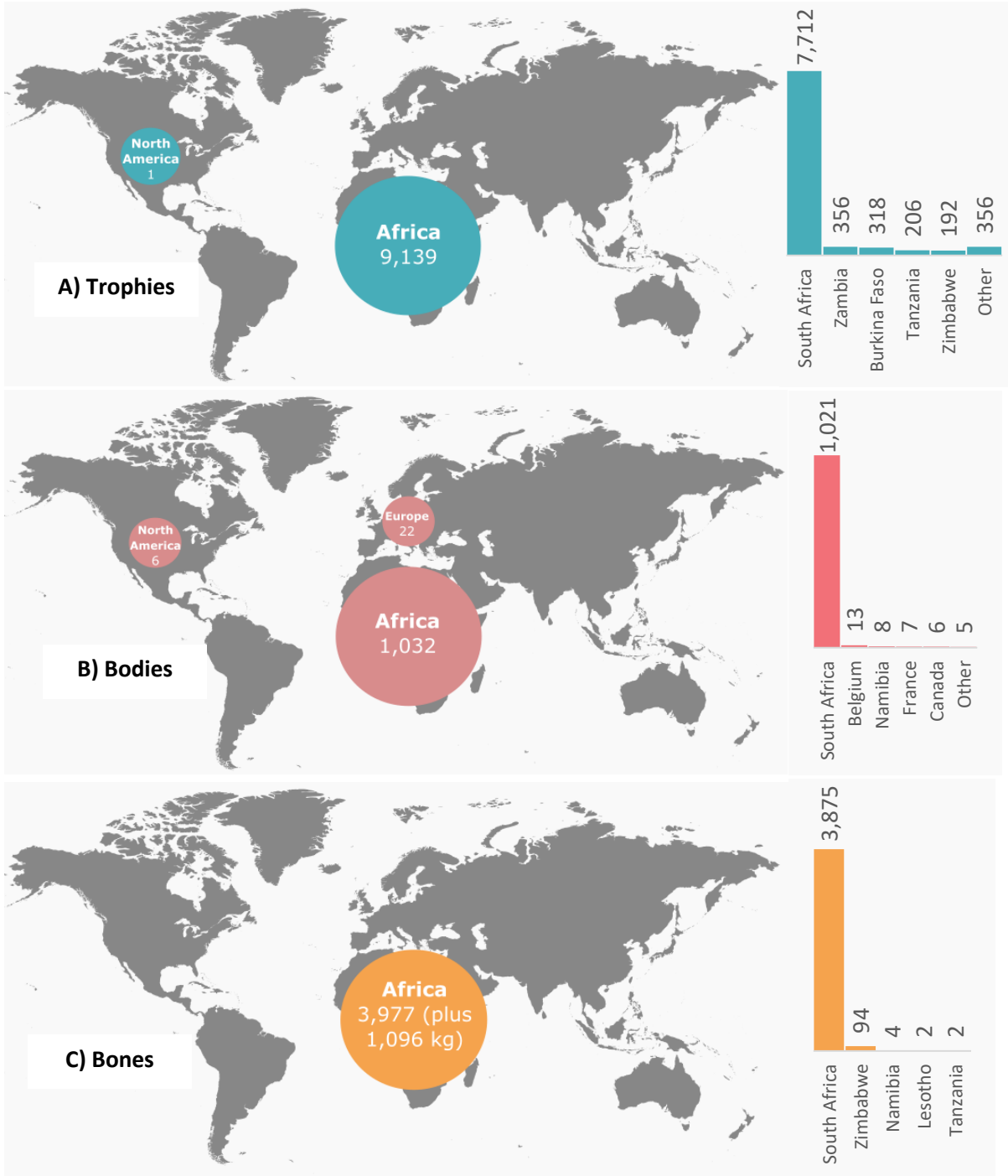


Figure 13 Suspected illegal trade routes for lion products within Africa. *Data sources: Williams et al. (2017a) (date range of data unknown), CITES Illegal Trade Reports, UNODC WorldWISE Database, TRAFFIC (1999–2018).* Trade routes may continue outside of Africa

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).



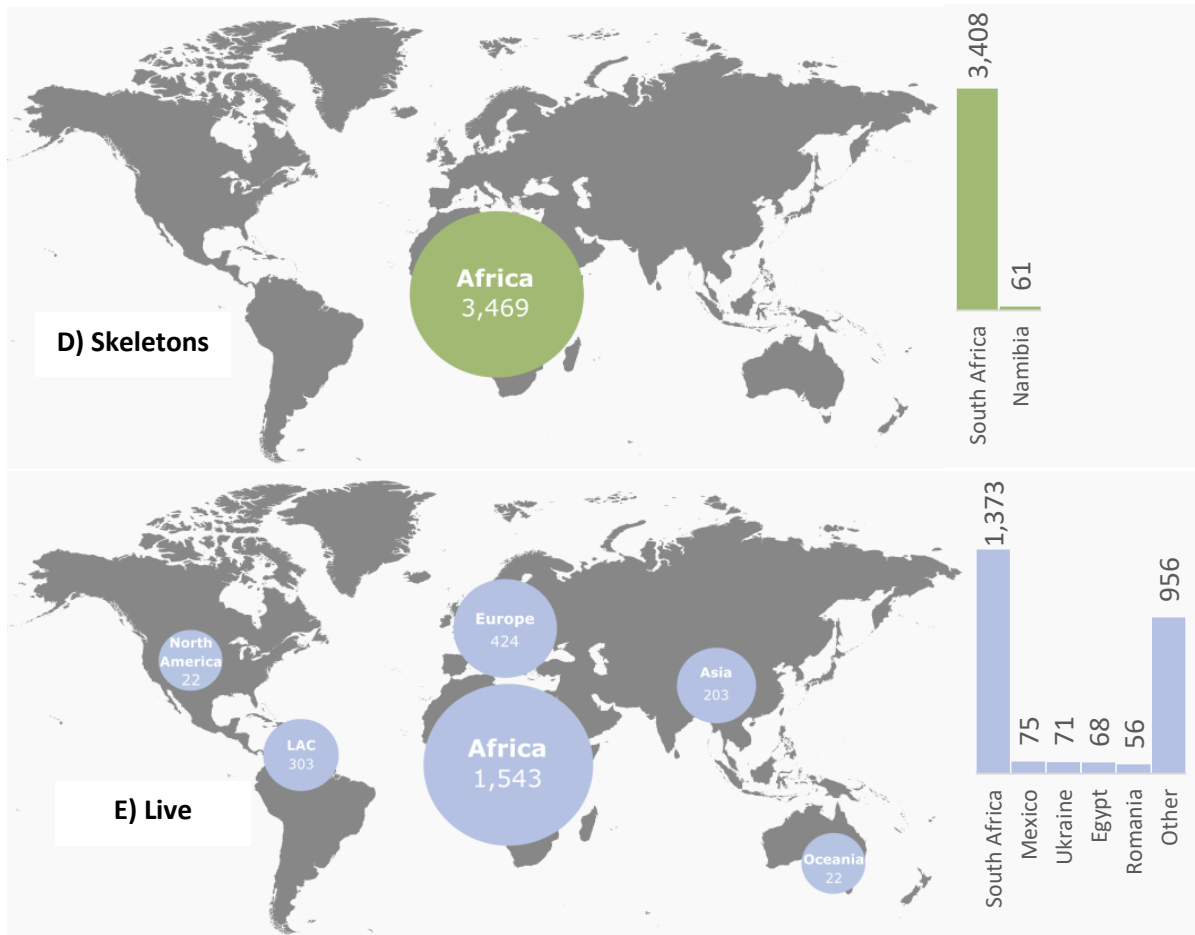


Figure 14 Number of lion (A) trophies, (B) bodies, (C) bones, (D) skeletons and (E) live exported by different regions – bar graph depicts countries exported from in the highest quantities (reported as number of individuals and kilograms, reported by exporting country, direct exports only) 2007–2016.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

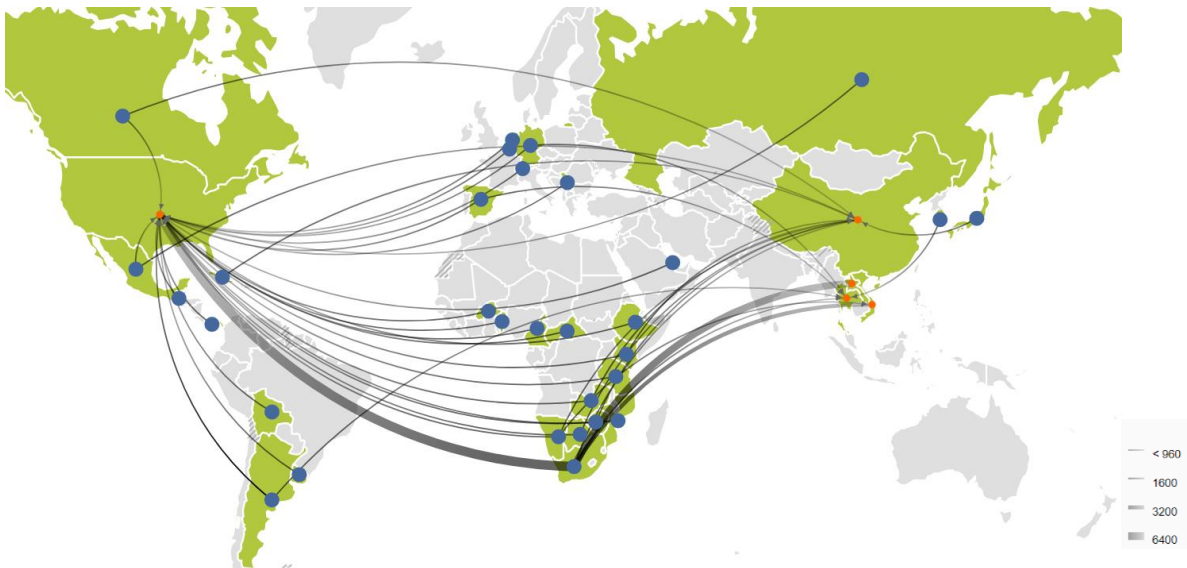


Figure 15 Trade of selected lion products (bodies, bones, claws, live, skeletons, skins, skulls, teeth and trophies) to key importing countries (China, Lao PDR, Thailand, Viet Nam and the USA) (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Blue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

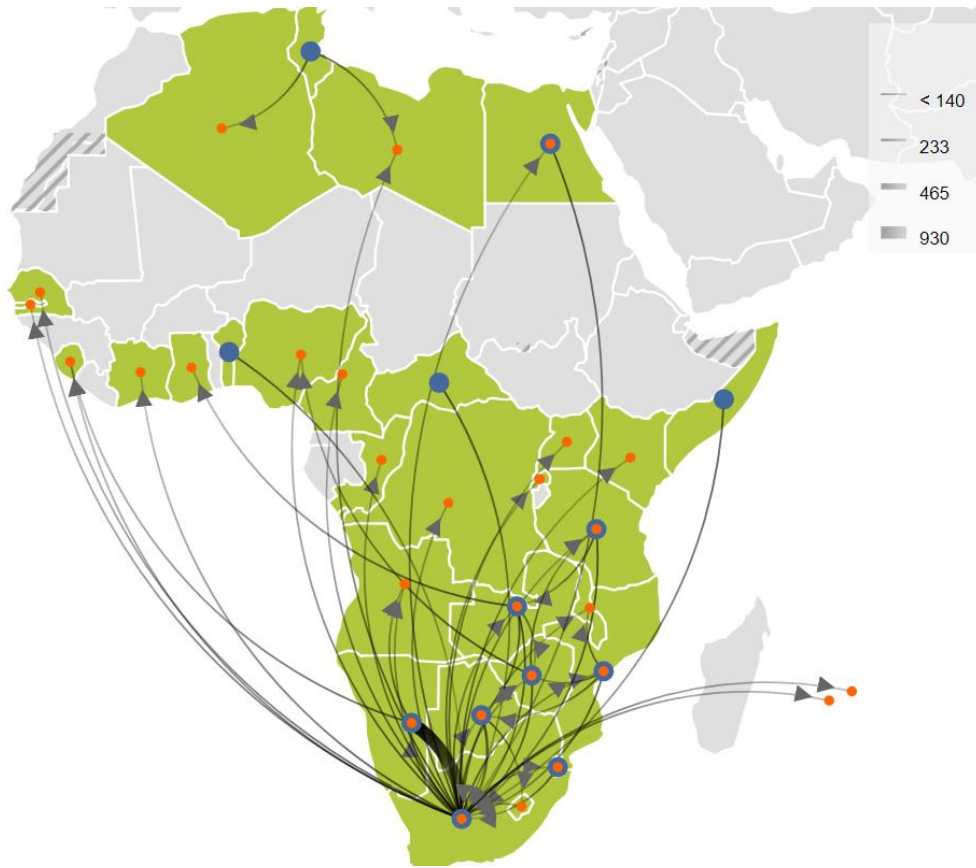


Figure 16 Trade routes for lion products within Africa (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Blue circle= exporting country, orange circle = importing country. *Source: CITES Trade Database*

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). 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

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. 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.

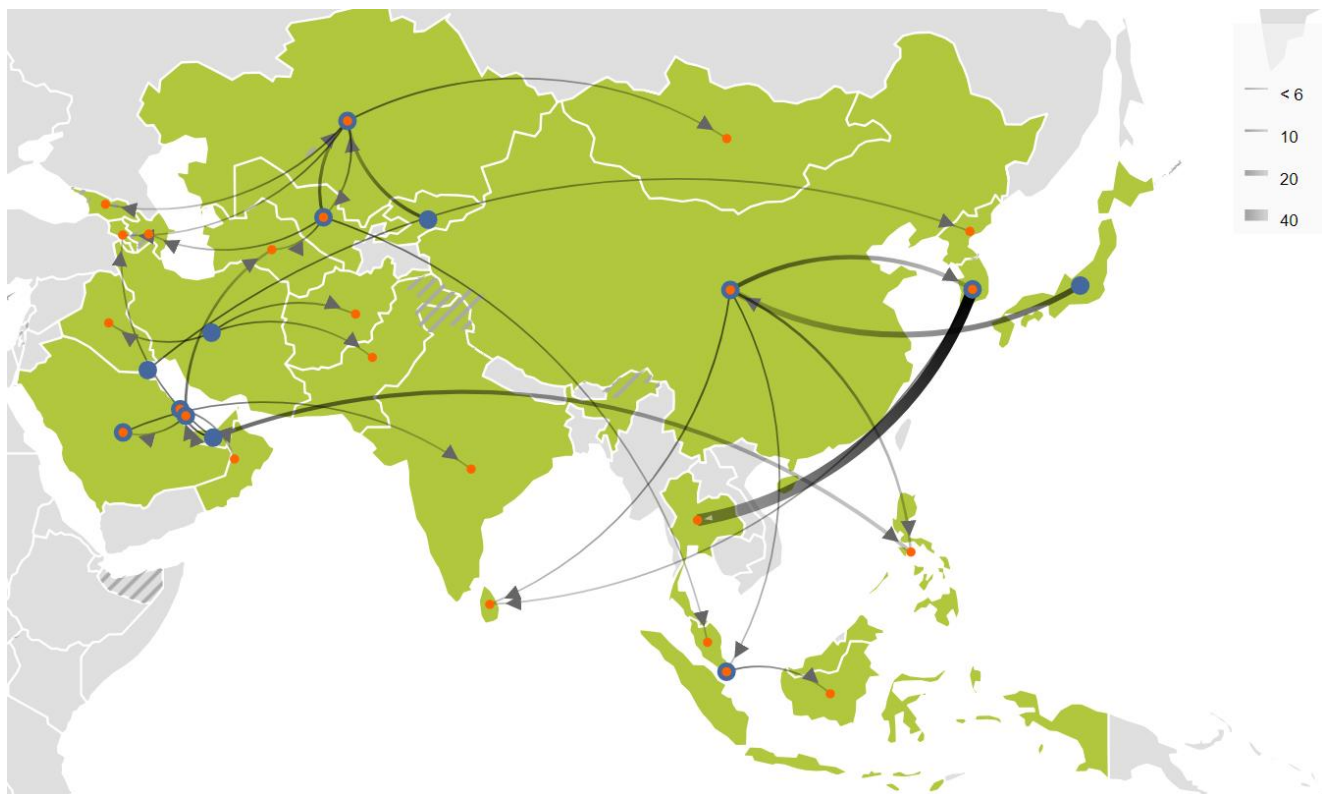


Figure 17 Trade routes for lion products within Asia (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. Blue circles= exporting country, orange circle = importing country. Source: CITES Trade Database

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). Stakeholders 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)

Box 1 Smuggling of lions from Africa to Asia

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 from 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 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). 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).

Commodities in Illegal Trade

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*

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 ⁴²
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 ⁴³ .
3	Mexico	2017	One white lion being kept in poor conditions seized from an abandoned farm after the authorities inspected the lion and found it to have no food, water and no one was able to present the correct documentation proving legal provenance ⁴⁴ .
4	South Africa	2017	Rhino horn with an estimated street value of about R500 000 (USD 38,278 ⁴⁵) 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 ⁴⁶ .
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 ⁴⁷ .
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. ⁴⁸
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 ⁴⁹ .

⁴² <https://e.vnexpress.net/news/news/vietnam-busts-major-wildlife-trafficking-ring-3577958.html>

⁴³ <https://kemptonexpress.co.za/161469/lion-rhino-parts-found-at-airport/>

⁴⁴ <https://www.gob.mx/profepa/es/prensa/asegura-profepa-ejemplar-de-leona-africana-blanca-en-jalisco?idiom=es>

⁴⁵ Converted using rate for 01/07/2017 www.oanda.com

⁴⁶ <http://germistoncitynews.co.za/154695/rhino-horn-lion-bones-found-at-house-in-wychwood/>

⁴⁷ <http://www.egyptindependent.com/cairo-airport-foils-smuggling-attempt-two-lion-cubs/>

⁴⁸ <https://citizen.co.za/news/south-africa/1141259/suspects-nabbed-with-lion-body-parts/>

⁴⁹ <http://www.customs.gov.cn/publish/portal105/tab63068/info832568.htm>

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 ⁵⁰ .
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 ⁵¹ .
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 were packaged in a foam box on a flight from Russia ⁵² .
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) ⁵³ . 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 ⁵⁴ .
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 ⁵⁵ .

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

⁵⁰ <https://www.tienphong.vn/content/ODcxMTk3.tpo>

⁵¹ <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>

⁵² <https://thanhvien.vn/thoi-su/40-kg-xuong-dong-vat-ve-tu-nga-la-xuong-su-tu-458298.html>

⁵³ http://www.xinhuanet.com/legal/2015-05/27/c_127845426.htm

⁵⁴ <http://anninhthudo.vn/an-ninh-doi-song/khoi-to-2-doi-tuong-van-chuyen-so-ho-xuong-su-tu/537449.antd>

⁵⁵ <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

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

According to CITES trade data, Lao PDR, Thailand, and Viet Nam are the primary lion product importers within Southeast Asia. Preliminary results for research conducted under this study have found close trade links between these lion importing companies operating within those three countries. The majority of wildlife in general imported into Lao PDR arrives at the international airport in Vientiane (Wattay International Airport) or by road from Thailand, and it is likely but not confirmed, that any lion trade would follow these routes. The major export from Lao PDR to Viet Nam appears to be a route between two border towns: Bolikhamxay (Lao PDR) and Nghe Anh (Viet Nam). Again, it has not been proven that lion products follow this route but it is probable.

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 is currently ongoing to understand better the companies involved in the import of lions to Southeast Asia and will be detailed in the revised report.

Preliminary 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 noted⁵⁶. Seizures in Mozambique, Zambia and Tanzania 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.

The significant 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 demand is for bone items. It has been suggested that lion parts are being used as cheaper, and often legal, substitute for products that would have traditionally contained tiger. While trade data confirms that lion products are now being exported to Asia, there remains a scarcity of knowledge on the trade dynamics of lion products once they enter Asia.

Preliminary results of our research show that although data are scarce, there does seem to be a difference in the consumption patterns in the four main importing countries (see below). It is acknowledged that it was not always been possible to substantiate information provided by stakeholders but based on their knowledge and experience their input was deemed invaluable.

- *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. One of the main uses for lion bone items in Viet Nam appears to be for “cake” (a highly processed product made by slowly boiling bones and mixing with other ingredients including from other species) which is difficult to distinguish from tiger “cake”, also produced and consumed in Viet Nam. Tiger “cake” is said to give strength to the consumer and used by people suffering with arthritis and is often mixed with wine for consumption. Surveys conducted for this study found no evidence of lion “cake” openly for sale in outlets in Viet Nam, but information suggests sale takes place within existing networks behind closed doors. While it is likely that at least some of the lion bone is being used as a substitute for

⁵⁶ 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.

tiger bone, there is a differentiated demand specifically for lion products in Viet Nam, and anecdotally it appears this may be increasing. It has been suggested that there are already lion farms in Viet Nam, but the captive-population is unknown—live imports have totalled 66 lions in the past 10 years.

- *Lao PDR* – The role that Lao PDR plays is unclear. According to trade records Lao PDR has been one of the major importers of lion bones, although Lao PDR itself has not reported the import or export of any lion products. Our research has found little evidence for consumption within the country. Errors which mis-labelled exports from South Africa to Viet Nam as to Lao PDR may have inflated the total exports, but are unlikely to explain all of the trade. It remains unclear whether bone items that entered Lao PDR were consumed locally, processed for export to Viet Nam/China, processed and sold within Lao PDR to subsequently be taken to Viet Nam/China by consumers (e.g. tourists), or a combination of these. One stakeholder considered that Lao PDR was acting as a re-exporter of bone items from South Africa to Viet Nam. The Lao PDR Scientific Authority stated there have not been any imports or exports of lions, and no lion farming takes place. A small number of live lions have been observed on a farm.
- *China* – Between 2007 and 2011 813 items were exported to China: 46 of which were bodies/skeletons. 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. 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. Captive lions are present in China, including at facilities holding other species such as tigers, which could be the source of the lion skeletons. If the need for lion products in China is met by lions bred within the country 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 *Panthera leo* may actually contain tiger bones or those of other species. Forensic testing of wine is needed to better understand this. Lion claws/teeth were also exported to China and observed for sale online.
- *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. 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.

No legal trade was reported between these countries, although seizures show illegal cross-border trade (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. Currently it is not clear which countries are acting as processors or consumers, and how the products are moving across borders. Little open trade was observed in the three countries surveyed, it appears that trade takes place through existing networks or is arranged via social media, making it very difficult to monitor. The current field research being undertaken for this study should help provide some further answers.

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. There also seems to be an element of opportunistic poaching by hunters who have heard that lions are now valuable so will take one where possible. It appears 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 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.

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.

Overall, currently the international trade in lion parts does not seem to be the largest threat facing wild lions: retaliatory killing and prey base depletion are of most concern, although poorly managed trophy hunting and use/trade are also identified as risks. The risk from use/trade is most likely 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). However, there are indications that a perception of increasing value and demand in Asia is going to lead to increased 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 bans⁵⁷. 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.

⁵⁷ 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)

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-CEN⁵⁸, EU-TWIX⁵⁹ 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 2016⁶⁰). 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

⁵⁸ World Customs Organization - Customs Enforcement Network

⁵⁹ European Union Trade in Wildlife Information eXchange

⁶⁰ *Vận chuyển thú 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 – A online survey was conducted of social media websites and traditional medicine websites. The survey was conducted in April 2018 using key words in Vietnamese.

Lao PDR – Surveys are ongoing and the final detail on the method used will be provided in the revised draft.

China – An online survey was conducted 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 between March and May 2018.

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 01 A, whereas trade reported in kilograms was nearly all bones (1,096 kg) or skeletons (480 kg) (Table 01 and Figure 01 B). 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 01 A), 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 01 A). 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 01 A). In addition, 480kg of skeletons were exported in 2015 (Figure 01 B). 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.

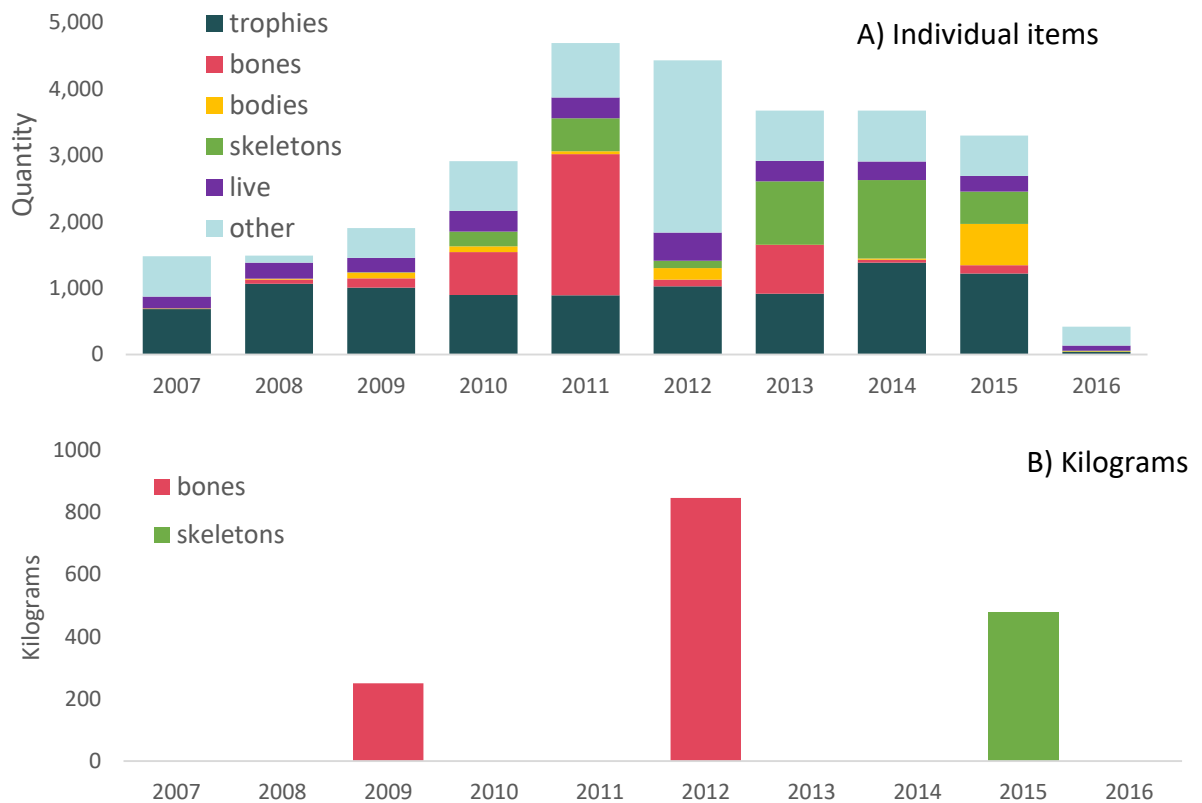


Figure 01 Annual exports of lion products (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

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 14 A-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

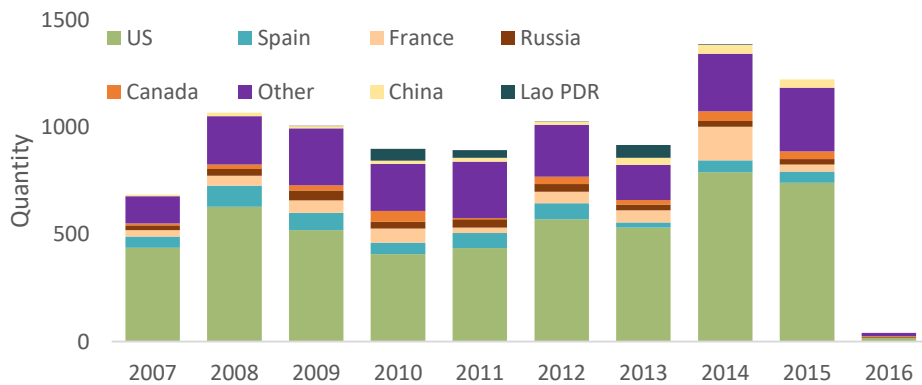
According to exporting countries, the US has consistency been the largest importer of trophies in the past 10 years (Figure 02 A). The largest five importers in that time period are all European or North American countries, although some Asian countries are emerging as destinations. For example, 41

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.

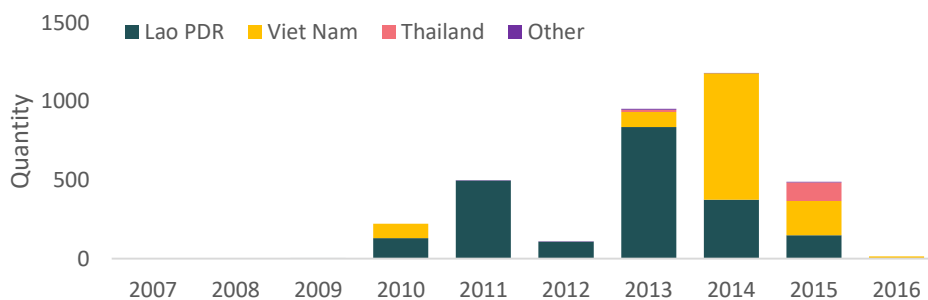
In 2014, Viet Nam became a major importer of skeletons and exports to Lao PDR reduced (Figure 02 B). A similar pattern was shown for bones around 2011–2013. Exports of bodies to Viet Nam spiked in 2015 and Lao PDR appeared to lose some of its market share (even considering it imported 480 kg skeletons in 2015) (Figure 02 C). 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 02 D).

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).

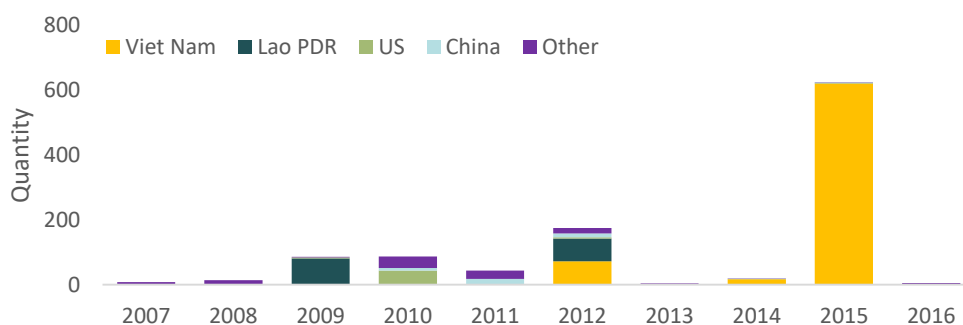
A) Trophies



B) Skeletons



C) Bodies



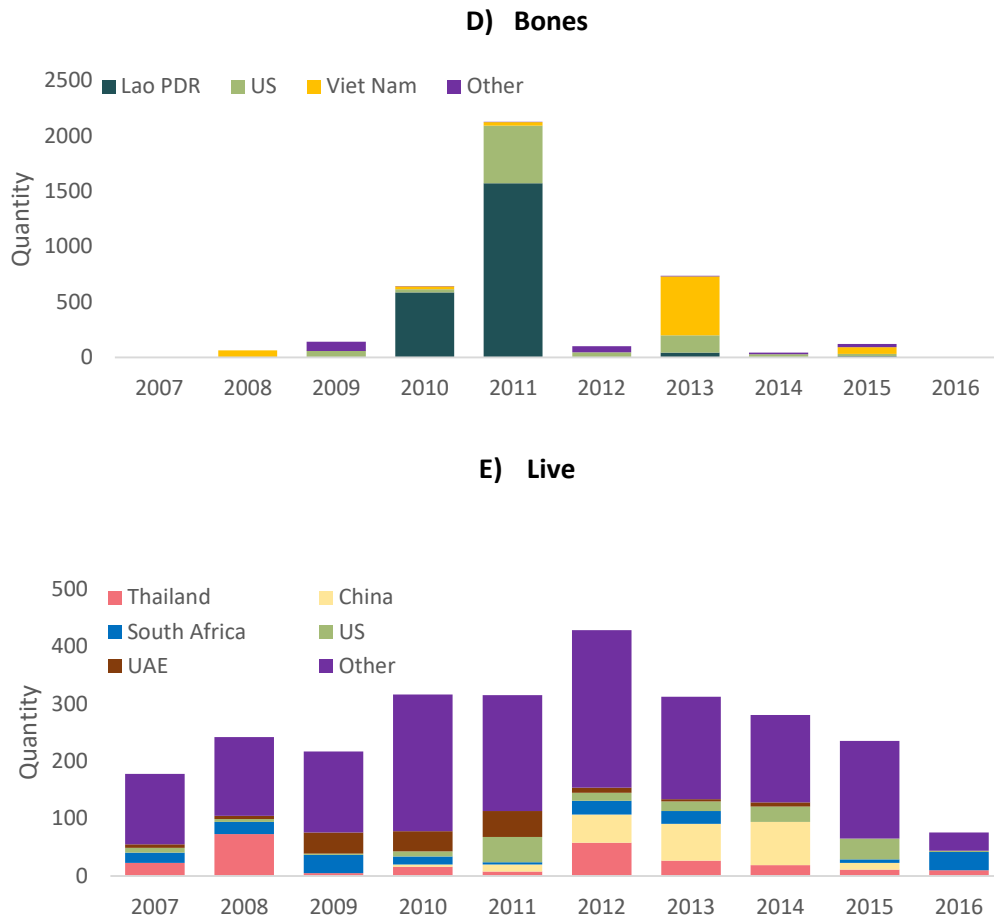


Figure 02 Importers of lion trophies, (A) skeletons (B), bodies (C), bones (D) and (E) live (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

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).

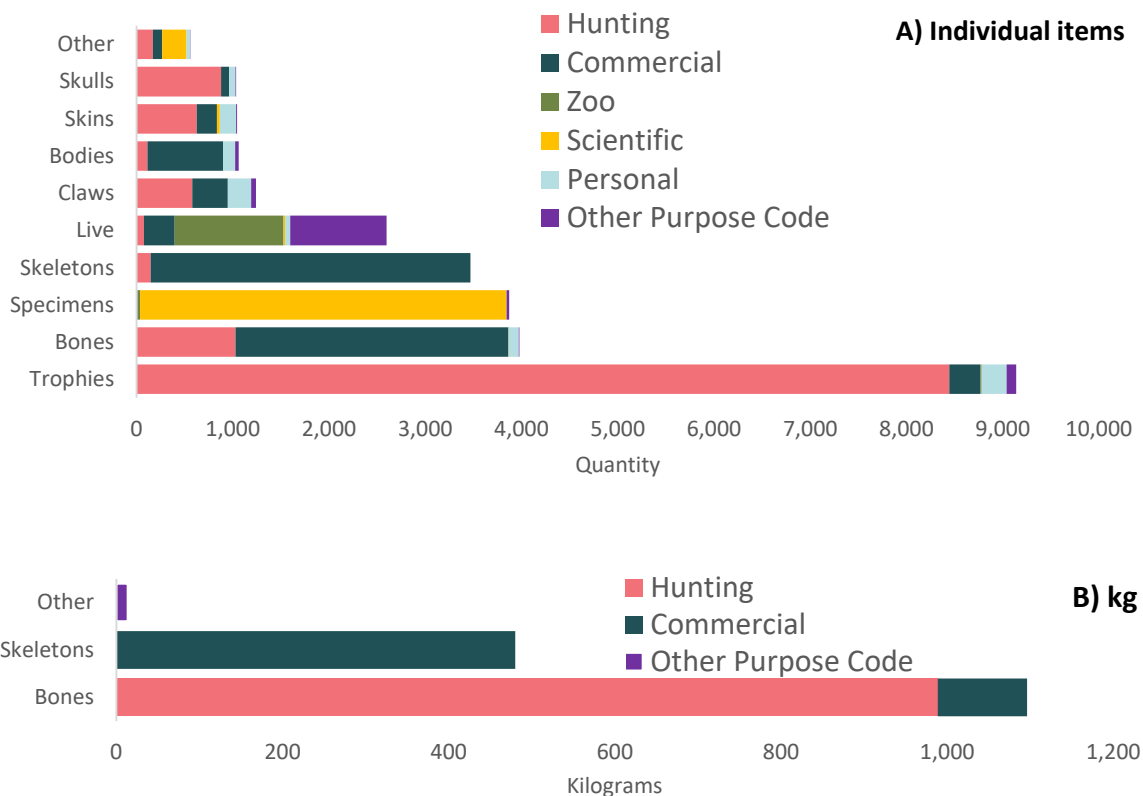


Figure 03 Purpose code of lion products by commodity type (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

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 period⁶¹ of time before being shot as wild.

⁶¹ The period varies by province but can be as little as 96 hours (North West Province (Williams *et al.*, 2015)).

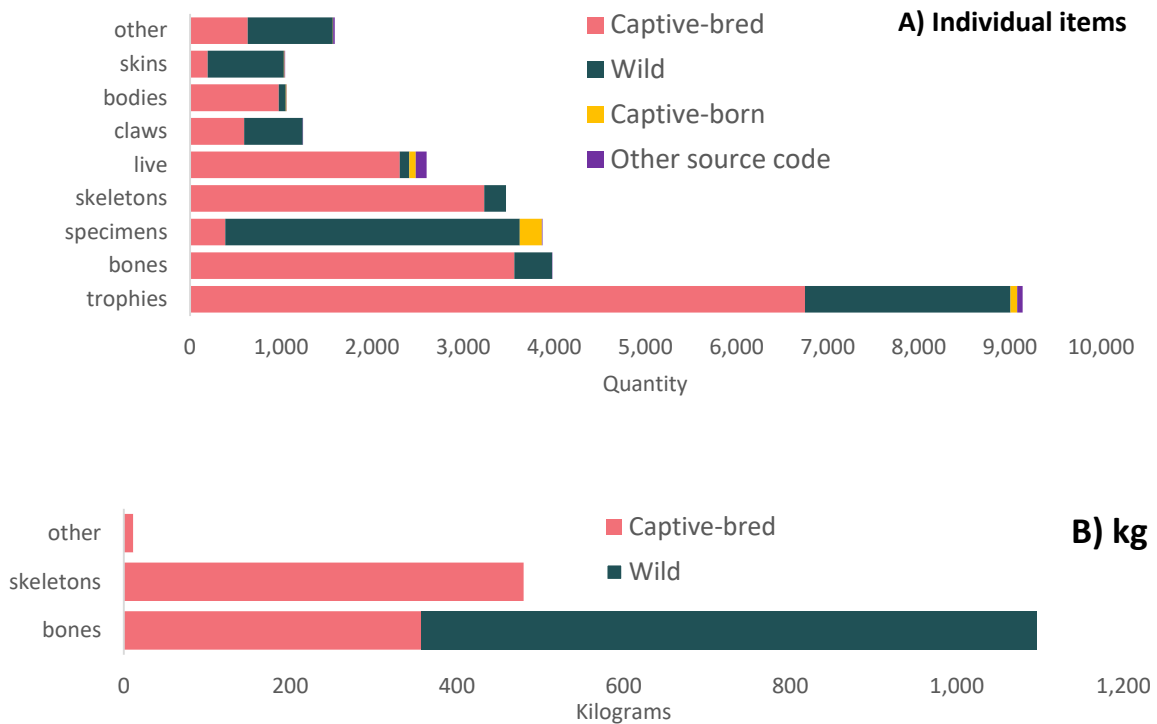


Figure 04 Source code of lion products by commodity type (reported as number of individual items (A) or kilograms (B), reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

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.

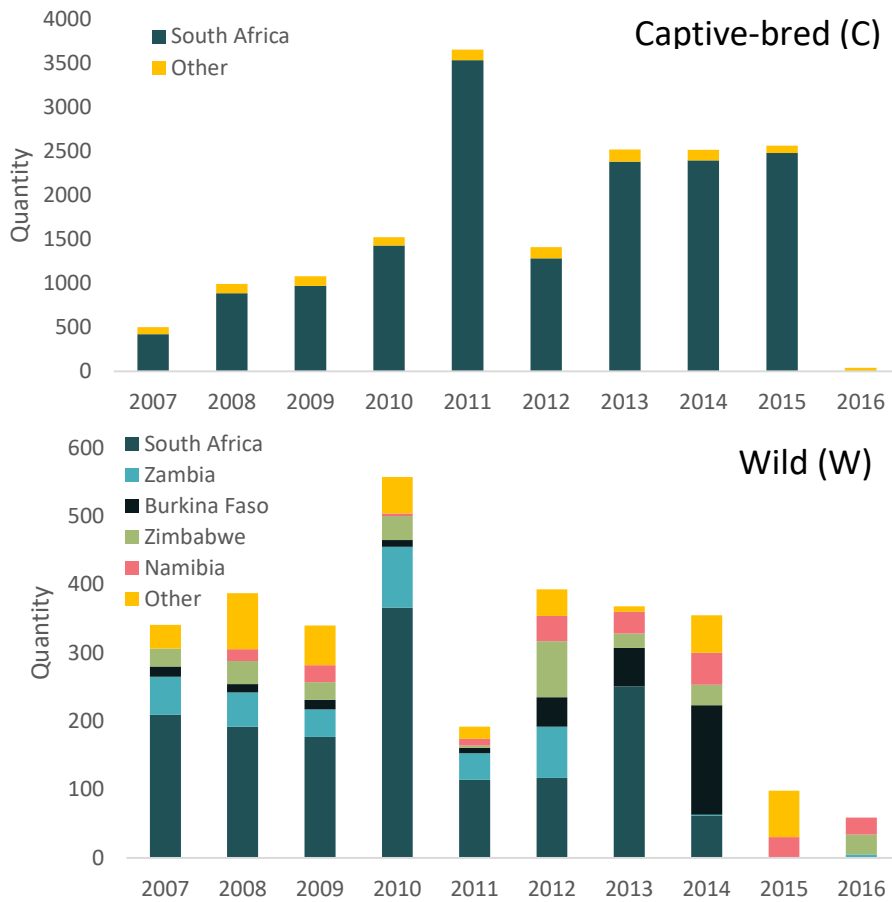


Figure 05 Exporters of lion bodies / bones / live / trophies / skeletons (combined) from captive-bred (A) or wild (B) lions (reported as number of individual items, reported by exporting country, direct exports only) 2007–2016. *Source: CITES Trade Database*

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).

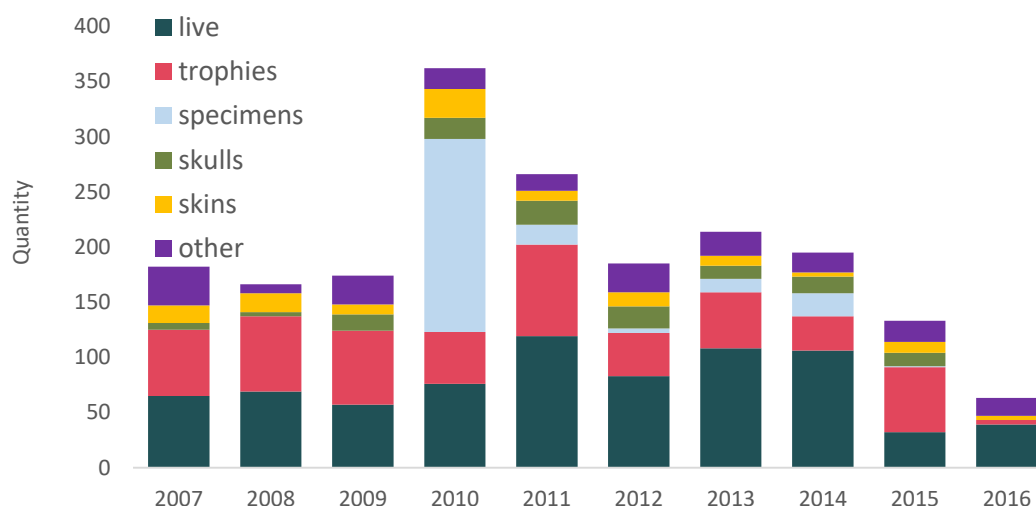
Table 03 Re-exports of lion products from key importing countries (reported in individual items, reported by re-exporting country, re- exports only). *Source: CITES Trade Database*

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).

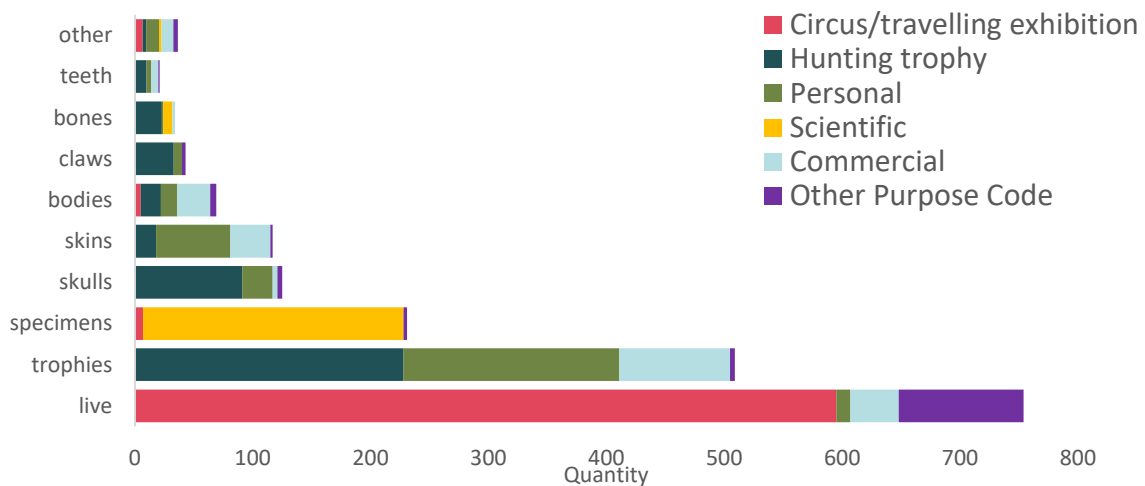


Figure 07 Purpose code of lion products by commodity type (reported as number of individuals, reported by re-exporting country, re-exports only) 2007–2016. *Source: CITES Trade Database*

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 kg⁶²), 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

⁶² Six 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

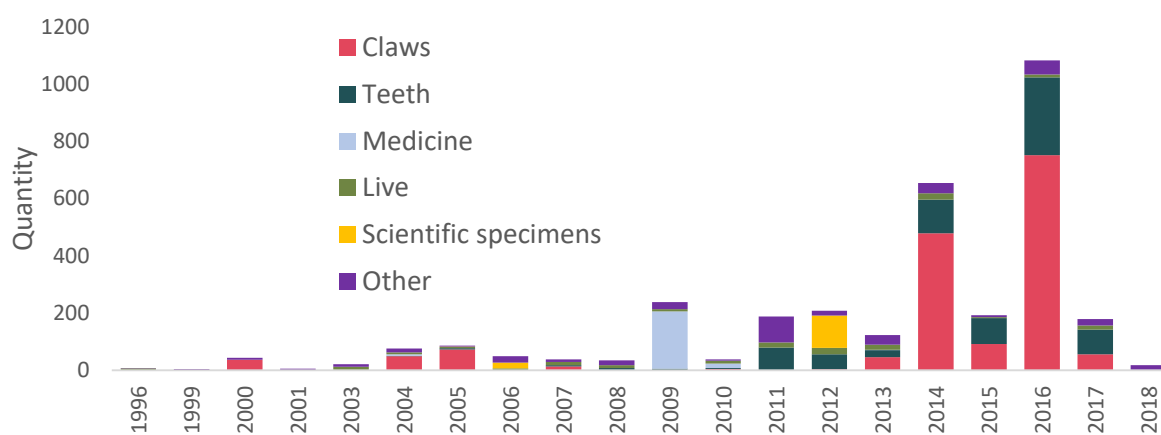


Figure 08 Annual seizures of lion products (reported as number of individual items), 1999–2018. *Data sources: WorldWise Database, CITES Illegal Trade Reports, TRAFFIC*

Country of Seizure

South Africa seized the most bones (62) and bodies (27), while all seizures of skeletons took place in China (11) 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).

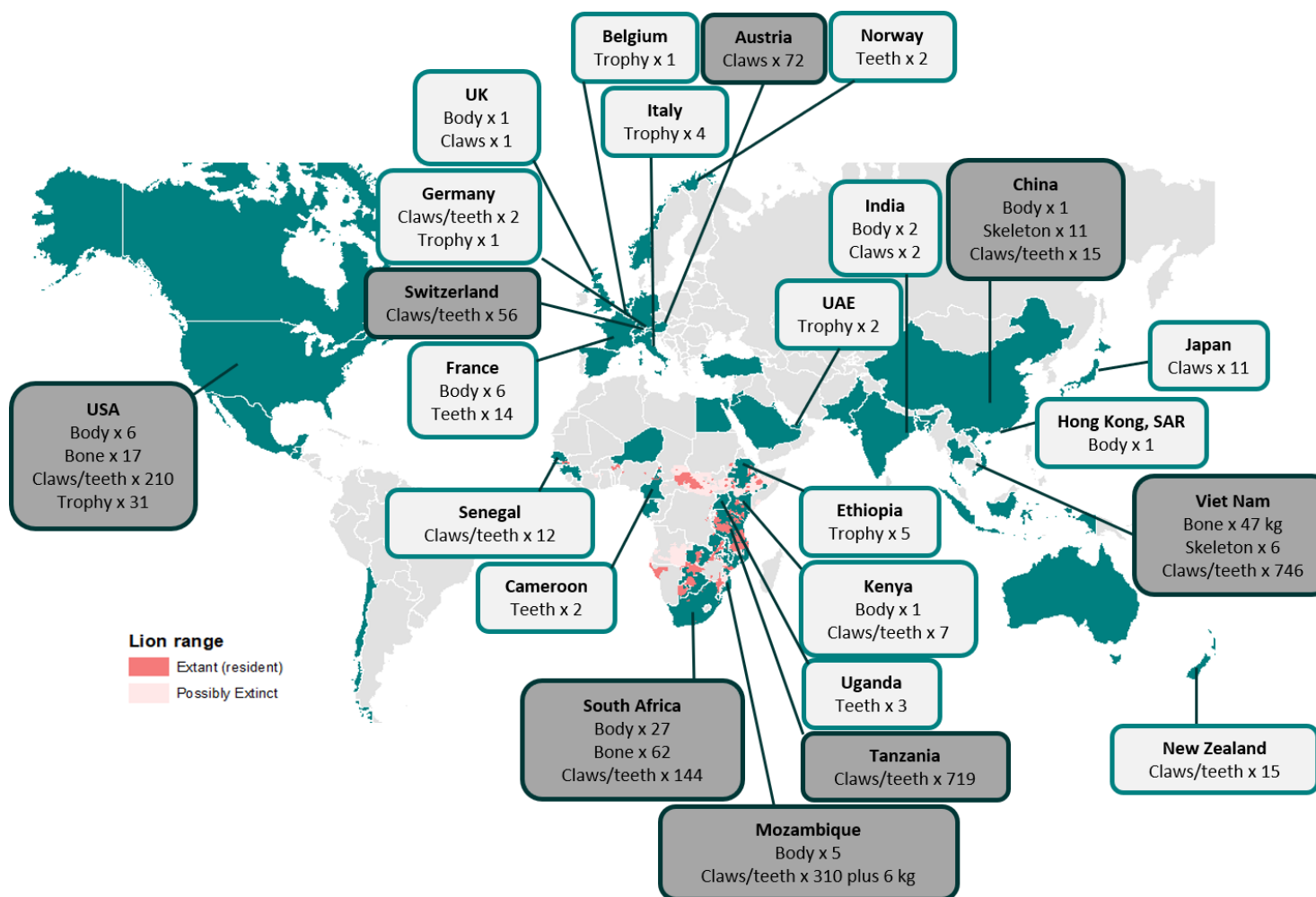


Figure 09 Locations of reported seizures of live lions or lion products 1999 - 2018 are coloured green. Quantities of key products (body/bone/claws/skeletons/teeth/trophy) are provided in boxes (dark grey boxes indicate 20+ key products were seized). Only information on specific seizures was included, 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*

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/>
- 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., Crosmary, 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., Crosmary, 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 (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.

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

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, ENV and Wildlife Friends Foundation (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>.

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. & Levedal, 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>.

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.

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 2006. 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>.

Mésochina 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

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>.

News items.

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

IOL (2017) Grim toll as captive lions poached, parts used for 'medicine'. <https://www.iol.co.za/news/south-africa/gauteng/grim-toll-as-captive-lions-poached-parts-used-for-medicine-12329903>

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>