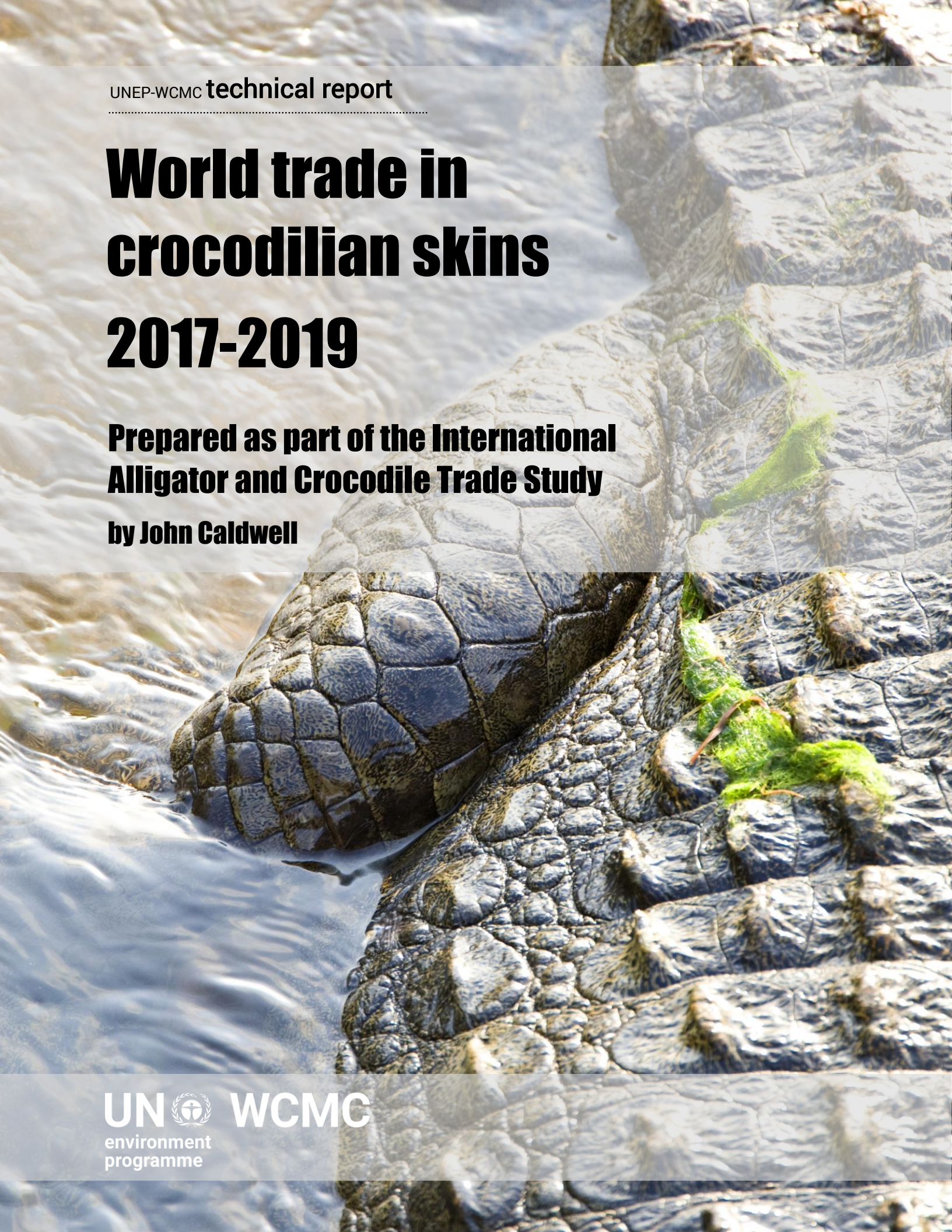


UNEP-WCMC technical report

World trade in crocodilian skins 2017-2019

Prepared as part of the International Alligator and Crocodile Trade Study

by John Caldwell

UN environment programme
WCMC

World trade in crocodilian skins 2017-2019

Prepared for
The Louisiana Alligator Advisory Council, Louisiana, United States of America

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Executive summary

All crocodilians are listed in either Appendix I or Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and many are found in international trade for the leather and fashion industry, for meat, and as live animals for breeding operations, food, the pet industry, and zoos. This report shows the changing trends in the species involved in this trade since 2010 with special emphasis on the years 2017 to 2019, the most recent three-year period for which there are reasonably complete data.

The species involved in the skin trade are the 'classics' such as *Alligator mississippiensis*, *Crocodylus acutus*, *C. moreletii*, *C. niloticus*, *C. novaeguineae*, *C. porosus* and *C. siamensis*, and the caimans such as *Caiman crocodilus crocodilus*, *C. c. fuscus*, *C. latirostris* and *C. yacare*. More recently, Black Caiman *Melanosuchus niger* has entered the skin trade. In the years since 2010 the skin trade has increased year on year reaching a peak of 1.9 million skins in 2013. The increase was across several species particularly American Alligator from the United States, Nile Crocodile from Southern Africa, Saltwater Crocodile from Australia, Indonesia and Papua New Guinea, Brown Caiman from Colombia and Yacaré from Bolivia, Brazil, and Paraguay. Since 2013 the total number of crocodilian skins traded globally has declined but nearly four million skins were reported in trade over the three-year period 2017-2019.

Live animal trade involves relatively few individuals except for the Far Eastern trade in Siamese Crocodile *Crocodylus siamensis*. These animals are bred in captivity in Cambodia, Thailand, and Viet Nam, and until 2019 were exported in large numbers to China where they are consumed as food. In the period 2017-2019, over 193,000 live *C. siamensis* were involved in this trade.

Crocodilian meat is traded widely but is particularly favoured in the Far East, especially China and Hong Kong, Special Administrative Region of China (hereafter referred to as Hong Kong, SAR); the top species in trade in the period 2017-2019 were *C. niloticus* and *C. siamensis.*

Introduction

This report, the twenty-seventh produced by UNEP-WCMC for the International Alligator and Crocodile Trade Study (IACTS), examines the international trade in crocodilian skins, with a particular focus on the years 2017 to 2019, but also refers to trends since 2010. It also attempts to identify and highlight problem areas such as apparent discrepancies in reporting and to recommend, where possible, workable solutions. The data used have been obtained from the CITES Trade Database maintained by UNEP-WCMC on behalf of the CITES Secretariat, with additional information provided by the Crocodile Farmers Association of Zimbabwe and the United Nations Food and Agriculture Organisation (FAO).

As in previous IACTS reports, this report presents an overview of global trade levels in classic skins (alligators and true crocodiles) and caimans, and a detailed species-by-species analysis of the trade in skins and other products such as live animals, meat, and teeth. All species within the order Crocodylia are listed in either Appendix I or II of CITES. Of those species specifically mentioned in this report as being in commercial trade, the following are listed in Appendix I: *Crocodylus acutus*, *C. moreletii*, *C. niloticus*, *C. porosus*, *C. siamensis*, *Caiman latirostris* and *Melanosuchus niger*; although some of these species have populations currently listed in Appendix II.

Data included

This report is based on an analysis of the annual reports submitted by the Parties to CITES for 2010 to 2019 and, where appropriate, data outside of this timeframe are presented to provide historical context. A list of annual reports for 2017-2019 that were included in the CITES Trade Database at the time of analysis (April 2021) is provided (Table 1). Additional data provided by FAO and the Crocodile Farmers Association of Zimbabwe (CFAZ) has been used where the annual report data are missing or thought to be incomplete.

All direct, commercial trade in whole skins and sides, live animals, meat, and teeth of crocodilian species has been analysed, with two sides being considered equivalent to one skin; trade in skins reported in other sub-units, such as 'tails', or in units of weight, area, or length, have been excluded. Re-export trade has not been included in the estimation of annual production. The figures and tables contain information on trade from all sources, including captive-breeding, ranching and wild specimens, unless otherwise specified. Wherever possible, data reported by the producer countries have been used in preference to that reported by importing countries. This is because there may be a time lag between when the export and the import are reported, which could lead to the same skins being counted in different years and thus an overestimation of trade volume. However, where producer countries have failed to submit annual reports, or where exporter-reported trade volumes are substantially less than those reported by importers, importers' data have been used. Many of the transactions have been analysed at the export permit level, and, where possible, importer-reported data have been corrected for year-end trade through permit analysis. The report discusses the key species in trade in taxonomic order, reviewing global trade trends before focussing on trends in trade from individual exporting countries.

Limitations of data

Incomplete data due to late submission of, or failure to submit, CITES annual reports remains an impediment to conducting trade studies using CITES trade data. Measures have been taken by the CITES Standing Committee to improve compliance with the reporting provisions of the Convention. These have included reminders being sent by the Secretariat on behalf of the Standing Committee and a recommendation to suspend trade in CITES-listed species should a Party fail, without providing sufficient justification, to submit reports for three consecutive years (Resolution Conf. 11.17 (Rev. CoP18)). Despite these efforts, some Parties fail to submit annual reports on a regular basis.

According to Resolution Conf. 11.17 (Rev. CoP18), annual reports for trade in 2019 should have been submitted by 31 October 2020. However, at the time of analysis (April 2021), several reports that might contain important crocodilian data had not yet been received by the CITES Secretariat. These include Argentina (2018), Australia (2018 and 2019), Cambodia (2018), Mauritius (2018), Mozambique (2019), Republic of Korea (2017 and 2019), United States (2019) and Venezuela (2018).

The accuracy of the data is a further limitation to analysis of the trade. The quality of some annual reports was poor as evidenced by comparisons of exporter- and importer-reported data and data obtained from other sources; occasionally skins have been misreported as live animals, while skin pieces, such as back strips, necks, flanks, and tails, have often been reported as whole skins. Since most of the countries trading in crocodilian skins report on a shipment-by-shipment basis, and many importers' reports include the exporters' permit numbers, importer-reported data can be cross-referenced with the original export permit information to keep reporting or typographical errors to a minimum. This type of checking is also useful for cross-referencing end-of-year trade, where an export may be reported in one year and the import of the same shipment reported the following year.

Analysing annual reports is also complicated by the inconsistent way in which the reports are compiled. According to CITES Notification to the Parties No. 2017/006 of 16 January 2017 (now replaced by Notification to the Parties No. 2019/072 Annex 1 of 4 December 2019), Parties may base their report simply on the permits and certificates that have been issued if they are unable to report on the actual number of specimens that entered or left the country. However, reporting based on permits issued may lead to overestimates of trade volume as permits are frequently issued for quantities exceeding those which are actually traded and indeed, some of the permits may expire without being used. Most Parties still fail to provide any details concerning the basis on which their annual reports are compiled.

Significant improvement in the reporting of crocodilian trade continues; however, the absence of annual reports from certain key producer countries continues to be a hindrance to timely analysis of the trade.

Table 1. CITES annual reports for 2017-2019 available for analysis as of April 2021

Country	2017	2018	2019
Afghanistan	-	-	-
Albania	✓	-	-
Algeria	✓	✓	-
Angola	✓	-	-
Antigua and Barbuda	✓	✓	✓
Argentina	✓	-	✓
Armenia	-	✓	-
Australia	✓	-	-
Austria	✓	✓	✓
Azerbaijan	✓	✓	-
Bahamas	-	-	✓
Bahrain	-	-	-
Bangladesh	✓	✓	✓
Barbados	✓	✓	✓
Belarus	✓	✓	-
Belgium	✓	✓	✓
Belize	✓	✓	✓
Benin	-	✓	✓
Bhutan	✓	✓	✓
Bolivia	✓	✓	-
Bosnia and Herzegovina	✓	✓	✓
Botswana	✓	✓	✓
Brazil	✓	✓	-
Brunei Darussalam	✓	✓	✓
Bulgaria	✓	✓	✓
Burkina Faso	✓	-	-
Burundi	✓	-	-
Cambodia	✓	-	✓
Cameroon	✓	✓	✓
Canada	✓	✓	-
Cabo Verde	✓	✓	✓
Central African Republic	✓	✓	✓
Chad	-	-	-
Chile	✓	✓	-
China	✓	✓	✓
Colombia	✓	✓	✓
Comoros	✓	✓	-
Congo	-	-	-
Costa Rica	✓	-	-
Côte d'Ivoire	✓	✓	✓
Croatia	✓	✓	✓
Cuba	✓	✓	✓
Cyprus	✓	✓	✓
Czech Republic	✓	✓	✓
Democratic Republic of the Congo	✓	✓	✓
Denmark	✓	✓	✓
Djibouti	-	-	-
Dominica	✓	-	-
Dominican Republic	✓	✓	✓
Ecuador	✓	✓	✓
Egypt	✓	✓	-

Country	2017	2018	2019
El Salvador	✓	✓	✓
Equatorial Guinea	✓	✓	✓
Eritrea	✓	✓	-
Estonia	✓	✓	✓
Eswatini	✓	✓	✓
Ethiopia	✓	✓	✓
Fiji	✓	✓	-
Finland	✓	✓	✓
France	✓	✓	✓
Gabon	✓	✓	✓
Gambia	✓	✓	✓
Georgia	✓	✓	-
Germany	✓	✓	✓
Ghana	✓	✓	✓
Greece	✓	✓	✓
Grenada	-	-	-
Guatemala	✓	✓	-
Guinea	✓	✓	✓
Guinea Bissau	✓	✓	✓
Guyana	✓	✓	✓
Honduras	✓	✓	✓
Hong Kong, SAR	✓	✓	✓
Hungary	✓	✓	✓
Iceland	✓	-	-
India	✓	✓	✓
Indonesia	✓	✓	✓
Iran, Islamic Republic of	✓	-	-
Iraq	-	✓	✓
Ireland	✓	✓	✓
Israel	✓	✓	-
Italy	✓	✓	✓
Jamaica	✓	✓	✓
Japan	✓	✓	✓
Jordan	✓	-	-
Kazakhstan	✓	✓	✓
Kenya	✓	✓	✓
Kuwait	✓	✓	-
Kyrgyzstan	✓	✓	-
Lao P.D.R.	✓	✓	✓
Latvia	✓	✓	✓
Lebanon	✓	✓	-
Lesotho	✓	✓	✓
Liberia	-	-	-
Libya	-	-	-
Liechtenstein	✓	✓	-
Lithuania	✓	✓	✓
Luxembourg	✓	✓	✓
Macao, SAR	-	✓	✓
Madagascar	✓	✓	✓
Malawi	✓	✓	✓
Malaysia	✓	✓	✓
Maldives	✓	✓	✓

Country	2017	2018	2019
Mali	✓	✓	✓
Malta	✓	✓	✓
Mauritania	✓	-	-
Mauritius	✓	-	✓
Mexico	✓	✓	✓
Monaco	✓	✓	-
Mongolia	-	-	-
Montenegro	✓	✓	-
Morocco	✓	✓	✓
Mozambique	✓	✓	-
Myanmar	✓	✓	✓
Namibia	✓	✓	✓
Nepal	✓	-	-
Netherlands	✓	✓	✓
New Zealand	✓	✓	✓
Nicaragua	✓	✓	✓
Niger	✓	-	-
Nigeria	-	✓	-
North Macedonia	✓	✓	✓
Norway	✓	✓	✓
Oman	✓	✓	✓
Pakistan	✓	✓	-
Palau	✓	✓	✓
Panama	✓	✓	✓
Papua New Guinea	✓	-	-
Paraguay	✓	-	-
Peru	✓	✓	-
Philippines	✓	✓	✓
Poland	✓	✓	✓
Portugal	✓	✓	✓
Qatar	✓	✓	-
Republic of Korea	-	✓	-
Republic of Moldova	✓	✓	✓
Romania	✓	✓	✓
Russian Federation	-	✓	✓
Rwanda	✓	✓	✓
Saint Kitts and Nevis	✓	✓	✓
Saint Lucia	-	-	-
Saint Vincent and the Grenadines	✓	✓	✓
Samoa	✓	-	-
San Marino	✓	-	-
Sao Tome and Principe	-	-	-
Saudi Arabia	✓	-	-
Senegal	-	✓	-
Serbia	✓	✓	✓
Seychelles	-	-	✓
Sierra Leone	-	-	-
Singapore	✓	✓	✓
Slovakia	✓	✓	✓
Slovenia	✓	✓	✓
Solomon Islands	-	-	-
Somalia	✓	✓	-

Country	2017	2018	2019
South Africa	✓	✓	✓
Spain	✓	✓	✓
Sri Lanka	✓	✓	✓
Sudan	✓	-	-
Suriname	✓	✓	✓
Sweden	✓	✓	✓
Switzerland	✓	✓	-
Syrian Arab Republic	✓	-	-
Tajikistan	✓	-	-
Thailand	✓	✓	✓
Togo	✓	-	-
Tonga	✓	✓	✓
Trinidad and Tobago	✓	✓	✓
Tunisia	✓	✓	✓
Turkey	✓	✓	✓
Uganda	✓	✓	✓
Ukraine	✓	✓	✓
United Arab Emirates	✓	✓	✓
United Kingdom of Great Britain and Northern Ireland	✓	✓	✓
United Republic of Tanzania	✓	✓	✓
United States of America	✓	✓	-
Uruguay	✓	✓	✓
Uzbekistan	✓	✓	✓
Vanuatu	✓	✓	✓
Venezuela, Bolivarian Republic of	✓	-	✓
Viet Nam	✓	✓	✓
Yemen	✓	✓	✓
Zambia	✓	✓	✓
Zimbabwe	✓	✓	✓

Key: ✓= report available; - = report not received

Overview of global trade in crocodilian skins

The overall volume of world trade in classic crocodilian and caiman skins has been variable over the ten-year period 2010 to 2019, with an average of 1.49 million skins[1] exported annually (Table 2; Figure 1). Between 2010 and 2013 overall global trade appeared to be increasing. The total number of skins entering international trade in 2013 was approximately 1.9 million, an increase of 33 per cent over the previous year. Trade in skins of *Alligator mississippiensis* from the United States of America (hereafter referred to as the United States) increased by nearly 50 per cent over the figure for 2012 and *Crocodylus niloticus* skins from southern Africa increased by 26 per cent. Exports of *Caiman crocodilus fuscus* from Colombia increased by 37 per cent compared to the previous year while *Caiman yacare* exports from Bolivia, Brazil and Paraguay showed an increase of 30 per cent. Despite increased numbers of 'classic' skins reported in 2014 and 2016, the overall number of skins in trade fell steadily between 2013 and 2017, particularly regarding exports of *Caiman crocodilus fuscus* from Colombia and *Crocodylus novaeguineae* from Indonesia and Papua New Guinea.

Some changes to the species in trade began in the early 2000s with two different species entering the market: captive bred *Crocodylus acutus* from Colombia and Honduras, and in 2019, Cuba, and *Caiman latirostris* from Argentina and Brazil. Trade in these species continues, but in relatively small quantities. The first exports in recent years of wild *Caiman crocodilus crocodilus* skins from Guyana began in 2001 and continued through 2018, while 2005 saw the first exports of ranched *Caiman yacare* from Argentina.

Crocodylus novaeguineae production peaked in 2015 but decreased to approximately one-fifth that level between 2017 and 2019. The steady increase in trade in *C. porosus* seen up to 2012 showed a slight decrease in 2013 but recovered to peak at almost 100,000 skins in 2016. Trade in *C. siamensis* averaged 42,800 skins over the decade peaking at over 55,000 in 2013, 2015 and 2018, with most of the skins being produced in Thailand and a smaller proportion in Viet Nam.

The following sections provide a more detailed review of each species and the primary exporter countries involved in the skin trade.

Table 2. Direct, commercial global exports of skins from the main taxa, 2010-2019.

Taxon	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Alligator mississippiensis	369,731	312,542	326,538	481,304	485,884	428,521	553,371	463,466	596,258	486,684
Crocodylus acutus	200	1,192	2.318	1,905	2,262	3,353	3,233	5,040	5,295	7,687
Crocodylus moreletii	0	184	679	1,300	2,031	1,291	1,640	3,000	4,338	421
Crocodylus niloticus	167,825	212,796	205,489	275,288	282,859	278,094	317,121	250,150	213,757	258,763
Crocodylus novaeguineae	24,480	16,632	23,461	26,046	24,982	39,070	14,022	7,649	8,849	9,786
Crocodylus porosus	58,157	63,380	72,382	53,936	67,979	69,470	102,768	72,173	81,505	65,832
Crocodylus siamensis	33,094	38,170	35,450	55,776	48,557	58,558	33,349	35,407	55,782	21,261

[1] Individual 'Species Accounts' provide details of the source of the data on which the figures for each species and country are based.

Taxon	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Subtotal of 'classic' skins	**653,487**	**644,896**	**666,317**	**895,555**	**914,554**	**878,357**	**1,025,504**	**836,885**	**965,784**	**850,434**
Caiman crocodilus crocodilus	24,643	44,271	47,130	45,485	35,196	30,594	22,328	41,402	54,381	20,457
Caiman crocodilus fuscus	651,121	634,761	625,128	857,115	738,401	530,357	368,515	315,338	371,139	365,957
Caiman latirostris	1,933	2,973	5,755	5,602	8,893	8,610	5,525	3,652	2,821	3,909
Caiman yacare	29,688	58,376	111,078	115,283	94,456	128,203	52,709	65,243	31,953	29,406
Melanosuchus niger	0	11	275	51	290	584	0	0	1,044	0
Subtotal of caiman skins	**707,385**	**740,392**	**789,366**	**1,023,536**	**877,236**	**698,348**	**449,077**	**425,635**	**460,840**	**419,729**
Grand total	**1,360,872**	**1,385,288**	**1,455,683**	**1,919,091**	**1,791,790**	**1,576,705**	**1,474,581**	**1,262,520**	**1,426,624**	**1,270,163**

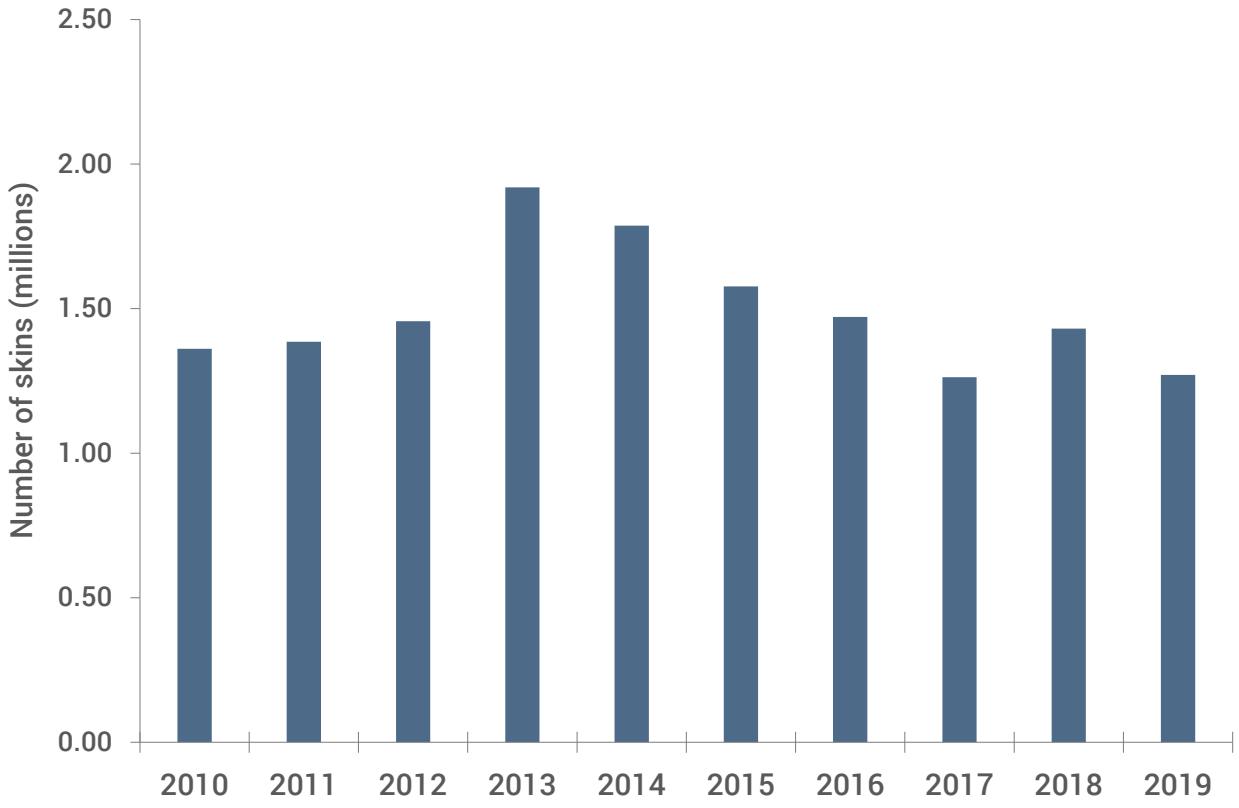


Figure 1. Direct, commercial global exports of crocodilian skins, 2010-2019.

Species accounts

Crocodylus acutus American Crocodile

Colombia has nine farms registered with CITES for production of this species, which was listed in Appendix I until 2017; the population of the Integrated Management District of Mangroves of the Bay of Cispata, Tinajones, La Balsa and Surrounding Areas, Department of Córdoba was transferred to Appendix II in 2017. Skin exports began in 2001 with 100 skins from captive-bred animals going to France. Exports of small numbers of skins have continued, rising to 7,682 in 2019. The main importer in 2019 was Viet Nam with substantial quantities also imported by the Republic of Korea.

Cuba reported exporting five skins from ranched individuals to Italy in 2019.

Honduras has one registered breeding operation for this species and the first reported trade was of 500 skins imported by Japan in 2003. Permits for the export of 1,004 skins were issued in 2008, but these, and a further 86 skins (totalling 1,090 skins) were exported in 2009. In 2012 Honduras reported exporting 350 skins to El Salvador which appear to have been reimported in 2013. Japan reported the import of 50 skins in 2015 but this was not confirmed by Honduras. No further trade has been recorded.

Crocodylus johnstoni Australian Freshwater Crocodile

No trade in skins of this species has been reported since 2005. Exports from Australia, the only range State, peaked at 3,875 skins in 1993, remained at this level until 1996, and subsequently fell to negligible levels.

Crocodylus moreletii Morelet's Crocodile

Found only in Belize, Guatemala and Mexico, this species was listed in CITES Appendix I until 23 June 2010 when the populations of Belize and Mexico were transferred to Appendix II with a zero quota for wild specimens traded for commercial purposes. Previously Mexico had had three captive-breeding operations for this species registered with the CITES Secretariat. Exports of skins from Mexico have fluctuated from zero in 2010 to a peak of 4,338 skins in 2018 (Figure 2). In 2019 only 421 skins were exported. The main importer was France.

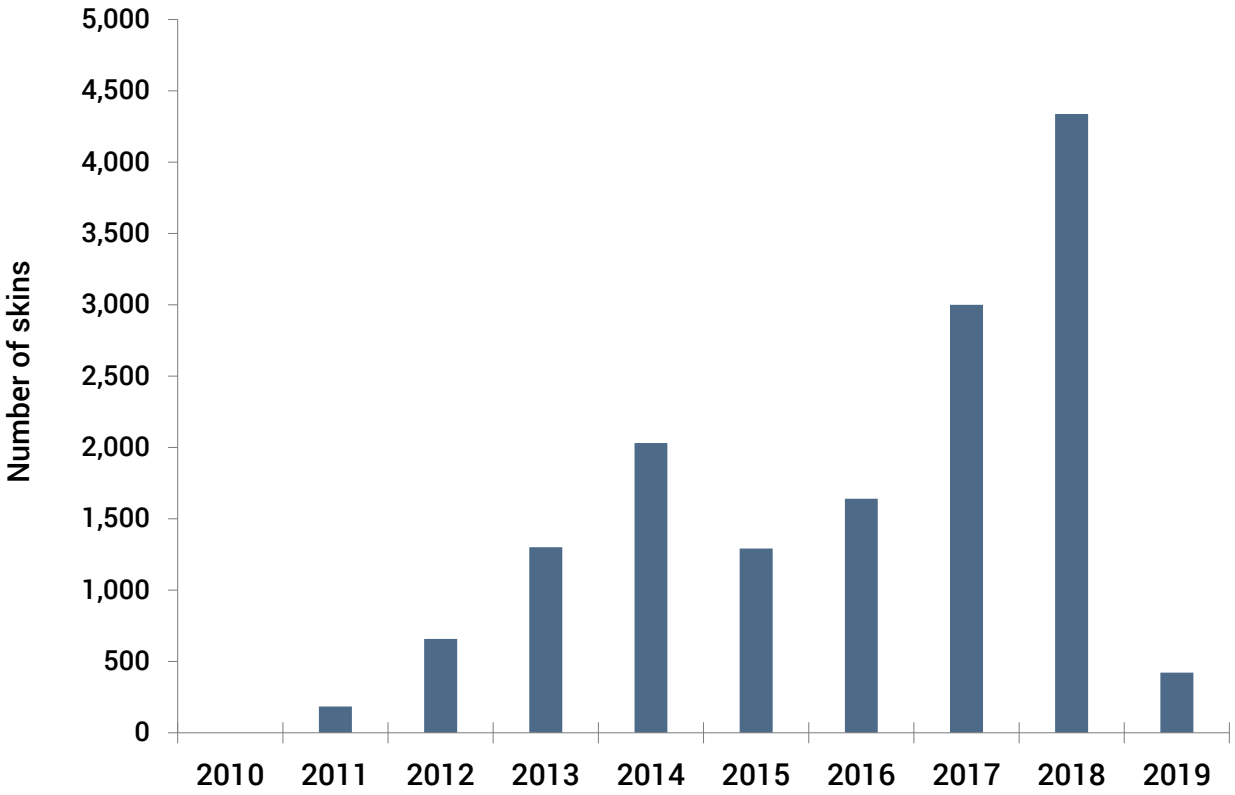


Figure 2. Direct, commercial exports of *Crocodylus moreletii* skins reported by Mexico, 2010-2019.

Crocodylus niloticus Nile Crocodile

Over the period 2010-2019, an average of 248,000 *Crocodylus niloticus* skins were exported globally per year, with an increasing trend over the period 2010-2016. Exports decreased in 2017 and 2018 but recovered in 2019 (Table 3). The section that follows summarises information on exports by range States and other countries with farms capable of commercial skin production. Currently, only three countries have captive-breeding operations registered with the CITES Secretariat: Mali, Senegal, and Tunisia each with one registered operation. *Crocodylus niloticus* is listed in CITES Appendix I except for the populations of Botswana, Egypt, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Namibia, South Africa, Uganda, the United Republic of Tanzania (hereafter referred to as Tanzania), Zambia and Zimbabwe, which are included in Appendix II.

Table 3. Direct, commercial exports of *Crocodylus niloticus* skins from producer countries, 2010-2019.

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Botswana	*1,500	1,800	1,000	4,000	4,500	1,200	*6,000	3,200	1,600	1,960
Ethiopia	4	*77	*400	0	0	6	7	4	0	0
Israel	0	0	100	0	0	78	0	0	0	0
Kenya	4,309	4,180	6,903	6,332	5,300	6,504	5,959	8,130	7,946	6,152
Madagascar	0	0	0	0	*3	154	500	0	0	0
Malawi	399	1,508	6,063	5,373	2,784	6,246	12,097	5,449	1,757	8,267
Mali	0	15	0	0	0	0	0	0	0	0
Mauritius	0	338	150	102	100	100	100	127	0	160
Mozambique	2,449	18,788	7,234	22,700	10,781	11,161	27,021	84,245	38,868	59,966
Namibia	2	200	800	1,103	1,471	769	*706	*130	250	*271
Senegal	0	0	0	0	0	7	0	0	0	0
South Africa	53,329	57,298	77,473	73,032	121,057	59,038	37,983	64,053	55,076	68,820
Sudan	20	0	0	0	0	0	0	0	0	0
Tanzania	601	*475	**1,209	**1,379	**1,287	**1,294	0	0	0	0
Thailand	0	0	0	0	0	0	323	0	0	0
Uganda	500	0	405	400	515	600	500	600	550	500
Zambia	23,717	37,584	15,331	*45,368	44,233	65,998	112,434	2	8,913	27,519
Zimbabwe	29,297	22,557	80,348	91,104	38,885	65,429	41,753	69,786	114,009	53,597
	♦80,995	♦90,533	♦88,421	♦115,499	♦90,828	♦124,939	♦113,491	♦84,210	♦98,797	♦85,148
Total	**167,825**	**212,796**	**205,489**	**275,288**	**282,859**	**278,094**	**317,121**	**250,150**	**213,757**	**258,763**

Key: * Figure derived from importer-reported data; ** Data supplied by FAO; ♦ Data supplied by CFAZ (the Crocodile Farmers Association of Zimbabwe)[2]: These data have been used for the totals.

Exports by range States

Botswana: Botswana reported exporting 3,200 skins in 2017 and a further 1,600 in 2018. Commercial exports of 1,960 skins to South Africa were reported in 2019. All skins reported by Botswana 2017-2019 for commercial purposes were from ranched specimens. However, a further 300 skins from wild-sourced animals were reported being exported to South Africa for scientific purposes; these have not been included in Table 3.

Central African Republic: No commercial exports of skins from the Central African Republic have been reported since 1986.

Congo: No commercial exports of skins from the Congo have been reported since 1989.

Ethiopia: Ethiopia's sole crocodile ranching operation (Arba Minch Crocodile Ranch) is owned and managed by the Ethiopian Wildlife Conservation Organisation (EWCO) which also acts as both the CITES Management and Scientific Authorities. Production appears to be variable and there have been discrepancies between the information contained in Ethiopia's annual reports to CITES, data received directly from EWCO, and information from importing countries. Ethiopia's annual report for 2017 recorded the export of four ranched skins but none have been reported since.

Guinea: No trade in skins from Guinea has been reported since 1995.

Kenya: Kenya reported exporting 8,130 skins in 2017, 7,946 in 2018 and a further 6,152 in 2019 with the only importers being Italy, the Republic of Korea and Singapore. All skins were reported to be from ranching operations.

[2] Sue Childes on behalf of CFAZ, *pers. comm.* numerous dates.

Liberia: Commercial exports of skins from Liberia have not been reported since 1984.

Madagascar: The situation in Madagascar has long been under review by both the IUCN/SSC Crocodile Specialist Group and the CITES Secretariat. Based on serious concerns raised about the trade, the CITES Standing Committee recommended Parties to suspend trade in *C. niloticus* from Madagascar on 17 June 2010 until further notice (See Notification to the Parties No. 2010/015 and SC63 Doc. 13). This suspension was not lifted until the end of 2014, with importers reporting three skins in that year. Madagascar reported exporting 500 skins to France in 2016, all from captive-bred animals. No skin exports have been reported subsequently.

Malawi: Malawi reported exporting 5,449 skins in 2017 and a further 1,757 skins in 2018. In 2019 Malawi reported exporting 8,276 skins. All, apart from 414 wild skins exported to Zimbabwe in 2017, were from ranching operations.

Mali: Mali has one captive-breeding operation registered with the CITES Secretariat (Ets Lassana Diaby Cuirs et Peaux) that was reportedly established in 1978 but was only registered with CITES in May 2008. Mali reported exports of 107 source 'D' skins to France in 2008 and 15 source 'D' skins to the United States in 2011, but no further trade has been reported since.

Mozambique: Mozambique reported exporting a total of 84,245 skins in 2017 and 38,868 in 2018. No report has been received from Mozambique for 2019 but the importing countries, Italy and South Africa, reported importing 79,360. However, given that South Africa reported no imports in 2018 whereas Mozambique reported exports to South Africa of 19,394 it suggests that a more realistic total of 59,966 should be used. Most of the skins were reported to be from ranching operations with the main importers in 2018 being Singapore and South Africa, and South Africa in 2019.

Namibia: Namibia reported exporting no skins in 2017, however South Africa reported 130 skins in 2017. These data have been used in Table 3. Namibia reported exporting 250 skins from animals bred in captivity in 2018 and 310 skin pieces in 2019, whereas Italy and South Africa reported imports of 271 skins in 2019.

Nigeria: No commercial shipments of skins from Nigeria have been reported since 1983.

Senegal: There is one farm registered with the CITES Secretariat for captive-breeding of this species that was established in 1995. In the decade under review, reported commercial trade appears to have been two captive-bred skins exported to Ukraine in 2006, one exported to France in 2008, and seven exported to Spain in 2015.

Somalia: No commercial shipments of skins have been reported from Somalia since 1981.

South Africa: South Africa reported exporting 64,053 skins in 2017, 55,116 in 2018, and a further 68,820 skins in 2019. It is known that South Africa has exported skins of animals imported as hatchlings from ranching operations in Mozambique without acknowledging their country of origin. However, the number of ranch-sourced skins reported in 2017 was only 213 to Japan, none in 2018 and only 25 in 2019. It should be noted that there are no ranching operations in South Africa.

Sudan: No commercial trade in skins originating in Sudan has been reported since 2010 and Sudan has no captive breeding operations registered with the CITES Secretariat.

Tanzania: Tanzania reported no exports of skins between 2017 and 2019 and no imports of skins from that country have been reported by importers in those years.

Togo: No trade in skins has been reported since the early 1980s.

Uganda: The Uganda annual report for 2017 shows 600 ranched skins being exported to the Republic of Korea. In 2018 the report showed exports of 550 skins from wild-sourced animals and in 2019, 500 skins source 'F' (see Table 14). No report has been received from the Republic of Korea for 2017 or 2019 but they did not report the trade in 2018. No other countries reported importing skins from Uganda in those years.

Zambia: Zambia reported exporting 112,374 skins in 2016, mostly to Singapore and Zimbabwe. All skins were from ranching operations and the increase appears to be the result of these operations reducing stock levels[3]. Since then, Zambia has reported exporting two skins in 2017 (although importers reported 31,853 skins most of which were probably exported in 2016), 8,913 skins of ranched animals in 2018 and a further 27,519 in 2019.

Zimbabwe: Exports of skins of this species reported by Zimbabwe in its annual reports are in most years substantially lower than those reported by importers, and also the figures supplied by the Crocodile Farmers Association of Zimbabwe (CFAZ); the CFAZ figures have therefore been used in this analysis as a precautionary measure where they exceed those in the CITES annual report (see Table 3). However, it should be noted that not all skins exported from Zimbabwe are produced by CFAZ members and therefore it is likely that no set of figures accurately represents a complete record of Zimbabwe's skin exports. In 2017 CFAZ reported 84,210 as opposed to 69,786 shown in Zimbabwe's annual report to CITES but their report for 2018 gave a higher total than the CFAZ data and these data have been used for 2018 in Table 3. In 2019 the CFAZ data have been used.

Exports from non-range States with commercial crocodile farms

Brazil: No exports of *C. niloticus* skins have been recorded from Brazil since 2004.

Israel: No imports of captive-bred skins from Israel have been reported since 2015, except for one imported by the Republic of Korea in 2018.

Mauritius: Mauritius reported the direct export of 100 skins to Zimbabwe in 2016, 127 skins to Zimbabwe in 2017, and 160 skins to Zimbabwe in 2019. No trade was reported in 2018.

Thailand: Thailand reported exporting 323 skins from captive-bred animals in 2016 but none since then. The trade was confirmed by the importer, Italy.

[3] P. Reilly *pers com.* to J Caldwell. 08/05/2018

Crocodylus novaeguineae New Guinea Crocodile

Over the ten-year period 2010 to 2019, the total number of skins of this species exported by the two main producers, Indonesia, and Papua New Guinea, was just under 195,000. Trade peaked at 39,070 in 2015 then declined rapidly to just over 14,000 in 2016 and was fewer than 10,000 in the three following years (Table 4).

Table 4. Direct, commercial exports of *C. novaeguineae* skins from producer countries, 2010-2019.

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indonesia	7,450	8,846	11,097	*10,169	11,232	13,083	4,294	2,806	905	1,164
Papua New Guinea	17,030	7,786	12,364	15,877	13,750	25,987	9,728	4,843	*7,944	*8,622
Total	**24,480**	**16,632**	**23,461**	**26,046**	**24,982**	**39,070**	**14,022**	**7,649**	**8,849**	**9,786**

Key: * Figure derived from importer-reported data

Indonesia: Exports increased steadily from just over 7,000 skins in 2010 to over 13,000 in 2015. However, over the next three years, exports declined steeply to less than 1,000 skins in 2018, increasing slightly in 2019. Most of the skins exported were from wild-caught animals. The main importer of *C. novaeguineae* skins 2017-2019 was Japan, with large quantities also imported by China and Singapore.

Papua New Guinea: Exports over the decade were highest in 2015 but, as with Indonesia, declined dramatically in 2016 and 2017. No report has been received from Papua New Guinea for either 2018 or 2019 so data from importing countries has been used in Table 4. These suggest an increase over the 2017 figure but still well below pre-2015 levels. Apart from 513 skins imported by Japan in 2019, all skins exported by Papua New Guinea in the three-year period 2017-2019 appear to have been wild-sourced.

Crocodylus porosus Saltwater Crocodile

During the period under review, *Crocodylus porosus* was listed in CITES Appendix I, except for populations of Australia, Indonesia and Papua New Guinea which were listed in Appendix II. In 2017, the population of Malaysia was transferred to Appendix II[4]. The total number of *C. porosus* skins in trade has fluctuated from 45,000 skins in 2009 to a peak of nearly 100,000 skins in 2016. Exports of *C. porosus* skins from range States between 2010 and 2019 are presented in Table 5.

Table 5. Direct, commercial exports of *Crocodylus porosus* skins from range States 2010-2019.

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	*34,561	*42,068	*42,849	*31,749	*30,758	32,456	59,020	*48,883	*39,194	*37,226
Bangladesh	0	0	0	0	430	400	*200	0	0	*477
Brunei Darussalam	0	0	5	0	0	0	0	0	0	0
Indonesia	4,302	7,934	6,763	*4,077	9,076	8,133	6,394	3,770	6,317	5,575
Malaysia	*1,303	*436	*1,807	*1,853	2,483	3,555	5,215	4,413	5,370	4,421
Papua New Guinea	15,787	9,432	12,753	8,099	8,340	8,044	12,329	6,728	*13,778	*9,341
Philippines	500	200	3,274	3,275	9,369	9,532	7,141	*3,913	8,760	3,596
Singapore	0	0	0	*90	15	0	5,739	150	244	32
Thailand	1,704	3,310	4,931	*4,793	7,508	7,350	6,730	4,316	7,842	5,164
Total	**58,157**	**63,380**	**72,382**	**53,936**	**67,979**	**69,470**	**102,768**	**72,173**	**81,505**	**65,832**

Key: * Figure derived from importer-reported data

[4] See https://cites.org/eng/app/appendices.php for further details.

Australia: Comparison of data reported by Australia with that reported by importing countries in certain years suggests that Australia may not have reported the full quantities of skins exported. Given these discrepancies, and the lack of annual reports for 2018 and 2019, the data provided in Table 5, apart from that for 2015 and 2016, have been taken from reports of the importing countries. The destinations of the skins exported 2017-2019 were mainly France and Singapore and the vast majority were reported as being from ranched individuals.

Bangladesh: This country has one farm registered with the CITES Secretariat in 2007. The stock is from animals bred in captivity in Malaysia. The first reported export was of 430 skins exported to Japan in 2014 with a further 400 exported in 2015. The 2016 annual report from Bangladesh showed no further exports of skins but Japan reported importing 600 skins. Japan reported importing no skins in 2015 so the difference, 200 skins, has been used in Table 5. No exports have been reported by Bangladesh in recent years, but Japan reported importing 477 skins in 2019.

Brunei Darussalam: This country reported exporting five skins from captive-bred animals to the Republic of Korea in 2012; no other trade in skins from the country has been reported. There are no breeding operations in the country registered with the CITES Secretariat.

Indonesia: Indonesia's exports showed a relatively steady increase, peaking at over 9,000 skins in 2014 but have been less in the five subsequent years. The main importers 2017-2019 were China, Japan, Singapore, and Thailand. From 2006 onwards, all skins were from either captive-bred or ranched animals, with the proportion from captive-bred sources increasing from less than 20 per cent in 2005 to 97 per cent in 2019.

Malaysia: Data from Malaysia came from at least two separate Management Authorities and appear to have be poorly correlated with data reported by importing countries for the years 2010 to 2013. The figures for those years provided in Table 5 are based on importer-reported data. Trade has shown a steady increase since 2012, peaking in 2018, with exports in 2019 returning to the level seen in 2017. The main importer has been Singapore. Until the species was transferred to Appendix II there were seven CITES-registered captive-breeding operations for this species in Malaysia.

Papua New Guinea: Papua New Guinea's exports peaked at 15,787 skins in 2010, of which 68 per cent were from animals bred in captivity. Exports have since fluctuated annually but decreased to under 7,000 skins in 2017. No report for 2018 or 2019 has been received from Papua New Guinea but data from importing countries suggest exports rose to over 13,000 then declined to just over 9,000. The main importers were France, Japan, and Thailand. The proportion of captive-source skins rose from 72 per cent in 2011 to 78 per cent in 2012 but fell to 30 per cent in 2015. In the three-year period under review 82 per cent of the skins were reportedly from animals bred in captivity.

Philippines: There are two farms registered with the CITES Secretariat to produce this species and small quantities of skins have been exported annually since 2007. In 2013 just over 3,000 skins, all of which were recorded as source 'D', were exported to Singapore. Philippines reported exporting 9,369 skins to Singapore in 2014, however Singapore reported importing 4,624 skins and 5,750 skin pieces in that year; a similar discrepancy between skins and skin pieces occurred in 2016 and 2018. A permit analysis indicated that the skin pieces reported by Singapore in these years were likely the same skins reported by Philippines on these permits. Philippines' exports over the ten-year period peaked at 9,532 skins in 2015, and have since decreased to 3,596 skins in 2019.

Singapore: All of Singapore's reported commercial exports of skins 2010-2019 were captive-bred; there is now only one registered captive-breeding operation in the country. Most of the skins were exported to China

and Japan. No exports were reported between 2010 and 2012 (Table 5), however exports in 2013 were reported to be 11,275. However, neither the 600 skins reportedly going to Hong Kong, SAR and the 10,585 destined for Thailand were reported by the importers so it seems likely that the total export was 90 skins that was confirmed by Japan. Singapore reported exporting 150 skins to China and Japan in 2017, 244 skins to China, Italy, and Japan in 2018, and 32 skins to Japan in 2019.

Thailand: Thailand's reported exports of skins increased steadily between 2010 and 2014 and appear to have fluctuated between 4,300 and 7,800 since then (Table 5). The principal importers between 2017 and 2019 were France and Japan. There are currently (May 2021) 17 CITES-registered captive-breeding operations for this species in Thailand.

Crocodylus rhombifer Cuban Crocodile

Cuba reported exporting four skins from captive bred animals to Italy in 2019. This was the first commercial trade reported since 1998. Cuba has one captive-breeding establishment registered with the CITES Secretariat.

Crocodylus siamensis Siamese Crocodile

Cambodia: Cambodia has 21 crocodile farms registered with the CITES Secretariat for the commercial production of this species. Cambodia reported exporting 4,652 skins in 2017, all of which were captive bred. The main importer was Thailand. No report has been received from Cambodia for 2018 or 2019 but Japan and Thailand reported importing 3,469 skins in 2018 and Japan 300 skins in 2019.

Thailand: There are 29 crocodile farms registered with the CITES Secretariat for commercial production of this species in Thailand and all reported exports of skins were captive bred. Reported exports peaked at 39,000 skins in 2008 and fluctuated between 25,000 and 36,000 until 2016 when they decreased to under 15,000 for the first time since 2003. Between 2017 and 2019 they declined further to around 12,000. Thailand's annual report for 2013 revealed several instances where Thailand reported exports of skin pieces which were reported as whole skins by several importing countries. Therefore, importer reported data has been used for Thailand for 2013, to take a precautionary approach. The main importers over the period 2017 to 2019 were China, Japan, Republic of Korea, and Singapore.

Viet Nam: Since the first reported exports of *C. siamensis* from the country in 2004, exports steadily increased to a peak of 23,062 skins in 2008. Exports subsequently declined and fluctuated between just over 3,000 skins in 2010 and 18,500 skins in 2017 (Table 6). In 2018 there was a large increase in reported skins, totalling over 40,000 of which 96 per cent went to China and Thailand. Although Viet Nam submitted a report for 2014 it is thought to contain an error, so importers' data have been used for that year. China, France, Japan, Singapore, and Thailand have been the main destinations of the skins. All skins exported were reported as captive-bred; Viet Nam has 10 captive-breeding operations registered with the CITES Secretariat for this species.

Table 6. Direct, commercial exports of *Crocodylus siamensis* skins from range States, 2010-2019.

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cambodia	0	0	0	10,000	7,602	19,050	5,720	4,652	*3,469	*300
Thailand	29,809	31,568	29,170	*36,457	26,442	26,914	14,588	12,251	12,201	11,762
Viet Nam	3,285	6,602	6,280	9,319	*14,513	12,594	13,041	18,504	40,112	9,199
Total	**33,094**	**38,170**	**35,450**	**55,776**	**48,557**	**58,558**	**33,349**	**35,407**	**55,782**	**21,261**

Key: * Figure derived from importer-reported data

Alligator mississippiensis American Alligator

Reported exports of *A. mississippiensis* from the United States increased from around 31,000 skins in 1986 to 422,931 skins in 2006. Although exports declined the following two years, they have subsequently increased steadily and over 400,000 skins have been exported every year since 2013 (Table 7; Figure 3). At the time of writing (May 2021) no report has been received from the United States for 2019 so importers' data have been used in Table 7. Between 2017 and 2019, four countries (France, Germany, Italy, and Singapore) together imported 97 per cent of production.

Table 7. Direct, commercial exports of *Alligator mississippiensis* skins reported by the United States, 2010-2019.

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
369,731	312,542	326,538	481,304	485,884	428,521	553,371	463,466	596,258	*486,684

Key: * Figure derived from importer-reported data

Since 2005 onwards, source code 'W' (wild taken) appears to have been used for ranched animals obtained from eggs collected in the wild and over 99 per cent of the skins exported now are reported as source 'W'. This is the result of the decision by the United States CITES Management Authority that the code 'R' should only be used in the case of crocodilian populations transferred from CITES Appendix I to Appendix II subject to ranching. Between 2017 and 2019, 3,779 of the skins exported were reported as source 'I' (seizures/confiscations). This species is also bred in captivity in Israel, but there have been no reported exports of skins from Israel since 2001.

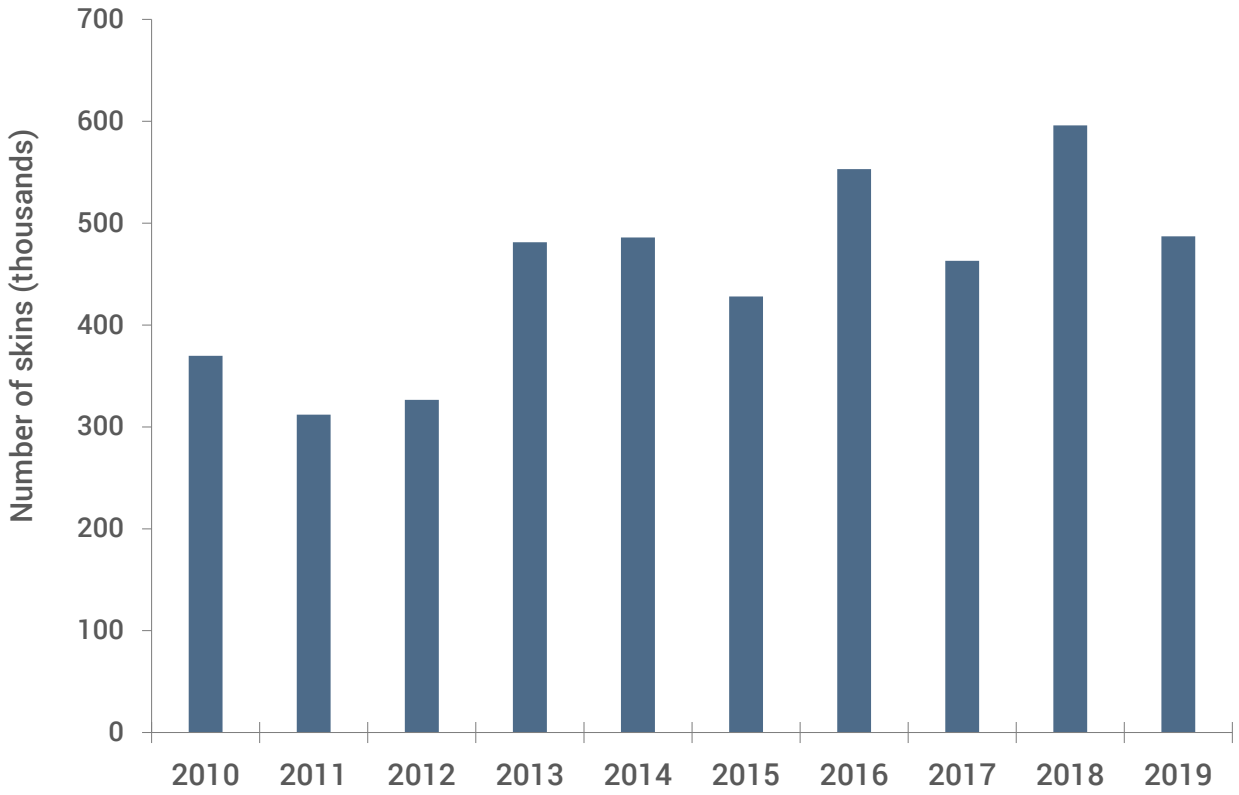


Figure 3. Direct, commercial exports of *Alligator mississippiensis* skins reported by the United States, 2010-2019.

Caiman crocodilus crocodilus Spectacled Caiman

Colombia used to regularly report exports of small numbers of skins from the nominate subspecies however, since 2010 they have been less frequent. Three thousand skins were reported as exports to Thailand in 2012 and a further 663 in 2013.

Guyana was a major supplier of this subspecies in the late 1980s, with over 320,000 skins reported by importing countries between 1983 and 1989, but exports dwindled during the 1990s and early 2000s. Trade has increased in recent years with reported exports of 16,460 skins in 2011, 18,000 in 2012, 1,500 in 2013, 18,500 in 2014 and 20,000 in 2015. No skin exports were reported by Guyana or importing countries in 2016 but Mexico reported importing 16,000 in 2017 and Guyana reported a further 10,000 skins to Mexico in 2018. No trade in skins has been reported in 2019. All skins were wild-sourced. For 2013, Mexican annual report data suggest that Guyana underreported that year, so the Mexican data have been used in Table 2.

Venezuela has historically been the main supplier of skins of this subspecies, almost all from wild-collected animals. Between 2010 and 2019 Venezuela exported an average of 21,800 skins annually; however, exports increased steadily between 2013 and 2018 but fell back in 2019 (Figure 4). The main importers of skins from Venezuela are Germany and Italy, and in 2019 over 3,000 went to Singapore.

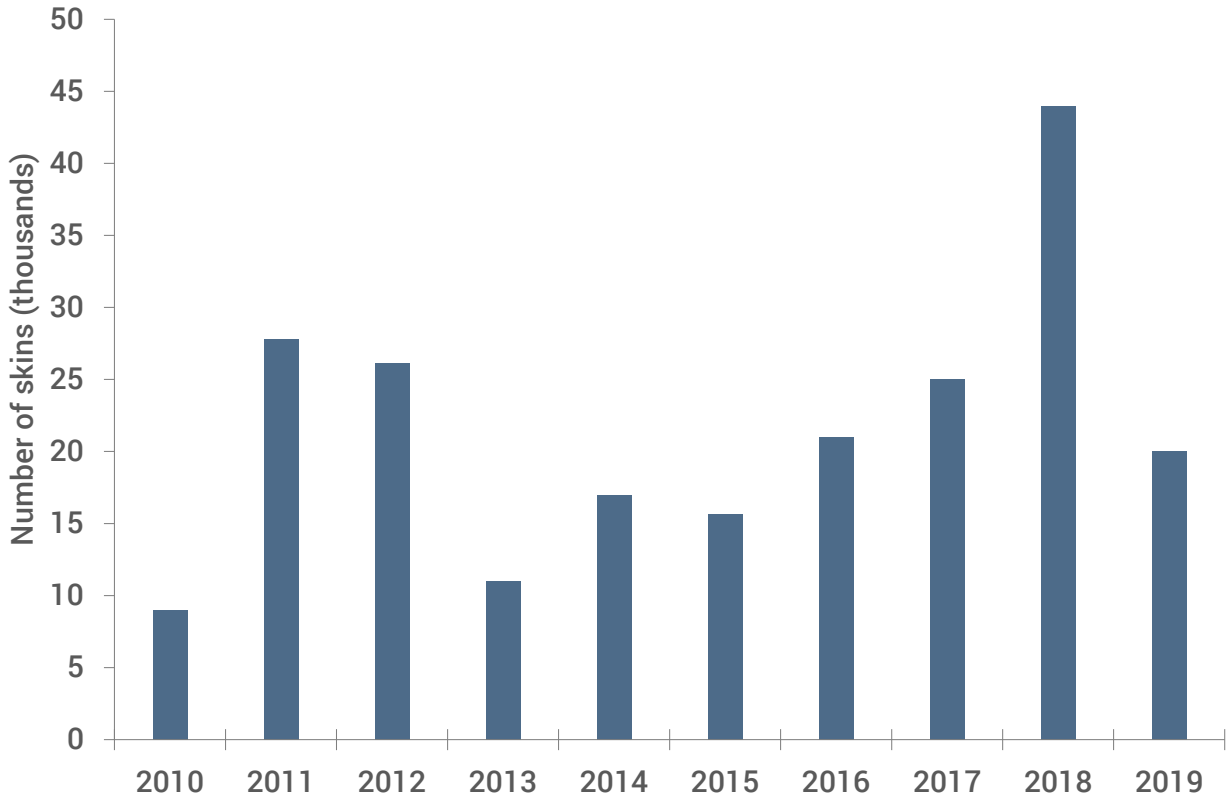


Figure 4. Direct, commercial exports of *Caiman crocodilus crocodilus* skins reported by Venezuela, 2010-2019. Importer-reported data were used for 2018.

Caiman crocodilus fuscus Brown Caiman

Reported exports of *Caiman crocodilus fuscus* skins from the two principal exporting countries between 2010 and 2019 are provided in Table 8.

Table 8. Direct, commercial exports of *Caiman crocodilus fuscus* skins from Colombia and Panama, 2010-2019.

Exporter	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Colombia	647,565	634,461	625,128	855,791	735,779	516,202	367,415	308,174	364,379	360,157
Panama	3,556	300	0	1,324	2,622	14,155	1,100	7,164	*6,760	5,800
Total	**651,121**	**634,761**	**625,128**	**857,115**	**738,401**	**530,357**	**368,515**	**315,338**	**371,139**	**365,957**

Key: * Figure derived from importer-reported data.

Colombia remains the major exporter of this subspecies. Exports remained steady at just over 600,000 between 2010 and 2012 but increased to 855,000 in 2013. They fell steadily over the next four years but have picked up slightly since then (Table 8, Figure 5). Mexico, the Republic of Korea, Spain, Thailand, the United States, and Viet Nam were the primary importers between 2017 and 2019.

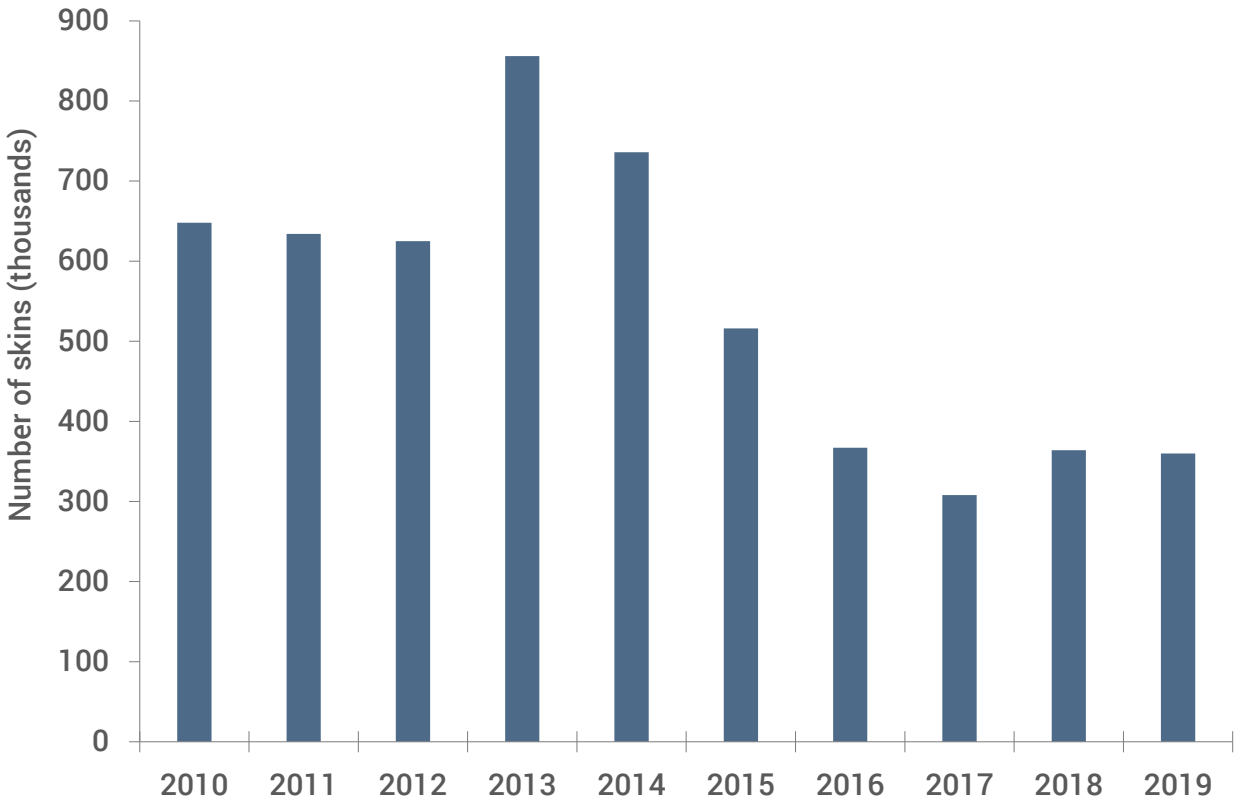


Figure 5. Direct, commercial exports of *Caiman crocodilus fuscus* skins reported by Colombia, 2010-2019.

Other range States: No exports have been reported by Honduras since 1998; Nicaragua reported the export of one wild-sourced skin to Italy in 2006, while the United States reported the import of 134 wild-sourced skins from Nicaragua in 2008.

Panama, although an important entrepôt State for skins coming from other countries, clearly distinguishes between exports and re-exports in its annual reports. The first significant direct export of

10,250 skins was reported in 2000 and trade appears to have peaked in 2003 at 19,840 skins. Export quantities reported by Panama have been considerably less over the decade under review although it should be noted that the export of 12,155 skins reported as exports to Spain in 2015, and included in Table 8, were not reported by the importer. Panama's main trading partners in recent years have been Mexico and Spain.

Caiman latirostris Broad-snouted Caiman

The Argentine population of this species was transferred from CITES Appendix I to Appendix II in 1997, and the first exports of skins from ranched animals were reported by Argentina in 2001. Argentina reported exporting 3,652 ranched skins in 2017; no report has been received from Argentina for 2018 but importing countries, Germany, France, Spain and the United States, report 2,811 skins. In 2019 Argentina reported exports of a further 3,909 ranched skins. The principal importer throughout the study period has been the United States.

Brazil reports exporting small numbers of skins from captive-bred animals most years. However, recently this has only amounted 12 skins to Italy in 2018.

Caiman yacare[5] Yacaré

Exports of *C. yacare* skins from the principal exporter of this species, Bolivia, appear to have increased since 2011, peaking in 2015 (Table 9).

Table 9. Direct, commercial exports of *Caiman yacare* skins from producer countries, 2010-2019.

Exporter	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Argentina	4,391	3,159	*2,037	607	*37	*3,105	*2,055	*1,510	0	0
Bolivia	24,192	48,616	86,914	69,646	84,970	112,379	43,492	52,043	29,734	*20,176
Brazil	1,105	6,601	19,623	22,280	*4,910	*12,719	*6,162	11,690	2,219	*9,230
Paraguay	0	0	2,504	22,750	*4,539	0	1,000	0	0	0
Total	**29,688**	**58,376**	**111,078**	**115,283**	**94,456**	**128,203**	**52,709**	**65,243**	**31,953**	**29,406**

Key: * Figure derived from importer data

Argentina: Reported exports were at their highest in 2010; exports then declined to negligible quantities between 2012 and 2014 but importers' data suggest an increase in 2015 (Table 9). Argentina reported exporting fewer skins between 2015-2017 than importing countries and no exports have been recorded for Argentina since then. The main destination of the skins was Mexico and the United States, and most of the skins were reported to be from ranching operations.

Bolivia: Reported exports have shown a steady increase between 2010 and 2015 but have decreased subsequently (Table 9). The principal importers 2017-2019 were Italy and Mexico who accounted for 84 per cent of the trade, with other large quantities imported by Japan and Spain. Skins were sourced from captive breeding, ranching and the wild however Bolivia has not reported exports of skins from captive-bred animals since 2015. The percentage of wild skins was 81 per cent in 2015 but this fell to 63 per cent in 2016 and to 52 per cent in 2017, the remaining skins apparently coming from ranching operations. In 2018 wild-sourced skins accounted for 90 per cent of exports however this fell to 60 per cent of reported imports in 2019.

[5] According to CITES Standard nomenclature, which the CITES Trade Database follows, *Caiman yacare* is a synonym of the subspecies *Caiman crocodilus yacare*, and as such trade reported from range States as *Caiman crocodilus* has been included as trade in the subspecies *C. crocodilus yacare*.

Brazil: For 2015 the data from Mexico far exceeds that reported by Brazil and have been used in Table 8. While all skins exported in 2010 were captive-bred and primarily destined for Colombia, most of the skins traded in subsequent years were reported as coming from ranching operations and exported more widely, with the main importing country being Mexico.

Paraguay: Paraguay imposed a moratorium on all exports of wildlife in September 2003, a result of the findings of a technical mission from the CITES Secretariat. This moratorium was partially lifted in 2009 (CITES Notification to the Parties No. 2009/036 of 10 August 2009) and further partially lifted in 2011 (CITES Notification to the Parties No. 2011/009 of 19 January 2011) to allow exports of existing stocks of skins legally acquired in 2001, 2002 or 2003 once the CITES Secretariat, in cooperation with the IUCN/SSC Crocodile Specialist Group, had confirmed their legal origin. No exports of skins were reported in trade until 2012, when Paraguay exported 2,506 skins, mostly to Spain. In 2013 Paraguay exported 22,750 skins, all of which were wild-sourced. The moratorium was fully lifted in 2014 (CITES Notification 2014/009 of 10 February 2014) during which year 4,539 skins were reported by importers (Spain and the United States). Paraguay reported exporting 1,000 wild skins to Bolivia in 2016 but none have been reported since then.

Melanosuchus niger Black Caiman

The Brazilian population of this species was transferred from CITES Appendix I to Appendix II in 2007. Brazil reported the export of 190 skins to Argentina and 100 to Italy in 2014 and a further 584 skins to Argentina in 2015. No skins were exported in 2016 or 2017 but in 2018 Brazil reported exporting 1,044 skins, all sourced from the wild, to Mexico. No further trade has been reported in 2019.

All other crocodilian species

There have been no reported commercial exports from range States between 2010 and 2019 of skins of the following taxa: *Crocodylus cataphractus*, *C. intermedius*, *C. palustris, Alligator sinensis*, *Osteolaemus tetraspis*, *Paleosuchus palpebrosus*, *P. trigonatus*, *Gavialis gangeticus* or *Tomistoma schlegelii*. In 2017 Venezuela reported exporting 202 wild-sourced skins of *Crocodilus intermedius* to the United States for scientific purposes but it seems likely that these were skin samples rather than whole skins.

Trade in live animals

The commercial export of live crocodilians outside of their range States poses a potential threat to the natural biological diversity of the importing countries, particularly if naturalized populations become established. Indeed, Spectacled Caiman, possibly discarded pet animals, can currently be found in Florida and the Everglades National Park where damage to natural fauna is being reported. The continued growth of the crocodilian farming industry means that such threats are likely to continue and should be guarded against.

Live crocodilians are traded for many purposes. Young animals are frequently kept as personal pets; circuses and zoos regularly exhibit such creatures and there are well-established crocodile breeding establishments in countries such as Denmark, France, Morocco, Spain, and Thailand. Crocodile farms and ranches import animals to supplement their gene pool and some animals are imported by range States to strengthen wild populations. This variety of use, and the limited number of possible purpose codes used in CITES annual reports, means that some conclusions drawn from analysis of CITES data are only tentative. For example, the purpose code 'T', which indicates a commercial transaction, could apply equally if the animals were destined for either the pet trade or the farming industry. Below we consider the reported trade in live animals on a species-by-species basis.

Alligator mississippiensis

The United States reported exporting eight source 'F' animals to Spain in 2017 and a further one in 2018. Most of the trade was reported as being for commercial purposes. In 2019 Sri Lanka reported importing 19 live animals with purpose 'M' (see Table 13).

Alligator sinensis

In 2017 China exported four animals to Japan, while in 2018 China exported five to the Czech Republic and another 17 to Japan. Japan reported importing a further five in 2019. All were probably destined for zoos despite the purpose code 'T' being reported for the majority.

Caiman crocodilus

Guyana: Guyana reported exports of 220 animals in 2017, 698 in 2018, and 315 in 2019. All were wild-sourced.

Suriname: This country regularly exports small numbers of wild-caught animals for the pet industry and in 2017 a total of 72 animals were reported being imported from Suriname by Germany. Suriname reported exporting 10 in 2018 and a further four in 2019. All were source 'W'.

Melanosuchus niger

No trade in live animals from range States was reported between 2017 and 2019.

Paleosuchus palpebrosus

For 2017 to 2019, Guyana published an annual export quota of 500 live, wild-sourced animals. Guyana reported exports of 85 animals in 2017 although import country data put the figure at 346. In 2018 Guyana reported exporting 447 animals and a further 420 in 2019. It should be noted that although the annual reports cover the period January to December, the quota year for Guyana runs from April to April. Most of

the animals were likely to be for the pet industry (recorded as purpose 'T'), with the main importing countries being Germany and the United States.

Paleosuchus trigonatus

For 2017 to 2019, Guyana published an annual export quota of 1,000 live, wild-sourced animals. Exports reported by Guyana remained below this number, with 400 animals exported in 2017, 994 in 2018 and 750 in 2019. Most were reported as purpose 'T', the main importing country being the United States.

Crocodylus mindorensis

In 2019 Philippines reported importing one captive-bred individual from Germany for reintroduction purposes.

Crocodylus moreletii

Ten animals were exported by Mexico to the Japan in 2017 and a further two to the United States. All were captive bred.

Crocodylus niloticus

Mozambique reported exporting 6,000 ranched animals to Zimbabwe in 2017. Also, in 2017 South Africa reported exporting 3,000 animals to China who confirmed the import. In 2018 Zimbabwe exported four animals, reportedly wild-caught, to the Democratic Republic of the Congo using the purpose code 'N' for reintroduction to the wild, and a further 10 ranched specimens with purpose code 'Z'.

Crocodylus porosus

Malaysia reported exports of 3,300 to China and Thailand in 2017 and a further 5,000 to the same destinations in 2018. Malaysia also reported exports of two animals to Brunei Darussalam, and 40 to the United Kingdom. All reported exports were captive-bred and for purpose 'T'.

Crocodylus siamensis

Over the decade under review, China has been the principal importer of live specimens of *C. siamensis* and began importing this species from Thailand in 1997, from Cambodia in 2000 and from Viet Nam in 2003. As shown in Table 10, China has imported around 435,000 live specimens from these countries in the ten-year period 2010 to 2019, all of which were captive-bred and the majority for purpose 'T'. Since 2010, imports had been falling with exports from Cambodia and Thailand becoming negligible but those from Viet Nam increasing. Cambodia exported 48,000 animals to Thailand in 2017, and a further 50 in 2019. Cambodia also reported exporting 1,000 animals to Viet Nam in 2019.

Table 10. Direct, commercial exports of live *Crocodylus siamensis* to China reported by the exporting countries, 2010-2019.

Exporter	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cambodia	0	0	0	0	0	2,000	*2,000	0	0	5,200
Thailand	50,200	10,500	330	15	0	0	0	0	2,000	2,000
Viet Nam	10,600	12,000	15,000	23,300	23,770	30,600	63,198	28,700	52,700	102,526
Total	**60,800**	**22,500**	**15,330**	**23,315**	**23,770**	**32,600**	**65,198**	**28,700**	**54,700**	**109,726**

Key: * Figure derived from importer-reported data.

Trade in other by-products

Meat

Total global commercial exports of crocodilian meat, as reported in CITES and CFAZ annual reports from 2010 to 2019, are provided in Figure 6. Between 1990 and 2002, the quantity traded globally fluctuated at around 400 tonnes per year. Exports began an upward trend in 2003, and in 2007 peaked at just under 1,000 t. They subsequently decreased to 400 t in 2009 but have been over 600 t per year between 2012 and 2017, falling to just over 500 t in 2018 and remaining at a similar level in 2019. Global trade averaged just over 600 t during the decade under review.

Since 1988, there have been major fluctuations in the countries and species involved in the meat trade. Until 1992, the main species in trade was *Alligator mississippiensis* from the United States, particularly to Canada, Japan, Taiwan, Province of China, and the United Kingdom. No exports to Taiwan, Province of China have been reported since 1994 and exports of meat from this species have fallen since 1995; the principal importer of *A. mississippiensis* in 2017-2019 was Hong Kong, SAR.

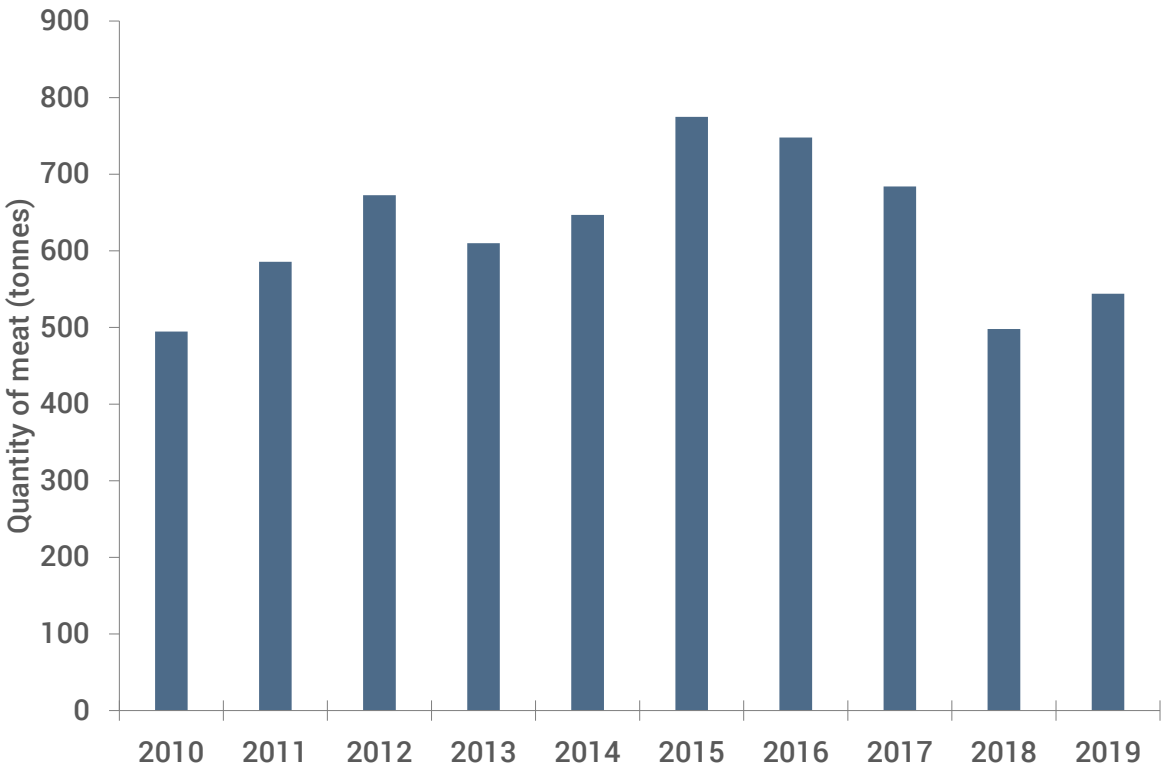


Figure 6. Direct, commercial global exports of crocodilian meat as reported by exporters in CITES and CFAZ annual reports, 2010–2019.

Exports of *Crocodylus niloticus* meat, which originate mainly from South Africa, Zambia, and Zimbabwe, increased steadily from less than two tonnes in 1992 to over 470 t in 2007, but then decreased to 125 t in 2009. Exports subsequently recovered and were around 250 t in both 2011 and 2012. Despite a drop in 2013 to 133 t, over 200 t was exported each year between 2014 and 2017. In 2018 exports fell to 127 t and further to 115 t in 2019. As with skin data for Zimbabwe, data provided by CFAZ have been used in preference to the CITES report. Reporting of the crocodile meat trade by southern African countries appears to be of varied quality based on comparisons with importer data. The main destinations for *C. niloticus* meat 2017-2019 were Europe, and Hong Kong, SAR.

Exports of meat of *Crocodylus novaeguineae* are infrequent with under one tonne reported in each of 2010, 2012 and 2015.

Australia's exports of C*rocodylus porosus* meat increased from 53 t in 2000 to 57 t in both 2001 and 2002 but averaged 23 t over the decade under review. The main importer of Australia's production was Japan, with other large quantities imported by New Zealand and Singapore. *C. porosus* meat was also traded at relatively low levels from Indonesia with over six t exported in 2016, 13.5 t in 2017 and just under 10 t in 2018. Malaysia appears to export between two and four t annually in 2016-2019, while Papua New Guinea exported 9.5 t in both 2016 and 2017. The Philippines exported 24 kg of meat to the Russian Federation in 2015 and Thailand reported exporting five t in that year.

Until 2005, Thailand was the only exporter of *Crocodylus siamensis* meat and exports had averaged about 35 t annually between 1999 and 2003. Exports from Thailand increased to almost 400 t in 2006 and in the decade under review averaged about 348 t annually. The main importers were China, Hong Kong, SAR and Singapore. Exports of *C. siamensis* meat from Viet Nam decreased from 5.5 t in 2008 to under a tonne annually between 2012 and 2015. An increase to 28.4 t was noted in 2016 but this may have been the result of a typographical error and importers' data suggest the real total was just over 3 t. The total quantities exported by Viet Nam in 2017, 2018 and 2019 were 1.4, 3.1 and 2 t respectively; the main importers were China and Hong Kong, SAR. *C. siamensis* meat was also traded from Cambodia, with Thailand reporting imports of 200 kg in 2017 and 5 t in 2018.

Teeth

Australia is the world's foremost importer of crocodile teeth, importing from Papua New Guinea and Singapore nearly 82,000 teeth between 2017 and 2019. All the teeth were obtained from *Crocodylus porosus* from captive-breeding operations.

Declared dollar value

Although CITES annual reports do not usually contain information concerning the value of the trade or of individual shipments, the United States has included this information in its annual reports since 1997. There are great fluctuations amongst the reported values and no indication of the size or quality of the skins is provided; furthermore, for caiman species, flanks may have been reported as whole skins which further complicates interpretation of the data. Values that appear erroneous and are likely to have been the result of typographic errors have been ignored in the analysis below. The average declared value per skin (in US$) of exports of *Alligator mississippiensis* skins and the reported value of re-imports of these skins from Europe, Mexico and Asia after tanning are provided in Table 11. Although the value of the original exports fluctuates from year to year, the value of the re-imports has been consistently higher. It should also be noted that the average value of the skins exported increased year on year between 2010 and 2015 but has remained stable over the last three-year period. The United States had not yet submitted a CITES annual report for 2019 at the time of writing.

Table 11. Reported US dollar value of *Alligator mississippiensis* skins (mean value per skin) exported and re-imported by the United States, 2010-2019. Data for 2019 was not available at the time of writing.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Exports by USA	136.0	167.5	194.9	241.1	261.6	275.6	241.0	243.5	242.3	-
Re-imports by USA	236.9	245.7	260.1	407.5	444.15	391.5	364.8	310.1	391.3	-

Source: United States annual reports to CITES.

Table 12 compares the average value per skin of Colombian *Caiman crocodilus fuscus* imported directly from Colombia and via third countries, as reported by the United States. The re-exporters of skins vary from year to year, but the majority are imported directly from Colombia, or indirectly via Singapore, Europe, and Mexico. The declared value of the direct imports from Colombia increased between 2008 and 2014, were stable for the next two years but decreased in 2017 and 2018. The value of skins imported from third countries showed no specific trends and it should be noted that in 2018 97 per cent of the skins were direct imports from Colombia.

Table 12. Reported US dollar value of *Caiman crocodilus fuscus* skins (mean value per skin) originating in Colombia and imported by the United States, 2010-2019. Data for 2019 was not available at the time of writing.

(Re-)Exporter	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Colombia	65.3	73.4	76.6	79.1	96.8	93.0	97.2	78.4	71.1	-
European Union	54.9	71.0	99.9	61.6	58.4	78.4	44.8	56.3	40.9	-
Mexico	34.5	33.0	34.0	23.4	23.7	20.7	41.5	41.0	40.5	-
Singapore	50.5	46.2	58.1	47.2	70.9	71.4	28.3	-	-	-

Source: United States annual reports to CITES.

Reported seizures

Information on seizures is reported inconsistently in CITES annual reports. Furthermore, the data recorded by Customs rarely allow the goods to be identified at the species level. Most of the seizures that are reported are of tourist items such as dried heads, whole stuffed baby crocodiles, etc., and personal imports of manufactured leather goods. Many of the items seized on import are subsequently released to the importer when adequate permits have been obtained. It should be noted that source code 'I' not only covers seizures but the further re-exportation or repatriation of the seized material.

The only significant seizures reported in the period 2017-2019 were 100 skins of *Crocodylus acutus* from Colombia in 2017 and 612 *C. niloticus* skins from Zimbabwe, originating in Zambia, in 2018 both reported by the United States.

Recommendations

The following recommendations made in previous IACTS reports remain valid:

- Countries should, where possible, adopt the CITES standard permit number format which identifies both the exporting country and the year of permit issuance (see CITES Resolution Conf. 12.3 (Rev. CoP18) on Permits and certificates). This would allow for more accurate cross matching of shipments.
- Standardisation of the terminology used to describe parts of crocodilian skins would reduce the danger of double-counting and subsequent overestimation of trade levels. There is often confusion between hornbacks and back skins for *Crocodylus niloticus* and between whole skins and sides for caiman.
- As the source of specimens (e.g. wild, captive-bred, etc.) provides critical information for determining the conservation impact of trade, CITES Parties should strive to accurately report the source of crocodilian material as defined in the *Guidelines for the preparation and submission of CITES annual reports* (see CITES Notification No. 2019/072 Annex 1).
- Countries with large-scale farming operations should establish strict monitoring and management programmes for their wild crocodilian populations, and any farming of non-native species should be strictly regulated to ensure there are no escapes into the wild. Although breeding in captivity can alleviate pressure on wild populations, it can also remove the incentive to preserve them.
- It is recommended that the CITES Secretariat and the Chairman of the Standing Committee contact Parties in June of each year to remind them of their reporting obligations under Article VIII, paragraphs 6 and 7 of the Convention.
- Wherever possible, Parties should report the actual quantities of skins being traded and should specify whether their annual report compilation is based on actual trade or permits issued.

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Annex: Purpose and source codes

Table 13. Codes for purpose of trade

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
Z	Zoos

Table 14. Codes for source of specimens in trade

Code	Description
A	Plants that are artificially propagated in accordance with Resolution Conf. 11.11 (Rev. CoP18), 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 (may be used with another code)
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)
W	Specimens taken from the wild
X	Specimens taken in 'the marine environment not under the jurisdiction of any State'