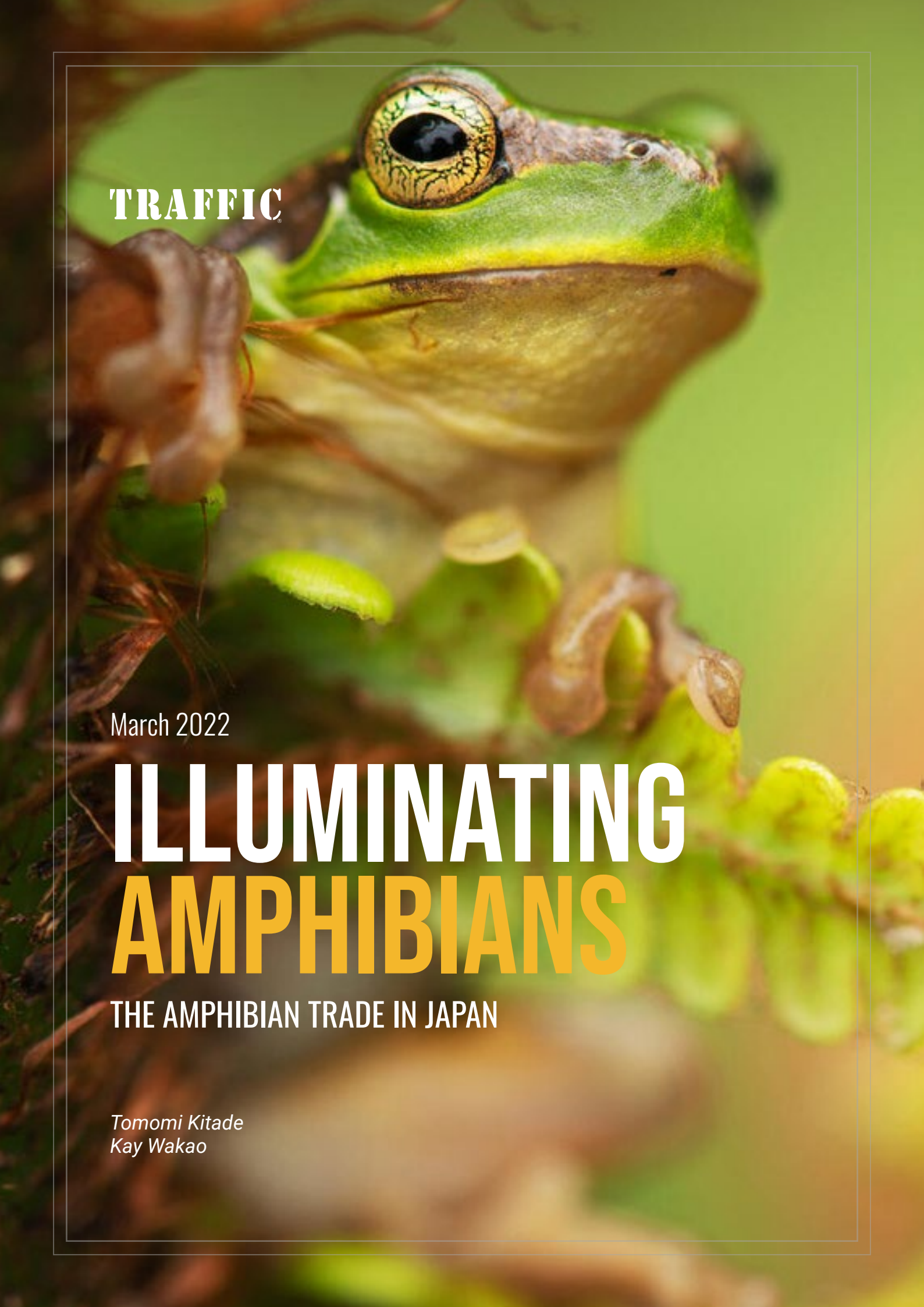

TRAFFIC

March 2022

ILLUMINATING AMPHIBIANS

THE AMPHIBIAN TRADE IN JAPAN

Tomomi Kitade
Kay Wakao

TRAFFIC REPORT

ABOUT US

TRAFFIC is a leading non-governmental organisation working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

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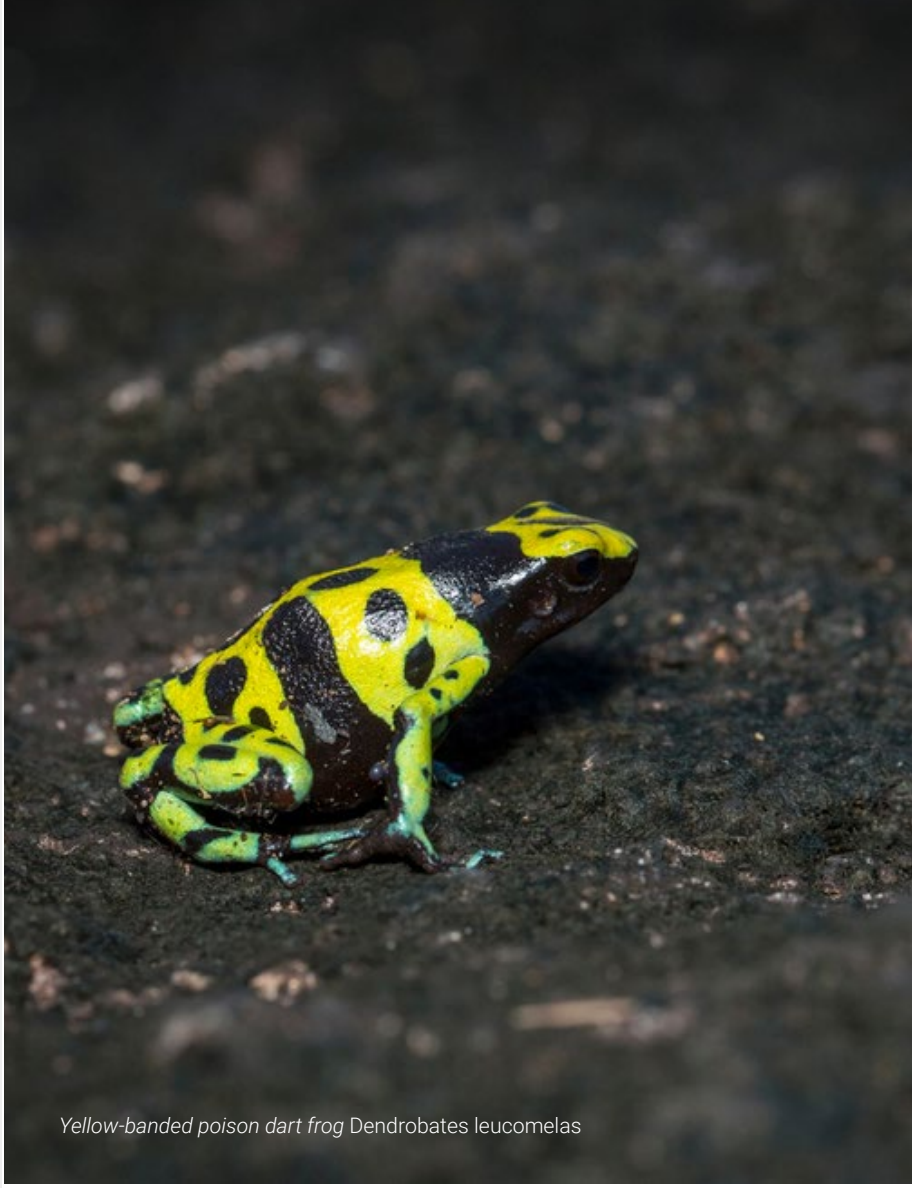

Yellow-banded poison dart frog Dendrobates leucomelas

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CONTENTS

EXECUTIVE SUMMARY

REDUCING THE IMPACT OF THE UNREGULATED PET TRADE IS AN URGENT PRIORITY FOR THE GLOBAL CONSERVATION OF AMPHIBIANS.

This study focused on Japan as a prime consumer and source country of amphibians to identify some of the high-risk taxa likely impacted by the pet trade. Characterisation of the Japanese market using import records suggested that the sourcing of live amphibians directly from range countries was increasing. Imports to Japan from Europe, Latin America, Africa, and Asia were all growing, with Nicaragua the top exporter in recent years.

at least 230 species and 25 subspecies of amphibians were offered for sale in Japan

Rapid surveys of both physical and online markets covering the period January 2020 to April 2021 identified at least 230 species and 25 subspecies of amphibians offered for sale in Japan. Of these, 81% were not listed in the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), while one in four species was of conservation concern (listed in the IUCN Red List in one of the following categories: Critically Endangered (CR)/Endangered (EN)/Vulnerable (VU)/Near Threatened (NT)).

There were indications—either from their labelling or in the accompanying online postings—that wild-caught (WC) specimens were traded in at least 27% of the species/subspecies observed. Some 39 species/subspecies observed in domestic markets were native to Japan, with at least 22 of them described as being WC, suggesting widespread sourcing of native species from the wild. Furthermore, an online search of selected sites in Europe and the USA identified at least three newt species endemic to Japan of conservation concern in trade.

The findings of this study highlight the need for urgent actions at multiple levels to address the footprint of the global pet trade on amphibians. Regulation of international trade through CITES measures should be mobilised effectively, while national and local level measures and private sector responses are also encouraged. Recommendations from this study highlight some of the high-risk taxa that merit immediate attention.

Black-spotted Rock frog Staurois natator

RECOMMENDATIONS

CONSERVATION ACTIONS TO TARGET TAXA MOST AT RISK FROM INTERNATIONAL PET TRADE

The findings of this study complement those from earlier assessments in other consumer countries, including the USA and Germany[1,2], to help inform governments and other relevant parties to target conservation actions on those amphibian taxa considered most at risk from the international pet trade and in Japan, both as a consumer and source country.

CONSIDER FURTHER CONSERVATION MEASURES INCLUDING INTERNATIONAL TRADE

For trade concerning high-risk taxa found in the Japanese market:

Range states and other concerned countries should review the lists of high-risk taxa identified both in this study and previous assessments and consider the need for further conservation measures, particularly for those species that lack adequate international trade regulation under CITES.

This study identified the following genera or higher-level taxa as popular in the pet trade and therefore likely impacted by it: South American horned frogs (*Ceratophrys* spp. and *Chacophrys pierottii*), fire salamanders (*Salamandra* spp.), mole salamanders (*Ambystoma* spp.), fire-bellied newts (*Cynops* spp.), glass frogs (Centrolenidae), and bug-eyed frogs (*Theloderma* spp.).

Table 4 (page 21) includes a list of all the species considered by IUCN as threatened with extinction and found for sale in Japan during this study, while Table 7 (page 28) lists all the species non-native to Japan found for sale whose populations are believed to be in decline. Those species native to Japan in this category are listed in Table 8 (page 29).

INTRODUCE LEGAL PROTECTIONS FOR NATIVE SPECIES

For trade concerning Japanese native/endemic species

The Ministry of the Environment of Japan (MOE) should consider submitting a proposal to list the Sword-tailed Newt *Cynops ensicauda* in Appendix II of CITES.

The MOE and relevant local government departments should consider introducing legal protection for the Sword-tailed Newt and other native/endemic species likely at risk from wild sourcing, including various Japanese salamanders (*Hynobius* spp. and *Onychodactylus* spp.).

The MOE should monitor the international trade in Japanese native/endemic amphibians to assess which taxa may merit regulation of their international trade through CITES (together with the need for any national-level protection measures).

IMPROVE THE ACCOUNTABILITY OF BUSINESSES TRADING IN LIVE AMPHIBIANS

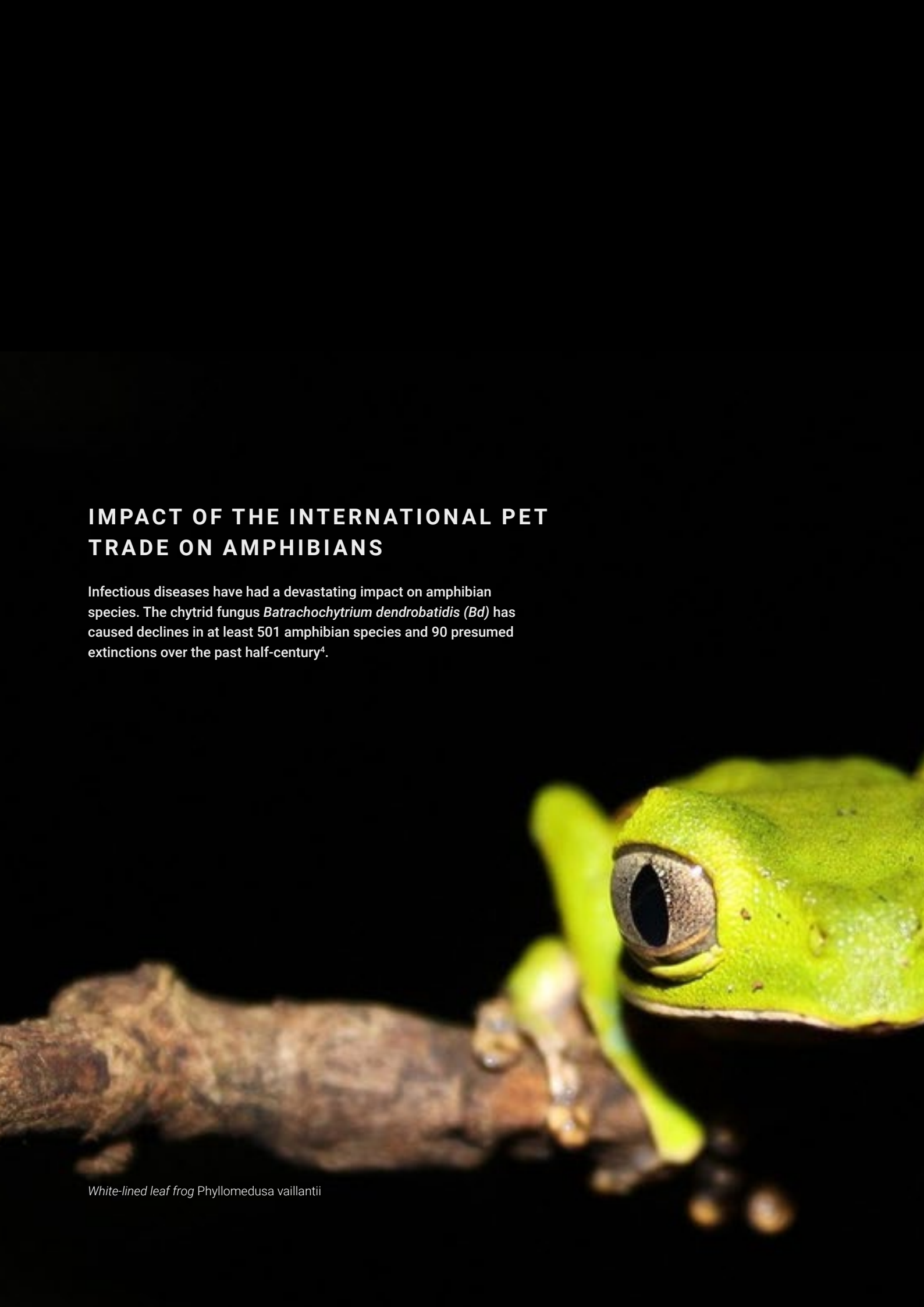
For reducing the negative impact of the Japanese market

The MOE should consider the merits of extending the coverage of the Act on Welfare and Management of Animals, which imposes various requirements on registered businesses trading in mammals, birds and reptiles, to amphibians.

Businesses trading in live amphibians, including e-commerce companies offering sales platforms, should carefully review their supply chains and discontinue the sourcing/sales of any species or specimens for which legality, sustainability and traceability cannot be verified and proven to consumers.

IMPACT OF THE INTERNATIONAL PET TRADE ON AMPHIBIANS

Infectious diseases have had a devastating impact on amphibian species. The chytrid fungus *Batrachochytrium dendrobatidis (Bd)* has caused declines in at least 501 amphibian species and 90 presumed extinctions over the past half-century[4].



White-lined leaf frog Phyllomedusa vaillantii

INTRODUCTION

newly-discovered species can appear in the pet market within months of scientific description

The recent outbreak of another chytrid fungus, *Batrachochytrium salamandrivorans (Bsal)*, has led to the decimation of Fire Salamander *Salamandra salamandra* populations in Europe, including a 99.9% decline within seven years in the Netherlands[5]. These fungi, both believed to have originated in Asia, spread rapidly, largely through the commercial international amphibian pet trade[4,6]. In response to the *Bsal* outbreak, the USA prohibited the import and interstate transport of about 201 salamander species in 2016[7], while the EU introduced health certificate requirements for salamanders in 2018 (E.U. 2018/320)[8].

In 2021 TRAFFIC produced a list of high-risk amphibian species currently not listed in CITES

Direct exploitation, especially for the international pet trade, is another serious threat to amphibians[9]. The international pet markets for amphibians are North America, Europe and other developed countries such as Japan, where there is a strong appetite for rare species from across the world[9,10]. Evidence suggests newly discovered species can appear in the pet market within one to three years or sometimes, even within a few months following their formal scientific description[11]. Despite the crisis facing amphibians from various threats, their international commercial trade is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) for only about 201 species—roughly 2.4% of all known amphibian species.

Global trade data for amphibian species not listed in CITES is unavailable due to the absence of standard customs codes. This makes it challenging to assess the extent of the global trade in amphibian species, let alone monitor the trade at a species-level[1]. Direct market observations are therefore a critical source of information on species in trade[2,3]. The first Global Amphibian Assessment found at least 278 amphibian species in the pet trade with a high likelihood of many more species regularly entering the trade[9]. An extensive survey of the German pet market in 2018–2019 recorded 352 amphibian species[2]. A systematic review of literature and species-level import data collected by the U.S. Fish and Wildlife Service (USFWS) Law Enforcement Management Information System (LEMIS) identified 443 amphibian species in the pet trade from 1971 to 2018[14].

An earlier analysis of LEMIS data by TRAFFIC found at least 267 non-CITES listed amphibian species were imported live to the USA for commercial purposes between 2008–2018 and that the unregulated international trade in live amphibians amounted to millions of individuals each year[1]. The majority of such trade is believed to comprise wild-caught individuals, posing a significant concern for wild populations[1,9]. Following the LEMIS data analysis and in conjunction with market observations from other countries and the IUCN Red List, TRAFFIC earlier produced a list of high-risk amphibian species currently not listed in CITES[1].

JAPAN: CONSUMER AND SOURCE COUNTRY

JAPAN HAS ONE OF THE LARGEST EXOTIC PET MARKETS IN THE WORLD[15]

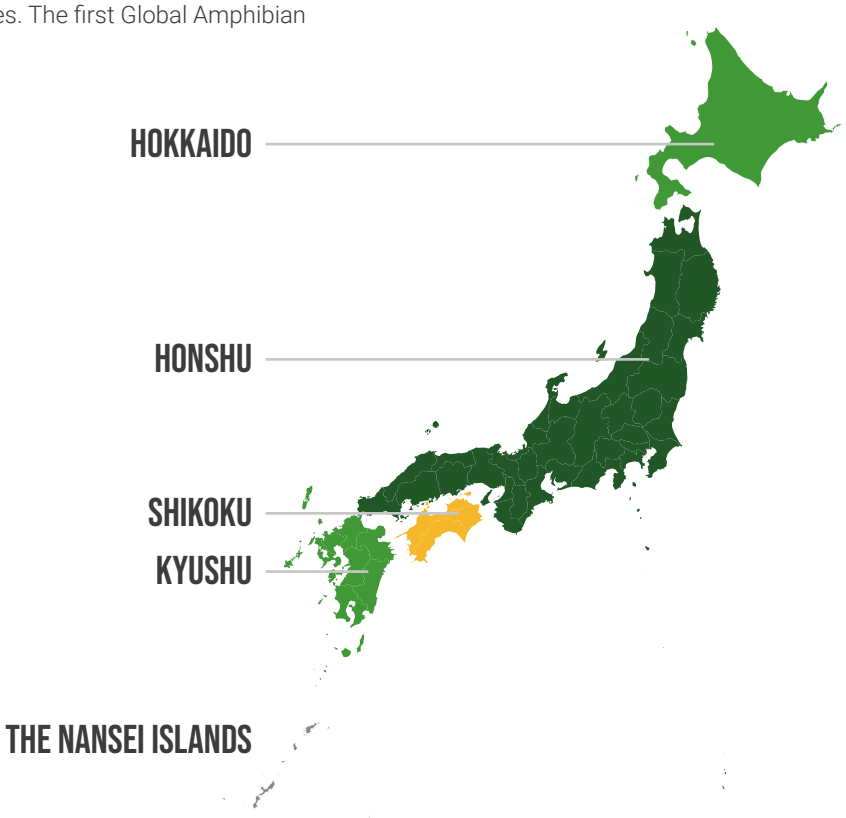
Although no dedicated market survey had been conducted for amphibians prior to this study, Japan was the second-largest importer of CITES-listed live amphibians in 2014–2018, after the USA[16].

Previous studies on reptiles and otters in the Japanese market have raised concerns about the country's lax domestic trade regulations, allowing illegally sourced animals to be sold legally without consequence[15,17]. Furthermore, a review of seizures and crime cases uncovered a wide range of wildlife species being smuggled into Japan's domestic pet market, with the frequent involvement of pet traders and businesses[18]. The regulations covering non-native amphibians in the domestic market are known to be especially limited (see Legislation).

Japan is also a source country for many amphibian species. The first Global Amphibian Assessment found up to 80% of amphibian species in Japan were endemic to the country[9]. Although the taxonomy is evolving, according to the Herpetological Society of Japan,[19] there are currently some 95 native amphibian species in Japan with some 66 species listed in Japan's National Red List 2020[i]. Japan is a particular centre of diversity for small Asian salamanders (family Hynobiidae)[9,21]. Furthermore, the Nansei Islands in southwestern Japan are famous for their high levels of endemism, including their herpetofauna[22]. An earlier study found 55% of the 67 reptile and amphibian species/subspecies endemic to the Nansei Islands were traded in domestic and/or international markets[23]. International trade of Japanese amphibians also has important implications for the conservation of amphibians globally as the *Bsal* strain of chytrid fungus has been found in several wild host species in Japan[24].

Japan was the second-largest importer of CITES-listed live amphibians in 2014–2018

MAP OF JAPAN AND REGIONS



[i] Japan's National Red List species are listed in categories equivalent to Critically Endangered (CR)/Endangered (EN)/Vulnerable (VU)/Near Threatened (NT) in the IUCN Red List

AIM OF THE STUDY

This Japan-focused study aimed to identify the high-risk amphibian taxa likely impacted by the pet trade. The role of Japan as a consumer country was assessed through domestic market surveys while the country's role as a source country was examined through surveys of native Japanese amphibians found in both domestic and some international marketplaces. Various rapid survey techniques were employed to gauge the extent of the trade and the range of species found in it. The scale of international trade was assessed through an analysis of Japan's import data. This study's findings and recommendations should complement those of earlier assessments of the international amphibian trade and provide further impetus for the much-needed conservation interventions for amphibians at both national and international levels.

LEGISLATION

Japan regulates imports and exports of CITES-listed species through the Customs Act and the Foreign Exchange and Foreign Trade Act. The Invasive Alien Species Act prohibits the import of designated non-native species deemed harmful to ecosystems, human safety, and primary industries, and covers 15 amphibian species as of October 2021[25]. The Japanese Giant Salamander *Andrias japonicus* (Appendix I) and the Anderson's Crocodile Newt *Echinotriton andersoni* (Appendix III since February 2021), the latter endemic to the Nansei Islands, are the only native Japanese amphibian species listed in the CITES Appendices[26].

Regulations regarding the domestic trade of amphibians are currently limited. The Act on the Conservation of Endangered Species of Wild Fauna and Flora (ACES) regulates the domestic trade of species listed in CITES Appendix I and designated Nationally Endangered species. As of January 2022, amphibian species covered by ACES included 24 CITES Appendix I-listed species and 40 Nationally Endangered species, of which 26 (mostly *Hynobius* spp.) were designated in January 2022, after this survey had been conducted (Table 1)[12,27].

Although the capture, trade (including non-commercial), advertising and import/export of designated Nationally Endangered species are prohibited, currently 24 species of Japanese salamanders are classified as second class Nationally Endangered species; a category introduced in 2017, which permits their non-commercial capture and trade.

The Act on Protection of Cultural Properties further protects the Japanese Giant Salamander as a special national monument. Other amphibian species are also protected at the prefectural or municipal levels through local ordinances. However, amphibians along with fish and invertebrates are excluded from the scope of regulations under the Act on Welfare and Management of Animals, meaning that businesses dealing in live amphibians are exempt from registration or other legal obligations.

TABLE 1

List of Nationally Endangered amphibians with the date they came under ACES and their conservation status as designated by IUCN and the Ministry of the Environment of Japan (MOE).

SPECIES NAME	COMMON NAME	YEAR AND MONTH	IUCN RED LIST 2021	MOE RED LIST 2020
Ranidae				
Babina holst	Holst's Frog	2016 March	EN	EN
Babina subaspera	Otton Frog	2016 March	EN	EN
Limnonectes namiyei	Namie's Frog	2016 March	EN	EN
Odorrana ishikawae	Okinawa Ishikawa's Frog	2016 March	EN	EN
Odorrana splendida	Amami Oshima Frog	2016 March	EN	EN
Odorrana utsunomiyaorum	Utsunomiya's Tip-nosed Frog	2019 February	EN	EN
Hynobiidae				
Hynobius abei	Abe's Salamander	1995 April	EN	CR
Hynobius amakusaensi	Amakusa-sanshouo	2015 December	CR	CR
Hynobius osumiensis	Osumi-sanshouo	2015 December	EN	EN
Hynobius shinichisatoi	Sobo-sanshouo	2015 December	EN	EN
Hynobius tokyoensis[1]	Tokyo Salamander	2020 February	VU	VU
Hynobius tosashimizuensis	Tosashimizu-sanshouo	2019 February	CR	CR
Onychodactylus tsukubaensis	Tsukuba Clawed Salamander	2015 December	CR	CR
An additional 26 salamander species[2] were designated in January 2022				
Salamandridae				
Echinotriton andersoni	Anderson's Crocodile Newt	2016 March	VU	VU

[1] *Hynobius tokyoensis* is listed as a second class Nationally Endangered species.

[2] The following additional species were designated in January 2022 (second class Nationally Endangered species are underlined):
Hynobius abuensis, H. akinesis, H. bakan, H. boulengeri, H. dunni, H. fossigenus, H. guttatus, H. hidamontanus, H. ikioi, H. iwami, H. katoi, H. kuishiensis, H. kunibiki, H. naevius, H. nebulosus, H. okiensis, H. oyamai, H. sematonotos, H. setoi, H. setouchi, H. stejnegeri, H. tsurugiensis, H. utsunomiyaorum, H. vandenburghi, Onychodactylus kinneburi, Salamandrella keyserlingii
CR = Critically Endangered; EN = Endangered; VU = Vulnerable

METHODOLOGY

This study carried out a rapid assessment of Japan's role as both a consumer and source country in the amphibian trade using a range of data analysis and online and physical market surveys as outlined in Table 2.

TABLE 2

Approaches used to assess Japan's role as a consumer and source country in the amphibian trade

TYPES OF DATA/SURVEY	1) JAPAN AS CONSUMER COUNTRY	2) JAPAN AS SOURCE COUNTRY
Japan Customs Import Data Analysis	x	
Market Surveys in Japan		
Physical Surveys of Major Fairs	x	
Specialised Sellers' Websites	x	
E-commerce Platforms	x	
Online Searches for Species Native to Japan		x
Online Survey of Japanese Endemic Species in Europe and the USA		x

JAPAN CUSTOMS IMPORT DATA ANALYSIS

Japan uses HS customs codes for the import of live amphibians recorded under 0106.90 which is designated for "live animals other than mammals, reptiles, birds and insects", whereby Anura (0106.90-011), Caudata (0106.90-012), and others (0106.90-019) are classified separately. The data for these codes for the period 2005–2020 were downloaded from the Japan Customs website. Note that consignments valued as less than JPY200,000 (~USD1,770 at the rate of October 2021) were not included in these data, which likely results in an underestimation of actual imports.

MARKET SURVEYS IN JAPAN

PHYSICAL SURVEYS OF MAJOR FAIRS

Although extensive physical market surveys were not possible due to COVID-19 restrictions, two major reptile fairs held during weekends in November 2020 in Tokyo—the first considered to be among the largest reptile and amphibian fairs in Japan—were visited. The surveyors recorded the amphibian species present using the indicated names on labels. Other information, such as the source and origin of specimens were recorded where possible, although there are no legal requirements to display such details and they were often not mentioned. The number of animals for sale was only recorded at the first of these fairs where the survey was conducted as the event opened.

SPECIALISED SELLERS' WEBSITES

The websites of five major sellers of amphibians, particularly those dealing in imports, were surveyed in December 2020. Species information was collected from each main website (i.e. the list of species on order/inventory pages) together with any information available from blog pages describing new arrivals posted during the 12 months of 2020. For species listed on order or inventory pages, the stock availability at the time was not confirmed, but an assumption was made that they had been available at some point during 2020. The names (Japanese and scientific where provided), together with any information on the origin and source of species were noted. The number of animals offered for sale or in stock was seldom mentioned and therefore was not recorded.

E-COMMERCE PLATFORMS

Snapshot surveys of four major e-commerce platforms—Yahoo Auction, Amazon Japan , Rakuten-Ichiba, and Yahoo Shopping —were conducted between January–March 2021. Yahoo Auction, Japan's largest online auction platform, has items sold by both businesses (B2C trade) and individuals (C2C trade). The other three sites are for B2C sales only. Relevant categories (i.e. live amphibians) on each site were reviewed thoroughly once during the period to identify and record details from all active online postings for live amphibians, including eggs. Data collected included the names of species for sale (usually the common names in Japanese), the identity of sellers, the origin and source of specimens, and the number of animals available. Social network sites were not surveyed in this study as scoping searches in Japanese failed to detect any conspicuous groups operating.

ONLINE SEARCHES FOR SPECIES NATIVE TO JAPAN

A rapid online keyword search was conducted in April 2021 of the Aucfan website, a comprehensive database covering auction results from the past 120 days on multiple auction sites including Yahoo Auction. The common names of 91 species and ten subspecies native to Japan (excluding introduced species) described by the Herpetological Society of Japan (as of 16 November 2020) were searched for [19]. Only the presence/absence of online postings for each species/subspecies was checked. Where described, the origin and source of any animals were also recorded.

A MASTER LIST OF SPECIES OBSERVED IN THE JAPANESE MARKET

Observations from all the above surveys were combined to produce a master list of amphibians found for sale in the Japanese market. The different methods and timing/coverage of these surveys mean the following caveats should be considered when interpreting this list: the representation of native species may be inflated due to the dedicated searches for these species; and although surveys took place during January 2020–April 2021, individual surveys did not all cover this entire time period.

ONLINE SURVEYS OF ENDEMIC JAPANESE SPECIES IN EUROPE AND THE USA

The availability of 29 selected Japanese endemic species (Annex 1) was surveyed on specialist websites based in Europe and the USA in April 2021. The selected species were listed in Japan's National Red List 2020 (equivalent to one of the IUCN categories CR/EN/VU/NT), protected in Japan, or both. The websites surveyed were Terraristik, Faunaclassifields, Caudata.org, and over 20 specialised amphibian groups on Facebook. Only scientific names were used in keyword searches because postings on these specialist websites commonly refer to species by scientific names.

Postings were recorded that included either:

1. offer for sale;
2. offer for trade with other animals; and
3. indication of ownership.

Information was collected on the dates of postings and additional information on the quantity, origin, subspecies/locality of specimens, and seller locations where available.

LIMITATIONS

There are several limitations associated with the methodology used in this research. Firstly, it is almost impossible to verify independently any statements made by sellers about the origin and source of animals for sale. This and other information, such as identification of the species/subspecies for sale, was taken at face value.

Secondly, given these were rapid not long-term surveys and there is a lack of information provided by sellers, the number of species and number of wild-caught specimens in trade are likely to be underestimated. Note that information on artificially produced hybrids (as seen for South American horned frogs) was not recorded.

Some species known to have been traded in Japan were not encountered during these rapid surveys, indicating the results reported here are likely an underestimation of the true level of trade. For example, Laos Warty Newt *Laotriton laoensis*, which has been previously highlighted as a high risk species[1,2] was not encountered during the data collection of this study but was found to be for sale in Japan at the time of the writing via an online keyword search. Furthermore, in 2018 the Nationally Endangered Amami Oshima Frog *Odorrana splendida*, Otton Frog *Babina subaspera*, and non-protected Amami Tip-nosed Frog *Odorrana amamiensis*, were seized in Japan and had been targeted for collection from the wild[29]. None of these species were observed in this study.

The IUCN Red List of Threatened Species (Version 2021–2) was referred to as the primary source of species information. MOE's Red List 2020[28] was used in parallel to describe the conservation status of Japanese native species. For common names and taxonomy, the databases offered by AmphibiaWeb (https://amphibiaweb.org/) and the American Museum of Natural History (https://amphibiansoftheworld.amnh.org/) were used.

KEY FINDINGS

THIS LATEST MARKET SURVEY HAS CHARACTERISED THE DIVERSITY OF AMPHIBIAN SPECIES SOLD IN JAPAN. IT IS LIKELY THAT MANY SPECIES ARE IMPACTED BY THE TRADE GIVEN THE LACK OF REGULATORY OVERSIGHT

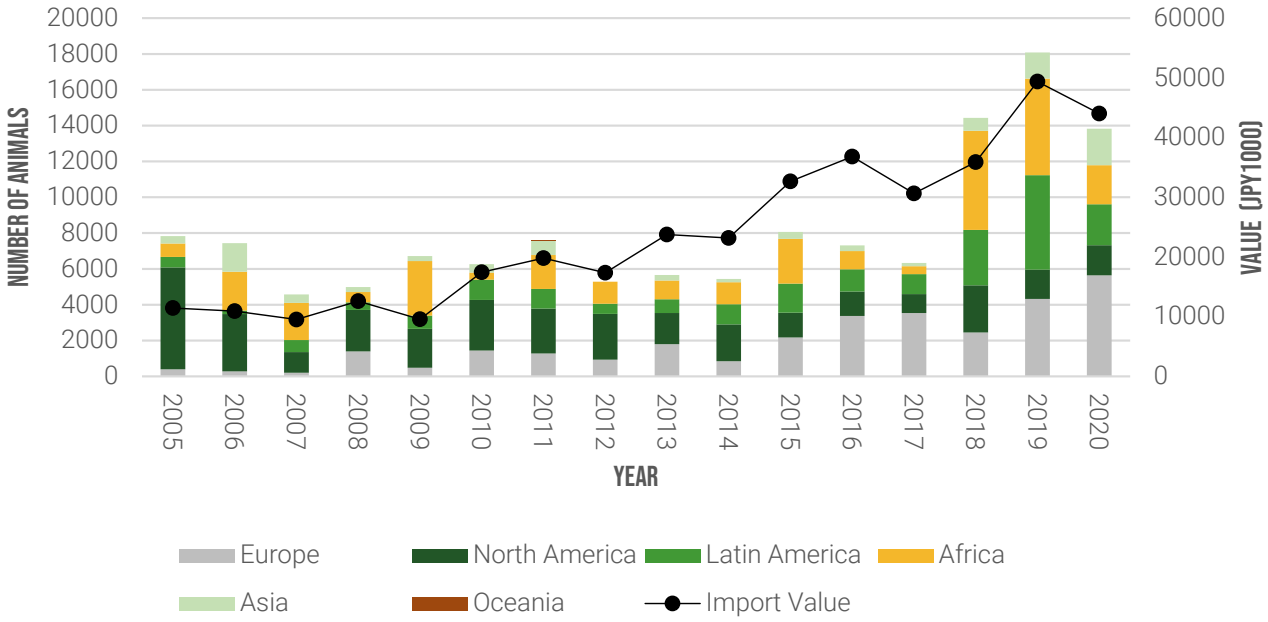
Fire salamander Salamandra salamandra*, on leaves, Plitvice National Park, Croatia*

JAPAN'S IMPORT OF LIVE AMPHIBIANS

The total number of live amphibians recorded as imports by Japan Customs between 2005 and 2020 was 129,809 with a total value of JPY384 million (~USD3.7 million). Nearly 82% were Anura (frogs), with 18% Caudata (newts and salamanders) and 314 live amphibians classified as "Other", supposedly caecilians (Gymnophiona). The import of live amphibians increased from 2005 to 2019 by 430% in value and by 230% in number (Fig. 1). This growth reversed somewhat in 2020, possibly due to the impact of COVID-19, although it was still at 380% and 180% by value and number, respectively, of the 2005 figures.

FIGURE 1

Live amphibian imports to Japan by exporting regions between 2005–2020 (Source: Japan Customs).



exports from Europe, Latin America, Africa and Asia are growing

The relative contribution of regions exporting live amphibians to Japan has changed over the period (Fig. 1). North America, dominated by the USA, was initially the largest exporter, while Europe, Africa, and Latin America have taken over as key exporting regions over the recent five to six years. Exports from Asia have been variable but seem to be growing steadily in recent years, surpassing North America in 2020. The contribution of Oceania was very small.

Nicaragua is the top exporter in recent years

At the country level, 41 countries/regions were identified as exporters between 2005–2020 (Fig. 2), of which the USA was the largest, followed by Germany and South Africa (Table 3). In the three most recent years (2018–2020), imports increased sharply. A total of 24 countries/regions exported live amphibians to Japan with the top being Nicaragua whose first exports to Japan were recorded as recently as 2015 (Table 3), followed by Cameroon, Germany, South Africa, the USA and the Czech Republic. Similarly, Peru's first exports were recorded only in 2017, but the country appeared in the top ten exporters in 2018–2020. The sixth-largest exporter across all years, Madagascar, did not register in the top ten in 2018–2020. Taiwan Province of China was the only top ten exporter in Asia in 2018–2020.

FIGURE 2

The 41 countries/territories (shaded colours) that exported live amphibians to Japan in 2005–2020 (Source: Japan Customs).

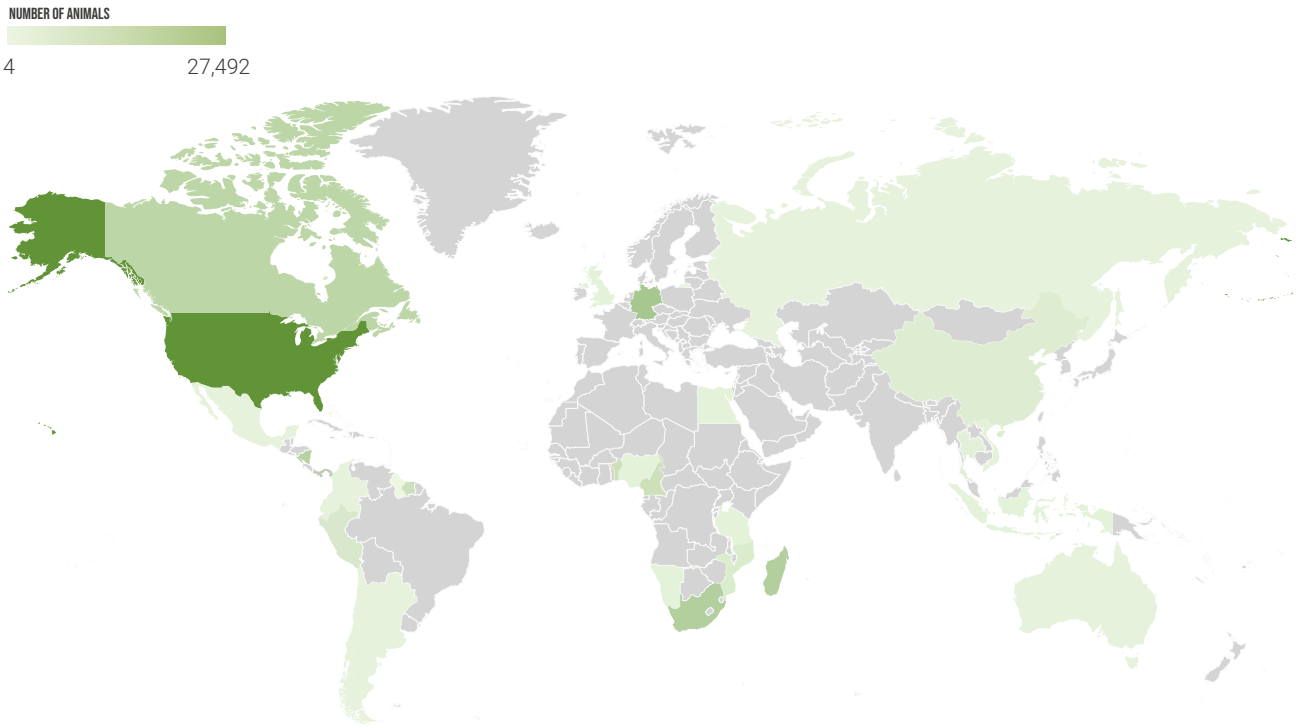


TABLE 3

Top 10 exporters of live amphibians to Japan across all years (2005–2020) and in the three most recent years (2018–2020).

TOP 10 EXPORTERS 2005–2020			TOP 10 EXPORTERS 2018–2020		
COUNTRY/TERRITORY	QUANTITY	%	COUNTRY/TERRITORY	QUANTITY	%
USA	27,492	21.2%	Nicaragua	7,197	15.5%
Germany	12,549	9.7%	Cameroon	4,720	10.2%
South Africa	10,254	7.9%	Germany	4,689	10.1%
Nicaragua	9,597	7.4%	South Africa	4,049	8.7%
Canada	8,465	6.5%	USA	3,686	8.0%
Madagascar	8,378	6.5%	Czech Republic	3,644	7.9%
Netherlands	7,107	5.5%	Peru	2,628	5.7%
Cameroon	5,357	4.1%	Canada	2,266	4.9%
Czech Republic	5,252	4.0%	Netherlands	2,249	4.9%
Suriname	5,111	3.9%	Taiwan Province of China	1,645	3.5%

Countries/territories shaded in grey were identified for both periods. Source: Japan Customs

AMPHIBIANS OFFERED FOR SALE IN JAPAN

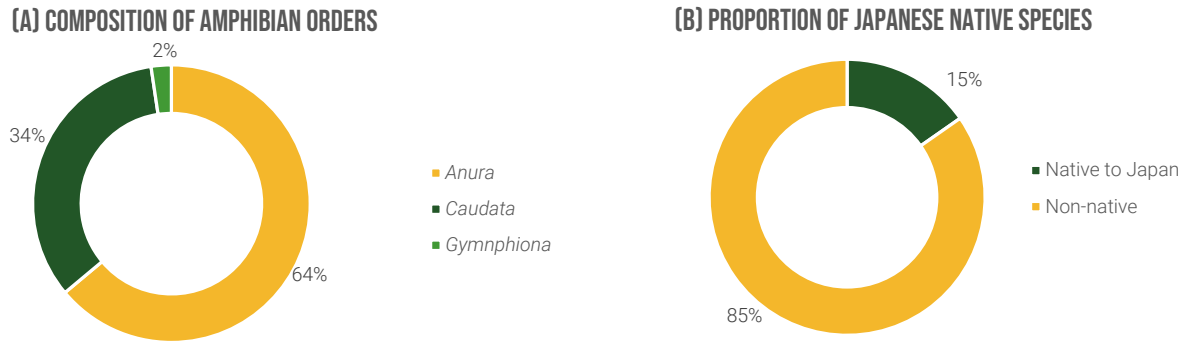
SPECIES-LEVEL OVERVIEW

Observations across all the physical and online outlets surveyed for this research identified at least 230 species and 25 subspecies offered for sale in Japan between January 2020–April 2021. The combined 255 species/subspecies comprised 163 Anura (64%), 86 Caudata (34%) and six species of Gymnophiona (Fig. 3a).

The most recorded subspecies belonged to Caudata. Some 216 (85%) of the total were non-native species/subspecies (Fig. 3b). Sales of all these species were all legal in Japan as none of them were listed under ACES which prohibits domestic trade in designated species (see Legislation).

FIGURE 3

Compositions of amphibian species/subspecies observed for sale in Japan during January 2020–April 2021 according to (a) taxonomic order and (b) indigeneity (N=255).



81% of the species are not listed in the CITES Appendices. One in four species is considered Threatened or Near Threatened.

Of the 230 species, 81% are not listed in the CITES Appendices (Fig. 4a). Of those listed in CITES, all except the North African Fire Salamander *Salamandra algira* (which was listed by Algeria in Appendix III), are in Appendix II. The Family Dendrobatidae (poison dart frogs) native to tropical Latin America comprised the largest number of Appendix II listed species observed (25 species). Six Asian newt species listed in Appendix II in 2019 from the genera *Paramesotriton* and *Tylototriton* were also observed.

Thirty-six species (16%) were categorised as Threatened (CR/EN/VU) according to the IUCN Red List (2021–2) (Fig. 4b, Table 4). Another 20 species were categorised as Near Threatened (NT), making a total of nearly one in four of the observed species of conservation concern. Just over half of the Threatened species (20 species) were not listed in the CITES Appendices. These included six Critically Endangered species, namely: Rio Pescado Stubfoot Toad *Atelopus balios* from Ecuador, Limosa Harlequin Frog *A. limosus* from Panama, Lemur Leaf Frog *Agalychnis lemur* from Colombia, Costa Rica and Panama, Anderson's Salamander *Ambystoma andersoni* from Mexico, Blue-gray Fire-bellied Newt *Cynops glaucus* from China, and Kurdistan Newt *Neurergus microspilotus* from Iran (Table 4).

FIGURE 4

Breakdown of amphibian species observed for sale in Japan during January 2020–April 2021 according to (a) CITES listing status and (b) IUCN Red List category (N=230).

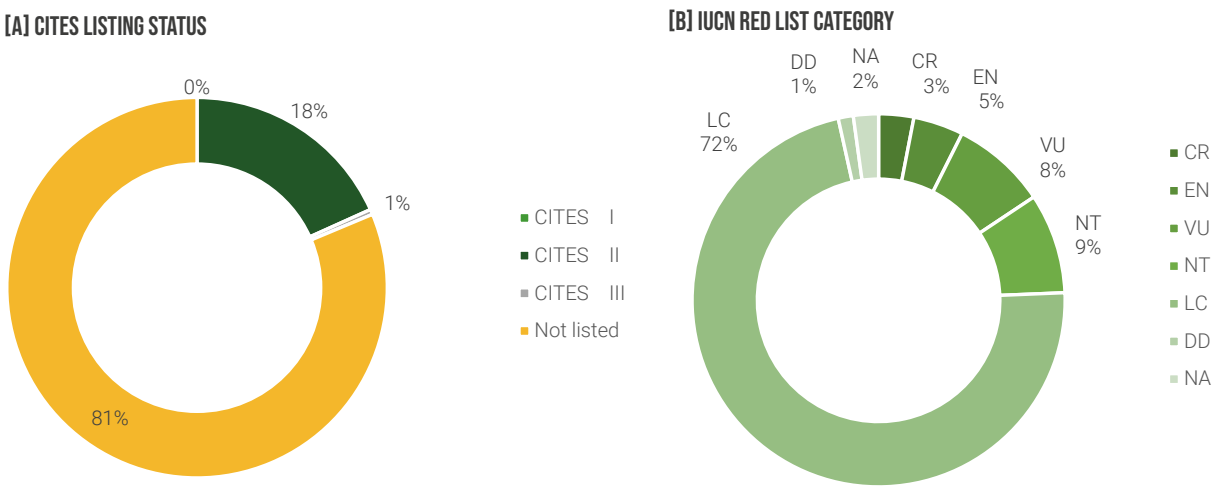


TABLE 4

The 36 species categorised as Threatened (CR/EN/VU) in IUCN's Red List (2021–2) observed for sale in Japan between January 2020–April 2021.

FAMILY	SCIENTIFIC NAME	COMMON NAME	CITES LISTING	IUCN RED LIST	RANGE
ANURA					
Arthroleptidae	*Leptopelis vermiculatus*	Amani Forest Treefrog	-	EN	Tanzania
Bufonidae	*Atelopus balios*	Rio Pescado Stubfoot Toad	-	CR	Ecuador
	Atelopus limosus	Limosa Harlequin Frog	-	CR	Panama
Ceratophryidae	*Ceratophrys stolzmanni*	Pacific Horned Frog	-	VU	Ecuador; Peru
Conrauidae	*Conraua goliath*	Giant Slippery Frog	-	EN	Cameroon; Equatorial Guinea
Dendrobatidae	*Epipedobates tricolor*	Phantasmal Poison Frog	II	VU	Ecuador
	Oophaga granulifera	Granular Poison Frog	II	VU	Costa Rica; Panama
	Phyllobates bicolor	Black-legged Poison Dart Frog	II	EN	Colombia
	Phyllobates terribilis	Golden Poison Frog	II	EN	Colombia
	Phyllobates vittatus	Golfodulcean Poison Frog	II	VU	Costa Rica
	Ranitomeya benedicta	Blessed Poison Frog	II	VU	Peru
	Ranitomeya fantastica	Fantastic Poison Frog	II	VU	Peru
Hemiphractidae	*Gastrotheca riobambae*	Riobamba Marsupial Frog	-	EN	Ecuador
Mantellidae	*Mantella aurantiaca*	Golden Mantella	II	EN	Madagascar
	Mantella expectata	Blue-legged Mantella	II	EN	Madagascar
	Mantella viridis	Green Golden Frog	II	EN	Madagascar
Microhylidae	*Scaphiophryne marmorata*	Marbled Rain Frog	II	VU	Madagascar
Pelodryadidae	*Litoria aurea*	Green and Golden Bell Frog	-	VU	Australia
Phyllomedusidae	*Agalychnis lemur*	Lemur Leaf Frog	-	CR	Colombia; Costa Rica; Panama
	Callimedusa ecuatoriana	Agua Rica Leaf Frog	-	VU	Ecuador
Rhacophoridae	*Theloderma bicolor*	Chapa Bug-eyed Frog	-	EN	Viet Nam

FAMILY	SCIENTIFIC NAME	COMMON NAME	CITES LISTING	IUCN RED LIST	RANGE
CAUDATA					
Ambystomatidae	*Ambystoma andersoni*	Anderson's Salamander	-	CR	Mexico
	Ambystoma mexicanum	Axolotl	II	CR	Mexico
Hynobiidae	*Hynobius dunni*	Dunn's Oriental Salamander	-	VU	Japan
	Hynobius fossigenus	Japanese Rift Salamander	-	VU	Japan
	Hynobius katoi	Akaishi Sansho-uo	-	EN	Japan
	Hynobius utsunomiyaorum	Highland Salamander	-	VU	Japan
Salamandridae	*Cynops ensicauda*	Sword-tailed Newt	-	VU	Japan
	Cynops glaucus	Blue-gray Fire-bellied Newt	-	CR	China
	Neurergus crocatus	Azarbaijan Mountain Newt	-	VU	Iran; Iraq; Turkey
	Neurergus microspilotus	Kurdistan Newt	-	CR	Iran
	Neurergus strauchii	Anatolia Newt	-	VU	Turkey
	Salamandra algira	North African Fire Salamander	III	VU	Algeria; Morocco; Spain
	Tylototriton kweichowensis	Red-tailed Knobby Newt	II	VU	China
	Tylototriton shanjing	Yunnan Newt, Mandarin Newt	II	VU	China
	Tylototriton shanorum	Taunggyi Crocodile Newt	II	VU	Myanmar

Species names where specimens were labelled as wild-caught (WC) are underlined..

Wild sourcing was described for at least 27% of the species/ subspecies observed

While information on the source and origin was often not displayed, at least one specimen label or online posting described animals as wild-caught (WC) for 27% (68 species/subspecies) of the total 255 taxa (230 species and 25 subspecies) observed. At least one specimen was described as captive-bred (CB) for 40% (103 species/subspecies) of the 255 taxa, while specimens from both sources (WC and CB) were observed in 5% (13 species) of the total taxa. It was not possible to quantitatively compare the WC and CB specimens traded for any given taxa or overall due to the lack of legal requirement to properly label the source and origin. Amongst the species in which WC specimens were observed, nearly half (47%) of these were native to Asia—made up of 31% Japanese native species and the remaining 16% from elsewhere in Asia. The next highest source regions were Latin America (23%) and Africa (13%). Note these observations very likely underestimate the true levels of wild sourcing given the lack of legislation in Japan to mandate the disclosure of such information.

Hourglass frog Dendropsophus ebraccatus

TABLE 5

The top 20 most frequently observed species at the large reptile and amphibian fair held in Tokyo in November 2020.

COMMON NAME	SCIENTIFIC NAME	COUNT	%	WC INDICATION[1]	CITES	IUCN RED LIST	POPULATION TREND[2]	RANGE	YEAR ASSESSED
Cranwell's Horned Frog	*Ceratophrys cranwelli*	78	12%	-	-	LC	↓	Argentina; Bolivia; Brazil; Paraguay	2004
Fire Salamander	*Salamandra salamandra*[3]	65	10%	-	-	LC	↓	European States[5]	2008
Brazilian Horned Frog	*Ceratophrys aurita*	40	6%	-	-	LC	↓	Brazil	2004
Green Tree Frog	*Litoria caerulea*	33	5%	Yes	-	LC	-	Australia; Indonesia; Papua New Guinea	2004
Chaco Horned Frog	*Chacophrys pierottii*	29	4%	-	-	LC	↓	Argentina; Bolivia; Paraguay	2020
Red-eyed Tree Frog	*Agalychnis callidryas*	27	4%	Yes	II	LC	↓	Belize; Colombia; Costa Rica; Guatemala; Honduras; Mexico; Nicaragua; Panama	2016
Sword-tailed Newt	*Cynops ensicauda (popei)*[4]	27	4%	Yes	-	VU	↓	Japan	2020
Surinam Horned Frog	*Ceratophrys cornuta*	23	4%	Yes	-	LC	-	Bolivia; Brazil; Colombia; Ecuador; French Guiana; Guyana; Peru; Suriname	2004
Argentine Horned Frog	*Ceratophrys ornata*	23	4%	-	-	NT	↓	Argentina; Brazil; Uruguay	2004
African Bull Frog	*Pyxicephalus adspersus*	22	3%	-	-	LC	↓	Angola; Botswana; Kenya; Malawi; Mozambique; Namibia; South Africa; Tanzania; Zambia; Zimbabwe	2013
Azerbaijan Mountain Newt	*Neurergus crocatus*	22	3%	-	-	VU	↓	Iran; Iraq; Turkey	2008
Western Tiger Salamander	*Ambystoma mavortium*	17	3%	-	-	LC	?	Canada; Mexico; United States	2015
Splash-Backed Poison Frog	*Adelphobates galactonotus*	11	2%	-	II	LC	-	Brazil	2008
Sharp-ribbed Salamander	*Pleurodeles waltl*	11	2%	-	-	NT	↓	Morocco; Portugal; Spain	2008
Red-tailed Knobby Newt	*Tylototriton kweichowensis*	11	2%	-	II	VU	↓	China	2019
Asiatic Toad (Miyako Toad)	*Bufo gargarizans (miyakonis)*[4]	10	2%	Yes	-	LC	-	Japan	2018
Fleischmann's Glass Frog	*Hyalinobatrachium fleischmanni*	10	2%	Yes	-	LC	-	Belize; Colombia; Costa Rica; El Salvador; Guatemala; Guyana; Honduras; Mexico; Nicaragua; Panama; Suriname	2019
Taunggyi Crocodile Newt	*Tylototriton shanorum*	10	2%	-	II	VU	↓	Myanmar	2016
Pacific Horned Frog	*Ceratophrys stolzmanni*	9	1%	-	-	VU	↓	Ecuador; Peru	2018
Dyeing Poison Frog	*Dendrobates tinctorius*	9	1%	-	II	LC	-	Brazil; French Guiana; Guyana; Suriname	2008

[1] Species with at least one observation of a specimen/online posting describing it as wild-caught (WC) origin are marked Yes.

[2] Population trends from the IUCN Red List Assessment: ↓ indicates decreasing/- indicates stable.

[3] In addition to the species-level description, the following subspecies were also observed: S. salamandra almanzoris, S. s. bejarae, S. s. crespoi, S. s. gallaica, S. s. gigliolii, S. s. salamandra, and S. s. terrestris

[4] All the observed specimens of the species were described as the subspecies specified in brackets.

[5] Albania; Andorra; Austria; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; Czechia; France; Germany; Greece; Hungary; Italy; Liechtenstein; Luxembourg; Montenegro; Netherlands; North Macedonia; Poland; Portugal; Romania; San Marino; Serbia; Slovakia; Slovenia; Spain; Switzerland; Ukraine

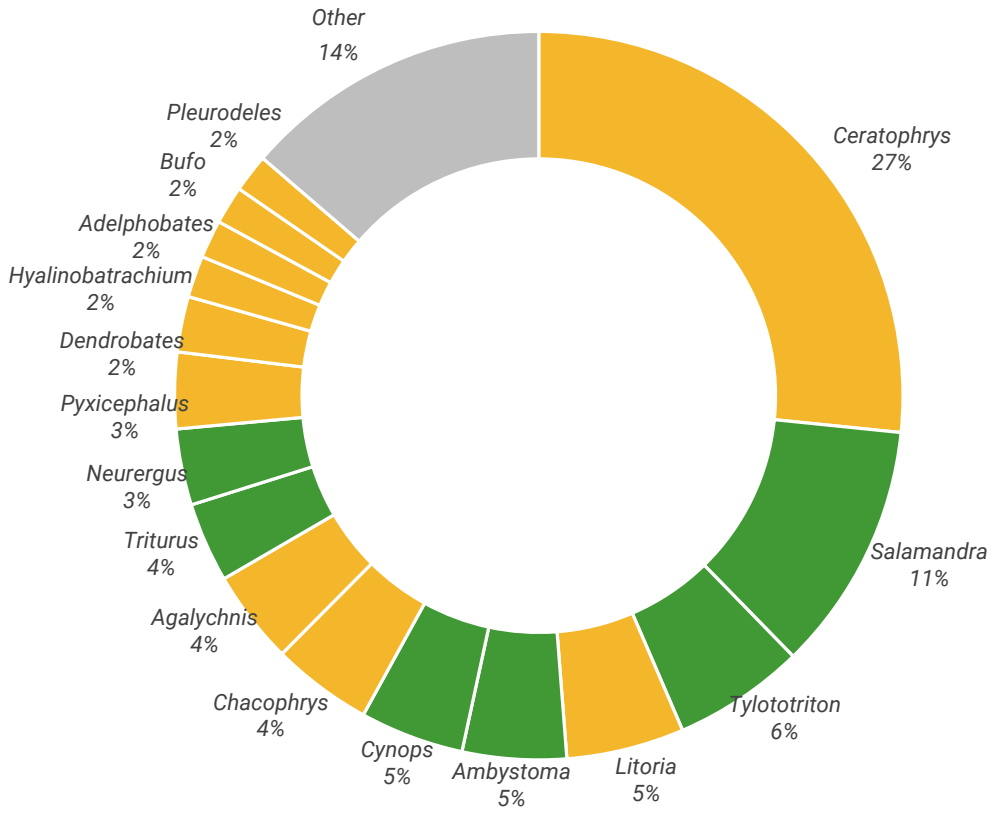
CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern

POPULAR AMPHIBIAN GROUPS IN JAPANESE MARKETS

The number of amphibians for sale at the large reptile and amphibian fair held in Tokyo was used as a proxy measure of the relative abundance and popularity of amphibian groups in the Japanese market. The observations totalled 650 specimens from 92 species/subspecies offered by 18 sellers. Figure 5 shows the genus-level breakdown of the observed specimens, and the top 20 most frequently encountered species are listed in Table 5.

FIGURE 5

Genus-level breakdown of the number of specimens observed at the large reptile and amphibian fair held in Tokyo in November 2020 (N=650). Shades of brown and green indicate Anura (frogs) and Caudata (newts and salamanders), respectively.



The genus *Ceratophrys*—South American Horned Frogs or Pacman Frogs—were found in the largest numbers comprising 27% of the observed specimens (Fig. 6), with Cranwell's Horned Frog *Ceratophrys cranwelli* the most numerous (Table 5). Many artificial breeds of *Ceratophrys* frogs, including hybrids and artificially coloured morphs, were also observed but are not included in the data. Origins as WC were noted for the Surinam Horned Frog *Ceratophrys cornuta* and as F1 (first generation from wild parents) for Chaco Horned Frog *Chacophrys pierotti*. A careful review of the impact of trade on this group appears warranted, especially given the Red List assessments have not been updated for many of these species and given Pacific Horned Frog *Ceratophrys stolzmanni* (VU) and Argentine Horned Frog *Ceratophrys ornata* (NT) were already of conservation concern in earlier assessments (Table 5).

South American Horned Frogs are the most common group

Anderson's Crocodile Newt

A DIVERSE ARRAY OF NEWTS AND SALAMANDERS AND SOME ICONIC TREE FROGS

A wide range of newts and salamanders were observed, ranging from fire salamanders *Salamandra* spp. native to Europe, crocodile newts *Tylototriton* spp. native to Asia, and mole salamanders *Ambystoma* spp. native to Northern America including Mexico, together comprising a total of 22% of the specimens recorded at the reptile fair (Fig. 5). Across all outlets, five species and 10 subspecies of *Salamandra* were observed, with WC attributed to Spotted Fire Salamander *Salamandra s. salamandra* from Slovenia (species listed as LC with declining populations). Six species and four subspecies of *Ambystoma* were encountered with some WC origin indicated for three species: Tiger Salamander *Ambystoma* tigrinum, Marbled Salamander *Ambystoma opacum*, Spotted Salamander *Ambystoma maculatum* (all LC with stable populations). Four species of *Tylototriton* were observed, none with any WC origin attributed to them.

At the species level, commonly available species with WC indications included Green Tree Frog *Litoria caerulea* native to Australia, Indonesia, and Papua New Guinea, and the CITES Appendix II-listed Red-eyed Tree Frog *Agalychnis callidryas* native to tropical Latin America (Table 5). Both species are categorised as Least Concern (LC) with declining populations. Among the fire-bellied newts genus *Cynops*, native to Japan and China, one Japanese endemic, Sword-tailed Newt *Cynops ensicauda* (VU), in particular the subspecies popei from the Okinawa Islands, was commonly observed (Table 5) alongside Japanese Fire-bellied Newt *Cynops pyrrhogaster* (NT) native to Japan, Blue-gray Fire-bellied Newt *Cynops glaucus* (CR) and Oriental Fire-bellied Newt *Cynops orientalis* (LC) native to China (data not shown). WC origin was mentioned for only the two Japanese species.

Glass frogs appear to be gaining popularity

While CITES-listed poison dart frogs (e.g. genera *Dendrobates, Adelphobates* and *Ranitomeya*) remain popular, other groups of similarly small-sized frogs were also encountered. In particular, glass frogs (Centrolenidae) native to Central and South America were described by some sellers in online posts as increasing in popularity, with some species apparently introduced to the Japanese market in recent years. Fleischmann's Glass Frog *Hyalinobatrachium fleischmanni* ranked in the top 20 species at the reptile fair with some indication of WC sourcing. At least five other species of glass frogs were observed across various sales outlets (Table 6), including the specialist shops and e-commerce sites.

TABLE 6

Glass Frog species observed in the Japanese market

COMMON NAME	SCIENTIFIC NAME	WC INDICATION[1]	%	IUCN RED LIST	POPULATION TREND[2]	RANGE	YEAR ASSESSED
Atrato Glass Frog	*Hyalinobatrachium aureoguttatum*	-	12%	LC	-	Colombia, Ecuador, Panama	2019
White-spotted Cochran Frog	*Sachatamia albomaculata*	-	10%	LC	↓	Colombia; Costa Rica; Ecuador; Honduras; Nicaragua; Panama	2019
Fleischmann's Glass Frog	*Hyalinobatrachium fleischmanni*	Yes	6%	LC	-	Belize; Colombia; Costa Rica; El Salvador; Guatemala; Guyana; Honduras; Mexico; Nicaragua; Panama; Suriname	2019
La Palma Glass Frog	*Hyalinobatrachium valerioi*	-	5%	LC	↓	Colombia; Costa Rica; Ecuador; Panama	2019
Chiriqui Glass Frog	*Teratohyla pulverata*	-	4%	LC	?	Colombia; Costa Rica; Ecuador; Honduras; Nicaragua; Panama	2019
Grainy Cochran Frog	*Cochranella granulosa*	-	4%	LC	↓	Costa Rica; Honduras; Nicaragua; Panama	2019

[1] Species with at least one observation of a specimen/online posting describing it as wild-caught (WC) origin are marked Yes.

While quantitative assessments were only conducted in the physical reptile fair survey, it was apparent that many of the rarer species recorded in this research were only observed in online postings from specialist outlets.

Conversely, Japanese native species tended to be recorded more often on regular e-commerce platforms, particularly Yahoo Auction (see page 31 for details).

SPECIES POTENTIALLY IMPACTED BY WILD SOURCING

Beyond groups/species offered in the largest numbers, others of potential concern were identified from those in which a WC origin was indicated (although it is highly likely many other species are also of WC origin with a varying degree of impact on wild populations). Table 7 lists those species non-native to Japan with a conservation status of CR/EN/VU/NT or declining populations according to the IUCN Red List while Table 8 lists species in these categories that are native to Japan.

Bug-eyed frogs from Asia potentially impacted by wild sourcing

The genus *Theloderma*—bug-eyed frogs or mossy frogs—native to Indochina, appeared to require attention. Wild sourcing was indicated for three species with declining populations: Chapa Bug-eyed Frog *Theloderma bicolor* (EN), Tonkin Bug-eyed Frog *T. corticale* (LC), and Taylor's Bug-eyed Frog *T. stellatum* (LC) (Table 7) and not mentioned for two others: Hill Garden Bug-eyed Frog *T. asperum* and Malaya Bug-eyed Frog *T. leporosum* (data not shown). Other species of potential concern from wild-sourcing included Spiny-headed Tree Frog *Triprion spinosus* (NT) from Central America and several CITES-listed species (Table 7).

TABLE 7

Species non-native to Japan found in the Japanese market with some indication of wild sourcing and with a conservation status of CR/EN/VU/NT or declining populations according to the IUCN Red List.

COMMON NAME	SCIENTIFIC NAME	CITES	IUCN RED LIST	POPULATION TREND	RANGE	YEAR ASSESSED
Red-eyed Tree Frog	*Agalychnis callidryas*	II	LC	↓	Belize; Colombia; Costa Rica; Guatemala; Honduras; Mexico; Nicaragua; Panama	2016
Mexican Giant Tree Frog	*Agalychnis dacnicolor*	-	LC	↓	Mexico	2014
Spiny-headed Tree Frog	*Triprion spinosus*	-	NT	↓	Costa Rica; Honduras; Mexico; Panama	2019
Oriental Fire-bellied Toad	*Bombina orientalis*	-	LC	↓	China; North Korea; South Korea; Russia	2019
Sambava Tomato Frog	*Dyscophus guineti*	II	LC	↓	Madagascar	2016
Marbled Rain Frog	*Scaphiophryne marmorata*	II	VU	↓	Madagascar	2015
Chapa Bug-eyed Frog	*Theloderma bicolor*	-	EN	?	Viet Nam	2004
Tonkin Bug-eyed Frog	*Theloderma corticale*	-	LC	↓	Viet Nam	2015
Taylor's Bug-eyed Frog	*Theloderma stellatum*	-	LC	↓	Cambodia; Thailand	2015
Thao Whipping Frog	*Zhangixalus feae*	-	LC	↓	China; Laos; Myanmar; Thailand; Viet Nam	2015
Jor Flying Frog	*Zhangixalus prominanus*	-	LC	↓	Indonesia; Malaysia; Thailand	2020
Chinese Warty Newt	*Paramesotriton chinensis*	II	LC	↓	China	2019
Fire Salamander	*Salamandra salamandra*[1]	-	LC	↓	European States[2]	2008
Mexican Caecilian	*Dermophis mexicanus*	-	LC	↓	El Salvador; Guatemala; Honduras; Mexico; Nicaragua	2019

[1] *Subspecies in which WC origin described: Salamandra* salamandra salamandra

[2] *Albania; Andorra; Austria; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; Czechia; France; Germany; Greece; Hungary; Italy; Liechtenstein; Luxembourg; Montenegro; Netherlands; North Macedonia; Poland; Portugal; Romania; San Marino; Serbia; Slovakia; Slovenia; Spain; Switzerland; Ukraine*

TABLE 8

Species native to Japan found in the Japanese market with some indication of wild sourcing and with a conservation status of CR/EN/VU/NT or declining populations according to the IUCN Red List.

COMMON NAME	SCIENTIFIC NAME	CITES	IUCN RED LIST	POPULATION TREND	RANGE	YEAR ASSESSED
Kajika Frog	*Buergeria buergeri*	-	LC	↓	Japan (Honshu, Shikoku, Kyushu)	2020
Japanese Common Toad	*Bufo japonicus*[1]	-	LC	↓	Japan (Honshu, Kyushu, Shikoku)	2020
Sword-tailed Newt	*Cynops ensicauda*[2]	-	VU	↓	Japan (Nansei-shoto)	2020
Japanese Fire-bellied Newt	*Cynops pyrrhogaster*	-	NT	↓	Japan (Honshu, Kyushu, Shikoku)	2020
Japanese Rift Salamander	*Hynobius fossigenus*	-	VU	↓	Japan (Honshu)	2020
Mahoroba Salamander	*Hynobius guttatus*	-	NT	↓	Japan (Honshu)	2020
Hida Salamander	*Hynobius kimurae*	-	LC	↓	Japan (Honshu)	2020
Tohoku Salamander	*Hynobius lichenatus*	-	LC	↓	Japan (Honshu)	2020
Mitsjama Salamander	*Hynobius nebulosus*	-	LC	↓	Japan; Japan (Kyushu)	2020
Black Salamander	*Hynobius nigrescens*	-	LC	↓	Japan (Honshu)	2020
Eiffinger's Tree Frog	*Kurixalus eiffingeri*	-	LC	↓	Japan; Taiwan Province of China	2004
Bandai clawed salamander	*Onychodactylus intermedius*	-	NT	↓	Japan (Honshu)	2020
Japanese Brown Frog	*Rana japonica*	-	LC	↓	Japan (Honshu, Kyushu, Shikoku)	2020
Montane Brown frog	*Rana ornativentris*	-	LC	↓	Japan (Honshu, Kyushu, Shikoku)	2020
Owston's Green Tree Frog	*Zhangixalus owstoni*	-	NT	?	Japan (Nansei-shoto)	2020
Japanese Gliding Frog	*Zhangixalus schlegelii*	-	LC	↓	Japan (Honshu, Kyushu, Shikoku)	2020

[1] *Subspecies in which WC origin described: Bufo japonicus formosa and B. japonicus japonicus.*

[2] *Subspecies in which WC origin described: Cynops ensicauda ensicauda and C. ensicauda popei*

TRADE IN JAPANESE NATIVE SPECIES

Of all the 91 species and ten subspecies of amphibians native to Japan searched, online postings were found for 39, of which all but five, were endemic. None of them was legally protected at the national level at the time of this survey.[ii] Seven species/subspecies were Threatened (EN/VU), and nine additional species were Near Threatened (NT) according to the IUCN Red List, together accounting for about 39% of all observed native species. Most of these were endemic newts and salamanders, including Sword-tailed Newt *Cynops ensicauda* (VU) (both subspecies, *ensicauda* from Amami and *popei* from Okinawa), and Japanese Fire-bellied Newt *Cynops pyrrhogaster* (NT), and nine species of Japanese salamanders (see Table 9 for a list of all Japanese salamander species encountered). Species of frogs with conservation concerns included Dark-spotted Frog *Pelophylax nigromaculatus* (NT), Ryukyu Brown Frog *Rana kobai* (NT), and Owston's Green Tree Frog *Zhangixalus owstoni* (NT). WC origin was indicated in at least 22 out of the 39 native species/subspecies observed, suggesting this practice is widespread.

39 native Japanese species/ subspecies were offered for sale

[ii] Note that 26 species of salamanders were newly designated under ACES in January 2022 (see Table 1).

TABLE 9

Japanese salamander species observed in the domestic market.

GENUS	SPECIES OBSERVED (IUCN RED LIST CATEGORY/MOE RED LIST CATEGORY)
Hynobius	*H. dunni* (VU/VU); *H. fossigenus* (VU/VU); *H. guttatus* (NT/VU); *H. hirosei* (NT/NT); *H. katoi* (EN/EN); *H. kimurae* (LC/NT); *H. lichenatus* (LC/NT); *H. nebulosus* (LC/VU); *H. nigrescens* (LC/NT); *H. retardatus* (LC/DD); *H. setouchi* (NT/VU); *H. tsuensis* (NT/NT); *H. utsunomiyaorum* (VU/VU)
Onychodactylus	*Onychodactylus intermedius* (NT/NT); *Onychodactylus japonicus* (LC/not listed)

Species underlined were designated as Nationally Endangered Species under ACES in January 2022.

ENDEMIC JAPANESE SPECIES IN OVERSEAS MARKETS

three at-risk endemic Japanese newt species offered for sale in Europe and the USA

Online searches of key Europe and USA-based specialist websites for 29 selected Japanese endemic species of concern (see Annex 1) found at least three endemic newt species offered for sale or trade: Sword-tailed Newt *Cynops eniscauda,* Japanese Fire-bellied Newt *Cynops pyrrhogaster*, and Anderson's Crocodile Newt *Echinotriton andersoni*. The last of these is listed in CITES (Appendix III since February 2021) (Table 10). The number of such online postings for sale or trade found in total was only 16, over a period ranging from 2008 to 2021.[3] The small number of online postings is perhaps expected given the selected species are mostly rare or Nationally Endangered, although it should be borne in mind that once sold, such postings tend to be removed, so this is likely to be an underestimate of the actual trade. Also encountered were postings relating to seven species of *Hynobius* salamanders and one Tsukuba Clawed Salamander *Onychodactylus tsukubaensis* (CR) owned by individuals based in North America and Europe over a period ranging from 2004 to 2017 (Table 10).

Overall, the online postings included reference to sale or ownership of three Nationally Endangered species —Anderson's Crocodile Newt, Tsukuba Clawed Salamander, and Tokyo Salamander *Hynobius tokyoensis*—although the postings either pre-dated legal protection or did not contain sufficient information to determine whether the specimens involved were illegally sourced in Japan or from captive bred stocks overseas.

TABLE 10

Japanese endemic species identified on Europe and USA based specialist websites through keyword searches covering the period 2004–2021.

TYPE OF POSTINGS	SPECIES OBSERVED (IUCN RED LIST CATEGORY/MOE RED LIST CATEGORY)
Offers for sale	*Cynops ensicauda (popei)* (VU/NT); *C. pyrrhogaster* (NT/NT); *Echinotriton andersoni*[1,2] (VU/VU)
Ownership	*Hynobius dunni*[3] (VU/VU); *H. kimurae* (LC/NT); *H. lichenatus* (LC/NT); *H. nebulosus*[3] (LC/VU); *H. nigrescens* (LC/NT); *H. tokyoensis*[2] (VU/VU); *H. tsuensis* (NT/NT); *Onychodactylus tsukubaensis*[2] (CR/CR)

[1] *E. andersoni has been listed in CITES Appendix III by Japan since February 2021.*

[2] *Species considered Nationally Endangered by ACES at the time of the survey: E. andersoni from March 2016; H. tokyoensis from February 2020; and O. tsukubaensis from December 2015.*

[3] *Species newly listed under ACES in January 2022.*

E-COMMERCE SALE OF AMPHIBIANS IN JAPAN

Snapshot surveys of Japan's primary e-commerce websites found active sales of live amphibians, although not all for the pet trade (e.g. live feed for aquarium fishes). In particular, a survey of Yahoo Auction identified a total of 71 sellers and 63 species/subspecies offered in 476 online postings (Table 11). Although on a smaller scale, the major online shopping malls—Rakuten-Ichiba, Yahoo Shopping, and Amazon Japan—also hosted retailers selling live amphibians. Threatened species were found for sale on all four platforms, including Sword-tailed Newt *Cynops ensicauda* (VU) observed on all four platforms with indications of WC origin in some postings. Pacific Horned Frog *Ceratophrys stolzmanni* (VU) was observed on two platforms. Other threatened species offered on one of the platforms, included Anderson's Salamander *Ambystoma andersoni* (CR) and Giant Slippery Frog *Conraua goliath* (EN), as well as the CITES-listed North African Fire Salamander *Salamandra algira* (VU) and Yunnan Newt *Tylototriton shanjing* (VU).

threatened species
observed for sale on all surveyed platforms

TABLE 11
Online postings for live amphibians on Japan's major e-commerce platforms, January–March 2021

E-COMMERCE PLATFORM	NO. OF ONLINE POSTINGS	NO. OF SELLERS	NO. OF SPECIES/ SUBSPECIES OBSERVED	SPECIES/SUBSPECIES CATEGORISED AS THREATENED (CR/EN/VU) BY IUCN	SPECIES LISTED IN THE CITES APPENDICES
Yahoo Auction	476	71	63	9	3
Rakuten-Ichiba	95	11	23	6	2
Yahoo Shopping	37	8	11	3	1
Amazon Japan	15	4	4	2	1

Amazonian Frog Hyla granosa

CONCLUSIONS

THE FINDINGS OF THIS STUDY HIGHLIGHT THE NEED FOR URGENT ACTIONS AT MULTIPLE LEVELS TO ADDRESS THE FOOTPRINT OF THE GLOBAL PET TRADE ON AMPHIBIANS

Sword-tailed Newts

CONCLUSIONS

This study's analysis of Japan's amphibian imports has found an overall increase in recent years, with source regions diversifying and countries such as Nicaragua and Peru emerging as key exporters. Although the USA and Europe have been the leading international suppliers of captive-bred amphibians to Japan, recent data suggest that imports of amphibians directly from range states in other regions are increasing, and may be indicative of the exploitation of wild-caught specimens of new taxa.

The number of amphibian species observed in the Japanese pet trade (230 species and 25 subspecies) was significant, albeit slightly less than the numbers encountered elsewhere, notably in the more comprehensive assessments made by the Global Amphibian Assessment (278 species), market surveys in Germany (352 species) and systematic literature reviews and LEMIS data (443 species)[2,9,14]. Doubtless the results of this rapid study in Japan are an underestimate of the true extent of the amphibian trade there.

This latest market survey has characterised the diversity of amphibian species sold in Japan through various outlets, including online sales through the major e-commerce platforms. It is likely that many species sold this way are impacted by the trade given the lack of oversight of international trade or domestic regulations within Japan. About 81% of the species encountered were not listed in the CITES Appendices, while one in four species was categorised as Threatened or Near Threatened on the IUCN Red List (CR/EN/VU/NT). This latest review sheds further light on some high-risk taxa that are currently not regulated by CITES, popular in the market, found with an indication of wild sourcing and are of conservation concern from declining populations. While the results are by no means comprehensive, the genus or higher-level taxonomic groups indicated as likely in need of better monitoring and regulation of their trade include South American horned frogs (*Ceratophrys* spp. and *Chacophrys* pierottii), fire salamanders (*Salamandra* sp.), mole salamanders (*Ambystoma* sp.), fire-bellied newts (*Cynops* sp.), glass frogs (family Centrolenidae), and bug-eyed frogs (*Theloderma* sp.).

Within amphibians native to Japan, the Sword-tailed Newt *Cynops ensicauda* endemic to the Nansei Islands stood out as it is already threatened (VU) and under pressure from both international and domestic trade. Various other native species, including a range of Japanese salamanders (*Hynobius* sp. and *Onychodactylus* sp.), were also found in the domestic market with an indication of WC specimens, especially those available through e-commerce. In January 2022, MOE prohibited the commercial trade in 26 additional species of Japanese salamanders by designating them under ACES as Nationally Endangered, a prudent move given the likely impact of trade on these species. Regulations relating to other species at risk from wild sourcing (listed in Table 7 (non-native species) and Table 8 (native species), as well as the threatened species listed in Table 4), should also be reviewed in conjunction with the list of high-risk species produced by the previous assessments by TRAFFIC and others[1,2].

Aside from Sword-tailed Newt, Japanese Fire-bellied Newt, and the Anderson's Crocodile Newt, few active sales of native Japanese amphibians in overseas markets were detected for the subset of Japanese species surveyed in this study. However, more robust monitoring is required to determine the extent of native Japanese amphibian species entering the international markets.

Overall, the results of this study indicate a need to regulate the international trade in amphibians through CITES and at the national level in source countries and in Japan as a consumer country. Furthermore, the study also highlights the need for responsible actions in the private sector, including businesses dealing in live amphibians and providers of e-commerce platforms.

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ANNEX

ANNEX I – JAPANESE ENDEMIC SPECIES SELECTED FOR ONLINE SURVEYS IN EUROPE AND USA BASED WEBSITES

SPECIES NAME	NATIONAL PROTECTION	YEAR OF ENTRY INTO FORCE	MOE RED LIST (2020)	IUCN RED LIST (2021-2)
Hynobius katoi	-	-	EN	EN
Hynobius abei	*Yes*	1995	CR	EN
Hynobius amakusaensis	*Yes*	2015	CR	CR
Hynobius hirosei	-	-	NT	NT
Hynobius dunni	-	-	VU	VU
Hynobius osumiensis	*Yes*	2015	EN	EN
Hynobius nebulosus	-	-	VU	LC
Hynobius nigrescens	-	-	NT	LC
Hynobius setouchi	-	-	VU	NT
Hynobius shinichisatoi	*Yes*	2015	EN	EN
Hynobius tsuensis	-	-	NT	NT
Hynobius tokyoensis	*Yes*	2020	VU	VU
Hynobius lichenatus	-	-	NT	LC
Hynobius tosashimizuensis	*Yes*	2019	CR	CR
Hynobius fossigenus	-	-	VU	VU
Hynobius kimurae	-	-	NT	LC
Hynobius utsunomiyaorum	-	-	VU	VU
Hynobius guttatus	-	-	VU	NT
Onychodactylus tsukubaensis	*Yes*	2015	CR	CR
Onychodactylus intermedius	-	-	NT	NT
Echinotriton andersoni	*Yes*	2016	VU	VU
Cynops pyrrhogaster	-	-	NT	NT
Cynops ensicauda	-	-	NT	VU
Odorrana splendida	*Yes*	2016	EN	EN
Odorrana ishikawae	*Yes*	2016	EN	EN
Odorrana utsunomiyaorum	*Yes*	2019	EN	EN
Babina subaspera	*Yes*	2016	EN	EN
Babina holsti	*Yes*	2016	EN	EN
Limnonectes namiyei	*Yes*	2016	EN	EN

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WORKING TO ENSURE THE TRADE IN WILD PLANTS AND ANIMALS IS NOT A THREAT TO THE CONSERVATION OF NATURE

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