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

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SUPPLEMENTARY INFORMATION

SOUTHERN AFRICA'S WILDLIFE TRADE: AN ANALYSIS OF CITES TRADE IN SADC COUNTRIES

This document has been submitted by South Africa in relation to working documents CoP17 Doc. 39.2 (Trade in hunting trophies of species listed on Appendix II) and CoP17 Doc. 58 (International trade in *Encephalartos* spp) as well as in relation to amendment proposal CoP17 Prop. 19 on *Psittacus erithacus* (African grey parrot)[*].

[*] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

SOUTHERN AFRICA'S WILDLIFE TRADE

AN ANALYSIS OF CITES TRADE IN SADC COUNTRIES

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Southern Africa's wildlife trade: an analysis of CITES trade in SADC countries

Prepared for South African National Biodiversity Institute (SANBI)

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Contents

Executive Summary ii
1. Introduction 1
2. Overview 2
    2.1 Exports 2
    2.2 Imports 6
3. Country Profiles 7
4. Case studies 41
    4.1 Hunting trophies 41
    4.2 Felids 53
    4.3 Parrots 60
    4.4 Reptiles 68
    4.5 Succulent plants 76
    4.6 Cycads 84
5. Species showing noteworthy trends in SADC countries 90
6. Trade by other countries in species native to SADC 99
    6.1 Wild-sourced trade 100
    6.2. Captive-produced trade 103
    6.3 Species endemic to SADC countries 106
7. Recommendations 109
    7.1 Reporting of trade in CITES listed species 109
    7.2 Management and conservation measures 110
    7.3 Further work 110
References 112
Annex A: Data included and methodology 116
Annex B: Source and purpose codes 122

Diceros bicornis, by PicturesWild, licenced via Shutterstock

Executive Summary

The Southern African Development Community (SADC) covers a vast territory in Africa, straddling from South Africa in the south to the Democratic Republic of Congo and Tanzania in the north, and including the Indian ocean island States of Madagascar, Mauritius and Seychelles. The region is home to a highly diverse range of wildlife, some of which is traded internationally and listed in the Appendices to the Convention on International Trade in Endangered Species of Fauna and Flora (CITES).

This report presents the first comprehensive overview of trade in CITES-listed wildlife in southern African countries. The analysis provides a baseline of information on trade levels and trends in SADC, based on the ten-year period 2005-2014, in order to inform future trade management in the region.

CITES trade from the SADC Region 2005-2014 was dominated by hunting trophies, live parrots, live reptiles, crocodile skins, crocodile meat, live plants (including cycads and succulent plants) and plant derivatives. As part of this analysis, six case studies are considered in more depth: hunting trophies, felids, parrots, reptiles, succulent plants and cycads.

On average, approximately 18 000 individuals of species mostly traded as **hunting trophies** were exported annually from the region; the principal mammal taxa in trade were (by volume of trade, in decreasing order) *Equus zebra hartmannae* (Hartmann's Mountain Zebra), *Papio ursinus* (Chacma Baboon), *Hippopotamus amphibius* (Hippopotamus), *Loxodonta africana* (African Elephant) and *Panthera leo* (African Lion). Hunting trophy trade also included high levels of *Crocodylus niloticus* (Nile Crocodile) trophies. Trophies in trade were predominantly from the wild, with the exception of *P. leo* which showed an increasing trend in exports of captive-bred trophies from South Africa. The United States and the European Union (EU) were the main import markets of mammal trophies, accounting for over 60% of exports of each of the top taxa in trade.

Trade in *P. leo* (Lion) bones and in live *Acinonyx jubatus* (Cheetah) and live lions increased over the study period. South Africa was the dominant exporter of **Felidae** bones and live felids during this period, with the trade in bones destined largely to the traditional medicine market in East and Southeast Asia and the trade in live big cats destined also to other SADC countries, the United Arab Emirates and the United States, including for zoos and for the pet market.

Live parrots are in demand globally as household pets, and this was reflected in the high numbers of parrots exported by SADC countries as live birds. Exports of live parrots increased over the period 2005-2014 (from 50 000 live birds in 2005 to over 300 000 in 2014 according to exporting countries), with western Asia (particularly Oman, Bahrain and Lebanon) emerging as a key import region of live parrots. South Africa (captive-produced birds) and the Democratic Republic of the Congo (wild-sourced birds) were the main exporters, while *Psittacus erithacus* (African Grey Parrot) and *Agapornis fischeri* (Fischer's Lovebird) were the most exported species.

Live *Crocodylus niloticus* and *C. niloticus* products (mainly skins for the fashion industry) represented the largest volume of **reptile** exports from the SADC region; live, wild-sourced Sauria (lizards), particularly from Tanzania, Madagascar and Mozambique, and captive-bred Testudines (tortoises) from Zambia were also exported in high numbers for the pet market. Wild-sourced lizards exported included globally threatened Malagasy endemics, although trade in these declined after 2010 following the introduction of lower export quotas. The United States of America and the EU (European Union) were the major importers of live lizards.

Hoodia gordonii (Bitter Ghaap) seeds were the **succulent plant** products exported in the largest quantity. *Hoodia gordonii* seeds were traded in high volumes particularly during 2007-2008 (over 90 million seeds over the two-year period), when the species was the focus of attention by international pharmaceutical companies researching its properties as a dietary supplement. Stems of *Rhipsalis* (Mistletoe Cacti, the only Cactaceae genus with a representation outside of the Americas) and live *Rhipsalis* plants also formed a large proportion of exports, mainly as ornamental plants. South Africa was the predominant exporter of live succulents and succulent products, while the Netherlands (stems and live plants for the ornamental trade) and Namibia (*Hoodia gordonii* seeds) were the main destination countries for South Africa's exports.

Live **cycads** are highly valued in the ornamental plant trade and an average of approximately 10 000 live cycads were exported per year from the region, mostly as artificially-propagated plants. Exports from South Africa formed the majority of trade in cycads; Mozambique was a main exporter prior to a trade suspension in 2005. *Cycas thouarsii* (Madagascar Cycad) and *Encephalartos* species formed the majority of trade, with large numbers of South African endemic *Encephalartos* species being exported. Trade was with a variety of countries, with Thailand (live cycads), Israel (seeds) and France (leaves) being top importers of cycads from the region.

The total **financial value** of CITES-listed exports from the region (excluding some taxa and products for which insufficient data on prices was available) is estimated to be USD340 million per year (USD3.4 billion over the ten-year period). The highest-value trade in individual taxa related to *Pericopsis elata* (estimated at USD73 million per year), *Arctocephalus pusillus* (Cape Fur Seal; USD64 million per year), *Crocodylus niloticus* (USD57 million per year), and *Psittacus erithacus* (USD31 million per year).The total financial value of the international trade in the case study groups analysed was estimated at an average of over USD150 million per year (USD1.5 billion over the ten-year period), with reptiles (40% of the value when excluding trophies; USD62 million per year), parrots (38%; USD58 million per year) and succulent plants (16%; USD14 million per year), representing the groups with the highest estimated value. The estimated value of the hunting trophies exported was an average of USD6.5 million per year. These estimates do not take into account additional financial values associated with the trade.

When criteria to identify species traded at high volumes or showing a sharp increase in trade over the period are applied, 104 CITES-listed species native to, and exported from, the SADC Region showed **noteworthy trends** (high volume and/or sharp increase) based on an analysis equivalent to that used to inform the CITES Review of Significant Trade process. Reptiles were the group with the highest number of species showing noteworthy trends, with 36 species meeting the selection criteria. Madagascar was the top exporter for these species amongst the SADC countries, exporting 63 of the 104 (61%) selected species during 2005-2014, and was the top global exporter for 62 of these species.

Nearly one thousand species native to the SADC Region were exported from non-SADC countries 2005-2014, both as wild-sourced and captive-bred or artificially-propagated. Nearly 500 of these species are endemic to a single SADC country. Exports from SADC countries account for a small proportion of the global trade in these species, potentially indicating an opportunity for development of sustainable use systems in SADC range countries.

Recommendations arising from the report, including on reporting of trade data, management and conservation considerations, and areas for future work are outlined in section 7 of the report.

01 | Introduction

This report provides a comprehensive overview of wildlife trade in the SADC Region during the period 2005-2014. The aim of this analysis is to provide a baseline of trade levels and trends in southern Africa, and to inform future trade management in the Region, in order to ensure that wildlife trade is legal, sustainable and traceable.

The analysis summarises both exports from and imports into the SADC Region, as well as trade within the Region, providing regional as well as national insights and focusing on the case studies of greatest relevance to the Region, i.e. hunting trophies, felids, parrots, reptiles, succulent plants and cycads. The analysis also includes a financial valuation of the trade, an assessment of noteworthy trade trends, and information on species native to the Region that are traded by other countries.

The analysis is based on CITES trade data reported by SADC countries, as well as by their trading partners, in their annual reports to CITES and available in the CITES Trade Database (trade.cites.org). The SADC countries considered in this analysis are: Angola, Botswana, Democratic Republic of Congo (hereafter referred to as the DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania (hereafter referred to as Tanzania), Zambia and Zimbabwe (see Figure 1.1). Further details on the data included and methods applied throughout the analysis are available in Annex A.

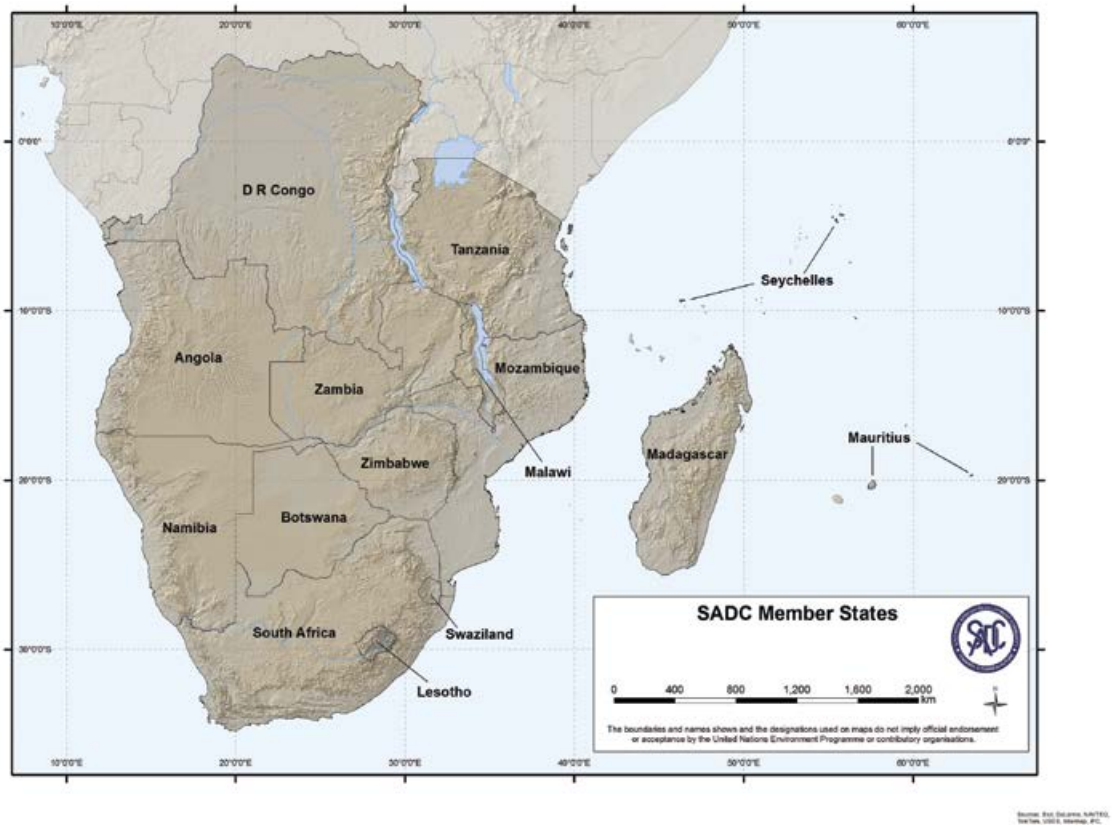


Figure 1.1: Map of the Southern African Development Community (SADC) Member States

02 | Overview

This chapter provides a general overview of wildlife trade in southern Africa. More detailed insights into the trade in groups of particular interest to the Region are presented in the chapters that follow.

2.1 Exports

Direct exports

The majority of exports by southern Africa were directly traded from the countries of origin. A short overview of direct exports is provided here, with a detailed overview of direct exports by each SADC country provided in Chapter 3.

The most highly traded commodity by SADC countries (based on quantities in trade) was seeds of *Hoodia gordonii* (Bitter Ghaap), which has purported weight loss properties (Van Heerden, 2008; Landor et al., 2016). The seeds were reported as both artificially-propagated (51%) and wild-sourced (49%). This trade was reported in 2007 (30 110 000 seeds) and 2008 (62 000 000 seeds) only; no other trade in this commodity was reported 2005-2006 and 2009-2014. The other commodities in trade in high volumes included live plants and plant parts and derivatives (extract and flowers), *Prunus africana* (African Cherry) bark, *Crocodylus niloticus* (Nile Crocodile) meat and skins, and an increasing trend in exports of live parrots (Table 2.1.1).

Virtually all high volume trade presented in Table 2.1.1 was for commercial purposes with the exception of *Hoodia gordonii*, which was predominantly exported for scientific purposes (84%), according to exporters. Countries of import reported that virtually all this trade was for commercial purposes.

Table 2.1.1: Commodities exported by SADC countries in quantities greater than 1 000 000 units 2005-2014, by group (all sources) in descending order by quantity, as reported by exporters. Source: CITES Trade Database, UNEP-WCMC. See Annex B for the full list of source codes.

Group	Commodity (unit)	Quantity	Main source (%)	# Taxa involved	Main taxa (%)
Plants	seeds	92 279 805	A (51%); W (49%)	87	*Hoodia gordonii* (>99%) Bitter Ghaap
Plants	extract (kg)	4 910 211	W (99%)	6	*Aloe ferox* (98%) Cape Aloe
Plants	flowers	3 607 490	A (>99%)	36	*Rhipsalis baccifera* (33%) Mistletoe Cactus *Rhipsalis* species (99%)
Timber	bark (kg)	2 184 088	W (100%)	1	*Prunus africana* (100%) African Cherry
Plants	live	1 735 572	A (91%)	923	*Hoodia gordonii* (22%) Bitter Ghaap
Reptiles	meat (kg)	1 605 025	C (74%)	1	*Crocodylus niloticus* (100%) Nile Crocodile
Reptiles	skins	1 448 136	C (65%)	2	*Crocodylus niloticus* (>99%) Nile Crocodile
Birds	live	1 215 143	C (92%)	290	*Psittacus erithacus* (29%) African Grey Parrot Family Psittacidae (93%)

Table 2.1.2: Commodities, by threatened species, exported by SADC countries at quantities greater than 50 000 units, 2005-2014 (all sources except 'I'), as reported by exporters[1]. Source: CITES Trade Database, UNEP-WCMC. See Annex B for the full list of source codes.

Taxa (IUCN Red List status)	Commodity (unit)	Quantity	Main source (%)	Top exporter (%)
Prunus africana (VU) African Cherry	bark (kg)	2 184 088	W (100%)	DRC (98%)
Psittacus erithacus (VU) African Grey Parrot	live	356 194	C (79%)	South Africa (83%)
Rhipsalis pilocarpa (VU)	flowers	286 334	A (100%)	Tanzania (100%)
Pericopsis elata (EN) African Teak	timber (m^3)	195 814	W (100%)	DRC (100%)
Rhipsalis pilocarpa (VU)	live	123 000	A (100%)	South Africa (100%)
Rhipsalis mesembryanthemoides (CR)	flowers	94 898	A (100%)	Tanzania (100%)
Loxodonta africana (VU) African Elephant	tusks (kg)	93 680	W (100%)	South Africa (54%)
Aratinga solstitialis (EN) Sun Parakeet	live	89 795	C (99%)	South Africa (99%)

IUCN Red List: CR: Critically Endangered; EN: Endangered; VU: Vulnerable.

In addition to *Hoodia gordonii* seeds, *Aloe ferox* (Cape Aloe) extract and *Prunus africana* bark (Table 2.1.1), the main wild-sourced commodities exported in high volumes from SADC countries were *Aloe ferox* leaves, *Arctocephalus pusillus* (Cape Fur Seal) skins and live reptiles. Virtually all of the approximately 409 400 wild-sourced mammal skins exported by southern Africa 2005-2014 were *Arctocephalus pusillus* (Cape Fur Seal), with trade mainly exported from Namibia (96%) to Turkey as the main country of import (50%). Sauria species (lizards) accounted for the majority (95%) of the approximately 397 400 wild-sourced live reptile exports in 2005-2014, with most trade originating in Madagascar (49%) and Tanzania (37%), and imported by the United States of America (hereafter referred to as the United States) (41%).

The most highly traded commodity of threatened taxa (those categorised as Critically Endangered, Endangered or Vulnerable in the IUCN Red List), by species, was *Prunus africana* bark (Table 2.1.2).

When considering the number of different taxa in trade, the main group of threatened species exported by southern African countries over the ten years were plants (Figure 2.1.1), with South Africa exporting the greatest number of globally threatened and Near Threatened taxa for all IUCN categories considered[2].

Arctocephalus pusillus, by Hans Hillewaert via Wikimedia Commons

1 In addition, flowers and live plants of one Data Deficient species, *Rhipsalis ewaldiana*, were also exported at quantities exceeding 50 000 units, 2005-2014.

2 This refers to the number of different taxa in trade and not the quantities in trade.

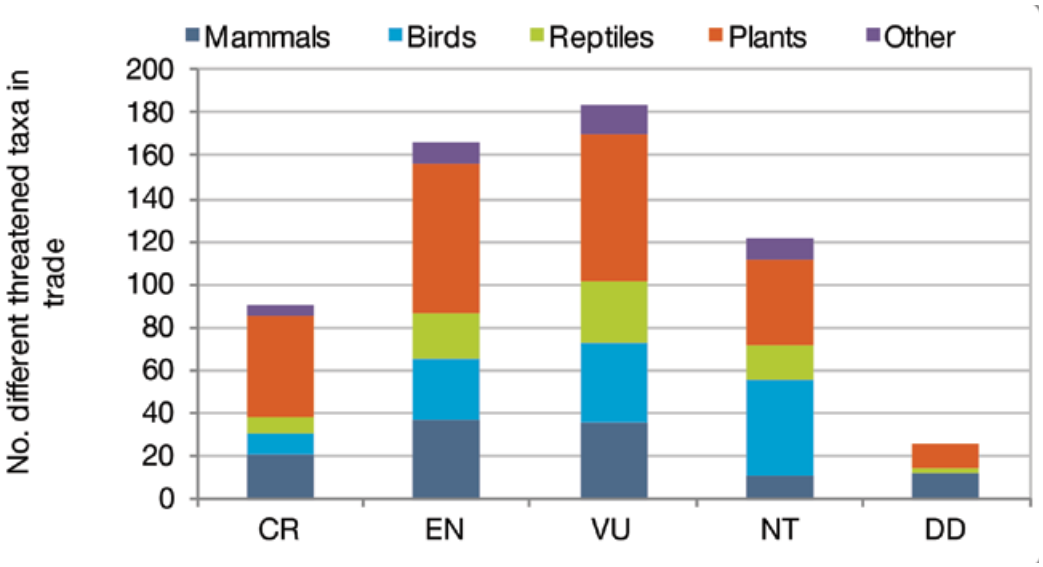


Figure 2.1.1: The number of globally threatened and Near Threatened taxa exported by SADC countries 2005-2014, by IUCN Red List status and group, all sources except source 'I', as reported by exporters. The category 'Other' includes small numbers of amphibian, coral, fish, invertebrate and timber taxa in trade. IUCN Red List: CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; DD: Data Deficient.

Estimated financial value of trade

While an estimate of the approximate financial value of international trade from the Region was produced for each of the six case studies and is presented in the relevant sections, a high-level overview is provided here. These estimates were calculated by multiplying reported trade volumes by median prices gathered from retail websites (for plants), and prices reported to customs at the point of import into the United States between 2006 and 2014 (for animals). The resulting value figures are estimates and should be treated with caution as the accuracy of all prices cannot be confirmed, and some combinations of traded taxa, terms or units could not be valued at the species level (see methodology in Annex A for more details). While not all taxa and products in trade could be assigned a financial value, using only those that could be, the total financial value

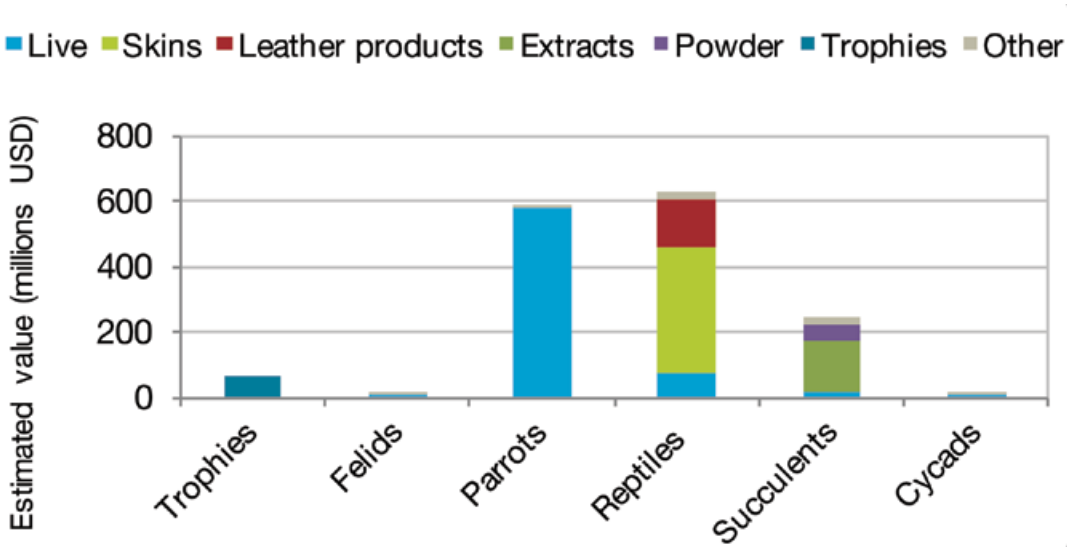


Figure 2.1.2: Total estimated financial value and value of major trade terms for exports by SADC countries 2005-2014 of each case study group presented in this report, all sources except source 'I', as reported by exporters. The category 'Other' includes all trade terms that comprised less than 5% of the total estimated value of the case study.

of exports from the region is estimated to be USD340 million per year (USD3.4 billion over the ten-year period). The value of those groups included as case studies is estimated at USD150 million per year (USD1.5 billion over the ten-year period). This does not include high-value products in trade such as *Pericopsis elata* (estimated at USD73 million per year) or *Arctocephalus pusillus* (Cape Fur Seal; USD64 million per year), the two taxa with the highest estimated value in total. Amongst the case study group, reptile exports had the highest estimated value of all of the case studies, followed by parrots and succulents (Figure 2.1.2).

Indirect trade

The most highly traded commodity re-exported by southern African countries (based on quantities in trade) was reptile small leather products (Table 2.1.3), which largely originated in the United States (73%), re-exported by Mauritius (71%) and imported by France (61%).

Table 2.1.3: Commodities re-exported by SADC countries in quantities greater than 10 000 units 2005-2014, by group (all sources), as reported by exporters. Source: CITES Trade Database, UNEP-WCMC. See Annex B for the full list of Source codes.

Group	Commodity (unit)	Quantity	Main source (%)	Top origin (%)	Top (re-) exporter (%)	Top importer (%)	Main taxa
Reptiles	leather products (small)	1 841 354	W (69%)	United States (73%)	Mauritius (71%)	France (61%)	*Alligator mississippiensis* (73%) American Alligator
Reptiles	skins	71 198	R (82%)	Zambia (51%)	Botswana (51%); South Africa (48%)	Singapore (53%)	*Crocodylus niloticus* (100%) Nile Crocodile
Reptiles	skin pieces	42 834	C (45%)	United States (46%)	South Africa (54%)	France (40%)	*Crocodylus niloticus* (53%) Nile Crocodile
Mammals	skins	35 768	W (>99%)	Namibia (95%)	South Africa (>99%)	Turkey (44%)	*Arctocephalus pusillus* (95%) Cape Fur Seal

Crocodylus niloticus, by Steve Slater via Flickr

2.2 Imports

The majority of imports comprised direct trade from the country of origin. Seeds of *Hoodia gordonii* represent the commodity imported in the highest volumes by countries in the Region during 2005-2014, with 50 300 400 seeds imported in 2007 and 2008 only (Table 2.2.1). The majority (70%) of these seeds were artificially-propagated and virtually all were imported by Namibia directly from South Africa.

Table 2.2.1: Direct and indirect imports of commodities by SADC countries in quantities greater than 100 000 units 2005-2014, by group (all sources), as reported by countries of import. Source: CITES Trade Database, UNEP-WCMC. See Annex B for the full list of Source codes.

Group	Commodity (unit)	Quantity	Main source (%)	Top (re-) exporter (%)	Top importer (%)	Main taxa (%)
Plants	seeds	50 406 140	A (70%)	South Africa (>99%)	Namibia (>99%)	*Hoodia gordonii* (>99%) Bitter Ghaap
Timber	bark (kg)	743 560	W (100%)	DRC (59%)	Madagascar (100%)	*Prunus africana* (100%) African Cherry
Reptiles	skin pieces	389 172	W (66%)	France (48%)	Madagascar (81%)	*Alligator mississippiensis* (68%) American Alligator
Reptiles	live	228 404	R (84%)	Mozambique (97%)	South Africa (94%)	*Crocodylus niloticus* (97%) Nile Crocodile
Reptiles	leather products (small)	194 889	W (75%)	France (37%)	Madagascar (72%)	*Alligator mississippiensis* (76%) American Alligator
Plants	live	131 290	A (96%)	China (30%); Thailand (30%)	South Africa (92%)	*Paphiopedilum hybrid* (16%) Orchid hybrid
Reptiles	skins	112 611	C (61%)	Zimbabwe (48%)	South Africa (96%)	*Crocodylus niloticus* (>99%) Nile Crocodile

Hoodia gordonii, by Cerlin Ng via Flickr

03 | Country Profiles

This chapter provides an overview of direct exports from each SADC country, including estimated valuations[3]. For each country where there are sufficient trade data available, each country profile contains a map showing the main commodities exported in 2005-2014 and the top importing countries for each (with arrows of three sizes representing the first, second and third biggest importers of each commodity). A chart is also included for each country, presenting an overview of direct exports, 2005-2014. These charts represent trade that could be equated to one individual animal or plant (see Annex A for details on methodology), grouped by source, commodity and taxa, for those combinations that made up at least 1% of the total trade (Figure 3.1).

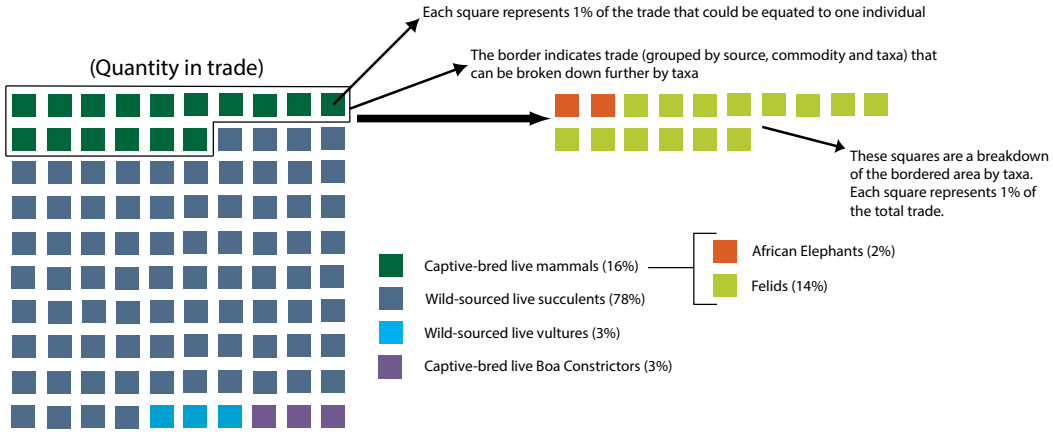


Figure 3.1: Example of direct exports by a SADC country 2005-2014, of commodities that could be equated to one individual. Source CITES Trade Database, UNEP-WCMC.

Hoodia gordonii, by Winfried Bruenken via Wikimedia commons

3 All valuations are based on direct exports, excluding Source 'I' and trade for scientific purposes. Not all trade could be valued, so these figures are likely to be underestimates. Full details of methods and caveats can be found in Annex A.

4 The levels of reported trade from Angola were too low to represent in a trade map or chart.

Angola

Angola became a Party to CITES at the end of 2013 and has therefore not provided any annual reports of trade to date. All trade data for Angola were as reported by the countries of import and the levels of trade from the country were very low compared to other SADC countries[4].

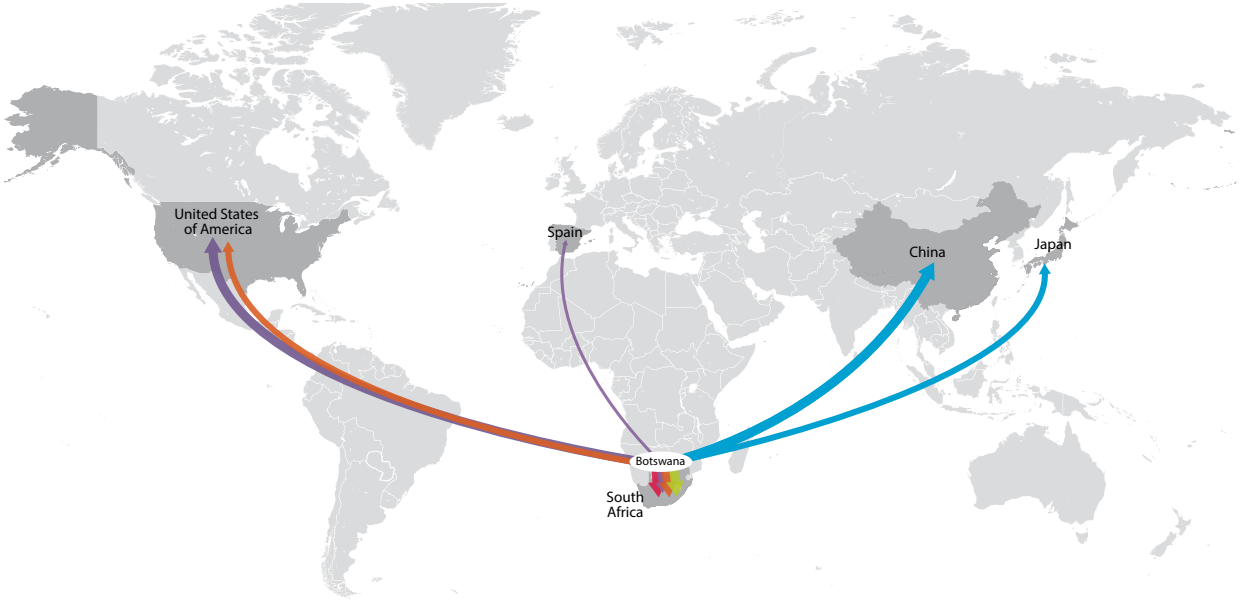
The most highly traded commodity by Angola, based on quantities in trade, was 139 source 'I' (seized) *Loxodonta africana* (African Elephant) ivory carvings, mainly reported by Portugal (76%) without a purpose specified. Other comparatively high volume commodities in trade included 20 wild-sourced scientific specimens of *Pan troglodytes* (Chimpanzee) imported by South Africa, 12 wild-sourced live *Psittacus erithacus* (African Grey Parrot) mainly imported by Portugal (57%) as personal items, and eight wild-sourced *Cordylus* species (spiny-tailed lizards) specimens imported by the United States for scientific purposes.

The value of Angola's CITES exports between 2005 and 2014, as reported by importers, was estimated at USD17 000. The products with the highest total estimated value exported from Angola were live *P. erithacus* (USD7272), live *Pan troglodytes* (USD6600) and live *Chlorocebus aethiops* (Grivet Monkey) (USD1140).

Loxodonta africana, by Bernard Dupont via Flickr

Botswana

The most highly traded commodity from Botswana was *Crocodylus niloticus* (Nile Crocodile) skins, predominately ranched (89%), imported entirely by South Africa 2012-2014 (Figures 3.2 and 3.3). *Loxodonta africana* (African Elephant) tusks and ivory pieces exported as part of the legal sell-off of stock-piled ivory in 2008, represented the second-highest commodity in trade, and wild-sourced mammal trophies, of which *L. africana* comprised 82%, was the third. Between 2005 and 2014, the value of Botswana's CITES exports as reported by Botswana was estimated at USD12.4 million. The products with the highest total estimated value exported from Botswana were *L. africana* trophies (USD5 290 992), *C. niloticus* skins (USD3 025 140) and *L. africana* tusks (USD1 220 268).



Nile Crocodile skins	
Total trade:	**9,500**
South Africa	100%

African Elephant tusks	
Total trade:	**6,132**
China	66%
Japan	34%

Mammal trophies	
Total trade:	**4,976**
United States	51%
South Africa	21%
Spain	10%

African Elephant skin pieces	
Total trade:	**3,138**
South Africa	47%
United States	34%

Nile Crocodile trophies	
Total trade:	**1,824**
South Africa	99%

Figure 3.2: Main destination countries of key commodities exported by Botswana 2005-2014 (excluding source I and scientific specimens). Source CITES Trade Database, UNEP-WCMC.

Crocodylus niloticus, by Pim Stouten via Flickr

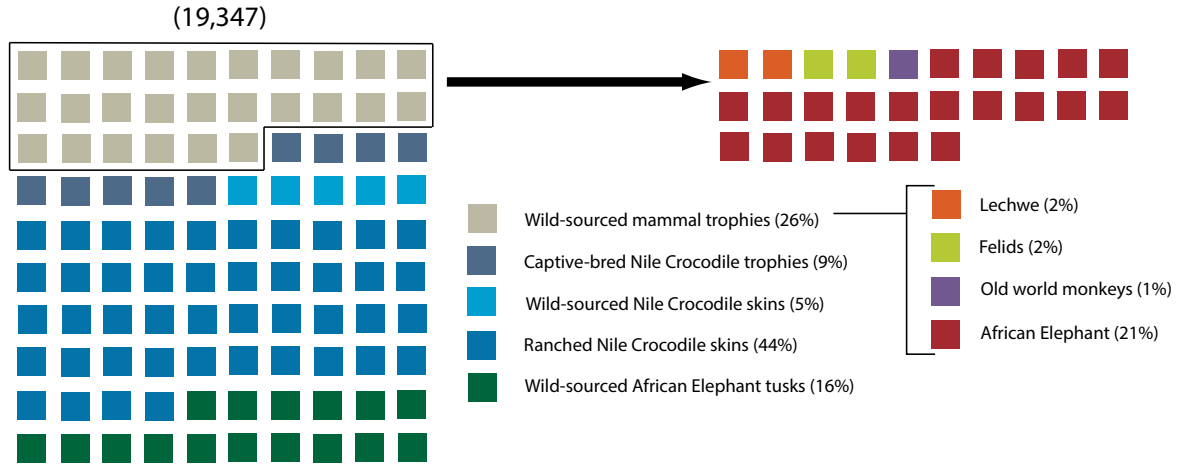
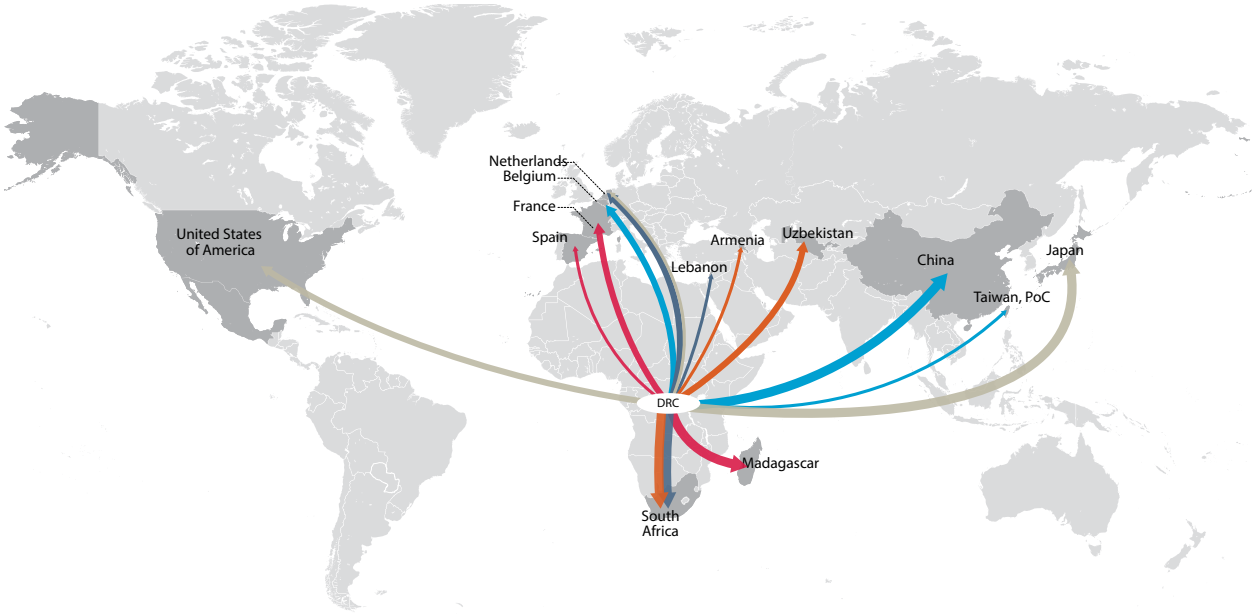


Figure 3.3: Direct exports by Botswana 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Loxodonta africana, by Arno Meintjes via Flickr

The Democratic Republic of the Congo

The most highly traded commodities by DRC 2005-2014 were wild-sourced *Prunus africana* (African Cherry) bark, mainly destined to Madagascar, France and Spain, and *Pericopsis elata* (Afrormosia) timber, going mainly to China and Belgium. This trade comprised virtually all trade in these commodities from the SADC Region (Figure 3.4). *P. africana* bark is used in the treatment of benign prostatic hyperplasia (BPH) (Bodeker *et al.*, 2014). Trade in *P. africana* declined significantly between 2008 and 2009, with no trade reported 2009-2011, coinciding with an EU import restriction in 2008. The restriction was lifted in 2012 and replaced with a "positive opinion" for bark from specific regions with annual export quotas. The main animal commodity exported was wild-sourced live parrots, of which *Psittacus erithacus* (African Grey Parrot) was the main species in trade (Figure 3.5). Between 2005 and 2014, the value of DRC's CITES exports as reported by exporters was estimated at USD933.1 million. The products with the highest total estimated value exported from DRC were *Pericopsis elata* timber (USD734.4 million), *Prunus africana* bark (USD166.7 million), and live *Psittacus erithacus* (USD30.6 million).



African Cherry bark (kg)	
Total trade:	**2,143,000**
Madagascar	28%
France	26%
Spain	20%

Afrormosia timber (m3)	
Total trade:	**195,814**
China	51%
Belgium	11%
Taiwan, PoC	8%

Live parrots	
Total trade:	**62,790**
South Africa	30%
Netherlands	12%
Lebanon	11%

Live reptiles	
Total trade:	**5,123**
Japan	32%
United States	26%
Netherlands	18%

Live old world monkeys	
Total trade:	**298**
South Africa	35%
Uzbekistan	17%
Armenia	17%

Figure 3.4: Main destination countries of key commodities exported by DRC 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

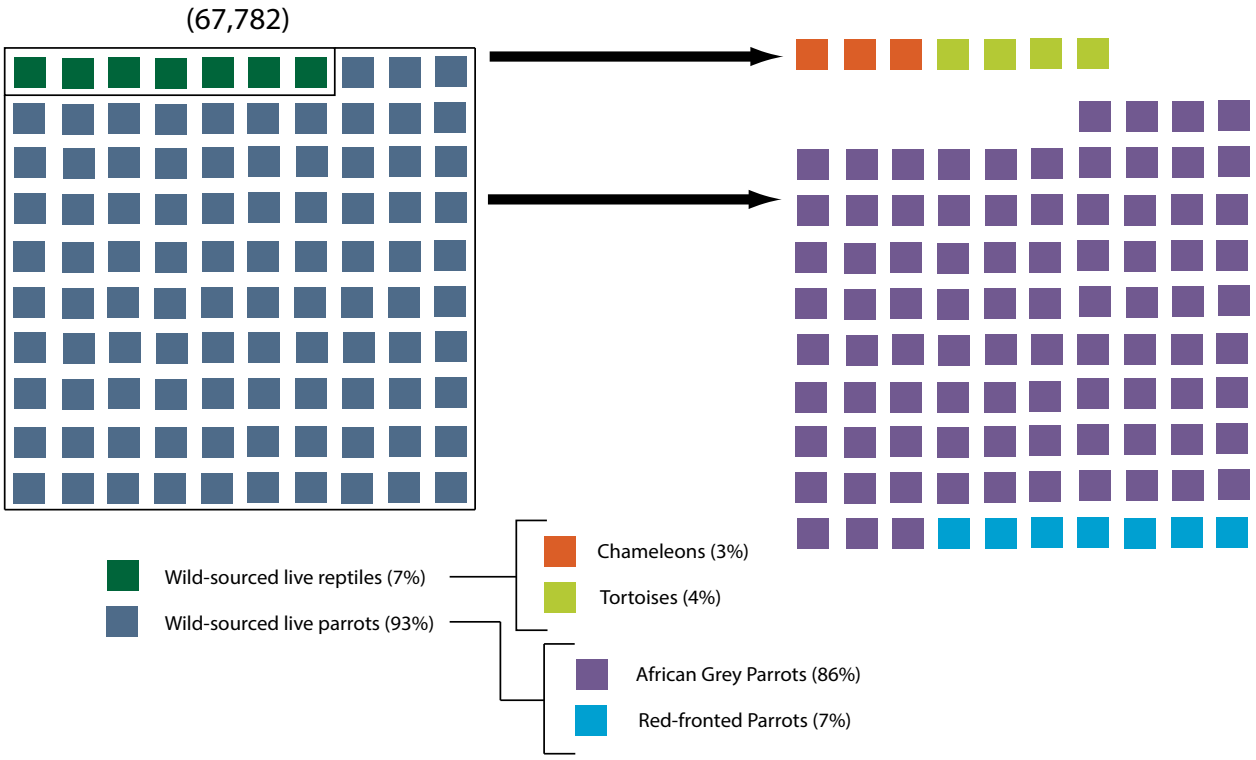


Figure 3.5: Direct exports by DRC 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Pericopsis elata, by Kristina Osen

Lesotho

Lesotho reported that no trade in CITES-listed species had occurred 2005-2008. Since 2008, no annual reports have been received from Lesotho and on 17/05/2013 a notification to the CITES parties (No. 2013/020) recommended a suspension of all trade for non-submission of annual reports. All trade discussed is therefore as reported by the countries of import, with no trade reported in 2014, in accordance with the trade suspension. All trade from Lesotho 2005-2014 was in live individuals imported by South Africa, of which wild-sourced succulent plants was the main group in trade (Figures 3.6 and 3.7). Between 2005 and 2014, the value of Lesotho's CITES exports as reported by Lesotho was estimated at USD66 800. The products with the highest total estimated value exported from Lesotho were live *Loxodonta africana* (African Elephant) (USD32 760), live *Panthera leo* (Lion) (USD16 666), and live *Panthera tigris* (Tiger) (USD15 960).

Figure 3.6: Main destination countries of key commodities exported by Lesotho 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

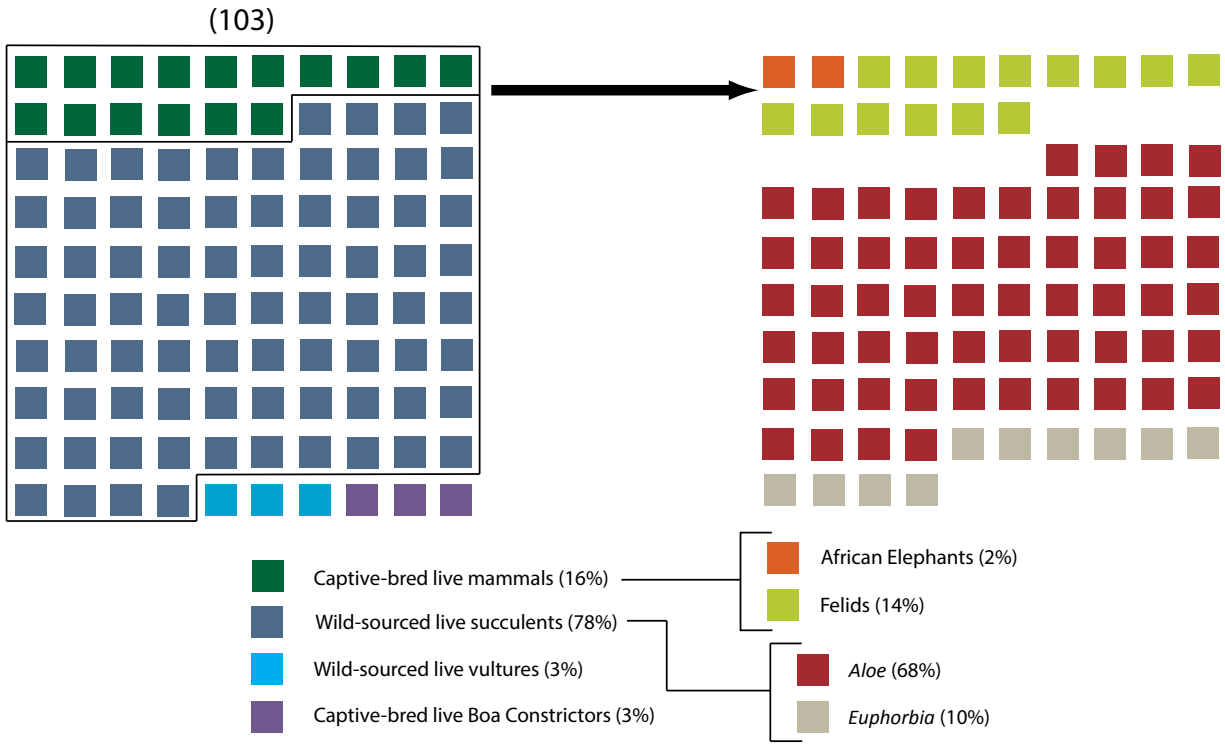


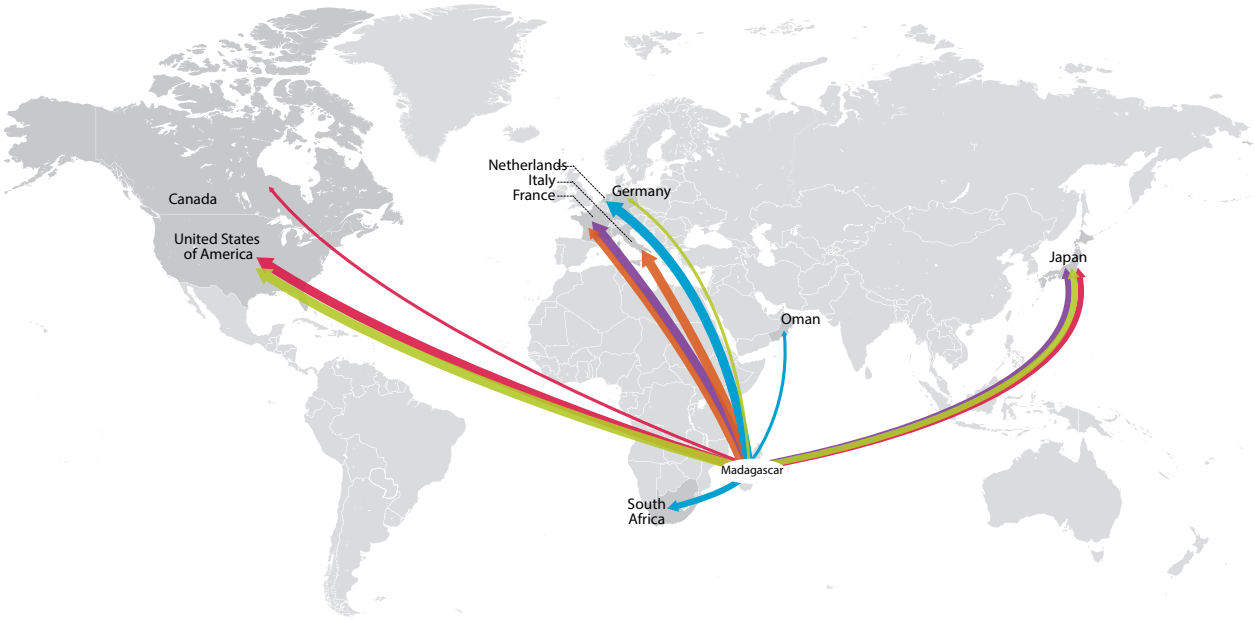
Figure 3.7: Direct exports by Lesotho 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Hippopotamus amphibius, by Michael Jansen via Flickr

Madagascar

The main trade in animal exports from Madagascar comprised live, wild-sourced reptiles (mainly Sauria species) and amphibians (mainly *Mantella* species), with the United States and Japan representing top import markets for both (Figures 3.8 and 3.9). Live plant and plant seeds comprised the majority of Madagascar's flora exports in 2005-2014 (Figures 3.10, 3.11 and 3.12). The live plants, which mainly consisted of succulent species, were a mix of wild-sourced and artificially-propagated and were largely exported to France and the United States. Between 2005 and 2014, the value of Madagascar's CITES exports as reported by Madagascar was estimated at USD27.1 million (76% of which was from trade in animal products). The products with the highest total estimated value exported from Madagascar were *Crocodylus niloticus* (Nile Crocodile) skins (USD6.6 million), leather products (USD6.5 million), trophies (USD1.6 million).

Animals



Live reptiles	
Total trade:	**193,794**
United States	37%
Japan	14%
Germany	13%

Live amphibians	
Total trade:	**124,817**
United States	55%
Japan	11%
Canada	10%

Nile Crocodile skins	
Total trade:	**22,150**
France	51%
Japan	49%

Live parrots	
Total trade:	**4,903**
Netherland	49%
South Africa	21%
Oman	10%

Nile Crocodile trophies	
Total trade:	**3,796**
Italy	82%
France	14%

Figure 3.8: Main destination countries of key animal commodities exported by Madagascar 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

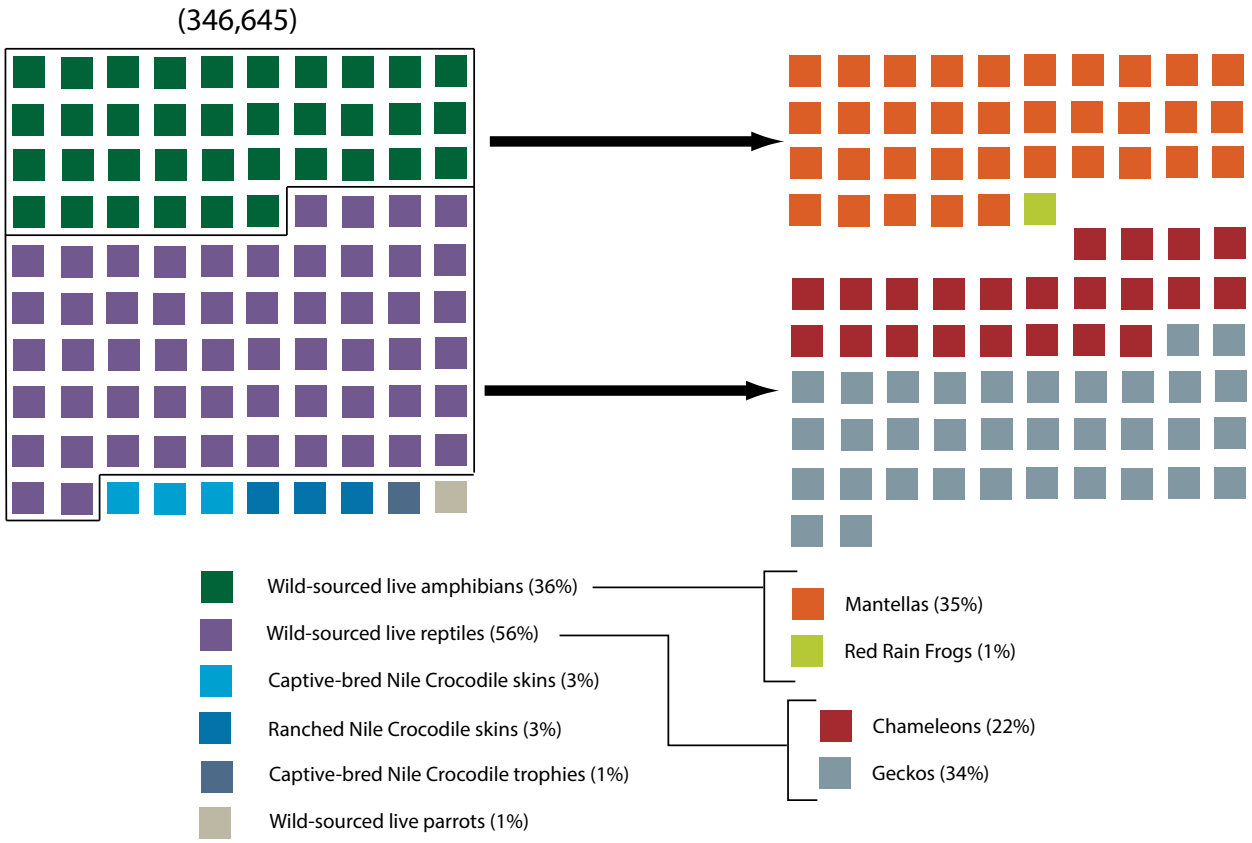
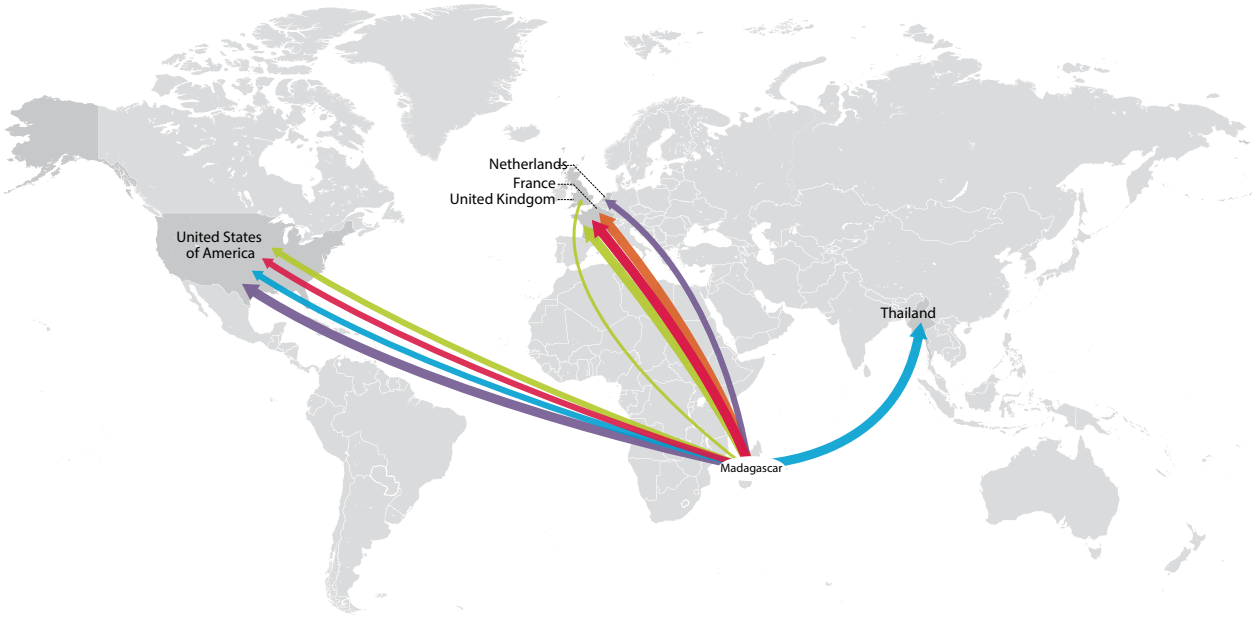


Figure 3.9: Direct exports by Madagascar 2005-2014, of animal commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Mantella pulchra, by Frank Vassen via Flickr

Plants



Live plants	
Total trade:	**166,919**
France	51%
United States	17%

Plant seeds	
Total trade:	**73,295**
Thailand	74%
United States	24%

Plant seeds (kg)	
Total trade:	**46,032**
United States	85%
Netherlands	11%

African Cherry bark (kg)	
Total trade:	**16,087**
France	100%

Dried plants	
Total trade:	**8,413**
France	51%
United States	28%
United Kingdom	10%

Figure 3.10: Main destination countries of key plant commodities exported by Madagascar 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Pachypodium rosulatum, by Megan Hansen via Flickr

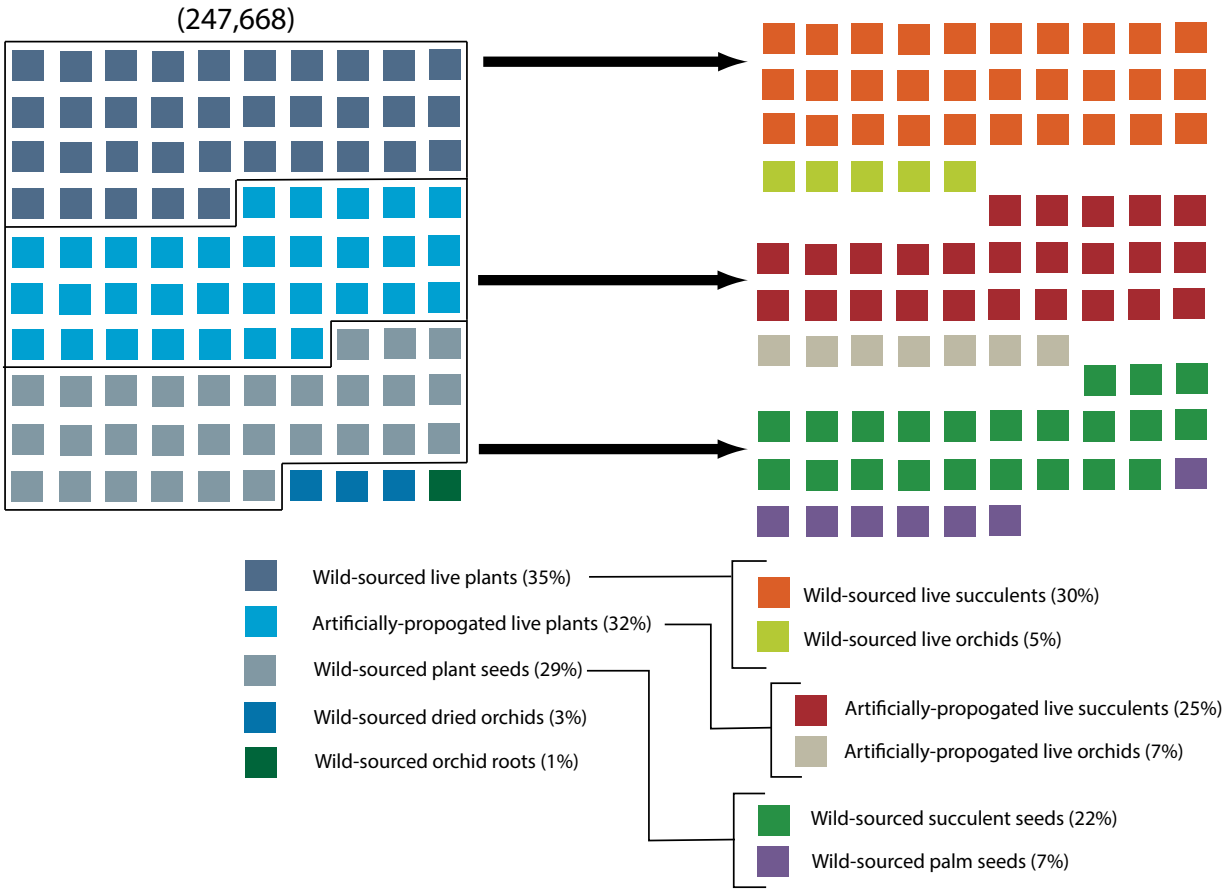


Figure 3.11: Direct exports by Madagascar 2005-2014, of plant commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

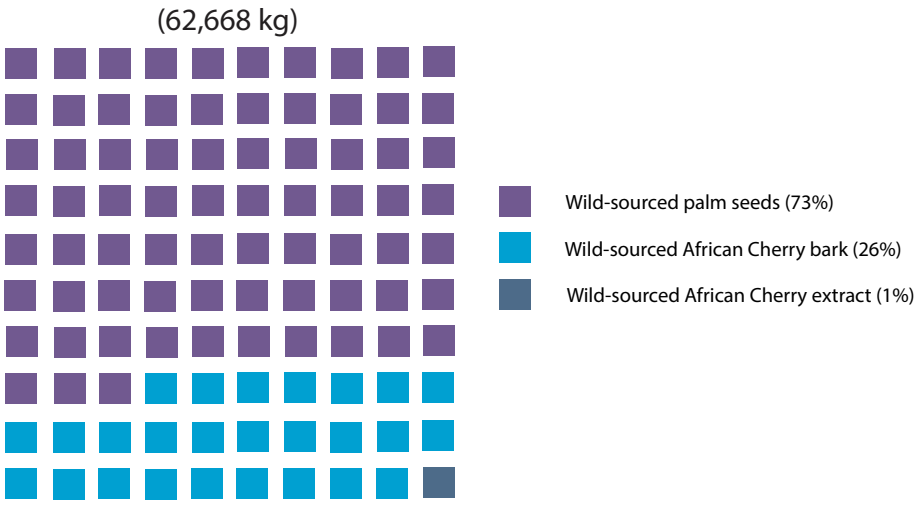
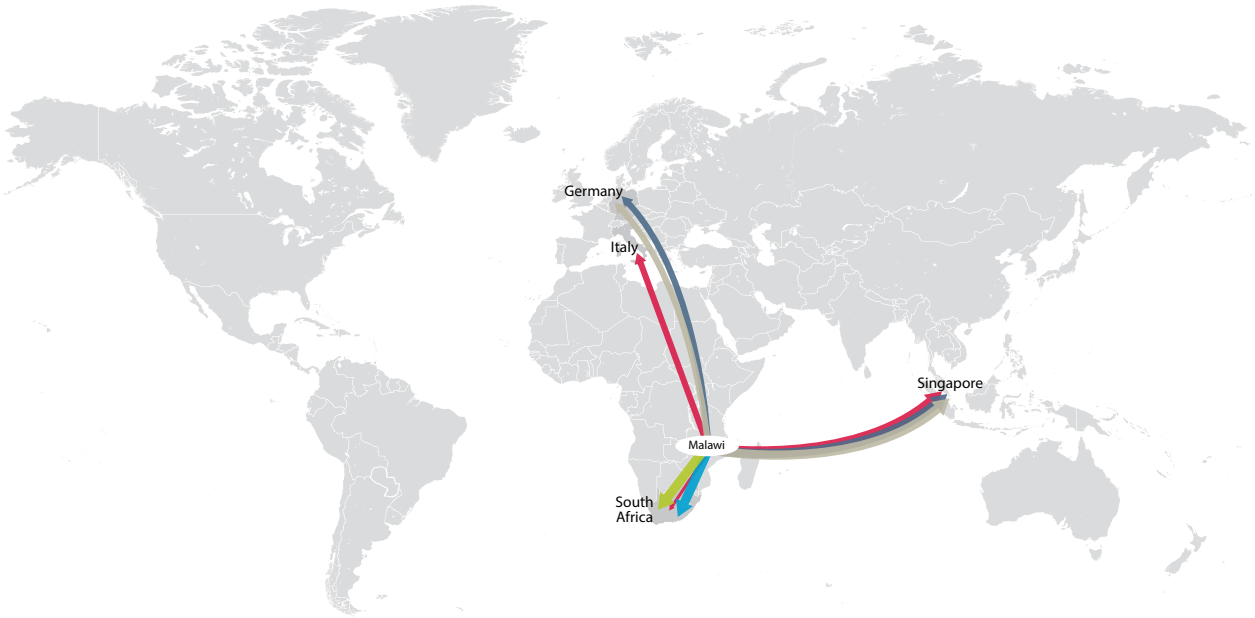


Figure 3.12: Direct exports by Madagascar 2005-2014, of plant commodities reported in kg (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Malawi

The main commodity exported by Malawi in 2005-2014 was *Crocodylus niloticus* (Nile Crocodile) skins (mostly ranched), which were imported mainly by Singapore, Italy and South Africa (Figures 3.13 and 3.14). Malawi's top exported products also included wild-sourced *Loxodonta africana* (African Elepahant) ivory carvings exported to South Africa. Between 2005 and 2014, the value of Malawi's CITES exports as reported by Malawi was estimated at USD14.4 million. The products with the highest total estimated value exported from Malawi were *L. africana* ivory carvings (USD7.5 million), and *C. niloticus* skins (USD6.5 million) and trophies (USD188 386).



Nile Crocodile skins	
Total trade:	**21,539**
Singapore	36%
Italy	25%
South Africa	19%

African Elephant ivory carvings	
Total trade:	**2,004**
South Africa	100%

Nile Crocodile skin pieces	
Total trade:	**1,443**
Singapore	69%
Germany	31%

Crocodile trophies	
Total trade:	**1,404**
Singapore	71%
Germany	28%

Hippopotamus teeth (kg)	
Total trade:	**899**
South Africa	100%

Figure 3.13: Main destination countries of key commodities exported by Malawi 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Loxodonta africana, by Michael Jansen via Flickr.

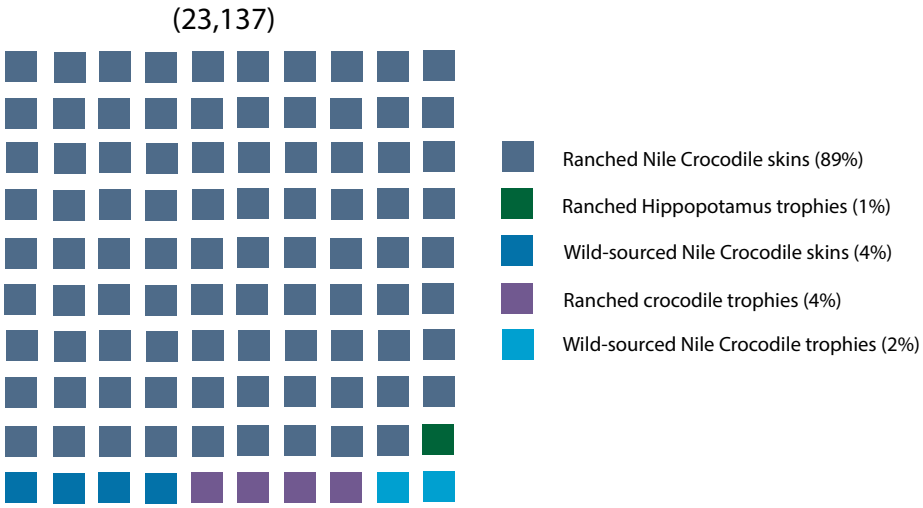
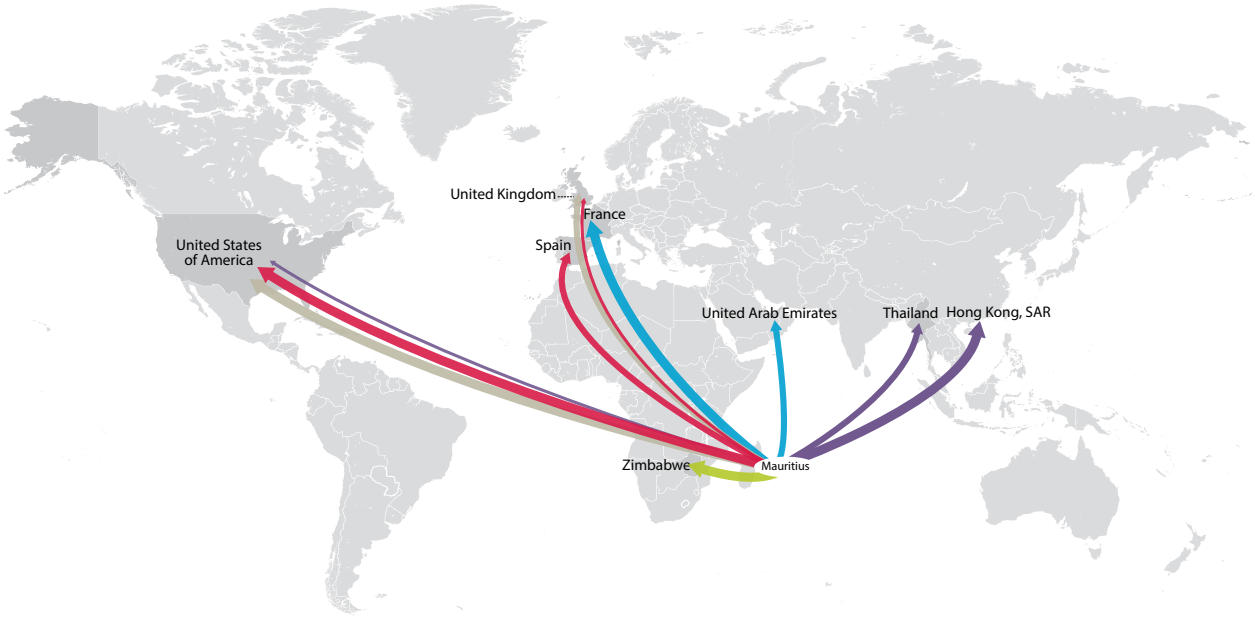


Figure 3.14: Direct exports by Malawi 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Crocodylus niloticus, by Arno Meintjes via Flickr

Mauritius

Mauritius' main export 2005-2014 was live *Macaca fascicularis* (Long-tailed Macaque), of which the majority were captive-bred (Figures 3.15 and 3.16). *Macaca fascicularis* is native to Southeast Asia that has been introduced to Mauritius. This trade was mainly destined for the United States, Spain and the United Kingdom. Leaves of artificially-propagated *Cycas circinalis* (Sago Palm), an Endangered species endemic to southern India, were exported in relatively high quantities to France and the United Arab Emirates. The live tortoises in trade were virtually all *Aldabrachelys gigantea* (Aldabra Giant Tortoise) exported to Hong Kong Special Administrative Region (hereafter Hong Kong, SAR) and Thailand. *A. gigantea* is a globally Vulnerable species native to the Seychelles that has been introduced to various neighbouring countries, including Mauritius. Between 2005 and 2014, the value of Mauritius's CITES exports as reported by Mauritius was estimated at USD184 million. The products with the highest total estimated value exported from Mauritius were live *M. fascicularis* (USD1176 million) and specimens (USD5 million), and live *A. gigantea* (USD2.0 million).



Live Long-tailed Macaques	
Total trade:	**67,299**
United States	48%
Spain	18%
United Kingdom	18%

Sago-palm leaves	
Total trade:	**14,960**
France	79%
United Arab Emirates	19%

Live tortoises	
Total trade:	**2,534**
Hong King, SAR	28%
Thailand	25%
United States	16%

Bird eggs	
Total trade:	**2,400**
United States	50%
United Kingdom	50%

Nile Crocodile skins	
Total trade:	**1,292**
Zimbabwe	96%

Figure 3.15: Main destination countries of key commodities exported by Mauritius 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

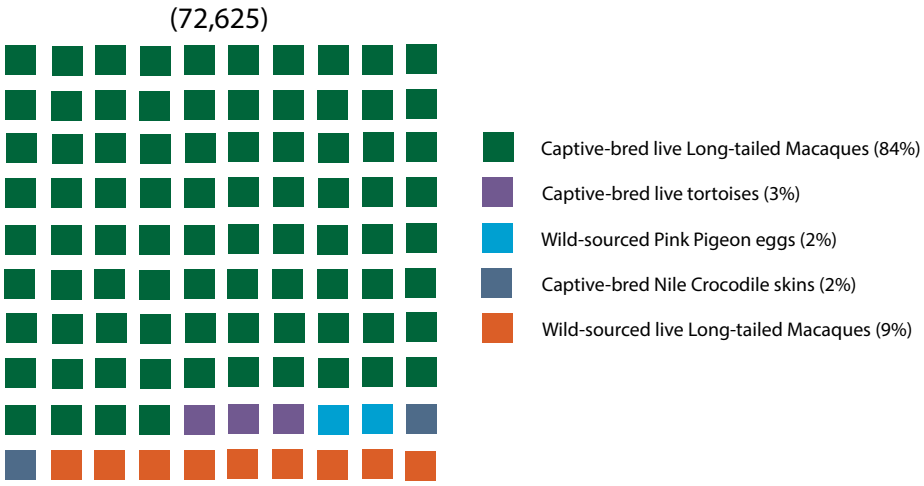
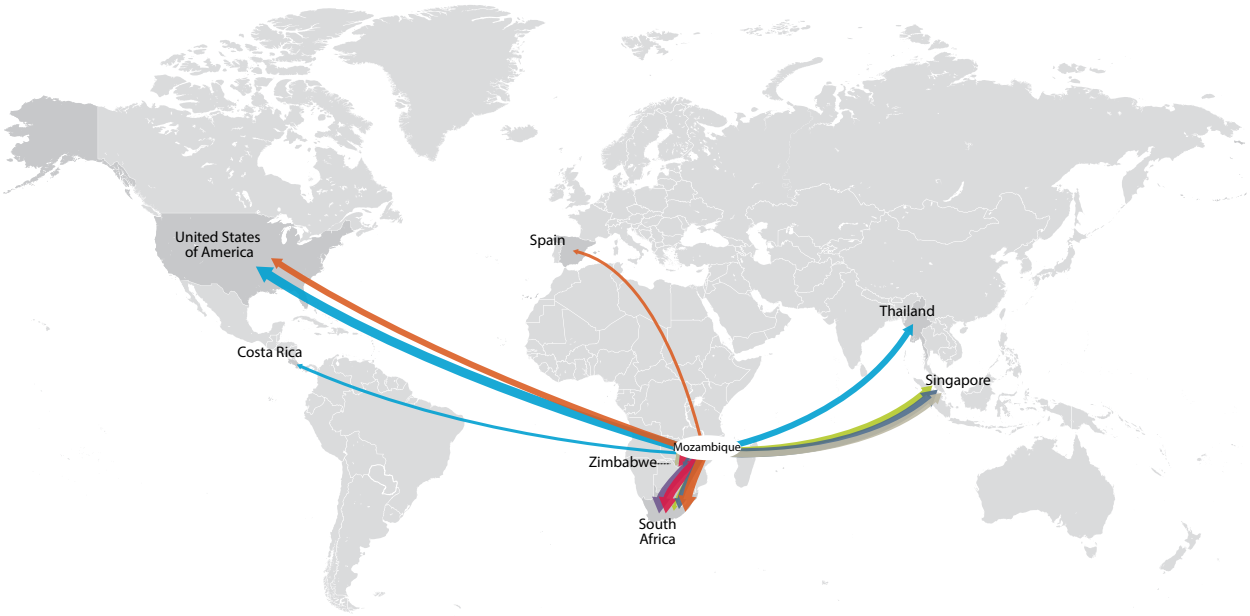


Figure 3.16: Direct exports by Mauritius 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC

Macaca fascicularis, by Brian Jeffery Beggerly via Flickr

Mozambique

Live reptiles represented the main commodity exported by Mozambique 2005-2014, of which ranched *Crocodylus niloticus* (Nile Crocodile) exported to South Africa and Zimbabwe comprised the majority; live, wild-sourced lizards were also exported in significant numbers, as were artificially-propagated cycad seeds, mostly representing species native to Mozambique (Figures 3.17 and 3.18). Between 2005 and 2014, the value of Mozambique's CITES exports as reported by Mozambique was estimated at USD26.2 million. The products with the highest total estimated value exported from Mozambique were *C. niloticus* skins (USD13.6 million), trophies (USD4.4 million), and skin pieces (USD1.3 million).



Live reptiles	
Total trade:	**371,300**
South Africa	50%
Zimbabwe	35%

Cycad seeds	
Total trade:	**68,810**
United States	36%
Thailand	20%
Costa Rica	18%

Nile Crocodile skins	
Total trade:	**45,296**
Singapore	53%
South Africa	15%
Zimbabwe	14%

Nile Crocodile trophies	
Total trade:	**27,735**
Zimbabwe	31%
Singapore	20%
South Africa	18%

Nile Crocodile skin pieces	
Total trade:	**22,948**
Zimbabwe	50%
Singapore	42%

Mammal trophies	
Total trade:	**3,768**
South Africa	30%
United States	25%
Spain	10%

Live plants	
Total trade:	**3,237**
South Africa	93%

Figure 3.17: Main destination countries of key commodities exported by Mozambique 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Cordylus mossambicus, by Josh More via Flickr

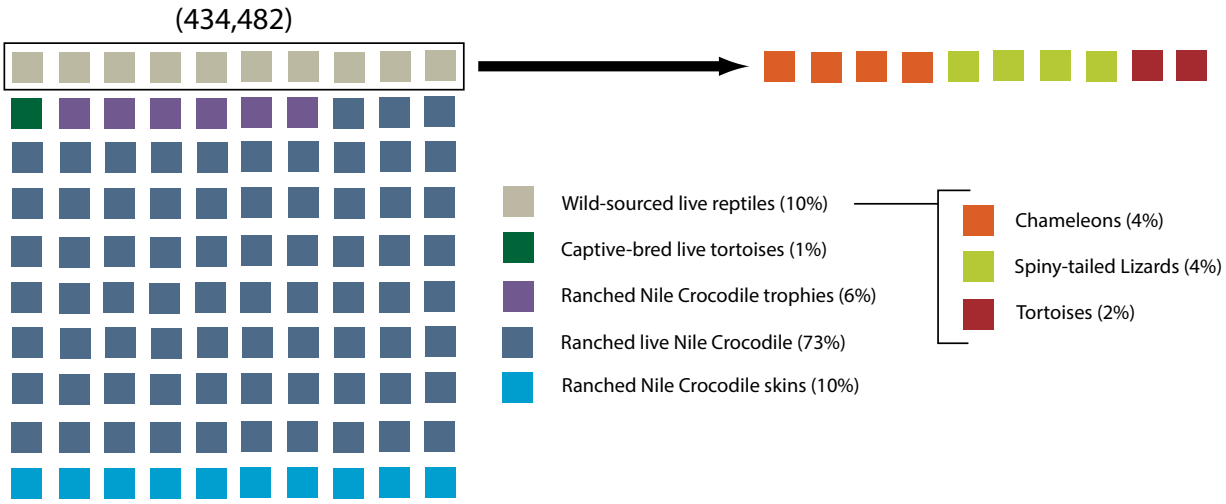
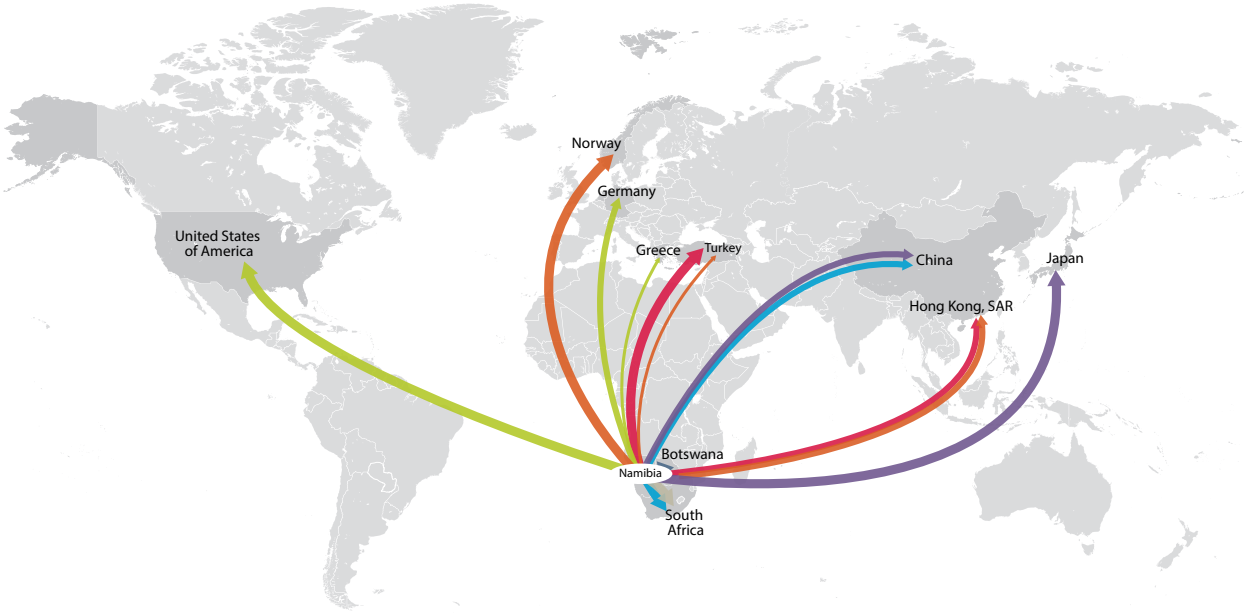


Figure 3.18: Direct exports by Mozambique 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC

Chamaeleo dilepis, by Scott Loarie via Flickr

Namibia

The main commodity exported by Namibia in 2005-2014 was wild-sourced *Arctocephalus pusillus* (Cape Fur Seal) skins, of which Turkey and Hong Kong SAR were the main importers; *Hoodia gordonii* (Bitter Ghaap) seeds were also exported in relatively large quantities (Figures 3.19 and 3.20). Between 2005 and 2014, the value of Namibia's CITES exports as reported by Namibia was estimated at USD655 million. The products with the highest total estimated value exported from Namibia were *A. pusillus* extract (USD548.9), skins (USD81.9 million), and *Hoodia gordonii* powder (USD4.2 million).



Cape Fur Seal skins	
Total trade:	**393,058**
Turkey	52%
Hong Kong, SAR	12%

Cape Fur Seal oil (l)	
Total trade:	123,768
South Africa	52%
China	28%

Live Bitter ghaap	
Total trade:	**100,000**
Botswana	100%

Mammal trophies	
Total trade:	**35,121**
United States	19%
Germany	18%
Greece	15%

Bitter Ghaap powder (kg)	
Total trade:	**25,502**
South Africa	94%

Mammal skin pieces	
Total trade:	**23,413**
Norway	38%
Hong Kong, SAR	30%
Turkey	24%

African Elephant ivory (kg)	
Total trade:	**7,508**
Japan	50%
China	50%

Figure 3.19: Main destination countries of key commodities exported by Namibia 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Hoodia gordonii, by Andrew Ashton via Flickr

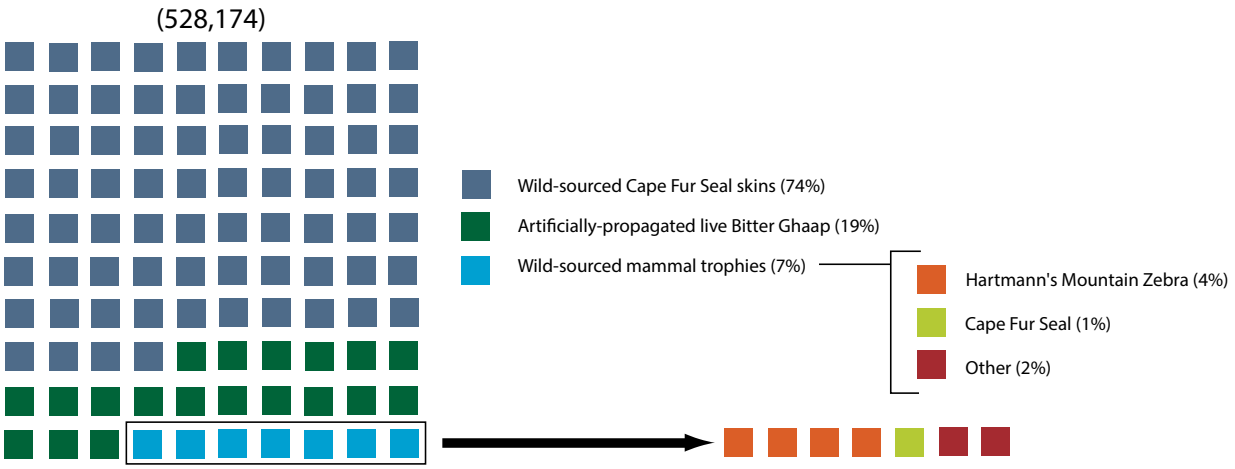


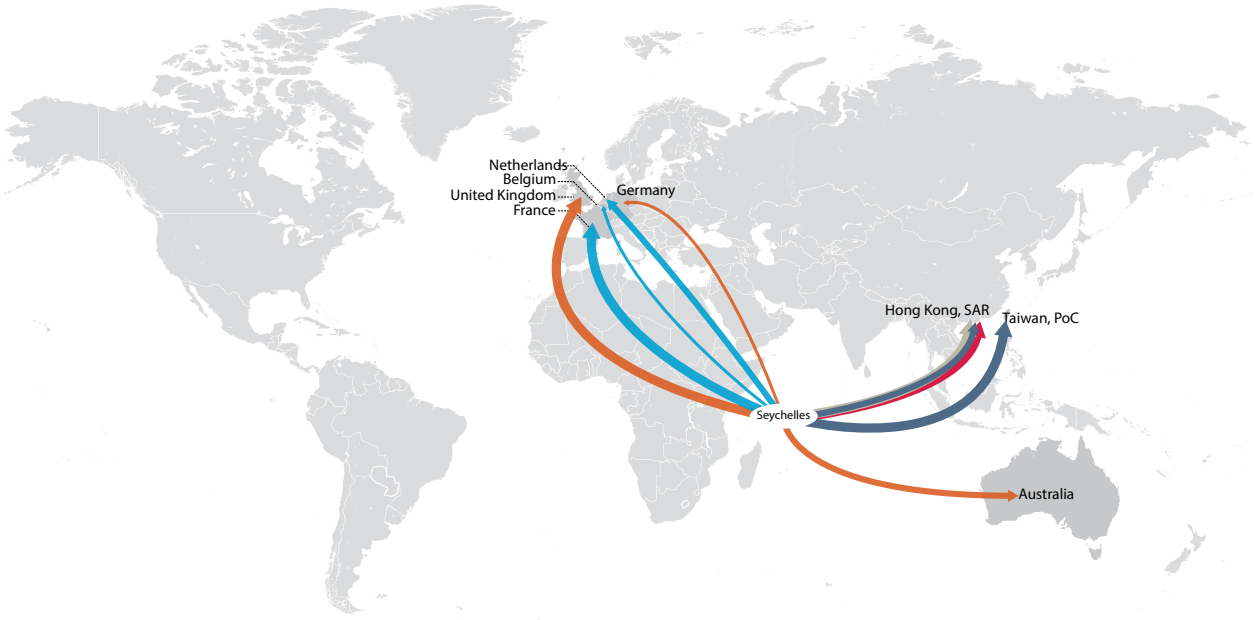
Figure 3.20: Direct exports by Namibia 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Arctocephalus pusillus by Alex Derr via Flickr

Seychelles

Exports from the Seychelles were low in volume compared to other SADC countries, and were mainly comprised of seeds of the endemic and Endangered *Lodoicea maldivica* (Double Coconut), destined for Hong Kong, SAR, and captive-bred, live *Aldabrachelys gigantean* (Aldabra Giant Tortoise) and *Tridacna maxima* (Small Giant Clam) (Figures 3.21 and 2.22).

Between 2005 and 2014, the value of the Seychelles' CITES exports as reported by Seychelles was estimated at USD3.9 million. The products with the highest total estimated value exported from the Seychelles were live *A. gigantea* (USD3.2 million), carapaces of *A. gigantea* (USD627 000), and live *T. maxima* (USD48 415).



Double Coconut seeds (kg)	
Total trade:	**18,658**
Hong Kong, SAR	98%

Live Small Giant Clam	
Total trade:	**4,908**
France	57%
Netherlands	18%
Belgium	18%

Live Aldabra Giant Tortoise	
Total trade:	**4,192**
Taiwan, PoC	45%
Hong Kong, SAR	17%

Double Coconut seeds	
Total trade:	**3,268**
Hong Kong, SAR	99%

Raw corals	
Total trade:	**814**
United Kingdom	27%
Australia	21%
Germany	15%

Figure 3.21: Main destination countries of key commodities exported by the Seychelles 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

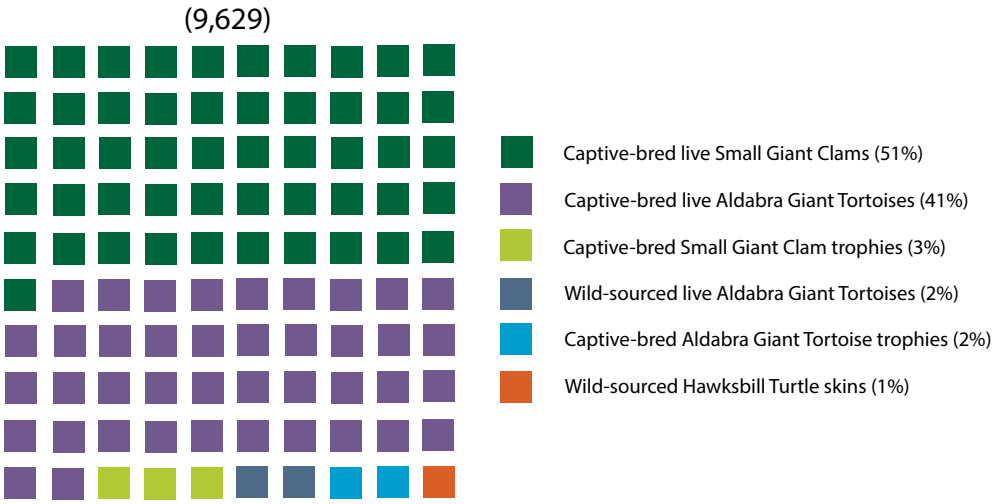


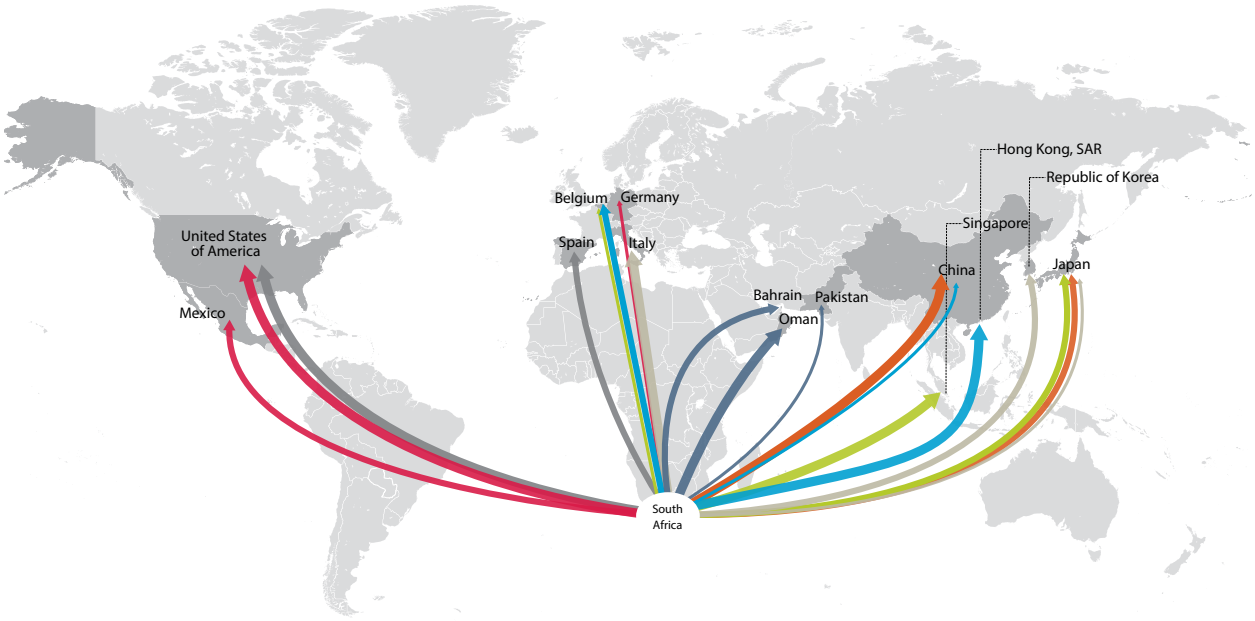
Figure 3.22: Direct exports by the Seychelles 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Tridacna maxima, by Martin Ünsal via Flickr

South Africa

The main animal exports from South Africa in 2005-2014 were live birds – mainly parrots, and *Crocodylus niloticus* (Nile Crocodile) skins and meat; all largely captive-bred (Figures 3.23, 3.24 and 3.25). *Hoodia gordonii* (Bitter Ghaap) seeds and *Aloe ferox* (Cape Aloe) extract comprised the vast majority of South Africa's plant exports in 2005-2014; the *H. gordonii* seeds were a mix of wild-sourced and artificially-propagated and were exported in 2007 and 2008 only, largely to Namibia (Figures 3.26, 3.27 and 3.28). Between 2005 and 2014, the value of South Africa's CITES exports as reported by South Africa was estimated at USD1.1 billion. The products with the highest total estimated value exported from South Africa were live *Psittacus erithacus* (African Grey Parrot; USD278 million), extract of *A. ferox* (USD153.8 million), and skins of *C. niloticus* (USD126.1 million).

Animals



Live birds		Nile Crocodile meat (kg)		Nile Crocodile skins		Nile Crocodile skin pieces	
Total trade:	**1,138,037**	**Total trade:**	**863,182**	**Total trade:**	**519,934**	**Total trade:**	**293,886**
Oman	18%	Hong Kong, SAR	49%	Italy	17%	Sinagpore	32%
Bahrain	13%	Belgium	19%	Republic of Korea	17%	Japan	24%
Pakistan	12%	China	17%	Japan	14%	Belgium	14%

African Elephant tusks (kg)		Mammal trophies		Nile Crocodile trophies	
Total trade:	**50,768**	**Total trade:**	**50,534**	**Total trade:**	**19,237**
China	65%	United States	56%	United States	15%
Japan	35%	Spain	7%	Mexico	13%
				Germany	13%

Figure 3.23: Main destination countries of key animal commodities exported by South Africa 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

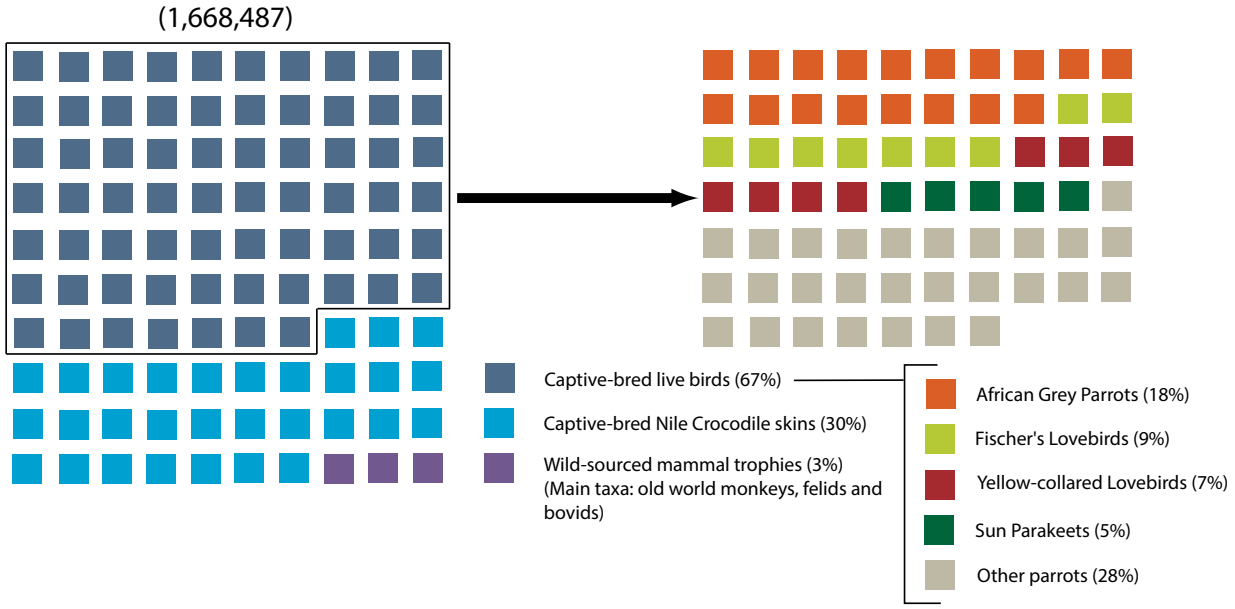


Figure 3.24: Direct exports by South Africa 2005-2014, of animal commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

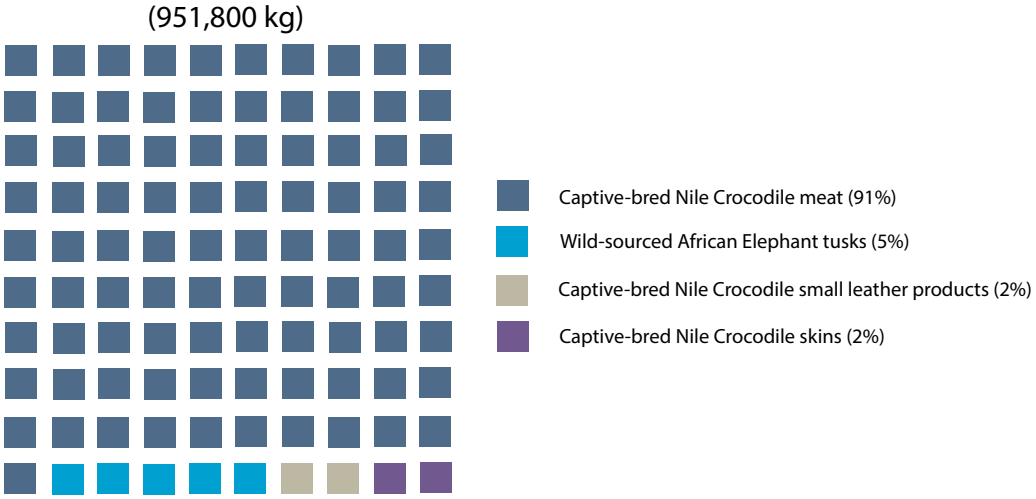


Figure 3.25: Direct exports by South Africa 2005-2014, of animal commodities reported in kg (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Panthera pardus, by Gregory Smith via Flickr

Plants

Bitter Ghaap seeds		Cape Aloe extract (kg)	
Total trade:	**92,134,127**	**Total trade:**	**4,908,786**
Namibia	84%	Argentina	41%
Germany	16%	Italy	15%
		Germany	12%

Figure 3.26: Main destination countries of key plant commodities exported by South Africa 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

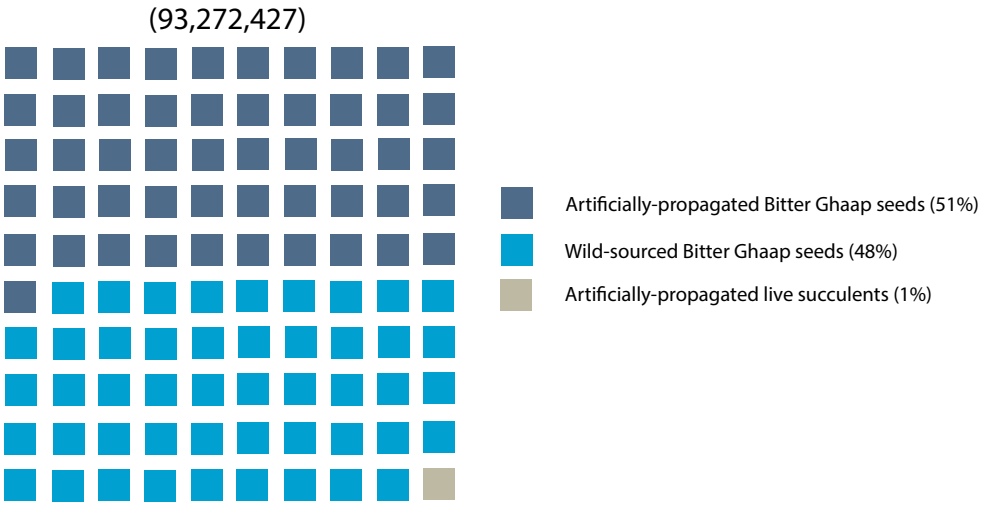


Figure 3.27: Direct exports by South Africa 2005-2014, of plant commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

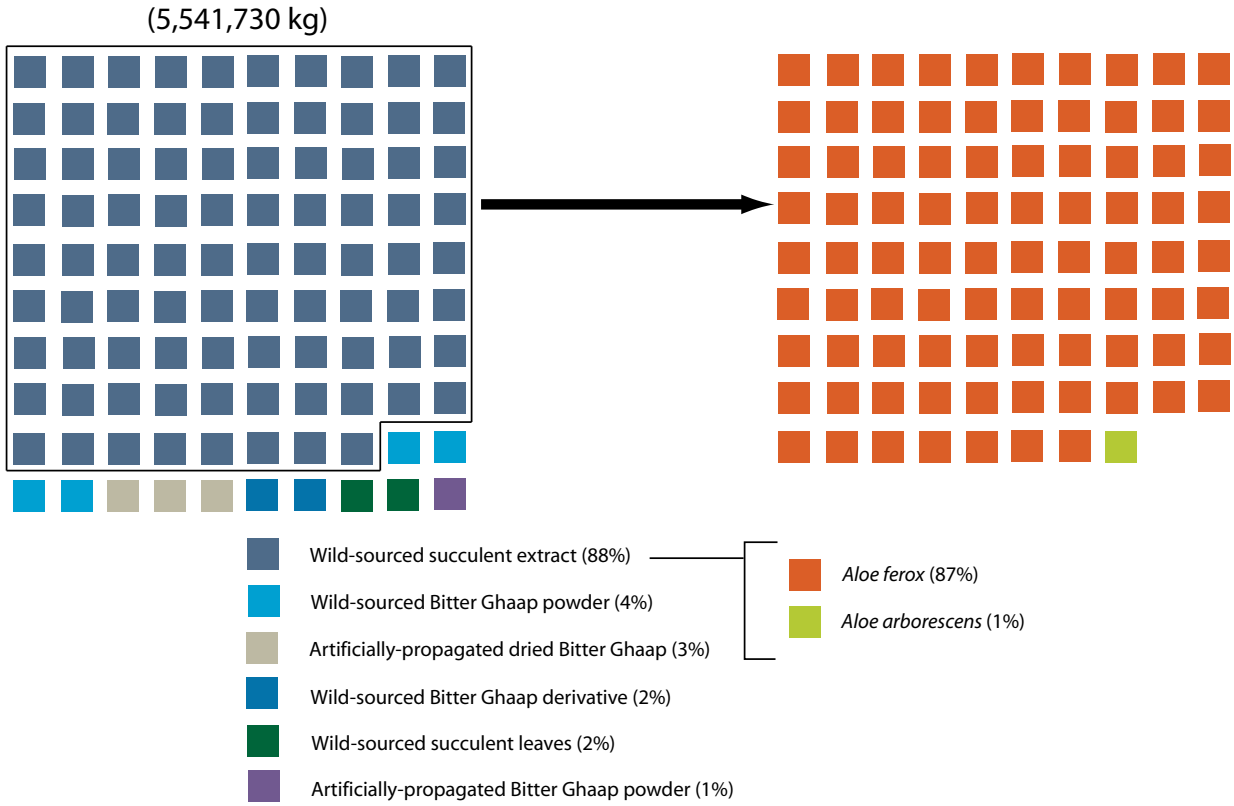


Figure 3.28: Direct exports by South Africa 2005-2014, of plant commodities reported in kg (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Aloe ferox, by Nicholas Turland via Flickr

Swaziland

Swaziland had very low levels of exports compared to the majority of SADC countries. These exports were mainly wild-sourced cycad seeds and live mammals, both destined for South Africa (Figures 3.29 and 3.30). Between 2005 and 2014, the value of Swaziland's CITES exports as reported by Swaziland was estimated at USD504 000. The products with the highest total estimated value exported from Swaziland were horns of Rhinocerotidae spp. (Rhinoceros) (USD434 400), live *Panthera leo* (Lion; USD35 000), and live *Ceratotherium simum simum* (Southern White Rhinoceros) (USD12 000).

Figure 3.29: Main destination countries of key commodities exported by Swaziland 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Hippopotamus amphibius, by Die Thukrals via Flickr

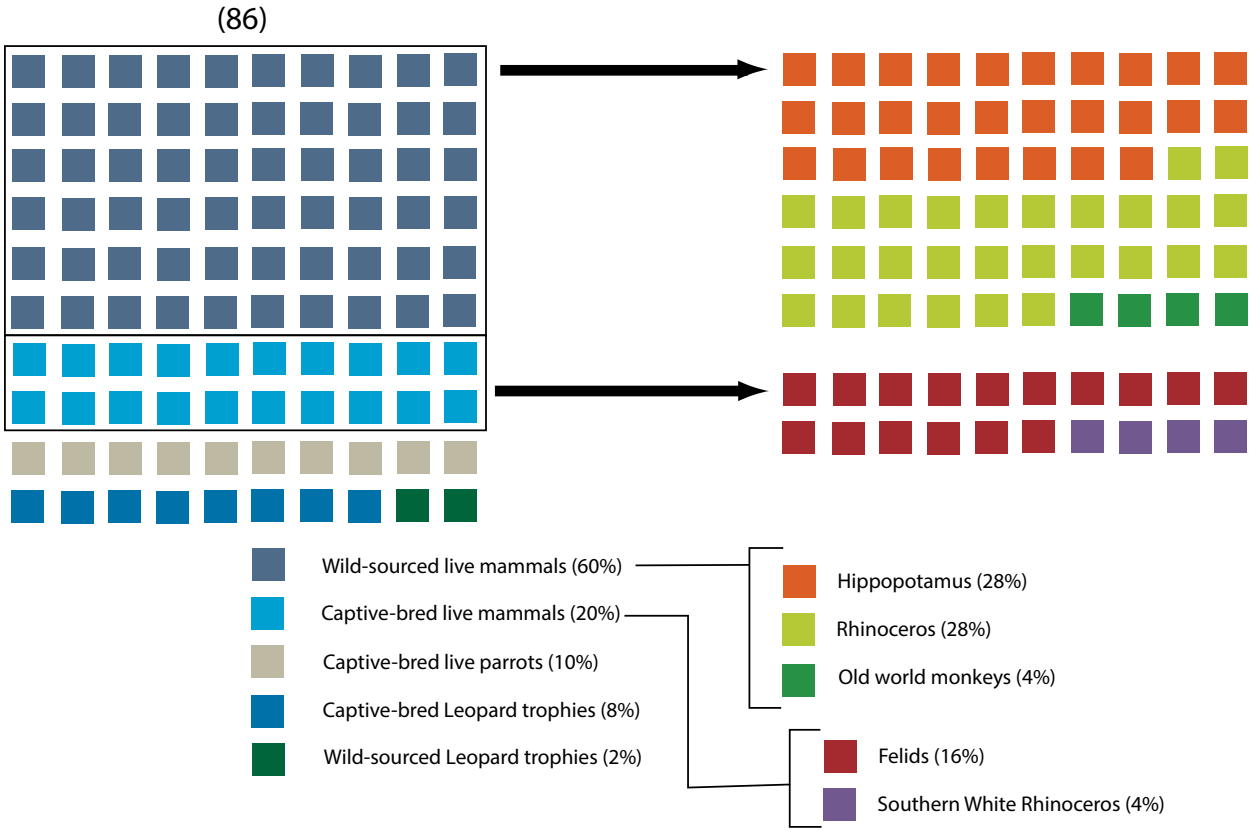
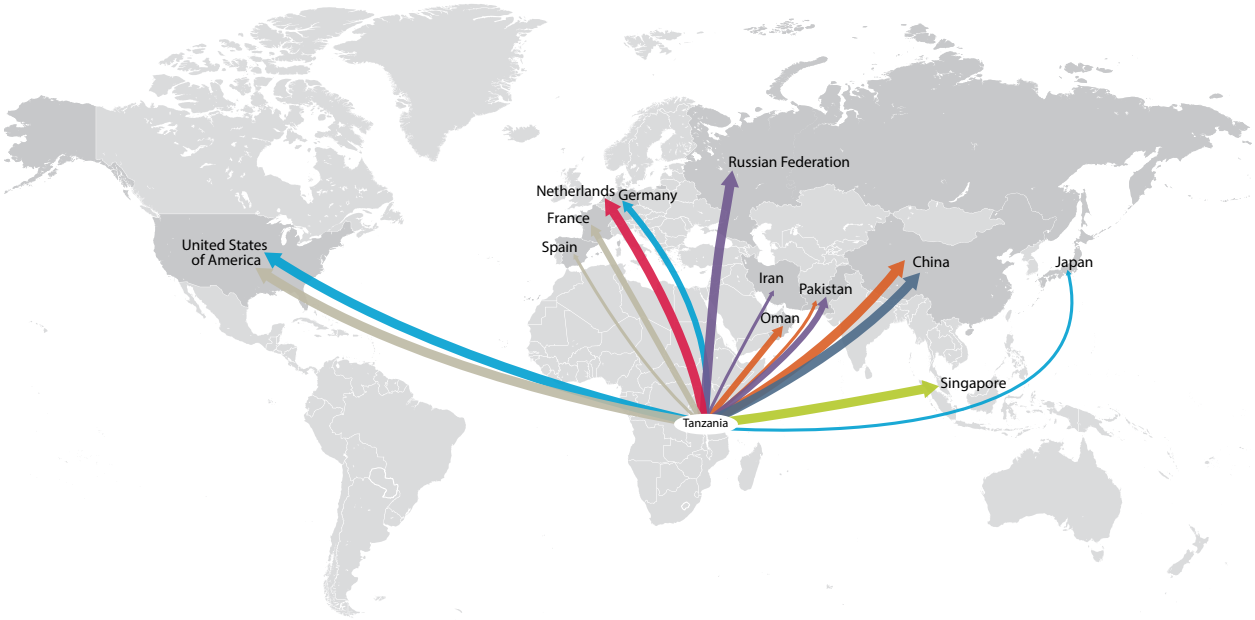


Figure 3.30: Direct exports by Swaziland 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Panthera pardus, by Pablo Sinovas

United Republic of Tanzania

Tanzania's main exports comprised artificially-propagated Cactaceae (cactus) flowers (virtually all of which were of the genus *Rhipsalis*), destined mainly for the Netherlands, live reptiles going mainly to the United States and Germany, and wild-sourced *Prunus africana* (African Cherry) bark destined largely to China (Figures 3.31 and 3.32). The main mammal trophies in trade were wild-sourced *Panthera* species, *Loxodonta africana* (African Elephant) and *Hippopotamus amphibius* (Hippopotamus). Between 2005 and 2014, the value of Tanzania's CITES exports as reported by Tanzania was estimated at USD18.5 million. The products with the highest total estimated value exported from Tanzania were live *Stigmochelys pardalis* (Leopard Tortoise) (USD6 million), *Crocodylus niloticus* (Nile Crocodile) skins (USD2.5 million), and *Prunus africana* (African Cherry) bark (USD1.9 million)



Cacti flowers		Live reptiles		African Cherry bark (kg)		Nile Crocodile skins	
Total trade:	**3,606,326**	**Total trade:**	**174,729**	**Total trade:**	**25,000**	**Total trade:**	**4,431**
Netherlands	90%	United States	38%	China	100%	Singapore	100%
		Germany	13%				
		Japan	10%				

Mammal trophies		Live birds		Live mammals	
Total trade:	**4,041**	**Total trade:**	**2,977**	**Total trade:**	**1,189**
United States	46%	China	12%	Russian Federation	32%
France	15%	Oman	10%	Pakistan	17%
Spain	10%	Pakistan	7%	Iran	16%

Figure 3.31: Main destination countries of key commodities exported by Tanzania 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

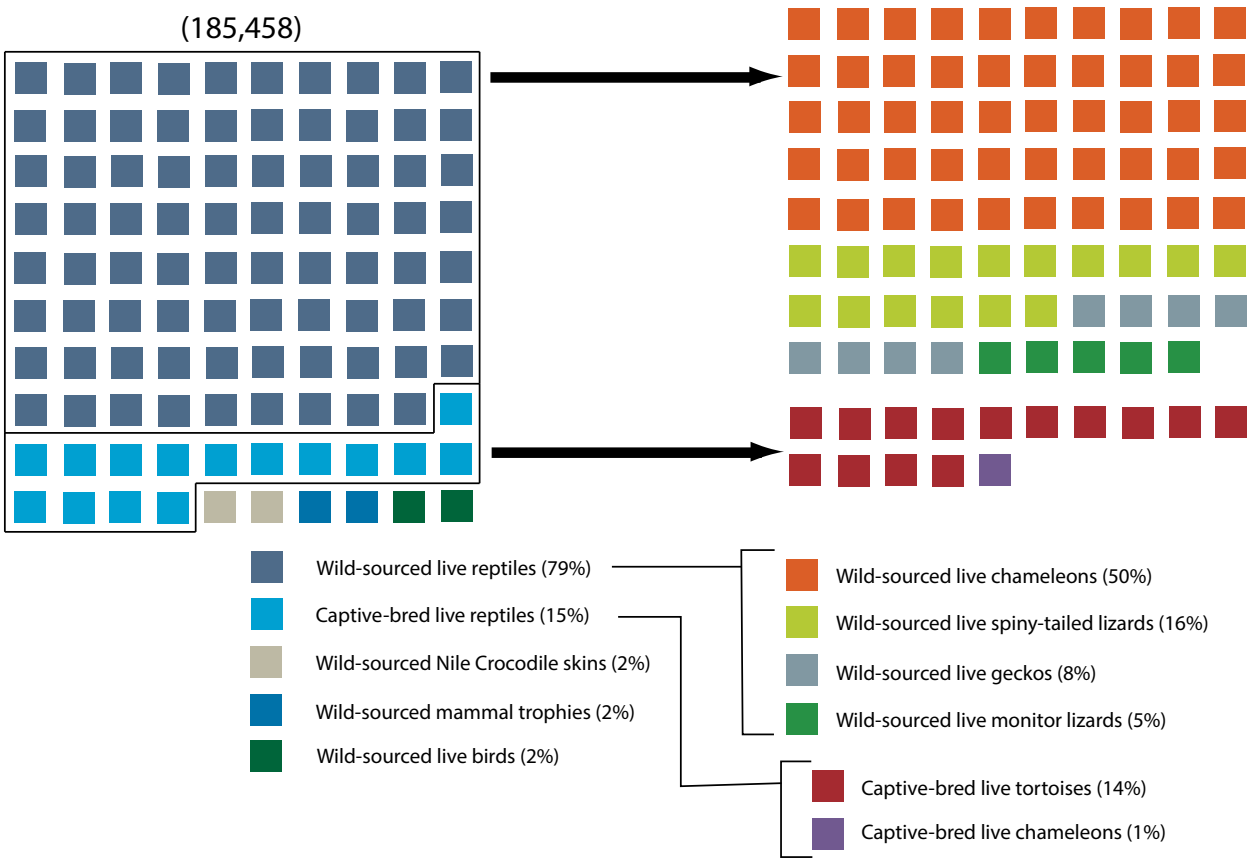
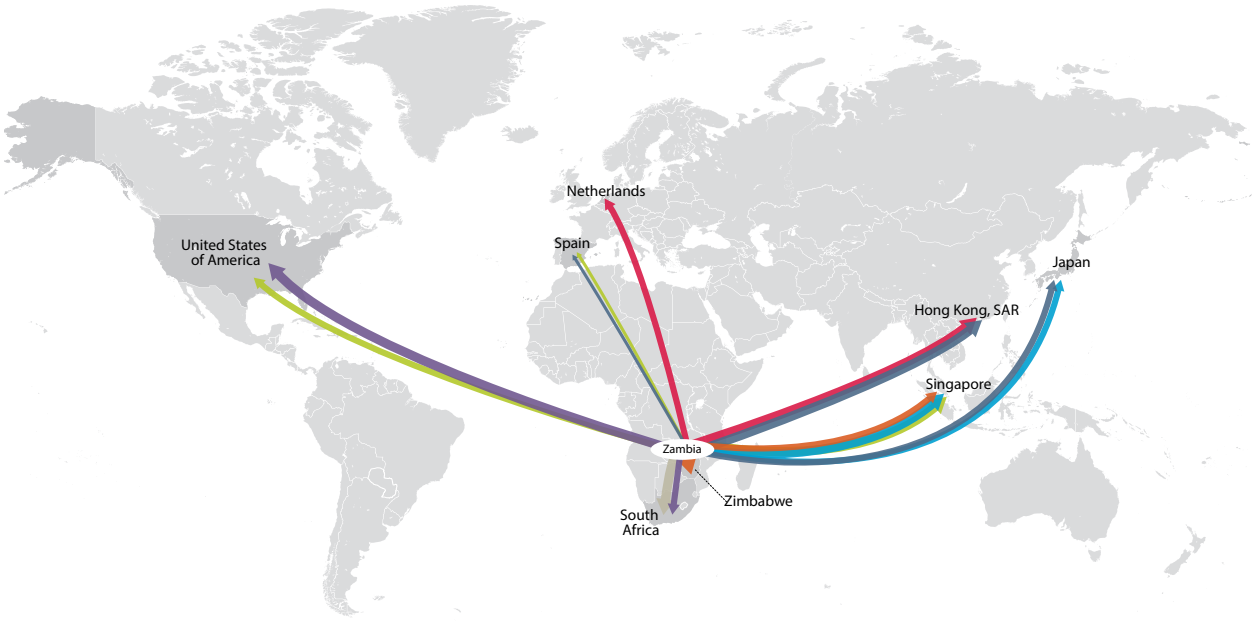


Figure 3.32: Direct exports by Tanzania 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Cordylus tropidosternum, by Frank Vincentz via Wikimedia

Zambia

Live captive-bred tortoises, largely *Stigmochelys pardalis* (Leopard Tortoise), along with *Crocodylus niloticus* (Nile Crocodile) skins and meat (mostly ranched) constituted Zambia's main exports 2005-2014 (Figures 3.33 and 3.34). Hong Kong, SAR and Singapore were the main importers of these commodities. Between 2005 and 2014, the value of Zambia's CITES exports as reported by Zambia was estimated at USD1655.8 million. The products with the highest total estimated value exported from Zambia were *C. niloticus* skins (USD92.9 million), live *S. pardalis* (USD50.8 million), and *C. niloticus* skin pieces (USD3.3 million).



Nile Crocodile meat (kg)	
Total trade:	**329,018**
Hong Kong, SAR	69%
Netherlands	18%

Nile Crocodile skins	
Total trade:	**291,243**
Singapore	78%
Japan	18%

Live tortoises	
Total trade:	**228,219**
Hong Kong, SAR	45%
Japan	12%
Spain	10%

Nile Crocodile skin pieces	
Total trade:	**144,975**
Zimbabwe	52%
Singapore	47%

Hippopotamus skin pieces	
Total trade:	**9,088**
South Africa	96%

Mammal trophies	
Total trade:	**6,329**
United States	38%
South Africa	25%

Nile Crocodile trophies	
Total trade:	**5,021**
Singapore	62%
United States	13%
Spain	9%

Figure 3.33: Main destination countries of key commodities exported by Zambia 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Malacochersus tornieri, by Josh More via Flickr

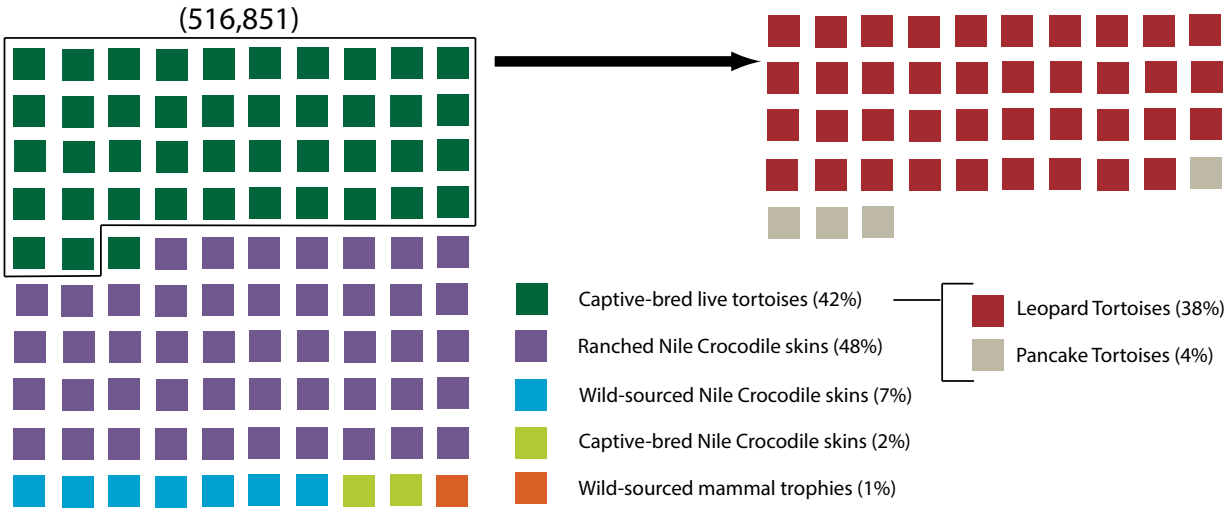
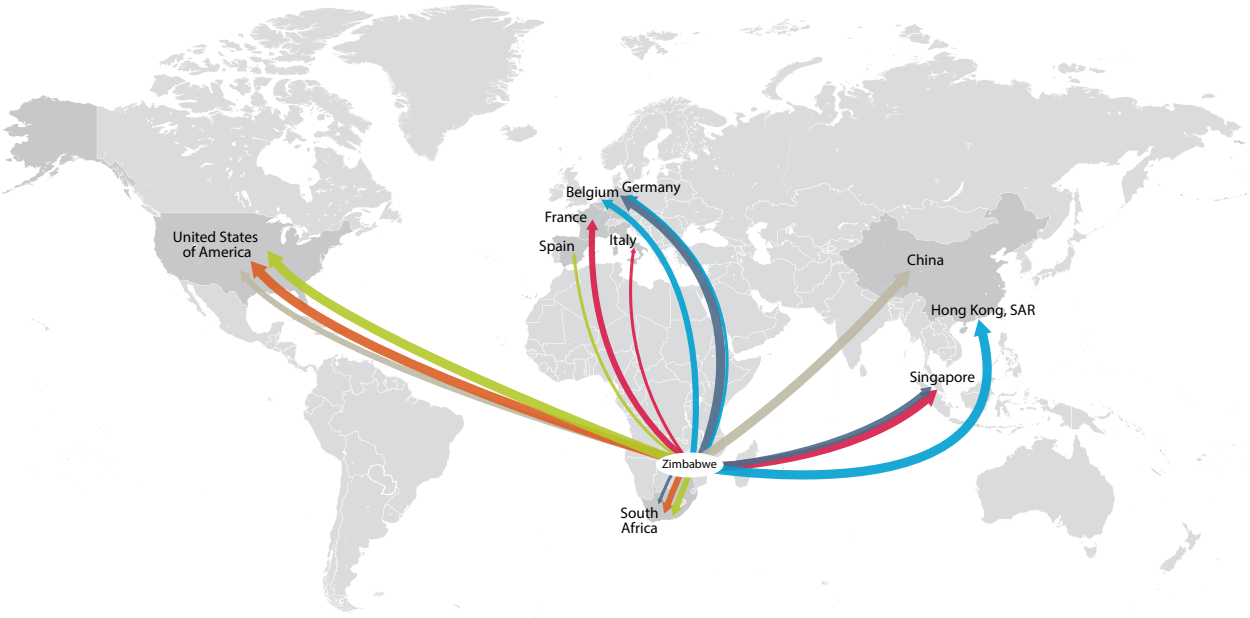


Figure 3.34: Direct exports by Zambia 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Stigmochelys pardalis, by Bernard Dupont via Flickr

Zimbabwe

The main commodity exported by Zimbabwe during 2005-2014 was *Crocodilus niloticus* (Nile Crocodile) skins, of which the majority were captive-bred; Singapore and France were the top destinations for this trade (Figures 3.35 and 3.36). The wild-sourced mammal trophies were mainly comprised of *Loxodonta africana* (African Elephant), *Hippopotamus amphibius* (Hippopotamus), Cercopithecidae (old world monkeys) and Felidae (felids) species. Between 2005 and 2014, the value of Zimbabwe's CITES exports as reported by Zimbabwe was estimated at USD199 million. The products with the highest total estimated value exported from Zimbabwe were *C. niloticus* skins (USD134 million), *L. africana* ivory carvings (USD33.2 million), and *C. niloticus* small leather products (USD8.9 million).



Nile Crocodile skins	
Total trade:	**528,965**
Singapore	44%
France	33%
Italy	11%

Nile Crocodile meat (kg)	
Total trade:	**412,825**
Hong Kong, SAR	55%
Belgium	22%
Germany	10%

Nile Crocodile skin pieces	
Total trade:	**224,895**
Germany	47%
Singapore	21%
South Africa	15%

African Elephant ivory (kg)	
Total trade:	**53,321**
China	42%
United States	34%

Mammal skin pieces	
Total trade:	**18,399**
United States	73%
South Africa	8%

Mammal trophies	
Total trade:	**12,238**
United States	57%
South Africa	10%
Spain	7%

Figure 3.35: Main destination countries of key commodities exported by Zimbabwe 2005-2014 (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

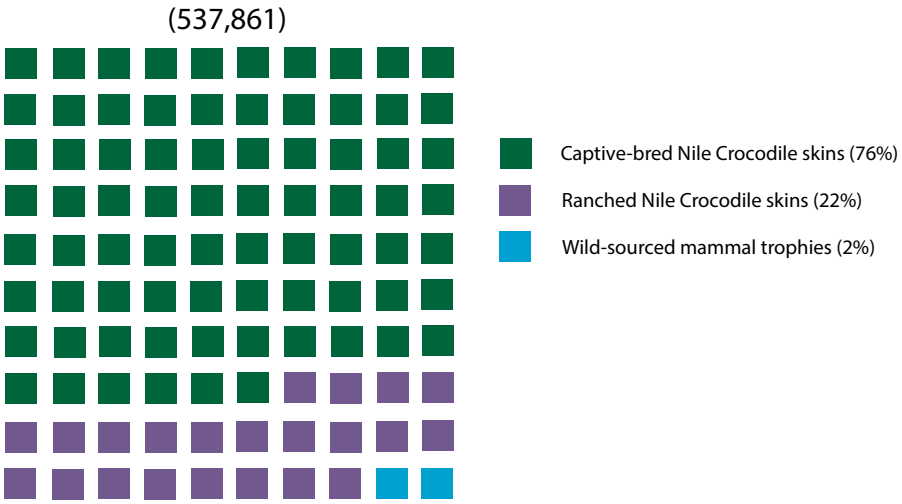


Figure 3.36: Direct exports by Zimbabwe 2005-2014, of commodities that could be equated to one individual (excluding source I and specimens). Source CITES Trade Database, UNEP-WCMC.

Crocodylus niloticus, by Paulo Sinovas

04 | Case studies

This section presents case studies that provide detailed trade analyses for the taxonomic groups of greatest relevance in the context of SADC's wildlife trade:

- Hunting trophies,
- Felids,
- Parrots,
- Reptiles,
- Succulent plants and
- Cycads

The case studies present an overview of trade volumes, trends and the main species involved, as well as estimates of the economic value of the trade, and any other aspects of note, on the basis of available information.

4.1 Hunting trophies

Within the context of CITES, hunting trophies can be reported in annual reports in a number of different ways, which can present challenges in interpreting CITES trade data relating to hunting trophies. In particular, understanding the actual numbers of animals involved in this trade and, therefore the impact of such trade on species conservation is challenging. In this section, trophies and trophy parts reported as purpose 'H' (hunting trophies), 'P' (personal)

Kobus leche, by Michael Jansen via Flickr

and 'T' (commercial) were analysed to estimate the number of individuals in trade from SADC countries for species that are primarily traded as hunting trophies. It should be noted that the estimate of number of individuals may include some trade (e.g. for the curio market) which may not represent hunting trophies. The method involves combining trophy terms that can equate to numbers of individuals (e.g. trophies, bodies, skulls, skins) and applying conversion factors where necessary (e.g. four feet = one trophy) in order to estimate the number of individual animals in trade. Where multiple trophy items were traded on the same permit and could be equated to whole individuals (e.g. four feet, one tail and one skull), these were assumed to have originated from the same animal. For further details of the methodology applied, see Annex A.

Approximately 180 000 individual animals are estimated to have been directly exported from the Region as hunting trophies during 2005-2014, according to exporters. Just over half of these were wild-sourced animals, while the remainder predominantly comprised captive-produced (source C and F; 30%) and ranched (15%) individuals. Hunting trophies were predominantly mammals (117 240 mammals; 65% of total trophies) and reptiles (61 937 reptiles; 34% of total trophies), with a very small number of birds exported as hunting trophies. Trade levels of hunting trophies reported by countries of export and import varied considerably throughout the ten year period for both mammals (Figure 4.1.1(a)) and reptiles (Figure 4.1.1(b)); this is likely to be due, at least in part, to missing annual report data and discrepancies in reporting terms and purpose codes.

The most highly traded trophy species from the Region was *Crocodylus niloticus* (Nile Crocodile) with 60 848 individuals (including trade reported as skins, skulls, bodies and tails for purposes H, P and T) in trade, which accounted for 34% of total trophy trade. Mammal taxa traded at high levels as trophies included *Equus zebra hartmannae* (Hartmann's Mountain Zebra), *Papio ursinus* (Chacma Baboon), *Hippopotamus amphibius* (Hippopotamus), *Loxodonta africana* (African Elephant) and *Panthera leo* (Lion; Table 4.1.1).

Of the taxa that accounted for over 1% of total trophy trade, four have been categorised as Vulnerable by the IUCN (one of which was assessed at the species level; Table 4.1.1). Low levels of wild-sourced trophies of Critically Endangered and Endangered species were reported, including *Gyps africanus* (White-backed Vulture; 56) and *Diceros bicornis* (Black Rhino; 38 - see section 4.1.1 below).

The main exporter of trophies from the Region was South Africa (39%), with Namibia and Mozambique also accounting for over 10% of the trade each (20% and 18% respectively).

Crocodylus niloticus was the principal trophy species exported from Madagascar, Malawi (reported as Crocodylidae spp. but likely to represent *C. niloticus*), Zambia, Mozambique and South Africa, while Botswana principally exported *Loxodonta africana* and Zimbabwe exported

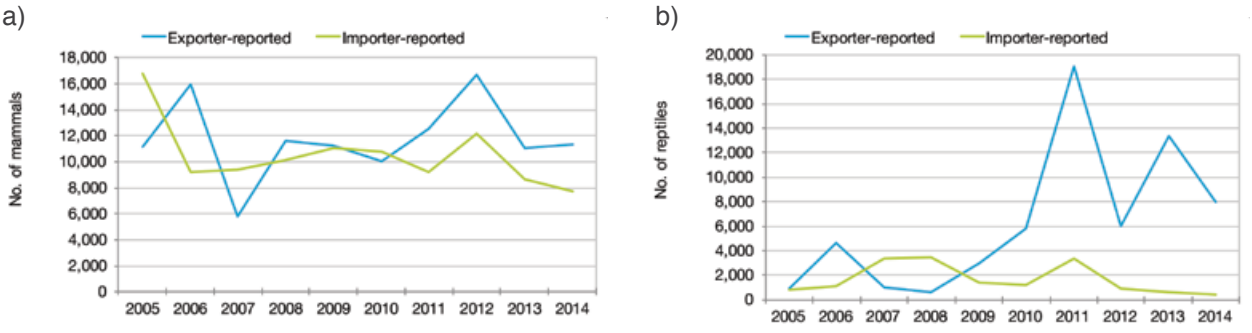


Figure 4.1.1: Number of hunting trophy mammals (a) and reptiles (b) exported as individuals from the SADC Region, 2005-2014 as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

Table 4.1.1: Top taxa directly exported (in numbers of individuals)[5] from the SADC Region, 2005-2014. Includes all taxa that represented over 1% each of total trophy trade according to exporter-reported data. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List.

Taxon	IUCN Red List Status	CITES Appendix	Exporter reported quantity	Importer reported quantity
Crocodylus niloticus Nile Crocodile	LC	I/II	60848	16612
Equus zebra hartmannae Hartmann's Mountain Zebra	VU*	II	21820	19258
Papio ursinus Chacma Baboon	LC	II	12271	9907
Hippopotamus amphibius Hippopotamus	VU	II	11850	19101
Loxodonta africana African Elephant	VU	I/II	10992	12060
Panthera leo African Lion	VU	II (subspecies *persica* in I)	10800	8748
Caracal caracal Caracal	LC	II (Asian populations in I)	6593	4347
Panthera pardus Leopard	NT	I	6576	8957
Arctocephalus pusillus Cape Fur Seal	LC	II	6489	1968
Kobus leche Lechwe	LC	II	6370	4631
Chlorocebus pygerythrus Vervet Monkey	LC	II	4478	2522
Chlorocebus aethiops Grivet	LC	II	3031	1758
Damaliscus pygargus pygargus Blesbok	LC*	II	2288	1319
Ceratotherium simum simum Southern White Rhinoceros	NT*	I/II	2145	905

*Assessed at the species level

mainly *Loxodonta africana, Papio ursinus* and *Hippopotamus amphibius*. Namibia primarily exported *Equus zebra hartmannae*, while the top exports from Tanzania were *Panthera pardus* and *Hippopotamus amphibius.* South Africa was the largest exporter of *Papio ursinus* and *Panthera leo*, and one of the main exporters of most other trophy species (Figure 4.1.2).

Further details on the top taxa in trade, along with trade in *Panthera pardus* and rhino, are presented in the sections below.

5 To estimate numbers of individuals in trade as trophies, trade reported as 'trophy' (for all purposes) and trade in parts that can be readily equated to one individual, reported as purpose H, P and T, were considered. The following conversion factors were applied to convert 'trophy parts' into whole individuals. Ears: 2 = 1 trophy, feet: 4 = 1 trophy, horns: 2 = 1 trophy, teeth (*H. amphibius* only): 12 = 1 trophy, tusks: 2 = 1 trophy).

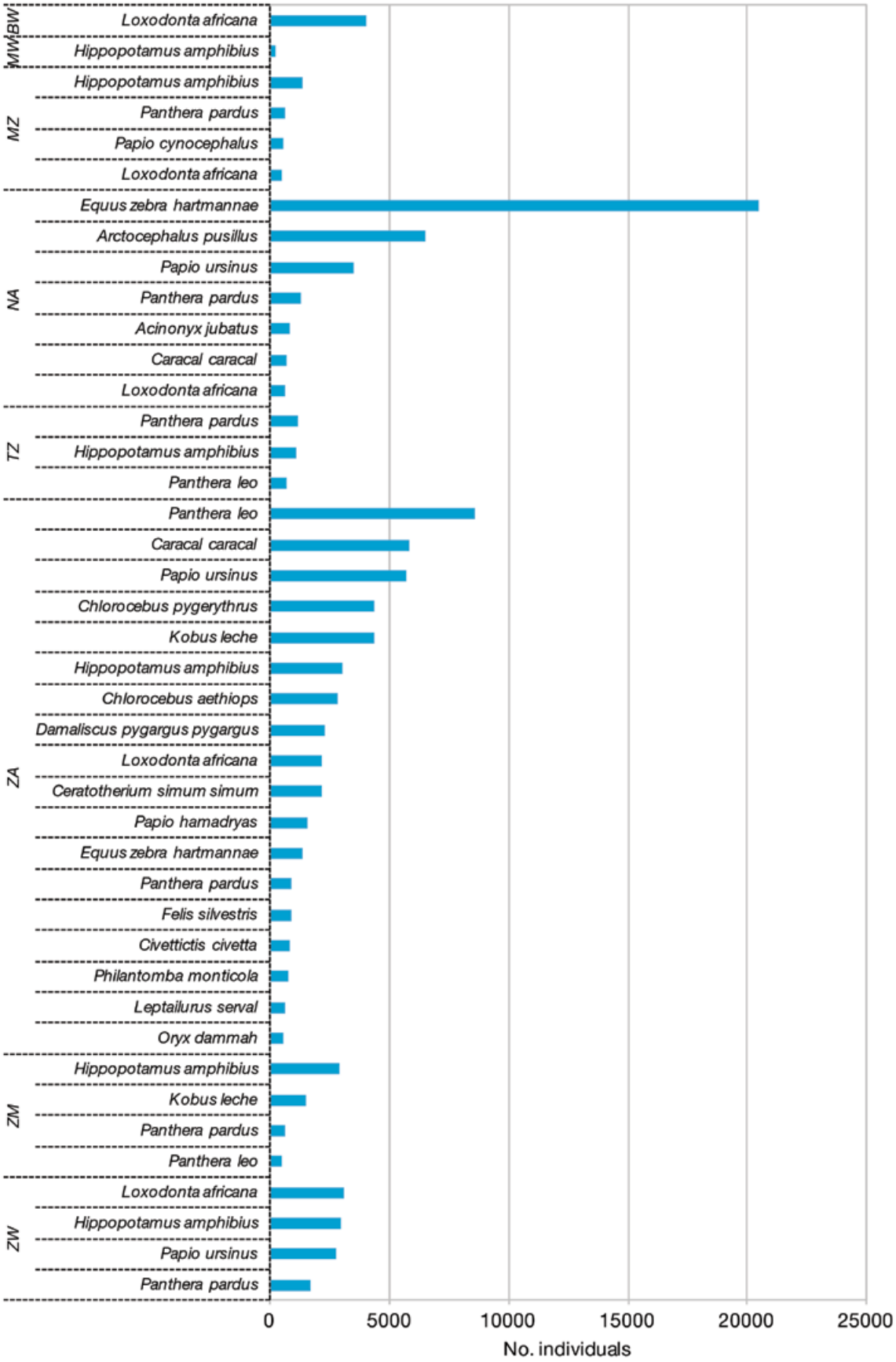


Figure 4.1.2: Main mammal taxa directly exported as trophies (at levels greater than 500) by SADC country, 2005-2014, as reported by exporters. Source: CITES Trade Database, UNEP-WCMC. BW = Botswana, MW = Malawi, MZ = Mozambique, NA = Namibia, TZ = Tanzania, ZA = South Africa, ZM = Zambia and ZW = Zimbabwe.

4.1.1 Mammal trophies

The top mammal taxa in trade as trophies were *Equus zebra hartmannae, Papio ursinus*, *Hippopotamus amphibius, Loxodonta africana* and *Panthera leo.* The vast majority of trade in these taxa exported from the SADC Region as trophies was wild-sourced (>98% for each taxa) with the exception of *Panthera leo,* for which two-thirds was captive-bred.

The principal exporter varied between species: Namibia accounted for the vast majority of exports of *E. z. hartmannae,* whilst South Africa was the main exporter of *P. leo* and *P. ursinus* trophies (Figure 4.1.3(a)). Exports of *Hippopotamus amphibius* and *Loxodonta africana* were not dominated by one exporter: South Africa, Zambia and Zimbabwe accounted for the majority of *H. amphibius* exports while Botswana and Zimbabwe were the principal exports of *Loxodonta africana* trophies.

For all top five species, the United States and the EU together accounted for at least 65% of the import market (Figure 4.1.3(b)).

Direct exports of ***Equus zebra hartmannae* (Hartmann's Mountain Zebra)** averaged 2182 animals per year over the period 2005-2014, as reported by exporters. The vast majority of these exports were from Namibia (94%), while the remaining trade was accounted for by South Africa (Figure 4.1.3(a)). Direct exports from Namibia varied throughout the ten year period, peaking in 2008, whilst exports from South Africa peaked in 2012 (Figure 4.1.4(a)). The principal import markets for *E. z. hartmannae* were the EU (47%) and the United States (23%; Figure 4.1.3(b)).

On average, 1227 ***Papio ursinus* (Chacma Baboon)** trophies were directly exported from SADC countries per year for the period 2005-2014. South Africa was the main exporter of *Papio ursinus* trophies (46%), followed by Namibia

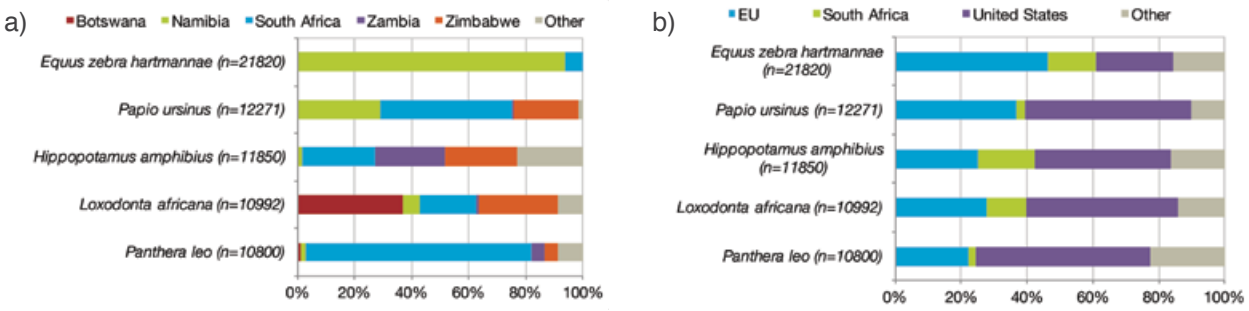


Figure 4.1.3: Main exporters (a) and import markets (b) of the top five mammal trophy species, as a proportion of trade, as reported by exporters 2005-2014. Source: CITES Trade Database, UNEP-WCMC.

Equus zebra hartmannae, by iladm via Shutterstock

Papio ursinus, by Bernard Dupont via Flickr

BOX 1. TRADE IN *LOXODONTA AFRICANA* IVORY BY WEIGHT

In addition to trade reported as number of tusks for purpose H, P and T (which have been converted into number of individuals for the purpose of this hunting trophy analysis and included in the African elephant section) countries in the SADC Region also reported exports of tusks in kilogrammes, as well as trade in ivory carvings and pieces. Zimbabwe was the main exporter of ivory carvings reported in kilogrammes (99%) and by number (66%); South Africa and Malawi also exported ivory carvings reported by number (17% and 15% respectively).

Approximately 93 700 kg of *Loxodonta africana* (African Elephant) tusks were directly exported by Namibia, South Africa and Zimbabwe during 2005-2014, all of which were wild-sourced and reported for purposes H, P and T. South Africa reported just over half of tusk exports by weight, all of which was reported in 2008 (Figure B1.1). The main import destinations of tusks reported by weight were China (45%), Japan (23%) and the United States (19%). One third of the trade in tusks reported by weight was accounted for by exports to China and Japan from Namibia and South Africa in 2008. This coincides with the legal sell-off of stockpiled ivory by these countries in 2008.

In addition, Botswana reported the export of 6132 tusks and ivory pieces to China and Japan in 2008, also as part of the authorised sale. Zimbabwe also participated in the authorised sale, however records pertaining to this sale were not distinguished from other trade in the original CITES annual report. As such, some of this trade is likely to have been included in the calculations for trophies in the previous paragraphs.

Since 2009, all trade in tusks reported by weight was from Zimbabwe; in many cases this trade was reported on the same permit as other *L. africana* trophy items.

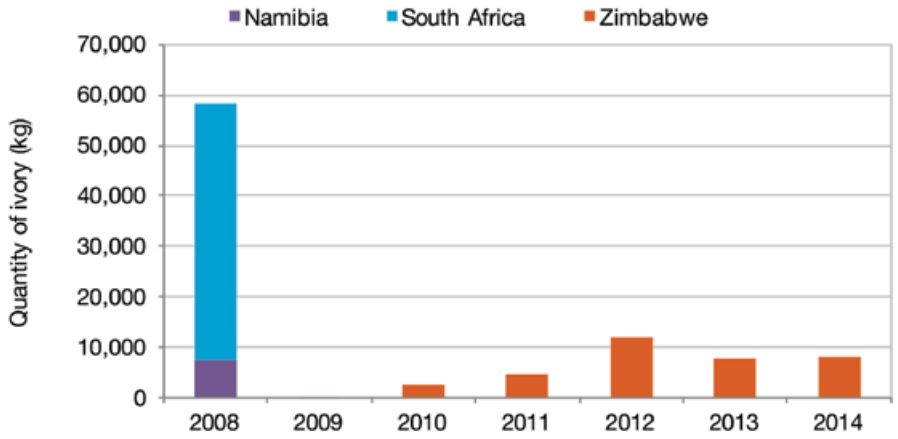


Figure B1.1. Direct exports of *Loxodonta africana* tusks in kilograms, from the SADC Region, as reported by exporters, 2005-2014. Source: CITES Trade Database, UNEP-WCMC. No exports by No exports by weight were reported 2005-2007

(29%) and Zimbabwe (23%) (Figure 4.1.3(a)). Exports from South Africa have decreased year on year since 2011 (Figure 4.1.4(b)). Approximately half of all direct exports were destined for the United States and 37% were imported by the EU (Figure 4.1.3(b)).

Direct exports of ***Hippopotamus amphibius* (Hippopotamus)** averaged 1185 individuals per year for 2005-2014 which were mainly exported by South Africa, Zimbabwe and Zambia, accounting for approximately a quarter of the trade each (Figure 4.1.3(a)). No country exported

Panthera pardus, by Villiers Steyn licenced via Shutterstock

greater than 400 trophies per year 2005-2009; trade from Zambia peaked in 2010, while for Mozambique and Zimbabwe peak trade was in 2011 (Figure 4.1.4(c)). The main import markets for *H. amphibius* trophies were the United States (41%), the EU (25%) and South Africa (17%) (Figure 4.1.3(b)).

An average of 1099 ***Loxodonta africana* (African Elephant)** trophies[6] per year were directly exported from SADC countries over the period 2005-2014. Direct exports were dominated by trade from Botswana and Zimbabwe (Figure 4.1.3(a)). Exports from Botswana more than tripled between 2010 and 2012 and subsequently declined in 2013 and 2014 (Figure 4.1.4(d)). The United States imported nearly half of all exports, while the EU was the destination for a further 28% of exports (Figure 4.1.3(b)).

Direct exports of ***Panthera leo* (Lion)** averaged 1080 animals per year over the ten-year period 2005-2014 with nearly 80% of these directly exported from South Africa (Figure 4.1.3(a)). Approximately two thirds of *P. leo* exports were captive-produced (source C, D and F), with the remainder wild-sourced. With the exception of two trophies, South Africa was the sole exporter of captive-bred *P. leo*. Trade showed an increasing trend in captive-bred lions over the ten year period (Figure 4.1.5).

Exports of *P. leo* trophies (all sources) from South Africa increased by more than four-fold over the ten year period, whilst exports from other SADC countries remained relatively stable at under 100 trophies per country (Figure 4.1.4(e)). The United States imported over half of these trophies, with the EU the destination for 23% of trade (Figure 4.1.3(b)). Within the EU, Spain was the principal importing country.

On average, 657 ***Panthera pardus* (Leopard)** individuals were directly exported per year by SADC countries between 2005 and 2014, according to exporters. Virtually all trade was wild-sourced. Zimbabwe was the main country of export (26%), followed by Namibia (20%), Tanzania (17%) and South Africa (14%, Figure 4.1.4(f)). Peaks in reported export volumes were

6 Trade reported as *Loxodonta africana* skins was excluded from this analysis as these skins are thick and they can be split into layers, making it difficult to equate to number of individuals. Where two tusks and one trophy were reported on the same permit, it was assumed that the tusks originated from the same animal as the trophy, and as such this was considered to equal one individual.

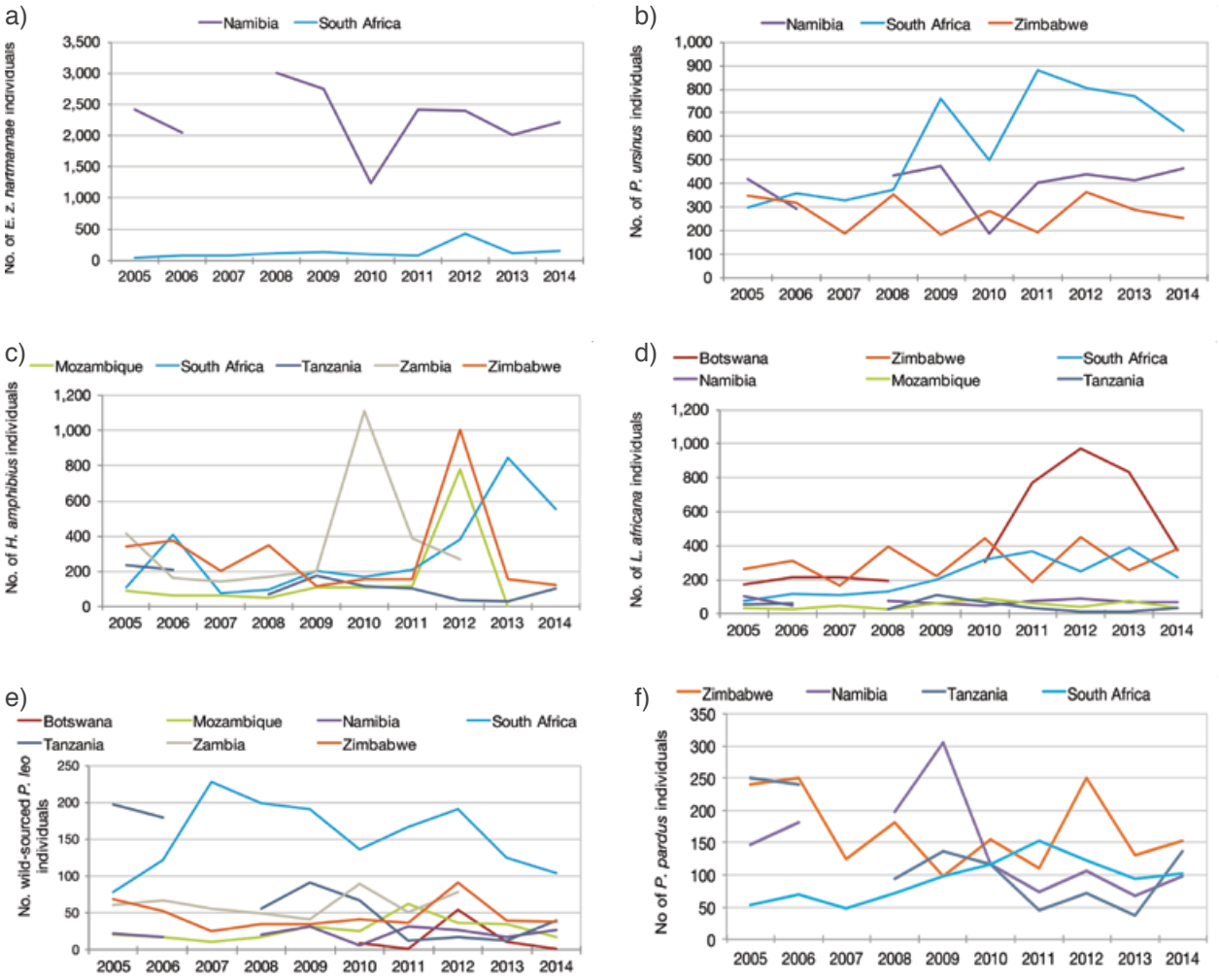


Figure 4.1.4. Main exporters of mammal trophy species, 2005-2014 as reported by exporters for a) *Equus zebra hartmannae*, b) *Papio ursinus*, c) *Hippopotamus amphibius*, d) *Loxodonta africana*, e) *Panthera leo* and f) *Panthera pardus*. Captive-bred *P. leo* have been excluded from the graph; the vast majority (>98%) of all other species were wild-sourced. Source: CITES Trade Database, UNEP-WCMC.

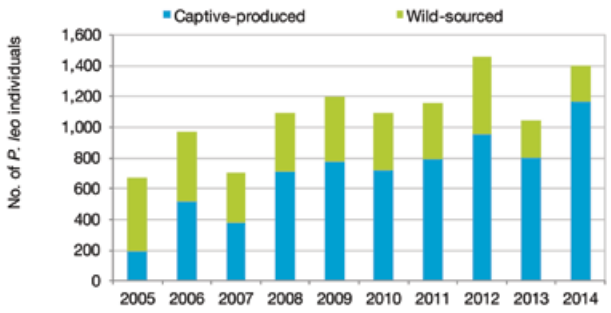


Figure 4.1.5. Number of *P. leo* individuals exported from the SADC Region, by source, 2005-2014, as reported by exporters. Source: CITES Trade Database, UNEP-WCMC.

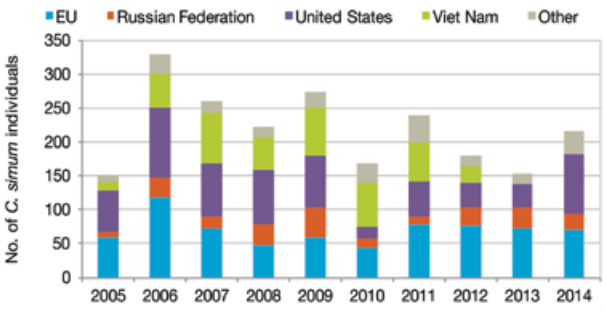


Figure 4.1.6. Number of *Ceratotherium simum* (including subspecies *C. simum simum*) individuals by import market, as reported by SADC exporters 2005-2014. Source: CITES Trade Database, UNEP-WCMC.

apparent in 2009 for Namibia and 2006 and 2012 for Zimbabwe. As with trade in other mammal trophies, the United States and the EU were the principal import markets (52% and 29%, respectively). Resolution 10.14 (Rev. CoP16) sets out CITES export quotas for *P. pardus* trophies for various range States, including Botswana (130), Malawi (50), Mozambique (120), Namibia (250), South Africa (150), Tanzania (500), Zambia (300) and Zimbabwe (500). Reported trade has remained below these levels, except for the 2009 peak in exports from Namibia.

Trade in **rhinos (*Ceratotherium simum* and *Diceros bicornis*)** from the SADC Region comprised an average of 215 *Ceratotherium simum simum* (Southern White Rhinoceros), 5 *C. simum* and 5 *Diceros bicornis* individuals[7] per year during the 10-year period. All trade reported as *C. simum simum* was from South Africa, with the exception of one export from Namibia. Trade reported at the species level was predominantly from Namibia. Nearly 90% of the trade was imported by the EU, the United States, Viet Nam and the Russian Federation (32%, 29%, 18% and 11% respectively; Figure 4.1.6).

The figures presented above include shipments where horns for purpose 'H' were the only trophy items reported on a permit. These cases, where one or more horns were reported on a permit without any additional trophy items, account for over 370 horns. Of these cases, over half were imported by Viet Nam (54%), and another 14% were imported by Thailand.

4.1.2 Reptile trophies

Crocodylus niloticus trophies accounted for 98% of reptile trophies, with nearly 7000 *C. niloticus* trophies directly exported annually from the Region over the ten year period 2005-2014. On average, just under half of exports were ranched and a further 36% were captive-bred. Of these

Ceratotherium simum, by cweng50 via Flickr

7 Number of individuals was calculated based on trade in parts that could be readily equated to one individual. For rhino species, the following conversions were applied: for body, genitalia, skin, skull, tail, trophy: 1 = one individual; ears: 2 = 1 individual, feet: 4 = one individual, horns: 2 = one individual. Where multiple trophy items were exported on the same permit, these were assumed to be from the same animal and number of individuals was calculated as such e.g. two horns, one skin and one skull exported on the same permit number was assumed to all originate from the same animal and was considered one individual in trade.

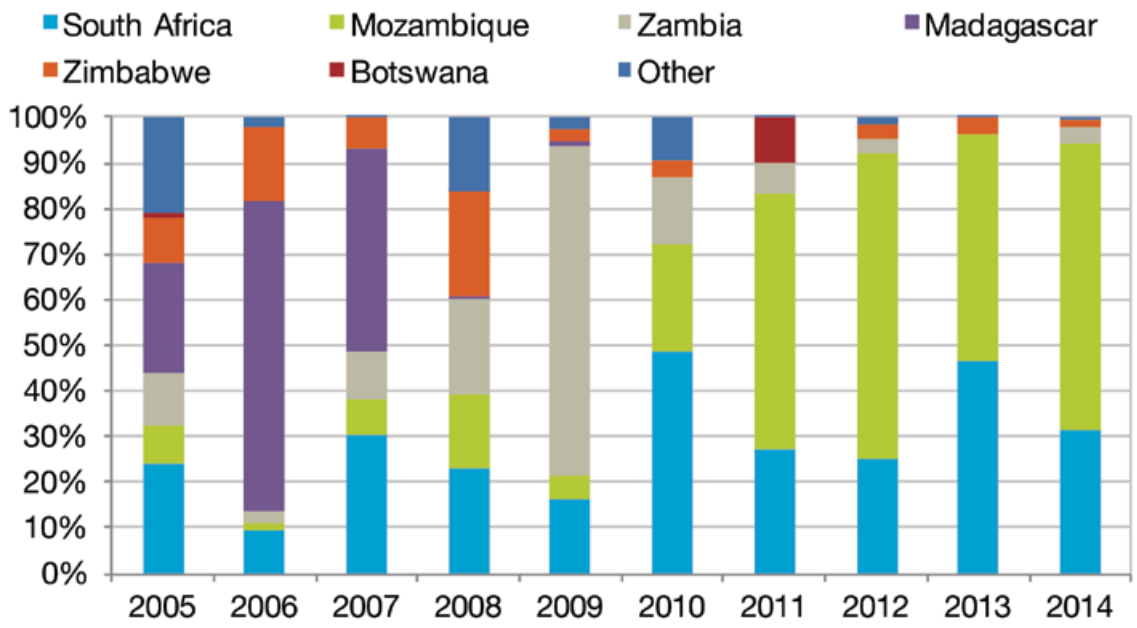


Figure 4.1.7: Exporters as a proportion of direct exports of *Crocodylus niloticus* trophies (in number of individuals) from the SADC Region 2005-2014. Source: CITES Trade Database, UNEP-WCMC.

trophies, 46% were exported by Mozambique with South Africa the next most important exporter, accounting for 32% of trade. Madagascar was the main exporter during 2005-2007 and Zambia in 2009 (Figure 4.1.7). Exports showed an increasing trend, peaking in 2011, with lower levels reported in subsequent years.

According to exporters, the single biggest importer of *C. niloticus* trophies was Singapore (19%) with Zimbabwe (14%) and South Africa (12%) also important importers. According to importer-reported data, Italy was the main import market, accounting for 47% of trade (equivalent to 7738 trophies for 2005-2014).

4.1.3 Estimated value of the hunting trophy trade

An estimate of the financial value of the international trade in hunting trophies from the Region is provided below in USD. This estimate is based on reported volumes of trade and on the median prices reported to customs at the point of import into the United States between 2006 and 2014, as reported in the U.S. annual reports to CITES. These are estimates and should be treated with caution; some combinations of taxa, terms, units and sources in trade did not have corresponding prices from the U.S. report, and these have been excluded from the valuation. Where possible, a 'proxy' of the median genus, family or order price was used instead, but this may not be accurate at the species level (see methodology in Annex A for more details).

Between 2005 and 2014 the total value of exports in hunting trophies as reported by exporters was estimated to be ~USD64.5 million, approximately 76% of which was in wild-sourced trophies (~USD49.0 million), 18% in captive-produced trophies (~USD11.7 million), and 6% in trophies from ranched individuals (~USD3.8 million). It should be noted that it was not possible to find prices for captive-produced trophies of some taxa, which may mean that captive-produced values are an underestimate.

Mammal trophies comprised 73% of the total estimated value of trophy exports between 2005 and 2014. In addition to the four highest value mammals included in Table 4.1.2 only two additional species represented more than 5% of mammal trophy trade total value: *Panthera leo* (6%: ~USD2.8 million) and *Equus zebra hartmannae* (6%: ~USD2.8 million).

Table 4.1.2. Estimated values of the top five highest value species exported as wild-sourced trophies over the period 2005-2014 as reported by exporters. Estimate based on median prices reported to customs at the point of import into the United States between 2006 and 2014. All prices should be treated as estimates.

Taxa	Estimated price per wild-sourced trophy (USD)	Total estimated financial value of exports (USD)
Loxodonta africana	1303	14 318 258
Panthera pardus	1520	9 964 702
Hippopotamus amphibius	759	8 836 000
Crocodylus niloticus	468	4 307 940
Arctocephalus pusillus	456*	2 958 984

*Order-level price proxy used as no price data at the species level could be found

Exports of reptile trophies comprised 27% of the total value of trophy exports between 2005 and 2014. The value of *C. niloticus* trade was over 99% of all reptile trophy export value.

South Africa has both the highest volume of hunting trophy exports (39%) and the exports with the highest total estimated value (31%: ~USD20.1 million). Zimbabwe's exports comprised 8% of export volume but 16% of total estimated export value (~USD10 million), and Namibia's exports comprised 19% of total export volume and 15% of total estimated export value (~USD9.4 million).

In addition to the financial value of the hunting trophies in international trade, there are other values associated with trophy hunting, which have not been estimated as part of this study. However, estimates from South Africa are provided as an example in Box 2 for context.

Loxodonta africana, by Pablo Sinovas

BOX 2. TROPHY HUNTING REVENUES IN SOUTH AFRICA

Trophy hunting, when well-managed, can be an important tool for the conservation of species and habitats through the provision of financial incentives, especially when revenues are invested back into conservation and when benefits are shared equitably with local communities (e.g. Lindsey *et al*., 2007; Dickson *et al*., 2009; UNEP-WCMC, 2013; IUCN, 2016).

Southern Africa has a particularly well-established sport hunting industry that generates substantial revenues. Lindsey *et al*. (2007) estimated the annual revenues generated by trophy hunting in sub-Saharan Africa at approximately USD200 million, with USD100 million of those accrued by South Africa. A summary of more recent revenue estimates for South Africa are provided below as an illustration of the potential of the trophy hunting industry to generate financial incentives for conservation. It should be noted that this potential may not always be translated into conservation benefits due to factors such as inequitable distribution of hunting revenues, insufficient resources to monitor populations and to establish sustainable harvest levels, or limited transparency in funding flows (Lindsey *et al*., 2007).

Trophy hunters in South Africa were reported to spend an average of USD17 300 (ZAR138 200) per hunter for the 2012 hunting season, including game hunted (USD7900), daily fees (USD3300) and other expenses such as transport and shipping cost and handling (USD6000) (van der Merwe, 2013; Cloete *et al*., 2015). This represents USD156 million (ZAR1.24 billion) for the approximately 9000 international hunters hosted by South Africa in that year (van der Merwe, 2013; Cloete *et al*., 2015). A comparable figure of USD141 million was calculated by Southwick Associates (2015) for the period 2012-2014.

Similarly, South African professional hunting statistics provided by South Africa's Department of Environmental Affairs show that over USD137 million (approximately ZAR1.5 billion) were generated as total income from professional hunting in South Africa in 2014 (DEA, 2015). This value includes licence fees for the animals hunted (USD94 million, or c. ZAR1 billion) and client daily fees (USD43 million, or ZAR474 million), but not other expenses incurred by hunters. The main species in terms of revenue generated through trophy hunting were reported to be *Panthera leo* (Lion), *Syncerus caffer* (Cape Buffalo), *Tragelaphus strepsiceros* (Greater Kudu), *Ceratotherium simum* (White Rhinoceros), *Hippotragus niger* (Sable Antelope), *Oryx gazella* (Gemsbok), *Tragelaphus angasii* (Nyala), *Equus quagga* (Burchell's zebra), *Kobus ellipsiprymnus* (Waterbuck) and *Connochaetes taurinus* (Blue Wildebeest) (DEA, 2015).

In addition to direct financial values, Unwin (PHASA CEO, pers. comm. 2016) estimated that thousands of jobs are created by professional hunting in South Africa, including hunting outfitters, professional hunters and other jobs created by international hunting tourists. Moreover, Unwin (PHASA CEO, pers. comm. 2016) estimated that over 60 000 bed nights were booked by international hunting tourists in 2014, amounting to approximately USD9 million.

4.2 Felids

Southern Africa is home to eight Felidae species, all of which are in trade in the SADC Region, including four species classified as Vulnerable on the IUCN Red List (*Panthera leo* - CITES Appendix II, *Acinonyx jubatus* – Appendix I, *Felis nigripes* – Appendix I, and *Profelis aurata* – Appendix II). Uses of Felidae products and derivatives include: trophy hunting (Lindsey *et al.*, 2012; Jorge *et al.*, 2013), traditional medicine (Williams *et al.*, 2015a, 2015b), ceremonial uses (IUCN SSC Cat Specialist Group, 2015), and as pets (Nowell, 2014b; D'Cruze and Macdonald, 2015; Harrington, 2015).

Excluding hunting trophies, which are discussed in the preceding case study, Felidae species were traded as a number of items, including bones, live cats and skeletons (Figure 4.2.1). Scientific specimens and claws were also top exported commodities, with claws mainly exported to the United States as hunting trophies. Neither of these are discussed here in more detail. There were very low volumes of re-exports of Felidae products; only direct trade is discussed in this case study.

Live *Panthera leo* (Lion) and *Acinonyx jubatus* (Cheetah) and *P. leo* bones and skeletons were the main commodities exported. Live animals and bones by quantity were mainly captive-produced (source C, D and F) according to exporters, while bones by weight according to exporters and skeletons according to importers were mainly reported as wild-sourced.

The majority of Felidae exports were from South Africa, with Zambia also exporting some bone (Figure 4.2.2).

The majority of bones (by quantity and weight) and skeletons were imported by countries in Eastern and South-eastern Asia (Figure 4.2.4), namely China, People's Democratic Republic of Lao (hereafter referred to as Lao, PDR),

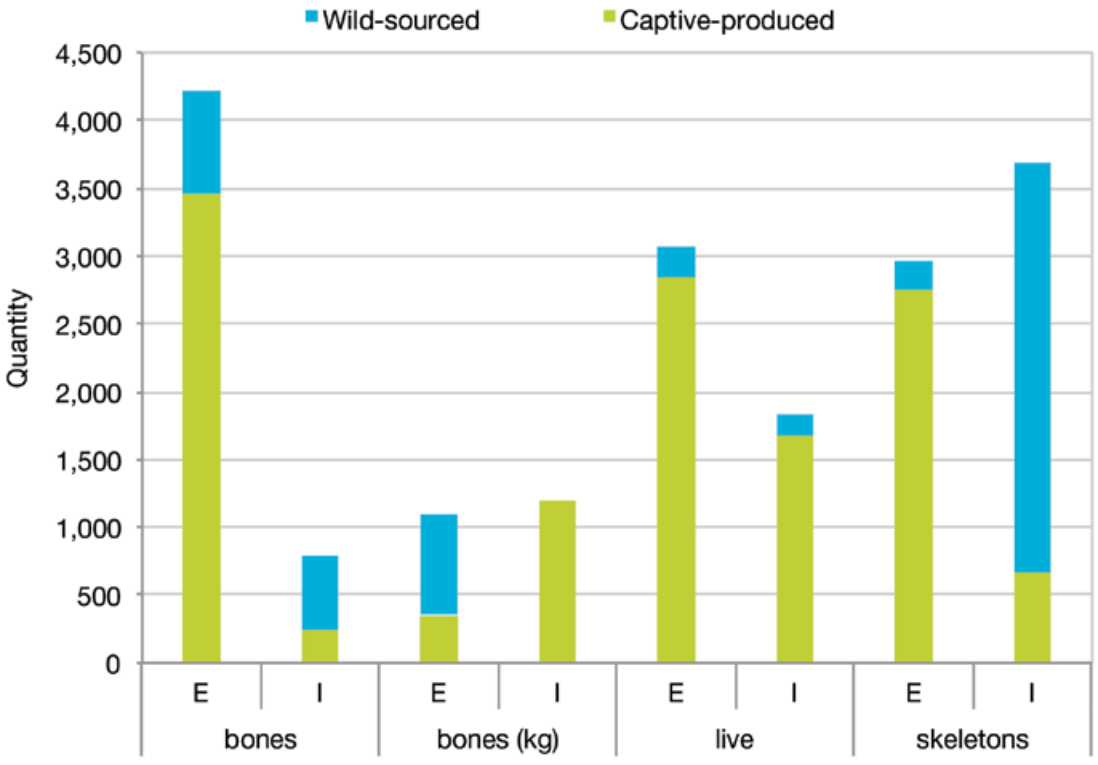


Figure 4.2.1: Direct exports of the top traded Felidae products (excluding hunting trophies) over the period 2005-2014 as reported by exporters (E) and importers (I). Small quantities of source I, R and unknown trade have been excluded. Source: CITES Trade Database, UNEP-WCMC.

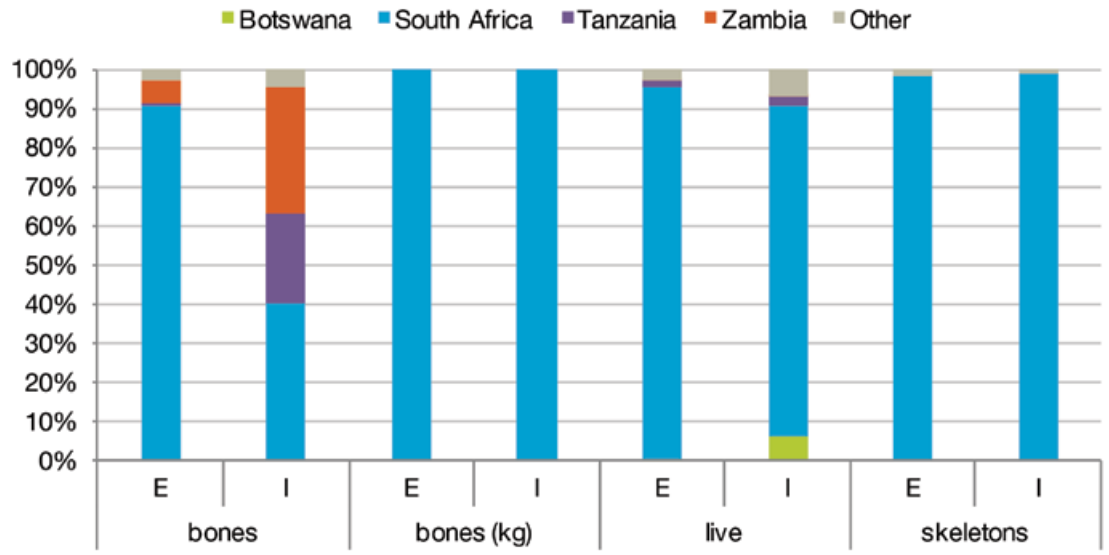


Figure 4.2.2: The exporters of direct exports of Felidae products over the period 2005-2014 as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

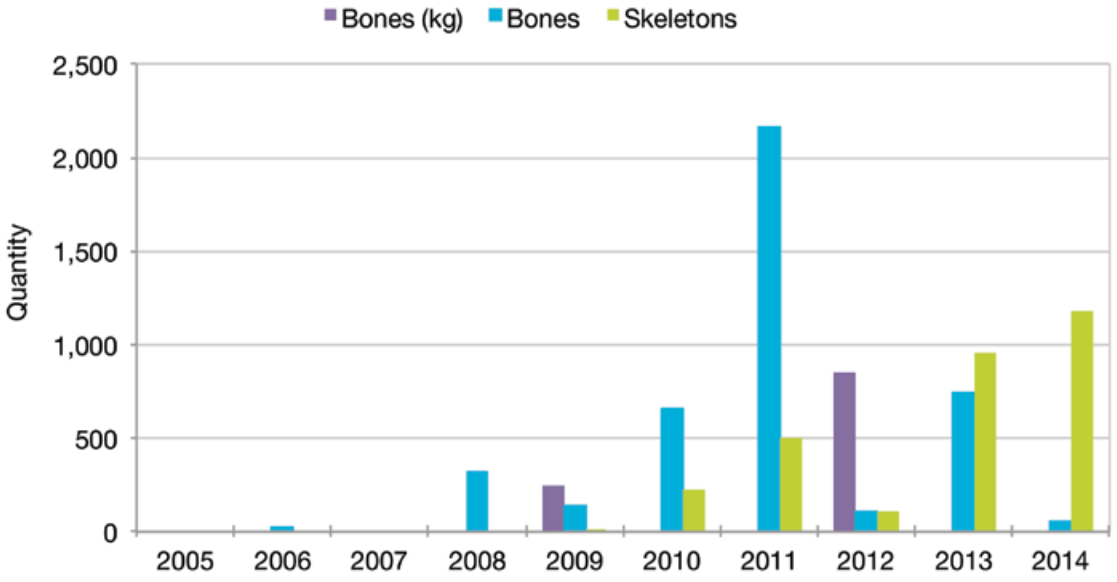


Figure 4.2.3: Exports of Felidae bones and skeletons over the period 2005-2014 as reported by exporters. Source: CITES Trade Database, UNEP-WCMC.

Singapore, Thailand and Viet Nam. All trade in these terms to the Eastern and South-eastern Asia Region is derived from *Panthera leo*, with the exception of two *Panthera pardus* (Leopard) bones exported in 2013. The majority of exports of bones and skeletons occurred from 2010 onwards (Figure 4.2.3) and coincided with an increase in exports of live animals to the Region during the same time period (see Figure 4.2.7).

This increase in exports to Eastern and South-eastern Asia may be linked to the increasing use of *P. leo* bones in Traditional Asian Medicine (Williams *et al.*, 2015a, 2015b). *Panthera leo* bones have been increasingly used as a substitute for *Panthera tigris* (Tiger) in Traditional Chinese Medicine (TCM) products, such as Tiger bone poultices and wine (Nowell and Ling, 2007) following the removal of *P. tigris* from the pharmacopoeia in 1993 (Williams *et al.*, 2015a, 2015b), 2005 legislation in China banning the sale of Leopard bones (an initial substitute for tiger) and the 2007 CITES Decision (14.69) on phasing out Tiger farms.

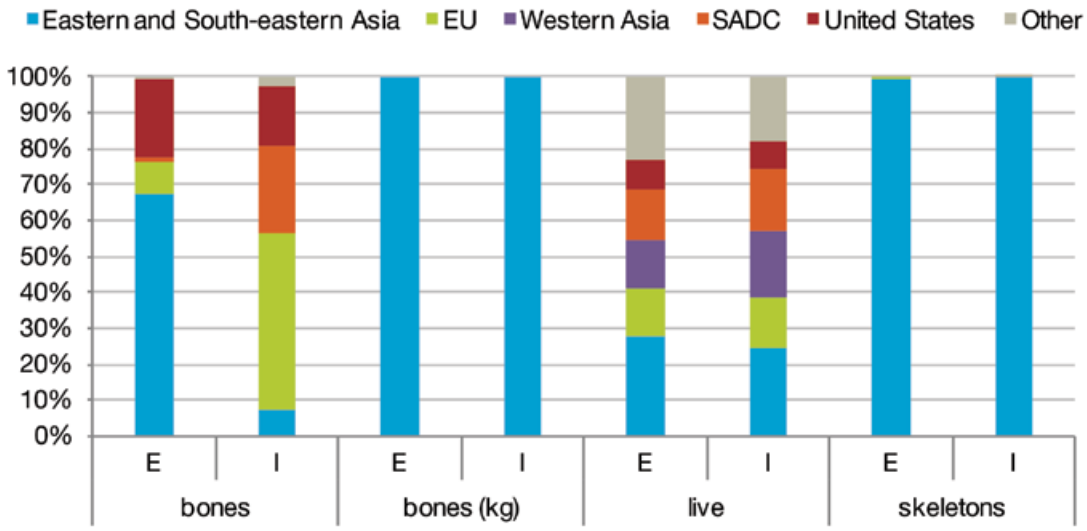


Figure 4.2.4: Importers of direct exports of Felidae products over the period 2005-2014, by proportion of trade, as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

The trade in *P. leo* bones for Traditional Medicine (in Africa as well as Asia) has been identified as an emerging threat to the species (Bauer *et al.*, 2015).

Live Felidae were imported by 85 different countries in total, of which 12 were SADC Member States. The largest single importers were the United Arab Emirates (9%), Thailand (8%), China (7%) and the United States (8%). Trade to "Other" countries was mainly composed of exports from Namibia to Cuba in 2012 and 2013 for zoological purposes.

Captive-produced *Panthera leo*, *P. tigris*, *Acinonyx jubatus*, *Caracal caracal* (African Caracal) and *Leptailurus serval* (Serval) comprised 95% of live exports (2454 live, captive-produced individuals), with wild-sourced *Panthera leo*, *P. pardus*, *Caracal caracal* and *Leptailurus serval* (Serval) comprising a further 7% (200 live, wild-sourced individuals; Figure 4.2.5).

Panthera leo, by Tambako The Jaguar via Flickr

The majority of live exports were reported as for zoo, breeding, scientific and education purposes, with commercial exports also making up a notable proportion for *Panthera leo*, *Leptailurus serval* and *Caracal caracal* (Figure 4.2.6).

The pet trade in the Gulf States has been reported to be a large source of demand for live *A. jubatus* and concerns have been raised about illegal trade from wild populations contributing to the decline of East African populations of

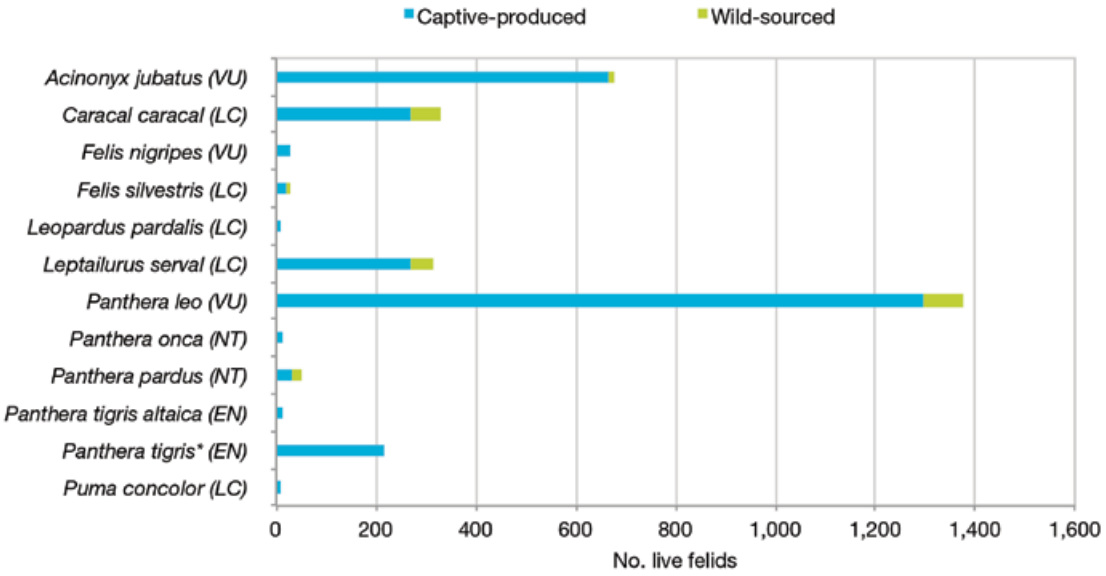


Figure 4.2.5: Direct exports of live felids by species over the period 2005-2014 as reported by exporters, indicating source of trade. Small quantities of trade from source I, R and unknown is not shown. Non-native species are indicated by an asterisk; IUCN Red List status is shown in brackets. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

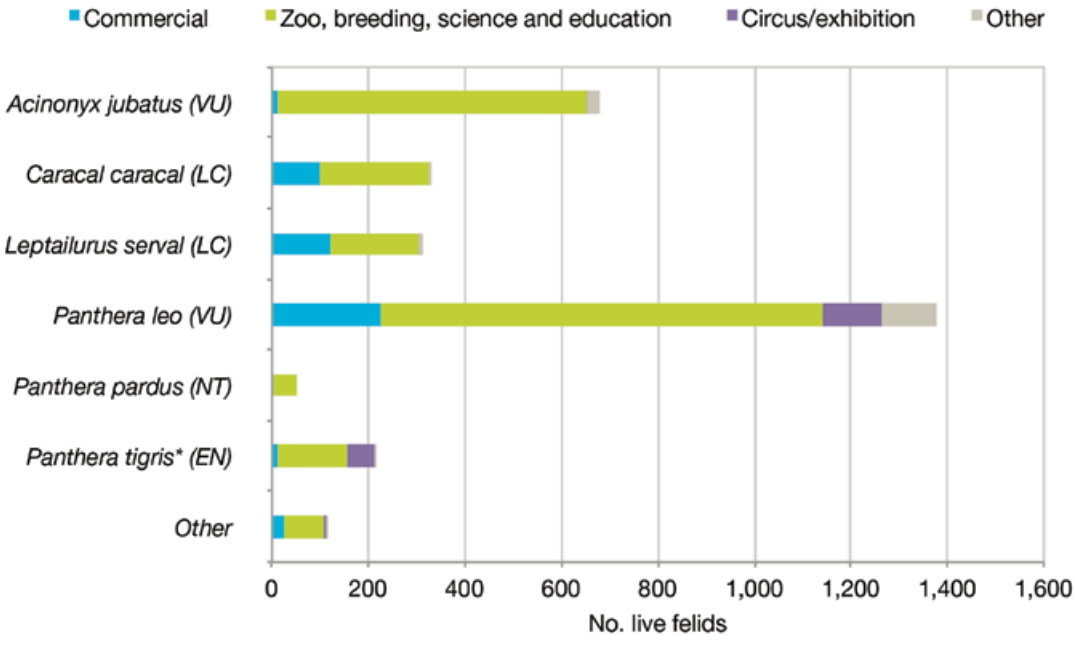


Figure 4.2.6: Top exported felid species as live animals by purpose of trade, 2005-2014 as reported by exporters. "Other" includes trade for purposes of hunting trophies, medicine, personal and unknown purposes. Non-native species are indicated by an asterisk; IUCN Red List status is shown in brackets. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

the species (Nowell, 2014a, 2014b; Durant *et al.*, 2015). Nearly all the live *A. jubatus* exports from the SADC Region 2005-2014 were reported as captive-produced (sources C, D and F) and exported for zoo, breeding, science and education purposes; however, Nowell (2014a, 2014b) expressed concerns that not all specimens reported as captive-bred meet the CITES captive breeding requirements. The main importers of live *A. jubatus* were the United States, China, Japan and the United Arab Emirates.

Exports averaged 309 individuals a year over the period 2005-2014 according to exporters, reaching a peak in 2012 (Figure 4.2.7); this peak was nearly entirely composed of an increase in *Panthera leo* exports from South Africa, with exports destined mainly to Thailand, the United Arab Emirates, China and Spain.

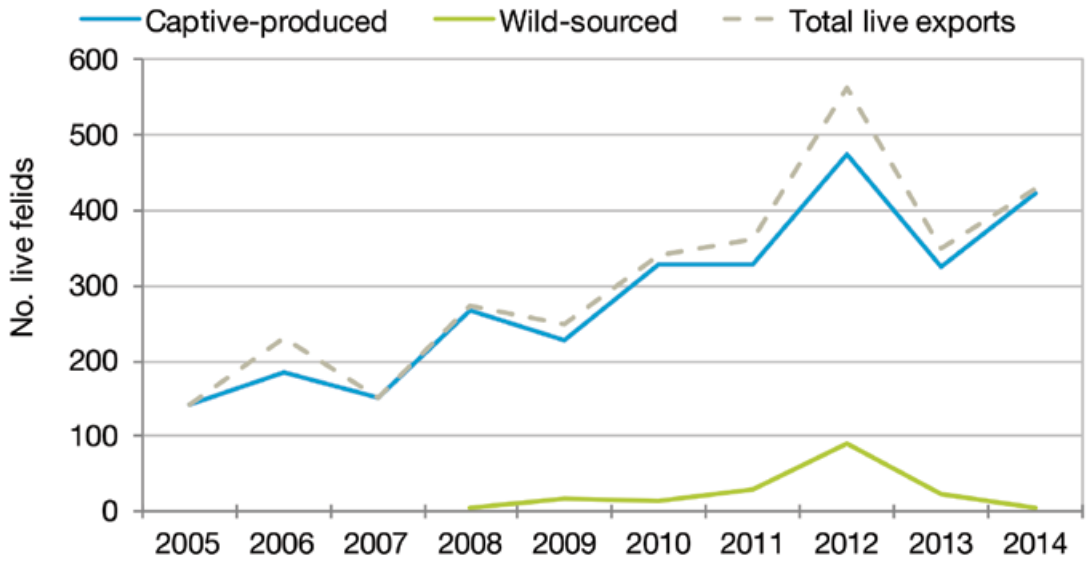


Figure 4.2.7: Direct exports of live Felidae over the period 2005-2014 as reported by exporters. Small quantities of trade from source I, R and unknown is not shown Source: CITES Trade Database, UNEP-WCMC.

Acinonyx jubatus, by Arnoud Quanjer licenced via Shutterstock

BOX 3. SCALE AND IMPACTS OF THE ILLEGAL LEOPARD SKIN TRADE IN SOUTHERN AFRICA (BY GUY BALME, LEOPARD PROGRAM DIRECTOR, PANTHERA)

Although still widespread, leopards *Panthera pardus* have suffered a significant reduction in numbers and range (Jacobson *et al.* 2016). A key cause of declines is the trade in leopard skins for ceremonial regalia. Leopards are revered in many African cultures; for example, followers of the Nazareth Baptist 'Shembe' Church in South Africa wear leopard skins as a symbol of worship and prestige. No reliable estimates exist on the size of the Shembe Church, but it likely exceeds one million members. Mark-resight and questionnaire surveys undertaken at Shembe gatherings suggest that between 1500 and 2500 leopards are harvested annually to fuel the demand for skins, and that there are as many as 15 000 leopard skins distributed among Shembe followers alone (and other cultural groups in southern Africa use leopard skins; Balme *et al.* unpubl. data).

The leopard skin trade is having a devastating effect on South Africa's leopard population, and likely leopard populations throughout the southern African subregion. Leopard density estimates (n = 37) from 13 protected areas in South Africa, derived using camera-trap data and spatially-explicit capture-recapture models, show that leopard populations are on average declining by 6% per annum (Balme & Pitman unpubl. data). Sites with more than five years of longitudinal data (n = 4) have typically declined by 56%. Camera-trap surveys conducted in Swaziland and southern Mozambique similarly reveal leopard populations near extirpation. Phylogenetic relationships between samples taken from leopard skins confiscated by police (n = 116) and a broader genetic reference dataset (n = 189) suggest that many skins entering Shembe markets originate from outside South Africa, particularly from southern Zimbabwe and central and northern Mozambique (Naude *et al.* unpubl. data). There are no reliable estimates of leopard population trends from any of these areas – or elsewhere in the subregion – but it seems likely that rates of decline will be similar or higher than those documented in South Africa, given the scale of the illegal leopard skin trade.

Panthera pardus by Bernard Dupont via Flickr

4.2.1 Estimated value of the felids trade

An estimate of the financial value of the international trade in felids from the Region is provided below in USD. For consistency with the valuation for other animal commodities this estimate is based on reported volumes of trade and on the median prices reported to customs at the point of import into the United States between 2006 and 2014, as reported in their annual reports to CITES (excluding trophies). However, according to (Lion Aid, 2012 in Williams *et al.*, 2015b) reported prices of bones and skeletons at the point of import into Asian countries were higher than reported by United States customs. Values presented below are estimates and should be treated with caution; some combinations of taxa, terms, units and sources in trade did not have corresponding prices from the United States report, and these have been excluded from the valuation. Where possible, a 'proxy' of the median genus, family or order price was used instead, but this may not be accurate at the species level (see methodology in Annex A for more details).

Between 2005 and 2014, the total value of Felidae exports (excluding trophies) was estimated to be approximately USD14.6 million based on exporter-reported trade levels, with trade in *Acinonyx* (~USD8.2 million), *Panthera* (~USD5 million), and *Caracal* (~USD0.5 million) representing the highest value trade.

Live animals (~USD13.6 million) were the highest value commodities in trade, comprising 93 per cent of the approximate total value of felids trade. It should be noted that not all terms could be assigned a value. The highest value exports of live, captive-bred felid species are shown in Table 4.2.1.

Between 2005 and 2014, the top exporters of felids in terms of value were also the top exporters in terms of volume. South Africa had 63% of estimated value and 45% of export volume (~USD17. 9 million), followed by Namibia with 11% of estimated value and 41% of export volume (~USD3.1 million), and Zimbabwe with 10% of estimated value and 4% of export volume (~USD2.8 million).

Table 4.2.1. Estimated values of the top five highest value felids species exported as live and captive-bred individuals over the period 2005-2014 as reported by exporters. Estimate based on median prices reported to customs at the point of import into the United States between 2006 and 2014. All prices should be treated as estimates.

Taxa	Price per captive-bred live animal (USD)	Total estimated financial value of trade (USD)
Acinonyx jubatus	12263	8 142 300
Panthera leo	2083	2 572 826
Leptailurus serval	3258	873 144
Panthera tigris	2280	492 480
Caracal caracal	1649	436 572

4.3 Parrots

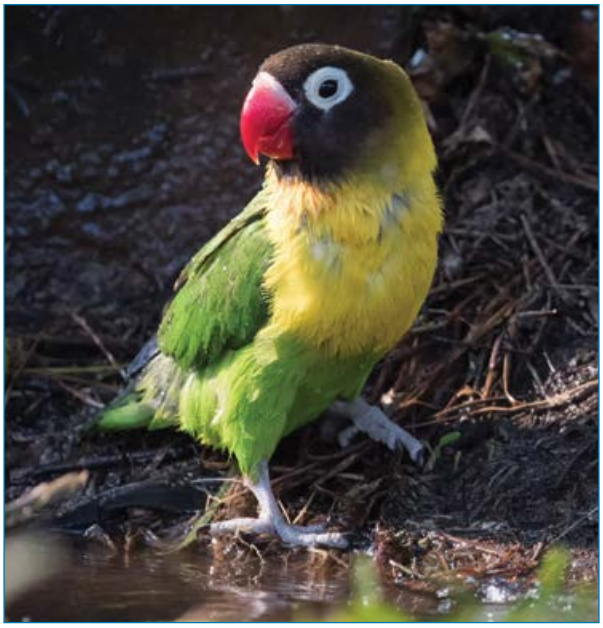
Live parrots are in demand globally as household pets (Annorbah *et al.*, 2016; Poole and Shepherd, 2016; Hart *et al.*, 2016). Eighteen species are native to the SADC Region, half of which have declining populations and three of which are globally threatened (IUCN, 2015).

The main trend identified over 2005-2014 was a steep increase in exports of live parrots, the majority of which were exported from South Africa to Western Asia and were composed of high volumes of captive-produced *Psittacus erithacus.*

Direct Exports

Two hundred and six parrot species were exported or re-exported from SADC countries over the period 2005-2014. The majority of trade was in live individuals (1 208 350 as reported by exporters), with exports mainly composed of captive-produced (sources C, D and F) parrots exported from South Africa for commercial purposes (93% of live exports) and wild-sourced parrots for commercial purposes exported from the DRC (5% of live exports).

It is important to note that there is a large disparity in direct exports of live parrots from South Africa as reported by South Africa (1 134 695) compared to those reported by importers (186 520), with South Africa reporting approximately six times more birds than trading partners (Figure 4.3.1).



Agapornis personatus, by Demetrius John Kessy, via Wikimedia Commons

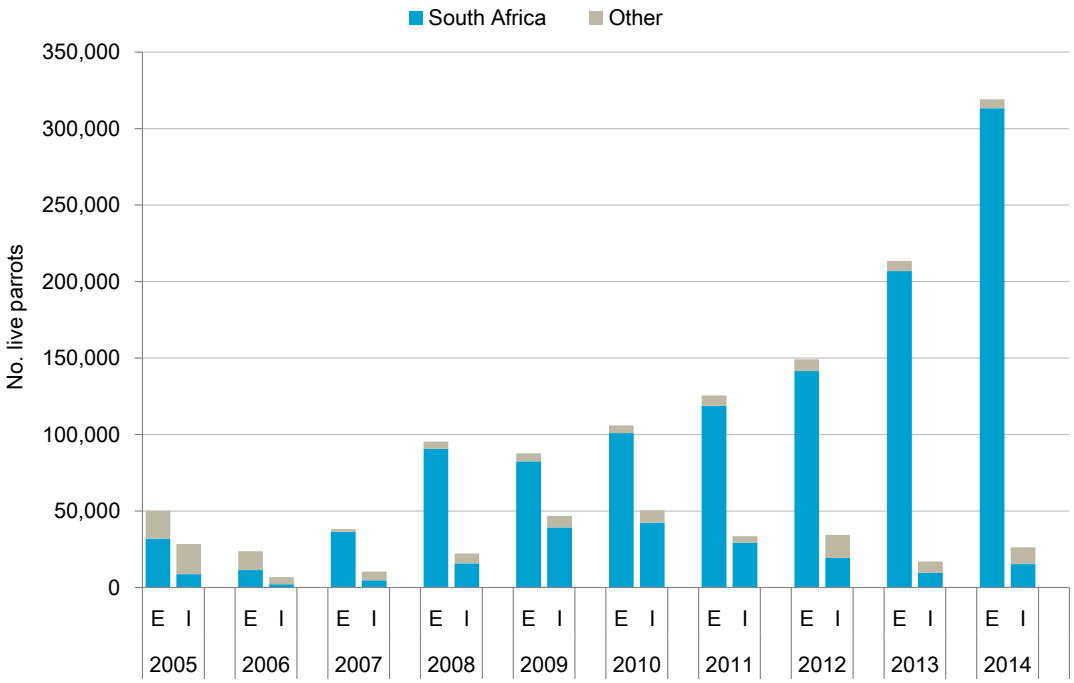


Figure 4.3.1. Direct exports of live parrots over the period 2005-2014 as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

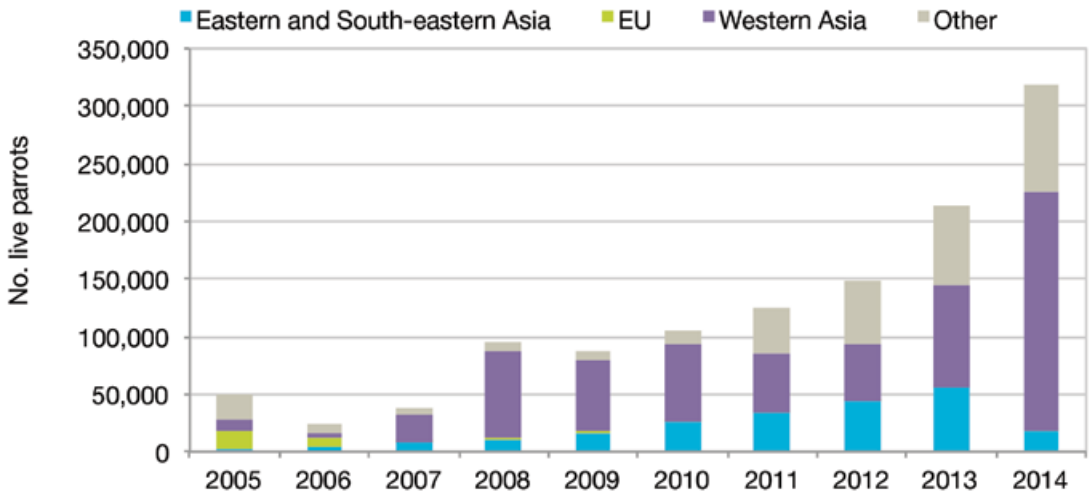


Figure 4.3.2. Direct exports of live parrots over the period 2005-2014, by import Region. Source: CITES Trade Database, UNEP-WCMC.

Differences in the importer and exporter-reported trade may partially be due to 13% of South Africa's exports being imported by Bahrain, which did not report on trade as it was not a CITES Party until 2012; the discrepancy could also be due to importers not reporting Appendix II imports. According to South Africa, their exported live parrots were mainly imported by Oman (18%), Bahrain (13%) and Pakistan (12%), while DRC mainly exported to South Africa (30%), the Netherlands (12%), Lebanon (11%) and Singapore (11%). Singapore has previously been highlighted as a trade hub for aviculture (Poole and Shepherd, 2016). Trade in live parrots increased notably over the ten-year period, with countries in Western Asia importing an increasing share of total live bird exports from SADC over the period 2005-2014 (Figure 4.3.2).

Direct exports of captive-produced individual parrots for commercial purposes increased notably over the period 2006-2014 representing an 11-fold increase from 30 510 in 2006 to 345 406 in 2014; wild-sourced trade peaked in 2005 and decreased since then according to exporters (Figure 4.3.3). The decline in wild-sourced exports is likely linked to an EU wide import ban of wild-sourced birds implemented in 2005 and made permanent in 2007 for purposes of animal health; in 2005 80% of wild-sourced

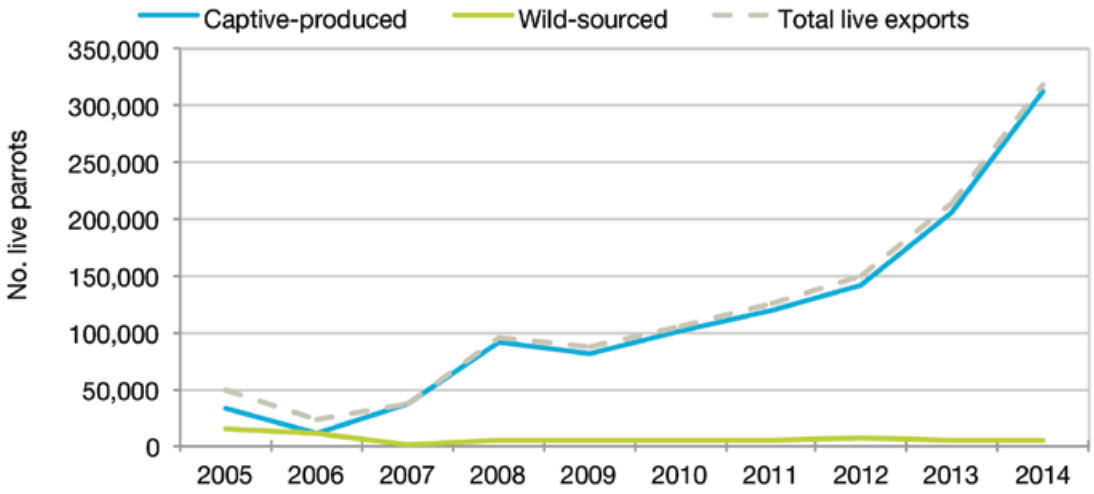


Figure 4.3.3: Direct exports of live captive-produced (source D, C and F), wild-sourced and other (source I and unknown) parrots over the period 2005-2014. Source: CITES Trade Database, UNEP-WCMC.

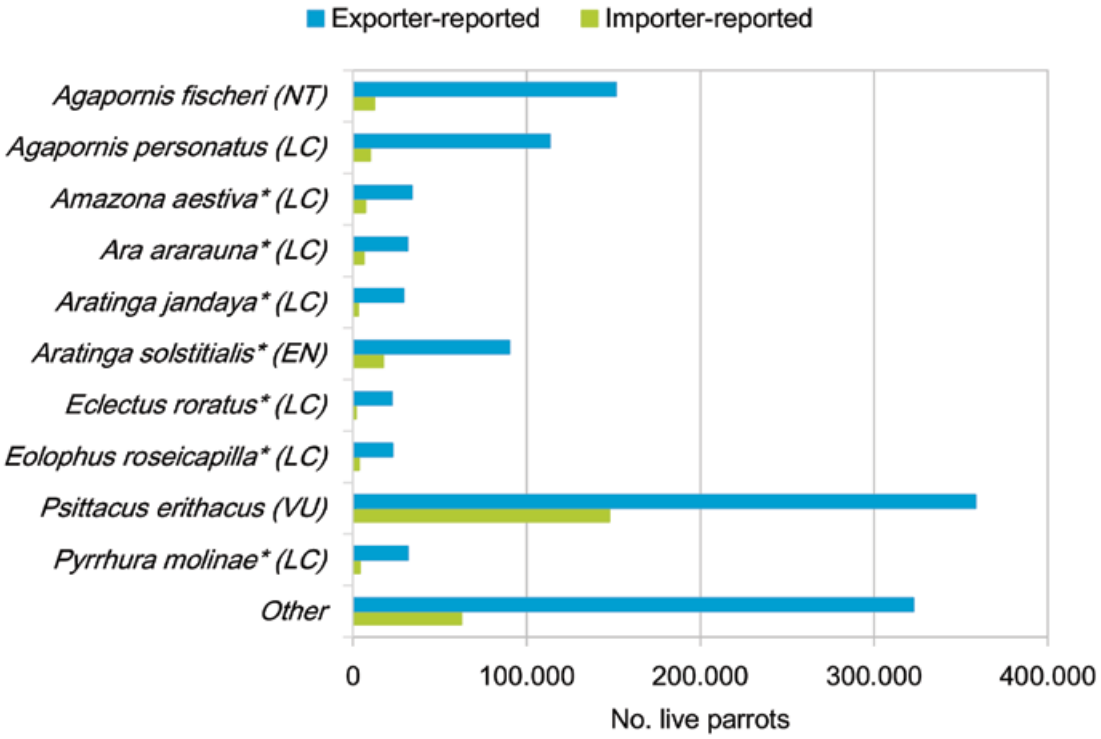


Figure 4.3.4. Top 10 parrot species directly exported from the SADC region as live individuals. IUCN Red List status is indicated in brackets (LC=Least Concern, NT=Not Threatened, VU=Vulnerable, EN=Endangered); species not native to a SADC country are indicated by an asterisk. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

parrots were imported by the EU, while in 2007 the EU imported less than one per cent of wild-sourced parrots from SADC.

The majority of live parrots exported were *Psittacus erithacus* (African Grey Parrot; 30%), classified as Vulnerable by the IUCN, followed by *Agapornis* (23%) and *Aratinga* species (11%). *Agapornis fischeri* (Fischer's Lovebird) was the second most traded species (13%) according to exporters (Figure 4.3.4). The named species in Figure 4.3.4 accounted for approximately 75% of the volume of exports and nearly all (97%) of the increase in exports between 2005 and 2014.

Re-exported Trade

Re-exports comprised much lower volumes than direct exports and showed some discrepancies in volumes, source and purpose of trade reported by re-exporters and importers. According to re-exporters, 367 captive-produced and wild-sourced live parrots were re-exported for commercial and law enforcement purposes, while according to importers there were 2763 captive-produced and wild parrots re-exported for commercial purposes.

The majority of the indirect exports of live individuals followed two main trade routes: wild-sourced birds from Namibia to Thailand originating in the Republic of the Congo (1,000 individuals); and captive-produced birds from South Africa to Singapore originating in the Solomon Islands (600 individuals), as reported by importers. The former consisted entirely of *Psittacus erithacus*, while the latter was made up of equal numbers of the native species *Cacatua ducorpsii* (Solomons Cockatoo), *Chalcopsitta cardinalis* (Cardinal Lory), *Eclectus roratus* (Eclectus Parrot) and *Lorius chlorocercus* (Yellow-bibbed Lory; i.e. 150 of each). The exports from the Solomon Islands were captive-bred (source C); however, it should be noted that Shepherd *et al.* (2012) question the feasibility of captive breeding these species on the Solomon Islands.

4.3.1 Psittacus erithacus trade

Psittacus erithacus (African Grey Parrot) is a popular species in the pet trade in Europe, the United States and Western Asia and has a decreasing population trend, with capture for the pet trade implicated as a driving cause (BirdLife International, 2013; Hart *et al*., 2016; Annorbah *et al*., 2016). A recent United Nations Office of Drugs and Crime (2016) report identified the species as the most seized single parrot species in seizures of illegal trade over the period 2007 -2014.

Trade in *Psittacus erithacus* was almost entirely comprised of live individuals for commercial purposes. Exporter and importer-reported data indicated different sources and volumes of trade: according to exporters 360 385 live parrots were exported from the SADC region, with the majority (84%) captive-produced(source C and F) and the remainder wild-sourced, whereas, according to importers, 147 950 parrots were imported, with the majority (52%) wild-sourced. As with the reporting discrepancy highlighted for all live birds, the lower levels reported by importers may partially be due to Bahrain being a major import market for *Psittacus erithacus* and only becoming a Party to CITES in 2012.

Trade in African Grey Parrot reflected the pattern for all species, with commercial exports of live wild-sourced individuals peaking in 2005-2006 and then remaining relatively stable at an average of 4400 per year, and captive-produced increasing since 2006, with 2014 showing the highest trade levels over the ten-year period (Figure 4.3.5).

Psittacus erithacus, by Quartl, via Wikimedia Commons

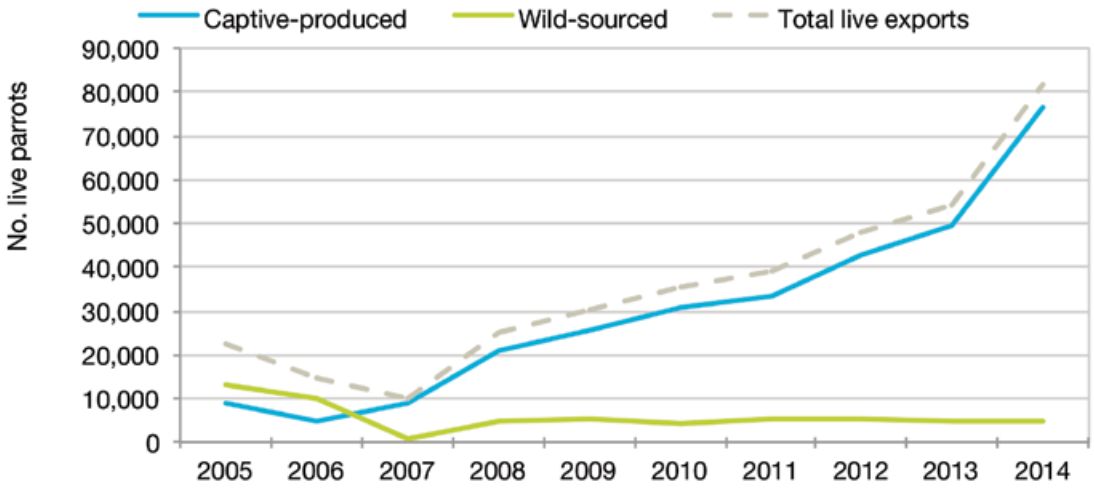


Figure 4.3.5: Direct exports from SADC of live *Psittacus erithacus* over the period 2005-2014 as reported by exporters. Source: CITES Trade Database, UNEP-WCMC.

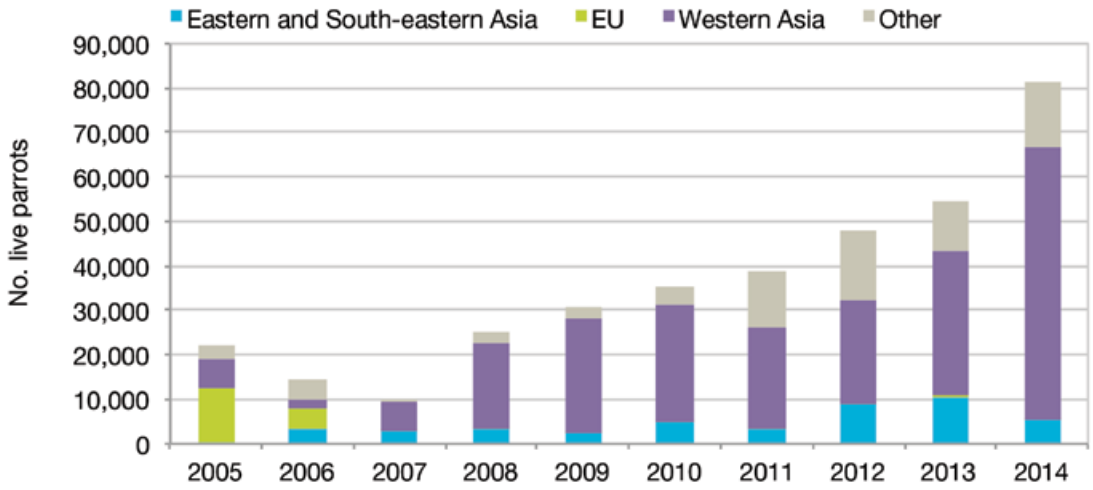


Figure 4.3.6. Direct exports of live *Psittacus erithacus* over the period 2005-2014 by main import markets. Source: CITES Trade Database, UNEP- WCMC.

A higher percentage of *P. erithacus* exports were wild-sourced than total exports of live parrots.

South Africa was the main direct exporter of captive-produced live *P. erithacus* (over 99% of captive-produced trade), with the DRC the main direct exporter of wild-sourced live individuals (98% of wild-sourced trade) according to exporters. Western Asia was the main import market for *Psittacus erithacus*, importing 226 831 live birds over the study period, with an increasing number imported in recent years (Figure 4.3.6).

Psittacus erithacus by Robert01 via Wikimedia Commons

BOX 4. TRADE IN *POICEPHALUS ROBUSTUS* (CAPE PARROT)

There is some confusion over the taxonomy of *Poicephalus robustus* (Cape Parrot), making monitoring trade in this species challenging. The CITES Standard Reference, BirdLife International and the IUCN consider *P. robustus* to consist of three sub-species: *P. r. fuscicollis*, *P. r. suahelicus* and *P. r. robustus* (Dickinson, 2003; BirdLife International, 2012). However, *Poicephalus robustus* (Cape parrot) has recently (in 2002 and again in 2005) been recognised by range-state taxonomists as a separate species from the Brown-necked Parrot (*P. fuscicollis fuscicollis*) and the Grey-headed Parrot (*P. f. suahelicus*).

Poicephalus robustus, *by Bram Cymet via Flickr*

The elevated species of *Poicephalus robustus* has a restricted and fragmented distribution within South Africa, occurring in the Eastern Cape and KwaZulu-Natal, with a small fragmented relic population estimated at c. 100 individuals in Limpopo Province. Annual censuses over the past 15 years estimated a global population size of 1000-1500 individuals, representing considerably less than 500 breeding pairs. Based on 15 years of survey data the population appears to be stable. However, there is also evidence of local declines.

The biological characteristics of *Poicephalus robustus* render it highly sensitive to harvesting as they are long-lived with relatively low reproductive rates. The species is furthermore an extreme specialist with respect to habitat and diet. While the ultimate threat to *P. robustus* is habitat loss through the degradation and reduction in Afromontane Southern Mistbelt forest, recent threats also include infection and mortality caused by Psittacine beak and feather disease virus (PBFDV) and poaching and trade. An uncertain level of illegal harvesting has been ongoing since the 1960s. The high demand for the species from aviculturists, owing to the Cape parrot's rarity, has caused an escalation in its market value to around ZAR100 000 per pair of birds. Nest poaching is also known to take place. Additionally, as the CITES Standard Reference does not recognise the subspecies of *P. robustus robustus* as a separate species, it is not possible to disaggregate trade in *P. r. robustus* from that in the other two sub-species, making monitoring of the legal trade difficult.

Direct exports of *Poicephalus robustus* 2005-2014 primarily comprised low levels of live individuals relative to overall live parrot exports, with 1707 reported by exporters. Importer reported figures were much lower, with direct exports of 391 live parrots reported over this period. Trade in live *P. robustus* parrots mainly consisted of captive-bred individuals for commercial (1220 individuals; 72%) and personal purposes (411 individuals; 24%). South Africa was the main exporter of live *P. robustus* parrots (93%), with the majority of these being imported by Israel and Oman (31 % and 18% of trade exported by South Africa, respectively).

Source: SANBI, W. Coetzer Pers. Comm. 2016, CITES Trade Database.

4.3.2 Trade in other parrot species native to the SADC Region

Trade in parrot species native to the SADC Region (excluding *Psittacus erithacus* and *Poicephalus robustus* which are discussed in 4.3.1 and Box 3) was dominated by exports of live parrots, with 299 666 live parrots exported. Two native species accounted for the majority of this trade, with *Agapornis fischeri* (Fischer's Lovebird) composing 51% and *A. personatus* (Black-masked Lovebird) composing 38% (as reported by exporters; Figure 4.3.7).

Nearly all direct exports of live, native parrots were captive-produced (sources C, D and F) and exported for commercial purposes. South Africa was the biggest exporter (96%), with Pakistan (25%) and Bahrain (17%) the biggest single importers of this trade. Direct exports underwent a

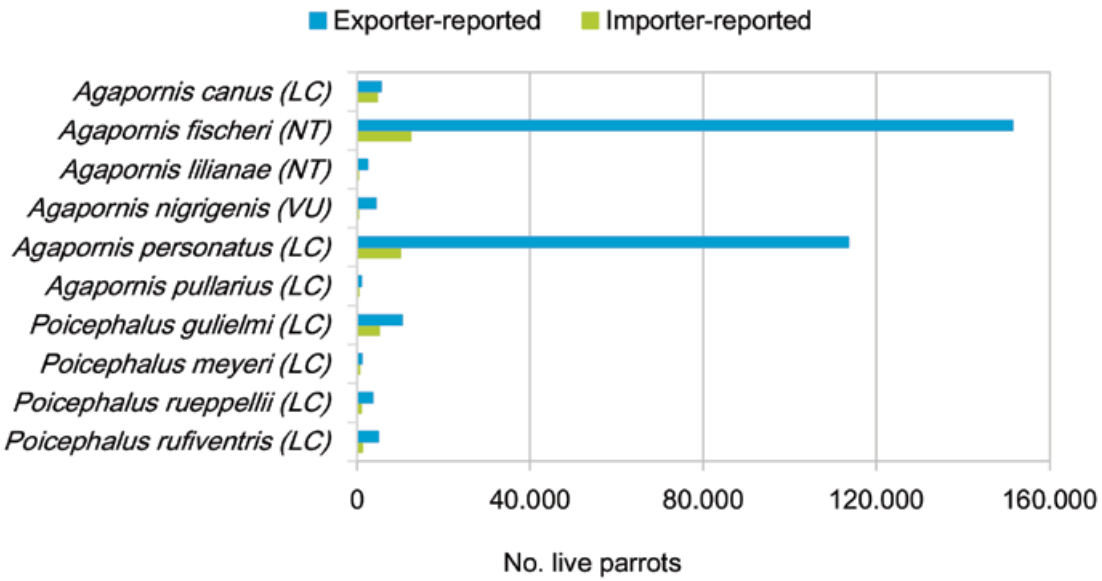


Figure 4.3.7. Quantities of SADC native parrots (excluding *Psittacus erithacus* and *Poicephalus robustus*) directly exported as live individuals over the period 2005-2014. Exports of *Agapornis swindernianus*, *Coracopsis nigra*, *C. vasa*, *Poicephalus crassus* and *P. cryptoxanthus* are not shown due to low quantities of exports. IUCN threat status is indicated in brackets (LC=Least Concern, NT=Not Threatened, VU=Vulnerable).Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

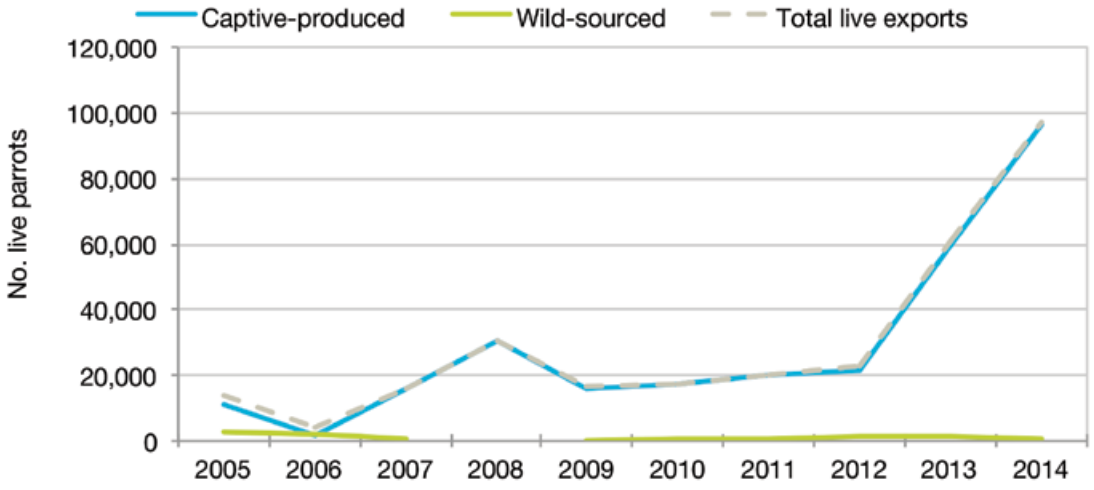


Figure 4.3.8. Direct exports of live parrots native to the SADC Region (excluding *Psittacus erithacus* and *Poicephalus robustus*) over the period 2005-2014. Source: CITES Trade Database, UNEP-WCMC.

sharp increase between 2012 and 2014, which is partially due to increases in exports of *Agapornis fischeri* and *A. personatus* to Pakistan and Oman. Nearly all exports have been captive-produced since 2007 (Figure 4.3.8).

4.3.3 Estimated value of the parrot trade

An estimate of the financial value of the international trade in parrots from the Region is provided below in USD. This estimate is based on reported volumes of trade and on the median prices reported to customs at the point of import into the United States between 2006 and 2014, as reported in the U.S. annual reports to CITES. These are estimates and should be treated with caution; some combinations of taxa, terms, units and sources in trade did not have corresponding prices from the U.S. report, and these have been excluded from the valuation. Where possible, a 'proxy' of the median genus, family or order price was used instead, but this may not be accurate at the species level (see methodology in Annex A for more details).

Between 2005 and 2014, the total value of parrot exports was estimated to be approximately ~USD582.5 million based on estimating the value of exporter-reported trade levels, with *Psittacus* (~USD311.3 million), *Ara* (~USD54.7 million) and *Amazona* (~USD43.8 million) the genera representing the highest value trade.

The total value of the trade in live parrots was approximately ~USD582.5 million, over 99% of the total value of parrot exports. Exports of live *Psittacus* species comprised 53% of the total value of live exports, with *Ara* the next highest valued genus at 9% of total live exports. The species estimated to represent the highest value can be found in Table 4.3.1.

Aratinga solstitialis, by Wayne Deeker, via Wikimedia Commons

Between 2005 and 2014, the top exporters of parrots in terms of value were also the top in terms of export volume. South Africa's parrot exports comprised 94% of all exports and total estimated value (~USD548 million), followed by DRC with 5% of both export volume and estimated value (~USD31 million).

Table 4.3.1. Estimated values of the top five parrot highest value species exported as live and captive-bred individuals over the period 2005-2014 as reported by exporters. Estimate based on median prices reported to customs at the point of import into the United States between 2006 and 2014. All prices should be treated as estimates.

Taxa	Estimated price per live bird (USD)	Total estimated financial value of trade (USD)
Psittacus erithacus	936	278 468 424
Ara ararauna	1368	42 856 704
Aratinga solstitialis	255	22 851 825
Eclectus roratus	922	20 724 074
Amazona aestiva	600	20 340 600

4.4 Reptiles

Southern Africa is home to a diverse reptile fauna (Alexander and Marais, 2007), with approximately 1500 species of reptiles native to the SADC Region (Uetz and Hošek, 2015). Just under half of these SADC species have been assessed for the IUCN Red List. Of the species assessed by the IUCN, 31% are categorised as globally threatened (CR, EN or VU) and 13% as Data Deficient. A total of 293 species of reptile native to SADC countries are listed in the CITES Appendices.

The majority of the reptile exports from the Region during 2004-2014 consisted of *Crocodylus niloticus* (Nile Crocodile) skins, meat and live individuals, as well as live, wild-sourced lizards (primarily of the families Chamaeleonidae, Gekkonidae, Cordylidae and Varanidae) and live, captive-bred tortoises (primarily of the family Testudinidae). Trade in snakes was much lower in volume, and it was mainly comprised of exports of live, captive-bred pythons.

4.4.1 Lizards (Order: Sauria)

During 2005-2014, an average of approximately 40 000 live lizards (Order: Sauria) per year were exported from the Region, with over 98% being reported as wild-sourced and virtually all for commercial purposes. The levels of trade reported by the exporting and importing countries were

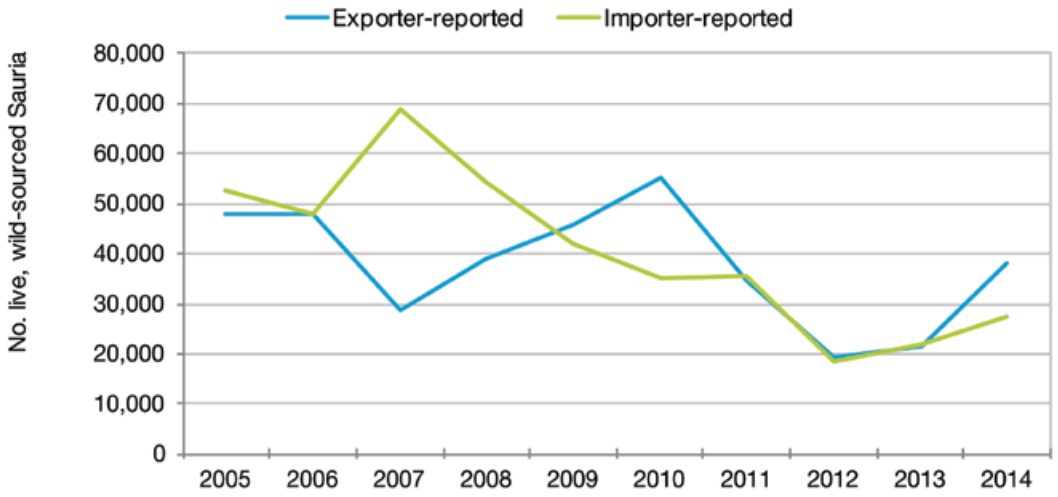


Figure 4.4.1. Exports of live, wild-sourced lizards (Order: Sauria) from the SADC Region during 2005-2014, as reported by the exporting and importing countries. Source: CITES Trade Database, UNEP-WCMC.

Chamaeleo dilepis, by Charlesjsharp via Wikimedia Commons

Furcifer pardalis, by Andreas Pott via Flickr

comparable overall, although importer-reported figures were notably higher in 2007-2008 and exporter-reported figures were higher in 2010 (see Figure 4.4.1)

Chamaeleonidae (chameleons) and Gekkonidae (geckos) were the main families in trade, followed by Cordylidae (girdled lizards) and Varanidae (monitor lizards) (Figure 4.4.2).

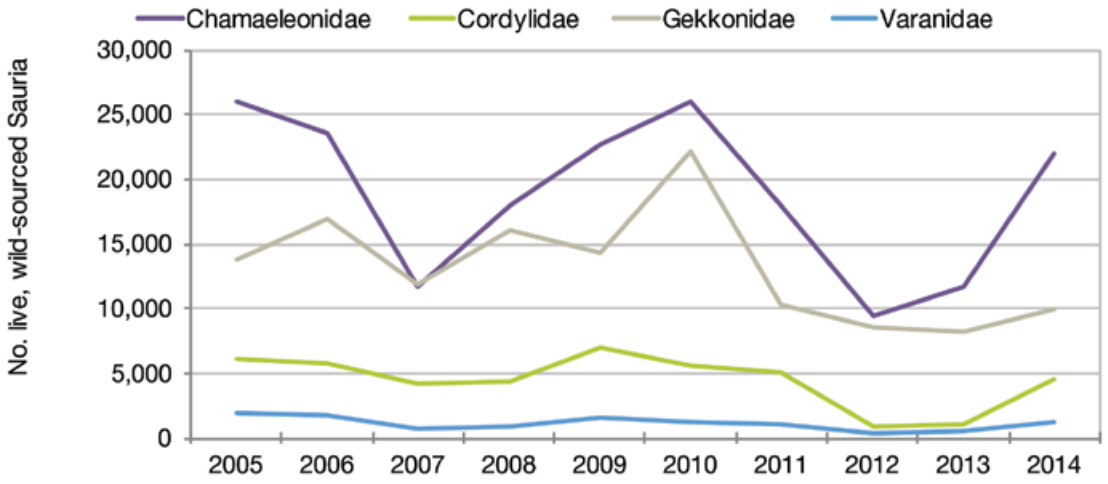


Figure 4.4.2. Breakdown by family of live, wild-sourced lizards (Order: Sauria) exports from SADC countries during 2005-2014, as reported by the countries of export. Source: CITES Trade Database, UNEP-WCMC.

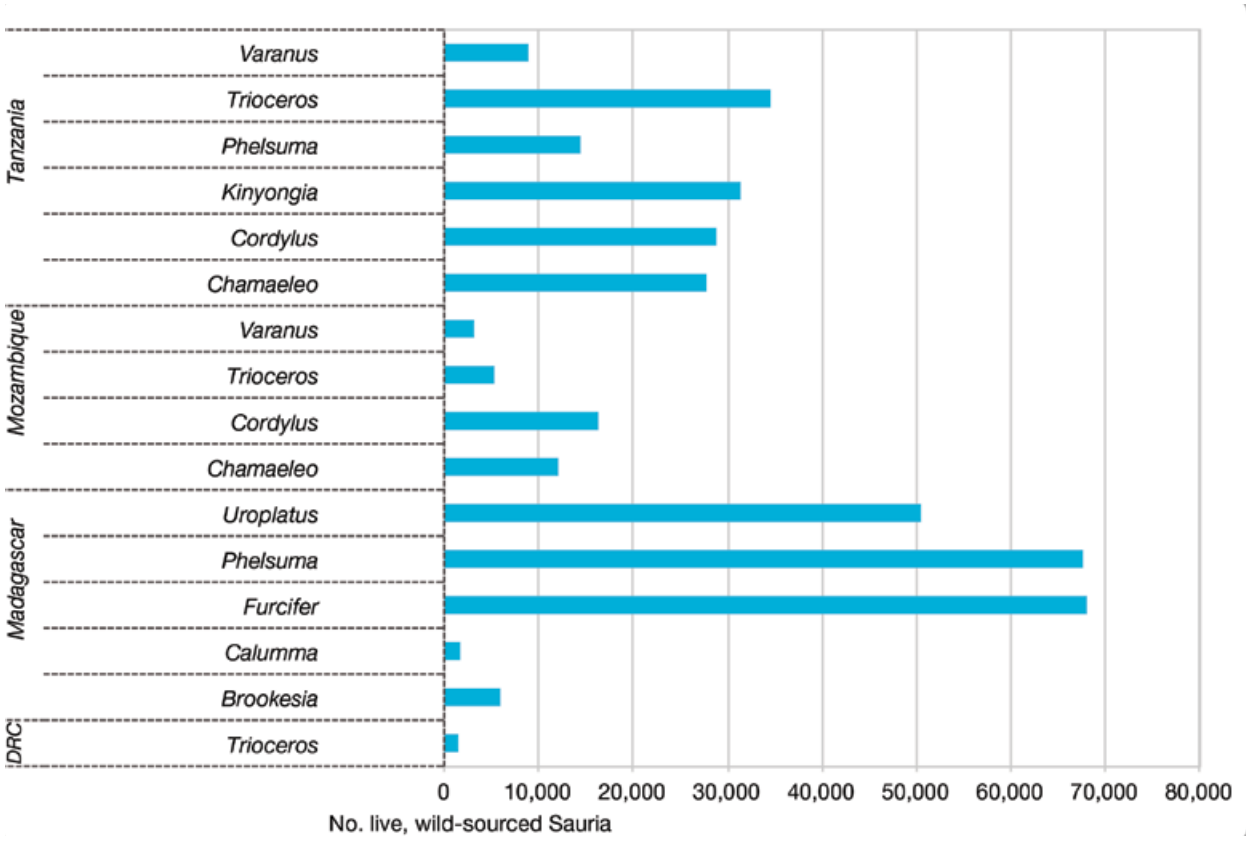


Figure 4.4.3. Exporter-reported trade in live, wild-sourced lizards (Order: Sauria) by country and genus, 2005-2014. Country/genus combinations averaging less than 100 individuals per year have been excluded. Source: CITES Trade Database, UNEP-WCMC.

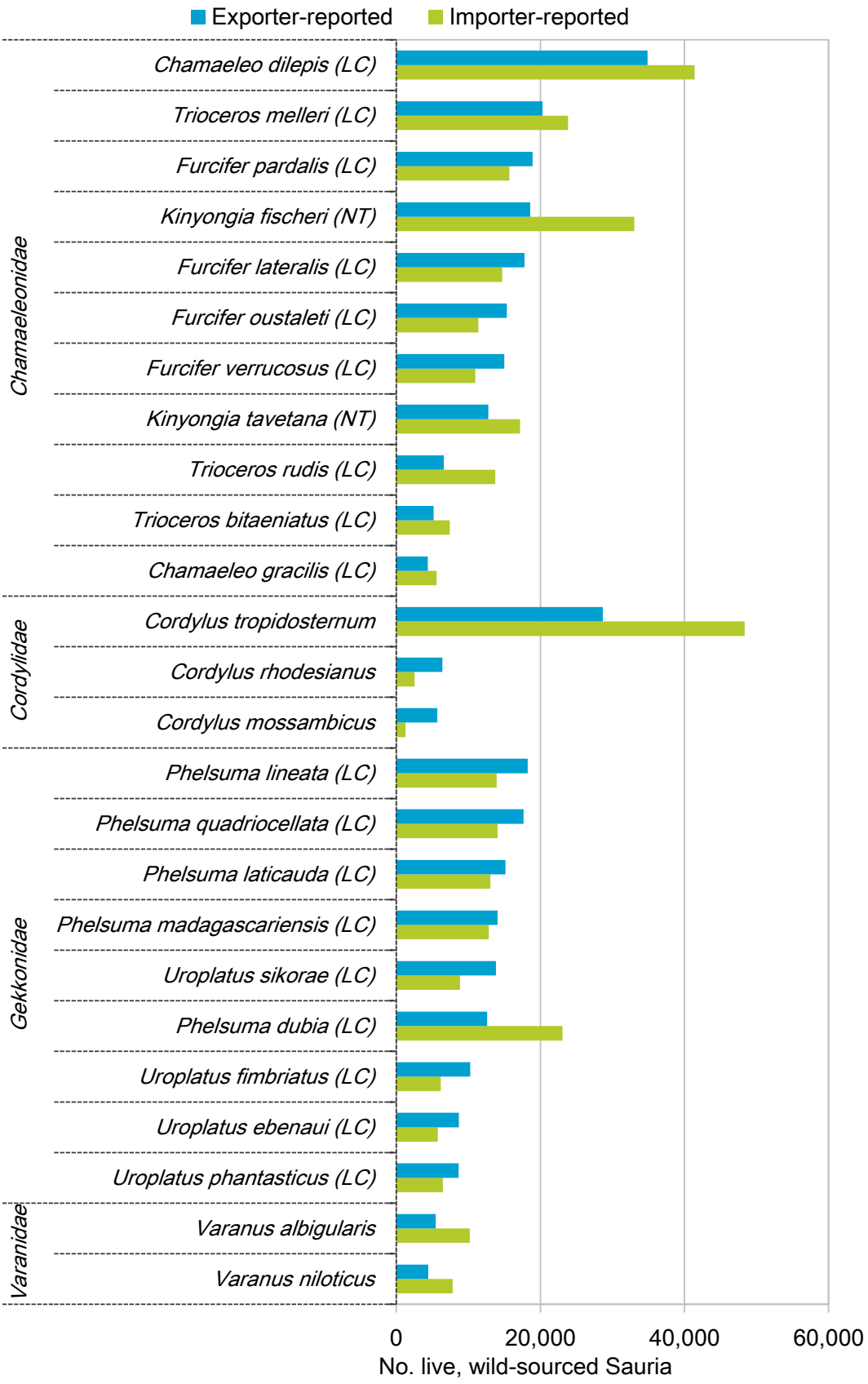


Figure 4.4.4: Trade volumes during 2005-20154 in live, wild-sourced Sauria individuals for species traded in quantities higher than 5000 during 2005-2014. The global IUCN Red List category is indicated next to the species name for species that have been assessed (LC=Least Concern, NT=Near Threatened). Source: CITES Trade Database, UNEP-WCMC.

Tanzania, Madagascar and Mozambique reported the export of the vast majority of lizards from the Region (see Figure 4.4.3). Tanzania's exports were dominated by *Cordylus tropidosternum* (East African Spiny-tailed Lizard, Not Evaluated), *Phelsuma dubia* (Zanzibar Day Gecko, Least Concern) and *Chamaeleo, Kinyongia, Trioceros* and *Varanus* species. Madagascar's exports were dominated by *Phelsuma, Uroplatus* and *Furcifer* species, with lower volumes of *Brookesia* and *Calumma* species. Lizard exports from Mozambique primarily comprised *Chamaeleo dilepis* (Flap-necked Chameleon, Least Concern), *Trioceros melleri* (Meller's Chameleon, Least Concern) and *Cordylus* species.

The most highly traded species from the Region are presented in Figure 4.4.4; all Cordylus and Varanus species shown have not been assessed for the IUCN Red List. Some of the species traded in highest numbers included *Cordylus tropidosternum* (Tropical Spiny-tailed Lizard), *Chamaeleo dilepis* (Flap-necked Chameleon), *Kinyongia fischeri* (Fischer's Chameleon), *Trioceros melleri* (Meller's Chameleon), *Furcifer pardalis* (Panther Chameleon), *Furcifer lateralis* (Carpet Chameleon), *Phelsuma lineata* (Lined Day Gecko) and *Phelsuma quadriocellata* (Peacock Day Gecko). Exports of globally threatened species comprised primarily Malagasy endemics exported directly from Madagascar, including the Endangered *Uroplatus guentheri* (Gunther's Flat-tailed Gecko, 607 individuals), *Uroplatus pietschmanni* (Corkbark Leaf-tailed Gecko, 1998 individuals) and the Vulnerable *Uroplatus ebenaui* (Nosy Bé Flat-tailed Gecko, 8672 individuals), *Uroplatus henkeli* (Henkel's Flat-tailed Gecko, 1170 individuals) and *Furcifer campani* (Madagascar Forest Chameleon, 512 individuals). Reported levels of trade in *Uroplatus* species (leaf-tail geckos) from Madagascar dropped noticeably after 2010, in line with lower export quotas published by Madagascar following the review of the genus as part of the CITES Review of Significant Trade at the 25th meeting of the Animals Committee in 2011 (AC25 Summary Record).

The single main importer of lizards from the Region was the United States, accounting for

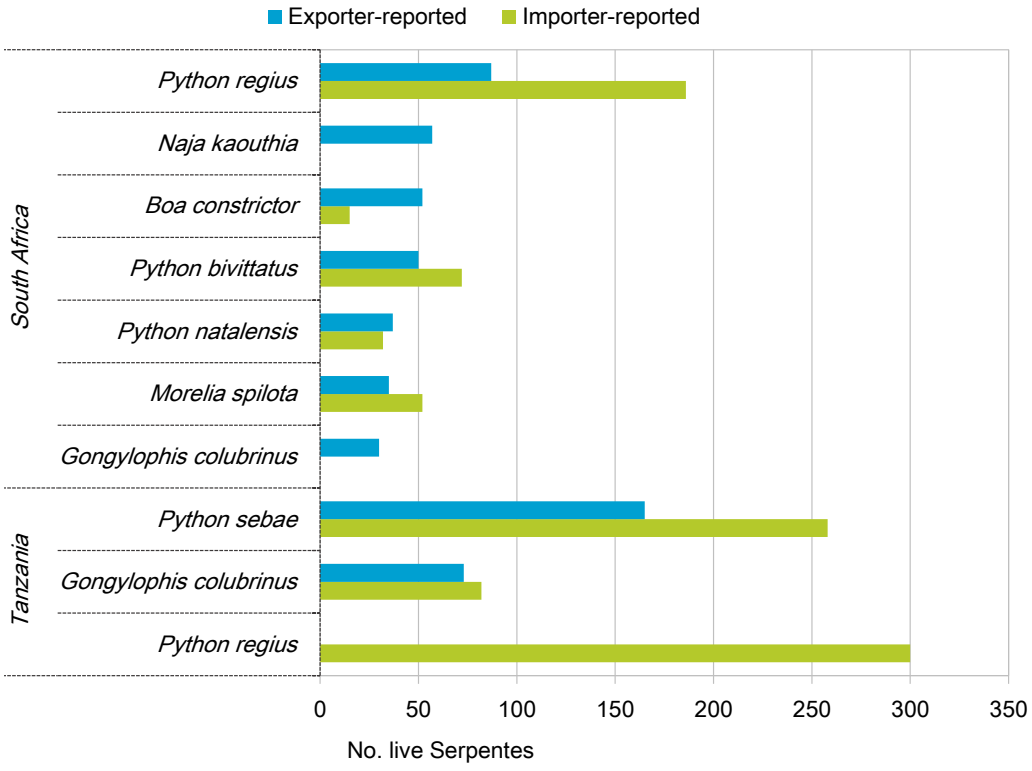


Figure 4.4.5. Main direct exports of live snakes (Order: Serpentes) from SADC, 2005-2014, by country and species, according to figures reported by both countries of export and countries of import. Source: CITES Trade Database, UNEP-WCMC.

half of all imports according to importer-reported figures. The EU was the second most important market, reporting the import of a third of lizards from the Region. Within the EU, Germany was the main importer (17% of all global imports from the SADC Region), followed by Spain (4%) and the Netherlands (3%). Japan and Canada were the other main importers (11% and 2% of global imports of lizards from the SADC Region, respectively).

4.4.2 Snakes (Order: Serpentes)

Exports of snakes (Serpentes) from the Region were only reported at low volumes, with an average of fewer than 70 live snakes exported per year during 2005-2014 according to countries of export. This trade was primarily in live, captive-bred individuals exported from South Africa and Tanzania, and included the export of both native species (e.g. *Python natalensis* – Southern African Python, *Python sebae* – African Rock Python and *Gongylophis colubrinus* – East African Sand Boa) and non-native species (e.g. *Python regius* – Ball Python, *Python bivittatus* - Burmese Python, *Morelia spilota* – Carpet Python, *Boa constrictor* and *Naja kaouthia* – Monocled Cobra) (Figure 4.4.5). While the majority of the trade was in captive-bred specimens, Tanzania also reported some trade in wild-sourced, live *Python sebae*.

Python sebae, by Hannes Steyn via Wikimedia Commons

4.4.3 Tortoises (Order: Testudines)

The vast majority of the trade in Testudines was in live individuals of the family Testudinidae. In total, an average of approximately 29 000 live tortoises were exported per year during 2005-2014 according to the countries of export. This trade was dominated by exports of *Stigmochelys pardalis* (Leopard Tortoise); in particular, captive-bred (source C) and captive-born (source F) live *Stigmochelys pardalis* from Zambia (70% of all regional trade in Testudines), followed by live, captive-born *Stigmochelys pardalis* from Tanzania (8% of all trade) and live, captive-bred *Malacochersus tornieri* (Pancake Tortoise) from Zambia (7% of all trade).

Kinixys spekii, By Bernard Dupont via Flickr

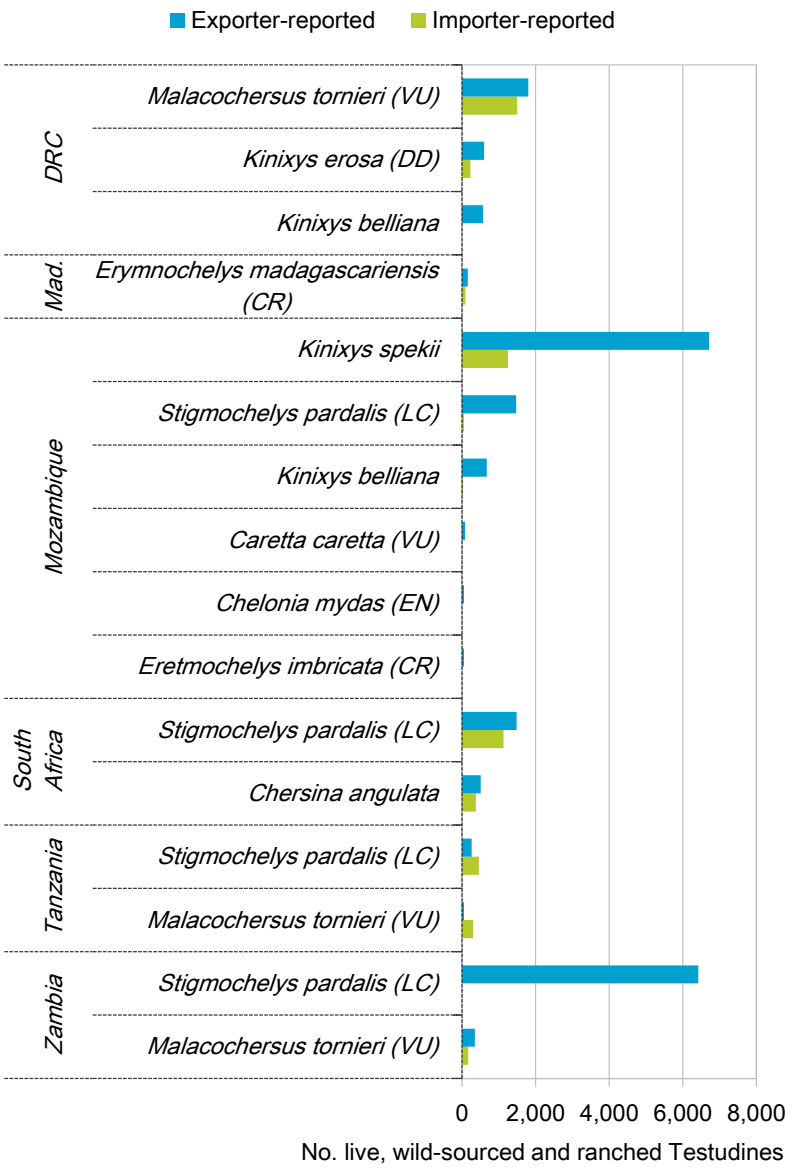


Figure 4.4.6. Main trade in live, wild-sourced and ranched tortoises (Order: Testudines), by country and by species. The only trade reported as ranched relates to part of the trade in *Stigmochelys pardalis* from Mozambique and Zambia, with the rest being reported as wild-sourced. The global IUCN Red List category is indicated next to the species name for species that have been assessed. CR = Critically Endangered, EN = Endangered, VU = Vulnerable, LC = Least Concern, DD = Data Deficient. Source: CITES Trade Database, UNEP-WCMC.

The trade in live, wild-sourced tortoises mostly comprised *Kinixys spekii* (Not Evaluated) from Mozambique, *Stigmochelys pardalis* (Least Concern) from Zambia, South Africa and Mozambique, and *Malacochersus tornieri* (Vulnerable) from DRC (see Figure 4.4.6).

4.4.4 Crocodiles (Order: Crocodylia)

Almost all direct exports of crocodiles comprised *Crocodilus niloticus* (Nile Crocodile), with meat (reported by weight), skins and skin pieces the most highly traded commodities according to exporters. For the main *C. niloticus* commodities, trade levels reported by exporters and importers tended to show comparable trends over the ten year period (Figure 4.4.7(a), 4.4.7(b), and 4.4.7(c)).

On average, approximately 160 500 kg of *C. niloticus* meat, 145 000 skins[8] and 70 000 skin pieces were exported annually for the period

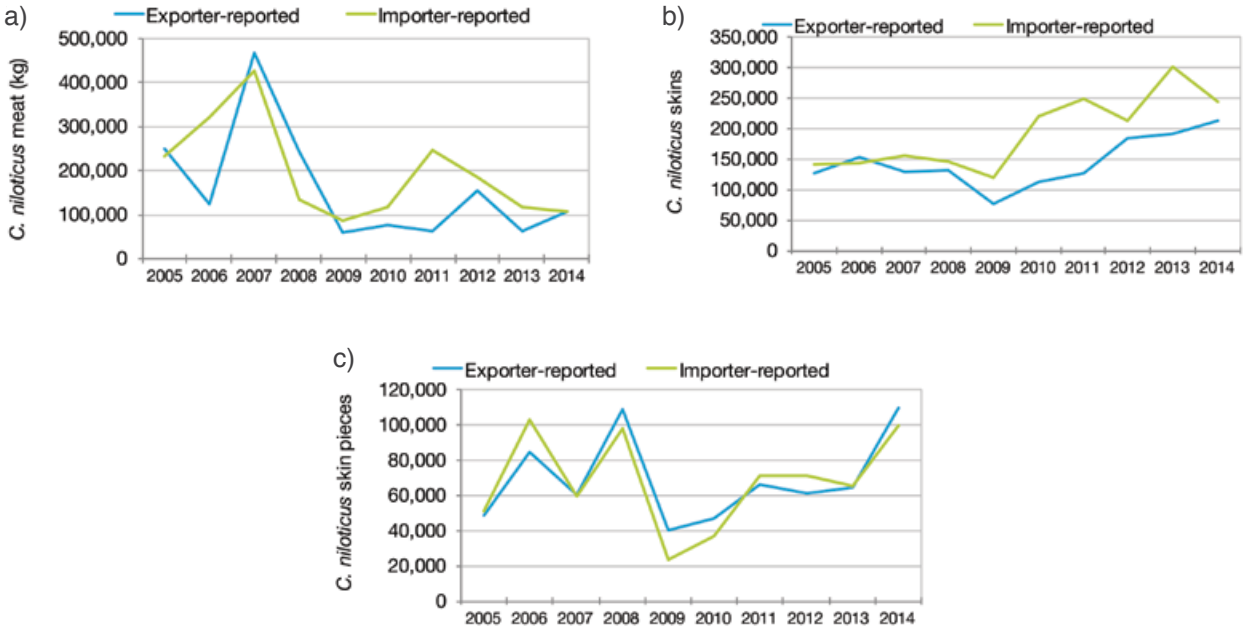


Figure 4.4.7: Exports of C. niloticus a) meat (reported by weight), b) skins and c) skin pieces, 2005-2014 as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

2005-2014, according to exporters. Captive-bred trade accounted for over 65% of trade of each main commodity, with the vast majority of the remaining trade reported as ranched. South Africa was the main exporter of meat (54%) and skin pieces (42%), while Zimbabwe was the main exporter of skins (36%). South Africa, Zimbabwe and Zambia together accounted for over 90% of direct exports of crocodile meat, skins and skin pieces from the Region. The main import markets for skins and skin pieces were Singapore and the EU, while for meat the main markets were Hong Kong, SAR and the EU.

4.4.5 Estimated value of the reptile trade

An estimate of the financial value of the international trade in reptiles from the Region is provided below in USD. This estimate is based on reported volumes of trade and on the median prices reported to customs at the point of import into the United States between 2006 and 2014, as reported in the U.S. annual reports to CITES. These are estimates and should be treated with caution; some combinations of taxa, terms, units and sources in trade did not have corresponding prices from the U.S. report, and these have been excluded from the valuation. Where possible, a 'proxy' of the median genus, family or order price was used instead, but this may not be accurate at the species level (see methodology in Annex A for more details).

Between 2005 and 2014, the total value of reptile exports (excluding trophies) from the SADC Region was estimated to be approximately USD626.8 million based on trade reported by exporters, with the genera *Crocodylus* (~USD548 million), *Stigmochelys* (~USD60.7 million), and *Aldabrachelys* (~USD59.6 million) representing the highest value trade.

Skins (~USD386.7 million – all of which were *Crocodylus niloticus*), small leather products (~USD142.7 million) and live reptiles (~USD73 million) were the terms with the highest estimated value, comprising 94% of the approximate total value of trade. It should be noted that not all

8 Skins reported for purpose H and P were included in the analysis of species subject to trophy hunting, and as such have been excluded from this section.

terms could be assigned a value. Due to the high value of crocodile skins, exports of species from the order Crocodylia were of the greatest value at 88% of estimated export value (~USD547.5 million), with much lower values estimated for tortoises (Order: Testudines) at 11% (~USD69 million), lizards (Order:Sauria) at 1% (~USD6 million), and snakes (Order: Serpentes) at 0.03% (~USD210,000). The species estimated to represent the highest value can be found in Table 4.4.1.

Between 2005 and 2014, the top exporters of reptiles in terms of value were also the top exporters in terms of trade volume. South Africa reported 38% of export volume with 42% of estimated value (~USD264.5 million), Zimbabwe had 23% of export volume and 24% of estimated value (~USD148 million), and Zambia reported 20% of export volume with 24% of estimated value (~USD148 million).

Varanus albigularis, by Bernard Dupont via Flickr

Table 4.4.1. Estimated values of the top five highest value reptile species exported from the SADC Region as live and captive-bred individuals over the period 2005-2014 as reported by exporters. Estimate based on median prices reported to customs at the point of import into the United States between 2006 and 2014. All prices should be treated as estimates.

Taxa	Estimated price per individual (USD)	Total estimated financial value of trade (USD)
Stigmochelys pardalis	255	58 925 655
Aldabrachelys gigantea	800	5 325 600
Malacochersus tornieri	59	1 303 085
Chersina angulata	1100	800 800
Varanus albigularis	102*	207 672

*Genus price proxy used as no price data at the species level could be found

4.5 Succulent plants

Southern Africa boasts a remarkably high diversity of succulent plant species, including as part of two major centres of endemism for succulents: the Succulent Karoo of South Africa and Namibia (approximately 1700 species of leaf succulents and the greatest diversity of succulents in the world) and the Maputaland-Pondoland-Albany Hotspot of Mozambique, South Africa and Swaziland (Mittermeier *et al.*, 2004). Nearly half of the world's succulent families are native to South Africa (Smith *et al.*, 1997 in Mittermeier *et al.*, 2004). Succulents are in demand globally for uses including horticulture (Grace, 2011) and traditional and modern medicine (Van Heerden, 2008; Grace *et al.*, 2008). Of the CITES-listed succulents native to the SADC Region that have been assessed for IUCN Red List and South Africa's Plant Red List status, 51 are Vulnerable, 29 are Endangered and 27 are Critically Endangered.

Over the period 2005-2014, succulents were predominantly exported from the SADC Region as seeds (over 90 million according to exporters, mostly reported in 2007-2008), with extract by weight (*c.* 5 million kg), flowers (3.6 million reported by exporters only), live plants (1.4 million) and stems (5.6 million reported by importers only) also traded at notable levels (Figure 4.5.1). Lower quantities of extract were reported by volume in litres and without a unit of measure specified (571 624 l and 850 329 units respectively, as reported by exporters). There were very low volumes of re-exports of succulents; only direct trade is discussed in this case study.

Extract was mainly wild-sourced and exported for commercial purposes; flowers, stems and live succulents were mainly artificially-propagated for

Rhipsalis pilocarpa, by Gerbil via Wikimedia commons

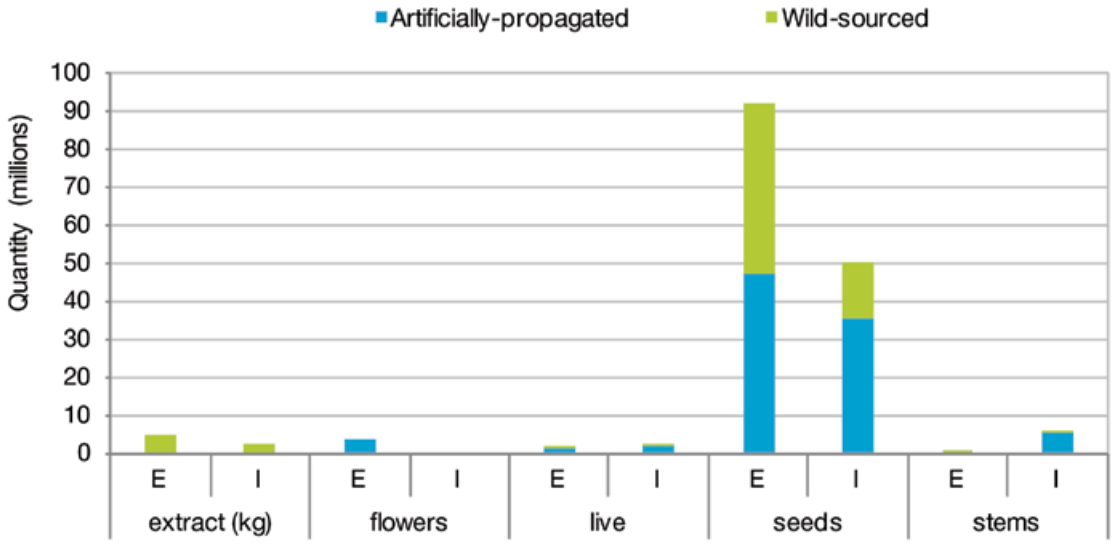


Figure 4.5.1: Direct exports in the top traded succulent plant products over the period 2005-2014 as reported by exporters (E) and importers (I). Small quantities of source I (seized), O (pre-Convention) and unknown trade are not shown. Source: CITES Trade Database, UNEP-WCMC.

commercial purposes, while seeds were traded as both artificially-propagated and wild-sourced and mainly for scientific purposes.

Most exports of seeds were reported to go to Namibia, and as Namibia's 2007 annual report was not available at the time of writing, trade in seeds reported by importing countries was significantly lower than reported by exporters.

South Africa exported nearly all extract (kg) and seeds and the majority of live succulents (according to exporters; Figure 4.5.2). Tanzania was the only exporter of flowers according

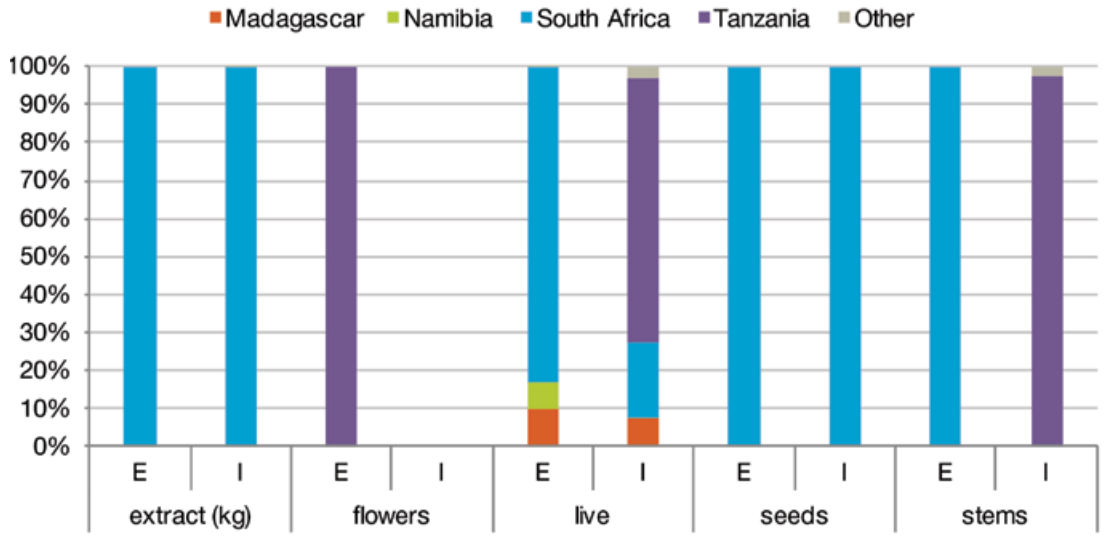


Figure 4.5.2: Proportion of succulent products by country of exporter over the period 2005-2014, as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

Pachypodium rosulatum by Rafael Medina via Flickr

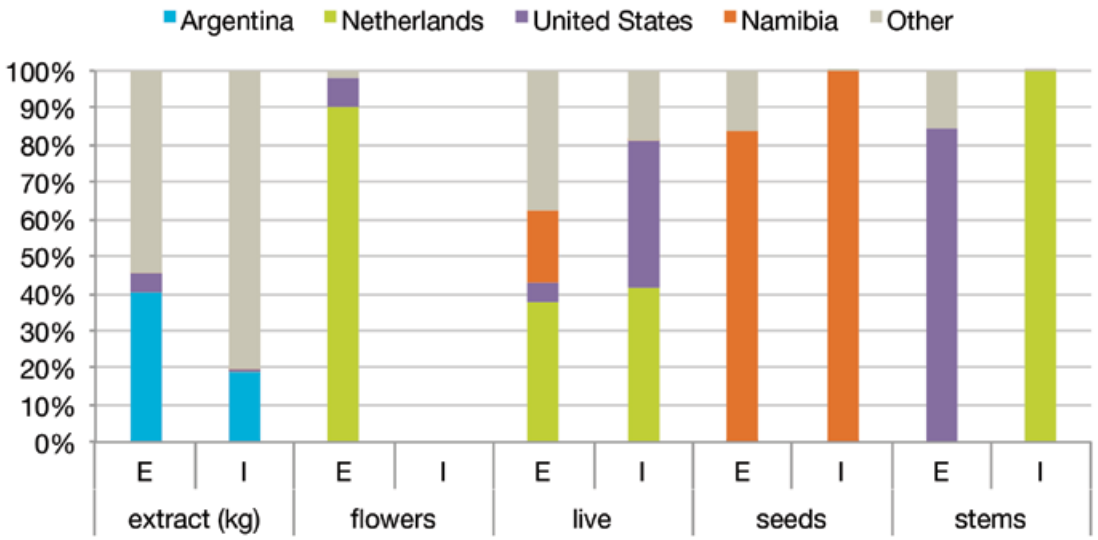


Figure 4.5.3: The proportion of succulent products by country of import over the period 2005-2014 as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

to exporters and the main exporter of stems according to importers; a permit analysis suggests that the majority of the importer-reported quantities of stems were the same shipments as the flowers reported by Tanzania, highlighting a reporting discrepancy between Parties on the terms used for succulent commodities. Nearly all trade in stems and flowers occurred during the period 2012-2014.

Succulents were mainly destined for the Netherlands (live plants and flowers), Namibia (live plants and seeds) and Argentina (kg of extract) (Figure 4.5.3).

Exports of live succulents averaged 142 265 per year over the period 2005-2014, reaching a peak in 2007 according to exporters (Figure 4.5.4). The majority of trade reported by importers in 2011 was exported by Tanzania, but Tanzania did not report any exports of flora in this year, potentially accounting for the large discrepancy in exporter and importer-reported trade in 2011.

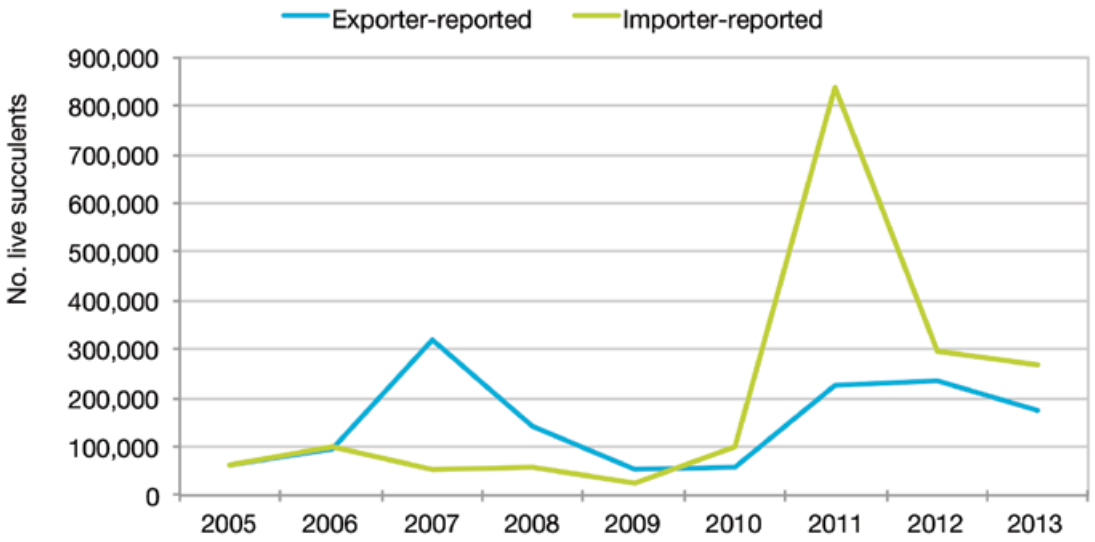


Figure 4.5.4: Direct exports of live succulents from SADC over the period 2005-2014, as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

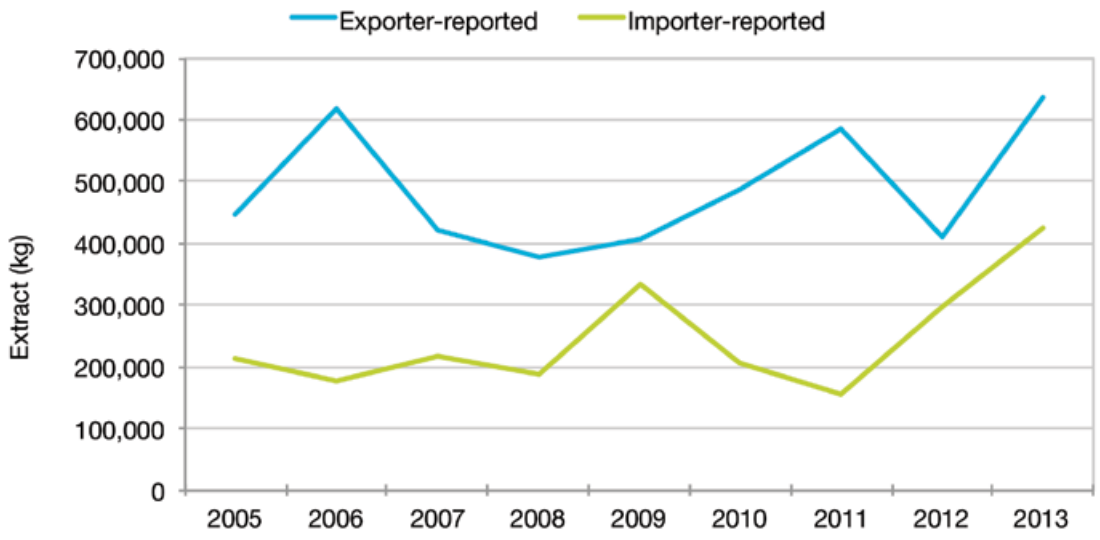


Figure 4.5.5: Direct exports of extract (kg) of succulents from SADC over the period 2005-2014, as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

Extract exported by weight (kg) averaged approximately 491 000 kg per year over the period 2005-2014 as reported by exporters, with importer-reported figures being approximately half that (Figure 4.5.5). The vast majority of extract exported by weight (kg) originated from wild-sourced *Aloe ferox* (Cape Aloe) (approximately 4.7 million kg; 96% of exports). *Aloe ferox* is widely used as a medicinal supplement (Knapp, 2006; Grace, 2011).

Over 99% of seed exports from the SADC Region occurred in 2007-2008 (Figure 4.5.6) and were of *Hoodia gordonii* (Bitter Ghaap). *Hoodia gordonii* is a spiny succulent plant native to Namibia and South Africa (Royal Botanic Garden Kew, 2016) and widely reported to act as an appetite suppressant based on traditional use by Kalahari tribes (Van Heerden, 2008; Landor *et al.*, 2016). While it is sold as a dietary supplement globally, clinical trials have suggested that there may

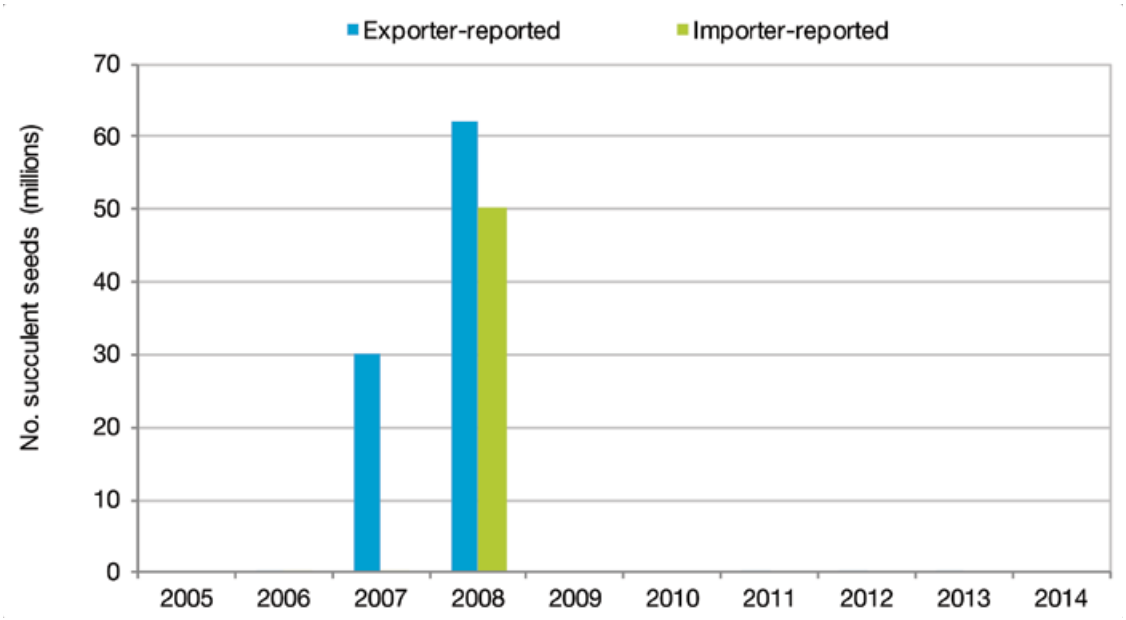


Figure 4.5.6: Direct exports of seeds of succulents (>99% *Hoodia gordonii*) from SADC over the period 2005-2014, as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

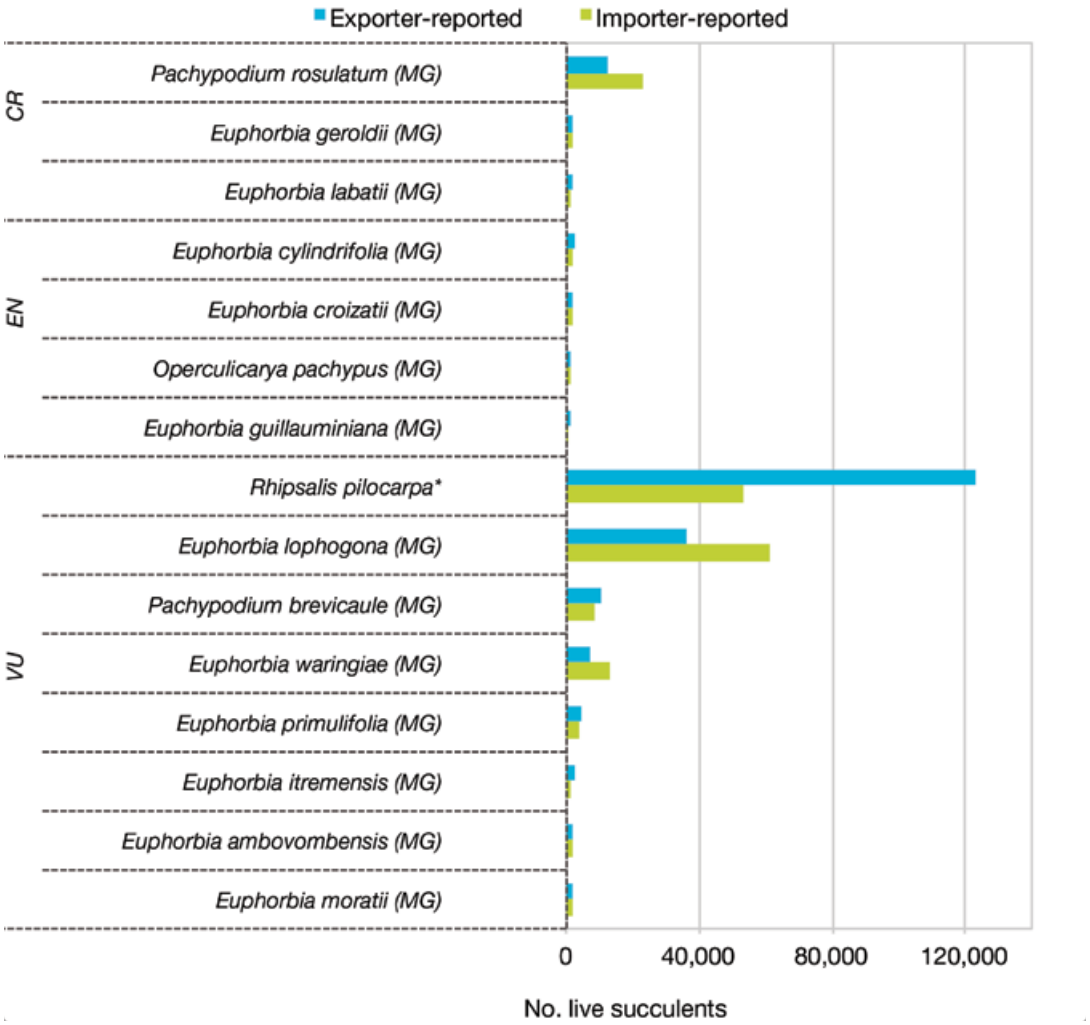


Figure 4.5.7: Direct exports of globally threatened species exported from SADC over 1 000 units over the period 2005-2014, as reported by exporters and importers. Single-country endemics are indicated by country of endemism in brackets (MG = Madagascar); species not native to a SADC country are indicated by an asterisk. CR = Critically Endangered, EN = Endangered, VU = Vulnerable. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

be some adverse effects to human health from consumption (Blom *et al.*, 2011; Vermaak *et al.*, 2011), and pharmaceutical development of *H. gordonii* products was halted in 2008 (Vermaak *et al.*, 2011; Royal Botanic Garden Kew, 2016).

The majority of exported live succulents from the SADC Region were *Rhipsalis* (40%), *Hoodia* (27%) and *Euphorbia* (18%) species as reported by exporters, with *Hoodia gordonii* the most exported single species according to exporters (Figure 4.5.7 and Figure 4.5.8).

Approximately 86 globally threatened (i.e. Vulnerable, Endangered or Critically Endangered) succulent species native to the SADC Region were exported as live plants, comprising 8% of the overall trade in live succulents as reported by exporters (116 950 plants). The most highly exported threatened succulents native to SADC (and also endemic to Madagascar) were *Euphorbia lophogona* (Vulnerable; 36 395 plants), *Pachypodium rosulatu*m (Critically Endangered; 12 087 plants) and *Pachypodium brevicaule* (Vulnerable; 10 666 plants). All of the globally threatened endemic species exported as live plants in volumes greater than 1000 units are endemic to Madagascar and were mainly exported by Madagascar, with the exception of *Euphorbia cylindrifolia*, which was mainly exported

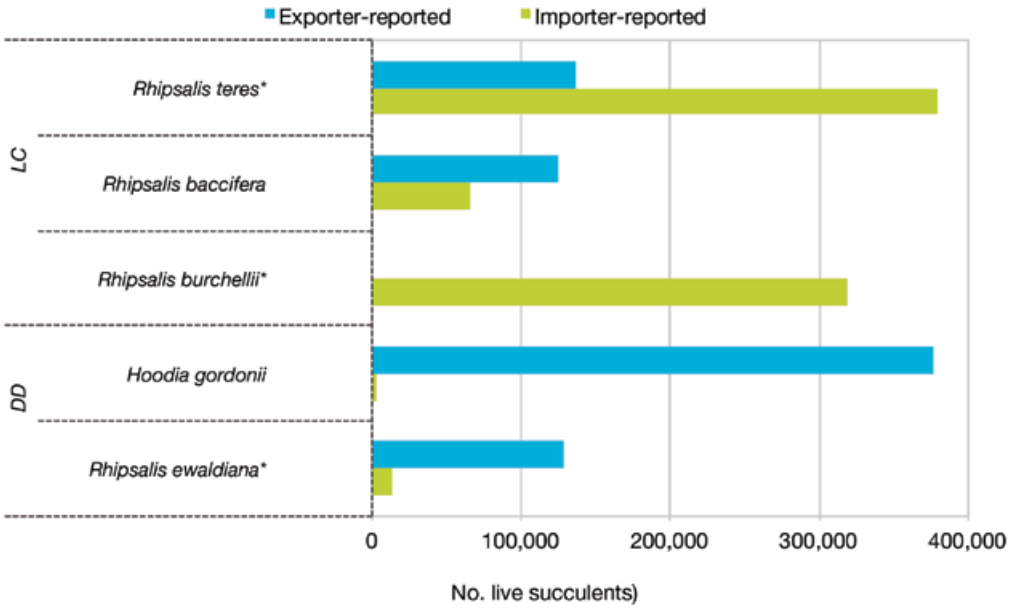


Figure 4.5.8: Direct exports of native succulent species exported from SADC as live plants at quantities over 100 000 units over the period 2005-2014, as reported by exporters and importers. Species not native to a SADC country are indicated by an asterisk. LC = Least Concern, NE = Not Evaluated. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Red List of South African Plants, Species+.

by South Africa (Figure 4.5.7). The majority (83%) were artificially-propagated.

The majority of succulent exports from SADC reported as flowers and stems were *Rhipsalis baccifera* (Mistletoe Cactus; 33%), with *R. teres* (17%; non-native) and *R. burchellii* (13%; non-native) also comprising large proportions (Figure 4.5.9). No globally threatened SADC native succulents were exported as flowers and stems; all exports of non-native Threatened species were artificially-propagated.

Euphorbia lophogona, by Dinkum via Wikimedia Commons

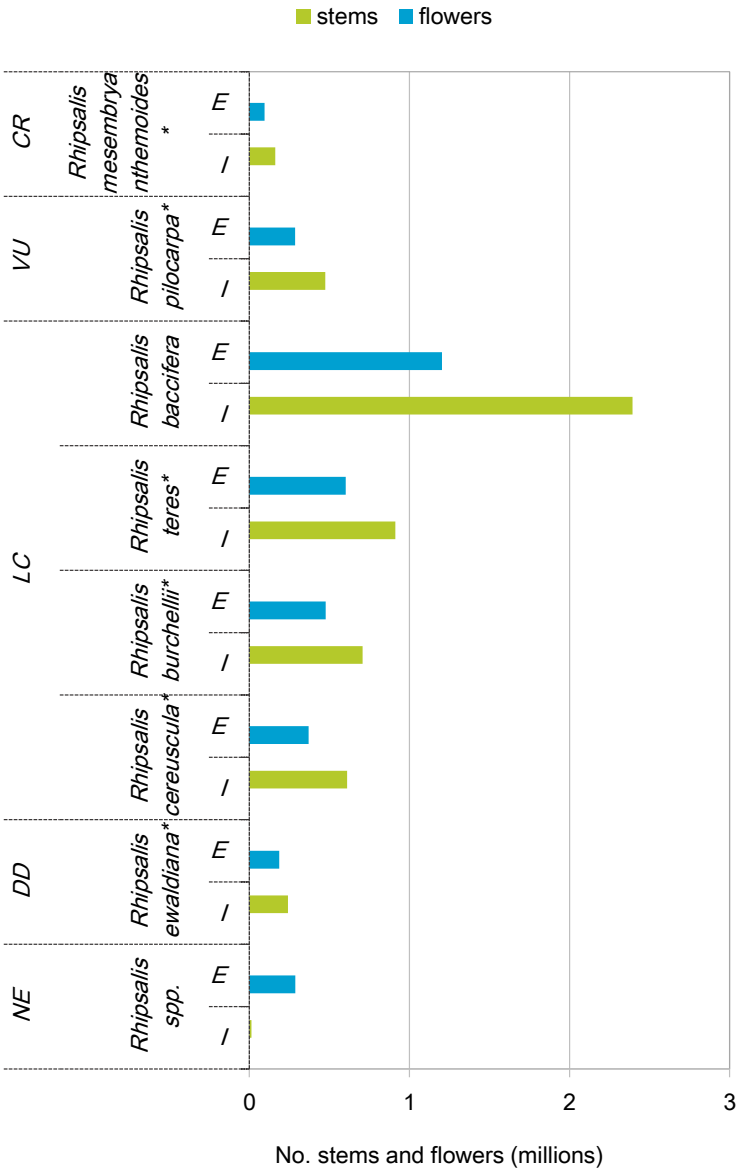


Figure 4.5.9: Direct exports of succulent plant species exported from SADC as flowers and stems in quantities of over 100 000 units (including non-native species) and threatened native succulent species in quantities of over 1 000 units over the period 2005-2014, as reported by exporters (E) and importers (I). Species not native to a SADC country are indicated by an asterisk. CR = Critically Endangered, VU = Vulnerable, LC = Least Concern, DD = Data Deficient, NE = Not Evalutated. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

Aloe maculata, by ecos de pedra via Flickr

4.5.1 Estimated value of the succulent trade

An estimate of the financial value of the international trade in succulents from the Region is provided below in USD. This estimate is based on reported volumes of trade and on median prices gathered from retail and wholesale websites in 2016. These are estimates and should be treated with caution; some combinations of taxa, terms and units in trade did not have corresponding prices from the online survey so do not have accurate price data. Where possible, a 'proxy' of the median genus, family or order price was used instead, but this may not be accurate at the species level. In some cases where no prices could be found, some taxa, term and unit combinations were excluded from the valuation (see methodology in Annex A for more details).

Between 2005 and 2014 the total value of exports in succulents as reported by exporters was estimated to be USD243.5 million, with *Aloe* (USD156 million), *Hoodia* (USD75.4 million), and *Euphorbia* (USD4.4 million) the genera in trade with the highest estimated value.

Extracts comprised 78% of the value of all succulent exports (USD157.2 million), predominately extract of *Aloe ferox* (USD153.8 million). In addition, succulent powder comprised 19% of the total estimated succulent value (USD46.4 million).

Seeds comprised 9% of the value of all succulent exports (USD23 million), the majority of which was from seeds of *Hoodia gordonii*. No prices were found for seeds by weight (kg), so all valuations are based on prices of individual seeds, with trade in kilograms omitted from the analysis. In addition, no prices were found for seeds of Vitaceae or Didiereaceae.

Live succulent trade from SADC comprised approximately 7% of total estimated value of succulent exports (USD16.9million). For live plants, the three highest value succulent genera were *Hoodia* (USD4.5 million), *Euphorbia* (USD4.4 million) and *Rhipsalis* (USD2.9 million).

Price data were not found for all species but of those with taxon-specific prices, the top five highest value succulent species are shown in Table 4.5.1.

South Africa both exported the highest volume of succulents and has exports with the highest estimated value, comprising 96% of the total estimated value of succulent exports (USD243.5 million).

Table 4.5.1. Estimated values of the top five highest value succulent species exported from SADC over the period 2005-2014 as reported by exporters. Estimate based on median prices gathered from online searches of retail and wholesale websites in 2016. All prices should be treated as estimates

Taxa/term	Estimated price per unit of combination (USD)	Total estimated financial value of trade (USD)
Aloe ferox extract	26.22 (per kg); 48 (per litre)	153 784 858.74
Hoodia gordonii powder	162.95 (per kg)	46 409 941.92
Hoodia gordonii seeds	0.25	23 027 500
Hoodia gordonii live	12	4 513 596
Aloe arborescens extract	26.22 (per kg)*	1 910 336

*Estimated price for the genus was used as a proxy as species-level price data could not be found

4.6 Cycads

Cycads (order Cycadales) are a globally distributed group of plants, with approximately 60 species found in SADC countries; all but two of these are in the genus *Encephalartos*. South Africa has the highest proportion of endemic cycads on the continent, approximately half of SADC single-country endemics are found there. All cycads are listed on Appendix II except for *Cycas beddomei* which is listed on Appendix I.

The majority (41 species) of SADC native cycads are categorised as Vulnerable, Endangered or Critically Endangered and four are Extinct in the Wild (IUCN, 2015) and cycads are the most threatened plant group in South Africa (South Africa, 2016). Two of the three South African cycad extinctions in the wild were caused by illegal harvesting of wild populations (South Africa, 2016); illegal harvesting of adult plants has also caused declines in most *Encephalartos* populations in South Africa (South Africa, 2016). There are records of exports from South Africa of African cycad species non-native to South Africa prior to any recorded imports into the country; while this may indicate illegal trade, it is important to note that the original imports into South Africa may have occurred prior to the listing of the species in the CITES Appendices. However, nine of these African cycad species were described after the CITES Appendix I listing of the genus in 1977, including the threatened species *Encephalartos delucanus* (Endangered), *E. equatorialis* (Critically Endangered), *E. kisambo* (Endangered), *E. macrostrobilus* (Endangered), *E. schaijesii* (Vulnerable) and *E. sclavoi* (Critically Endangered); unless they were imported prior to description under a synonym, these species are less likely to have been imported prior to the listing and therefore may be indicative of some illegal trade into South Africa.

Uses of cycads include ornamental purposes (live plants), ornamental flower arranging (leaves), as a food source (the starchy pith or seeds; CITES, 2012) and as traditional medicine (bark and stems; Cousins *et al.*, 2012).

Encephalartos ferox, **by Wendy Cutler via Flickr**

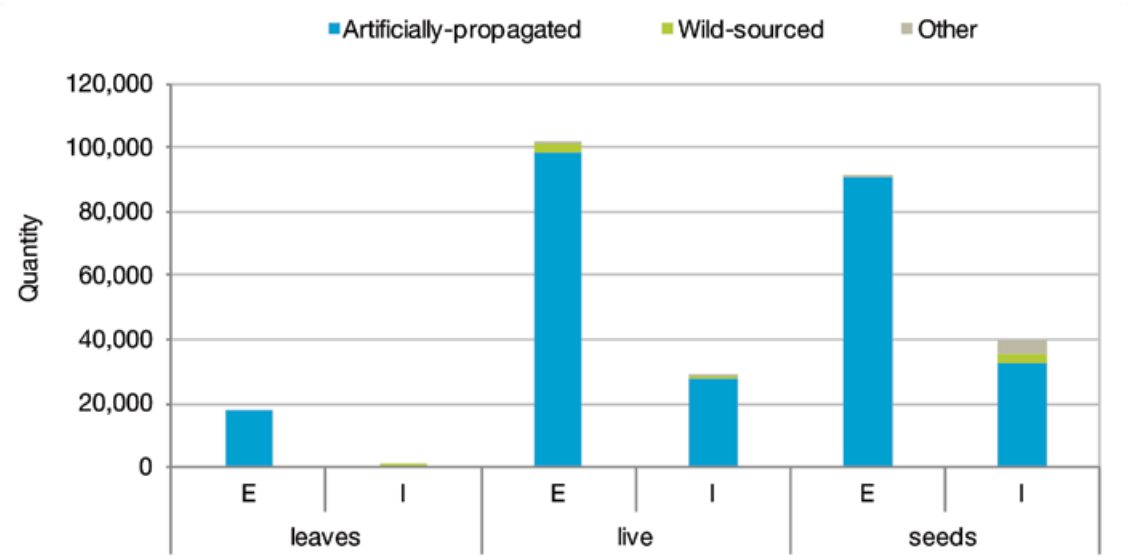


Figure 4.6.1: Direct exports of the top exported cycad products over the period 2005-2014 as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

Direct exports of cycads from the SADC Region during 2005-2014 predominantly comprised live plants, seeds and leaves, the majority of which were artificially-propagated (Figure 4.6.1).

South Africa exported the majority of live cycads, Mozambique the majority of seeds and Mauritius the majority of leaves (Figure 4.6.2). The wild-sourced trade in live cycads and seeds reported by exporters was nearly all from Mozambique.

Exporters reported higher volumes than importers in all cases. There were very low volumes of re-exports of live cycads and leaves, and none of seeds.

Thailand, Costa Rica and the United States imported the majority of South Africa's live cycads and seeds exports from Mozambique, while Israel was the main importer of cycad seeds exported from South Africa. The majority of cycad

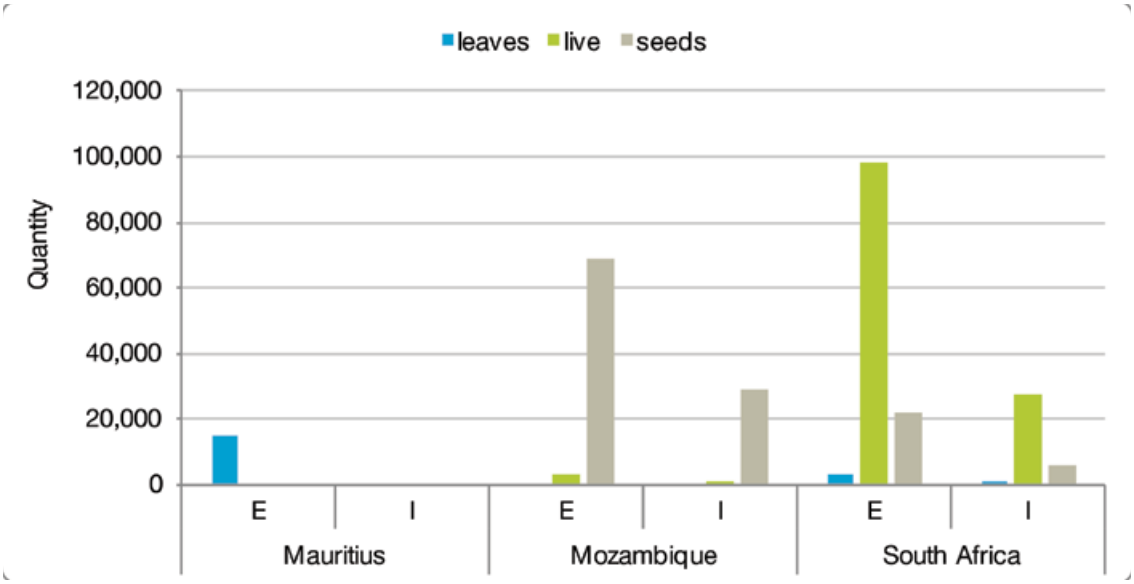


Figure 4.6.2: Direct exports of the top exported cycad products over the period 2005-2014 as reported by exporters (E) and importers (I). Source: CITES Trade Database, UNEP-WCMC.

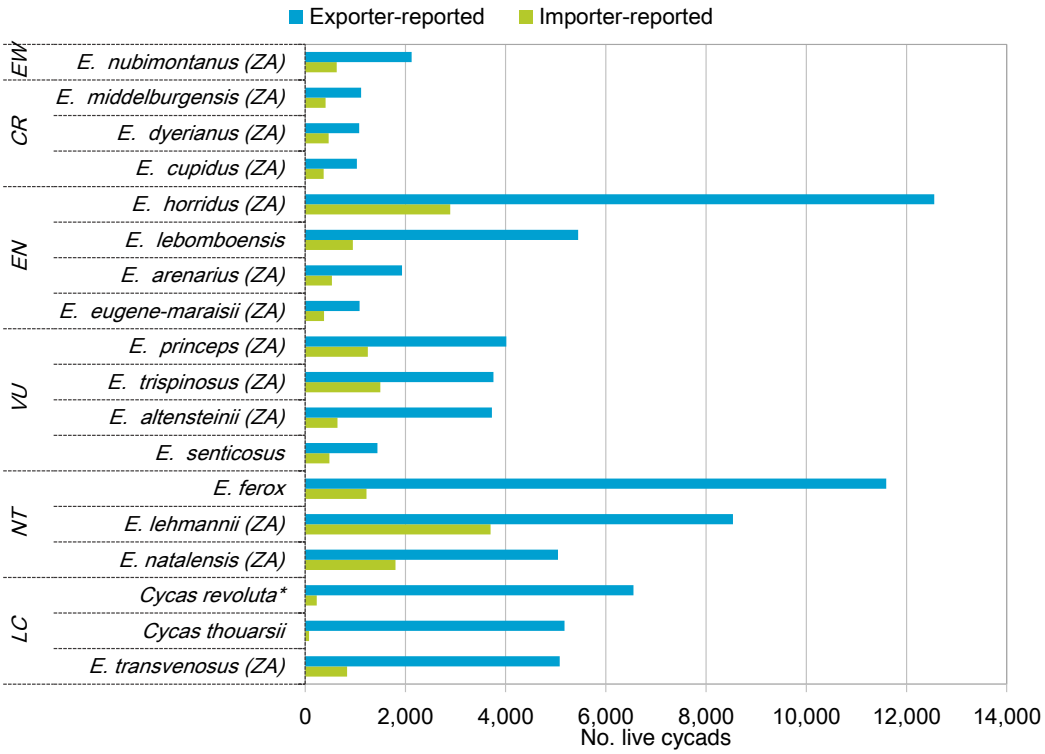


Figure 4.6.3: Direct exports of native cycad species exported from SADC as live plants over 5000 units and globally threatened (including Extinct in the Wild) species exported as live plants over 1000 units during the period 2005-2014, as reported by exporters and importers. Single-country endemics are indicated by country of endemism in brackets (ZA = South Africa), species not native to a SADC country are indicated by an asterisk. EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern
Source: CITES Trade Database, UNEP-WCMC; IUCN Red List; Species+.

leaves exported from Mauritius were imported by France.

Approximately half of the live plant and seed exports of cycads from SADC were in single-country endemics and approximately 39% were from threatened species. All high quantity exports of threatened cycads as seeds and live cycads were artificially-propagated with the exception of relatively very small quantities of Endangered *Encephalartos lebomboensis* (Lebombo Cycad) and *E. umbeluziensis* (Umbeluzi Cycad) seeds and *E. horridus* (Eastern Cape Blue Cycad) live cycads, reported as wild-sourced. Direct exports of leaves from threatened native cycads were all lower than 1000 units, and mainly exported for scientific purposes.

Encephalartos horridus was the most exported cycad species by volume of live exports, followed by *E. ferox* and *E. lehmannii* (Figure 4.6.3); *Cycas thouarsii* (Madagascar Cycad) was the most exported by volume of seed exports, followed by *E. ferox* and *E. turneri* (Figure 4.6.4). However, *E. manikensis* (Gorongo Cycad) was the most exported Threatened species by volume of seeds, with *E. munchii* exported in similar quantities (Figure 4.6.4). All high quantity exports of threatened live cycads were exported from South Africa while the vast majority of seeds were exported from Mozambique (with the exception of *E. altensteinii* - Eastern Cape Giant Cycad, which was exported from South Africa).

Direct exports of live cycads reached a peak in 2009 (Figure 4.6.5) and averaged 10 151 live cycads exported per year (as reported by exporters) over the period 2005-2014.

Direct exports of seeds were much lower in the years after 2005 (Figure 4.6.6), coinciding with a CITES trade suspension for all species of the

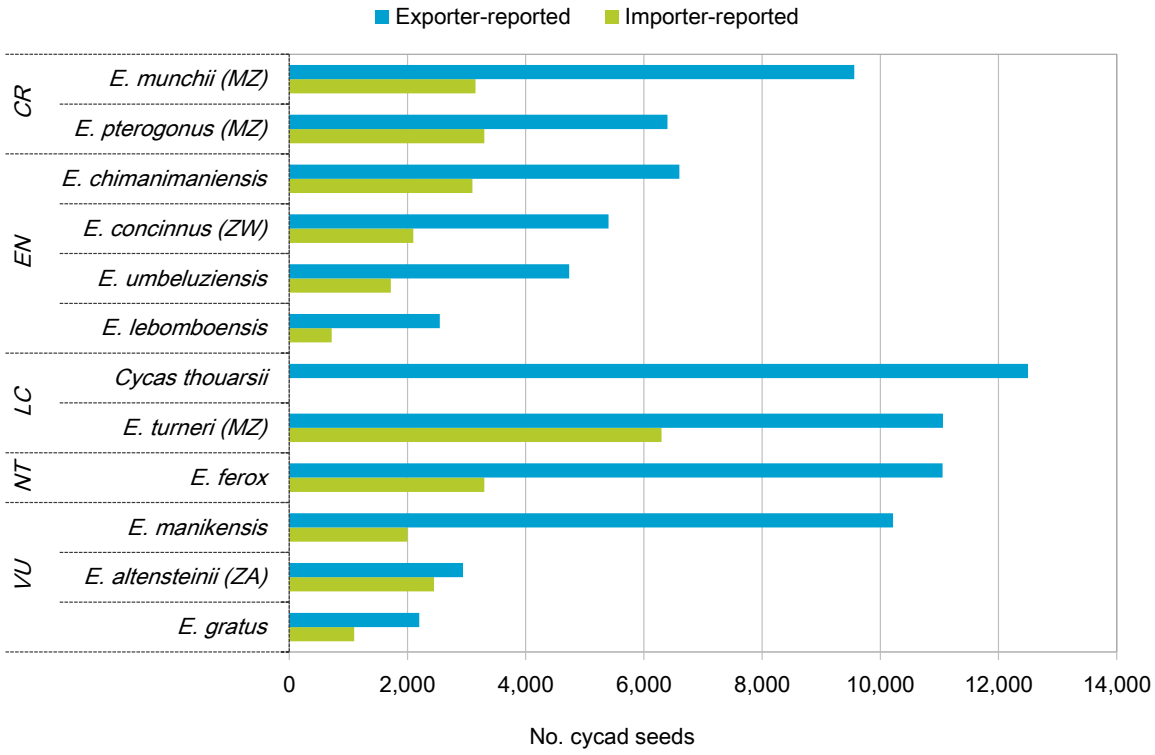


Figure 4.6.4: Direct exports of threatened cycad species from SADC as seeds over 1 000 units and non-threatened cycad species over 5000 units over the period 2005-2014, as reported by exporters and importers. Single-country endemics are indicated by country of endemism in brackets (MZ = Mozambique, ZA = South Africa, ZW = Zimbabwe). CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List, Species+.

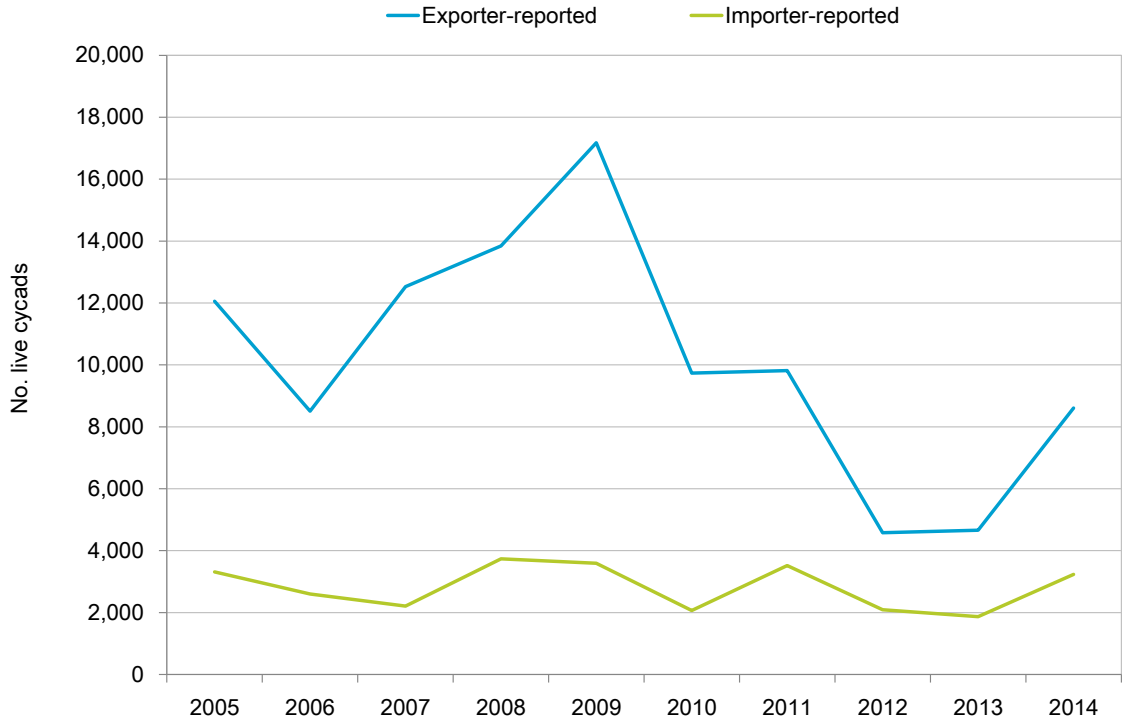


Figure 4.6.5: Direct exports of live cycads from SADC over the period 2005-2014, as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

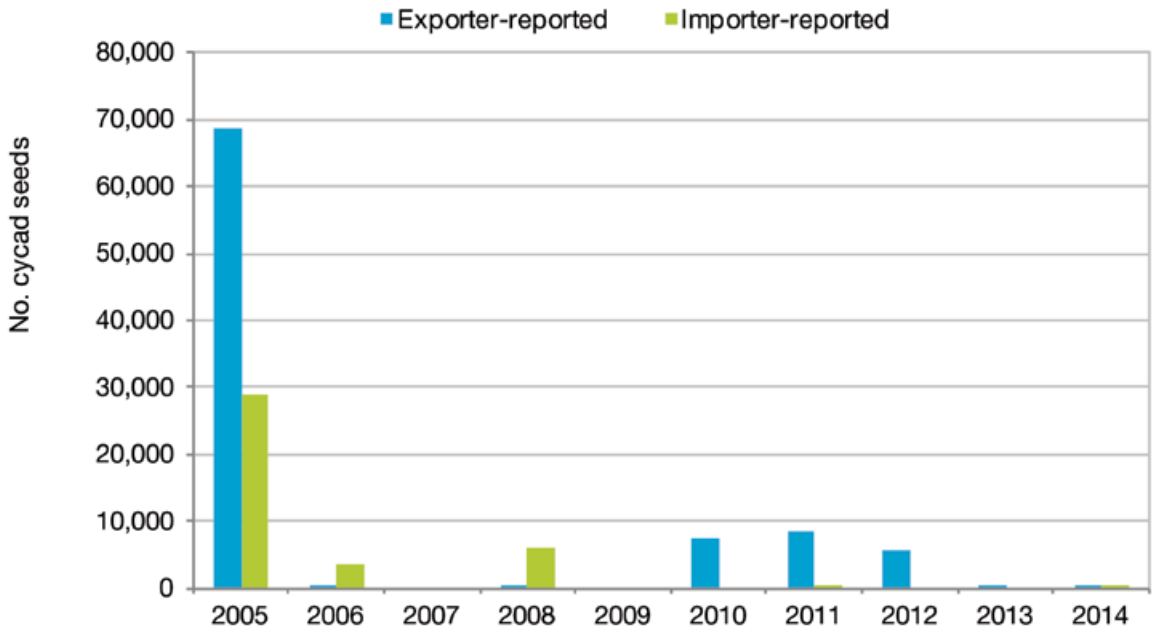


Figure 4.6.6: Direct exports of cycad seeds over the period 2005-2014, as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

family Zamiaceae for Mozambique that came into effect in 2006. All direct exports in 2005 were from Mozambique.

Direct exports of leaves increased in the years after 2005, reaching a maximum of 5470 leaves in 2008 (Figure 4.6.7). This coincides with Mauritius beginning to export *Cycas circinalis* (Queen Sago) leaves in 2007, with the last reported export in 2011. Trade in 2014 comprised higher export volumes than previously of *Encephalartos* leaves from South Africa.

Figure 4.6.7: Direct exports of cycad leaves from SADC over the period 2005-2014, as reported by exporters and importers. Source: CITES Trade Database, UNEP-WCMC.

Encephalartos manikensis, by Ton Rulkens via Flickr

Encephalartos horridus, by FarOutFlora via Flickr

4.6.1 Estimated value of the cycad trade

An estimate of the financial value of the international trade in cycads from the Region is provided below in USD. This estimate is based on reported volumes of trade and on median prices gathered from retail and wholesale websites in 2016. These are estimates and should be treated with caution; some combinations of taxa, terms and units in trade did not have corresponding prices from the online survey so do not have accurate price data. Where possible, a 'proxy' of the median genus, family or order price was used instead, but this may not be accurate at the species level. In some cases where no prices could be found, some taxa, term and unit combinations were excluded from the valuation (see methodology in Annex A for more details). Between 2005 and 2014 the total estimated value of exports in cycads as reported by exporters was estimated to be USD7.7 million, with *Encephalartos* (~USD6.9million), *Cycas* (~USD0.7 million) and *Macrozamia* (~USD26 000) the highest value genera in trade.

The majority of the estimated value of cycad exports was comprised of live plants (~USD7.2million; 94% of the total value of cycad exports). Seeds comprised 6.31% of the total estimated value of exported cycad products. No price data were identified for cycad leaves. The top five species in terms of value are shown in Table 4.6.1.

The top exporters in terms of value were the same as the top exporters by volume of cycads. South Africa's cycad exports comprised 91% of the total estimated value (~USD7.7 million), which was more than the proportion of cycads by volume exported from South Africa (58%). Mozambique's cycad exports comprised 8% of the total estimated value of cycad exports (~USD0.6 million), whilst cycad exports from the country comprised 34% of the total volume.

Table 4.6.1. Estimated values of the top five highest value cycad species exported over the period 2005-2014 as reported by exporters. Estimate based on median prices gathered from online searches of retail and wholesale websites in 2016. All prices should be treated as estimates

Taxa	Estimated price per live plant (USD)	Total estimated financial value of trade (USD)
Encephalartos horridus	172.89	2 173 802
Encephalartos princeps	153.68	617 817
Encephalartos lehmannii	59	509 744
Cycas thouarsii	85*	493 041
Encephalartos ferox	34	455 056

*Genus price proxy used as no price data at the species level could be found

05 Species showing noteworthy trends in SADC countries

This chapter assesses trends in the trade of CITES Appendix II species for the period 2005-2014, based on methodology developed for the CITES Review of Significant Trade. As the CITES Review of Significant Trade process is of relevance to all range States of species selected, the aim of this chapter is to support countries in the SADC Region by identifying species native to SADC States that may be selected as part of the CITES Review of Significant Trade process on the basis of global trade levels and trends.

Global trade data for species from wild, ranched or unknown/unspecified sources were analysed for 2005-2014. Patterns were identified according to the following criteria (see Annex C for the selection process):

- Endangered species: trade in Critically Endangered (CR) and Endangered (EN) taxa, where mean trade was more than one item per year for 2010-2014.
- High volume or High volume (globally threatened): high volume trade over the previous five years weighted according to IUCN threat status.
- Sharp increase or Sharp increase (in country): substantially higher trade in most recent year in comparison to a five year average of the preceding five years at the global level ("Sharp increase") or the range State level ("Sharp increase (in country)").

A summary of the species directly exported from SADC countries that were selected according to the criteria outlined above, along with key information on the criteria met, the top global exporter, and the top term (e.g. live, skins etc.) reported in trade, is provided in Table 5.1

The criteria for selection were met by 104 taxa native to, and exported from, the SADC Region. Reptiles were identified as the group with the highest number of taxa showing noteworthy trends, with 35 taxa meeting the selection criteria. This was followed by plants (30), mammals (13), amphibians (10), birds (8), corals (3), timber (3), and fish (1). Amongst the SADC countries, Madagascar was the top exporter of the taxa meeting the selection criteria; it exported 63 of these during 2005-2014 and was the top global exporter for 62 of these taxa (54 of which were endemic). This was followed by Tanzania (17 taxa exported that met at least one of the criteria/8 selected taxa where Tanzania was the top exporter), South Africa (15/7), Mozambique (13/1), Namibia (10/4), the DRC (8/5), Zimbabwe (6/1), Zambia (5/2), Botswana (3/0), the Seychelles (3/0), and Malawi (2/0).

Of the taxa exported by SADC countries, 63 met the selection criteria on the basis of high volume, with 26 of these considered globally threatened. Twenty-five taxa were selected due to sharp increases in exports from across their global range, of which five also met the criteria for high volume (with three of these considered globally threatened). Of the remaining twenty taxa which showed sharp increases but did not meet the criteria for high volume, 12 were endemic to Madagascar, three were considered Endangered and three were considered Critically Endangered. In addition, 30 taxa exported by SADC counties showed sharp increases based on country-level trade within one or more of their native SADC range states. Of the species showing sharp increases within one or more SADC country (based on country-level trade) during 2005-2014, 8 did not show sharp increases when global exports were combined.

Table 5.1. Species native to SADC countries meeting the noteworthy trends criteria for the period 2005-2014. Quantities have been rounded to the nearest whole number, where applicable. Source: CITES Trade Database, UNEP-WCMC.

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Mammals	*Arctocephalus pusillus* (Cape Fur Seal)		LC	458 723 skins	Namibia	High volume; Sharp Increase; Sharp increase (Namibia)	Namibia; South Africa
	Cercopithecus dryas (Dryas Monkey)	DRC	CR	17 live	DRC	Endangered species	DRC
	Cercopithecus neglectus (De Brazza's Monkey)	DRC	LC	259 live	DRC	Sharp increase (DRC)	DRC
	Chlorocebus pygerythrus (Vervet Monkey)		LC	2953 skulls	South Africa	High volume	South Africa; Tanzania; Zimbabwe
	Equus zebra hartmannae (Hartmann's Mountain Zebra)		NE	15 833 skins	Namibia	High volume	Namibia
	Eupleres goudotii (Malagasy Mongoose)	Madagascar	EN	23 live	Madagascar	Endangered species	Madagascar
	Felis silvestris lybica (Northern African Wild Cat)		NE	89 trophies	South Africa	Sharp Increase; Sharp increase (South Africa)	South Africa
	Hippopotamus amphibius (Hippopotamus)		VU	58 315 kg teeth	Tanzania	High volume (GT)	Malawi; Mozambique; Namibia; South Africa; Tanzania; Zambia; Zimbabwe
	Loxodonta africana (African Elephant)		VU	160 202 kg tusks	Zimbabwe	High volume (GT); Sharp increase (Mozambique; Zimbabwe)	Botswana; Mozambique; Namibia; South Africa; Zimbabwe
	Manis tricuspis (White-bellied Pangolin)		VU	1039 live	Togo	Sharp Increase	DRC
	Panthera leo (African Lion)		VU	5031 trophies	South Africa	High volume (GT)	Botswana; Mozambique; Namibia; South Africa; Tanzania; Zambia; Zimbabwe

9 Term is as reported by the highest trading partner (according to "gross exports" in Annex C). The term "trophies" in this analysis just refers to trade reported by the trading partners as "trophies" and is not the result of the trophy analysis in Chapter 4.1)

10 Summed by term and unit across the period 2005-2014

11 Where sharp within-country increases were recorded, only SADC countries are individually listed

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Mammals (cont.)	*Papio cynocephalus* (Yellow Baboon)		LC	902 trophies	Mozambique	High volume	Mozambique; Tanzania; Zambia
	Papio ursinus (Chacma Baboon)		LC	7633 trophies	South Africa	High volume	Mozambique; Namibia; South Africa; Zimbabwe
Birds	*Balearica regulorum* (Grey Crowned-crane)		EN	134 live	DRC	Endangered species	DRC
	Gyps africanus (White-backed Vulture)		CR	197 live	Guinea	Endangered species; High volume (GT)	Namibia; South Africa
	Gyps coprotheres (Cape Vulture)		EN	24 live	South Africa	Endangered species	South Africa
	Phoeniconaias minor (Lesser Flamingo)		NT	1058 live	Tanzania	High volume (GT); Sharp Increase; Sharp increase (Tanzania)	Tanzania
	Phoenicopterus ruber (Caribbean Flamingo)		LC	5486 live	Cuba	High volume; Sharp increase (Tanzania)	Tanzania
	Poicephalus gulielmi (Red-fronted Parrot)		LC	10 501 live	DRC	High volume; Sharp increase (in country: not SADC)	DRC
	Psittacus erithacus (African Grey Parrot)		VU	142 223 live	DRC	High volume (GT); Sharp increase (in country: not SADC)	DRC; Mozambique; South Africa
	Spheniscus demersus (African Penguin)		EN	166 live	Namibia	Endangered species; High volume (GT)	South Africa
Reptiles	*Brookesia minima* (Minute Leaf Chameleon)	Madagascar	EN	140 live	Madagascar	Endangered species; Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Brookesia peyrierasi (Antongil Leaf Chameleon)	Madagascar	EN	47 live	Madagascar	Endangered species	Madagascar
	Calumma gastrotaenia (Perinet Chameleon)	Madagascar	LC	140 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Calumma gastrotaenia (Perinet Chameleon)	Madagascar	LC	140 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Reptiles (cont.)	*Calumma hilleniusi*	Madagascar	EN	7 bodies	Madagascar	Endangered species	Madagascar
	Calumma malthe (Yellow-green Chameleon)	Madagascar	LC	186 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Calumma nasutum (Big-nosed Chameleon)	Madagascar	LC	327 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Calumma oshaughnessyi (O'Shaughnessy's Chameleon)	Madagascar	VU	114 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Chamaeleo dilepis (Flap-necked Chameleon)		LC	44 281 live	Tanzania	High volume	Mozambique; Tanzania
	Chamaeleo gracilis (Slender Chameleon)		LC	47 042 live	Togo	High volume	Tanzania
	Cordylus tropidosternum (Tropical Spiny-tailed Lizard)		NE	49 019 live	Tanzania	High volume	Tanzania
	Crocodylus niloticus **(Nile Crocodile)**		LC	816 091 skins	Zambia	High volume; Sharp increase (Botswana; Zimbabwe)	Botswana; Madagascar; Malawi; Mozambique; Namibia; South Africa; Tanzania; Zambia; Zimbabwe
	Erymnochelys madagascariensis (Madagascar Sideneck Turtle)	Madagascar	CR	182 live	Madagascar	Endangered species	Madagascar
	Furcifer campani (Madagascar Forest Chameleon)	Madagascar	VU	512 live	Madagascar	Sharp increase (Madagascar)	Madagascar
	Furcifer lateralis (Jewelled Chameleon)	Madagascar	LC	18 273 live	Madagascar	High volume	Madagascar
	Furcifer oustaleti (Oustalet's Giant Chameleon)	Madagascar	LC	15 541 live	Madagascar	High volume	Madagascar
	Furcifer pardalis (Panther Chameleon)	Madagascar	LC	19 464 live	Madagascar	High volume	Madagascar
	Furcifer verrucosus (Madagascar Giant Chameleon)	Madagascar	LC	15 105 live	Madagascar	High volume	Madagascar

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Reptiles (cont.)	*Kinixys belliana* (Bell's Hinged Tortoise)		NE	20 997 live	Togo	Sharp increase (Mozambique)	Mozambique
	Kinyongia fischeri (Fischer's Chameleon)	Tanzania	NT	33 918 live	Tanzania	High volume (GT)	Tanzania
	Kinyongia tavetana (Mount Kilimanjaro Two-horned Chameleon)		NT	17 993 live	Tanzania	High volume (GT); Sharp increase (Tanzania)	Tanzania
	Phelsuma dubia (Zanzibar Day Gecko)		LC	23 894 live	Tanzania	High volume	Tanzania
	Phelsuma grandis (Madagascar Giant Day Gecko)	Madagascar	LC	810 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Phelsuma laticauda (Flat-tailed Day Gecko)		LC	16 300 live	Madagascar	High volume	Madagascar
	Phelsuma lineata (Striped Day Gecko)	Madagascar	LC	19 606 live	Madagascar	High volume	Madagascar
	Phelsuma madagascariensis (Madagascar Day Gecko)	Madagascar	LC	15 692 live	Madagascar	High volume	Madagascar
	Phelsuma quadriocellata (Peacock Day Gecko)	Madagascar	LC	18 151 live	Madagascar	High volume	Madagascar
	Phelsuma spp.		NE	324 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Stigmochelys pardalis (Leopard Tortoise)		LC	11 182 live	Zambia	Sharp Increase; Sharp increase (Zambia)	Mozambique; South Africa; Tanzania; Zambia
	Trioceros melleri (Meller's Chameleon)		LC	25 596 live	Tanzania	High volume	Mozambique; Tanzania
	Uroplatus ebenaui (Nosy Bé Flat-tailed Gecko)	Madagascar	VU	8971 live	Madagascar	High volume (GT)	Madagascar
	Uroplatus guentheri (Günther's Flat-tailed Gecko)	Madagascar	EN	607 live	Madagascar	Endangered species	Madagascar

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Reptiles (cont.)	*Uroplatus pietschmanni*	Madagascar	EN	1998 live	Madagascar	Endangered species	Madagascar
	Uroplatus sikorae (Southern Flat-tailed Gecko)	Madagascar	LC	13 918 live	Madagascar	High volume	Madagascar
	Varanus exanthematicus (African Savanna Monitor)		LC	295 702 live	Ghana	High volume	Tanzania
	Varanus niloticus (Nile Monitor)		NE	736 095 skins	Mali	High volume	Tanzania
Amphibians	*Mantella aurantiaca* (Golden Mantella)	Madagascar	CR	4400 live	Madagascar	Endangered species; High volume (GT)	Madagascar
	Mantella baroni (Baron's Mantella)	Madagascar	LC	33 679 live	Madagascar	High volume	Madagascar
	Mantella bernhardi (Bernhard's Mantella)	Madagascar	EN	1 166 live	Madagascar	Endangered species; High volume (GT)	Madagascar
	Mantella betsileo (Betsileo Mantella)	Madagascar	LC	35 955 live	Madagascar	High volume	Madagascar
	Mantella crocea (Yellow Mantella)	Madagascar	EN	4871 live	Madagascar	Endangered species	Madagascar
	Mantella expectata (Blue-legged Mantella)	Madagascar	EN	5462 live	Madagascar	Endangered species	Madagascar
	Mantella laevigata (Folohy Golden Frog)	Madagascar	NT	9251 live	Madagascar	High volume (GT)	Madagascar
	Mantella pulchra (Beautiful Mantella)	Madagascar	VU	14 684 live	Madagascar	High volume (GT)	Madagascar
	Mantella viridis (Green Mantella)	Madagascar	EN	3 472 live	Madagascar	Endangered species	Madagascar
	Scaphiophryne gottlebei (Red Rain Frog)	Madagascar	EN	4 488 live	Madagascar	Endangered species; High volume (GT)	Madagascar
Fish	*Carcharhinus longimanus* (Oceanic whitetip shark)		VU	451 kg fins	Sri Lanka	High volume (GT); Sharp Increase	Seychelles

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Corals	*Acropora* spp.		NE	1 158 646 live	Fiji	High volume	Seychelles
	Scleractinia spp. (Stony corals)		NE	19 714 571 kg raw corals	Fiji	High volume; Sharp increase (in country: not SADC)	Mozambique; Seychelles
	Seriatopora hystrix (Needle Coral)		LC	121 369 live	Fiji	High volume	Mozambique
Plants	*Aloe ferox* (Cape Aloe)		LC[12]	3 657 828 kg extract	South Africa	High volume	South Africa
	Aloe macroclada	Madagascar	NE	1129 extract	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Aloe spp.		NE	1300 seeds	Madagascar	Sharp Increase	Madagascar
	Cyphostemma elephantopus	Madagascar	NE	100 live	Madagascar	High volume	Madagascar
	Ebenaceae spp.		NE	768 dried plants	Madagascar	High volume; Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Euphorbia ankarensis	Madagascar	EN	509 live	Madagascar	Endangered species; Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Euphorbia guillauminiana	Madagascar	EN	1039 live	Madagascar	Endangered species; High volume (GT); Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Euphorbia hedyotoides	Madagascar	EN	786 live	Madagascar	Endangered species; High volume (GT)	Madagascar
	Euphorbia horombensis	Madagascar	EN	286 live	Madagascar	Endangered species	Madagascar
	Euphorbia itremensis	Madagascar	VU	2295 live	Madagascar	High volume (GT)	Madagascar
	Euphorbia kondoi	Madagascar	CR	175 live	Madagascar	Endangered species; Sharp Increase; Sharp increase (Madagascar)	Madagascar

12 Taken from the Red List of South African Plants (SANBI, 2012).

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Plants (cont.)	*Euphorbia labatii*	Madagascar	CR	1811 live	Madagascar	Endangered species; High volume (GT)	Madagascar
	Euphorbia neohumbertii	Madagascar	EN	240 live	Madagascar	Endangered species; Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Euphorbia pachypodioides	Madagascar	CR	673 live	Madagascar	Endangered species; Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Euphorbia primulifolia	Madagascar	VU	5046 live	Madagascar	High volume (GT)	Madagascar
	Euphorbia razafindratsirae	Madagascar	CR	106 live	Madagascar	Endangered species; Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Euphorbia spp.		NE	5665 live	Madagascar	High volume	Madagascar
	Hoodia gordonii (Bitter Ghaap)		DD[13]	45 010 000 seeds	South Africa	High volume	Namibia; South Africa
	Leguminosae spp.		NE	291 dried plants	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Oeceoclades spp.		NE	1597 live	Madagascar	Sharp Increase; Sharp increase (Madagascar)	Madagascar
	Operculicarya hyphaenoides	Madagascar	EN	383 live	Madagascar	Endangered species	Madagascar
	Operculicarya pachypus	Madagascar	EN	1189 live	Madagascar	Endangered species	Madagascar
	Orchidaceae spp.		NE	37 345 live	Madagascar	High volume; Sharp increase (Madagascar)	Madagascar
	Pachypodium brevicaule	Madagascar	VU	8274 live	Madagascar	High volume (GT)	Madagascar
	Pachypodium eburneum	Madagascar	CR	783 live	Madagascar	Endangered species; High volume (GT)	Madagascar
	Pachypodium inopinatum	Madagascar	CR	402 live	Madagascar	Endangered species	Madagascar
	Ravenea rivularis (Majesty Palm)	Madagascar	EN	51 320 kg seeds	Madagascar	Endangered species; High volume (GT)	Madagascar

13 Taken from the Red List of South African Plants (SANBI, 2012).

Group	Taxon	SADC Endemic	IUCN Red List*	Top term[9] and corresponding quantity[10]	Top global exporter	Selection criteria[11]	All SADC exporters
Plants (cont.)	*Welwitschia mirabilis*		NE	70 leaves	Namibia	Sharp Increase; Sharp increase (Namibia)	Namibia
	Zygosicyos pubescens	Madagascar	NE	165 live	Madagascar	High volume	Madagascar
	Zygosicyos tripartitus	Madagascar	NE	144 live	Madagascar	High volume	Madagascar
Timber	*Dalbergia normandii*	Madagascar	EN	14 leaves	Madagascar	Endangered species	Madagascar
	Pericopsis elata (African Teak)		EN	176 649 m^3 logs	DRC	Endangered species; High volume (GT); Sharp increase (in country: not SADC)	DRC
	Prunus africana (African Cherry)		VU	10 541 732 kg bark	Cameroon	High volume (GT); Sharp increase (in country: not SADC)	DRC

Key

*CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = not yet assessed for the IUCN Red List.

** GT = globally threatened. Species were considered globally threatened if they were classified as CR, EN, VU, NT or DD on the IUCN Red List.

06 Trade by other countries in species native to SADC

This chapter examines direct exports of species native to SADC countries from countries outside the Region over the ten year period 2005-2014.

Trade in species native to the SADC Region by other exporting Parties can be of relevance to SADC for a number of reasons, including:

- To ensure that utilisation of these species in other areas of their range is not detrimental to their survival in the wild;
- To inform discussions on access and benefit sharing of biological resources, particularly with respect to single-country endemics;
- To highlight cases where the sharing of relevant conservation and captive-production information by non-range States that are breeding the species may be of benefit to SADC range States; and
- To help identify global demand and existing sustainable use systems already in place in other countries, to help inform the potential establishment of similar use programmes in SADC countries where appropriate. Sustainable use of species has the potential to provide positive incentives for the conservation of the species concerned and their habitats, as well as result in economic benefits to the Region.

The chapter provides an overview of trade in species native to SADC by non-SADC countries focusing first on wild-sourced trade and second on captive-produced or artificially-propagated trade. It then examines notable trade in species endemic to single countries within SADC by countries outside the SADC Region.

Tridacna maxima, by Bernard Dupont via Wikimedia Commons

6.1 Wild-sourced trade

Fifty-one Appendix I species, 642 Appendix II species and seven Appendix III species native to the SADC Region were reported as wild-sourced direct exports from countries other than those in the SADC Region. Table 6.1.1 presents the details of trade in commodities exported in quantities greater than 100 000 units over the period 2005-2014 and commodities of globally threatened species (i.e. Vulnerable, Endangered or Critically Endangered) exported at levels above 10 000 units. Of those species traded, three mammals, one bird, three reptiles, four fish, one mollusk, 25 corals and two plant species met the threshold.

Commodities of SADC species most highly traded as wild-sourced by non-SADC countries included *Balaenoptera physalus* (Fin Whale) meat, *Prunus africana* (African Cherry) bark and powder, live corals and *Varanus niloticus* (Nile Monitor) skins. Trade in commodities at high quantities (over 100 000 units) was mainly for commercial purposes (98% or greater), with the exception of trade in the coral species *Acropora tenuis* and *Hippopotamus amphibius* teeth which were mainly exported for scientific purposes. The main exporters of wild-sourced SADC species for commercial purposes were Indonesia (for coral species), Viet Nam, Malaysia, Thailand and China (for fish) and Cameroon, Mali, Ghana and Senegal (for bird, reptile and plant species). Key markets for wild-sourced exports include Japan (*Balaenoptera* meat), the Unites States (live corals and seahorses), Hong Kong (live fish and their derivatives) and France (*Prunus africana* bark and powder and *Varanus niloticus* skins).

Varanus niloticus, by Bernard Dupont, via Flickr

Table 6.1.1: Top commodities of species native to the SADC Region exported as wild-sourced by the rest of the world during 2005-2014 at levels above 100 000 units and commodities of globally threatened species (i.e. Vulnerable, Endangered and Critically Endangered) native to the SADC Region exported at levels above 10 000 units, according to exporter-reported data. All exporters were range states for the relevant taxon. The Table is ordered taxonomically by Class and in descending order by quantity within each Class. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List; SADC range States from Species+

Taxonomic group	Taxon (Appendix)	IUCN Red List Assessment	SADC range States	Term (unit)	Quantity exported by Parties other than SADC countries	Main exporter (%)	Main importer (%)	Main Purpose
Mammals	*Balaenoptera physalus* (I)	EN	AO, MG, MZ, NA, TZ	meat (kg)	4 881 000	Iceland (100%)	Japan (>99%)	T (100%)
				specimens (kg)	165 047	Iceland (>99%)	Japan (>99%)	T (>99%)
	Balaenoptera acutorostrata[14] (I/II)	LC	MZ	meat (kg)	267 301	Norway (60%)	Japan (91%)	T (98%)
	Hippopotamus amphibius (II)	VU	AO, BW, CD, MW, MZ, NA, SZ, TZ, ZA, ZM, ZW	teeth (kg)	18 463	Kenya (72%)	United States (75%)	S (71%)
Birds	*Psittacus erithacus* (II)	VU	AO, CD, TZ	live	35 865	Cameroon (70%)	Netherlands (24%)	T (99%)
Reptiles	*Varanus niloticus* (II)	NE	AO, BW, CD, LS, MW, MZ, NA, SZ, TZ, ZA, ZM, ZW	skins	489 366	Mali (66%)	France (76%)	T (>99%)
	Varanus exanthematicus (II)	LC	AO, CD, MW, TZ	live	183 889	Ghana (92%)	United States (60%)	T (100%)
	Python sebae (II)	NE	AO, CD, NA, TZ	leather products (small)	110 254	Senegal (>99%)	France (22%)	T (>99%)
Fish	*Hippocampus* species[14] (II)	VU	MU, MZ, TZ, ZA	live	89 908	Viet Nam (64%)	United States (80%)	T (>99%)
	Cheilinus undulatus (II)	EN	MG, MZ, SC, TZ	live	68 148	Malaysia (57%)	Hong Kong (97%)	T (>99%)
				meat	26 290	Malaysia (100%)	Hong Kong (73%)	T (100%)
	Hippocampus kelloggi (II)	VU	TZ	bodies (kg)	44 415	Thailand (>99%)	Hong Kong (72%)	T (100%)
	Hippocampus histrix (II)	VU	MU, TZ, ZA	derivatives	30 000	China (100%)	Japan (100%)	T (100%)
Molluscs	*Tridacna maxima* (II)	LR/cd	MG, MU, MZ, TZ, ZA	live	179 543	France (58%)	United States (53%)	T (100%)

14 Aggregated exports of *Hippocampus histrix*, *H. kelloggi* and *H. kuda* live exports above 10 000 units

Taxonomic group	Taxon (Appendix)	IUCN Red List Assessment	SADC range States	Term (unit)	Quantity exported by Parties other than SADC countries	Main exporter (%)	Main importer (%)	Main Purpose
Corals	*Anthozoa* species[15] (II)	NE/LC/NT/VU	MG, MU, MZ, SC, TZ, ZA	live	4 881 410	Indonesia (83%)	United States (53%)	T (>99%)
	Acropora tenuis (II)	NT	MG, MU, SC, TZ, ZA	raw corals	160 551	Japan (>99%)	Netherlands (>99%)	S (>99%)
Plants	*Prunus africana* (II)	VU	AO, CD, MG, MW, MZ, SZ, TZ, ZA, ZM, ZW	bark (kg)	4 512 670	Cameroon (91%)	France (70%)	T (>99%)
				powder (kg)	706 500	Cameroon (>99%)	France (99%)	T (100%)
	Pericopsis elata (II)	EN	CD	timber (m^3)	30 309	Cameroon (94%)	Belgium (63%)	T (>99%)

Key

IUCN Red List: NE = Not Evaluated, LC = Least Concern, NT = Near Threatened, LC/cd = Lower Risk/ conservation dependant, VU = Vulnerable, EN = Endangered, CR = Critically Endangered
Range States: See Annex A.
Purpose codes: Full details on Purpose codes are available in Annex B.

15 Aggregated exports of *Catalaphyllia jardinei*, *Cynarina lacrymalis*, *Eguchipsammia fistula*, *Euphyllia glabrescens*, *Galaxea astreata*, *G. fascicularis*, *Goniopora lobata*, *G. minor*, *G. stokesi*, *Heliofungia actiniformis*, *Heliopora coerulea*, *Hydnophora exesa*, *Lobophyllia corymbosa*, *Pachyseris rugosa*, *Pectinia lactuca*, *Physogyra lichtensteini*, *Plerogyra sinuosa*, *Polyphyllia talpina*, *Seriatopora hystrix*, *Trachyphyllia geoffroyi*, *Tubipora musica*, *Turbinaria mesenterina, T. peltata* and *T. reniformis* live corals above 100 000 units.

6.2. Captive-produced and artificially-propagated trade

Nine hundred and twenty CITES-listed native SADC species were exported as captive-produced (sources C, D, F) or artificially-propagated (sources A, D) by non-SADC countries during 2005-2014. Table 6.2.1 presents details of trade for species commodities exported at quantities greater than 100 000 units over the ten-year period.

Highly traded captive-produced or artificially-propagated commodities of species native to the SADC Region mainly comprised live succulent plants and their derivatives and live cycads. The majority of commodities exported over 100 000 units were exported by non-range State countries, with the exception of live *Hippocampus kuda* (Yellow Seahorse; Viet Nam), *Euphyllia glabrescens* (Torch Coral; Indonesia) and *Tridacna maxima* (Small Giant Clam; Australia). The main import markets were the Netherlands (live plants and plant derivatives) and the United States (live marine species). Trade was mainly for commercial purposes (94% or greater), with the exception of *Euphorbia milii* (54% exported with no purpose specified) SADC Countries exported very low proportions of the global trade with the exception of live *Agapornis fischeri* (Fischer's Lovebird) and *A. personatus* (Black-masked Lovebird; 33% of global trade each) and *Rhipsalis baccifera* (Mistletoe Cactus; 38% of global trade).

Aloe maculata, by The Blackthorn Orphans via Flickr

Table 6.2.1. Species native to the SADC Region exported as captive-produced/artificially-propagated by the rest of the world during 2005-2014 at levels above 100 000 units, according to exporter-reported data. The Table is ordered taxonomically by Class and in descending order by quantity. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List; Species+ for SADC range states.

Taxonomic group	Taxon (Appendix)	IUCN Red List Assessment	SADC range States	Term (unit)	Quantity exported by Parties other than SADC countries	Main exporter (%)	Main importer (%)	Main purpose
Birds	*Agapornis fischeri* (II)	NT	MZ, TZ	live	309 286	Cuba* (37%)	Indonesia (41%)	T (99%)
	Agapornis personatus (II)	LC	TZ	live	225 373	Cuba* (57%)	Mexico (35%)	T (>99%)
Reptiles	*Python regius* (II)	LC	CD	live	116 717	United States* (85%)	United Kingdom (25%)	T (99%)
Fish	*Hippocampus kuda* (II)	VU	MZ, TZ, ZA	live	432 674	Viet Nam (93%)	United States (62%)	T (>99%)
Molluscs	*Tridacna maxima* (II)	LR/cd	MG, MU, SC, TZ, ZA	live	161 193	Australia (63%)	United States (34%)	T (99%)
Corals	*Euphyllia glabrescens* (II)	NT	MG, MU, SC	live	337 211	Indonesia (>99%)	United States (43%)	T (100%)
Plants	*Euphorbia milii* (II)	DD	MG	live	4 199 026	Thailand* (97%)	United States (36%)	U (54%)
	Rhipsalis baccifera (II)	LC	MG	stems	2 072 000	Kenya* (>99%)	Netherlands (94%)	T (>99%)
	Aloe maculata (II)	LC[16]	LS, SZ, ZA	extract	1 370 616	Republic of Korea* (100%)	Japan (99%)	T (100%)
	Euphorbia tirucalli (II)	LC	AO, MG, TZ, ZA, ZW	live	921 740	Dominican Republic* (49%)	Netherlands (82%)	T (99%)

16 Taken from the Red List of South African Plants (SANBI, 2012).

Taxonomic group	Taxon (Appendix)	IUCN Red List Assessment	SADC range States	Term (unit)	Quantity exported by Parties other than SADC countries	Main exporter (%)	Main importer (%)	Main purpose
Plants (cont.)	*Cycas thouarsii* (II)	LC	MG, MZ, SC, TZ	leaves	918 474	Costa Rica* (>99%)	Netherlands (98%)	T (100%)
	Anacampseros rufescens (II)	LC[17]	LS, ZA	live	495 686	Republic of Korea* (>99%)	France (91%)	T (>99%)
	Aloe mitriformis (II)	NE	ZA	live	462 769	China* (96%)	Japan (88%)	T (97%)
	Euphorbia abyssinica (II)	NE	ZW	live	351 831	Costa Rica* (95%)	Germany (55%)	T (>99%)
	Neodypsis decaryi (II)	VU	MG	live	324 546	Costa Rica* (75%)	Netherlands (86%)	T (98%)
	Aloe arborescens (II)	LC[17]	MW, MZ, SZ, ZA, ZW	leaves (kg)	179 511	Georgia* (92%)	Belarus (61%)	T (100%)
	Aloe aculeata (II)	LC[17]	ZA, ZW	live	107 496	Canada* (91%)	United States (91%)	T (94%)

*Main exporter is not a range State.

Key

IUCN Red List: NE = Not Evaluated, LC = Least Concern, NT = Near Threatened, LC/cd = Lower Risk/ conservation dependant, VU = Vulnerable, EN = Endangered, CR = Critically Endangered
Range States: See Annex A.
Purpose codes: Full details on Purpose codes are available in Annex B.

17 Taken from the Red List of South African Plants (SANBI, 2012).

6.3 Species endemic to SADC countries

Four hundred and sixty-nine SADC single-country endemic species were exported by non-SADC countries as captive-produced (Source C, D or F) or artificially-propagated (Source A or D) in the period 2005-2014. Of these, 148 (32%) were categorised as globally threatened (Vulnerable, Endangered, Critically Endangered and Extinct in the Wild) and 15 had commodities exported in quantities over 1000 units. Table 6.3.3 presents details of top exported commodities of species endemic to SADC countries.

Five countries have endemic species traded in high volumes by non-SADC countries, with Madagascar having the highest number of endemic species traded in high volumes by other countries. Botswana and Lesotho had no endemic species traded by non-SADC countries.

Highly traded commodities of SADC country endemics were mainly comprised of live succulents (*Aloe*, *Euphorbia* and *Pachypodium* species and *Anacampseros telephiastrum*), live palms and their derivatives (*Neodypsis decaryi* – Feather Palm and *Ravenea rivularis* – Majesty Palm) and live pitcher plants (*Nepenthes madagascariensis* and *Nepenthes pervillei*). Commodities of Threatened species traded at lower volumes included cycad seeds (*Encephalartos* species) and live frogs (*Mantella aurantiaca* - Golden Mantella and *Nectophrynoides asperginis* – Kihansi Spray Toad). There were no clear main exporters of the main exported SADC endemic commodities with the exception of Canada for South African succulents; the main import markets included the United States (live succulents), the United Kingdom (live pitcher plants) and Thailand (cycad seeds). One SADC country (Tanzania) was the sole importer of *Nectophrynoides asperginis*; this species was exported for zoo purposes and were likely to be part of the species reintroduction programme (IUCN SSC Amphibian Specialist Group, 2015). Other trade was mainly for commercial purposes (62% or greater), with the exception of live *Euphorbia milii*, *E. decaryi* and *E. francoisii*, which were predominantly reported with purpose “Unknown”.

Aloe mitriformis, by James Gaither via Flickr

Table 6.3.3. Top commodities by volume of species endemic to single SADC countries exported by the rest of the world as captive-produced/artificially-propagated during 2005-2014 and commodities of globally threatened single SADC country endemic species exported at levels above 1000 units, according to exporter-reported data. The Table is grouped by range State and ordered by quantity, with highest traded first. Source: CITES Trade Database, UNEP-WCMC; IUCN Red List.

Range State	Taxon (Appendix)	IUCN Red List Assessment	Term	Total	Main exporter (%)	Main importer (%)	Purpose
Madagascar	*Euphorbia milii* (II)	DD	live	4 199 026	Thailand (97%)	United States (36%)	U (54%)
	Neodypsis decaryi (II)	VU	live	324 546	Costa Rica (77%)	Netherlands (86%)	T (98%)
			leaves	40 000	Costa Rica (100%)	Poland (100%)	T (100%)
			live (kg)	6804	Honduras (100%)	Germany (100%)	T (100%)
	Pachypodium lamerei (II)	NE	live	91 921	Canada (89%)	United States (89%)	T (98%)
	Ravenea rivularis (II)	EN	live	16 473	China (87%)	Japan (87%)	T (100%)
	Nepenthes madagascariensis (II)	VU	live	11 098	Sri Lanka (95%)	United Kingdom (69%)	T (79%)
	Euphorbia geroldii (II)	CR	live	7837	Costa Rica (>99%)	Netherlands (98%)	T (>99%)
	Pachypodium brevicaule (II)	VU	seeds	5230	Malta (100%)	Taiwan (38%)	T (100%)
	Euphorbia decaryi (I)	EN	live	1497	Netherlands (46%)	Switzerland (26%)	U (61%)
	Euphorbia francoisii (I)	CR	live	1483	Thailand (81%)	United States (39%)	U (80%)
	Mantella aurantiaca (II)	CR	live	1096	Canada (77%)	Netherlands (51%)	T (87%)
	Euphorbia cylindrifolia (I)	EN	live	1051	United States (59%)	Republic of Korea (51%)	T (79%)
Seychelles	*Nepenthes pervillei* (II)	VU	live	13 453	Sri Lanka (99%)	United Kingdom (68%)	T (>99%)
South Africa	*Aloe mitriformis* (II)	NE	live	462 769	China (96%)	Japan 88%)	T (97%)
	Euphorbia tuberculata (II)	NE	live	90 100	Costa Rica (100%)	United States (100%)	T (100%)
	Aloe ciliaris (II)	NE	live	77 071	Canada (69%)	United States (86%)	T (>99%)
	Euphorbia enopla (II)	NE	live	69 636	Canada (95%)	United States (95%)	T (97%)
	Aloe distans (II)	NE	live	43 384	Canada (98%)	United States (97%)	T (98%)
	Anacampseros telephiastrum (II)	LC[18]	live	37 741	Canada (>99%)	United States (>99%)	T (>99%)

18 Taken from the Red List of South African Plants (SANBI, 2012).

Range State	Taxon (Appendix)	IUCN Red List Assessment	Term	Total	Main exporter (%)	Main importer (%)	Purpose
South Africa (cont.)	*Aloe peglerae* (II)	EN	live	19 968	Canada (55%)	United States (55%)	T (62%)
Tanzania	*Nectophrynoides asperginis* (I)	EW	live	11 600	United States (100%)	Tanzania (100%)	Z (90%)
	Encephalartos sclavoi (I)	CR	seeds	2898	Australia (100%)	Thailand (84%)	T (100%)
Zimbabwe	*Encephalartos concinnus* (I)	EN	seeds	4350	Australia (100%)	Thailand (97%)	T (100%)

Key

IUCN Red List: NE = Not Evaluated, LC = Least Concern, NT = Near Threatened, LC/cd = Lower Risk/ conservation dependant, VU = Vulnerable, EN = Endangered, CR = Critically Endangered
Range States: See Annex A.
Purpose codes: Full details on Purpose codes are available in Annex B.

07 | Recommendations

7.1 Reporting of trade in CITES listed species

A number of issues were identified that relate to the quality and completeness of data recorded by SADC countries in their annual reports to CITES. The Guidelines for the preparation and submission of CITES annual reports (CITES Notification No. 2011/019) specifies the information that should be included in the reports. These data provide the basis for monitoring the implementation of CITES and support key decision making, including the making of non-detriment findings. Accurate reporting is therefore key in ensuring that international trade in wildlife is sustainable.

- ***Use of accepted nomenclature:*** Accepted scientific names for species should be used on permits and in annual reports, as opposed to synonyms or common names, to avoid confusion. For example, synonyms reported by SADC countries included *Geochelone pardalis* (synonym of *Stigmochelys pardalis*), *Rhipsalis cassutha* (synonym of *Rhipsalis baccifera*) and a number of *Chamaeleo* species which were subject to nomenclature changes at CoP16 (synonyms of *Trioeros* species). SADC countries with electronic CITES permitting systems may wish to consider the use of the Species+/CITES Checklist Application Programming Interface (API)[19] to facilitate the automatic transfer of up-to-date taxonomic and legal information from the CITES Checklist/Species+ directly to national systems, to help ensure that accepted nomenclature is used in permits.

- ***Timely submission of annual reports:*** Parties are required to submit their annual report by 31 October following the reporting year. At the time of writing (June 2016), no report had been received from Lesotho for 2009-2014, from Namibia or Tanzania for 2007, from Zambia for 2013, or from Mauritius, Malawi or Seychelles for 2014.

  Reports for 2011 and 2012 from Botswana, for 2010 and 2011 from DRC, for 2010-2012 from Malawi, for 2010 from Mauritius, for 2011 from Mozambique, and for 2010, 2012 and 2013 from Seychelles were received by the CITES Secretariat with a delay of more than a year.

  SADC countries are encouraged to submit annual reports within the deadline, to ensure that the most up-to-date information is available to Parties and decision makers for monitoring international trade in wildlife. There are ongoing discussions in the CITES arena regarding the development of electronic permitting systems, which have the potential to enable monitoring of trade transactions in near-real time. SADC countries are encouraged to engage with the Working Group on CITES Electronic Permitting in future discussions on this topic.

- ***Basis of reporting:*** Annual reports should, whenever possible, be compiled on the basis of actual trade rather than on the basis of permits and certificates issued, to avoid

19 http://api.speciesplus.net/

overestimation of trade volumes. The basis of reporting should be clearly specified in the annual report; for the period 2005-2014, the majority of annual reports received did not specify the basis of compilation.

- ***Reporting of hunting trophies:*** To facilitate interpretation of CITES trade data relating to hunting trophies SADC countries should report hunting trophies in accordance with the Guidelines for the preparation and submission of CITES annual reports. In particular, all the parts that reasonably add up to one animal (e.g. horns, skull, skin, tail and feet) should be reported as one trophy when shipped together.

- ***Use of preferred term and unit combinations:*** wherever possible the recommended term and unit combinations, as described in the Guidelines for the preparation and submission of CITES annual reports, should be used on permits and within annual reports. This standardizes the data and allows for more meaningful analysis of trade. Frequently misreported units within trade include meat, extract and derivatives reported without units.

7.2 Management and conservation measures

Impact monitoring and benefit sharing: Wildlife trade has the potential to generate substantial revenues that can serve as incentives to conservation. However, for these conservation benefits to be maximised, it is widely recognised that a number of conditions need to be met, including the equitable sharing of benefits with local communities and investment in ensuring adequate monitoring of populations. Considering the relevance to the region of the trade in a number of key commodities, such as hunting trophies, parrots and reptiles for the pet trade, as well as cycads and succulent plants, as outlined in this report, it will be important to ensure that adequate management practices are in place so this trade can result in positive livelihood and conservation impacts.

Making of non-detriment findings: The export of several species from various SADC countries has in recent years been subject to CITES import suspensions and/or import suspensions as part of stricter domestic measures such as the EU Wildlife Trade Regulations. In the majority of cases, import suspensions have been based on concerns about the sustainability of the trade, for example following the CITES Review of Significant Trade process. SADC countries are therefore encouraged to ensure that: robust NDFs are in place for species in trade, monitoring measures are in place to track the effects of the trade, and that exporting countries collaborate with importing partners to address any concerns.

7.3 Further work

Endemic species: An assessment should be conducted of the potential conservation implications of the trade in endemic and threatened species from the region, particularly reptiles, succulent plants and cycads.

Taxa of potential concern: Taxa showing recent increases in wild-sourced trade, threatened taxa or taxa showing sharp increases in trade could warrant further research to ensure that trade is not detrimental to the wild populations. Potential areas for further scrutiny highlighted in this report include lion bones, *Psittacus erithacus* and threatened cycads.

Additional species that may need monitoring under CITES: While this analysis focuses on CITES-listed species, it is likely that species from the region that are not covered by the CITES Convention may also benefit from additional protection and monitoring. It is therefore suggested that efforts are made to identify which additional taxa may merit listing in the CITES appendices, such as reptiles and timber trees.

Traceability: Considering the relatively high volumes of trade in artificially-propagated plants (including threatened and endemic succulents and cycads) and captive-bred animals (including threatened and endemic tortoises, as well as parrots), as well as the increasingly recognized

threat from illegal wildlife trade, SADC countries are encouraged to consider the development and implementation of traceability measures to minimise the risk of laundering, including the laundering of wild-sourced specimens as artificially-propagated or captive-bred.

Potentially under-utilised species: The analysis identified a number of species native to SADC that are exported in high volumes from other countries. SADC countries may wish to assess the potential for sustainable use of such species that are potentially under-utilised, as it has the potential to provide economic benefits and in turn may have a positive impact on the species concerned in terms of creating incentives for improved management or habitat conservation.

Conservation benefits of captive-breeding/ artificially-propagated trade: The analysis highlighted that CITES trade in certain commodities from the region is in artificially-propagated plants or captive-bred animals. While trade from these sources is likely to reduce pressure on wild populations, it might also remove incentives for local communities to manage wild populations sustainably. An assessment of the benefits of captive or artificial production to conservation, as well as of the potential for sustainable use from the wild, should be undertaken.

Refine hunting trophy analysis methodology: This report presents a preliminary method to calculate the number of individuals involved in the hunting trophy trade, to enable more meaningful analysis of these data and the conservation implications of this trade. Further refinement of this methodology, in collaboration with SADC countries and relevant experts, could facilitate more robust analysis of these data.

Financial valuation of wildlife trade: While this report provides a financial valuation of the items traded internationally at one point in the trade chain (import), additional work to estimate the value of wildlife in trade at different levels in the trade chain, including to assess benefits to communities and to better understand additional values associated with the trade, would be merited. This would be of relevance to inform, for example, the prioritization and financing of wildlife trade management and monitoring efforts.

Knowledge sharing across the region: The analysis demonstrates that, while there are notable differences in the species in trade in different countries, there are also marked similarities. SADC provides an umbrella for regional cooperation, including in relation to wildlife trade issues, and the region is encouraged to continue collaborating and sharing information and knowledge across countries, including on shared populations, management experiences and enforcement issues, to continue to strengthen wildlife trade management in the region.

07 | References

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Annex A | Data included and methodology

Data included

Table A.1: CITES annual reports received at the time of writing (May 2016). N.B. Angola became a Party to CITES in 2013 and has a one year initial period during which no annual reports are due. Key: ✓ = received and included in the analysis; ■ = report not received in time for the analysis.

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Angola (AO)	Not a party	Not a party	Not a party	Not a party	Not a party	Not a party	Not a party	Not a party		
Botswana (BW)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Democratic Republic of the Congo (CD)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lesotho (LS)	✓	✓	✓	✓						
Madagascar (MG)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Malawi (MW)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓*
Mauritius (MU)	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Mozambique (MZ)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Namibia (NA)	✓	✓		✓	✓	✓	✓	✓	✓	✓
Seychelles (SC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	
South Africa (ZA)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Swaziland (SZ)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tanzania (TZ)	✓	✓		✓	✓	✓	✓	✓	✓	✓
Zambia (ZM)	✓	✓	✓	✓	✓	✓	✓	✓		✓
Zimbabwe (ZW)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

*Malawi's annual report for 2014 was not received in time to be included in this analysis.

Table A.2: Countries and territories included in each Region grouping. Source: Europa.eu, UN Statistics Division. Western Asia excludes Cyprus as it is an EU Member State.

EU	Western Asia	Eastern and South-eastern Asia
Austria	Armenia	Brunei Darussalam
Belgium	Azerbaijan	Cambodia
Bulgaria	Bahrain	China
Croatia	Georgia	Hong-Kong, SAR
Cyprus	Iraq	Indonesia
Czech Republic	Israel	Japan
Denmark	Jordan	Lao, People's Democratic Republic
Estonia	Kuwait	Macau, SAR
Finland	Lebanon	Malaysia
France	Oman	Myanmar
Germany	Qatar	Philippines
Greece	Saudi Arabia	Republic of Korea
Hungary	State of Palestine	Singapore
Ireland	Syrian Arab Republic	Thailand
Italy	Turkey	Timor-Leste
Latvia	United Arab Emirates	Viet Nam
Lithuania	Yemen	
Luxembourg		
Malta		
Netherlands		
Poland		
Portugal		
Romania		
Slovakia		
Slovenia		
Spain		
Sweden		
United Kingdom of Great Britain and Northern Ireland		

Trophy analysis methodology – Chapter 4.1

The CITES definition of 'hunting trophy' is: 'a whole animal, or readily recognizable part or derivative of an animal, specified on any accompanying CITES permit or certificate, that:

i. Is raw, processed or manufactured;
ii. Was legally obtained by the hunter through hunting for the hunter's personal use; and
iii. Is being imported, exported or re-exports by or on behalf of the hunter, as part of the transfer from its country of origin, ultimately to the hunter's State of usual residence.'

To estimate numbers of individuals in trade as trophies, trade reported as 'trophy' (for all purposes) and trade in parts that can be readily equated to one individual, reported as purpose H, P and T, were considered. For trade in trophy parts, conversion factors were used to convert parts into number of trophies. These conversion factors are included in Table A.3. An automated permit analysis was used, to calculate the minimum number of whole animals traded, provided the following parameters were the same: taxon, source, unit of trade, year, reported type (importer or exporter), country of export, country of import, country of origin, export permit number[20]. For *Loxodonta africana*, where trade on the same permit was recorded as 'one trophy' and 'two tusks', this was considered to be one trophy (rather than 1 trophy: 1 and two tusks: 1 = 2 trophies) as tusks associated with trophies are often reported separately for this species.

Where no export permit number was provided, the converted trophy parts were each considered a separate animal[21]. A precautionary approach was taken to trade reported without an export permit number because the remaining parameters do not provide sufficient information to conclude that the trophy parts likely derived from the same animal.

Table A.3: Accepted trophy parts and conversion factors to trophies

Reported term	Conversion factor to equate to one trophy
Bodies	1
Ears	2
Feet	4
Genitalia	1
Horns	2
Skins	1
Skulls	1
Tails	1
Teeth[(a)]	12
Trophies[(b)]	1
Tusks [(c)]	2

(a) Teeth only included for *Hippopotamus amphibius* and *Hippopotamus* spp.
(b) Trophies only considered a trophy part when reported on the same export permit as tusks, for *Loxodonta africana* only.
(c) Any tusks reported for *Hippopotamus amphibius* and *Hippopotamus* spp. were treated as "Teeth".

Exclusions

The following records were excluded from the trophy combination analysis:

- *Crocodylus niloticus* and *Arctocephalus* spp. skins exported for commercial purposes, as these are likely to be traded for further processing and do not represent trophies;
- *Loxodonta africana* skins: these skins are thick and can be split several times, as such they cannot be equated to a number of individuals;
- *Loxodonta africana* tusks identified as being traded as part of the authorized sale of stockpiled ivory;

20 For example (all key parameters being equal): 2 ears (converted to 1 by the conversion factor) + 1 tail + 1 skull = 1 trophy.
21 For example (all key parameters being equal): 2 ears (converted to 1 by the conversion factor) + 1 tail + 1 skull = 3 trophies if the export permit number was absent.

- Trade reported by weight or units other than in number, which cannot be converted to numbers of individuals.

Succulent methodology – Chapter 4.5

The families analysed were chosen based on the orders listed in *The Illustrated Encyclopedia of Succulents* (Rowley, 1978) and *List of Names of Succulent Plants other than Cacti* (Eggli and Taylor, 1994) and comprised: Agavaceae, Anacardiaceae, Apocynaceae, Asclepiadaceae, Asphodelaceae, Cactaceae, Cucurbitaceae, Didiereaceae, Dioscoreaceae, Euphorbiaceae, Liliaceae, Passifloraceae, Pedaliaceae, Portulacaceae and Vitaceae.

Valuation methodology – Chapters 3 & 4

Data collection: Animals

Financial values for animal products were obtained using species-specific values in United States dollars (USD) that are included in the United States annual report to CITES (as transmitted by the United States Fish and Wildlife Service). All annual reports from 2006 to 2014 were used to compile price data for the analysis, and prices were corrected for inflation.

Data collection: Plants

The United States annual reports do not report prices for most plant imports so data for plants were collected from retail and wholesale websites from around the world. Google searches for the names of the main plant groups in trade (e.g. cacti, succulents, cycads, timber) plus the phrases 'for sale', 'nursery', and 'buy' were carried out to find plants and plant products for sale. In addition, eBay searches for the main plant groups and genera plus terms were carried out. The process was repeated using the names of some of the key genera, species and trade terms that lacked price data after the first phase. All prices were converted to USD.

Analysis

The two datasets were used to calculate the median value for each combination of taxa/term/unit/source for animals, and taxa/term/unit for plants, as the source could not be determined for the majority of retail products. These medians were then multiplied by the reported trade volume of that combination to obtain total values for CITES-listed SADC exports. Only medians for which at least five prices were found were used in the final calculations. In cases where there was an insufficient sample size, a suitable proxy was used. For example, where the sample size at the species level was not large enough, a proxy of the next lowest taxonomic level for which there was a large enough sample size was used (up to order). In cases where no suitable proxy could be found, the data were excluded.

Limitations

The exclusion of some trade records will reduce the overall estimated value of SADC trade, and this exclusion is likely to be biased towards taxa/term/unit/source combinations that are infrequently traded. In addition, the use of proxies at the family or order level may underestimate trade values at the species level, especially for particularly high value species.

In addition, retail and wholesale prices for plants and import values for animals may not be comparable, due to the different sources of these data. A comparison between prices found on reptile retail websites in South Africa and corresponding prices in the United States annual report shows many similarities but also some significant differences, primarily in prices for wild-collected individuals. Overall figures should therefore be interpreted with some caution.

Noteworthy trends methodology – Chapter 5

The process of selection of species for inclusion in Chapter 4 is based on proposed revisions to the methodology for selecting species under

the 'extended analyses' of the CITES Review of Significant Trade process by the CITES Advisory Working Group on the Evaluation of the Review of Significant Trade (UNEP-WCMC, 2015).

Data selection

In line with the CITES Review of Significant Trade process, only direct trade in CITES Appendix II species from wild, ranched, unknown, and unreported sources were included in this analysis. Data were extracted from the CITES Trade Database on 4 May 2016, and encompassed trade data from the most recent ten-year period for which near-complete data were available (2005-2014).

Only trade reported under the following terms (i.e. types of specimens in trade) were included in the analysis:

- **Animals:** baleen, bodies, bones, carapaces, carvings, cloth, eggs, egg (live), fins, gall and gall bladders, horns and horn pieces, ivory pieces, ivory carvings, live, meat, musk (including derivatives for *Moschus moschiferus*), plates, raw corals, scales, shells, skin pieces, skins, skeletons, skulls, teeth, trophies, and tusks.
- **Plants:** bark, carvings, chips, cultures, derivatives, dried plants, extract, flowers, flower pots, fruit, furniture, leaves, live, logs, plywood, powder, roots, sawn wood, seeds, stems, timber, timber carvings, timber pieces, veneer, and wax.

Following the precautionary principle, gross export levels of trade were used for each combination of taxon, country, term, unit and year. "Gross exports" reflects the highest level of trade reported, irrespective of whether this is reported by the country of export or the country of import. It therefore represents the maximum level of trade on which a non-detriment finding, implemented under Article IV of the Convention, would be required by the relevant range State. Using the higher of the two reported values also accommodates for cases where the data from one of the trading partners are incomplete (e.g. in the case of non-submission of annual reports).

Prior to analysis, any taxa subject to very low levels of trade (averaging <20 items per year over the past five years, or <1 item per year over the past five years if categorised as Endangered or Critically Endangered) were removed. Data were also excluded where species were reported as "introduced" to a range State, as these do not represent native wildlife.

Following the methodology for the extended Review of Significant Trade (UNEP-WCMC, 2015), the SADC analysis of noteworthy trends used five main criteria for the selection of species:

- **Endangered species:** Trade in Critically Endangered (CR) and Endangered (EN) taxa, where mean trade was ≥1 item per year for 2010-2014.
- **High volume and High volume (globally threatened):** high volume trade over the previous five years weighted according to IUCN threat status.
- **Sharp increase and Sharp increase (in country):** substantially higher trade in most recent year in comparison to a five year average of the preceding five years at the global level ("Sharp increase") or the range State level ("Sharp increase (in country)").

High volume and high volume (globally threatened)

To determine taxa traded at high volume, the top third of taxa within each order were selected as "High volume" (based on the average of the most recent five years of direct trade levels).

Order level thresholds (all terms combined, and all standardised units treated as equal) were assigned as the average trade volume for the species at the cut-off point (the last of the top one-third within the order, with the remaining two-thirds of species in the order traded at lower trade volumes). The threshold for globally

threatened species (DD, NT, VU, EN, CR[22]) of each order was calculated as 10% of this order level threshold, these species were classified as "High volume (globally threatened)".

Where only one or two taxa within an order was represented, all were selected.

Sharp increase and sharp increase (in country)

To determine taxa exhibiting a sharp increase in trade, two criteria had to be met:

- Total trade over the ten year period was greater than 100
- The most recent year of trade (2014) was at least three times higher than the average trade over the previous five years (2009-2013)

Because combined global trade may mask crucial within-country trends, this criteria was also run at the country level for finer resolution. This means that taxa could be listed as exhibiting both a "Sharp increase" (i.e. at the global scale), and a "Sharp increase (in country)" for one or more range states. Because, in most cases, country-level trade will be lower than global trade in a taxon, criteria (a) for sharp increase (total trade > 100) did not have to be met, instead the most recent year of trade had to be at least 10.

22 DD: Data Deficient; NT: Near Threatened; VU: Vulnerable; EN: Endangered; CR: Critically Endangered according to the 2016 IUCN Red List of threatened species (IUCN, 2015)

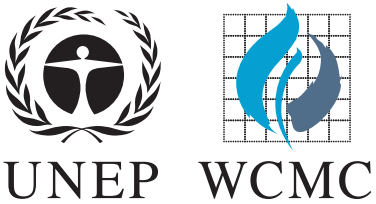
Annex B | Source and purpose codes

Table B.1. Codes for source of trade. Source: Conf. 12.3 (Rev. CoP16).

Code	Description
A	Plants that are artificially-propagated in accordance with Resolution Conf. 11.11 (Rev. CoP15), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5 (specimens of species included in Appendix I that have been propagated artificially for non-commercial purposes and specimens of species included in Appendices II and III)
C	Animals bred in captivity in accordance with Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5
D	Appendix-I animals bred in captivity for commercial purposes in operations included in the Secretariat's Register, in accordance with Resolution Conf. 12.10 (Rev. CoP15), and Appendix-I plants artificially-propagated for commercial purposes, as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 4, of the Convention
F	Animals born in captivity (F1 or subsequent generations) that do not fulfil the definition of 'bred in captivity' in Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof
I	Confiscated or seized specimens
O	Pre-Convention specimens
R	Ranched specimens: specimens of animals reared in a controlled environment, taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood
U	Source unknown (must be justified)
X	Specimens taken in "the marine environment not under the jurisdiction of any State"
W	Specimens taken from the wild

Table B.2. Codes for purpose of trade. Source: Conf. 12.3 (Rev. CoP16).

Code	Description
B	Breeding in captivity or artificial propagation
E	Educational
G	Botanical gardens
H	Hunting trophies
L	Law enforcement/judicial/forensic
M	Medical (including biomedical research)
N	Reintroduction or introduction into the wild
P	Personal
Q	Circuses and travelling exhibitions
S	Scientific
T	Commercial / Trade
Z	Zoos



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