A Global Assessment of Songbirds in Trade

Part 1: Patterns and processes in the global trade in songbirds

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Contents

Executive Summary

Trade in songbirds is pervasive, taking place at all scales, from local to global, and across many songbird families. Millions of songbirds are taken from the wild annually for a range of purposes, although exact numbers are hard to determine since trade is incompletely reported. Domestic and international trades are inextricably linked, with domestic markets often supplemented by international imports of songbirds.

This report provides a quantitative overview of the trade in songbirds, drawing on a wide range of data sources to assess the volume of trade in songbirds and its spatial and temporal trends. The extent to which songbirds are covered by international legislation, with particular reference to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), is also assessed.

A number of key findings emerge from this analysis:

1. Songbirds have low representation in CITES Appendices relative to their prevalence in all trade sectors. Around 60% of all birds are songbirds, and songbirds comprise a high proportion of all birds in trade, yet they comprise just 1.4% of the species listed in CITES Appendices. Furthermore, the taxonomic representation of songbirds in CITES Appendices is heavily skewed towards a small number of families.

2. Songbird families with particularly high prevalence in trade include the Estrildidae (estrildid finches), Paradisaeidae (birds of paradise), Cardinalidae (cardinals and allies), Viduidae (indigobirds and wydahs), Sturnidae (starlings, mynas and allies) and Emberizidae (buntings). In contrast, the avian families Furnariidae (ovenbirds), Grallaridae (antpittas), Tyrannidae (tyrant flycatchers), Rhinocryptidae (tapaculos) and Thamnophilidae (antbirds), comprising largely South American assemblages of dull-plumaged forest birds with simple songs, are among the least traded families of songbirds globally.

3. Southeast Asia, South America, western Africa, the Mediterranean (including the Maghreb region of North Africa) and the Middle East emerge as hotspots of trade in songbirds, with some of this trade supplying significant exports of songbirds to North America and western Europe.

4. In most trade sectors, particularly in domestic trade, the majority of songbirds in trade are presumed to be wild-caught, largely due to the ease with which songbirds can be harvested from the wild relative to the challenge of breeding them in captivity. In contrast, the numbers and proportion of wild-caught songbirds in legal international trade has fallen, due to improved legislation, concerns about the spread of zoonotic disease and improvements in the captive breeding of a few highly traded species.

5. Challenges relating to interpretation and/or enforcement often compromise the effectiveness of existing regulations, particularly those addressing the control of illegal trade. As a consequence, there is clear evidence that the songbird trade poses a threat to numerous songbirds.

A further report will develop a quantitative approach to identifying a short-list of songbird species for which international trade is likely to be particularly severe and which might benefit most from management and conservation actions.

1. Introduction

1.1. Background to the report

Decisions 18.256 to 18.259 on *Songbird trade and conservation management (Passeriformes spp.)* were adopted at the 18th meeting of the Conference of the Parties of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CITES, 2022b). These were subsequently revised and renewed at the 19th meeting of the Conference of the Parties to allow time to raise the necessary funds to implement the Decisions (CoP19 Doc.74). The status of the implementation of the decisions was further discussed at the 32nd meeting of the Animals Committee (AC32 SR).

The Decisions 18.256 (Rev. CoP19) to 18.259 (Rev. CoP19) on *Songbird trade and conservation management (Passeriformes spp.)* directed the CITES Secretariat to:

a) *'within 12 months of the conclusion of the meeting of the Conference of the Parties, commission a preliminary study on the scale and scope of international songbird trade to consider the management and conservation of priorities of songbird taxa involved in such trade;*
b) *consult with appropriate technical experts in the preparation of documents on the conservation, trade, management, enforcement and regulatory priorities of the songbird taxa identified;*
c) *convene a technical workshop to consider the findings of the study and the reports referred to in paragraph b);*
d) *invite the members of the Animals and Standing Committees, representatives from range, exporting, transit and consumer States, and relevant intergovernmental and non-governmental organizations to participate in the workshop; and*
e) *make the results of the study and workshop, together with recommendations, available to the Animals Committee for its consideration.'*

This Global Assessment of Songbirds in Trade (Part 1) responds to paragraphs a) and b) of the above Decision by providing an overview on the scale and scope of the global trade in songbirds and the representation of songbirds in CITES Appendices.

A separate report (*A Global Assessment of Songbirds in Trade. Part 2: A prioritisation of songbirds in global trade*) develops this analysis by using a range of additional data sources to identify the songbird species likely to be at greatest risk from global trade, with a view to informing management and conservation actions.

1.2. Songbirds and trade

The direct exploitation of organisms is recognised in the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) global assessment of biodiversity and ecosystem services as the second greatest direct driver of negative impacts on nature, after land and sea use change (Díaz *et al.*, 2019). Wildlife trade is a multi-billion dollar industry (Haken, 2011), and exploitation to meet demand for wildlife trade has driven widespread population declines and local extinctions of traded species. A recent meta-analysis revealed an average of 62% decline in the abundance of traded species where trade occurs (Morton *et al.*, 2021). Unsustainable exploitation has contributed to the deterioration in conservation status of many birds, with international trade affecting the conservation status of around a third of all extant bird species (Butchart, 2008). Trade is pervasive, acting across spatial scales

(Morton *et al.*, 2021), from local to global, with a large proportion of bird species recorded in international trade also recorded in domestic (national and local) trade (Butchart, 2008). Whereas local trade often relates to bushmeat, international trade focuses on trade in pets, medicines, ornaments and luxury meats (Morton *et al.*, 2021). Almost half (45%) of all bird species are used by humans for one purpose or another, primarily as pets (37%) (Butchart, 2008; Donald *et al.*, 2023) [1].

Songbirds, or passerines, comprise the avian order Passeriformes, the largest order of birds, numbering 6,603 extant species, or 60% of all bird species worldwide.[2] Songbirds include many charismatic species valued for their song and physical attractiveness (De Oliveira *et al.*, 2020). The existence of unsustainable trade in songbirds is well-recognised, with growing volumes of trade recorded in some parts of the world (Khelifa *et al.*, 2017; Scheffers *et al.*, 2019; Davies *et al.*, 2022; Ferrari *et al.*, 2023). A recent review of the global trade in wild birds concluded that while songbirds are generally less threatened by trade on average than non-songbird species, they account for the highest overall number of traded species of any order (Donald *et al.*, 2023).

In some regions of Southeast Asia and the Neotropics, keeping songbirds in cages is a long-established tradition (Jepson and Ladle, 2005; Alves *et al.*, 2010; Souto *et al.*, 2017a; De Oliveira *et al.*, 2020), with up to 84 million songbirds kept on Java, Indonesia, alone (Marshall *et al.*, 2020b). A high demand is often put on those species with subjectively more attractive songs or plumages, and often on rarer species, factors that increase their price and demand (Souto *et al.*, 2017a; De Oliveira *et al.*, 2020). Songbirds are also used in faith ceremonies in parts of Asia (Gilbert *et al.*, 2012). Although extensive research has been undertaken on certain songbird trade sectors, particularly in Southeast Asia, in most regions of the world the scale and scope of the trade in songbirds is poorly understood and the international dimension to this trade is particularly poorly known.

The primary international policy instrument to regulate international trade in specimens considered by countries to be potentially threatened by international trade is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to which 183 of the world's countries, plus the European Union, are now Parties. This agreement subjects international trade in species included in the Appendices to CITES to certain controls, including authorisation of the trade through a permitting system that considers both legality and sustainability. The species covered by CITES are listed in three Appendices. Appendix I includes species threatened with extinction which are or may be affected by trade and the trade in specimens of these species must only be authorized in exceptional circumstances. Appendix II includes species whose trade must be controlled in order to avoid utilization incompatible with their survival. Appendix III includes species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the co-operation of other Parties in the control of trade.

The global trade in CITES-listed birds has undergone a number of notable shifts in the past 40 years in terms of trade routes, volumes and source (from wild-caught to captive-bred birds) (Harfoot *et al.*, 2018). However, little is known about the impact of global trade in songbirds, which are under-represented on the CITES appendices in proportion to the number of species and their prevalence in international trade (CITES CoP19 Doc.74, CITES, 2022). The number and regional diversity of states engaged in the export of CITES-listed species has changed significantly since 1995, with decreasing trends in both aspects (Harfoot *et al.*, 2018). This corresponds with a large decrease in the volume of CITES-listed birds being exported, from a peak of c. 1.5 million exports in 2000, to below 100,000 in 2005. These changes have been influenced by a diverse set of factors both on the supply and demand side (Challender, Harrop

[1] Other use types include hunting for food, hunting for sport, ornamentation and traditional medicine.
[2] This report uses as its baseline taxonomy the Handbook of the Birds of the World and BirdLife International digital checklist of the birds of the world, v.6 (2021): http://datazone.birdlife.org/userfiles/file/Species/Taxonomy/HBW-BirdLife_Checklist_v6_Dec21.zip.

and MacMillan, 2015). Evidence suggests that the international trade in CITES-listed songbirds has moved away from wild-caught to captive-bred birds (Harfoot *et al.*, 2018). However, for species not listed in CITES Appendices, the international trade remains dominated by wild-caught birds (Juergens *et al.*, 2021).

Other regulatory systems also influence the trade in songbirds. For example, the EU import ban on wild-caught birds (Decision 2005/760/EC and subsequent decisions) has resulted in declines in the volume and diversity, both taxonomic and in geographic origin, of wild-caught birds in international trade, both CITES-listed and non-listed species (Harfoot *et al.*, 2018), demonstrating that regulation can be effective in modifying supply and demand across the supply chain.

1.3. Data sources used

This report is based on a literature review and an analysis of a number of global trade databases, shown in Table 1**.** Both cover domestic as well as international trade; although CITES explicitly concerns only international trade, this is not independent of domestic trade and for an initial scoping it is helpful to consider both. The literature review includes both grey and peer-reviewed literature. The datasets shown in Table 1 were combined to develop a 'trade prevalence score', which integrates multiple datasets and can discriminate between heavily or unsustainably traded species and all other species (Donald *et al.*, 2023).

Abbreviated name	Full name (compiler/ manager)	Type of trade covered	Species covered	Years covered	Filters applied	No. songbird species recorded	Summary of data included in the analyses
CITES	CITES Trade Database (UNEP-WCMC on behalf of the CITES Secretariat, https://trade.cites.org/)	International ; legal	All species included in the CITES Appendices and Annex D of the EU Wildlife Trade Regulations	1975-2021 (data accessed June 2023)	Direct and indirect trade; all purpose codes; source = wild, unknown or blank; units = blank or number of specimens; terms = whole organism equivalents, defined as live, bodies, eggs, eggs (live), skeletons, skins, trophies and skulls	118	Quantitative: Data on frequency (number of transactions species reported in) and total number of individuals
LEMIS	United States Fish and Wildlife Service's (USFWS) Law Enforcement Management Information System (LEMIS)	International (imports to the United States of America; mostly legal	Any	2005-2020	Excludes animals bred or born in captivity or commercially, hunting trophies, and imports for scientific, biomedical or educational use.	600	Quantitative: Data on frequency (number of events species reported in) and total number of individuals of each species recorded (based on whole-bird metrics) across filtered 10,029 import events to the United States of America.
Market Surveys	A digitised dataset of market survey reports and other sources of information on birds in trade (Donald *et al.*, 2023)	Domestic and international ; legal and illegal (in unknown proportions)	Any; mostly (>77%) species native to country market	2001-2022	None; data were checked for independence from WiTIS seizure data	970	Quantitative: Data on frequency (number of surveys species reported in) and total number of individuals of each species reoccurred across 97 published or unpublished surveys of birds in trade, mostly market surveys.

Abbreviated name	Full name (compiler/ manager)	Type of trade covered	Species covered	Years covered	Filters applied	No. songbird species recorded	Summary of data included in the analyses
SiTDB	The Songbirds in Trade Database (Juergens *et al.*, 2021)	Domestic and international ;	Songbirds	Including CITES Trade database records 1975-2018; LEMIS 2000-2014	None	6,603	Summary of LEMIS, CITES, World WISE, and WiTIS alongside additional qualitative information regarding songbirds. Contains metric on whether literature exists to suggest species is threatened by trade.
EU TWIX	The EU Trade in Wildlife Information Exchange (TWIX)(Belgian Federal Police and TRAFFIC)	International (imports to the EU); illegal	Any, but focus on CITES-listed species	2005-2019	Excludes seizures of birds known to be of captive origin	32	Quantitative: Data on frequency (number of seizures species reported in) and total number of individuals of each species recorded across 5,265 seizure events of birds illegally imported into the EU.
WiTIS	The Wildlife in Trade Information System (TRAFFIC) (www.wildlifetradeportal.org)	Domestic and international ; illegal	Any	2005-2019	None	263	Quantitative: Data on frequency (number of seizures in which species is reported) and total number of individuals of each species recorded across 2,217 seizures.

Table 1. *Trade data sources used in the study.*

2. Representation of songbirds in the CITES Appendices

Currently 94 songbird species (1.4% of all songbird species) are listed in CITES Appendices I-III (see Annex 1). Of these, 13 are listed in Appendix I, 75 in Appendix II[3] and six in Appendix III[4]. The number of species listed in Appendices I and II has increased slightly (Figure 1).

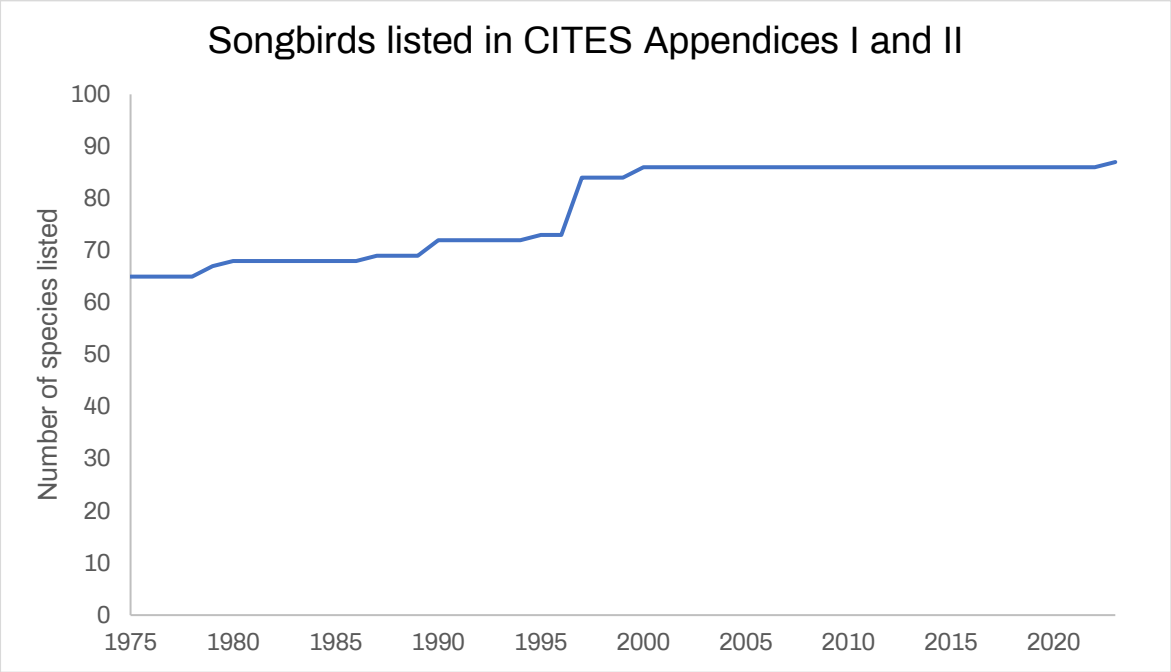

Figure 1. *Changes over time (1975-2023) in the total number of songbird species listed in CITES Appendices I and II.*

Despite this increase, songbirds have significantly lower representation in CITES Appendices, in terms of the proportion of species listed, than do non-songbird species (Figure 2 & Figure 3). In marked contrast with their dominance in terms of global numbers of extant bird species (60%), songbirds account for just 5.8% of all species listed in CITES Appendices I-III. Representation is also disproportionate in the case of globally threatened species[5], 45.1% of globally threatened non-songbirds species are listed in CITES Appendices I-III, compared to just 4.1% for threatened songbirds (Figure 2).

[3] This total is based on the recognition in the baseline taxonomy of 43 species in the family Paradisaeidae and two species in the genus *Rupicola*. Three species are listed in Appendix II on the basis of a single subspecies.
[4] A further 16 species are listed in Appendix III on the basis of their populations in Ukraine, which entered the listings in 2022 and for which few data are available.
[5]Globally threatened species are those listed as Vulnerable, Endangered or Critically Endangered on the IUCN Red List.

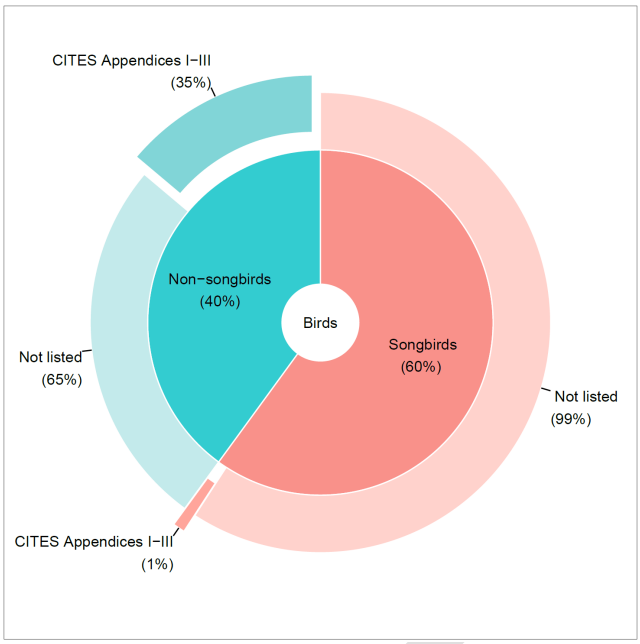

Figure 2. *Representation of songbird (red) and non-songbird (blue) species in the CITES Appendices. The raised segments represent species listed in CITES Appendices I-III.*

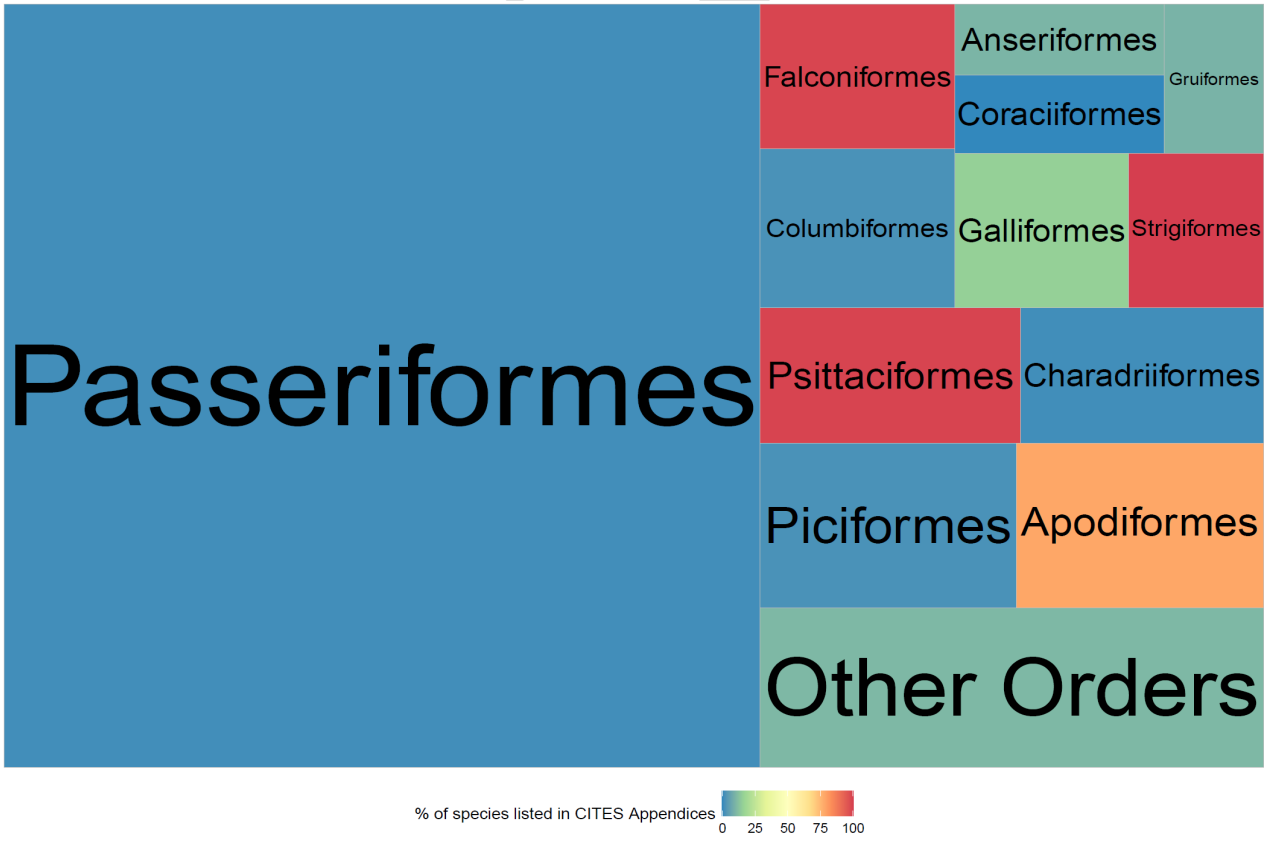

Figure 3. *Treemap showing avian orders shaded by the percentage of species listed in CITES Appendices I-III. The size of each cell is proportional to the number of species in the order.*

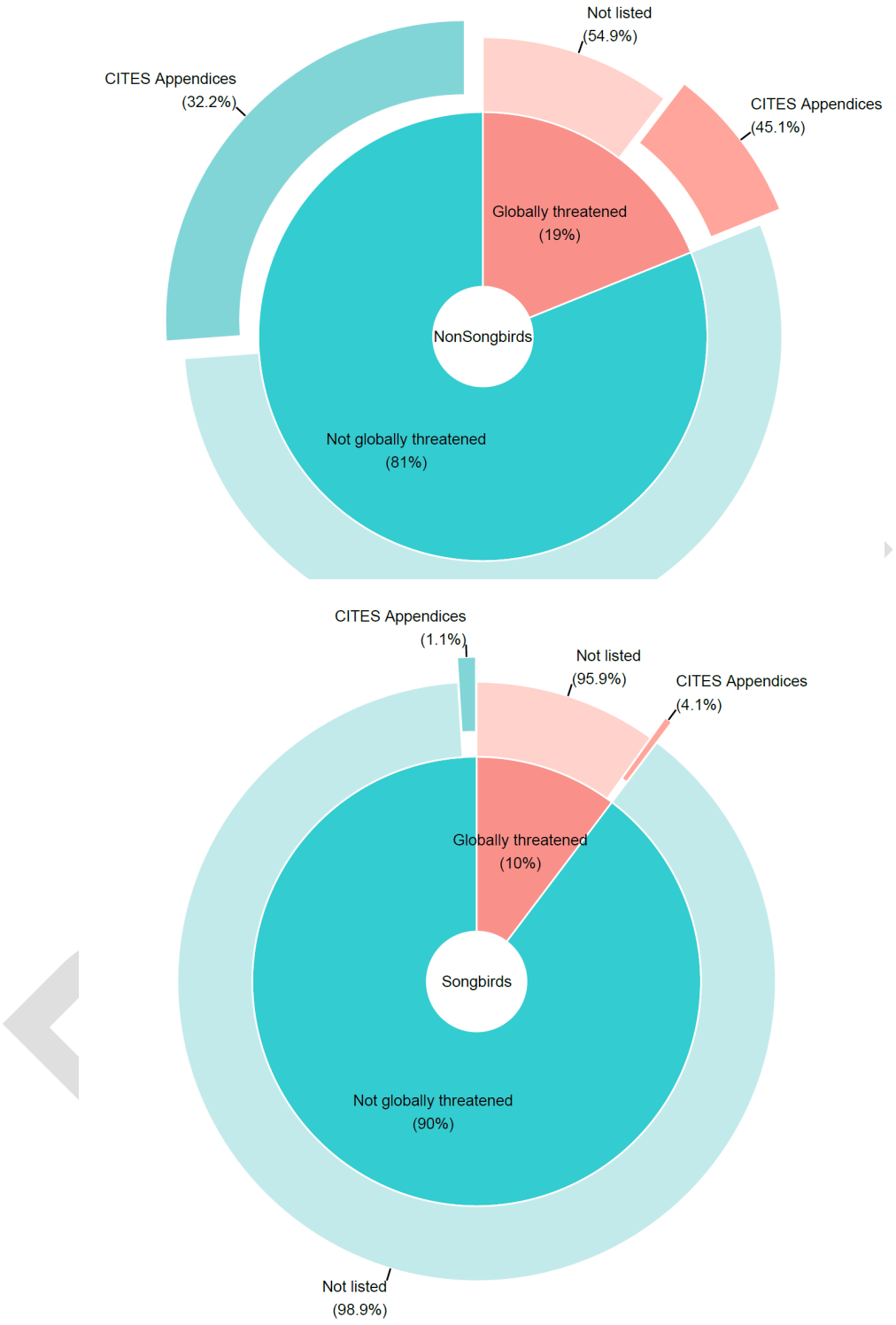

Figure 4. *Representation of globally threatened bird species (red) and non-threatened species (blue) in CITES Appendices for non-songbirds (top figure) and songbirds (bottom figure). The raised segments represent species listed in CITES Appendices I-III*

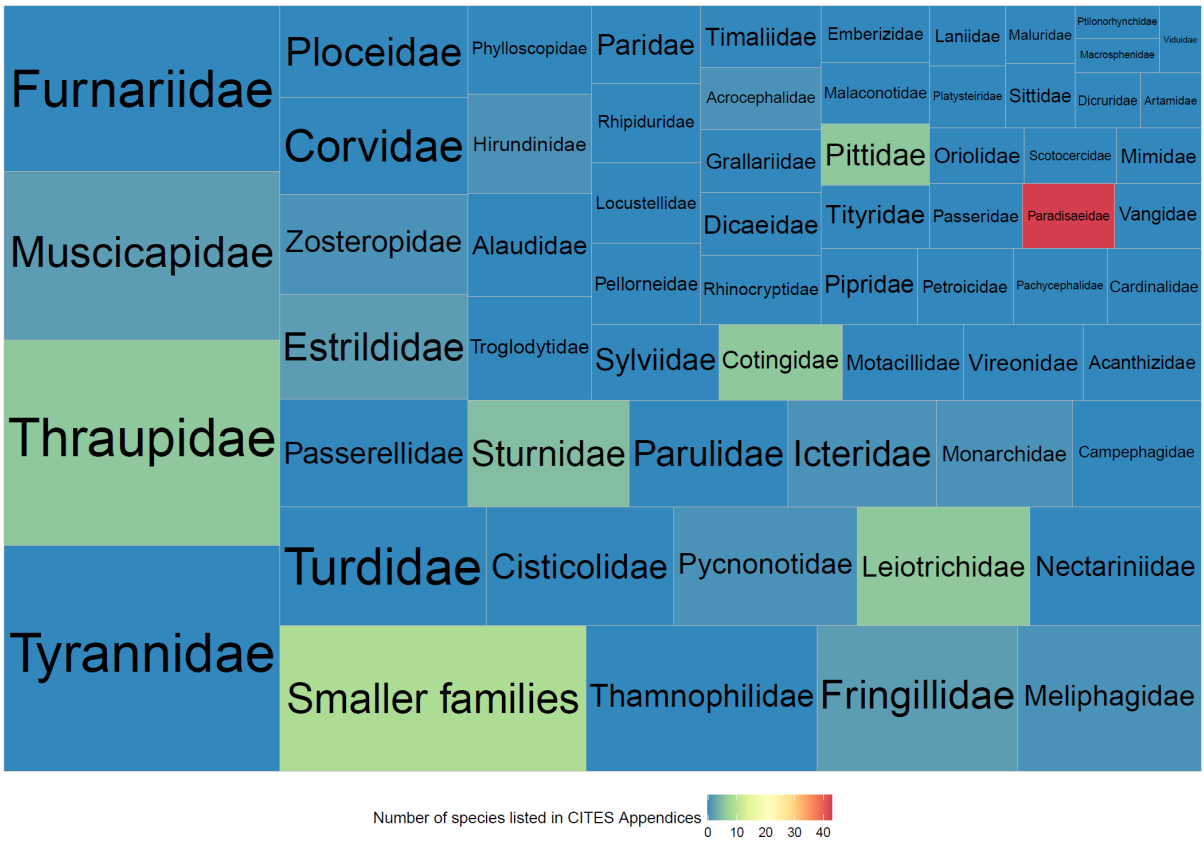

Figure 5. *Treemap showing songbird families shaded by the number of species listed in CITES Appendices I-III. The size of each cell is proportional to the number of species in the family.*

Songbird species listed in CITES Appendices are distributed very unevenly across families, with a single family, the Paradisaeidae (birds of paradise), containing almost half (48%) of all CITES-listed songbirds (**Error! Reference source not found.**). Appendix I species represent a diverse set of family groups and geographies, whereas the Appendix II songbirds (n=71) are largely resident in the Asia-Pacific region (78.9%, n=56), reflecting the listing of all members of the Paradisaeidae (n=45 species under the taxonomy used here). Such group listing in CITES was intended in some instances to reduce the problems of identifying traded birds to species level, or to circumvent any inappropriate omission of species through species-level taxonomic change or uncertainty. The family Paradisaeidae represents the only higher-taxon group listing in the Passeriformes; all other songbird species in CITES Appendices are listed individually.

3. Volumes and trends in trade in songbirds

This section analyses data from trade databases, seizure records and the published literature on the volume of songbird species in both legal and illegal trade. Beyond the datasets with global coverage, the evidence collected and available is unevenly distributed globally, with significant evidence on trade collected for Asia and Middle East, and less for South America and Africa, although both are considered hubs of wildlife trade (Bush, Baker and Macdonald, 2014; Scheffers *et al.*, 2019; Ferrari *et al.*, 2023).

3.1 Volumes of legal trade in songbirds Patterns of legal trade in songbirds were assessed by analysing data from two sources: the CITES trade database, which has global coverage but records data only on CITES-listed species, and the LEMIS database, which records only imports to United States of America but records all species (see Table 1). There are no datasets equivalent to LEMIS for other major demand centres such as Asia and Europe, but the degree of demand in the United States of America for non-CITES-listed species may reflect demand for the same species in other regions.

Table 2 summarises the volume of legal trade in songbirds as recorded in these two datasets, broken down by the stated purpose of trade. The trade in CITES-listed songbirds is shown for the period 1975-2018 and separately for 2006-2018 (following the de-listing of a number of African seed-eaters – see below). The majority of legal trade in songbirds, as recorded in these databases, was for commercial reasons, with only a small minority for other uses such as scientific or educational purposes. Annual trade in non-CITES species to the United States of America was significantly greater than trade in CITES-listed species at a global level on an annual basis.

Period	Source	No. live individuals	No. species	Percent individuals per purpose code							
				Commercial	Unknown	Personal	Trophy	Education	Scientific	Zoological	Other*
1975 - 2018	CITES	10,280,244 – 10,642,211	158**	76.7–99.8%	0.01–23.3%	<0.06%	<0.2%	<0.01%	<0.01%	<0.01%	<0.5%
2006 - 2018	CITES	254,052–355,320	78	98.4–98.9%	<1.0%	<0.23%	<0.6%	0%	<0.01%	<0.12%	<1.0%
2000 - 2014	LEMIS	2,434,739	341	98.3%	<0.01%	0.16%	0.08%	0.01%	0.36%	0.25%	<1.0%

Table 2. *Volumes of live traded individual songbirds in the CITES Trade Database and LEMIS. For CITES these are live songbirds traded under purpose code T commercial only. Values are given as ranges due to discrepancies in importer- and exporter-reported quantities. CITES-listed species are excluded from the LEMIS data to prevent double-counting of records. LEMIS data are taken from the cleaned version of the dataset produced by Eskew* et al.*, (2020), which covers the period 2000-2014. Source: Ovando* et al.*, 2022.*

* Includes the following purpose codes: medical (M), reintroduction/introduction into the wild (N), law enforcement/judicial/forensic (L), breeding in captivity (B), and circus or traveling exhibition (Q).

** Includes currently or previously CITES-listed species, in addition to 39 species recorded as 'N' due to listing in the EU Wildlife Trade Regulations.

3.1.1 Volumes of CITES-listed songbirds in legal trade

The volume of CITES-listed birds in trade, as recorded in the CITES Trade Database, peaked between 1995-2005, with a high point of 1.4 million recorded birds (whole organism equivalents, WOEs[6]) exported in the year 2000 (Harfoot *et al.*, 2018). This dropped to below 100,000 in 2005 (Harfoot *et al.*, 2018), with the EU-wide ban on the import of wild-caught birds, although numbers have steadily increased since that point, predominantly representing trade in captive-bred specimens (Harfoot *et al.*, 2018).

The CITES Trade Database records 15,895 international trade transactions of CITES-listed songbirds between 1975 and 2022, involving a total of 17,696,230 songbirds (calculated as WOEs).[7] The great majority of these, comprising 13,195 transactions (83%) and 16,287,195 birds (92%), relate to a group of small, seed-eating African species in the families Estrildidae, Fringillidae and Ploceidae that were listed in CITES Appendix III from 1976 to 2007, when they were de-listed. The overwhelming majority of these birds (99.5%) were assumed to have been wild caught. There was no clear temporal pattern of trade in these species during the time they were listed in CITES Appendix III (Figure 6). Trade was spread fairly evenly across species, with ten species exceeding 500,000 traded individuals.[8]

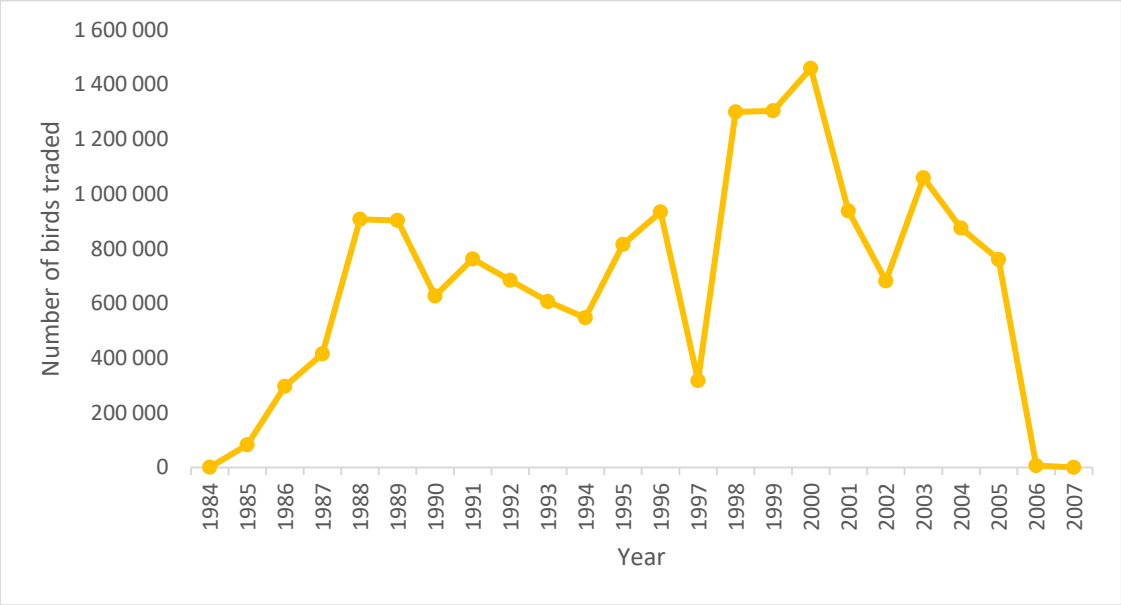

Figure 6. *Temporal pattern of trade in African seed-eaters listed in Appendix III between 1976 and 2007, as reported in trade in the CITES Trade Database. Data on trade in these species were not recorded in the CITES Trade Database until 1984.*

Of the remaining CITES-listed songbirds, i.e. excluding the African seed-eaters de-listed in 2007, 54 species were recorded at least once in the CITES Trade Database. In terms of overall numbers, trade in songbirds was dominated by just three species, Java Sparrow

[6] Whole of organism equivalent (WOEs). The conversion of products reported within the CITES trade database to WOEs enables the comparison of heterogeneous types of products, here we adopted the conversion factor as described by Harfoot *et al.*, 2018.
[7] Data filtered according to recommendations given by UNEP-WCMC. The 23,277 records in the comparative tabulation of transactions of songbirds between 1975 and 2022 were filtered to remove: unidentified taxa; hybrids; cases of indirect trade; non-CITES-listed species; CITES-listed species in years before they were added to the Appendices, or years after they were removed; cases where Units or Terms did not equate to whole birds; cases where the Source was set of "I" (confiscated) or "O" (pre-Convention). Birds were assumed to be wild-caught if their Source code was set to "W", "U" or blank, and not wild-caught otherwise. For each transaction, the larger of the exporter-reported or importer-reported number of individual birds was used.
[8] The species exceeding 500,000 traded individuals included *Serinus mozambicus, Amadina fasciata, Uraeginthus bengalus, Estrilda troglodytes, Estrilda melpoda, Amandava subflava, Euplectes orix, Lagonosticta senegala, Serinus leucopygius,* and *Estrilda caerulescens.*

(*Lonchura/Padda oryzivora*), Red-billed Leiothrix (*Leiothrix lutea*) and Common Hill Myna (*Gracula religiosa*) (**Error! Reference source not found.**). When trade in captive-bred birds was excluded, Red-billed Leiothrix (*Leiothrix lutea*), Common Hill Myna (*Gracula religiosa*) and Silver-eared Mesia (*Leiothrix argentuaris*) were the dominant species in terms of overall numbers traded (**Error! Reference source not found.**).

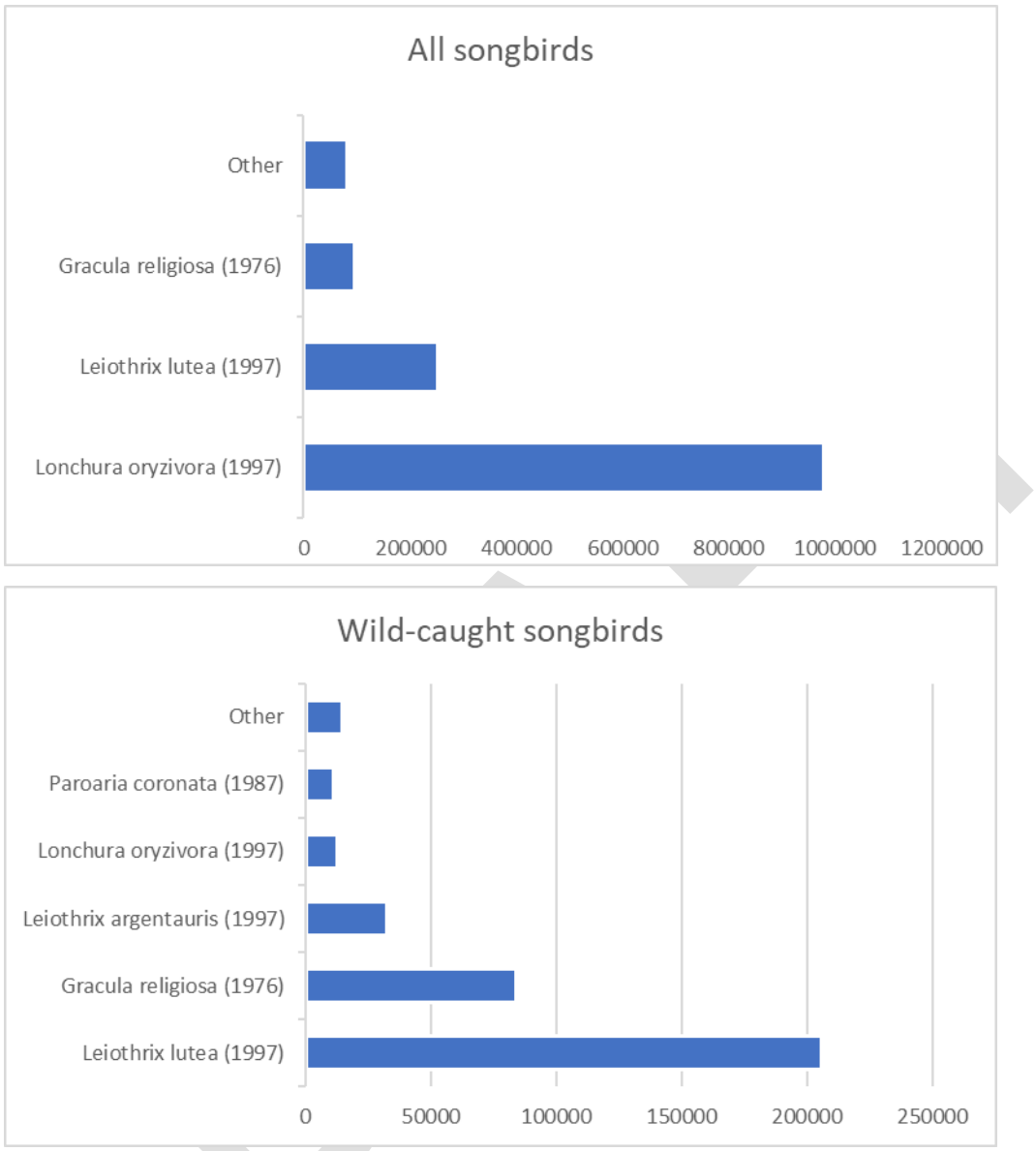

Figure 7. *Trade in CITES-listed songbirds, 1975-2022, as reported in the CITES Trade Database. A small number of species compromised a very high proportion of all traded species, both for all birds traded (upper) and for wild caught birds only (lower). See Table 1 for information on how and when the data were accessed.*

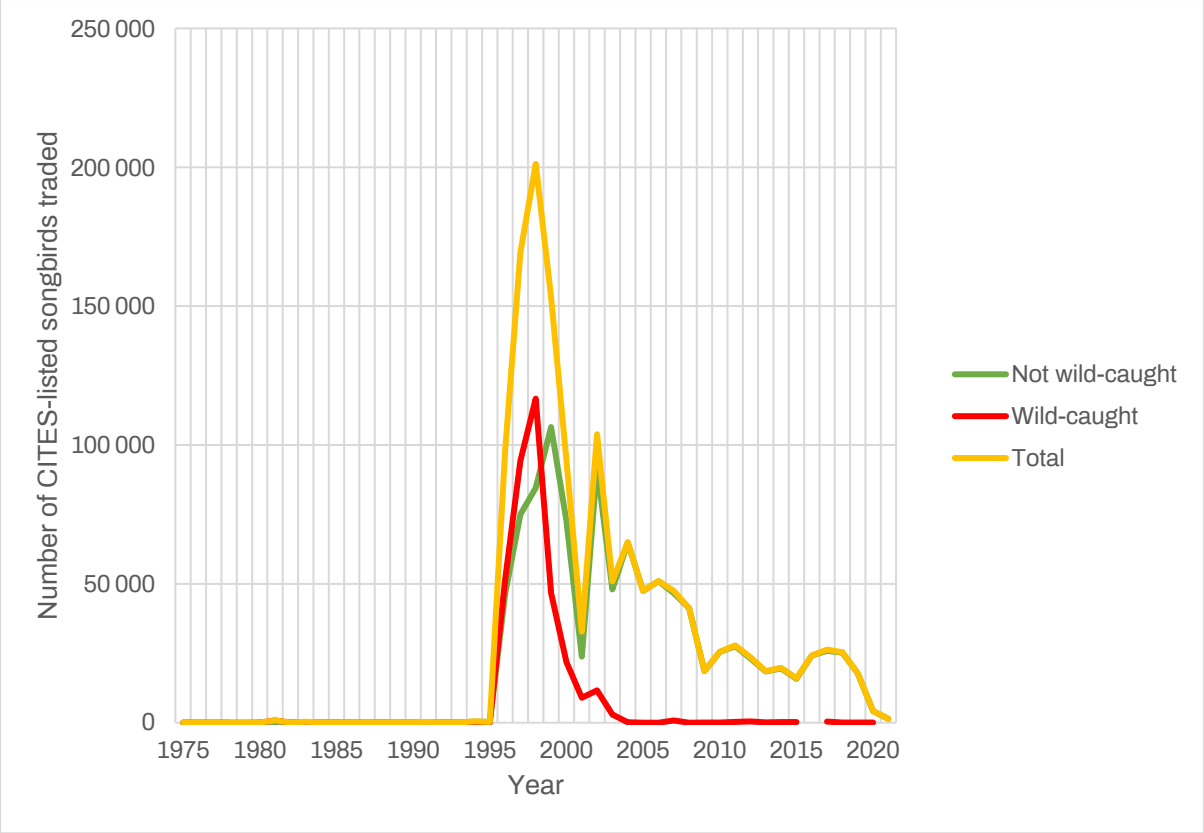

Figure 8. *Temporal changes in numbers of CITES-listed songbirds reported in trade in the CITES Trade Database, 1975-2022. This graph excludes 73 African species that were added to Appendix III in 1976 and removed in 2007 (data for which are presented in Figure 6 above). The steep rise in numbers of traded birds from 1997 was due to the addition to the CITES Appendices in that year of a small number of heavily traded species (see* ***Error! Reference source not found.****). After 1997, the patterns shown are not influenced by the addition or removal of species from the Appendices.*

The trend in trade in CITES-listed songbirds, excluding the African species delisted in 2007, is shown in Figure 8. Before 1997, very few CITES-listed birds were recorded in trade. The addition in 1997 to CITES Appendices of the heavily traded species shown in Figure 7 led to a huge increase in the number of traded CITES-listed birds, since when there has been a steady decline, first in wild-caught birds, which were rarely recorded in trade after 2005, and more recently in captive-bred birds.

3.1.2 Volumes of songbirds traded with the United States of America

The Law Enforcement Management Information System (LEMIS), managed and maintained by the United States Fish and Wildlife Service (USFWS), records imports of wildlife into the United States of America. This dataset is unique in being the only dataset to capture legal trade in both CITES and non-CITES listed species into a single major demand centre. A cleaned version of the dataset, covering the years 2000-2014 (Eskew *et al.*, 2020), records over 300,000 import events of birds, around 90% of them identifiable to species. Of these, 28,697 (8.8%) relate to songbirds, of which 17,454 (60.8%) were described as scientific or museum specimens. Taking only the 10,346 imports of 555 species of songbirds for personal or commercial use or for captive breeding, 4291 (41.5%) were of wild-caught birds and the rest either captive-bred, ranched or of unknown provenance. The number of import events of live songbirds into the United States of America showed little change between 2000 and 2014 but the overall number of live songbirds imported fell; by 2014 very few wild-caught songbirds

were being imported (Figure 9). In the case of both wild-caught and captive-bred or ranched birds, the most commonly imported species were small African or Asian seed-eaters (Figure 10).

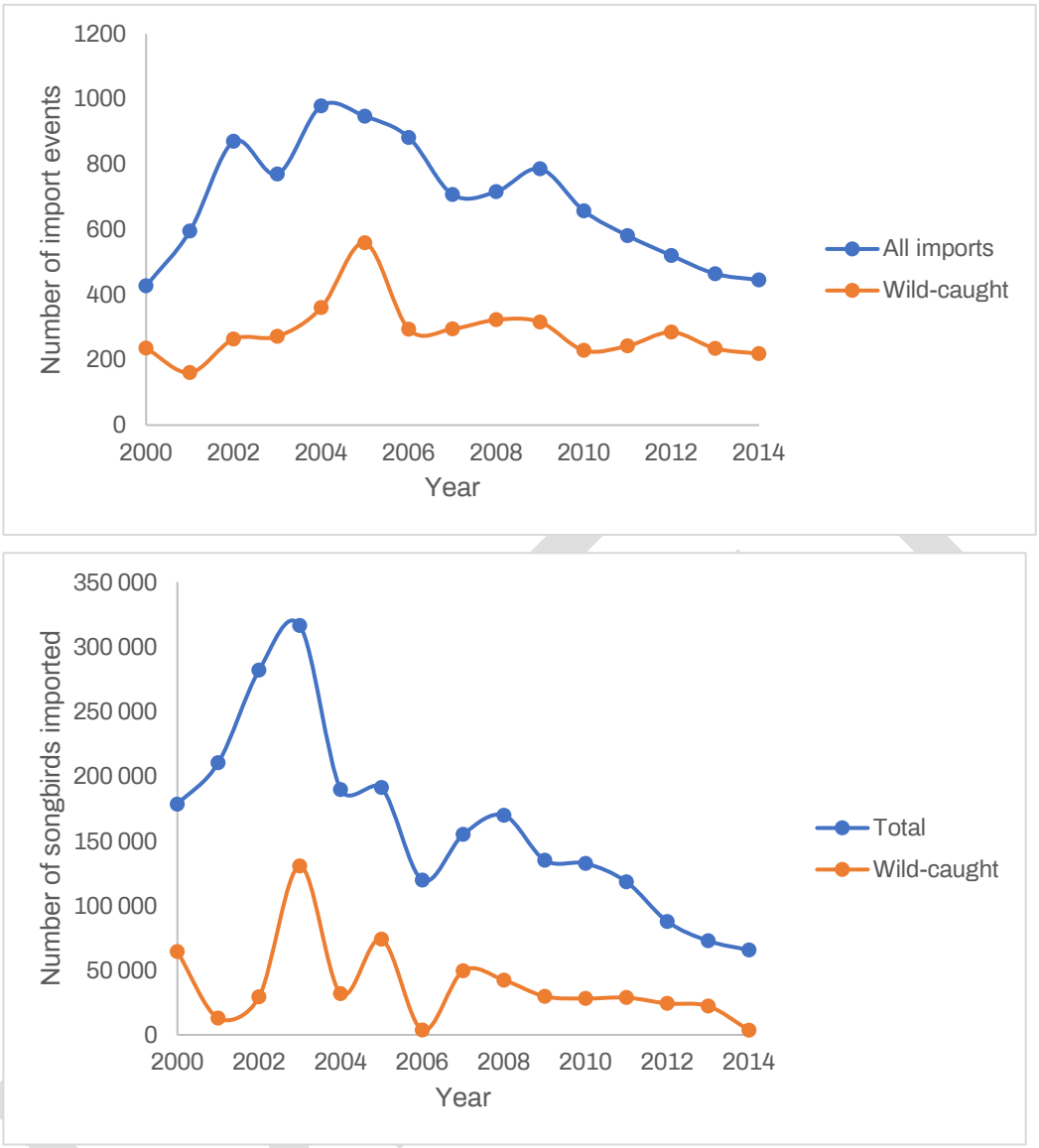

Figure 9. *Changes between 2000 and 2014 in the number of import events to United States of America of live songbirds (upper) and the total number of individual songbirds imported (lower) from data in the LEMIS database, with all birds and wild-caught birds only shown separately. Data were filtered to include only live birds imported for personal or commercial use or for captive breeding.*

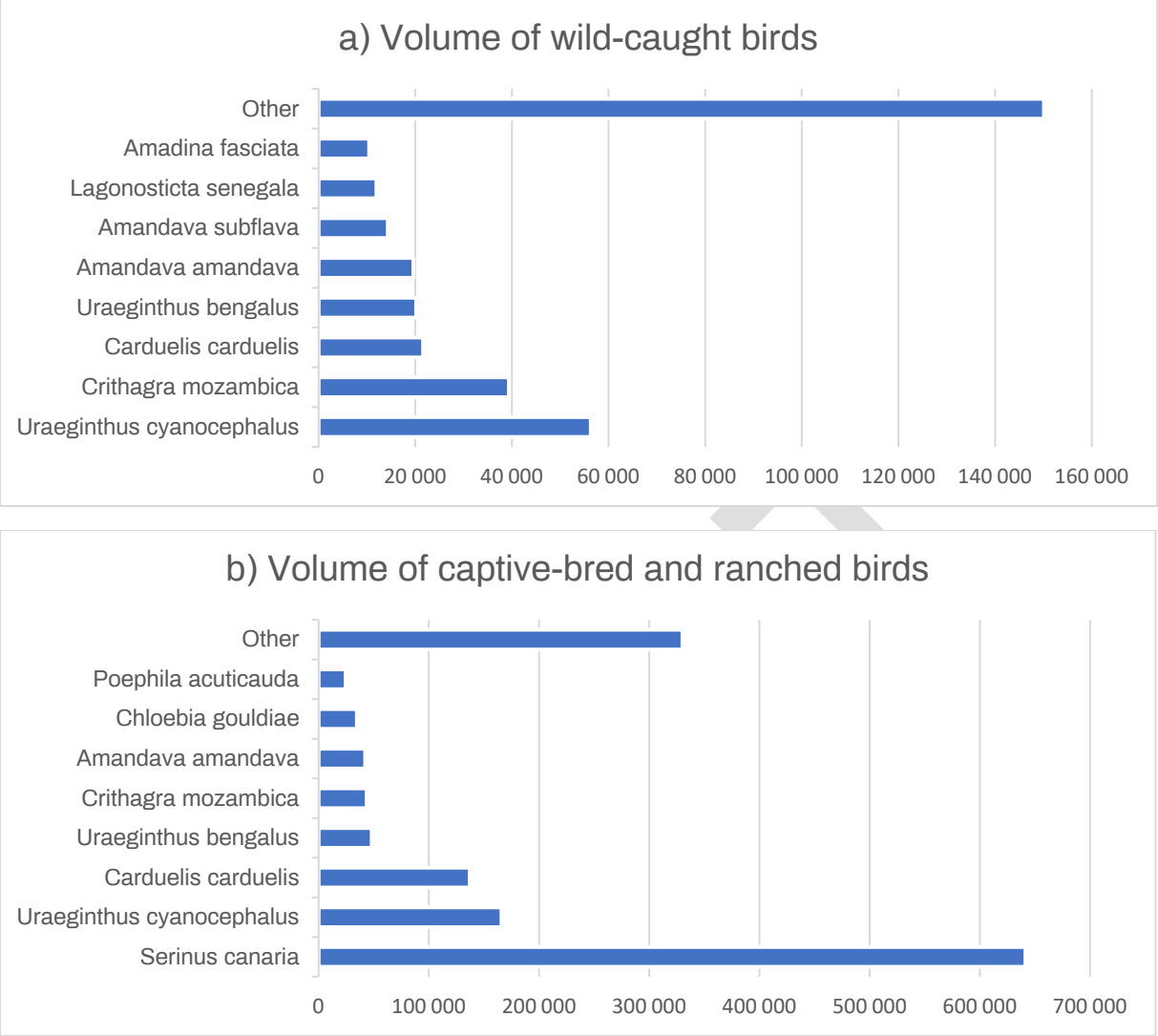

Figure 10. *Numbers of live songbirds imported in largest volumes to the United States of America (2000-2014, LEMIS), filtered to include only birds imported for personal and commercial use. a) wild-caught birds and b) captive-bred and ranched birds. Birds of unknown provenance were excluded.*

3.2 Volumes of illegal trade in songbirds

3.2.1 Illegal international trade

This section examines the available evidence regarding volumes of songbirds in illegal domestic and international trade, drawn from data in seizures databases (WiTIS, EU TWIX, and market surveys (data sources described in Table 1).

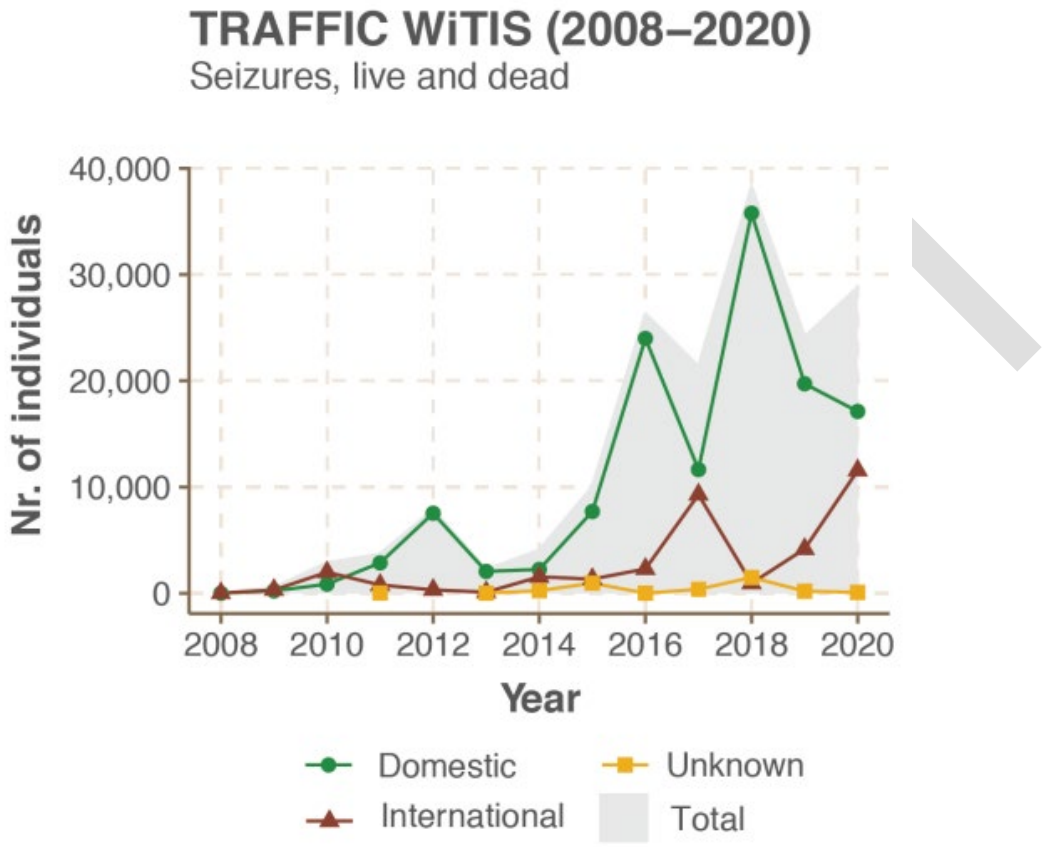

Figure 11. *Trends in the seizure trade data from the TRAFFIC WiTIS database (all species, 2008–2020). The grey area shows total number of seized individuals across all categories. Source: Species360 Conservation Science Alliance, 2021.*

The **Wildlife in Trade Information System** (WiTIS) records seizures of illegal shipments of traded wildlife, incidents of illegal harvesting or smuggling and the outcome of legal enforcement actions. The recorded number of individuals has increased between 2008 and 2020 (Figure 11), although this is likely a reflection of increased seizure effort. Of the 2,217 incidents recorded between 2005 and 2020 that included birds, 609 (27.5%) included one or more species of songbirds, with 263 songbird species being recorded across all seizure incidents. Of these, 235 (89.4%) are not listed in CITES Appendices. However, the two most frequently recorded songbird species, White-rumped Shama (*Kittacincla malabarica*[9]) (78 incidents) and Common Hill Myna (*Gracula religiosa*) (74 incidents), are both listed in CITES Appendix II (the former being added in 2023). Six other songbird species were recorded in more than 20 incidents (Table 3).

9 Listed as *Copsychus malabaricus* in CITES Appendix II.

Species	Region	Incidents
White-rumped Shama (*Kittacincla malabarica*)	Asia	78
Common Hill Myna (*Gracula religiosa*)	Asia	74
Oriental Magpie-robin (*Copsychus saularis*)	Asia	50
Red-whiskered Bulbul (*Pycnonotus jocosus*)	Asia	35
Saffron Finch (*Sicalis flaveola*)	South America	33
Greater Green Leafbird (*Chloropsis sonnerati*)	Asia	31
European Goldfinch (*Carduelis carduelis*)	Palearctic	30
Double-collared Seedeater (*Sporophila caerulescens*)	South America	29

Table 3. *Species recorded seized in >20 seizure incidents in WiTIS.*

Between 2008 and 2020, a total of 169,898 individual seized songbirds are recorded in the WiTIS database, 34,699 of them in international trade and 131,751 in domestic trade. For eight species, all of them restricted to or occurring in Asia, the number of individual birds recorded in WiTIS between 2005 and 2020 exceeded 2,500 individuals (Table 4).

Species	Region	No. Individuals
Oriental Magpie-robin (*Copsychus saularis*)	Asia	9,367
White-rumped Shama (*Copsychus malabricus*)	Asia	9,005
Eurasian Tree Sparrow (*Passer montanus*)	Palearctic & Asia	7,200 (in one incident)
Eurasian Blackcap (*Sylvia atricapilla*)	Palearctic & Asia	6,830 (in three incidents)
Greater Green Leafbird (*Chloropsis sonnerati*)	Asia	3,491
Chestnut-eared Bunting (*Emberiza fucata*)	Asia	3,351 (in one incident)
Streaked Weaver (*Ploceus manyar*)	Asia	2,699
Common Hill Myna (*Gracula religiosa*)	Asia	2,622

Table 4. *Species recorded seized in volumes exceeding 2,500 individuals as recorded in WiTIS.*

The **EU TWIX (Trade in Wildlife Information Exchange) database** records illegal imports of species (largely CITES-listed species) into the EU. The most frequently recorded songbird species in terms of seizure events, and the songbird species seized in largest numbers, are shown in Figure 12.

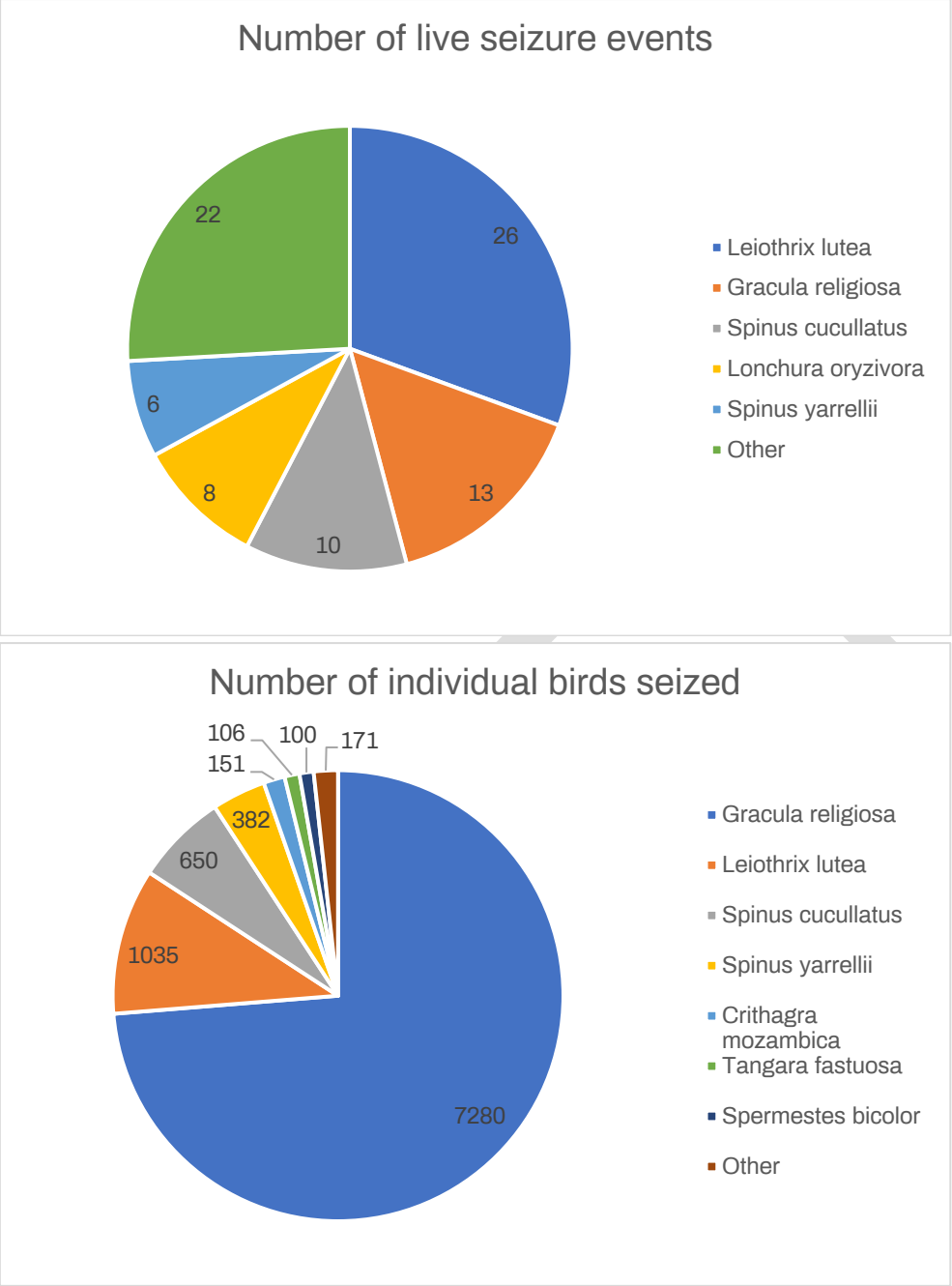

Figure 12. *Frequency with which CITES-listed songbirds were recorded in seizures of illegal shipments into the EU, as recorded in the EU TWIX database (upper), and the proportion by species of the total of 9,875 individual live birds seized (lower).*

3.2.2 Illegal domestic trade

As part of a global analysis of birds in trade (Donald *et al.*, 2023), BirdLife International compiled a database of unpublished market surveys. These market surveys capture data on trade that is largely domestic and, in many cases, suspected to be illegal. The countries with the highest number of surveys included in the database are Indonesia, with data from 24 market surveys, and Brazil, with data from 10 market surveys. These offer an opportunity to assess the mix of native and non-native songbirds being offered for sale in local bird markets in those two countries.

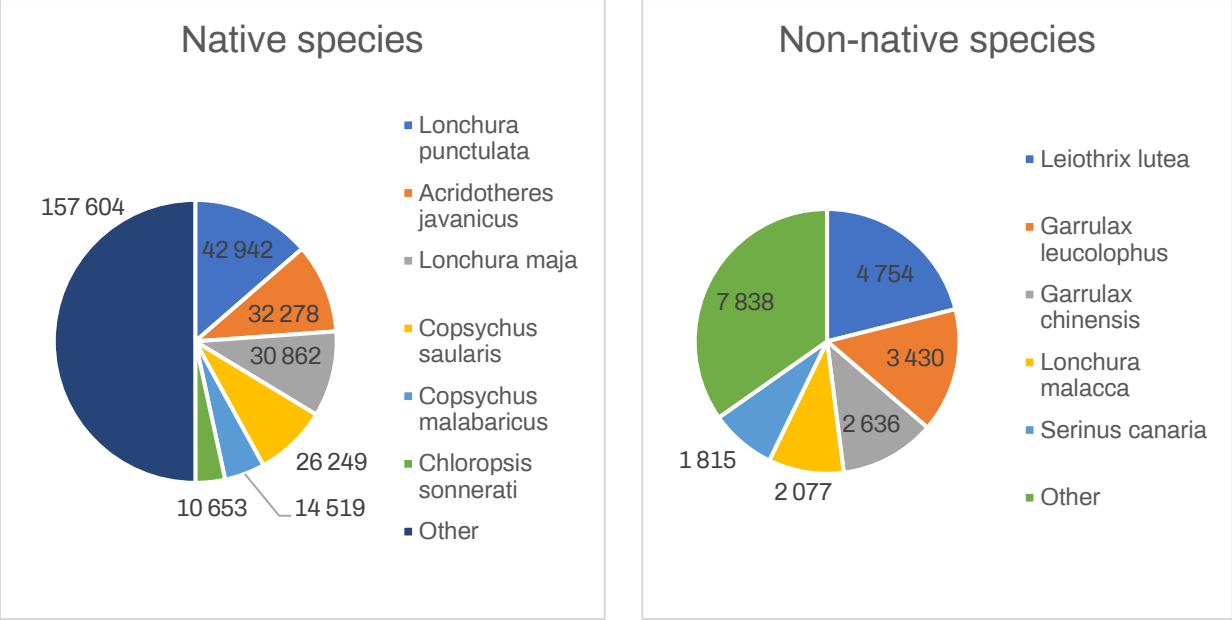

Figure 13. *The most numerous species recorded in 24 market surveys in Indonesia, showing native species (left) and non-native species (right) separately.*

Of the 340,050 individual songbirds recorded for sale in markets in Indonesia, 312,240 (91.8%) were of species native or introduced to that country (Figure 13), although it was generally not possible to assess whether birds were caught locally or imported from elsewhere. Of the birds recorded in Indonesian markets, 71.5% were known or considered to have been wild caught, 2.2% were known or considered to have been captive bred, and the remainder were of unknown provenance. Of the non-native species recorded, the majority are native to southern Asia and are likely to have been imported into Indonesia rather than bred locally.

Whilst it is not possible to ascertain what percentage of birds reported in market surveys would have been traded legally or illegally, given the widespread flouting of quota restrictions and trade in protected species (Nijman *et al.*, 2022), a significant proportion are likely to have been illegally traded.

All of the 27,862 songbirds of 163 species recorded in 10 markets surveys in Brazil were native to the country, and all of those whose source could be inferred or assumed were wild-caught, a practice that is illegal in Brazil (Charity and Ferreira, 2020). Of the most numerous species recorded, most were small seedeaters (Thraupidae) (Figure 14). This tallies with findings in the literature, which report significant numbers of individual songbirds being extracted from the wild for local, domestic and international trade (Alves, Lima and Araujo, 2013; Souto *et al.*, 2017b; Ferrari *et al.*, 2023). Ferrari *et al.* (2023) collated a database of songbird seizures in the Brazilian Atlantic Forest, where trade in all wild-caught birds is illegal, recording 139,000 individual birds of 47 species (1997-2018), 70% of which were Thraupidae (tanagers and allies, including New World seedeaters).

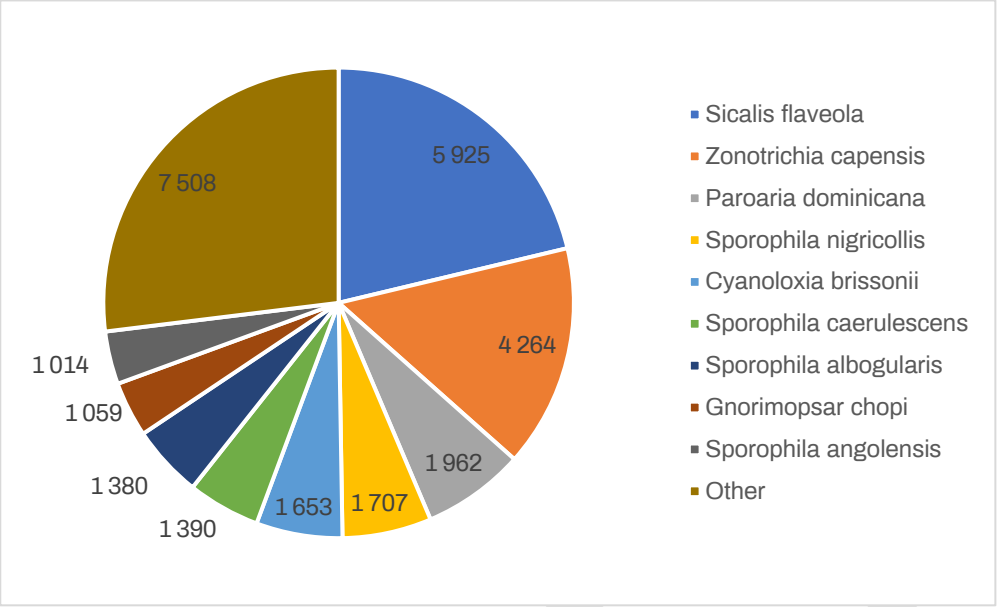

Figure 14. *The most numerous songbird species recorded in 10 market surveys in Brazil.*

Across all 84 market surveys included in the database, 1.33 million songbirds of 872 species were recorded, of which 91.4% were native to the country in which the survey was undertaken. Of the 1.16 million songbirds whose provenance was known or assumed, 92.2% were wild caught.

3.3 Assessing the volume of songbirds in trade from other sources

The analyses presented above are based on records of species from a number of trade datasets, all of which sample only a small part of the overall global trade in songbirds and all of which are likely to suffer from a number of inherent biases. Numbers of birds in trade are certainly very much higher than the totals indicated by these datasets. Another way to assess the scale of the problem is to examine estimates of numbers of birds being kept in captivity. These indicate that trade takes place on a far greater scale than is captured in trade databases.

For example, it is estimated that there are 14-17 million captive European Goldfinches (*Carduelis carduelis*) in the Maghreb region of North Africa (Khelifa *et al.*, 2017). Because of the low captive-breeding effort and near-extinction of the species in Algeria and Tunisia, it is likely that this illegal trade is largely supplied by cross-border trade in wild-caught birds from Morocco. In Indonesia, it has been estimated that a third of Java's 36 million households between them keep 66-84 million cagebirds (Marshall *et al.*, 2020b). For some species, such as the White-rumped Shama, the volume of locally traded birds (>3 million) could not have been supplied by native forests and must be augmented by international trade from outside Indonesia (Marshall *et al.*, 2020b). Other studies suggest that the number of birds recorded in global datasets greatly underestimate the scale of trade in songbirds. For example, market surveys in Guangzhou, China, found that high volumes of songbirds are being sold in markets as pets and for food (Lees and Yuda, 2022), and there is evidence of significant online trade in African songbirds that is likely to be greatly under-recorded in global trade datasets (Davies *et al.*, 2022).

These studies show that the volumes of international songbird trade captured by databases only provide a glimpse of the full scale of international trade in songbirds. Moreover, there are potential data gaps in the literature that limit the potential to infer where exactly the trade in songbirds may be under-represented in the data. For example, there is limited literature on the scale of local trade in birds of paradise in the New Guinea region, which may lead to under-estimation of the threat local trade poses to these species. Additionally, there are significant data gaps concerning the numbers of birds being illegally trapped in the Mediterranean region that end up in international trade. An additional consideration is that songbirds captured in the wild are subject to high levels of mortality in the first few days after capture, so the true scale of the trade is further under-represented (Alves, Lima and Araujo, 2013).

Across the literature there are numerous examples from market surveys, household surveys and seizure data recording large numbers of individual songbirds being observed and/or confiscated. Table 5 lists species for which >500 individuals were recorded in market surveys/seizures over a period up to a year. Table 6 lists species for which >1,000 individuals were recorded over a period of years. The full list of species for which >100 individuals were recorded in a single study is listed in Annex 2. The greatest number of individuals recorded in any single study within a single year period was seizure data for the Saffron Finch (*Sicalis flaveola*, n=16,514). Within the single species studies recording individuals over a period of years, the Yellow-breasted Bunting (*Emberiza aureola*, n=824,815) was the most prevalent species amongst the seizure data.

Species	Source	Time Period	No. Individuals	Reference
Chloropsis sonnerati	Market surveys; seizures	June-July 2015	3,008	Chng, Eaton and Miller, 2017
Cyanoloxia brissonii	Seizures	2011	654	Silva, 2016
Pycnonotus bimaculatus	Market surveys	Oct 2018-Jun 2019	1,751	Leupen and Gomez, 2020
Sicalis flaveola	Seizures	2011	16,514	Reis *et al.*, 2017
Sicalis flaveola	Seizures	2008	3,907	Mello, 2016
Sporophila angolensis	Seizures	2011	2,030	Mello, 2016
Sporophila angolensis	Seizures	2011	1,836	Bastos *et al.*, 2008
Sporophila lineola	Seizures	2018	2,932	Reis *et al.*, 2017
Sporophila nigricollis	Seizures	2011	526	Bastos *et al.*, 2008

Table 5*. Species for which 500> individuals were recorded in a single study involving market surveys/ seizures during <1 year period as identified in the literature reviewed for this study.*

Species	Source	Time Period	No. Individuals recorded	Reference
Acridotheres melanopterus	Market survey	2015-2018	1,253	Nijman *et al.*, 2018
Cophyscus malabaricus	Seizures	2008-2018	15,480	Leupen and Shepherd, 2018
Cyanoloxia brissonii	Seizures	2012-2015	2,341	Reis *et al.*, 2017
Emberiza aureola	Seizures/ confiscations	2000-2013	799,477	Kamp *et al.*, 2015
	Seizures	2015-2019	25,338	Heim *et al.*, 2021
Garrulax bicolor	Market surveys	1997-2008	3,422	Shepherd, 2010*
	Market surveys	2015-2016	2,610	Bušina, Pasaribu and Kouba, 2018
Garrulax chinensis	Market surveys	1997-2008	2,525	Shepherd, 2010

Species	Source	Time Period	No. Individuals recorded	Reference
Garrulax palliatus	Market surveys	1991-2020	5,821	Leupen *et al.*, 2020
	Market surveys	1997-2008	2,359	Shepherd, 2010
Gnorimopsar chopi	Seizures	2008-2010	3,386	Reis *et al.*, 2017
Gracupica jalla	Market surveys	2014-2020	24,358	Nijman *et al.*, 2021
Paroaria coronata	Seizures	2003-2008	1,088	Martins-Ferreira and Glock, 2006
Paroaria dominicana	Seizures	2006-2007	1,712	Reis *et al.*, 2017
Pterorhinus mitratus*	Market surveys	1997-2008	1,843	Shepherd, 2010
Pycnonotus jocosus	Seizures	2007-2010	28,139	Techachoochert and Round, 2013
Saltator similis	Seizures	2010-2017	10,098	Reis *et al.*, 2017
	Seizures	2014-2016	3,486	Mello, 2016
	Seizures	2003-2008	1,975	Souza, 2014
	Seizures	1998-2002	1,315	Freitas *et al.*, 2015
	Seizures	2012-2015	1,165	Anastacio, 2017
Sicalis flaveola	Seizures	1998-2002	6,932	Bastos *et al.*, 2008
	Seizures	2003-2005	3,480	Silva, 2016
	Seizures	2012-2014	2,114	Souza, 2014
	Seizures	1999-2003	1,359	Morita, 2009
	Seizures	1998-2000	1,325	Freitas *et al.*, 2015
Spinus magellanicus	Seizures	2012-2014	2,158	Reis *et al.*, 2017
Sporophila angolensis	Seizures	2003-2008	1,901	Reis *et al.*, 2017
Sporophila caerulescens	Seizures	2008-2014	12,128	Reis *et al.*, 2017
	Seizures	2006-2010	4,549	Mello, 2016
Sporophila frontalis	Seizures	2012-2015	4,520	Mello, 2016
Sporophila nigricollis	Seizures	2012-2014	2,500	Silva, 2016
	Seizures	2003-2005	1,109	Souza, 2014
Turdus rufiventris	Seizures	2004-2011	1,912	Reis *et al.*, 2017
Volatinia jacarina	Seizures	2012-2016	2,008	Mello, 2016
Zonotrichia capensis	Seizures	2012-2016	1,032	Mello, 2016

Table 6. *Species for which >1000 individuals were recorded in a single study involving market surveys/ seizures/ confiscations over a period of years as identified by the literature reviewed for this study.*

4. Taxonomic patterns in songbirds in trade

The trade prevalence score generated by Donald *et al.* (2023) provides a useful measure with which to gauge the proportional volume in trade made up by different songbird families because it provides an index that is applied across all bird species. The highest average (mean) trade prevalence scores by family are recorded in the families Estrildidae (estrildid finches), Paradisaeidae (birds of paradise), Cardinalidae (cardinals and allies), Viduidae (indigobirds and wydahs), Sturnidae (starlings, mynas and allies) and Emberizidae (buntings) (Figure 14). In contrast, the avian families Furnariidae (ovenbirds), Grallaridae (antpittas), Tyrannidae (tyrant flycatchers), Rhinocryptidae (tapaculos) and Thamnophilidae (antbirds),

comprising largely South American assemblages of dull-plumaged forest birds with simple songs, are among the least traded songbird families.

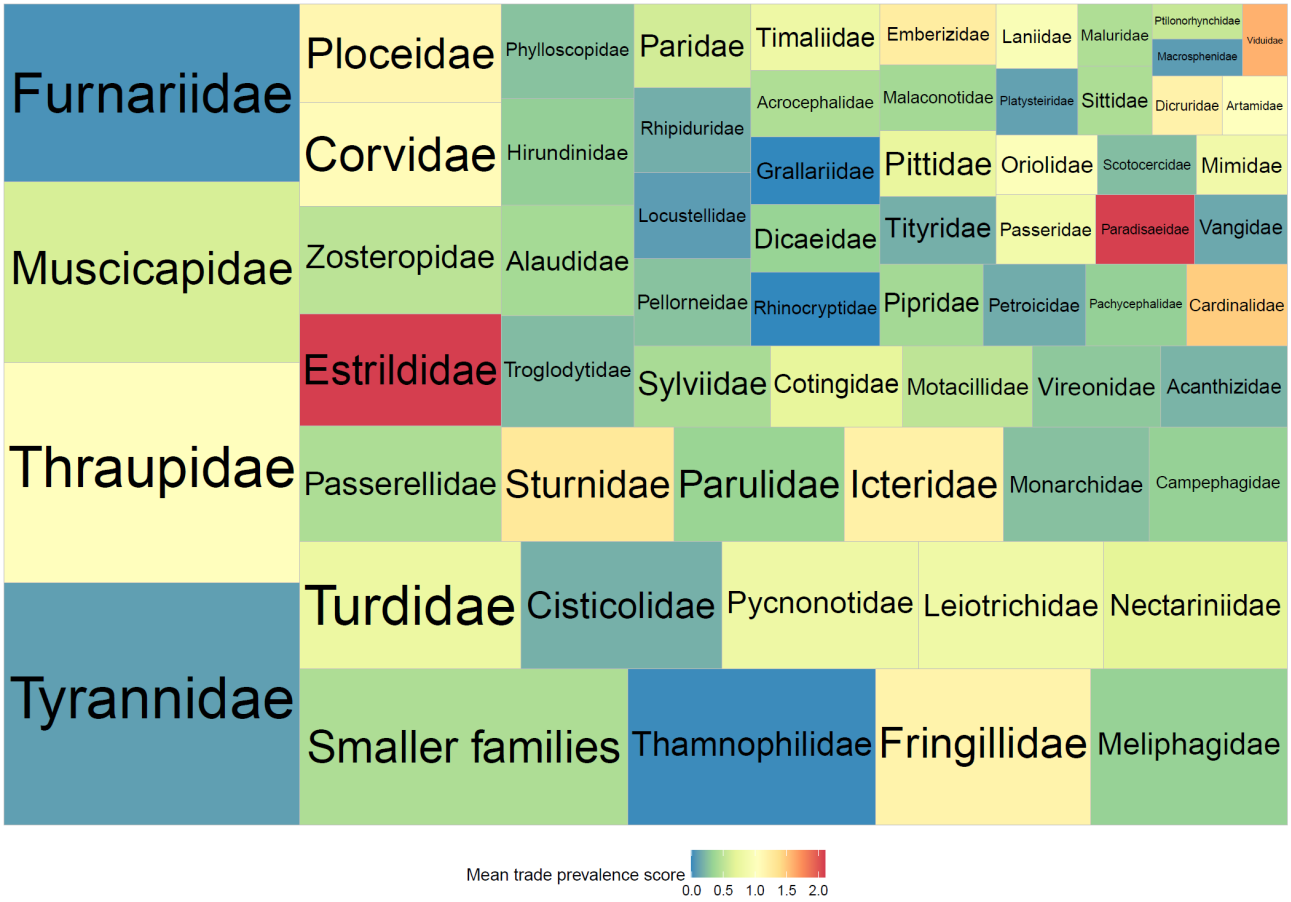

Figure 15. *Treemap showing the mean trade prevalence score (Donald* et al.*, 2023) of songbird species by family. The size of the cells is proportional to the global number of species in each family.*

Prior to the delisting of a suite of African seedeaters from Appendix III, the CITES trade database recorded very high levels of trade in songbirds in the families Fringillidae (finches) and Ploceidae (weavers). When these species were de-listed, the three species that dominate trade in CITES-listed species were Java Sparrow (*Lonchura/Padda oryzivora*), Red-billed Leiothrix (*Leiothrix lutea*) and Common Hill Myna (*Gracula religiosa*), in the families Estrildidae (estrildid finches), Leiothrichidae (laughingthrushes), and Sturnidae (starlings, mynas and allies) respectively.

The global pattern of trade in songbird families shown in Figure 15 may vary at a regional scale and, because it is based on the mean trade score across all members of a family, does not necessarily represent particularly heavy trade in a few individual species. Furthermore, some heavily traded families containing only a small number of species, such as the Chloropseidae (leafbirds), are merged with other small families in the figure for reasons of scale. In Asian market surveys, the most commonly reported incidents of illegal trade are among species in the families Muscicapidae (Old World flycatchers), Sturnidae (starlings, mynas and allies), Pycnonotidae (bulbuls), and Chloropseidae (leafbirds). In the Americas, members of the family Thraupidae (tanagers and allies) and Icteridae (New World blackbirds) dominate seizure data, but only a relatively small proportion of the species in these families are recorded in trade, so the mean trade score at the level of the family is only moderate.

5. Geographic patterns in songbird trade

This section summarises what is known about international trade routes, including the key exporter, importer and transit countries of songbird species at both global and regional levels. It also reviews a number of regional songbird trade sectors. Knowledge of songbird trade routes is uneven, with significant geographical variation in data quality and quantity (often skewed by varying enforcement and reporting effort), in relation to both legal and illegal trade, and might therefore not show the full picture. However, information drawn from a range of sources, including the CITES trade database, LEMIS (US Imports), the Songbirds in Trade database, and available seizures data, in combination make it possible to draw some conclusions and recognise and identify key knowledge gaps.

The Songbirds in Trade Database (SiTDB) identifies 986 songbird species that have been recorded in international trade and 1,137 in domestic trade, with significant overlap in species composition between the two trade sectors (Figure 16).

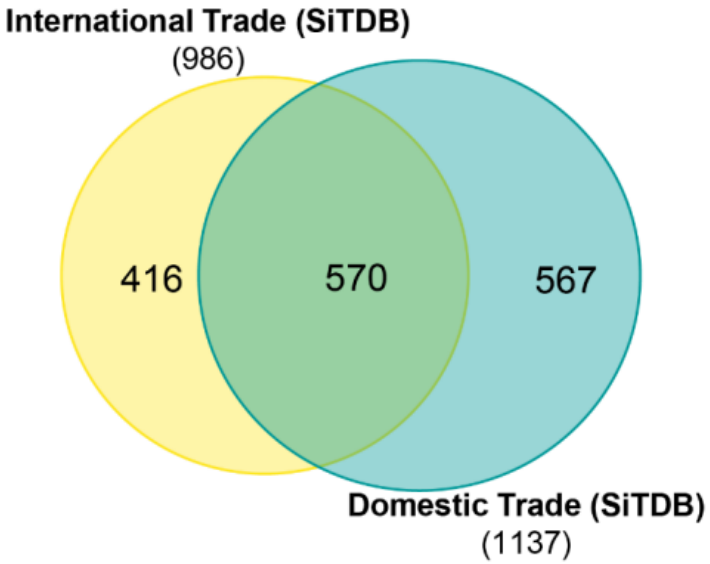

Figure 16. *Numbers of songbird species known to be in international and domestic trade of live individuals according to datasources collated in the Songbirds in Trade Database. Reproduced here with permission from Species360 Conservation Science Alliance, 2021.*

Songbirds harvested to supply domestic and international trade may therefore be under additional pressure as distant demand may cause a local decline in species abundances (Morton *et al.*, 2021). Trade routes are fluid, with geographic centres of demand and supply responding to changes in factors such as population abundance of target species (Nijman *et al.*, 2021), regulation, consumer trends and fashions (Marshall *et al.*, 2020b), market conditions, and emerging opportunities to facilitate trade (e.g. online (Fink *et al.*, 2021)). The impact of these factors is apparent in the global trade in songbirds, both legal and illegal.

5.1 Trade routes of legally traded songbirds

The international legal trade in CITES-listed wild-caught songbirds was previously dominated by imports into countries within the European Union from Africa. However, trade between the two regions had all but ceased by 2010, an effect of the EU regulation banning the import of wild birds, which saw the majority of wild bird trade cease between 2005-2009 (Harfoot *et al.*, 2018).

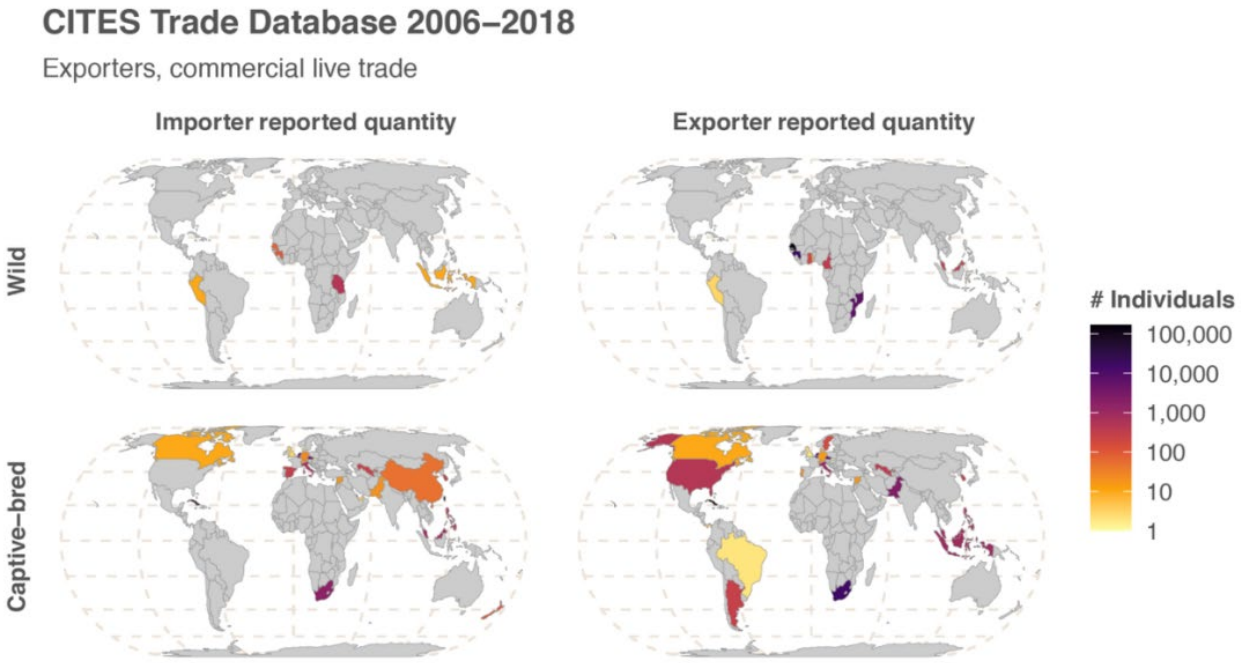

Figure 17. *Exporter countries of live commercial trade in songbirds as reported in the CITES Trade Database (2006-2018) for the two most traded sources (i.e., wild caught and captive bred). Both importer-reported (left column) and exporter-reported quantities (right column) are shown. Note the logarithmic scale (log10) ranging from 1 to 165,945 individuals. From Species360 Conservation Science Alliance, 2021.*

The export of wild-caught CITES-listed songbirds between 1975 and 2005 (including the African seed-eaters) was dominated by Senegal, Guinea, and Mali, with 5.2 million individual songbirds traded, accounting for 86% of the total exports over the period (Juergens *et al.*, 2021). Almost half of these were exported to Portugal and Belgium. Exports from these countries into Europe largely involved small, seed-eating African songbird species which were, and still are, abundant and globally Least Concern on the IUCN Red List but added to Appendix III in Ghana in 1976 following concerns about sustainability of international trade from there.[10] The CITES-recorded trade in these species was beginning to decline during the 1990s before collapsing between 2005 and 2009 (Harfoot *et al.*, 2018). Simultaneous to this collapse in recorded trade were two key policy changes, the implementation of the EU's ban on trade in wild-caught birds, and the delisting of these species from Appendix III by Ghana. It is likely that the delisting of these species has had the effect of removing a key source of information to support understanding of the full extent of the remaining trade, with evidence for emerging trade routes between African countries and Asian countries via Türkiye and Bangladesh (Davies *et al.*, 2022). Details of the extent of this trade are unknown as it is no longer required to be recorded.

A different picture of the major exporters emerges when looking at WOEs (see Footnote 7) and with the removal of Ghanas' Appendix-III listed species, with a shift away from African countries as the major exporters. Before 2005, the major exporters included China, Taiwan, Province of China, Viet Nam and Malaysia for all songbirds, and for wild-caught only songbirds, China, Viet Nam, Hong Kong SAR of China and Malaysia (Figure 18), indicating a strong demand for CITES-listed songbirds from South and Southeast Asia in the period 1976-

10 These included e.g. Yellow-fronted Canary (*Serinus mozambicus*), Cut-throat Finch (*Amadina fasciata*), and Red-cheeked Cordon-bleu (*Uraeginthus bengalus*) in the families Estrildidae, Fringillidae and Ploceidae. These species were previously listed in CITES Appendix III (1976 to 2007).

2005. Elements of this trade persisted into the period 2006-2022, though volumes dropped considerably, and major new exporters emerged, with Cuba emerging as the largest exporter of all songbirds and Taiwan, Province of China, the second largest exporter (Figure 18). Figure 19 shows the key importers of songbirds, which are geographically widely distributed across Asia, the Americas and Europe.

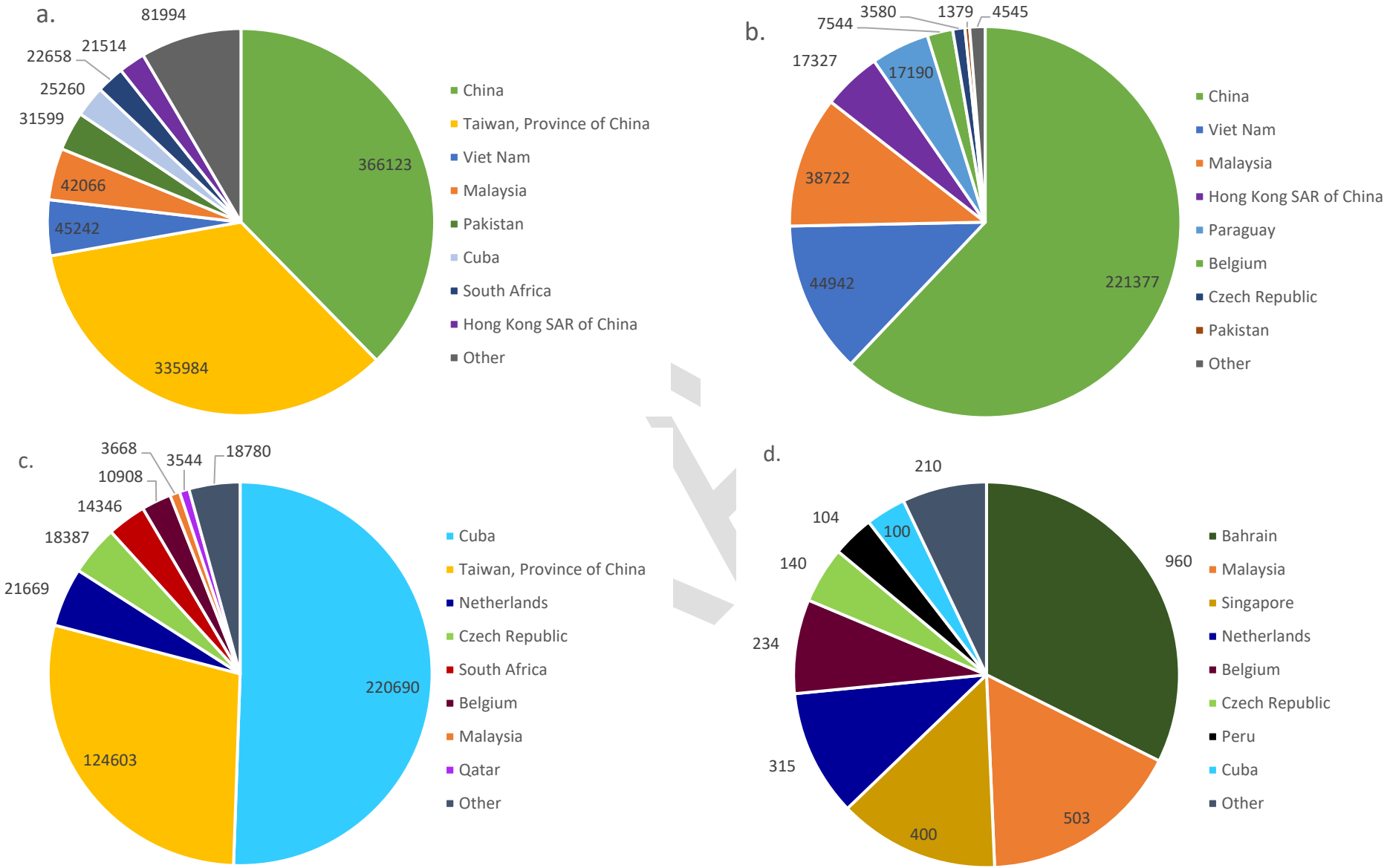

Figure 18. *Major exporters 1975-2005 and 2006-2022, a) all songbirds 1975-2005 (n = 972,440), b) wild-caught songbirds 1975-2005 (n=356,606), c) all songbirds 2006-2022 (n=436,595), d) wild-caught songbirds 2006-2022 (n=2,966). These figures exclude the Appendix III listed African seed-eaters. These numbers are calculated using WOEs, see footnote [7].*

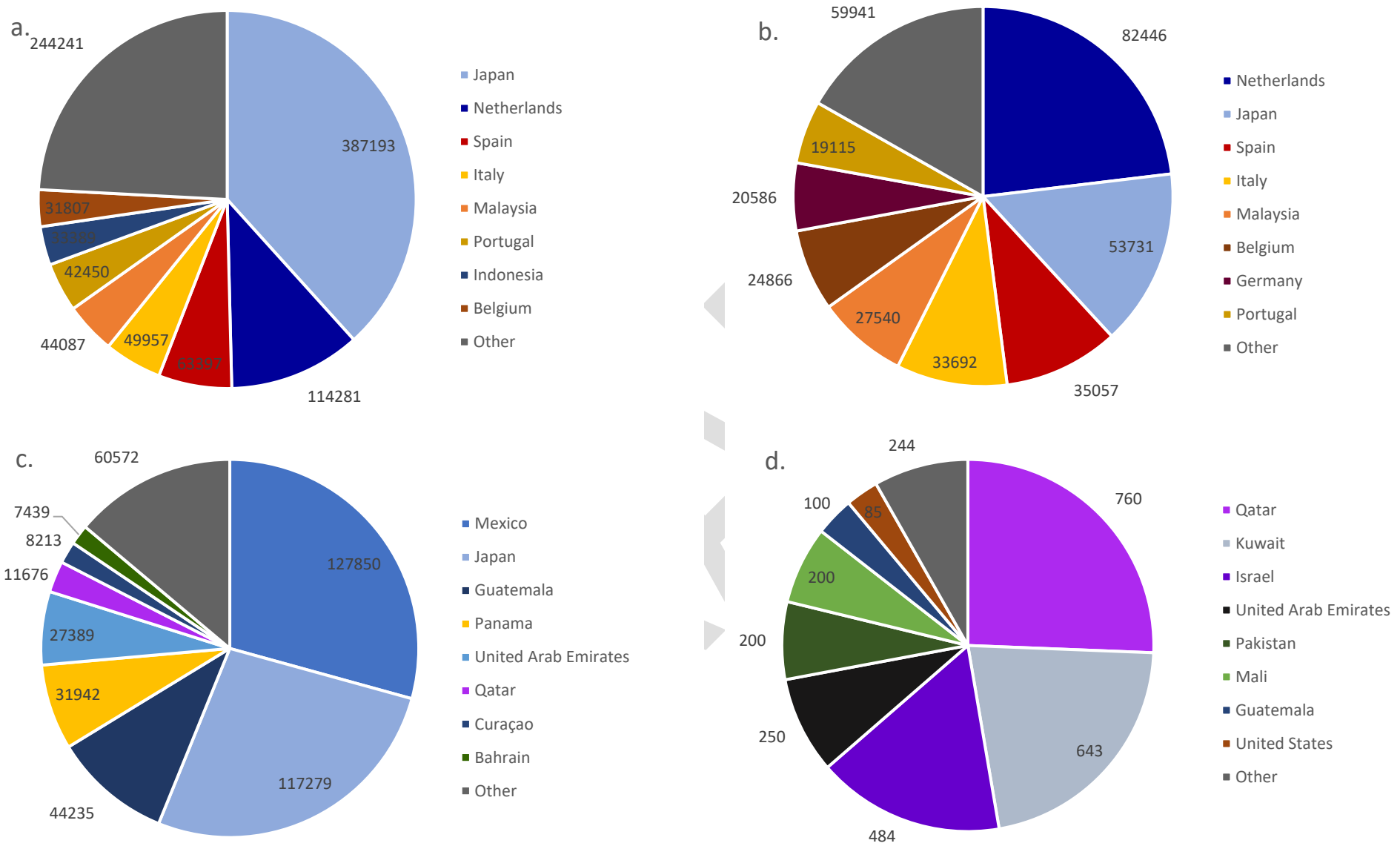

Figure 19. *Major importers 1975-2005 and 2006-2022, a) all songbirds 1975-2005, (n = 972,440), b) wild-caught songbirds 1975-2005 (n=356,606), c) all songbirds 2006-2022 (n=436,595), d) wild-caught songbirds 2006-2022 (n=2,966). These numbers are calculated using WOEs see Footnote [7].*

The USFWS LEMIS data is the most complete record of the sources of songbirds being imported into any single country (the United States of America), and includes both CITES and non-CITES listed species, wild-caught and captive bred specimens. Over the period 2006-2014 there was significant variation in the major exporting countries accounting for trade entering the United States of America (Figure 20). Guyana, Suriname, Mexico, and Peru were recorded as the largest exporters of wild-caught CITES-listed songbirds, with Senegal, Guinea, France and Uzbekistan the largest exporters of non-CITES-listed songbird species into the United States of America (2009-2018) (Watters *et al.*, 2022).

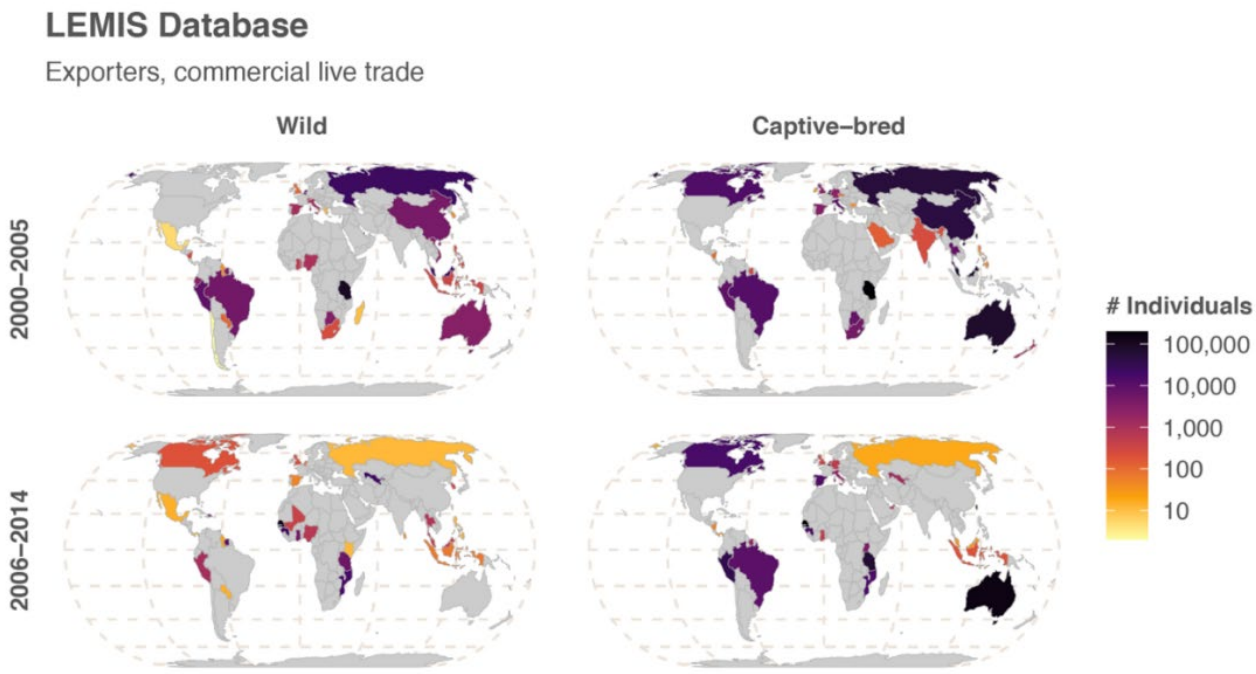

Figure 20. *Countries/regions exporting live songbirds for commercial trade into the United States of America. Data were extracted from the LEMIS database for 2000-2005 and 2006-2014 for wild and captive-bred sources. Note the logarithmic scale (log10), ranging from 2 to 196,061 individuals. Source: Species360 Conservation Science Alliance, 2021.*

Of the 38 countries/regions reported to have exported a combined total of 340,162 individual wild-caught songbirds to the United States of America in 2000-2005, Trinidad and Tobago and United Republic of Tanzania accounted for 59% of all individuals recorded. A significant quantity of trade in wild-caught birds was also recorded from Malaysia, Russian Federation and Belgium. In the period 2006-2014, imports of wild-caught songbirds to the United States of America from 36 exporting countries were lower (n= 227,985 individual birds). Over this period, Senegal emerged as the major exporter, accounting for 57% of the total wild-caught songbirds recorded entering the United States of America, with Guinea also emerging as a top exporter. Furthermore, whilst imports from Tanzania waned, trade from neighbouring Mozambique grew. Imports of wild-caught birds from Suriname remained steady across the period 2000-2014. Trade in wild-caught songbirds from Uzbekistan also emerged as that from Russian Federation declined and China ceased. Trade also appeared to cease in wild-caught birds from Brazil and Australia, with imports from those countries moving solely to captive-bred specimens.

For the period 2000-2005 captive-bred songbirds entered the United States of America from a total of 31 exporting countries/regions, with Belgium, Taiwan, Province of China, and Tanzania being the source of more than half of imports (57%). Between 2006 and 2014, almost half of imports (48%) to the United States of America came from Taiwan, Province of China, and Senegal. Imports of captive-bred songbirds from Russian Federation and China to the United States of America declined over the two periods, whereas imports from Australia and parts of Europe remained relatively constant.

5.2 Trade routes of illegally traded songbirds

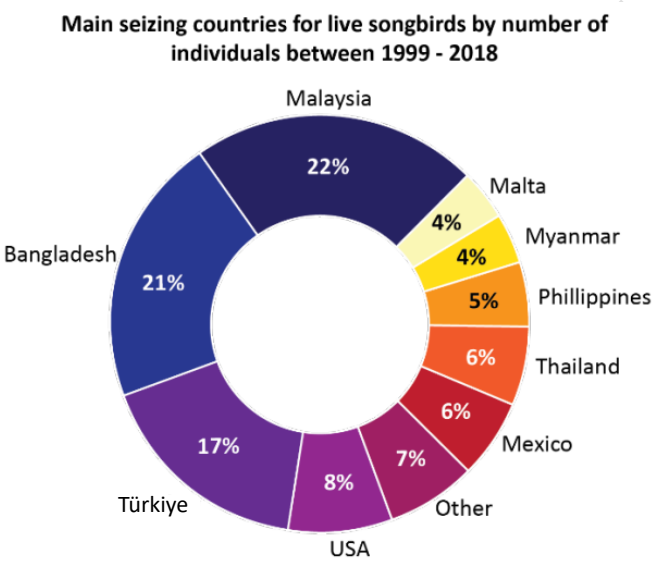

Figure 21. *Main seizing countries/regions for live songbirds by number of individuals between 1999 and 2018 as recorded in UNODC World Wise. Source: Species360 Conservation Science Alliance, 2021.*

Inevitably, information on the countries/regions of origin and destination of birds in illegal trade is fragmentary and potentially heavily biased, based largely on opportunistic seizures of illegally traded birds. The UNODC World WISE database records seizures of illegally traded wildlife, primarily CITES-listed species. Seizures of live or dead songbirds recorded in the World WISE data were mainly exported from Bangladesh and Belgium, with the most common intended destinations Syria, Malta, Italy, the United States of America and the Philippines (Juergens *et al.*, 2021). Figure 21 shows the countries/regions responsible for intercepting 92% of all seizures of live songbirds, with most of these seizures occurring due to third-party tipoffs enabling detection of shipments by local authorities. It is likely to be made biased by the intensity of enforcement effort. Whilst there is a degree of convergence between reported export and import countries/regions and the main seizing countries/regions, seizing countries/regions also include transit countries/regions and should not necessarily be regarded as either the source of the birds, or their intended final destination.

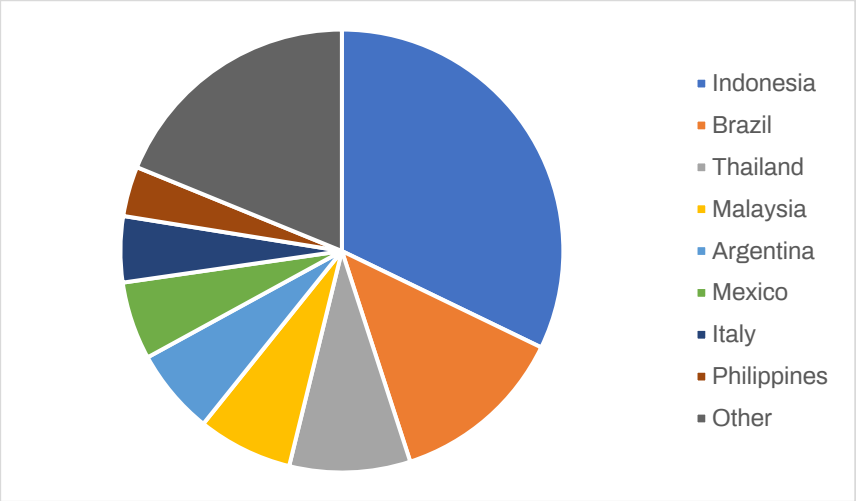

Figure 22. *Likely country/region of origin of songbirds seized in illegal trade, as recorded in the Wildlife in Trade Information System (WiTIS), 2005-2020.*

Songbirds were reported in 263 seizures recorded within the Wildlife in Trade Information System (WiTIS; see Table 1), the majority of which originated from within Southeast Asia and the Americas (Figure 22), known from other studies as hotspots of the illegal songbird trade. Smuggling attempts have been uncovered of Asian songbirds destined for Europe, the Middle East and Asia, with Singapore and Malaysia frequently used by traffickers as transit countries (Watters *et al.*, 2022).

5.3 Regional songbird trade sectors

This section briefly reviews the trade in songbirds at a regional level, focusing on the regions for which there is the most available information.

5.3.1 Songbird trade in the Asia-Pacific region

Songbirds are widely traded in Southeast Asia, principally to satisfy the widespread and growing demand for cagebirds as pets and, less extensively, for bird singing contests (Mirin and Klinck, 2021) and merit releases (Gilbert *et al.*, 2012). The extent of the songbird trade in Asia in terms of both volume and species diversity has led to it being commonly referred to as 'The Asian Songbird Crisis' (Nijman, 2010; Sykes, 2017) and prompted the establishment of the IUCN SSC Asian Songbird Trade Specialist Group (ASTSG: https://www.asiansongbirdtradesg.com). Many countries across the region are involved in some part in perpetuating the growth of this trade, feeding large-scale domestic and international markets. A recent overview of trade in wild birds identified Southeast Asia as a global hotspot of heavily traded songbird species (Donald *et al.*, 2023).

Indonesia is a major centre of the songbird trade within Asia (Marshall *et al.*, 2020b), with evidence from both market surveys and seizure data for a widespread domestic and international trade in songbirds. Perhaps most acute is the threat provided by demand on Java, where the habit of keeping songbirds has a deep cultural history (Jepson and Ladle, 2005). Marshall *et al.*(2020a) characterised birdkeepers on Java, into three profiles (in order of estimated abundance): (1) hobbyists (those who own birds chiefly as pets); (2) contestants (those who enter their birds into singing contests); and (3) breeders (those who keep and breed birds as a pastime). On Java alone these groups were estimated in 2018 to keep a total of between 66 and 84 million birds (a majority of them songbirds) (Marshall *et al.*, 2020b). Although much of the supply to satisfy this demand is met domestically, the Indonesian

populations of many songbird species are now so depleted (or even extirpated) (Eaton *et al.*, 2015), that demand can now only be met by supplementation provided by international trade. For example, many of Indonesia's native taxa of White-rumped Shama (*Kittacincla malabarica*)—a species with huge demand by all three groups of Javan birdkeepers identified by Marshall *et al.* (2020a)—are now very rare or extirpated in the wild (Wu *et al.*, 2022; Berryman, 2023) such that the supply needed for the 3 million kept on Java alone must be supplemented by trade in birds from other countries (Marshall *et al.*, 2020b). More broadly, Java's songbird trade is supplied through major markets in Indonesia, China, Taiwan, Province of China, and Viet Nam, with birds sourced from across Java, Borneo, Sumatra, Peninsular Malaysia and East Africa (e.g. Chng, Lee and Shepherd, 2016; Indraswari *et al.*, 2020; Juergens *et al.*, 2021).

Within the Greater Sundas and Wallacea bioregion, two key broad trading regions for songbirds have been identified. The first is in the west, centred around Jakarta, West Java, and the island of Sumatra, the origin of a thriving domestic trade route for songbirds destined for Jakarta and other major Javan cities (Indraswari *et al.*, 2020). Sumatra and its nearby islands are also key to the international trade, acting as a transit point for songbirds traded between Peninsular Malaysia, Singapore and Jakarta (Indraswari *et al.*, 2020). Trade routes criss-cross the seas between Sumatra, the Riau Archipelago, and Peninsular Malaysia, with thousands of Oriental Magpie-robins (*Copsychus saularis*) alone known to be traded between Malacca and Sumatra, and Johor and the Riau Archipelago (Chng *et al.*, 2021). In a single seizure in the Riau Archipelago (2017), 4,280 White-rumped Shamas (*Kittacincla malabarica*) were seized, having been trafficked from Malaysia into Indonesia, giving an indication of the scale of the trade in songbirds along this trade route (Chng *et al.*, 2021). Market surveys in Java show Peninsular Malaysia and Sumatra to be crucial to meeting the demand for songbirds on the island following the precipitous decline in local populations (Marshall *et al.*, 2020b). The second key trading region for songbirds is centred on central and eastern Indonesia. One of these is largely domestic, connecting Nusa Tenggara (Lesser Sundas) to Bali and East Java, but the other is an international trade route connecting Sarawak to Java via West Kalimantan (Indraswari *et al.*, 2020). There is evidence for trade in songbirds flowing in both directions across the Malaysia–Indonesia border in this region. In nine seizure incidents, over 2,500 Oriental Magpie-robins (*Copsychus saularis*) were intercepted between Sarawak and West Kalimantan, indicating the scale of trade in the region (Chng *et al.*, 2021). Whilst this trade is partly to meet local demand , Borneo has been identified, alongside Sumatra and Peninsular Malaysia, as a key source for songbirds traded to Java to meet the large Javanese demand for songbirds (Marshall *et al.*, 2020b).

The songbird trade in this region is also connected more broadly to continental Southeast Asia. Malaysia and Singapore are known to be key transit hubs for songbirds traded between Indonesia and mainland Southeast Asian nations, particularly Thailand and Viet Nam (Juergens *et al.*, 2021). For example, Nash (1993) and Edmunds *et al.* (2011) reported traders from Singapore buying birds from Viet Nam, as well as numerous species sold in Viet Nam being sourced from other countries in the region, including Malaysia and Indonesia. Thailand is similarly both an importer of songbirds from Indonesia (Chng *et al.*, 2021) and a transit country, for example for Chinese Hwamei (*Garrulax canorus*) being traded out of China (Juergens *et al.*, 2021).

Within mainland Asia, evidence suggests that Cambodia and Lao People's Democratic Republic do not have a strong birdkeeping culture (Eaton *et al.*, 2017), but in some regions birds (mostly native) are traded for merit releases (Gilbert *et al.*, 2012). These countries are thought to largely act as exporters of songbirds, mainly in cross-border trade with Viet Nam. Viet Nam also has extensive cross-border bird trade with China (Eaton *et al.*, 2017), with Chinese Hwamei (*Garrulax canorus*), a songbird close to extirpation in Viet Nam (Nelson and Shepherd, 2023), reported extensively in market surveys in Viet Nam's largest cities (Shepherd *et al.*, 2020; Leupen *et al.*, 2022). China is a key exporter of songbirds, not just to

Viet Nam and Indonesia but also to Myanmar (Shepherd *et al.*, 2020), with illegal trapping supplementing the trade (Kamp *et al.*, 2015). Unlike in Viet Nam and Indonesia, however, and despite high levels of domestic trade in certain songbirds such as the Yellow-breasted Bunting (*Emberiza aureola*), there is little evidence to suggest that trade in songbirds in China is supplemented by imports of wild-caught birds from elsewhere (Heim *et al.*, 2021).

Patterns of trade in South Asia are less well understood, but both Bangladesh and India are major importers of songbirds from West Africa (Alberts, 2022; Davies *et al.*, 2022). Recent seizure data from India indicated that while Psittacidae (parrots) were by far the most abundantly seized group, Estrildidae (estrildid finches) and Sturnidae (starlings, mynas and allies) also emerged as heavily traded. Myanmar and Bangladesh emerged as sources, in addition to a complex domestic network of trade (Kalra *et al.*, 2023).

In Oceania, the focus of trade in songbirds is on birds of paradise (Paradisaeidae), although little is known about volumes of trade or trade routes (Van Den Bergh, Kusters and Dietz, 2013; Juergens *et al.*, 2021). Nevertheless, there is known to be legal customary trade in skins and feathers for use in ceremonies, largely between members of the same clan or tribe. Because of poor enforcement of wildlife trade laws this is known to be augmented by significant levels of illegal trade (Van Den Bergh, Kusters and Dietz, 2013). The high trade prevalence scores (Donald *et al.*, 2023) of several birds of paradise (Figure 15) indicates significant trade in them beyond New Guinea. Indonesia and Papua New Guinea are known to export birds of paradise to largely Middle Eastern and Eastern European countries (Juergens *et al.*, 2021). There is also a 2005 record of trade in these species between the Solomon Islands and Singapore (Shepherd, Stengel and Nijman, 2012). The Solomon Islands may be a transit country for birds of paradise exported from Indonesia and Papua New Guinea on their way to markets in Southeast Asia (Shepherd, Stengel and Nijman, 2012). Despite being CITES-listed there are no records of imports of live birds of paradise into the Solomon Islands, suggesting that the import of these species is illegal.

5.3.2 Songbird trade in the Americas

The trade in songbirds in the Americas is less extensively documented than that in Southeast Asia but is nevertheless clearly significant at a global scale, as was noted by the CITES authorities for United States of America and Sri Lanka in their original submission to CITES COP18 (CoP18 Doc. 79). Like Southeast Asia, South America is a hotspot of heavily traded songbirds (Donald *et al.*, 2023). The market in songbirds for singing competitions across Latin America is particularly strong (Mirin and Klinck, 2021; Roldán-Clarà *et al.*, 2021).

The Brazilian Atlantic and dry tropical forest (the Caatinga biome) are key sources of songbirds (Alves *et al.*, 2010; Ferrari *et al.*, 2023). The Guiana Shield and surrounding region is a hotspot of songbird trade, where songbirds are known to sell for up to $10,000 for singing competitions (Neme, 2015; Watters *et al.*, 2022). In particular, the Eastern Amazonia and the Northeastern provinces of Piaui, Bahia, Paraiba and Pernambuco in Brazil are centres of demand for both wild-caught and captive bred songbirds (Alves *et al.*, 2010; De Oliveira *et al.*, 2020), with many of these birds being traded in the Guiana shield region (Suriname, French Guiana, Venezuela, and Guyana) (Verheij, 2019; Sánchez-Mercado, Cardozo-Urdaneta, Rodríguez-Clark, *et al.*, 2020; Silva *et al.*, 2022). Venezuela is a key source of songbirds, with a thriving cross-border trade in the Endangered and CITES-listed Red Siskin (*Spinus cucullatus*), for which there is already a thriving domestic trade (Sánchez-Mercado, Cardozo-Urdaneta, Moran, *et al.*, 2020). Trinidad and Tobago (Gibson, 2022), Guyana and Suriname are reported to import significant volumes of illegally trafficked birds from Venezuela, including the Red Siskin and the Large-billed Seed-finch (*Sporophila crassirostris*) (Verheij, 2019; Venezuela Investigative Unit, 2020). This latter species has been extirpated in Suriname due to decades-long systematic harvesting from the wild, fuelling illegal trade of the species, with birds being smuggled from Venezuela via Guyana and Brazil (Verheij, 2019). Songbirds are also reported to be imported

illegally into the United States of America from the Guiana Shield and Caribbean regions; the hundreds of songbirds being seized each year are estimated to represent only a small proportion of the true number of individuals being trafficked annually (USFWS, 2023).

Peru and Venezuela are the major exporters of songbirds to Brazil, with two subspecies of the Saffron Finch (*Sicalis flaveola flaveola* and *S. f. valida*) dominating trade between these countries due to their larger size, which makes them attractive for illegal finch fighting competitions (Charity and Ferreira, 2020). There is also significant domestic trade of songbirds within Brazil, with birds trafficked along federal highways from the north to urban centres of the southeastern and southern regions of the country (RENCTAS, 2001; Gomes Destro *et al.*, 2012; Ferrari *et al.*, 2023). Guyana, Suriname, Mexico and Peru have been identified as the origin of many CITES-listed species destined for the United States of America (Watters *et al.*, 2022).

The Southern Cone (Argentina, Chile, Uruguay) is another region in which songbird trade is significant, with a large number of species from the region being prevalent in trade (Donald *et al.*, 2023). Western Argentina is a source of trafficked wild-caught songbirds, with species of the Thraupidae (tanagers and allies, including the Gold-billed Saltator *Saltator aurantiirostris* and Diuca Finch *Diuca diuca*) destined for the pet trade commonly being seized (Becerra, Marinero and Borghi, 2022). The Yellow Cardinal (*Gubernatrix cristata*) is also frequently recorded in the Argentinian domestic trade (Pessino and Tittarelli, 2006), with trade cited as a factor in why the species is listed as Endangered (BirdLife International, 2023b).

5.3.3 Songbird trade in Africa

Trade in African species, particularly small, colourful seed-eaters in the families Estrildidae and Fringillidae, has historically been high, particularly in West Africa (Senegal, Guinea, Mali), and significant exports to a range of countries across the world continue to be registered (Harfoot *et al.*, 2018; Davies *et al.*, 2022). However, this trade declined greatly after the EU ban on the importation of wild birds (see section 3.1.1 above). Songbirds from East Africa have been recorded entering Southeast Asian markets (Ferrari *et al.*, 2023), and songbirds from West Africa are reported to be entering South Asian markets (Alberts, 2022). Non-CITES listed birds from Senegal and Guinea are exported to the United States of America (Watters *et al.*, 2022; Ferrari *et al.*, 2023). There is also significant domestic trade in songbirds in Sub-Saharan Africa, particularly in West Africa (Nigeria, Benin and Burkina Faso), where songbirds are the most commonly recorded taxa amongst species traded for traditional medicine (although none of the 20 most recorded individual species in the traditional medicine trade were songbirds) (Williams *et al.*, 2014).

The Maghreb region of North Africa is emerging as a global hotspot of songbird trade (Khelifa *et al.*, 2017; Louadj *et al.*, 2022). Here, species such as European Goldfinch (*Carduelis carduelis*) are being driven towards local extinction in Algeria due to demand in Algeria and Tunisia (Khelifa *et al.*, 2017). This dramatic decline in the European Goldfinch's range within Algeria has led to wide-scale smuggling of this species from neighbouring Morocco to feed demand for cagebirds (Bergin, 2019; Razkallah *et al.*, 2019).

5.3.4 Songbird trade in Europe and the Middle East

Across the whole Mediterranean region it is estimated that between 11 and 36 million birds are killed each year with 6 to 22 million of these birds killed in Middle Eastern countries around the Mediterranean (Brochet *et al.*, 2016). In absolute numbers, songbirds are the order of birds illegally killed in the highest numbers in the Mediterranean region (Brochet *et al.*, 2019). Commercial trade is a significant driver of this illegal killing, especially in the Middle East (Brochet *et al.*, 2019) and the Balkans (Brochet *et al.*, 2016), both for the pet cagebird trade

and as a delicacy. However, much of the offtake of songbirds is in the form of recreational hunting, which may not involve a trade element.

Throughout the 2000s, the main illegal hunting hotspots of songbirds in the Balkans shifted from Hungary to Bulgaria, Romania, Serbia and Montenegro. The main transit countries are Slovenia, Croatia, and Hungary from where the birds are exported to Italy where there is a significant demand for songbirds as a delicacy (TRAFFIC, 2008). Serbia is also reported to be a transit hub for songbirds smuggled into Europe from the West African nation of Guinea (Rujević *et al.*, 2023). Although there has not been extensive monitoring of trade of songbirds across this region in recent years, there is evidence to suggest that trade continues along these routes (Brochet *et al.*, 2016).

In the Middle East there is little information on the extent of trade between countries in the region, largely due to lack of monitoring. There is strong evidence of a demand for songbirds native to the region in the cagebird trades in the Palestinian Territories (Handal *et al.*, 2021), Iraq and Iran (Brochet *et al.*, 2019), but it is not clear whether this demand is supplied by domestic or international trade. There is also evidence of a flourishing trade in exotic songbirds, for example in the Palestinian Territories (Handal, Al-Shomali and Amr, 2023). Whether this trade is sourced mostly from wild or captive-bred birds is unclear, but there is evidence to suggest Middle Eastern countries such as the United Arab Emirates, Kuwait and Saudi Arabia are significant importers of songbirds from Southeast Asia, particularly Indonesia (Indraswari *et al.*, 2020; Heinrich *et al.*, 2021) and possibly also from West Africa (Davies *et al.*, 2022).

6. The sourcing of songbirds in international trade

Critical to gauging what impact international trade has on the conservation status of songbird species is understanding the extent to which songbirds in international trade are harvested from wild populations or bred in captivity. In this section, we review the available evidence regarding the extent wild-caught and captive populations supply songbirds to international trade, and assess why wild-caught birds are the biggest source of songbirds in international trade.

6.1 Trends in the sourcing of songbirds in trade

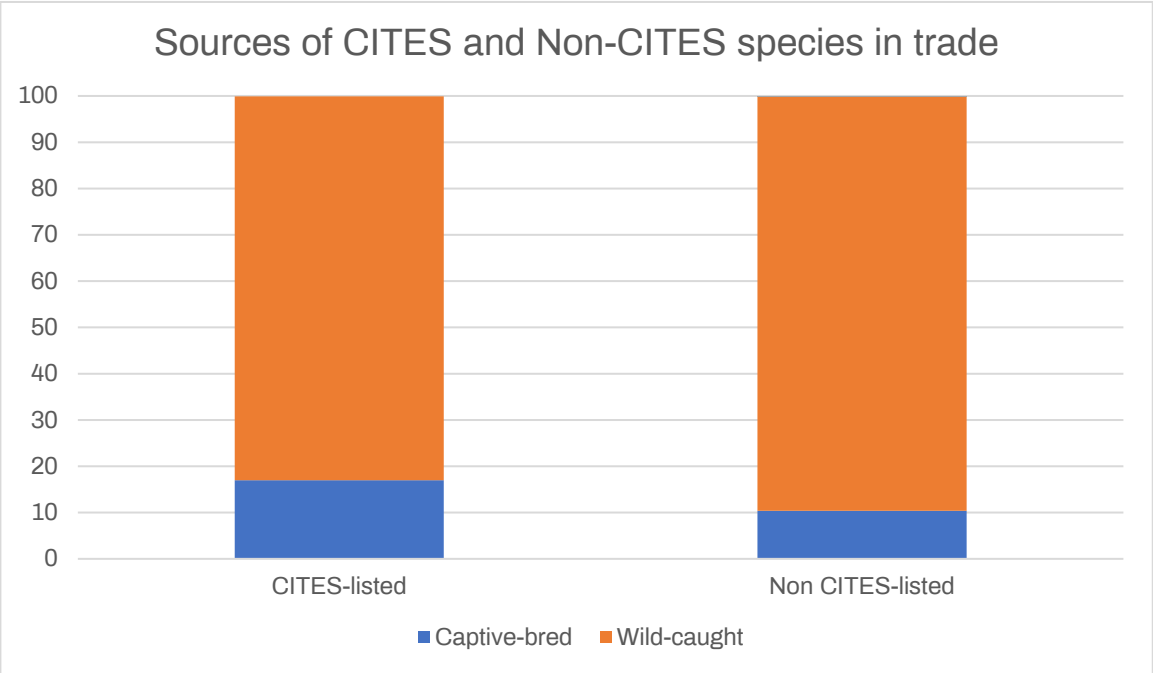

Figure 23. *Proportion of captive-bred versus wild-caught specimens in trade for CITES-listed and non-CITES listed songbirds in the SiTB. Adapted from Species360 Conservation Science Alliance, 2021a).*

The available evidence indicates that wild-caught individuals dominate the international trade in songbirds, with 89.4% of traded songbird species recorded as being primarily traded as wild-caught individuals (Juergens *et al.*, 2021) for both CITES-listed and non-listed species (Figure 23). However, amongst CITES-listed species, the numbers of wild-caught individuals have declined in relation to captive-bred individuals over time (Harfoot *et al.*, 2018). Figure 8 illustrates temporal patterns in trade in CITES-listed songbirds (excluding African species that were removed from the appendices in 2007), showing that while numbers of both wild-caught and captive-bred CITES-listed songbirds in trade increased hugely following the inclusion in the Appendices in 1997 of a small number of heavily traded species, both have fallen over time, with the decline in wild-caught birds preceding that in captive-bred birds. A similar pattern is apparent in imports of songbirds into the United States of America (Figure **9**).

Possible explanations for the apparent replacement of wild-caught birds with captive-bred birds are the greater reliability and flexibility of supply and improved quality of captive-bred birds, a growing negative perception of wild-sourced products, CITES regulation of supply of wild-sourced products to sustainable levels, and declining wild populations (Harfoot *et al.*, 2018).

Family	Species	Captive-bred origin (%)	Captive breeding effort	Region	Red List Status	CITES Appendix
Cotingidae	Long-wattled Umbrellabird (*Cephalopterus penduliger*)	100	NA	Americas	VU	III
Estrildidae	Green Avadavat (*Amandava formosa*)	100	NA	S & SE Asia	VU	II
Fringillidae	Red Siskin (*Spinus cucullatus*)	100	Normal	Americas	EN	I
Fringillidae	Yellow-faced Siskin (*Spinus yarrellii*)	100	NA	Americas	VU	II
Leiothrichidae	Red-billed Leiothrix (*Leiothrix lutea*)	100	Normal	S & SE Asia	LC	II
Leiothrichidae	Silver-eared Mesia (*Leiothrix argentauris*)	100	NA	S & SE Asia	LC	II
Paradisaeidae	King Bird-of-*paradise* (*Cicinnurus regius*)	100	NA	Oceania	LC	II
Paradisaeidae	Lesser Bird-of-paradise (*Paradisaea minor*)	100	NA	Oceania	LC	II
Paradisaeidae	Greater Bird-of-paradise (*Paradisaea apoda*)	100	NA	Oceania	LC	II
Pittidae	Javan Banded Pitta (*Hydrornis guajanus*)	100	NA	S & SE Asia	LC	II
Ploceidae	Yellow-crowned bishop (*Euplectes afer*)	100	Normal	Africa	LC	(III)
Thraupidae	Yellow Cardinal (*Gubernatrix cristata*)	100	Normal	Americas	EN	II
Estrildidae	Java Sparrow (*Padda oryzivora*)	99	Easy	S & SE Asia	EN	II
Thraupidae	Red-crested Cardinal (*Paroaria coronata*)	87	Normal	Americas	LC	II
Sturnidae	Bali Myna (*Leucopsar rothschildi*)	79	Normal	S & SE Asia	CR	I
Sturnidae	Common Hill Myna (*Gracula religiosa*)	70	NA	S & SE Asia	LC	II
Estrildidae	Bronze Mannikin (*Spermestes cucullata*)	60	Easy	Africa	LC	(III)

Table 7. *CITES-listed songbird species for which legal international trade is largely or wholly in captive-bred birds (2006-2018; adapted from Juergens* et al. *2021). In column 'CITES Appendix', '(III)' denotes species previously CITES-listed under Appendix III but no longer listed. 'NA' = not assessed.*

In the case of 17 CITES-listed songbirds, all or most of the individuals in international legal trade are of captive-bred origin (Table 7). However, the same is not necessarily true of birds in illegal trade. For example, all legal trade in Yellow Cardinal (*Gubernatrix cristata*) and Red Siskin (*Spinus cucullatus*) involved captive-bred individuals according to the CITES database, yet these species are known to be threatened by large-scale illegal trade in wild-caught individuals (Pessino and Tittarelli, 2006; Sánchez-Mercado, Cardozo-Urdaneta, Moran, et al., 2020). Therefore, even though there is an observed trend for captive-breeding contributing a greater proportion of individuals in legal trade, this may not be reflective of what is happening in reality for certain illegally traded species.

Furthermore, there is a degree of alignment between the regulatory environment at the domestic level and the prevalence of wild-caught versus captive-bred specimens. Where international trade in wild-caught species is highly restricted or prohibited, trade in captive-bred specimens prevails. As shown in the LEMIS data (Figure 9), there is now little trade in wild-caught specimens, largely due to the United States of America's strict restrictions on imports of wild-caught birds.

In most of the world, however, restrictions are less stringent, and wild-caught individuals continue to comprise a significant proportion of the trade in songbirds. Many countries permit trade in wild-caught songbirds, with some countries enabling trade in protected species where an individual has a permit or authorisation (see Section 7). Moreover, failure to effectively enforce regulations is also a key reason why wild-caught songbirds remain prevalent in trade (see Section 7).

This diversity in regulations means that in the wider trade of non-CITES listed species (both domestic and international), wild-caught individuals continue to dominate where restrictions are less stringent (Figure 10). In the international trade (including both CITES and non CITES-listed species) between 2006-2018 the United Republic of Tanzania was the main exporter of wild-caught individuals, and Taiwan, Province of China, and Cuba were the main exporters of captive-bred individuals (Species360 Conservation Science Alliance, 2021).

6.2 Captive breeding

Captive-breeding is the primary source of origin for a minority of songbird species in the CITES Appendices (Table 7). CITES compiles a register of captive-breeding operations that breed Appendix-I animal species for commercial purposes (Resolution Conf. 12.10 (Rev. CoP15)). Indonesia is the only country with a registered facility for a songbird, the Bali Myna (*Leucopsar rothschildi*). Although there are no registered facilities for the captive-breeding of the Appendix I listed Red Siskin (*Spinus cucullatus*) for the international trade, breeding of this species occurs in a number of countries, including within the European Union[11] (Sanchez-Mercado *et al.*, 2019). Information on captive-breeding facilities for non-CITES listed songbirds traded both internationally and/or domestically in dedicated facilities is currently unavailable.

[11] The European Union does not currently register captive-breeding facilities with CITES.

Captive breeding effort[12]	All assessed songbirds (%)	CITES-listed songbirds (%)
Challenging	19.1	34.8
Hard	45.0	34.8
Normal	33.0	25.5
Easy	2.9	4.7

Table 8. *Percentage of songbirds (n=1,569) categorised by captive-breeding effort (modified from Juergens* et al.*, 2021). For CITES-listed species this is derived for 43 of total 84 CITES-listed songbirds. From data in Juergens* et al. *(2021).*

The difficulty of breeding many songbirds contributes to the low percentage (c.10.5%) of them that are of mostly captive-bred origin. For 64.1% of assessed species, there is either no evidence they can be bred successfully in captivity, or breeding can only be achieved in specialised settings with considerable effort (denoted as 'challenging' and 'hard' respectively: Table 8). In many cases, the benefits of easy capture of wild songbirds and a lack of regulation at the domestic and international level outweigh the benefits of captive breeding (De Oliveira *et al.*, 2020).

Some groups of birdkeepers have expressed a preference for wild-caught versus captive-bred songbirds, believing the song quality of the former to be superior (e.g. Burivalova *et al.*, 2017; Marshall *et al.*, 2020a). However, it is unclear whether this preference is strong enough to drive the disproportionate volume of wild-caught birds observed in trade, or how this preference interacts with others. Other studies have found songbird owners exhibit no preference for the song of either wild-caught or captive-bred songbirds (Chiok *et al.*, 2022) and some have a preference for captive-bred songbirds, perceiving their singing ability to be superior (Sanchez-Mercado *et al.*, 2019; De Oliveira *et al.*, 2020; Marshall *et al*. 2020b). Since subjective preferences for singing abilities can favour both captive-bred and wild-caught individuals, it is possible that the inability of captive-breeding to meet the demand for songbirds in trade plays a greater role than song preference in why wild-caught individuals dominate trade.

For species that can be easily bred in captivity, large numbers of individuals of captive origin have been recorded in international trade. For example, 215,000 captive-bred Java Sparrows (*Padda oryzivora*), a CITES Appendix II species, were recorded in international trade between 2006 and 2018, comprising 99% of total recorded trade in this species (Juergens *et al.*, 2021). This is significant considering this species' wild population is suspected to be 1,000-2,499 mature individuals (BirdLife International, 2023a). The songbird with the highest volume of trade from captive-bred origin was the domesticated form of the Atlantic Canary (*Serinus canaria f. domestica*), with over 600,000 individuals exported to the United States of America alone between 2000 and 2014 (Juergens *et al.*, 2021).

For both the domestic and international trade, captive breeding may offer a more reliable supply, since the captive populations can avoid environmental or ecological fluctuations that can affect wild populations (Natusch and Lyons, 2014).

[12] Captive-breeding effort categories are defined as follows; "challenging" for species with no or only accidental breeding success known; "hard" for species where breeding is possible in specialised settings and with considerable effort; "normal" for species found being bred consistently when good conditions are available; and "easy" for species identified to be bred routinely in captivity without much effort. This is a preliminary assessment based on personal observations of zoo employees, private breeders, and literature such as avicultural magazines, which are cited in the SiTDB (Juergens *et al*., 2021).

6.3 Captive breeding impacts on wild populations

Captive-breeding can alleviate pressure on wild songbird populations (Marshall *et al.*, 2021), but requirements to supplement the breeding stock with wild individuals, and abuses in the permitting system, mean that captive-breeding operations can continue to affect wild populations (Charity and Ferreira, 2020; Nijman *et al.*, 2021; Species360 Conservation Science Alliance, 2021). This is largely because trade in captive-bred animals is less scrutinised and less restricted compared to trade in wild-caught animals (Janssen and Leupen, 2019).

There is also evidence for fraudulent labelling of wild-caught songbirds, such as Chinese Hwamei (*Garrulax canorus*) to circumvent CITES requirements (CITES Resolution Conf. 17.7) on trade in wild-caught individuals (Shepherd *et al.*, 2020). Purposeful misreporting of wild individuals as captive-bred is more likely for species whose wild populations remain abundant (Chinese Hwamei has a Red List status of Least Concern) and which are expensive or difficult to breed in captivity (Harfoot *et al.*, 2018).

Significant issues with quota-setting mean that mislabelling of origins creates a false impression of sustainability, masking negative impacts on wild populations and undermining the implementation of wildlife trade legislation (Nijman and Shepherd, 2009). A review of Indonesian quota-setting for offtakes and export revealed issues with unrealistic biological parameters used in calculations, lack of breeding stock at facilities, and inclusion of animals from previous years, all providing opportunities to launder wild animals (Janssen and Chng, 2018).

Captive-breeding operations often require the collection of wild-caught individuals to bolster or to found new breeding populations. In the case of Javan Pied Starling (*Gracupica jalla*), this increased pressure on the last remaining wild individuals has contributed to this species' likely extinction in the wild (Nijman *et al.*, 2021). Furthermore, many captive-breeding operations, for example for Saffron Finch (*Sicalis flaveola*) and White-rumped Shama (*Kittacincla malabrica*), routinely interbreed different subspecies. These interbred individuals, or introduced subspecies, could conceivably escape or be intentionally released in the wild, eroding the genetic lineages and genetic diversity of wild songbird populations.

7. Sustainability and legislation

For songbirds, as for all species, the impact of trade on the long-term viability of wild populations, and therefore the sustainability of the trade itself, is driven by many factors. Attributes of the supply chains themselves, such as the volume of trade and its reliance on wild populations, can affect outcomes for the species, but external influences also exist. Trapping for trade may be the sole driver of declines, but on average a species highly threatened by other pressures is likely to be more vulnerable to trade impacts than one without. Many other factors, such as geographic range, population size and trends and the factors driving them, determine the overall conservation status of any given songbird species. Regulations are developed in response to these, with a primary objective of ensuring that any trade that takes place is sustainable.

To our knowledge, no systematic review of the impact of trade on the viability of wild songbird populations has been carried out, and such a review would not be feasible as part of this study. Therefore, this section briefly introduces the main elements that such a review would need to explore and resolve, and then focuses on the regulatory frameworks that govern the legal songbird supply chain.

7.1 Unsustainable trade in songbirds

7.1.1 Examples

Examples of trade in songbirds that is unsustainable at local, national or global levels appear to be numerous. As the following cases in recent literature show, unsustainable trade can impact a wide range of wild songbird populations, and do so even when the species concerned is initially abundant.

Illegal wildlife trade can become a greater threat as species become rarer because of the role rarity has in driving up a species' desirability and price (Haken, 2011). However, even the least threatened species, i.e. those assessed as 'Least Concern' on the IUCN Red List, can be impacted by unsustainable levels of trade (Rentschlar *et al.*, 2018). In the absence of data to determine sustainable trade levels, unsustainable trade can be permitted, driving a species rapidly from Least Concern (not globally threatened) to globally threatened status (Lachs and Onate-Casado, 2019). Songbirds provide one of the most dramatic examples in the form of the Javan Pied Starling (*Gracupica jalla*), a species until comparatively recently described as one of the commonest birds in the Javan countryside, but now overexploited, with an estimated rate of take reaching 80,000 birds per year, to the point where it is now considered Critically Endangered and may even be extinct in the wild (Nijman *et al.*, 2021; van Balen and Collar, 2021).

Other songbird examples from a recent multi-taxon review of wildlife trade (Hughes *et al.*, 2023) are summarised in Table **9.** Songbird examples of unsustainable international wildlife trade. Species were chosen on the basis of being classified as globally threatened on the IUCN Red List of Threatened Species, with population trend decreasing or unknown, and 'Biological Resource Use' and 'Use and Trade' noted as a threat, with additional information on use from other sources. Adapted from Hughes et al. (2023).

9. Of the eight species these authors selected, five are resident in Southeast Asia and treated as high priority species by the IUCN SSC Asian Songbird Trade Specialist Group (ASTSG 2023); a sixth, Java Sparrow (*Padda oryzivora*) is also a Southeast Asian resident and a popular cagebird. The others comprise a Middle-Eastern finch kept as a cagebird, the Syrian Serin (*Serinus syriacus*), and a long-distance Asian migrant, Yellow-breasted Bunting (*Emberiza aureola*), trapped in large numbers for human consumption and to a lesser extent also merit releases (Gilbert *et al*., 2012).

Species	Wild range	Population (mature individuals)	Red List Status	Use	CITES listed?	Information on sustainability
Cissa thalassina Javan Green Magpie	Indonesia (Java)	50-249	CR	Pet trade Local, national	No	Trade is main threat. Previously commonly seen in bird markets, but now very rare.
Emberiza aureola Yellow-breasted Bunting	Eurasia (breeds in N, winters in S)	Unknown	CR	Food, mascots, pet trade: local, national, international	No	Trapping is main threat. Declined by 83-95%, 1980-2013 with huge numbers trapped and sold across much of East Asia; other migratory songbird species also trapped in large numbers.
Garrulax bicolor Sumatran Laughingthrush	Indonesia (Sumatra)	2,500-9,999	EN	Pet trade: local, national, international	No	Rapid, ongoing decline caused by trapping for trade, compounded by habitat loss. Local extirpation observed across much of the range with price increases and reduced availability in the market.
Garrulax rufifrons Rufous-fronted Laughingthrush	Indonesia (Java)	50-249	CR	Pet trade: local, national, international	No	Severe declines caused by heavy trapping pressure for cage bird trade. Disappeared from much of previous range, now close to extinction in the wild.
Padda oryzivora Java Sparrow	Indonesia	1,000-2,499	EN	Pet trade: national, international	Yes, App. II	Popularity as cagebird led to intense trapping, almost to extinction in wild in natural range; most in trade now captive-bred and continuing popular in global pet bird trade: >390,000 sold, 2002-2021.
Pycnonotus zeylanicus Straw-headed Bulbul	Brunei; Indonesia; Malaysia; Myanmar; Thailand; Singapore	600-1,700	CR	Pet trade: national, international	Yes, CITES App. I	Extirpated from most of its range by trade. Exploited for its singing abilities, the most sought-after member of the bulbul family. Trapping is the major threat. Decreasing in markets in Indonesia.
Serinus syriacus Syrian Serin	Syria, Egypt, Israel, Jordan, Lebanon, State of Palestine	2,500-9,999	VU	Food, pet trade Local, national, international	No	Habitat loss and hunting are main threats but species is traded as pet, found in market surveys in Palestine and Lebanon and available in European pet trade.
Zosterops flavus Javan white-eye	Indonesia	unknown	EN	Pet trade National, international	No	Rapid decline or disappearance from multiple areas across range due to trapping for cagebird trade; also affected by habitat loss.

Table 9. *Songbird examples of unsustainable international wildlife trade. Species were chosen on the basis of being classified as globally threatened on the IUCN Red List of Threatened Species, with population trend decreasing or unknown, and 'Biological Resource Use' and 'Use and Trade' noted as a threat, with additional information on use from other sources. Adapted from Hughes et al. (2023).*

7.1.2 Scientific uncertainty and the precautionary principle

For most songbird species, wild population sizes at global and local scales are not precisely known (Rosser and Mainka, 2002; Ribeiro *et al.*, 2019; Indraswari *et al.*, 2020). Accurate assessments, or sometimes any assessments, of trade volume and reliance on wild populations are often lacking (see preceding sections; also Fukushima et al., 2020). However, the overall conservation status of all songbird species, taking into account other threats as well as trade, is assessed (and reassessed at regular intervals) on the IUCN Red List of Threatened Species, but in varying degrees of detail and confidence. Consequently, Hughes *et al.* (2023) suggest that the basic data standard that should serve as a prerequisite for determining sustainable levels of trade is usually not available.

In response to scientific uncertainties, the precautionary principle is an important element of decision-making and advocacy in CITES, supported in many more specific resolutions and decisions (Cooney, 2004) and explicitly incorporated into the criteria for amendment of Appendices I and II (Resolution Conf. 9.24 (Rev. CoP17)). However, its application is not always straightforward, as decisions need to be made where scientific knowledge on species populations and their dynamics is less than would be hoped for, and even with good data the responses of ecosystems and species to management decisions are unpredictable and impacts of a decision are also influenced by social, economic and political factors. No comprehensive overview of these factors, based on species-level assessment, has ever been carried out for songbirds. Such a study is beyond the scope of this review and CITES responses including proposed amendments to the appendices need to be considered on a case-by-case basis.

7.1.3 Supply chain effects

Large-scale attributes of supply chains are associated with sustainability. Wildlife trade, as with any supply chain, has multiple actors along its length, from source to final consumer. In the international legal trade this may involve multiple source, transit, and consumer countries, and ensuring its sustainability requires cooperation and coordination (TRAFFIC, 2023). The illegal wildlife trade is also multifaceted and has highly complex supply chains that bear comparison with other international criminal operations, such as the smuggling of drugs or weapons (UNODC, 2020).

In wild-caught specimens, the distance between the source and market has been found to correlate inversely with the degree of hunting-induced population decline: i.e. remote populations are on average less vulnerable to overexploitation (Harfoot *et al.*, 2018). Some of the songbird populations most threatened by trade are those closest to large population centres, such as those in the densely populated island of Java (Marshall *et al.*, 2020b). The depletion of the local supply of songbirds in Java led to increased establishment and use of supply chains bringing birds from their wider ranges to population centres in Java, including across borders (Marshall *et al.*, 2020b), and the distance travelled is also positively associated with price at market: monetary reward increases with remoteness of the source. As a result of these distance-related factors, evidence from Indonesia showed that populations have declined because of bird trapping across an entire remoteness gradient (Harfoot *et al.*, 2018).

7.2 Legislation regulating songbird trade

7.2.1 International and national regulation

Legislative tools available to regulate trade in songbirds include international conventions working at the global level (but sometimes specific to regional and national levels), national and regional laws and regulations. International regulation with species-level detail is primarily

that agreed under CITES. Regulation of songbird trade under CITES works primarily through the permitting process, in the same way as for all listed taxa; as a foundation of the Convention, this is not described here. Specificity to songbirds is introduced by the listing of species on the appendices, which were summarised earlier (Section 2. Representation of songbirds in the CITES Appendices) and are included in Annex 1, and by Decisions 18.256 (Rev. CoP19) to 18.259 (Rev. CoP19) on *Songbird trade and conservation management*, adopted at COP 18 and renewed at COP19 (See Section 1.1).

A review of regulation across all countries is beyond the scope of this report. However, at the country as well as global level, much national regulation in wildlife trade refers to all wildlife or to specific taxa; the latter may include songbirds, but in most cases, there is no legislation explicitly regulating songbird trade as texts do not refer specifically to them. Therefore, we initially review national legislation in relation to CITES obligations and to birds, largely summarised from the CITES National Legislation Project (CITES, 2022a), under which national legislation in relation to CITES obligations is kept under review globally.

The National Legislation Project first categorised countries by the degree to which CITES can be effectively implemented through national legislation, through a set of criteria (Figure 24**Figure 24**). It shows that most countries, including major exporters of songbirds such as Indonesia, Venezuela, Brazil, and Malaysia, are advanced in the translation of CITES into their domestic legislation.

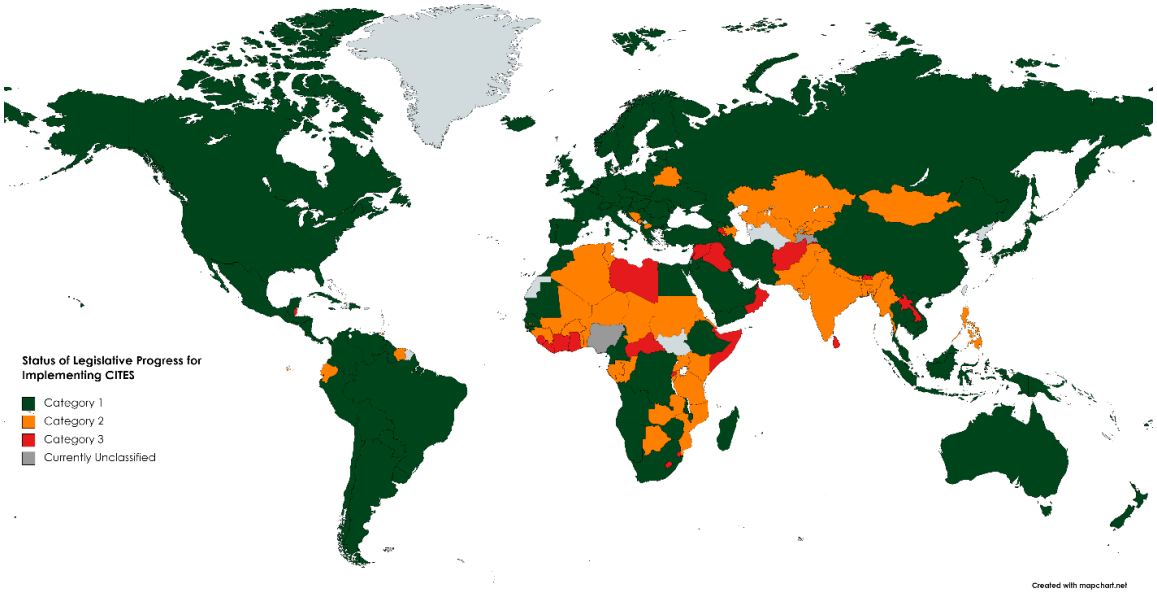

Figure 24. *Status of CITES implementation in relation to national legislation. In Category 1 countries, legislation is believed to generally meet all 4 requirements for effective implementation of CITES. In Category 2 countries, legislation is believed to generally meet 1 to 3 requirements for effective implementation of CITES. In Category 3 countries, legislation is believed to generally meet none of the requirements for effective implementation of CITES. These requirements are (i) designate at least one Management Authority and one Scientific Authority; (ii) prohibit trade in specimens in violation of the Convention; (iii) penalize such trade; and (iv) confiscate specimens illegally traded or possessed (as adapted from information in the National Legislation Project).*

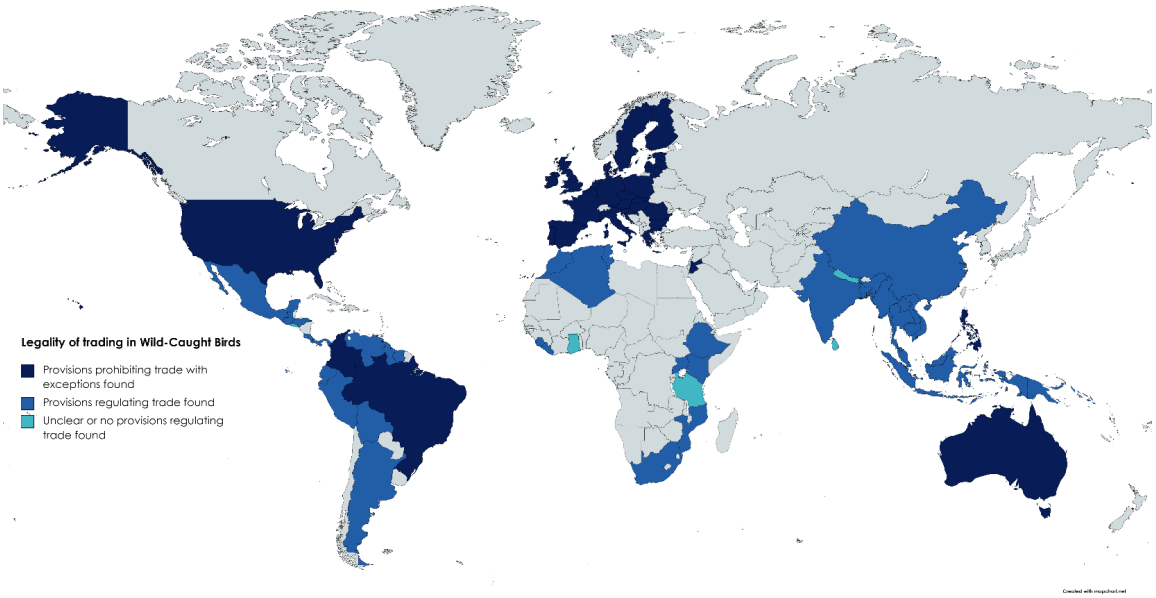

Figure 25. *Map illustrating the diversity in regulation of legal trade for a subset of CITES Parties (n=78)*

Figure 25 illustrates the legality of trading in wild-caught birds in 78 Parties; examples demonstrating the range of national regulatory approaches are given in Table 10. Example legislation for the regulation of trade in wild-caught birds. Instruments listed do not cover all regulation related to trade for the countries concerned.

Brazil, Colombia, Australia, Philippines, the United States of America and the European Union were among large and/or high-biodiversity Parties with domestic regulations that largely prohibit both domestic and international trade in all wild-caught songbirds.

Among the same 78 Parties considered by the review, the most common type of regulation (16 Parties) stipulated that permission or authorisation was required to trade in wild-caught birds, regardless of their protection status (Figure 25). Permits may be associated with a quota limit (which can be zero) set by the national CITES Scientific Authority or by the Conference of the Parties, although there is no specific requirement in the text of the Convention to establish such quotas.

National regulation of trade may be associated with national species protection legislation. Countries that permit trade in wild-caught birds vary in their regulation of trade in nationally protected species; some, such as Malaysia and Costa Rica, completely prohibit trade in such species, while others such as Gabon and Thailand permit trade in certain nationally protected or scheduled species categories (for example, Thailand refers to “breedable protected wild animals”) subject to regulation.

7.2.2 The impact of regulatory change

There is strong evidence that regulatory changes have an influence on trade in wild-caught birds. For example, a notable decline in the number of wild-sourced birds traded internationally followed both the 1992 United States Wild Bird Conservation Act and the European Union's 2005 Decision 2005/760/EC (and subsequent Decisions) to ban imports of all wild birds (Harfoot *et al.*, 2018). Whilst these regulatory changes were adopted to reduce the spread of avian diseases, they reduced the global trade in wild-caught birds by cutting off access to these two major destination markets; the consequent reduction of legal trade reported in the CITES Trade Database after the EU ban was driven by the cessation of live imports mainly of songbird species. They have been assumed to have had a positive impact on the sustainability (or population viability) of wild songbird populations, by reducing demand in those species previously exported in large numbers to the EU and United States of America.

When examined in greater detail, the consequences were found to be more complex. The bans enabled the United States and EU markets to transition to primarily importing captive stock of birds (Reino *et al.*, 2017) and also brought about a reduction in the risk of invasion by non-native species (Carrete and Tella, 2008; Cardador *et al.*, 2019). However, the global effects were less clear-cut than they at first seemed, at least in the case of the European legislation, for at least three reasons. First, 70 % of the songbird trade before 2007 was in Appendix III species de-listed (removed from the Appendix) by one country (Ghana) in that year, and so much of the reduction was accounted for by this de-listing rather than by an actual reduction in trade (Juergens 2021). Second, legal trade into the EU was replaced by illegal trade with birds known to be ‘laundered’ into the supposedly ‘captive-bred’ market (Hitchens and Blakeslee, 2020). Third, bird trade was displaced into other regions: traders of birds from Africa may have used new routes to the Middle East and South Asia (Davies *et al.*, 2022).

Party	Legislation title		Legislation summary	Quotation from legislation text
Sierra Leone	The Wildlife Conservation Act (1972)		Trade permitted, with authorisation, license, or permit	"Article 37d Notwithstanding anything in this Act contained, the Permits Minister may grant permits authorising the holder thereof to- sell animals killed or captured under the authority of a permit granted in terms of this section and to sell the meat, hides or skins obtained from such animals, but only if the Minister is satisfied that the sale of the animals or such products is in the interests of wild life conservation and the proper regulation of commercial development connected with wild life"
Malaysia	Wildlife Protection Ordinance (1998)		Trade permitted in non-protected species, with authorisation, license, or permit, no trade in protected species permitted	Article 29: Any person who hunts, kills, captures, sells, offers for sale or claims to be offering for sale, imports, exports, or is in possession of, any totally protected animal or any recognizable part or derivative thereof, or any nest thereof, except in accordance with the permission in writing of the Controller for scientific or educational purposes or for the protection and conservation of such totally protected animal, shall be guilty of an offence. No person shall breed, rear or keep any wild mammal, bird, reptile or amphibian for the purpose of trade, sale or commercial usage without a licence from the Controller"
Indonesia	Regulation on Wild Flora and Fauna exploitation (1999)		Trade prohibited in protected species	Article 18: Wild flora and fauna which can be commercialised are not protected wild flora and fauna species.
	Administrative directive of harvest or capture and distribution of specimens of wild plant and animal species (2003)	Trade prohibited unless a quota is established	Article 6 (1): Harvest or capture quota of the wild plants and animals specimens from the wild habitat is established as the maximum value in terms of the species and the number of specimens of those species which can be harvested or captured from the wild habitat."	
Thailand	Wild animal conservation and protection act, B.E.2562(2019)	Trade permitted in some protected species, with authorisation, license, or permit, no trade in other protected species permitted	Section 29: A person shall not trade in conserved wild animals, protected wild animals, carcasses of such wild animals or products from carcasses of such wild animals. Section 30: A person who intends to trade in breedable protected wild animals under section 8, controlled wild animals under section 9 of the kinds prescribed in the Notification of the Minister, carcasses of such wild animals or products from carcasses of such wild animals shall acquire a license granted by the Director-General."	
Brazil	Law N 5.197 (3 January 1967)	Provision against trade in wild-caught birds	"The trade in specimens of wild fauna and products and objects that involve hunting, chasing, destroying or catching them is prohibited."	

Party	Legislation title	Legislation summary	Quotation from legislation text
Trinidad and Tobago	Conservation of Wild Life Act Chapter 67:01 Act 16 of 1958 Conservation of Wild Life Regulations	Provision against trade in listed or protected bird species	"No person shall have in his possession…purchase, sell, offer for sale any cage bird referred to in Part III of the Second Schedule to the Act"
United States of America	The Wild Bird Conservation Act (1992)	Provision against import of exotic bird species	"The WBCA limits or prohibits imports of exotic bird species to ensure that their wild populations are not harmed by trade. It also encourages wild bird conservation programs in countries of origin by ensuring that all imports of such species into the United States of America are biologically sustainable and not detrimental to the survival of the species."

***Table 10**. Example legislation for the regulation of trade in wild-caught birds. Instruments listed do not cover all regulation related to trade for the countries concerned.*

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9. Annex 1: CITES-listed songbirds (Passeriformes)

	Appendices		
Taxa	**I**	**II**	**III**
PASSERIFORMES			
Alaudidae (Larks)			***Alauda arvensis*** (Population of Ukraine) (Ukraine)
			Galerida cristata (Population of Ukraine) (Ukraine)
			Lullula arborea (Population of Ukraine) (Ukraine)
			Melanocorypha calandra (Population of Ukraine) (Ukraine)
Atrichornithidae (Scrub birds)	***Atrichornis clamosus***		
Contigidae (Contingas)			***Cephalopterus ornatus*** (Colombia)
			Cephalopterus penduliger (Colombia)
	Cotinga maculata		
		***Rupicola* spp.**	
	Xipholena atropurpurea		
Emberizidae (Cardinals, tanagers)			***Emberiza citrinella*** (Population of Ukraine) (Ukraine)
			Emberiza hortulana (Population of Ukraine) (Ukraine)
		Gubernatrix cristata	
			Melopyrrha nigra (Cuba)
		Paroaria capitata	
		Paroaria coronata	
		Tangara fastuosa	
			Tiaris canorus (Cuba)
Estrildidae (Mannikins, waxbills)		***Amandava formosa***	
		Lonchura oryzivora	
		Poephila cincta cincta	
Fringillidae (Finches)			***Carduelis cannabina*** (Population of Ukraine) (Ukraine)
			Carduelis carduelis (Population of Ukraine) (Ukraine)
	Carduelis cucullata		
			Carduelis flammea (Population of Ukraine) (Ukraine)
			Carduelis hornemanni (Population of Ukraine) (Ukraine)

	Appendices		
Taxa	**I**	**II**	**III**
			Carduelis spinus (Population of Ukraine) (Ukraine)
		Carduelis yarrellii	
			Carpodacus erythrinus (Population of Ukraine) (Ukraine)
			Loxia curvirostra (Population of Ukraine) (Ukraine)
			Pyrrhula pyrrhula (Population of Ukraine) (Ukraine)
			Serinus serinus (Population of Ukraine) (Ukraine)
Hirundinidae (Martins)	***Pseudochelidon sirintarae***		
Icteridae (New-world blackbirds)	***Xanthopsar flavus***		
Meliphagidae (Honeyeaters)		***Lichenostomus melanops cassidix***	
Muscicapidae (Old-world flycatchers)			***Acrocephalus rodericanus*** (Mauritius)
		Copsychus malabaricus	
		Cyornis ruckii	
		Dasyornis broadbenti litoralis	
		Dasyornis longirostris	
			Erithacus rubecula (Population of Ukraine) (Ukraine)
			Ficedula parva (Population of Ukraine) (Ukraine)
		Garrulax canorus	
		Garrulax taewanus	
			Hippolais icterina (Population of Ukraine) (Ukraine)
		Leiothrix argentauris	
		Leiothrix lutea	
		Liocichla omeiensis	
			Luscinia luscinia (Population of Ukraine) (Ukraine)
			Luscinia megarhynchos (Population of Ukraine) (Ukraine)
			Luscinia svecica (Population of Ukraine) (Ukraine)
			Monticola saxatilis (Population of Ukraine) (Ukraine)
	Picathartes gymnocephalus		

	Appendices		
Taxa	**I**	**II**	**III**
	Picathartes oreas		
			Sylvia atricapilla (Population of Ukraine) (Ukraine)
			Sylvia borin (Population of Ukraine) (Ukraine)
			Sylvia curruca (Population of Ukraine) (Ukraine)
			Sylvia nisoria (Population of Ukraine) (Ukraine)
			Terpsiphone bourbonnensis (Mauritius)
			Turdus merula (Population of Ukraine) (Ukraine)
			Turdus philomelos (Population of Ukraine) (Ukraine)
Oriolidae (Orioles)			***Oriolus oriolus*** (Population of Ukraine) (Ukraine)
Paradisaeidae (Birds of Paradise)		**Paradisaeidae spp.**	
Paridae (Tits)			***Parus ater*** (Population of Ukraine) (Ukraine)
Pittidae (Pittas)		***Pitta guajana***	
	Pitta gurneyi		
	Pitta kochi		
		Pitta nympha	
Pycnonotidae (Bulbuls)	***Pycnonotus zeylanicus*** (*Entry into effect delayed by 12 months, i.e. until 25 November 2023)*		
		Pycnonotus zeylanicus (*To be deleted on 25 November 2023)*	
Sturnidae (Mynas, starlings)		***Gracula religiosa***	
	Leucopsar rothschildi		
Troglodytidae (Wrens)			***Troglodytes troglodytes*** (Population of Ukraine) (Ukraine)
Zosteropidae (White-eyes)	***Zosterops albogularis***		

10. Annex 2: Single species studies data on market surveys, household surveys, seizures and confiscations

This table includes data on all records of individuals (above 100) as recorded in market surveys, household surveys, seizures, and confiscations from the literature search.

Species	Source	Time Period	No. Individuals recorded	Reference
Acridotheres melanopterus	Market survey	2015-2018	1253	Nijman *et al.*, 2018
	Market survey	NA	105	Nijman *et al.*, 2017
Carduelis carduelis	Household surveys; seizures	2016; 2008-2015	21,086 (2517; 18,569)	Khelifa *et al.*, 2017
Chloropsis sonnerati	Market surveys; seizures	June- July 2015	3,008	Chng, Eaton and Miller, 2017
Cophyscus malabaricus	Seizures	2008-2018	15480	Leupen and Shepherd, 2018
	Household surveys		294	Marshall *et al.*, 2020a
Copsychus saularis	Household surveys; Seizures	2015-2020	28412 (1462;26950)	Chng, Eaton and Miller, 2017
	Household surveys	2018	186	Marshall *et al.*, 2020a
Coryphospingus cucullatus	Seizures	1998-2000	158	Ferreira and Glock, 2004
	Seizures	2003-2008	119	Silva, 2016
Cyanoloxia brissonii	Seizures	2012-2015	2341	Reis *et al.*, 2017
	Seizures	2011	654	Silva, 2016
	Seizures	2012-2016	404	Souza, 2014
	Seizures	1999-2003	247	Morita, 2009
	Seizures	2011	221	Freitas *et al.*, 2015
	Seizures	2008-2010	207	Martins-Ferreira and Glock, 2006
	Seizures	2008	159	Pagano *et al.*, 2009
	Seizures	1997-2005	135	Neto, 2018
	Seizures	2003-2005	119	Bastos *et al.*, 2008
Emberiza aureola	Seizures/ confiscations	2000-2013	799,477	Kamp *et al.*, 2015

	Seizures	2015-2019	25338	Heim *et al.*, 2021
Garrulax bicolor	Market surveys	1997-2008	3422	Shepherd, 2010
	Market surveys	2015-2016	2610	Bušina, Pasaribu and Kouba, 2018
Garrulax canorus	Market surveys	1997-2008	643	Shepherd, 2010
	Market surveys	2014-2015	157	Chng, Eaton and Miller, 2017
Garrulax chinensis	Market surveys	1997-2008	2525	Shepherd, 2010
Garrulax lugubris	Market surveys	1997-2008	101	Shepherd, 2010
Garrulax palliatus	Market surveys	1991-2020	5821	Leupen *et al.*, 2020
	Market surveys	1997-2008	2359	Shepherd, 2010
	Market surveys	2014-2015	215	Chng, Eaton and Miller, 2017
Gnorimopsar chopi	Seizures	2008-2010	3386	Reis *et al.*, 2017
	Seizures	2003-2005	882	Bastos *et al.*, 2008
	Seizures	2003-2005	370	Souza, 2014
	Seizures	1999-2012	290	Gogliath *et al.*, 2010
	Seizures	2008-2014	188	Freitas *et al.*, 2015
	Seizures	1999-2003	175	Morita, 2009
	Seizures	2011	110	Neto, 2018
Gracupica jalla	Market surveys	2014-2020	24358	Nijman *et al.*, 2021
	Household surveys	2018	125	Marshall *et al.*, 2020a
Laniellus albonotatus	Market surveys	2016-2020	216	Nijman *et al.*, 2021
Paroaria coronata	Seizures	2003-2008	1088	Martins-Ferreira and Glock, 2006
	Seizures	1998-2002	377	Hundertmarck, 2004
	Seizures	1998-2000	122	Araujo *et al.*, 2010
Paroaria dominicana	Seizures	2006-2007	1712	Reis *et al.*, 2017
	Seizures	2003-2005	886	Silva, 2016
	Seizures	2006-2010	770	Mello, 2016
	Seizures	2012-2015	214	Pagano *et al.*, 2009

	Seizures	2006-2010	171	Bastos *et al.*, 2008
	Seizures	2003-2008	159	Morita, 2009
Pitangus sulphuratus	Seizures	1998-2000	386	Morita, 2009
Pterorhinus mitratus*	Market surveys	1997-2008	1843	Shepherd, 2010
	Market surveys	2014-2015	106	Shepherd, Eaton and Chng, 2016
Pycnonotus bimaculatus	Market surveys	Oct 2018- Jun 2019	1751	Leupen *et al.*, 2020
Pycnonotus goiavier	Household surveys	2018	208	Marshall *et al.*, 2020a
Pycnonotus jocosus	Seizures	2007-2010	28139	Techachoochert and Round, 2013
Saltator similis	Seizures	2010-2017	10098	Reis *et al.*, 2017
	Seizures	2014-2016	3486	Mello, 2016
	Seizures	2003-2008	1975	Souza, 2014
	Seizures	1998-2002	1315	Freitas *et al.*, 2015
	Seizures	2012-2015	1165	Anastacio, 2017
	Seizures	2006-2010	959	Neto, 2018
	Seizures	2002-2004	361	Morita, 2009
	Seizures	2011	364	Gogliath *et al.*, 2010
	Seizures	1998-2002	349	Silva, 2016
	Seizures	2002-2004	340	Viana and Zocche, 2013
	Seizures	2002-2004	303	Nunes, Barreto and Franco, 2012
	Seizures	2006-2007	190	Morita, 2009
	Seizures	2002-2004	136	Medeiros, 2014
Sicalis flaveola	Seizures	2011	16514	Reis *et al.*, 2017
	Seizures	1998-2002	6932	Bastos *et al.*, 2008
	Seizures	2008	3907	Mello, 2016
	Seizures	2003-2005	3480	Silva, 2016
	Seizures	2012-2014	2114	Souza, 2014

	Seizures	1999-2003	1359	Morita, 2009
	Seizures	1998-2000	1325	Freitas *et al.*, 2015
	Seizures	2012-2014	977	Anastacio, 2017
	Seizures	2006-2007	845	Neto, 2018
	Seizures	1998-2000	586	Ferreira and Glock, 2004
	Seizures	2002-2004	465	Gogliath *et al.*, 2010
	Seizures	1998-2000	227	Nunes, Barreto and Franco, 2012
	Seizures	2012-2014	212	Pagano *et al.*, 2009
	Seizures	1999-2002	186	Hundertmarck, 2004
	Seizures	2004-2011	157	Viana and Zocche, 2013
	Seizures	2011	153	Matias, Oliveira and Rodrigues, 2012
Spinus cucullatus	Seizures	NA	1113	Sanchez-Mercado *et al.*, 2019
Spinus magellanicus	Seizures	2012-2014	2158	Reis *et al.*, 2017
	Seizures	2004-2011	169	Anastacio, 2017
	Seizures	1998-2000	130	Ferreira and Glock, 2004
	Seizures	2014-2016	115	Neto, 2018
Sporophila albogularis	Seizures	1998-2000	646	Silva, 2016
Sporophila albogularis	Seizures	2006-2010	227	Pagano *et al.*, 2009
Sporophila angolensis	Seizures	2011	2030	Mello, 2016
	Seizures	2003-2008	1901	Reis *et al.*, 2017
	Seizures	2011	1836	Bastos *et al.*, 2008
	Seizures	1998-2002	175	Nunes, Barreto and Franco, 2012
	Seizures	2012-2016	147	Neto, 2018
	Seizures	2012-2014	111	Silva, 2016
	Seizures	2003-2008	108	Freitas *et al.*, 2015
Sporophila bouvreuil	Seizures	2004-2011	135	Pagano *et al.*, 2009
Sporophila caerulescens	Seizures	2008-2014	12128	Reis *et al.*, 2017

	Seizures	2006-2010	4549	Mello, 2016
	Seizures	2012-2015	917	Neto, 2018
	Seizures	2003-2008	382	Morita, 2009
	Seizures	1999-2012	826	Souza, 2014
	Seizures	2008	454	Anastacio, 2017
	Seizures	1997-2005	454	Freitas *et al.*, 2015
	Seizures	1998-2002	405	Gogliath *et al.*, 2010
	Seizures	2011	365	Viana and Zocche, 2013
	Seizures	2003-2005	235	Nunes, Barreto and Franco, 2012
	Seizures	2011	221	Matias, Oliveira and Rodrigues, 2012
	Seizures	2011	150	Medeiros, 2014
	Seizures	1998-2000	143	Ferreira and Glock, 2004
Sporophila frontalis	Seizures	2012-2015	4520	Mello, 2016
	Seizures	1998-2002	335	Morita, 2009
	Seizures	2018	135	Nunes, Barreto and Franco, 2012
	Seizures	2011	133	Matias, Oliveira and Rodrigues, 2012
Sporophila lineola	Seizures	2018	2932	Reis *et al.*, 2017
	Seizures	2008	304	Souza, 2014
	Seizures	2006-2010	184	(de Moura *et al.*, 2012)
	Seizures	2012-2014	184	Neto, 2018
	Seizures	2006-2007	100	Freitas *et al.*, 2015
Sporophila nigricollis	Seizures	2012-2014	2500	Silva, 2016
	Seizures	2003-2005	1109	Bastos *et al.*, 2008
	Seizures	2003-2005	733	Mello, 2016
	Seizures	2006-2010	710	Freitas *et al.*, 2015
	Seizures	2011	526	Bastos *et al.*, 2008

	Seizures	2018	269	Pagano *et al.*, 2009
Stephanophorus diadematus	Seizures	1998-2000	109	Ferreira and Glock, 2004
Tangara sayaca	Seizures	2003-2008	184	Morita, 2009
Turdus leucomelas	Seizures	2011	265	Souza, 2014
	Seizures	2011	107	Neto, 2018
Turdus rufiventris	Seizures	2004-2011	1912	Reis *et al* 2017
	Seizures	2003-2008	668	Morita, 2009
	Seizures	1998-2000	202	Bastos *et al.*, 2008
	Seizures	2018	105	Silva, 2016
	Seizures	2002-2004	101	Neto, 2018
Volatinia jacarina	Seizures	2012-2016	2008	Mello, 2016
Zonotrichia capensis	Seizures	2012-2016	1032	Mello, 2016
	Seizures	1998-2000	521	Souza, 2014
	Seizures	2014-2008	241	Freitas *et al.*, 2015