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GOING DUTCH

An analysis of the import of live animals from Indonesia by the Netherlands

NOVEMBER 2016

Jordi Janssen and Lisa J. Blanken





TRAFFIC REPORT

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Front cover photograph: Soft corals *Dendronephthya* sp. thrive on a reef in Raja Ampat, Indonesia.

Credit: © Ethan Daniels/Dreamstime.com

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Soft corals *Dendronephthya* sp. thrive on a reef in Raja Ampat, Indonesia.



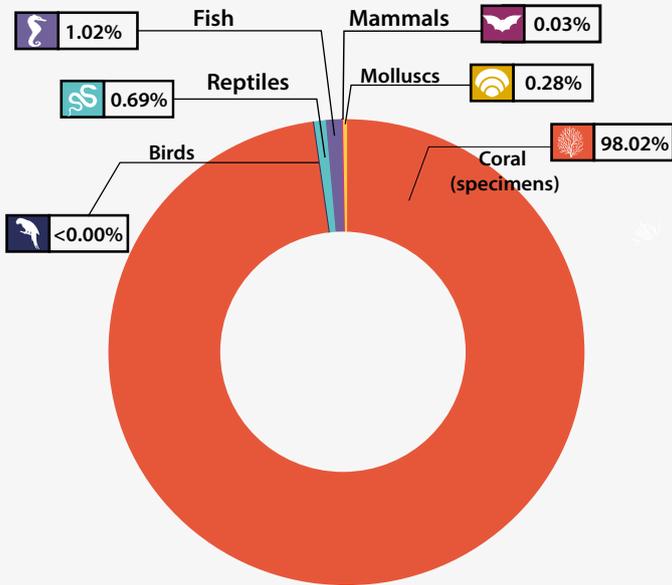
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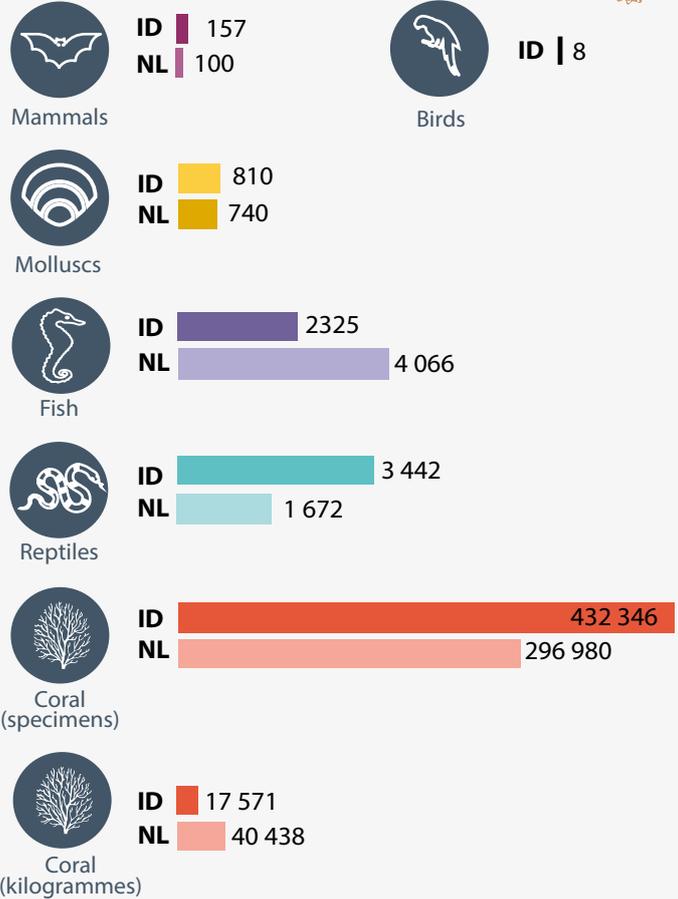
“547 947 CITES and EU Annex listed live animals imported from Indonesia by the Netherlands during 2003-2013”



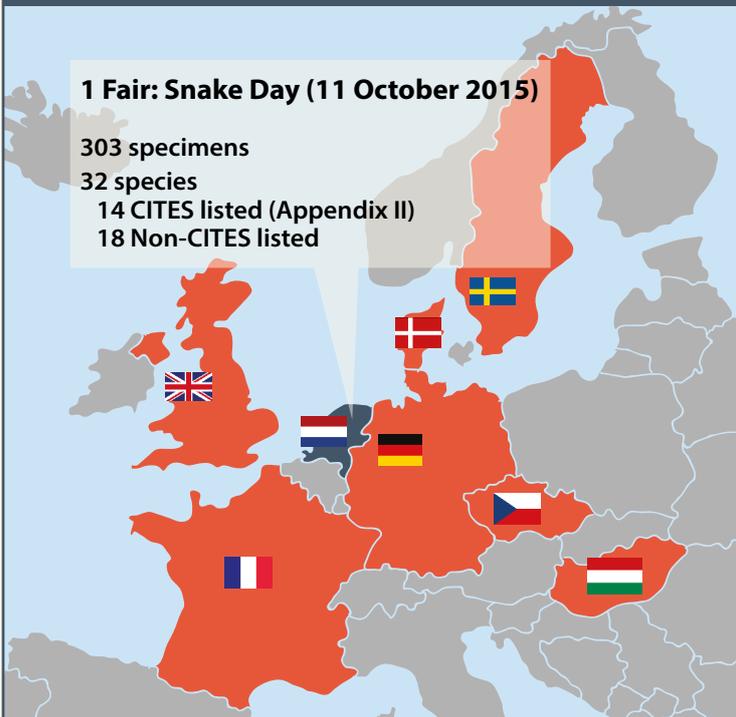
PERCENTAGES OF ANIMALS TRADED FROM DIFFERENT GROUPS



DISCREPANCIES IN NUMBERS REPORTED BETWEEN INDONESIA (ID) AND THE NETHERLANDS (NL)



INDONESIAN REPTILES SOLD IN THE NETHERLANDS



DOCUMENTED TRANSACTIONS IN *Hydnophora microconos* DESPITE EU TRADE RESTRICTION

Hydnophora microconos (wild-sourced specimens)

EU Negative opinion: 22 May 2003

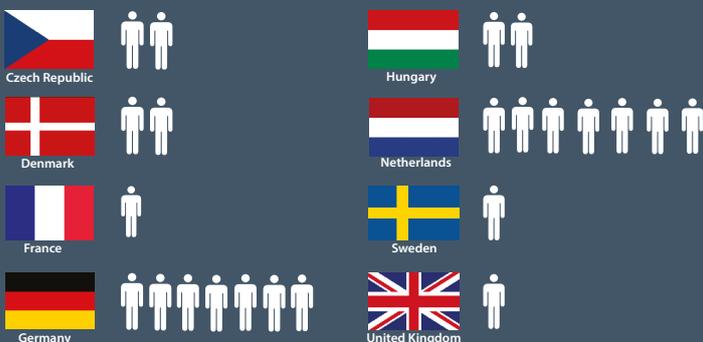
EU Trade suspension: 10 May 2006

UNEP-WCMC CITES Trade Database

Trade reported by both Indonesia and Netherlands:



COUNTRIES OF ORIGIN OF THE DIFFERENT VENDORS



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ABBREVIATIONS AND ACRONYMS

BKSDA	Natural Resources Conservation Agency (Indonesia)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EC.....	European Commission
EU	European Union
IUCN	International Union for Conservation of Nature
UNEP.....	United Nations Environment Programme
WCMC.....	World Conservation Monitoring Centre (referred to as UNEP-WCMC)
NDF	Non-Detriment Finding
NVWA.....	Netherlands Food and Consumer Product Safety Authority
PHKA	Directorate General of Forest Protection and Nature Conservation (Indonesia)
RVO.NL.....	Netherlands Enterprise Agency
SRG	Scientific Review Group

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EXECUTIVE SUMMARY

Ongoing illegal and unsustainable trade in wildlife is an increasing threat to species conservation in Indonesia, a biodiversity hotspot in Southeast Asia, with possible irreversible effects on wild populations. In particular, rare and newly identified species have a high commercial value and are increasingly harvested for the international exotic pet trade. Large numbers of live animals, both CITES listed and EU Annex listed, were imported from Indonesia by the Netherlands between 2003 and 2013. This report does not include trade on species not listed in CITES or the EU Annexes.

Reported trade in CITES-listed species between the two countries comprised 98% coral specimens followed by fish (1.02%) and reptiles (0.69%). The total volume of trade between Indonesia and the Netherlands is likely a lot higher since e.g. fewer than 8% of reptiles are currently listed in the CITES Appendices. This makes the Netherlands a major importer of Indonesian corals and to a lesser extent of fish and reptiles. The majority of the species were native to Indonesia, except for a few non-native reptile species originating from Africa. This report highlights several issues as observed in the trade data. Large discrepancies were observed between the quantities reported by Indonesia and the Netherlands. For only 41 of 1146 records both countries reported the same quantities. For 496 records, the Netherlands did not report any quantity, and 132 records had no reported quantity by Indonesia. The large discrepancies mentioned in the report can be caused by differences in reporting; such as permits issued versus actual trade. Other reasons for reported differences in quantities may be: discrepancies in reporting of source, purpose, terms and units, or permits may be issued at the end of one year and arrive in the import country in the following year. However, a possibility that cannot be excluded is that no permits were issued for the 132 cases with no recorded quantity in export documentation.

The UNEP-WCMC CITES Trade Database indicated trade in five wild-sourced reptile species and 14 coral species between the two countries, despite European Union (EU) trade suspensions or negative opinions being in place. However, for almost all species quantities were only reported by Indonesia, making it likely these originate from permits issued and not actual trade. Nevertheless, commercial trade in wild-sourced specimens was reported by both Indonesia and the Netherlands for the coral species *Hydnophora microconos* despite an EU negative opinion being in place at the time. Further efforts are therefore required by the Dutch authorities to ensure that in the future all EU import restrictions are fully complied with. In addition, this report shows that trade suspensions can lead to a sudden increase in trade of captive-bred specimens like that demonstrated for the trade in Common Seahorse. A sudden switch to captive-bred specimens raises questions about the legality of the reported source and if the specimens are potentially fraudulently declared as such. Even though signs are positive that for several species groups (e.g. molluscs and fish) animals reported as captive-bred or farmed are indeed originating from breeding facilities, the significant trade in taxa like coral and reptile species, for which laundering has been well documented, suggest that some of the wildlife imported into the Netherlands could be fraudulently declared as captive-bred or captive-born.

The EU single market makes it easy to transport wildlife between EU countries with virtually no documentation. Therefore the true quantities and species imported and traded in the Netherlands are likely to be higher and some species imported into the Netherlands are destined for other EU Member States. This has also been found through surveys of the annual Snake Day in Houten where the trade in Indonesian species by vendors from eight different EU countries was documented.

In light of the above, the following recommendations have been made:

To ensure that trade in live animal species is not occurring to the detriment of wild populations in Indonesia, the Government of Indonesia should:

- Increase transparency of the process under which the government conducts Non-Detriment Findings in order to evaluate issued harvest and trade quotas for CITES-listed species;
- The CITES Management Authority of Indonesia should take into account the viable production capacity and economic viability of any commercial captive breeding/mariculture facility when authorizing their operations and should continuously monitor and inspect their operations in order to prevent laundering of wildlife;
- Initiate regular dialogue with the European Commission and individual EU Member States to prevent, discuss or lift trade suspensions and negative opinions;
- Ensure that exported quantities do not exceed the quantities for which permits have been granted;
- Improve compliance with the CITES requirements regarding the documentation of trade in coral species, both for specimens and trade in kilogrammes, and should not issue export permits for taxonomic levels for which trade has not been found appropriate by CITES as mentioned in CITES Notification No. 2003/020 and 2013/035;

To ensure fraudulently exported wild-sourced specimens are not imported into the Netherlands and into the EU common market, and to ensure that the import of live animal species from Indonesia is not detrimental to the survival of wild populations the Government of the Netherlands and the European Commission should consider the following priorities:

- The CITES Scientific Authorities of the Netherlands/ European Commission should take steps to take into consideration scientific evidence regarding possible false declarations of captive breeding before issuing import permits. Systematic requests for detailed information should be made to exporting countries on captive breeding facilities (including for captive-born specimens) and steps taken to monitor breeding facilities to prevent laundering of wild specimens.
- The Netherlands should take steps to record coral trade more accurately, and consider refusing imports which are incorrectly documented, i.e. with trade terms LIV instead of COR;
- The European Commission and the Netherlands should consider refusing the imports of species for which quotas have been set at genus or higher taxonomic level, unless the use of higher taxonomic levels is accepted by the CITES Parties (e.g. CITES Notification No. 2003/020 and 2013/035).
- The scale of trade in certain taxa, such as corals and reptiles, should be recognized and EU law enforcement efforts should be enhanced to respond more effectively to fraudulent and illegal imports at EU points of entry;
- The enforcement authorities of the Netherlands, in particular the Netherlands Food and Consumer Product Safety Authority (NVWA), should increase regulatory vigilance over commercial events (e.g. reptile trade fairs) that bring together vendors/buyers from various EU Member States in order to prevent the import of species into the Netherlands for which trade restrictions are in place, but likely entered the EU via other Member States (possibly those with weaker enforcement capacities);
- To ensure a co-ordinated response to illegal and unsustainable trade, EU Member States should pursue a more consistent law enforcement effort across the EU, guided by the effective implementation of the EU Action Plan against Wildlife Trafficking. This could include exchange of information obtained by regular monitoring of key EU wildlife fairs and markets (physical and online), which could provide early warnings for emerging trends and potential illegal trade;
- The European Commission should consider improving co-operation on a scientific and/or enforcement level between Indonesia and the EU (including the Netherlands) for example through inviting representatives of the Indonesian Government to the Scientific Review Group (SRG). Such co-operation could include study exchanges, exchange of scientific information and underlying methodologies or joint enforcement operations that target Indonesian wildlife traded onto the EU consumer market.

INTRODUCTION

Unsustainable trade is increasingly seen as a major threat to the conservation of species in Southeast Asia, driven by global consumer demand for pets, traditional medicine, luxury items and food (Lenzen *et al.*, 2012; McNeely *et al.*, 2009; Nijman, 2010; Sodhi *et al.*, 2004; Zhou *et al.*, 2004). With its archipelagic geography and high biodiversity level, Indonesia is one of the largest sources of wildlife traded from Southeast Asia (Iskandar *et al.* 2006; Nijman *et al.*, 2009). Ongoing illegal and unsustainable harvest threatens the survival of populations of many different species groups (Gibbons *et al.*, 2000; Natusch *et al.*, 2012; Shepherd *et al.*, 2005, Shepherd, 2010; van Balen *et al.*, 2000; Yuwono *et al.*, 1998). Indonesia has been identified as the most significant exporting country of wild-sourced specimens of reptiles and corals in Southeast Asia between 1998 and 2007 (Nijman, 2010). The laundering of wild-sourced specimens fraudulently declared as captive-bred reportedly occurs on a large scale (Nijman *et al.*, 2009; Nijman *et al.*, 2015) and potentially can have a grave impact on wild populations in Indonesia (Natusch *et al.*, 2012).

One of the driving forces of wildlife trade in Indonesia is the exotic pet trade (Natusch *et al.*, 2012; UNEP-WCMC 2007; Yuwono *et al.*, 1998). It has been confirmed that in particular rare and newly identified species have a high commercial value and are increasingly traded internationally. These specific taxa attract specialist collectors, fuelling commercial exploitation, which can lead to species extinction (Nijman *et al.*, 2014; Shepherd *et al.*, 2005; Stuart *et al.*, 2006; Theile *et al.*, 2004; Vinke *et al.*, 2015). Reptiles are possibly the most intensively harvested terrestrial fauna that are sourced in great volumes both legally and illegally (Sodhi *et al.*, 2004; Soehartono, 2002; Nijman, 2010; Nijman *et al.*, 2012), with more reptile species traded for the live pet trade than for any other consumer market (Nijman *et al.*, 2009). Besides terrestrial species, Indonesian aquatic species are also traded in large volumes to meet the demand of the marine aquarium industry. Since the Philippines has prohibited the export of live corals, Indonesia has become the most significant exporting country (Raymakers, 2001; UNEP-WCMC, 2014b).

Indonesia became a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1979. CITES regulates the international trade in wildlife through the listing of species in three Appendices subject to different degrees of regulation. Commercial international trade in species listed in Appendix I is generally prohibited, except when it concerns animals bred at registered breeding facilities (source code 'D'). It is possible to commercially trade species listed in Appendix II and III if certain conditions are met and relevant CITES documents are obtained.. The government of Indonesia has therefore adopted an extensive quota system for both harvest and export (Nijman *et al.*, 2012; Vinke *et al.*, 2015). These quotas are also established for non-CITES listed species. Despite these extensive legal instruments, illegal trade and a lack of enforcement has repeatedly been observed and documented (Natusch *et al.*, 2012, Nijman *et al.*, 2012; Shepherd *et al.*, 2005; Siswomartono, 1998; van Balen *et al.*, 2000). Indonesia is a range State that is closely monitored by the EU to identify possible trade irregularities (Engler *et al.*, 2007). Because of concerns regarding the trade volumes and sustainability of the trade the European Union (EU) has suspended the trade in numerous Indonesian species, in particular reptile species (Engler *et al.*, 2007; UNEP-WCMC, 2007; UNEP, 2016).

1.1 The European Union

The EU is one of the largest and most diverse destination markets for wildlife (Auliya, 2003; Engler *et al.*, 2007; Theile *et al.*, 2004), with an estimated import value of CITES-listed animal species of EUR582 million in 2013, excluding the trade between EU Member States (UNEP-WCMC, 2015b). CITES is implemented in the EU by the so-called EU Wildlife Trade Regulations, which include *Council Regulation (EC) No. 338/97* and *Commission Regulation (EC) No. 865/2006* (European Commission *et al.*, 2015). According to a detailed analysis of the EU and candidate countries trade

in wildlife covered by the EU Wildlife Trade Regulations in 2013, skins and live animals were the most important animal and animal products imported into the EU in terms of volumes (UNEP-WCMC, 2015b). Corals, reptiles and leeches dominated the live animal imports into the EU which accounted for EUR5.7 million in 2013. In addition wildlife is also illegally imported into the EU, with birds and reptiles amongst the species that are most commonly seized (Pieters, 2016). In 2013 the majority of the specimens imported into the EU were either wild-sourced (54%) or of captive sources (43%)¹ (UNEP-WCMC, 2015b). Because of the common European market and fewer controls with regard to wildlife trade within the EU, it is difficult to quantify the actual size of the internal EU wildlife trade. In addition, uneven enforcement and implementation of the EU Wildlife Trade Regulation across EU Member States provide opportunities for offenders to import specimens through Member States with less stringent border controls (European Commission, 2015). Once a specimen has entered the EU it becomes very difficult to regulate trade. Particularly in certain EU countries such as Germany, the Netherlands, the United Kingdom and the Czech Republic, there is a high demand and collector interest for live animals intended for the exotic pet trade (Auliya, 2003; Engler *et al.*, 2007; Milieu Ltd *et al.*, 2006). Wildlife traders in these EU Member States often try to import and breed rare species after which they are sold with high profits (Vinke *et al.*, 2015). So far little research has been done on the role of individual EU Member States in the legal and illegal live animal trade (UNEP-WCMC, 2007).

1.2. The Netherlands

It has been acknowledged that within the EU, the Netherlands plays a key role in the wildlife trade, both as a destination market and as a transit country (Engler *et al.*, 2007; UNEP-WCMC, 2007; van Krevelt, 2007). The role that the Netherlands plays in the trade and trafficking of wildlife is partly attributed to the Port of Rotterdam, the largest European harbour, and Schiphol airport, one of the main European transit airports. As the bulk of the trade operates through ports, the logistical position of the Netherlands makes it an attractive wildlife trade hub on an international scale (Government of the Netherlands, 2014; Pieters, 2016; van Uhm, 2009).

Although many species are traded in accordance with the EU Wildlife Trade Regulations, illegal and unsustainable trade still takes place. The consumer market inside the Netherlands is diverse with expanding markets and marketplaces. Private collectors are prone to be involved in the trade in wildlife, in particular when dealing with the trade in live species (van Krevelt, 2007; van Uhm, 2009). Specialist wildlife fairs for exotic pets (e.g. reptiles, birds, and fish) regularly take place in the Netherlands, providing a market place for individuals trading in both legal and illegal wildlife. These fairs also attract wildlife traders and specialist collectors from across the EU. As the European market enables free movement of goods, it is relatively easy to take a specimen from one EU Member State to another (Altherr, 2014). The sale of wildlife through the Internet is also an increasing trend, both for the legal and illegal market (van Krevelt, 2007).

The scale of the trade is demonstrated through the amount of seizures that are made in the Netherlands. The latest CITES biennial report of the Netherlands for 2013-2014 showed that a total of 3908 import permits were issued. Over the same two-year period a total of 1634 seizures of both animal and plant species were reported. The majority of the seizures (40%) involved Traditional Chinese Medicine, followed by birds (25%), plants (15%), reptiles (10%) and mammals (10%) (CITES 2015). Indonesia is connected regularly with important seizures in the Netherlands and is one of the significant players with regard to the animal trade (CITES 2015). Yet, the true dynamics of the trade relationship between the Netherlands and Indonesia had been poorly understood prior to the compilation of the present report.

¹Includes species with CITES source code 'A'; plants that are artificially propagated, source code 'C'; animals bred in captivity, source code 'D'; Appendix I listed animals bred in captivity and source code 'F'; animals born in captivity.

1.3. Aim of the study

The aim of this study was to gain insights into the import-export relationships between Indonesia and the Netherlands by studying the trade in live animals from 2003 to 2013. The true dynamics of the trade between both countries are relatively poorly understood. This report allows a better understanding of the role of the Netherlands as an importing country, and Indonesia as an exporter of live animal species by providing an overview of trade dynamics. The results can be used to guide future policy and regulatory interventions and highlight issues of concern. Within the scope of this study, only trade in species listed in the CITES Appendices and EU Annexes has been analysed. As several Indonesian species have been fraudulently documented as being captive-bred, while in reality were illegally obtained from the wild, this report will pay special attention to the source of the specimens. In addition, the import figures are compared to their compliance with the Indonesian export quotas and EU import restrictions. This report also pays special attention to species listed as being threatened on the IUCN Red List of Threatened Species. Recommendations are formulated and addressed to the Governments and CITES Management Authorities of Indonesia and the Netherlands, and to the European Commission.

1.4. Background: Legislation, quota setting and import restrictions

1.4.1. Indonesia

Indonesia ratified CITES in December 1978, which entered into force in March 1979. The implementation and enforcement of CITES regulations, including the compliance with the established export quotas² is the responsibility of the appointed CITES Management Authority, the Directorate General of Forest Protection and Nature Conservation (PHKA). On a provincial and district level this implementation and enforcement is carried out through the regional offices of the Natural Resources Conservation Agency (BKSDA). Hunters and traders must be registered through the BKSDA to be able to harvest species legally from the wild or to be entitled to export a specimen. In addition a permit is needed in order to harvest or export wildlife. To be able to breed specimens in captivity for export, the breeding facility must be registered with PHKA. Facilities that supply captive-bred specimens but do not trade themselves are registered at the provincial level through the BKSDA.

The import and export requirements are different for species that are captive-bred than for wild-sourced animals. Since it is argued that the trade in captive-bred specimens does not pose a similar threat to the survival of wild populations as trade in specimens sourced from the wild, CITES accommodates more lenient permit and certificate requirements for these specimens. Hence the Indonesian Government actively encourages captive breeding as a way to prevent, in theory, overexploitation and to reduce the pressure on wild populations. According to Indonesian *Government regulation No. 8, 1999*, second generation captive-bred offspring do not require quotas and can therefore be commercially exported. The Indonesian Government regulates the number of animals that can be bred in captivity for each registered facility. Trade in wild-sourced species in Indonesia is regulated through an annual harvest and export quota system. Quotas for species listed in Appendix II and III of CITES are set by the Indonesian Institute of Sciences (LIPI), the responsible CITES Scientific Authority at the national level. Indonesia also establishes quotas for species that are not CITES-listed.

For species that are fully protected under national legislation, no export quotas are established and commercial trade in these species is unlawful, unless it comprises animals bred in captivity. Before quotas can be established, CITES protocols require that a non-detriment finding (NDF) is made, where the CITES Scientific Authority has to advise if the export of the specimen is not

² Quotas for wild-sourced and captive-bred specimen are set by the Government of Indonesia, as part of the non-detriment finding (NDF). Indonesia also sets quotas for non-CITES species.

detrimental to the survival of the species. All Indonesian quotas are established in dialogue with various stakeholders, including licensed traders and hunters. The established quotas can distinguish between the types of the specimen traded (e.g. live or skins) and it is only permitted to trade specimens within assigned quantities, use/type of specimen and from designated origins. In Indonesia, around 10% of the harvest quota may be used for domestic trade.

1.4.1.1 Law Enforcement issues

Even though Indonesia has adequate national legislation in place, illegal and fraudulent trade is well documented and persistent (Auliya, 2003; Nijman *et al.*, 2009; Natusch *et al.*, 2012; Nijman *et al.*, 2012; Nijman *et al.*, 2015; Siswomartono, 1998; Yuwono *et al.*, 1998). Actual harvests sometimes greatly exceed quota levels or quotas are reportedly established based on limited biological information (Iskandar *et al.*, 2006; Nijman *et al.*, 2012). As many of the Indonesian species collected for the international trade originate from remote provinces such as West Papua and Papua, located on Western New Guinea, information on the reproduction and distribution of species is lacking. In many cases quotas are reportedly not established on reliable NDFs but are rather based on quotas of previous years and information provided by exporters (Natusch *et al.*, 2012; Nijman *et al.*, 2012).

To avoid export quotas and to continue to supply the domestic and international markets, many wild-sourced specimens are reportedly fraudulently declared as captive-bred and laundered in large volumes (Lyons *et al.*, 2011). Even though Indonesia is not the only country that actively supports captive breeding to reduce pressure on wild populations, this system is complex and can be misused as an effective laundering mechanism. Trade in species taken from the wild is far more profitable, as no financial investments have to be made to breed and raise wild-sourced specimens. A recent study on the commercial captive breeding of Tokay Geckos *Gekko gecko* found that the quantities reported in trade cannot be sustained by the breeding facilities currently registered in Indonesia (Nijman *et al.*, 2012, Nijman *et al.*, 2015). So far no special techniques have been developed to distinguish easily wild-sourced specimens from captive-bred specimens.

1.4.2 The European Union

On the European level wildlife trade is governed by the EU Wildlife Trade Regulations that jointly implement the provisions of CITES (European Commission, 2015; European Commission *et al.*, 2015). All Member States have ratified the Convention and the EU, as a regional entity, has recently also acceded to CITES, which entered into force in July 2015. The scope of the EU Wildlife Trade Regulations is more encompassing and stricter than CITES. However trade is not only defined by the import, export or re-export of wildlife, but also by the movement or transport within the EU and the possession thereof (European Commission *et al.*, 2015). The EU Annexes (A, B and C) largely correspond with the CITES Appendices although some species are listed in a higher Annex. Annex B and C also include some non-CITES species. For example, Annex A also includes a few species that are listed in CITES Appendix II and III. Species included in Annex D are imported into the EU in volumes that warrant monitoring or concern species that can potentially constitute an ecological threat to indigenous European wildlife (European Commission, 2015; European Commission *et al.*, 2015).

Because implementation of the EU Wildlife Trade Regulations and external border control is the responsibility of the individual Member States, weak national enforcement can seriously affect the overall capacity of the EU to regulate wildlife trade (Engler *et al.*, 2007; Theile *et al.*, 2004). To strengthen the EU policy against wildlife trafficking the EC launched a public consultation process in 2014 on the EU approach against wildlife trafficking. Uneven and insufficient implementation and enforcement of the EU Wildlife Trade Regulations at the Member State level was identified as a major problem, further aggravated by low political will and insufficient awareness, among other issues (European Commission, 2015). Recognizing its role as a wildlife trade hub and destination market, the EC adopted a strategic and co-ordinated EU Action Plan against Wildlife Trafficking on

26 February 2016³. The action plan focuses on three priority areas: increase enforcement through closer EU collaboration, more effective prevention through demand and supply reduction and strengthening of co-operation with range States.

1.4.2.1 EU import restrictions

Through Article 4(6) of European Commission (EC) *Regulation No. 338/97*, the EU Wildlife Trade Regulations also provides the European Commission with the legal authority to apply trade restrictions to species that are a cause of concern to the Scientific Review Group (SRG). The SRG, consisting of Scientific Authority representatives from each Member State, can give an advice on import restrictions. Meeting three to four times a year, the SRG gives an opinion whether the import of certain species from certain countries complies with the EU Wildlife Trade Regulations. If one or more Member States are concerned that the trade in a species from a certain range State is detrimental to the species's survival, the SRG consults with the particular range State and gathers information on the trade and conservation status of the species to be able to reassess the NDF conducted. The Scientific Authorities of the range States also make an NDF before issuing an export permit. If the information available is insufficient to ensure that the introduction into the EU would not have a harmful effect on the conservation status of the species, the SRG forms a "negative opinion". The SRG can also form an opinion for EU Annex B species that show a high mortality rate during transportation or are unlikely to survive in captivity. As long as a negative opinion is in place EU Member States cannot issue any import permits for this specific species-country combination. These negative decisions are temporary and can be easily changed into a "positive opinion" once the SRG has been assured that the survival of the species in the wild is no longer at risk. However, if there is a continuous concern and the respective range State has not provided sufficient information to prove otherwise, a trade suspension can be imposed, through the so-called "suspension regulation". The trade suspension becomes effective once it is published in the official journal of the EU. Lastly, if there are not sufficient data available to enable the SRG to form an opinion, the SRG can decide to issue a "no opinion", implying that there is little or no actual or anticipated trade, or that there are insufficient data available for a positive or negative opinion. In these cases, European Management Authorities have to ask the national Scientific Authorities of the exporting country for a NDF before granting an import permit (European Commission *et al.*, 2015).

Because of the large volumes being exported by Indonesia, the SRG has raised concerns regarding the quota levels and sustainability of a number of species traded from Indonesia (UNEP-WCMC, 2007). Following limited scientific justification of export quotas, the EU has a number of negative opinions and trade suspensions in place for animal species exported from Indonesia (Engler *et al.*, 2007; UNEP-WCMC, 2007; UNEP 2016). At the time of writing, a total of 15 negative opinions are in place for Indonesia, which ban the EU import of certain species of coral (12), insect (1) and reptile (2). The number of trade suspensions at the time of writing totals 39, suspending the import in certain Indonesian species of bird (1), coral (9), fish (7), insect (1), mammal (2) and reptile (19) into the EU (UNEP, 2016).

1.4.3 The Netherlands

The actual implementation of the EU Wildlife Trade Regulations is the responsibility of the individual Member States. The Netherlands ratified CITES in April 1984, and it entered into force in July of the same year. Effective implementation is the responsibility of the CITES Management Authority of the Netherlands, the Ministry of Economic Affairs. An import permit or certificate of origin has to be acquired in order to import any CITES listed or EU Annex listed species into the Netherlands. This is carried out by the executing agency of the CITES Management Authority, the Netherlands Enterprise Agency (RVO.nl) (van Uhm, 2009; RVO, 2016). The CITES Scientific Authority of the Netherlands is also positioned within the Ministry of Economic Affairs.

³ http://ec.europa.eu/environment/cites/trafficking_en.htm

METHODS

Data on the trade in live animals from Indonesia and the Netherlands were retrieved from the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade Database, publicly available at <http://trade.cites.org>. The UNEP-WCMC CITES Trade Database contains records on the import, export and re-export of CITES listed species. The database also contains records on the import of non-CITES species listed in EU Annexes C and/or D. However, this is limited to the years when species are listed in these Annexes and only comprise records of import into the EU. Information on quotas and CITES/EU suspensions, as well as EU Annex listing and EU decisions were retrieved from the Species+ website, which can be accessed through <http://www.speciesplus.net/>. Species+ has been developed by UNEP-WCMC and the CITES Secretariat to centralize information on, amongst others, CITES and EU listings. This report does not include trade in species which are not listed in the CITES Appendices or EU Annexes. The total volume of trade between Indonesia and the Netherlands is likely to be a lot higher since e.g. less than 8% of all reptiles are listed in CITES (Auliya *et al.*, 2016).

This report focuses on the trade in live animals between Indonesia and the Netherlands from 2003 to 2013, with Indonesia as the country of origin. Only records with a mentioned purpose of commercial trade (purpose code 'T') were included in the dataset. Trade records are required to be annually submitted to the CITES Secretariat by the individual Parties which are then uploaded to the UNEP-WCMC database. Both the importing (the Netherlands) and exporting (Indonesia) country are required to report the trade quantities in their statistics. As large discrepancies were observed between the imported and exported mentioned quantities, the highest mentioned quantity was used for analysis. By using the highest mentioned quantity the results of this report can be interpreted as a "worst-case" scenario. This report relies on the data provided by the Parties to CITES and therefore as available in the UNEP-WCMC CITES trade database and Species+ website (UNEP, 2016). Data from the UNEP-WCMC CITES trade database and Species+ were downloaded in August 2015.

This report uses CITES nomenclature, and therefore may not be consistent with the latest taxonomic classification. Definitions used in this report follow the CITES definitions and English common names are given where available. Some coral species are only described with a scientific name. Animals bred in captivity (source code 'C') refers to at least second generation offspring that were born in a controlled captive environment (in accordance with CITES *Resolution Conf. 10.16 Rev.*). Source code 'D' refers to Appendix I animals bred in captivity for commercial purposes at facilities included in the CITES Secretariat's Register in accordance with *Resolution Conf. 12.10 (Rev. Cop15)*. Animals born in captivity (source code 'F') refers to offspring of wild parents or subsequent generation offspring that do not fulfil the CITES definition of "bred in captivity" in *Resolution Conf. 10.16 (Rev.)*. Source code 'I' refers to confiscated or seized specimens. Wild-sourced animals (source code 'W') refers to animals taken from the wild.

Besides analysis of the UNEP-WCMC CITES Trade Database, a survey was conducted at the annual Snake Day of the European Snake Society in Houten, the Netherlands on 11 October 2015. This is the largest snake-only reptile show in the world, held annually in the Netherlands. This particular show was chosen for a survey since it was held during the study period and was limited to only one species group. This limited the number of Indonesian species potentially present at the show to only one group and therefore increased the chance of identifying Indonesian species compared to a show with all species groups present. During this survey all available Indonesian species, the source, locality and price were documented whenever possible. Colour morphs were excluded from the survey, as these specimens are bred for their morphological characteristics and are therefore likely not wild-sourced or even imported from Indonesia. The goal of the survey was to observe which



Coral Reefs in Banda Neira, Moluccas, Indonesia.

Indonesian species were sold by the various vendors, and if the specimens that were traded were declared as captive-bred or wild-sourced to gain insight into the trade between EU Member States.

2.1 Seizure data

Data on any seizures of live animals imported from Indonesia into the Netherlands, or wildlife seized by Indonesian authorities with the Netherlands as a destination country, was requested from both the Indonesian and Dutch Governments. On 19 October 2015 a formal Dutch Freedom of Information law, *Wet Openbaarheid van Bestuur (WoB)*, request was sent to the RVO.nl. The goal of this request was to obtain data on any seizures of live animals originating from Indonesia by the Dutch authorities and obtain data on both CITES and non-CITES listed species imported into the Netherlands. On 17 November 2015 RVO.nl approved the WoB request (nr. Wob/2015/256) and provided the data on all live animals seized originating from Indonesia between 2003 and 2013.

The Indonesian CITES Management Authority, PHKA, was approached with a similar request as the Dutch authorities based on the Indonesian act on Public Information Openness. No response has been received to this request.

RESULTS AND DISCUSSION

According to the UNEP-WCMC CITES trade database, 547 947 live animals, both CITES and EU Annex listed, were imported into the Netherlands between 2003 and 2013 (Table 1). The vast majority of animals were directly imported from Indonesia. Coral, fish and reptiles were also imported from Indonesia via Japan, Malaysia, Singapore, Switzerland, Thailand, and the USA. Coral specimens comprised 98% of the total trade in live animal specimens from Indonesia to the Netherlands, followed by fish (1.02%), reptiles (0.69%) and molluscs (0.24%). The share of coral imports is even higher when coral reported in kilogrammes is taken into account. Between 2003 and 2013 only one bird species (Pesquet's Parrot *Psitttrichas fulgidus*) and one mammal species (Large Flying-fox *Pteropus vampyrus*) were reportedly imported from Indonesia. Five reptile species imported from Indonesia were not native to Indonesia and originated from Madagascar and Mozambique. Of the live animals imported from Indonesia 55% were reportedly wild-sourced (source code 'W'), 45% were reported as animals born in captivity (source code 'F') and 0.55% of the animals were bred in captivity (source code 'C'). Quite a substantial percentage of trade is recorded under source code 'F', which includes species born in captivity of first or subsequent generations. It is not clear if trade in specimens under this source code falls outside the quota levels issued as the Government of Indonesia only excludes second generation specimens born in captivity from quotas. For coral species, comprising the bulk of the trade, the use of source code 'F' has been endorsed by the CITES Management Authority of Indonesia for specimens originating from mariculture.

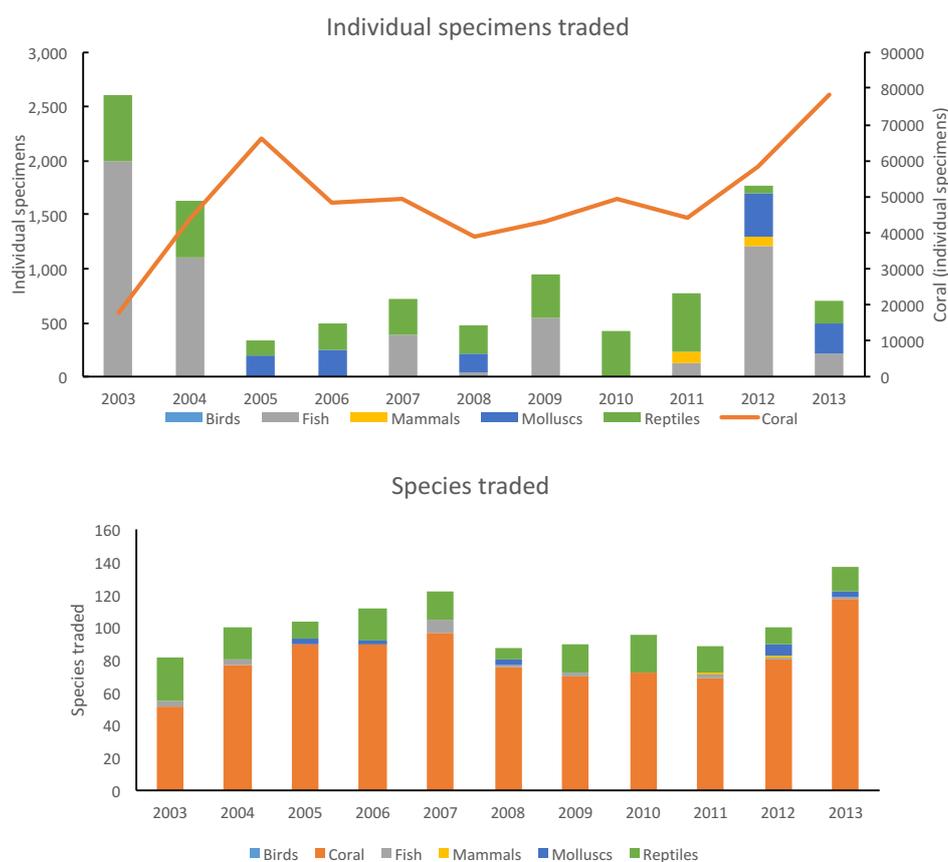


Figure 1. Overview of the trade in live animals, both CITES and EU Annex listed, from Indonesia to the Netherlands during the period 2003-2013. The top graph displays fluctuations in the number of specimens for six species groups, with coral trade on the second axis. The bottom graph displays the fluctuations in number of species per species group imported per year. Source: UNEP-WCMC CITES Trade Database.

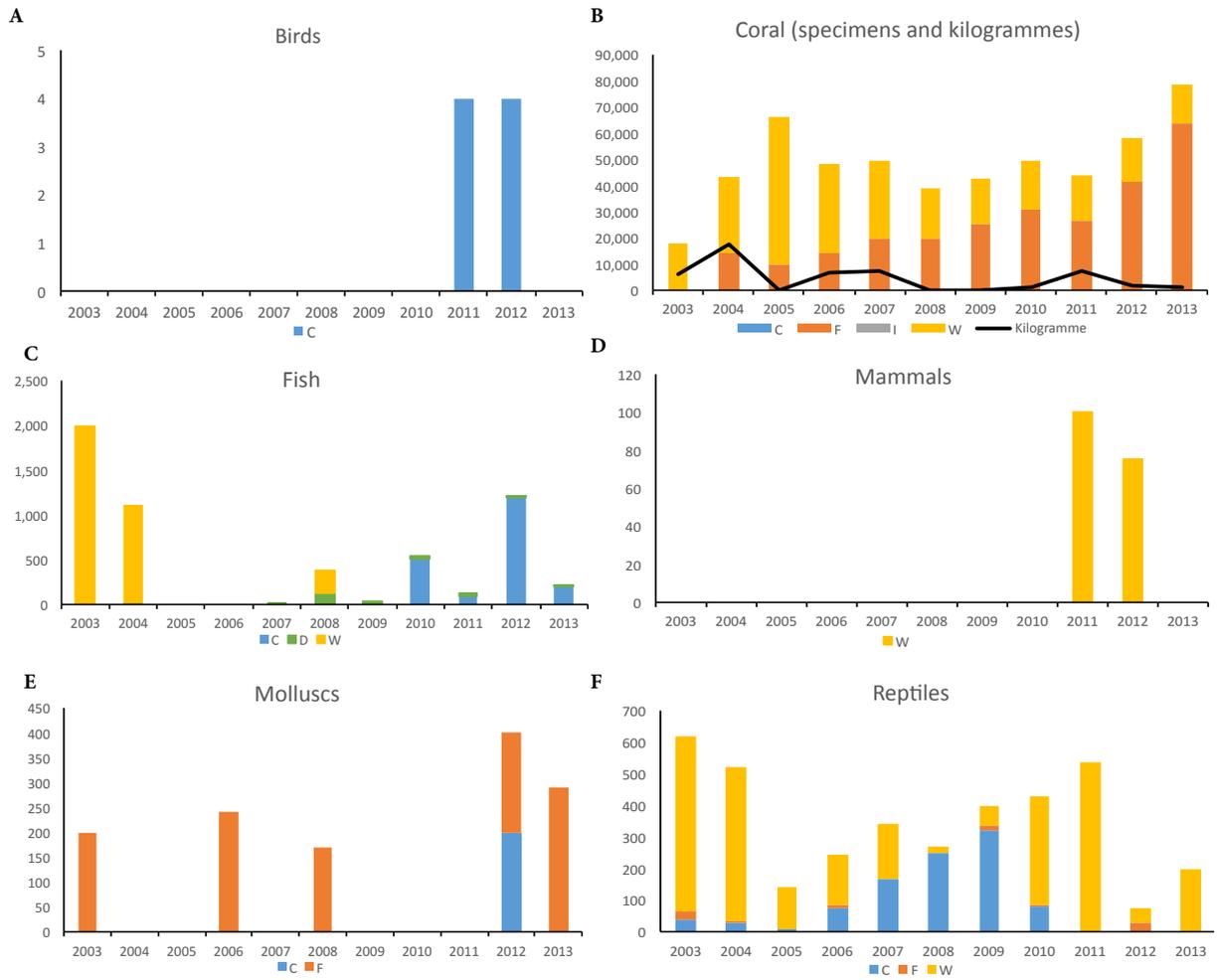


Figure 2. Overview of the trade in live, both CITES listed and EU Annex listed, animals from Indonesia to the Netherlands during 2003-2013. Graph B comprises both the trade in live coral specimens (stacked bars) and in kilogrammes (line). Captive-bred: source code 'C', and Captive-born: source code 'F' and Wild-sourced: source code 'W', CITES Appendix I species bred for commercial purposes: source code 'D'; Seized animals: source code 'I'. Source: UNEP-WCMC CITES Trade Database.

Table 1. Overview of trade in live animals, as reported in both individual specimens and kilogrammes of all orders and their corresponding sources. The table shows the reported trade for all orders specified by CITES source code. Trade quantities are also reported for both countries specific to highlight discrepancies between the reported numbers. Captive-bred: source code 'C' and 'D' (fish), Captive-born: source code 'F', Confiscated: source code 'T' and Wild-sourced: source code 'W'. 'NL' refers to the reported quantity by the Netherlands, and 'ID' to the reported quantity by Indonesia. Source: UNEP-WCMC CITES Trade Database.

Order	Captive bred	Captive born	Confiscated	Wild-sourced	ID	NL
Birds	8				8	
Coral (specimens)	135	265 598	26	271 320	432 346	296 980
Coral (kilogrammes)				48 773	17 571	40 438
Fish	2286			3327	2325	4066
Mammals				175	157	100
Molluscs	200	1100			810	740
Reptiles	961	91		2720	3442	1672

3.1 Seized animals

The data received from RVO.nl on seized live animals, both CITES and non-CITES listed, from Indonesia provided only a very general insight on seizures made within the Netherlands. Data obtained from RVO.nl did not include any detailed information on particular species or species names but were confined to general terms like "Coral" or "Stony Coral". The majority of the seized animals consisted of live coral with only a few reptiles, clams and shrimp specimens (Table 2). The data provided did not specify the seized coral to species level. A total of 52 pieces of soft coral, and 263 pieces of stony coral were seized. In addition 852 coral pieces (spp. unknown) were seized during 2003 and 2013. In addition to the unidentified coral pieces, five individual Green Tree Pythons *Morelia viridis* were seized in 2010 and one Giant Clam *Tridacna gigas* in 2012. Five sponges (not CITES-listed) and 31 shrimps were seized as well.

Nonetheless, the CITES biennial reports submitted by the Netherlands provide a more complete overview of the specimens seized, even though only a few documented seizures found in the biennial reports matched the data received through RVO.nl. Of all Dutch biennial reports for the period examined, only the reports of 2011-2012 and 2013-2014 contained detailed data on specimens seized from Indonesia. The biennial report of 2009-2010 describes the seizure of 991 kg *Scleractinia* spp. as was also mentioned in the data received from RVO.nl. However between 2011 and 2012, an additional 615 substrate stones of which 73 contained living colonies of *Porites* spp. were reportedly seized due to missing CITES export and import permits. Moreover, 169 living coral specimens (157 *Acropora* spp., 11 *Montipora* spp., 1 *Merulina* spp.) and one clam (*Tridacna* spp.) were included in a shipment of ornamental fish, destined for Romania, and seized in transit due to missing CITES export and import permits. A shipment of 680 kg live corals, containing at least 117 pieces, was also seized due to a lack of CITES permits. Thirty-one pieces of natural stone were seized based on the fact that they contained live or recently live colonies of *Scleractinia* spp. and *Heliopora* spp. while import permits were lacking. Furthermore, 13 pieces of stony corals, identified as *Tubastrea* spp. (4), *Fungia* spp. (3), *Cynarina lacrymalis* (1), *Symphyllia* spp. (5), were seized as CITES permits were lacking. Additionally the biennial report 2013-2014 revealed that the five live corals seized in 2013 comprised pieces of *Fungia* spp. (3), *Tubastrea* spp.(1) and *Herpolitha* spp. (1). Specimens were seized as no CITES export and import permits were included.

Table 2. Overview of all seized live animals, both CITES listed and non-CITES listed, in the Netherlands with Indonesia as origin. Quantity data are in specimens unless stated otherwise. Data were obtained via a Dutch Freedom of Information law request (Wob/2015/0256) to the Netherlands Enterprise Agency (RVO. NL) and biennial reports submitted by the Netherlands.

Seizure data provided by RVO.nl			Seizure data provided by the biennial reports		
Year	Taxon	Quantity	Year	Taxon	Quantity
2003	Stony coral (spp. unknown)	6			
2003	Coral (spp. unknown)	37			
2004	Coral (spp. unknown)	42			
2004	Coral (spp. unknown)	19			
2005	Soft coral (spp. unknown)	38			
2005	Stony coral (spp. unknown)	29			
2006	Stony coral (spp. unknown)	68			
2006	Stony coral (spp. unknown)	30			
2006	Soft coral (spp. unknown)	14			
2007	Coral (spp. unknown)	125 g			
2008	Coral (spp. unknown)	25			
2008	Coral (spp. unknown)	20			
2008	Coral (spp. unknown)	16			
2010	Green tree pythons <i>Morelia viridis</i>	5			
2010	Coral (spp. unknown)	991 kg	2010	Scleractinia spp.	991 kg
2011	Coral (spp. unknown)	180 kg	2011-2012	<i>Porites</i> spp.	73
2011	Stony coral (spp. unknown)	65	2011-2012	<i>Acropora</i> spp.	157
2011	Stony coral (spp. unknown)	65	2011-2012	<i>Montipora</i> spp.	11
2012	Coral (spp. unknown)	106	2011-2012	<i>Merulina</i> spp.	1
2012	Giant Clam <i>Tridacna gigas</i>	1	2011-2012	Coral (spp. unknown) Scleractinia and <i>Heliopora</i> spp	680 kg 31
2012	Coral (spp. unknown)	582			
2012	Cleaner Shrimp (spp. unknown)	31	2011-2012	<i>Tubastrea</i> spp	4
2012	Sponges (spp. unknown)*	5	2011-2012	<i>Fungia</i> spp. <i>Cynarina lacrymalis</i> <i>Symphyllia</i> spp.	3 1 5
2013	Coral (spp. unknown)	5	2013	<i>Fungia</i> spp. <i>Tubastrea</i> spp. <i>Herpolitha</i> spp.	3 1 1

*Not CITES listed.

3.2 Inconsistent quantities

The UNEP-WCMC CITES trade database provides a unique insight into the trade in CITES listed species, but must be interpreted taking into account certain caveats. The reliability of the trade database is dependent on the quality of the national reporting by the CITES Parties. Often, Parties are bound by limited capacity and unlimited demands on their resources (Foster *et al.*, 2014). CITES Parties may report data to the UNEP-WCMC CITES trade database based on actual trade numbers or on the number of permits issued. This may result in substantial discrepancies within the database and can cause uncertainty about actual trade quantities. Earlier studies have shown that the importer and exporter reported species and quantities often differ significantly, thereby compromising the reliability of these datasets (Foster *et al.*, 2014; Nijman, 2010.). Actually traded quantities are often considerably less than the quantities for which permits have been issued. Moreover, some permits are not used at all, which leads to reported trade transactions in the database that actually never took place (UNEP-WCMC, 2013b). Nonetheless for Appendix III or EU Annex C and D species only an export permit and/or import notification is required which may result in a reporting gap by the importing country. The import notification is not a requirement by CITES but a stricter EU measure. Other reasons for reported differences in quantities may be: discrepancies in reporting of source, purpose, terms and units, or permits may be issued at the end of one year and arrive in the import country in the following year UNEP-WCMC (2013b).

Even though detailed analyses of the database are tremendously valuable, the factors influencing the reliability of the dataset should be taken into account. Discrepancies between the importer- and exporter-mentioned quantities were observed in our analysis. Of all 1146 reported records, 132 showed no exporter-reported quantity and 496 no importer-reported quantity. Moreover, large differences were observed between the exporter- and importer-reported quantities with only 41 cases in which both parties reported the same trade quantities. In 2012 data provided by the Netherlands were based on actual trade (UNEP-WCMC, 2015a), however, in 2013 (UNEP-WCMC, 2015b) it was not specified. Hence, the actual amount of animals imported is likely lower than quantities mentioned in this report. The largest difference in reported quantities was 12 509 specimens. In this particular case, Polyp Stony Coral *Acropora* spp. were imported by the Netherlands in 2013. The Netherlands reported the import of 14 955 specimens while Indonesia reported the export of 27 464 specimens. Discrepancies between reported quantities were also observed in one case where coral was traded in kilogrammes instead of specimens. In this case, stony corals *Scleractinia* spp., the exporter reported quantity was 17 571 kg, while the imported quantity was 9236 kg. For our analysis the highest reported quantity was used to represent a "worst case" scenario. It is possible that the difference is caused by the fact that Indonesia reported the number for which permits were issued whereas the Netherlands reported the actual imported animals (UNEP-WCMC, 2013b), therefore both the importer- and exporter-mentioned quantities are additionally displayed in the report.

For 2013-2014 the Netherlands did report refusing CITES permits due to "inadvertent mistakes or omissions" and is together with France and the United Kingdom responsible for the majority of refused import permits (Crook *et al.*, 2016). EU Member States rejected CITES permit applications during 2013-2014 for the following reasons: Insufficient basis for finding of non-detriment, technical violations, suspected fraud or insufficient basis for finding of legal acquisition (Crook *et al.*, 2016). Rejection of the CITES permit application could be an additional reason for transactions with no importer-mentioned quantities.

3.3 Birds

Imports of live birds into the EU have been generally prohibited since October 2005 (EC 2005/760) due to veterinary considerations⁴. According to CITES trade data, four captive bred Pesquet's Parrots were exported to the Netherlands from Indonesia in 2011 and 2012; yet only Indonesia reported any trade quantities (Table 1). This raises doubt as to whether the specimens were actually imported, or Indonesia only issued permits for export. No other bird species were reportedly traded between Indonesia and the Netherlands. The Pesquet's Parrot is endemic to the rainforests of New Guinea and classified as Vulnerable on the IUCN Red List. The main threat to this species is rapid population decline due to hunting for feathers (BirdLife International, 2012).

3.4 Coral (Reported as No. of Specimens)

The Indonesian archipelago has an enormous wealth of coral reefs (Allen, 2008), and is together with Malaysia, the Philippines and Papua New Guinea part of the Coral Triangle Biodiversity hotspot (Tittensor *et al.*, 2010). The Indonesian coral reef area comprises approximately 51 000 km² and accounts for almost 20% of the global coral reef area (Center for Ocean Solutions, 2009; Wilkinson, 2008)

Over the last three decades Indonesian coral reefs declined (Allen, 2008) from which many are considered severely damaged (Scaps *et al.*, 2007). In the mid-2000s the majority of Indonesian coral reefs were considered to be under "moderate to severe risk" (Center for Ocean Solutions, 2009) even though the condition appeared to be improving between 1993 and 2014 (UNEP-WCMC, 2014b). The main threat to corals in Indonesia is considered to be destructive fishing with explosives (Burke *et al.*, 2011) while the damage due to harvesting for the aquarium trade is considered as a relative minor impact compared to other human-induced impacts (Reksodihardjo-Lilley *et al.*, 2007). Even though the international illegal trade was considered to be substantial (Jones, 2008), the CITES Scientific Authority of Indonesia regarded this as highly unlikely due to checks in both Indonesia and importing countries (UNEP-WCMC, 2014b).

For the Indonesian coral species, only the trade in Black Coral *Antipathes* spp. is prohibited, while other wild-sourced corals can be traded for commercial purposes (Timotius, 2009; UNEP-WCMC, 2014b). Only live corals can be traded and the regulation of coral harvest falls under PHKA (UNEP-WCMC, 2014b). Even though legislation is in place, both legal and non-legal instruments have a limited effect in managing the marine and coastal resources (Dirhamsyah, 2005). Weak governance and vague legal instruments open for interpretation are seen as the main reasons for this (Tissot *et al.*, 2010). Indonesian export quotas are based on reef accretion rates and the condition of the reef (UNEP-WCMC, 2014b). Coral taxa are categorized in five categories depending on the size, relative frequency, relative dominance and hard coral cover (UNEP-WCMC, 2014b). According to Bruckner and Borneman (2006) collection quotas were set too high for several taxa as there was a considerable discrepancy between the level of harvest and the abundance of the species. Export quotas represented 90% of the allowable harvest taking into account any losses during the collection process.

The Government of Indonesia is aiming at a ban on wild-sourced coral when sufficient coral can be produced in mariculture (UNEP-WCMC, 2014b). Before 2008, Indonesia reported trade/export of maricultured corals under source code 'W', but since 2008 under source code 'F' (UNEP-

⁴ Commission Regulation (EC) No. 318/2007 was replaced by (EU) 139/2013 which specifies import and quarantine conditions. The import of captive-bred birds is possible when they originate from specific countries, show negative results for avian influenza and Newcastle disease virus, are accompanied by animal health certificates and can be identified by a leg-ring or microchip (European Commission, 2007). It is unknown if there are any captive breeding facilities in Indonesia that have the paperwork to breed this species which could support the legitimacy of the documented import into the Netherlands.

WCMC, 2014b). This is also visible in Figure 2B in which wild-sourced corals made up the majority of imported corals before 2008. Since Indonesia changed the source codes, the majority of imported corals were declared under source code 'F'. This should be taken into account as the number of wild-sourced specimens is therefore likely to be overestimated before 2008. However, the shift to the majority of exported coral being declared under source code 'F' might raise questions if some coral exports are not actually sourced from the wild. The quantity of corals produced by mariculture operations in Indonesia is growing, with almost 75% of the *Acropora* spp. exported as mariculture specimens. Coral under source code 'F' are produced by cultivation of fragments taken off other corals and grown in open seabeds. The first fragmentation is obtained from a wild coral, while subsequent fragmentations are taken from the earlier fragmented pieces (Wood *et al.*, 2012). Indonesia was the main global exporter of live coral with an average of 70% of the annual global export between 2000 and 2010 (Wood *et al.*, 2012). Coral mariculture is regulated by the PHKA and specific permits are needed for the captive breeding and export of live specimens.

When analysing the trade by reported highest quantities, coral specimens comprised 98% of the trade between Indonesia and the Netherlands between 2003 and 2013 (Table 1). Coral trade quantities comprised 537 079 specimens, of which 50.20% were reportedly wild-sourced 'W', 49.45% were reported as born in captivity 'F' and 0.03% captive-bred 'C', see Table 8 in Appendix I. Trade in wild-sourced coral increased between 2003 and 2005 after which it decreased again and from 2008 remained relatively stable (Figure 2). This is in contrast to the coral reported under source code 'F'. Coral reported under this latter source code increased throughout the study period and comprised the majority of individual corals traded since 2008. Of all 537 079 specimens, only 526 specimens, (three reported at species level and one at coral order level), were imported by the Netherlands via other countries, namely Malaysia. This comprised *Acropora hyacinthus* (3), *Acropora jacquelineae* (20), *Caulastrea tumida* (3) and the order Scleractinia spp. (500).

Trade in a total of 305 043 coral specimens was reported at genus level (Table 3), with the remaining 232 036 specimens reported at the species level (Table 8 in Appendix 1). Only one genus (*Acropora* spp.) and 29 species were imported on an annual basis. However, there were large discrepancies between the quantities reported between Indonesia and the Netherlands. Indonesia reported 219 480 specimens traded at genus level, while the Netherlands reported 190 607 specimens. Indonesia reported 212 866 specimens traded at species level, while the Netherlands reported only 106 373 specimens. These discrepancies are likely partly due to the difference in reporting; i.e. permits issued versus actual trade. Coral specimens also included pieces of reef rock and were reported under the order Scleractinia (CITES, 2008). Since 2007, trade in pieces of reef rock has not required import permits for the EU as it is considered as "fossilized" (CITES, 2008). Therefore the actual import of Scleractinia spp. might be higher than documented in the UNEP-WCMC CITES Trade Database.

Trade in coral specimens should be reported at the species level. However, there are certain coral genera for which identification at the genus level has been found to be acceptable (*CITES Notification No. 2003/020* and *2013/035*). The genus *Merulina* spp. for which Indonesia reported the export of 150 captive-born specimens is not included in this list (*CITES Notification No. 2003/020* and *2013/035*) and therefore should have been traded at species level, and not at genus level. Furthermore, Indonesia reported the export of 69 504 specimens of Scleractinia spp. which comprises the order of stony corals. Since only Indonesia reported the trade, it is likely that the transactions did not actually take place or were reported by the Netherlands at the species level. Nonetheless, trade in live corals should only be conducted on higher level taxa when the use of these taxa was found appropriate. For both *Merulina* spp. and the order Scleractinia spp. this is not the case i.e. both the genus and order are not mentioned in *CITES Notification No. 2003/020* and *2013/035* and should therefore be traded at species level. Trade in live corals at the order level is undesirable as it fails to take into account the genus or species-specific threats, and therefore may include both non-threatened and threatened species.

Table 3. Number of live specimens of coral taxa (reported above species level) imported into the Netherlands from Indonesia and their reported source during the period 2003-2013. Captive-bred: source code 'C', Captive-born: source code 'F', and Wild-sourced: source code 'W'. 'NL' refers to the reported quantity by the Netherlands, and 'ID' to the reported quantity by Indonesia.

Taxon	Captive-bred	Captive-born	Wild-sourced	ID	NL
<i>Acanthastrea</i> spp.		190	31	212	96
<i>Acropora</i> spp.	20	131 517	24 168	141 676	90 396
<i>Alveopora</i> spp.		160		160	30
<i>Anacropora</i> spp.		190			190
<i>Caulastrea</i> spp.	15	4828	1767	6458	2687
<i>Cycloseris</i> spp.			20	20	
<i>Dendrophyllia</i> spp.		10		10	
<i>Distichopora</i> spp.		90	245	273	67
<i>Echinophyllia</i> spp.		857		857	233
<i>Echinopora</i> spp.		1450		1450	520
<i>Euphyllia</i> spp.		150		150	
<i>Favia</i> spp.		315	497	812	330
<i>Favites</i> spp.		200	295	495	322
<i>Fungia</i> spp.			1334	1334	805
<i>Galaxea</i> spp.		481		481	299
<i>Goniastrea</i> spp.		50	158	197	83
<i>Goniopora</i> spp.		656	5265	5774	2278
<i>Hydnophora</i> spp.		912		912	367
<i>Lobophyllia</i> spp.		330	1405	1623	
<i>Merulina</i> spp.		150		150	591
<i>Millepora</i> spp.			291	291	39
<i>Montastrea</i> spp.			412	401	200
<i>Montipora</i> spp.	20	25 951	4826	29 443	11 296
<i>Oxypora</i> spp.		370		370	90
<i>Pavona</i> spp.		216		216	59
<i>Pectinia</i> spp.		732	25	757	274
<i>Pocillopora</i> spp.	15	1731		1731	674
<i>Porites</i> spp.		1780	12 675	14 515	5512
Scleractinia spp.*			70 004	500	69 504
<i>Seriatopora</i> spp.	20	1877		1877	791
<i>Stylophora</i> spp.		1557		1557	678
<i>Symphyllia</i> spp.		411	82	493	214
<i>Tubastraea</i> spp.		20	1011	1024	502
<i>Turbinaria</i> spp.		1806	1455	3261	1480

*Trade in a coral order, instead of genus. Source: UNEP-WCMC CITES Trade Database.

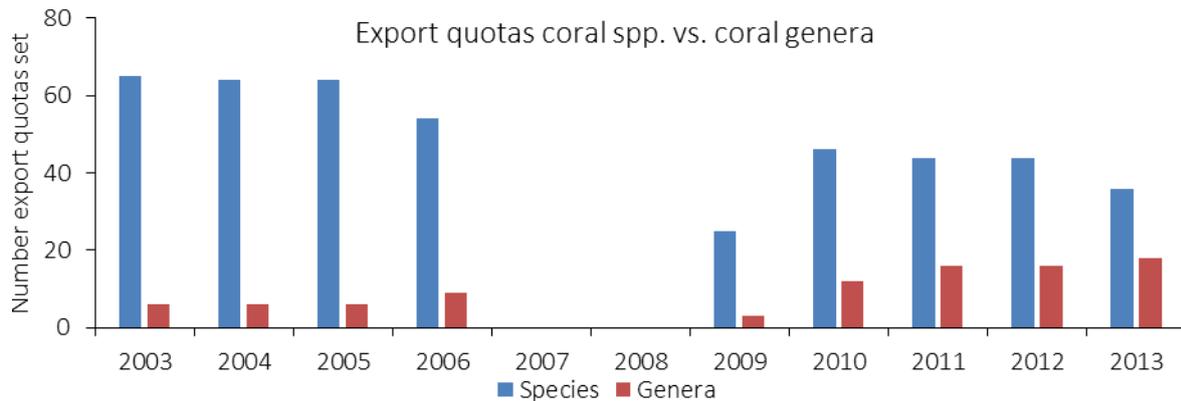


Figure 3. Overview of the number of export quotas set for coral species versus the number of quotas set for coral genera in Indonesia over the period 2003-2013. Showing an increasing number of quotas set for coral genera compared to quotas set for coral species. Source UNEP-WCMC CITES Trade Database.

In 2003, Indonesia set export quotas for 62 coral species, but the number of species-specific quotas decreased to no species-specific quota in 2007 and 2008 (Figure 3). Indonesia set no export quotas for coral in 2007 and 2008. In 2009 export quotas were set again, for 20 species, which increased to 42 species the next year and remained relatively stable with 36 species in 2013. From 2009 a decrease in species-specific export quotas can be observed while export quotas at genus level increased to 18 genera in 2013. It is obvious that more and more quotas are set at genus level and less for species specific. Even though trade at genus level was found acceptable by CITES Parties for certain genera (*CITES Notification No. 2003/020* and *2013/035*), it may obscure species specific threats and should be used with caution. Moreover, it should only be applied to the genera mentioned in *CITES Notification No. 2003/020* and *2013/035*.

Trade in the Leafy Hedgehog Coral *Echinopora lamellosa* reached 191% of the quota set for 2012. However, the coral was reported under category 'F'; animals born in captivity while the quota was set for wild-sourced specimens. It raises questions since coral exported under category 'F' increased dramatically after 2010 and peaked in 2012. Post 2010, import numbers are significantly higher than previous import numbers. The sudden increase of Leafy Hedgehog Coral declared under source code 'F' raises questions if some exports are not actually sourced from the wild instead of comprising animals born in captivity.

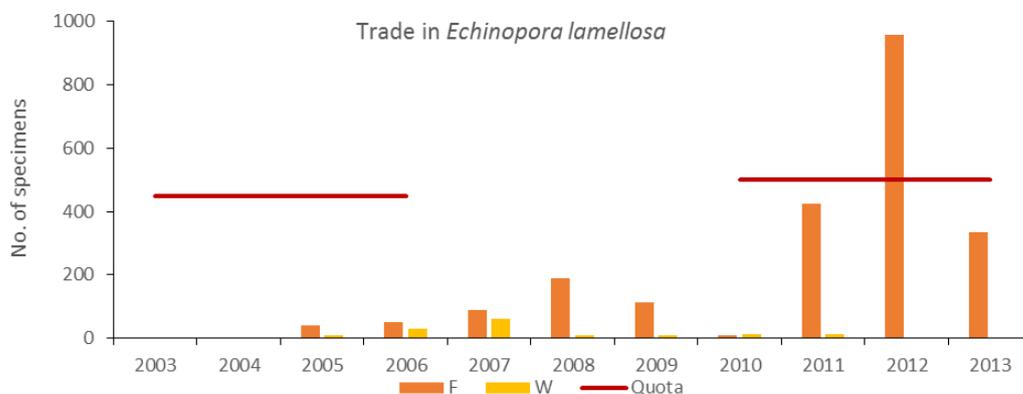


Figure 4. Trade in Leafy Hedgehog Coral *Echinopora lamellosa*. Displaying the number of animals traded as Captive-born: source code 'F' and Wild-sourced: source code 'W', versus the annual set export quota. Source: UNEP-WCMC CITES Trade Database and Species +.

3.4.1 EU trade restrictions

Trade suspensions were in place for wild-sourced specimens for 10 coral species according to the UNEP-WCMC CITES trade database and Species+ during the period 2003-2013, for either the whole or a part of the study period. Before the EU decides on a trade suspension, an SRG negative opinion is formed, which also results in a temporary trade suspension. For five species a negative opinion was in place during the study period that was not turned into a trade suspension. For all species except *Euphyllia glabrescens* the UNEP-WCMC CITES Trade Database included trade records following the adoption of a negative opinion or suspension.

Trade in *Catalaphyllia jardinei* was suspended on 1 March 2003, however the trade database indicated reported trade in wild-sourced specimens in 2006 (19 specimens), 2010 (4), and 2011 (20) and 2013 (30). These transactions were only reported by Indonesia. It is therefore likely that the discrepancy is caused by the difference in reporting; i.e. permits issued vs. actual trade. Similar observations were made for the other coral species with trade suspensions in place; *Blastomussa wellsi*, *Cynarina lacrymalis*, *Eguchipsammia fistula*, *Euphyllia divisa*, *Heliofungia actiniformis*, *Plerogyra sinuosa* and *Plerogyra turbida*; and with negative opinions issued: *Euphyllia cristata*, *Euphyllia divisa*, *Euphyllia paraancora* and *Porites cylindrical*. In 2008 (10 specimens), 2011 (5), 2012 (30) and 2013 (50) wild-sourced White Grape Corals *Euphyllia cristata* were imported with EU trade suspensions being in place since 10 May 2005. For 2008, 2011 and 2012 only Indonesia reported traded quantities. For 2013, both Indonesia and the Netherlands reported trade in White Grape Corals. However, in contrast to the other imports, these were imported under source code 'F', which does not fall under the EU suspension. A negative opinion for White Grape Corals was already in place between 2000 and 2005 (UNEP, 2016). For *Hydnophora microconos* a negative opinion was formed on 22 May 2003, formalized into a trade suspension on 10 May 2006. According to the CITES trade database specimens were reportedly imported into the Netherlands in 2003 (22), 2004 (25), 2005 (19), 2006 (57), 2007 (20), 2008 (30) and 2009 (3). Although for 2007, 2008 and 2009 only Indonesia reported the quantities, in 2004, 2005 and 2006 both Indonesia and the Netherlands indicated reported trade in wild-sourced *H. microconos*, which makes it very likely the specimens were actually imported despite an EU import restriction in place. The same might be the case for trade in *Trachyphyllia geoffroyi* for which a negative opinion was in place since 22 May 2003 and a trade suspension was issued on 18 February 2005. Trade was reported in the CITES trade database in 2003 (285), 2006 (20), 2012 (12) and 2013 (69). Although for 2006, 2012 and 2013 only Indonesia reported the trade, which can indicate that only permits were issued but no actual trade took place. However, in 2003 both Indonesia and the Netherlands reported trade in *T. geoffroyi*. All trade could have taken place before the negative opinion that was formed in May 2003 although it is notable that a particularly large quantity (285) was reportedly traded in 2003 compared to other years.

3.5 Coral (Reported in Kilogrammes)

Besides trade in individual pieces, live coral (source code: LIV) was also reported in kilogrammes. This was despite the fact that *EC No 865/2006* Annex VII states that live coral, i.e. transported in water, needs to be reported in number of specimens, and raw coral (CITES trade term COR) in kilogrammes. Accordingly, coral traded in kilogrammes should normally comprise coral rock consisting of formed or dead coral fragments which may also be colonized by live coralline algae (CITES, 2008; Wood *et al.*, 2012). Nonetheless, the UNEP-WCMC CITES Trade Database contains records of 48 773 kg live coral imported from Indonesia in the period 2003-2013. European Commission *regulation No 865/2006* clearly states that "*Specimens of live coral transported in water should be recorded by number of pieces only*". It is unclear if the coral reported in kilogrammes is incorrectly documented with trade term LIV instead of COR, or that it actually comprised live coral incorrectly documented as kilogrammes instead of pieces. Moreover the coral imported in kilogrammes is not classified to species or genus level but traded at the order level; *Scleractinia* spp. Interestingly, Indonesia reported only the export of 17 571 kg during 2003-2013, while the Netherlands reported the import of 40 438 kg during the

same period. This may suggest that part of it was illegally exported outside the quantities mentioned in the permits or that Indonesia reported some of this trade in number of specimens (and not in kg). Indonesia was the second supplier globally for coral rock with an average of 11% of the global export annually between 2000 and 2010 (Wood *et al.*, 2012). In 2010, coral rock export of Indonesia increased up to 22% of the global export corresponding to 268 tonnes (Wood *et al.*, 2012).

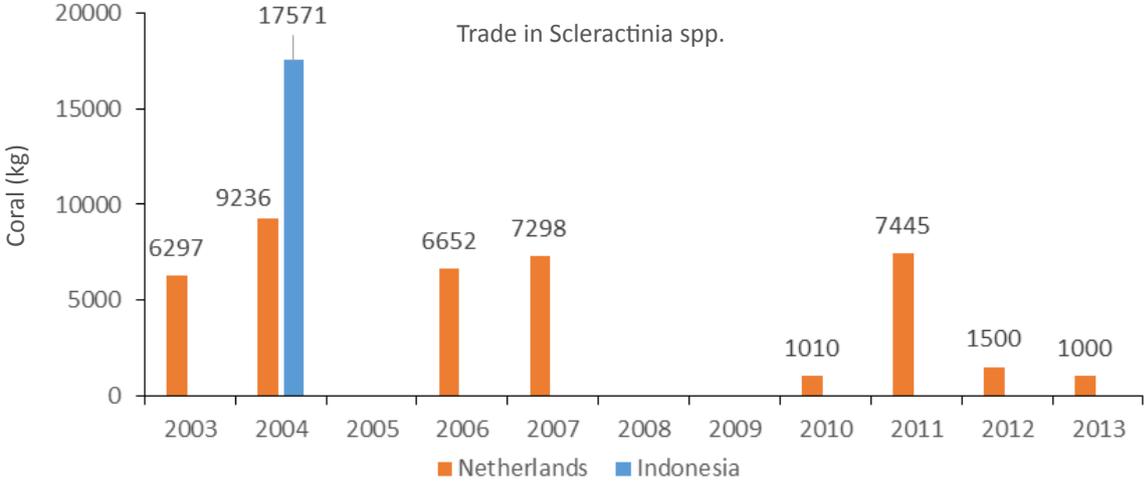


Figure 5. Trade of live coral, Scleractinia spp., from Indonesia into the Netherlands. Quantities display importer 'NL' and exporter 'ID' mentioned quantities and are given in kilogrammes. Source: UNEP-WCMC CITES Trade Database.



Table corals *Acropora* spp.

3.6 Fish

All CITES-listed fish imported between 2003 and 2005 were wild-sourced (Table 4) and quantities decreased from 2000 live specimens to none in 2005. Since 2007 hardly any wild-sourced CITES listed fish have reportedly been exported from Indonesia to the Netherlands, while the number of fish reported as captive-bred increased (Fig. 1D). In total, eight seahorse species and the Asian Arowana *Scleropages formosus* were imported from Indonesia between 2003 and 2013. For four Seahorse species only Indonesia documented an export quantity, which might be due to difference in reporting i.e. permits issued versus actual trade, and the specimens may not actually have been imported by the Netherlands.

The Asian Arowana is categorized as Endangered by IUCN and listed in Appendix I of CITES and EU Annex A. Nonetheless, trade in the Asian Arowana is possible when captive breeding facilities comply with both national and CITES regulations. All Asian Arowanas reported as traded between Indonesia to the Netherlands were imported as source code 'D', which comprises Appendix I animals bred in captivity by registered breeding facilities for commercial purposes. Until 1995, the Indonesian population of ranched Asian Arowana was listed in Appendix II, while all other populations were listed in Appendix I. Since 1995 however, the Indonesian population was also listed in Appendix I. Of the 286 Asian Arowana, only 137 were directly imported from Indonesia. The other 149 were imported from Indonesia via Singapore (133) and Thailand (16). The Asian Arowana is one of the most popular and expensive fishes in the international aquarium industry fetching high prices (Hua Yue *et al.*, 2004). Prices depend on the colour variety in which the red form as found in West Kalimantan can fetch up to 10 times more than e.g. the green variety which is widespread in Southeast Asia (Ng *et al.*, 1997). Large-scale harvesting of Asian Arowanas has been detrimental to wild populations of the species (Rowley *et al.*, 2008). In response to the listing in Appendix I, captive breeding facilities have been established all over Southeast Asia, including Indonesia (Dawes *et al.*, 1999).

The import of eight seahorse species is documented in the UNEP-WCMC CITES Trade Database. Besides seahorses identified to species level, the database also documents 2654 wild-sourced seahorses only identified to genus (*Hippocampus* spp.) level. However, this transaction was only reported by Indonesia. In 2002, all seahorse species of the *Hippocampus* genus were listed in Appendix II of CITES. However, this was not implemented until 2004. For Kellogg's Seahorse *Hippocampus kelloggi* and Common Seahorse *Hippocampus kuda* EU trade suspensions for wild-sourced specimens have been in place since 2008, and for the Barbour's Seahorse *Hippocampus barbouri*, Tiger Tail Seahorse *Hippocampus comes*, Spiny Seahorse *Hippocampus histrix* and Hedgehog Seahorse *Hippocampus spinosissimus* since 2007 (UNEP, 2016). These trade suspensions are apparent from the trade data as well. Since 2009 only two species, Barbour's Seahorse and Common Seahorse, were exported from Indonesia to the Netherlands. Before 2008, all seahorse species traded were reportedly wild-sourced. However, since 2009 all seahorses were reportedly captive-bred with a trade peak in the year after a trade suspension was in place (Figure 6). Lenzen *et al.* (2007) already reported an increase in trade shortly before trade bans were installed, suggesting CITES authorities should have a closer look at the requested import and export permits during transition periods and in adhering to quotas. Seahorses reported at the genus level were also imported from Indonesia. It is therefore unknown which species were involved. The IUCN Red List status of the eight known seahorse species imported into the Netherlands ranges from Least Concern to Vulnerable with EU suspensions in place for several species.

Table 4. Imported fish species and their corresponding source in the period 2003-2013. Captive-bred: source code 'C' and 'D', and Wild-sourced: source code 'W'. IUCN categories: Endangered (EN), Vulnerable (VU) and Least Concern (LC). CITES corresponds to their CITES Appendix listing, where 'N' means not listed in CITES. 'NL' refers to the reported quantity by the Netherlands, and 'ID' to the reported quantity by Indonesia. EU corresponds to the species's EU Annex listing, with *meaning that there is an EU import restriction for trade in wild-sourced specimen during the study period. Source: UNEP-WCMC CITES Trade Database.

Taxon	Captive-bred	Wild-sourced	NL	ID	IUCN	CITES	EU
Barbour's Seahorse <i>Hippocampus barbouri</i>	1400	100	720	1300	VU	II	B*
Tiger Tail Seahorse <i>Hippocampus comes</i>		25		25	VU	II	B*
Crowned Seahorse <i>Hippocampus coronatus</i>		67	67		LC	II	B
Long-snouted Seahorse <i>Hippocampus guttulatus</i>		121	121		LC	II	B
Spiny Seahorse <i>Hippocampus histrix</i>		25		25	VU	II	B*
Kellogg's Seahorse <i>Hippocampus kelloggi</i>		50		50	VU	II	B*
Common Seahorse <i>Hippocampus kuda</i>	600	260	335	625	VU	II	B*
Hedgehog Seahorse <i>Hippocampus spinosissimus</i>		25		25	VU	II	B*
Seahorses <i>Hippocampus</i> spp.		2654		2654	-	II	B
Asian Arowana <i>Scleropages formosus</i>	286		169	275	EN	I	A

All seahorses traded at genus level were imported in 2003 and 2004, overlapping with time period when the CITES Appendix II-listing of all *Hippocampus* species came into force (15 May 2004). Trade in seahorses is focused on two purposes, either dried for use in traditional medicine, or live as aquarium fish. Seahorse life characteristics make them vulnerable to overexploitation (Foster *et al.*, 2004) and concerns have been raised regarding the sustainability of the trade for many populations (Vincent *et al.*, 2011). Seahorses are mainly sourced from non-selective fisheries although Vincent *et al.* (2011) mentioned that all live wild-sourced specimens were sourced by targeted fisheries.

Foster *et al.* (2014) stated that dried seahorses make up between 97-99.6% of the global trade in seahorses, with global trade in live seahorses ranging from 22 000-172 000 specimens annually. Indonesia was reported as a significant exporter of live seahorses, with a reported export of 45 000 live, wild-sourced specimens in 2005. Foster *et al.* (2014) included the Netherlands in the top five importers of live seahorses, but interestingly no live seahorses were imported by the Netherlands in 2005.

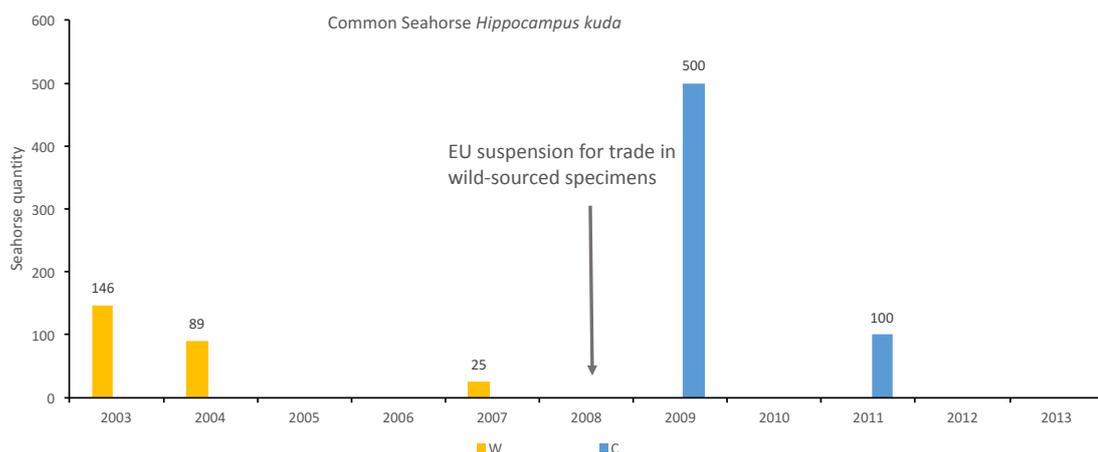


Figure 6. Trade in Common Seahorses *Hippocampus kuda* between Indonesia and the Netherlands. Difference in source of the seahorses pre- and post-EU suspension (2008). Captive-bred: source code 'C' and Wild-sourced: source code 'W'. Source: UNEP-WCMC CITES Trade Database.

Following the EU suspensions of wild-sourced specimens only two species have been imported since 2009; Common Seahorse and Barbour’s Seahorse. The Common Seahorse is one of the two species that dominates the global trade in live seahorses (Foster *et al.*, 2014), which can also be observed in this study. In contrast to Foster *et al.* (2014), who observed that trade in captive-bred specimens halved between 2004 and 2011 after the EU suspensions for most seahorse species came into force, trade in reportedly captive-bred specimens imported into the Netherlands rose sharply in 2009. In an overview of global aquaculture ventures for seahorse breeding, Koldewey *et al.* (2010) mentioned that in 1999, Indonesia had at least one facility that was breeding both the Tiger Tail Seahorse and Common Seahorse (Vincent, 1996). In Indonesia, the Seafarming Development Centre is involved in aquaculture of seahorses, and managed to rear up to 53% of the young (Vincent, 1996). The sudden switch from wild-sourced to captive-bred following the EU trade suspension of wild-sourced specimens can be seen as suspicious, however, evidence of successful captive breeding suggests a genuine shift to captive-bred specimens.

3.7 Mammals

Only one mammal species was imported from Indonesia, namely the Large Flying-fox between 2003 and 2013. This species was imported from Indonesia by the Netherlands in 2011 and 2012. Interestingly, the trade data show discrepancies between reported quantities. In 2011, Indonesia reportedly exported 100 specimens, while the Netherlands reported importing only 25 specimens. In contrast, Indonesia reported 57 specimens in 2012 while the Netherlands reported 75 specimens. The Large Flying-fox is listed as Near Threatened by IUCN and in Appendix II of CITES. In the years of import, Indonesia reported a quota of 270 and 225 specimens for 2011 and 2012 respectively. However, the 2011 UNEP-WCMC overview of EU wildlife trade suggests that taking the highest quantity is an overestimation of the actual imported quantity in this particular case (UNEP-WCMC, 2013a). In 2011 the Netherlands and Italy were the top EU importers for the Large Flying-fox with a total of 53 live, wild-sourced specimens for both countries combined. In this case the Netherlands reported 25 specimens, compared to 100 by Indonesia. The discrepancies in the reported quantities can be the result of the differences between reporting i.e. permits issued or actual trade. The discrepancy for 2012 may be a result of export permits obtained at the end of 2011 in Indonesia but actually getting imported into the Netherlands in early 2012. However, it can also mean that more animals were exported than the permits allowed for. The EU reports an increasing trend in the import of Large Flying-fox into the EU. From 2002-2008 no specimens were imported from Indonesia, but this increased to 30 in 2009 and 20 in 2010 to 53 in 2011 and 75 in 2012 (UNEP-WCMC, 2013a). This represents an increase of 42% between 2011 and 2012. The Indonesian export quotas showed the opposite trend, decreasing from 1000 specimens during 2002-2005 to fewer than 300 specimens since 2010.

3.8 Molluscs

Giant clams (Subfamily Tridacninae) are an important food source in the South Pacific, but are also traded as aquarium specimens, for their shells and shellcraft. The vast majority of live maricultured giant clams sold to Europe are destined for the aquarium trade (Wells, 1997). Giant clams play an important role in removing nitrates, nitrites and ammonia from water and are therefore increasingly popular in the aquarium trade. They live in shallow waters in association with coral reefs throughout the Indo-Pacific region. Giant clams prefer to live in shallow water to maximize the use of sunlight. Giant clams are susceptible to over-harvesting as they can be easily collected due to their bright colours, late sexual maturity, slow growth and low natural recruitment (Wabnitz, 2003).

Until the 1990s clam farming was poorly developed in Indonesia. Recent technological innovations lifted the constraints on the spawning of giant clams, and raising of giant clam larvae and juveniles. Concerns for the survival of giant clams fuelled the interest in giant clam mariculture after wild stocks declined throughout their range. Giant clam hatcheries were initially used to restock natural populations and grow clams for food production. However, nowadays hatcheries are used to supply the aquarium trade with giant clams with government-owned and commercial hatcheries in most Indo-Pacific countries (Wabnitz, 2003; Wells, 1997). Giant clam mariculture is relatively simple and only requires clean seawater and sunlight. The number of eggs ranges from millions to hundreds of millions which make giant clams well suited for mariculture (Ellis, 2000).

The UNEP-WCMC CITES Trade Database documents trade in five species of giant clams, between 2003 and 2013. Trade in these species fluctuated during this period with years of no reported trade and years in which four out of five species were imported (Figure 1F). All species are listed as Least Concern by IUCN, in Appendix II of CITES and EU Annex B (Table 5). There are no export quotas or EU import restrictions in place for the Indonesian populations of any of the traded species. The Southern Giant Clam *Tridacna derasa* was the least traded species with only 20 specimens in 2008. The most frequently traded species was the Boring Clam *Tridacna crocea* which was imported in five out of ten years. However, the Fluted Giant Clam *Tridacna squamosa* was the most traded

species in terms of number of specimens with respectively 600 specimens. All giant clams imported by the Netherlands were either reported as captive-bred or captive-born. When taking the largest quantity reported, the trade comprised 1500 live specimens. However, discrepancies were found between importer and exporter mentioned quantities. Indonesia reported a total of 810 specimens, while the Netherlands reported 740 live specimens. The literature review carried out for this study found no evidence for mis-declaration of specimens of the reported source (F) in trade.

Table 5. Imported clam species and their corresponding source in the period 2003-2013. Captive-bred: source code 'C', and Captive-born: source code 'F'. CITES refers to their CITES Appendix listing, and 'EU' corresponds to the species's EU Annex listing, 'NL' refers to the reported quantity by the Netherlands, and 'ID' to the reported quantity by Indonesia. Source: UNEP-WCMC CITES Trade Database.

Taxon	Captive-bred	Captive-born	NL	ID	IUCN	CITES	EU
Bear Paw Clam <i>Hippopus hippopus</i>		210	110	150	LC	II	B
Boring Clam <i>Tridacna crocea</i>	20	460	100	380	LC	II	B
Southern Giant Clam <i>Tridacna derasa</i>		20		20	LC	II	B
Maxima Clam <i>Tridacna maxima</i>	45	145	105	85	LC	II	B
Fluted Giant Clam <i>Tridacna squamosa</i>	135	465	175	425	LC	II	B



Giant clam *Tridacna gigas*

3.9 Reptiles

Indonesia is one of the 17 megadiverse countries in the world (Mittermeier 1997) and home to at least 7.3% of all reptile species (Iskandar *et al.*, 2006; Kusmana, 2011). The trade in reptiles from Indonesia is well studied over the years. Although Indonesia has regulations and guidelines in place to regulate trade in its wildlife, wildlife laws are often violated (Natusch *et al.*, 2012; Nijman, 2010). Recent studies on Green Tree Pythons *Morelia viridis* (Lyons *et al.*, 2011) and Tokay Geckos (Nijman *et al.*, 2015) concluded that wildlife laundering through breeding farms is a common problem in Indonesia. For specimens that are captive-bred, no quotas are set in Indonesia and permits can be obtained more easily than for their wild-sourced counterparts. However, research showed that many of the harvested wild-sourced specimens are actually taken to breeding farms and subsequently exported as captive-bred while in fact the animals originated from the wild (Lyons *et al.*, 2011). Many breeding facilities do not have the capacity to breed the quantities they reportedly export as captive-bred (Nijman *et al.*, 2009). For many species it is not economically viable to breed the large numbers requested by the international trade as breeding farms are not able to produce them fast enough (Nijman *et al.*, 2015) and profits decline when animals need to be cared for at breeding facilities compared to harvesting from the wild (Lyons *et al.*, 2011). Species with long reproductive cycles, like many reptiles, are therefore not economically viable for captive breeding at the scale the international trade would require (Lyons *et al.*, 2011). Interestingly, a key document on the CITES implementation in Indonesia (Soehartono *et al.*, 2002), recognizes this problem and describes breeding of monitor lizards and snakes for commercial use as not cost-effective.

After corals, CITES listed and EU Annex listed reptiles were the third group traded in the highest quantities between Indonesia and the Netherlands. Between 2003 and 2013 trade comprised 3772 specimens of 46 species according to the CITES Trade Database (Table 6). Of the 3772 specimens, 72% were reportedly wild-sourced, 26% captive-bred and 2% captive-born. Of all 3772 specimens, 129 specimens comprising seven species were imported via other countries than Indonesia but with a registered origin in Indonesia. A Tanimbar Python *Morelia nauta* (1) was imported from the Czech Republic⁵, Green Tree Pythons (22) from Japan, and Viper Boas *Candoia aspera* (6), Pacific Ground Boas *Candoia carinata* (10), Green Tree Pythons (4), Brongersma's Short-tailed Pythons *Python brongersmai* (28) Sumatran Short-tailed Pythons *Python curtus* (34) and Water Monitors *Varanus salvator* (24) from the USA.

Import quantities of reptiles varied during the 10-year study period (Figure 1G). In the period 2003-2005 the number of wild-sourced specimens dropped significantly and subsequently remained stable until 2007. From 2005 to 2009 the number of specimens reported as captive-bred increased to exceed the wild-sourced specimens. This is followed by a steep decline in captive-bred specimens. After the initial decline, the number of wild-sourced specimens increased again after 2008. However, large discrepancies were found between the quantities reported by the Netherlands and Indonesia. The Netherlands reported the import of 1672 specimens, while Indonesia reported the export of 3442 specimens.

Of all reptile species mentioned in the UNEP-WCMC CITES Trade Database, one (2%) was listed as Critically Endangered by IUCN, one (2%) as Endangered, six (13%) as Vulnerable, one (2%) as Near Threatened, 16 (35%) as Least Concern, and 21 (46%) were not listed in the IUCN Red List. The two species with the most alarming conservation status are the Sulawesi Forest Turtle *Leucocephalon yuwonoi* (CR) and the Spiny Turtle *Heosemys spinosa* (EN).

The Sulawesi Forest Turtle is listed as Critically Endangered by IUCN and in Appendix II of CITES. This Critically Endangered species was first described in 1995 and is endemic to the Minahassa Peninsula of Sulawesi (McCord *et al.*, 1995). The species remains one of the most poorly studied

⁵ The Czech Republic joined the European Union in May 2004, trade with EU Member States prior to that was reported to the CITES Trade Database as external trade.

turtles in the world and hardly anything is known about its ecology (Platt *et al.*, 2001; Riyanto, 2006). Within a year following its description, the species already appeared at markets in mainland China (Riyanto, 2006). A survey by Riyanto (2006) suggested that populations may already be depleted in certain parts of its range. Moreover, the Sulawesi Forest Turtle appears to be a relatively difficult species to keep in captivity (Lovich *et al.*, 2000). Besides being threatened by international trade, the species faces destruction of its habitat (Riyanto, 2006). Even though the imported number of specimens by the Netherlands is low and most likely imported before the EU negative opinion, for a species that is Critically Endangered such small numbers may still have a significant impact on local populations.

The EU listed the species on Annex B and suspended trade since 10 May 2006, but a negative opinion was formed already in 2004 (UNEP, 2016), the same year when the export of six wild-sourced specimens was reported by Indonesia. As the Netherlands did not report an import quantity it is likely that the specimens were not actually exported to the Netherlands (and merely the export permit was issued).

In the same year, the export of 10 wild-sourced specimens of the Spiny Turtle was reported by Indonesia. This species is currently listed as Endangered by IUCN and listed in CITES Appendix II and EU Annex B. The import of wild-sourced specimens was suspended by the EU at the same date as for the Sulawesi Forest Turtle. The Spiny Turtle is a species heavily exploited for the food and Traditional Chinese Medicine markets in China and faces destruction of its habitat (Gong *et al.*, 2009; Spinks *et al.*, 2012). Nijman and Shepherd (2009) concluded that even though specimens might be sold as captive-bred, all specimens of this species exported are very likely to be wild-sourced based on the low fecundity and extremely slow growth of the Spiny Turtle. Similar to the Sulawesi Forest Turtle, only Indonesia reported a trade quantity. It is likely that only an export permit was issued by Indonesia but the actual international trade never took place.

Five of the 46 imported reptile species are currently not listed in CITES; 40 species are listed in CITES Appendix II and one species is listed in CITES Appendix III. The Red-eyed Crocodile Skink *Tribolonotus gracilis* and Radiated Ratsnake *Elaphe radiata* are both listed in EU Annex D but not in CITES. Species listed in EU Annex C and D require an import notification, which is a stricter EU measure. Therefore any non-CITES species listed in EU Annex C and D are also found in the UNEP-WCMC CITES Trade Database. This was the same in the cases of the Blue-tongued Skink *Tiliqua scincoides* and Sunbeam Snake *Xenopeltis unicolor* – both species were listed in EU Annex D until 2004. All reported trade in these species between Indonesia and the Netherlands took place in 2003 and 2004.

3.9.1 Species not native to Indonesia

Of the 46 imported species, five were not native to Indonesia, of which four species had a reported origin in Mozambique; Mozambique Girdled Lizard *Cordylus mossambicus* (15), Rhodesian Girdled Lizard *Cordylus rhodesianus* (15), Transvaal Girdled Lizard *Cordylus vittifer* (20) and African Helmeted Turtle *Pelomedusa subrufa* (10). For trade in the Mozambique Girdled Lizard, both Indonesia and the Netherlands reported trade, but for the other non-native species only Indonesia reported trade. All three girdled lizard species are listed in CITES Appendix II and EU Annex B with EU trade suspensions. Only the Mozambique Girdled Lizard and African Helmeted Turtle are listed by the IUCN Red List, as Vulnerable and Least Concern respectively. For the Mozambique Girdled Lizard annual quotas were set for 500 specimens between 2003 and 2009 and for 1500 specimens in 2010. Since 2012 a CITES trade suspension has been in place for this species and since 10 May 2006 for the EU (UNEP, 2016). EU trade suspensions are also in place for the Rhodesian Girdled Lizard (since 4 September 2014) and Transvaal Girdled Lizard since 10 May 2006 (UNEP, 2016). All trade in these species occurred in 2003 (before trade suspensions were in place). The fifth non-native species, the Panther Chameleon *Furcifer pardalis* (6), originates from Madagascar,

however a country of origin is not reported in the database records. The Panther Chameleon is categorized as Least Concern by the IUCN Red List, listed in Appendix II of CITES and EU Annex B. All reported sources were wild-sourced, except for the Panther Chameleon, which was reported as captive-bred. Trade in the African Helmeted Turtle was only recorded until 2004, as the species was removed from EU Annex D during that year.

3.9.2 EU trade restrictions

EU suspensions are in place for imports of wild-sourced specimens of 12 reptile species from Indonesia (Table 6). However, for five species, trade in wild-sourced specimens was still reported to the UNEP-WCMC CITES trade database after the trade suspension. Even though the species are imported in relatively low numbers, import of wild-sourced specimens should not be possible with the current EU suspensions in place. Negative opinions on trade are in place before trade is suspended.

The Asiatic Soft-shell Turtle *Amyda cartilaginea* is listed as Vulnerable by IUCN due to its demand in trade for meat. Even though Indonesia has set annual export quotas for this species (varying between 25 200 and 27 000 during the study period) the EU has suspended trade in wild-sourced specimens since 3 September 2008, with a negative opinion in place since 2 October 2006 (UNEP, 2016). Despite this EU suspension, trade in wild-sourced Asiatic Soft-shell Turtles was recorded in the trade database for 2010, 2011 and 2013 with a total of 18 specimens. However, only Indonesia reported the transactions, making it likely that only export permits were issued but the actual trade never took place.

The Malayan Flat-shelled Turtle *Notochelys platynota*, is listed as Vulnerable by IUCN, in Appendix II of CITES and EU Annex B. IUCN reported in 1999 that this species was traded at 2-3 tonnes per day at Asian food markets (Asian Turtle Trade Workgroup, 2016). The EU has suspended trade in wild-sourced specimens since 3 September 2008, and a negative opinion preceded that from 12 June 2006 (UNEP, 2016). Trade in this species was reported for 2010, comprising 10 wild-sourced specimens. Similar to the Asiatic Soft-shell Turtle, only Indonesia reported the transaction, it is therefore likely that only export permits were issued but the specimens were never actually imported by the Netherlands.

This is similar for the Black Marsh Turtles *Siebenrockiella crassicolis* for which trade was reported in 2004 and 2011. The Indonesian population of this species is listed as Vulnerable by the IUCN Red List due to exploitation and habitat conversion and loss. Moreover, it is listed in Appendix II of CITES and EU Annex B. Indonesia has an annual export quota in place for 4500 live specimens. A SRG negative opinion for this species-country combination was formed in 2003. Since 10 May 2006 the EU has suspended the import of wild-sourced specimens into the EU (UNEP, 2016). According to the database 50 wild-sourced turtles were imported directly from Indonesia in 2004, and in 2011 again 14 wild-sourced specimens were imported. Since only Indonesia reported the transaction it is likely that the transaction never took place and only export permits were issued.

Dumeril's Monitor *Varanus dumerilii* is not listed in the IUCN Red list, but is listed in Appendix II of CITES and EU Annex B. Indonesia has set annual export quotas for live specimens which ranged during the study period between 400 and 900 specimens. Since 1998 there has been an EU trade suspension in place for wild-sourced specimens of the Dumeril's Monitor. The trade database mentions the export of four wild-sourced specimens in 2010, although the Netherlands did not report the import of the specimens. However, wild-sourced specimens of this species have been observed for sale by a French vendor during a German reptile fair in 2015 (J. Janssen unpublished data). It is therefore possible that wild-sourced specimens can still be brought through other EU countries into the Netherlands.

The Peach-throated Monitor *Varanus jobiensis* has a large distribution range and can be found throughout New Guinea and its offshore islands. It is suggested that this species is not suffering from major threats (Shea *et al.*, 2016). However, logging is taking place in the lowland habitat this species lives in. This widespread species is listed as Least Concern by IUCN, in Appendix II of CITES and EU Annex B. Indonesia has set annual export quotas for live specimens, comprising 450 live specimens annually since 2008. Since 1998 there has been an EU trade suspension in place for wild-sourced specimens of the Peach-throated Monitor (UNEP, 2016). Similar to all other species with an EU suspension on the import of wild-sourced specimens, trade documented in the trade database only consists of quantities reported by Indonesia. Therefore, it raises doubts if the two wild-sourced specimens reportedly exported in 2013 were actually imported by the Netherlands.

The Green Tree Python was the most common reptile species imported by the Netherlands from Indonesia between 2003 and 2013. All 819 specimens were declared as captive-bred. This species is nationally protected in Indonesia under *Governmental Regulation 7/1999*, which prohibits all exports of wild-sourced specimens. Although on paper declared as captive-bred, Lyons *et al.* (2011) estimated that up to 80% of the Green Tree Pythons exported annually by Indonesia were in fact wild-sourced. If accurate, this means potentially 655 of the reported 819 Green Tree Pythons imported by the Netherlands could have been wild-sourced and laundered through breeding farms. Even though captive breeding has the potential to reduce pressure on wildlife populations (Revol, 1995), when wildlife is laundered through breeding facilities a false sense of sustainability is created. Population declines as a result of extensive collection have already been reported for Green Tree Pythons (Lyons *et al.*, 2011) and the Roti Island Snake-necked Turtle, *Chelodina mccordi* (Shepherd *et al.*, 2005)



A Red-tailed Ratsnake *Gonyosoma oxycephalum* for sale at Snake Day 2015.



Green Tree Python *Morelia viridis*.

3.9.3 Reptile survey

The total value of live reptiles imported by the EU was estimated at approximately EUR7 million in 2005 (Engler *et al.*, 2007), making the EU the largest importer of live reptiles after the USA (Robinson *et al.*, 2015). Although wildlife trade is governed within the EU through the EU Wildlife Trade regulations encompassing the CITES regulations, day-to-day implementation and the enforcement is the responsibility of each Member State. The EU single market ensures free movement of goods since the EU is seen as one territory without internal borders. Discrepancies between Member States in capacity, resources and legal frameworks to enforce these regulations can facilitate illegal wildlife trade within the EU (Milieu Ltd *et al.*, 2006). Traders that traffic wildlife can exploit these vulnerabilities and seek the easiest entry point into the EU, from thereon wildlife can be more easily moved across Member States (Milieu Ltd *et al.*, 2006). It also shows that increased enforcement by one Member State will not sufficiently tackle the problem. A co-ordinated response, like that outlined within the EU Action Plan against Wildlife Trafficking, is needed to address this problem and prioritize implementation gaps.

On 11 October 2015 the annual Snake Day was surveyed for the presence of Indonesian species. Snake Day is the annual snake expo organized by the European Snake Society in the Netherlands. This snake show allows commercial trade in snakes and any products related to snake husbandry. Moreover, it allows the sale of venomous snake species in a specific room used for this purpose. During the survey all Indonesian species were documented including available price, origin and age (Table 7). Colour morphs of the Indonesian species were not included in the survey as these are the result of selective captive breeding and most likely bred outside Indonesia. Indonesian species were observed at 23 stands, comprising 301 specimens of 31 snake species and interestingly also included two specimens of an Indonesian lizard species; the Giant Blue-tongued Skink *Tiliqua gigas gigas*. Stand holders selling Indonesian species came from Czech Republic (2), Denmark (2), France (1), Germany (7), Hungary (2), the Netherlands (7), Sweden (1) and the United Kingdom (1).



Figure 7: Reportedly farmed Green Tree Python *Morelia viridis* (left) and wild-sourced Papuan Python *Apodora papuana* (right) for sale by a German vendor at Snake Day (2015).

The most common Indonesian species encountered was the Green Tree Python with 52 specimens, described by vendors as variously captive-bred and wild-sourced. Price differences were based on age and locality. Green Tree Python origin localities from eastern Indonesia comprised Biak, Aru, Wamena, Jayapura, Sorong and Cyclops Mountains. Biak, with 22 animals, was the most common locality listed by vendors. However, the Green Tree Python is nationally protected in Indonesia, which prohibits the export of wild-sourced specimens of this species (*Governmental Regulation 7/1999*). Mis-declaring wild-sourced Green Tree Pythons as captive-bred has been documented in

the past (Lyons *et al.*, 2011). For two adult Green Tree Pythons, no source was mentioned by the vendor, raising questions about the legality of those animals.

Although King Cobras *Ophiophagus hannah* are native to Indonesia and were for sale at the reptile show, origin localities were listed respectively as Malaysia and China. Amethyst Pythons *Morelia amethystina* origin localities were listed as Biak and Aru. Paulson's Bevel-nosed Boa *Candoia paulsoni* and in particular the subspecies *Candoia paulsoni tasmai* occurs in Indonesia (Halmahera and Sulawesi). However, the origin locality of only one boa was mentioned, which was Santa Isabel, Solomon Islands. The Reticulated Python *Python reticulatus* was one of the most common snake species sold at the reptile show, except for two wild-sourced snakes, all were so-called colour morphs. The two wild-sourced Reticulated Pythons were reportedly from the Indonesian localities Sumana and Bisol. The island of Sumatra was the supposed origin of one of the Brongersma's Short-tailed Pythons *Python brongersmai*. The observed Macklot's Python *Liasis mackloti* was not openly for sale but a bag containing this species was seen behind the stand. Two Giant Blue-tongued Skinks were for sale despite the fact that Snake Day only specifically allows the sale of snake species. Although it is unclear if this comprised captive-bred animals or wild-sourced, this species is nationally protected in Indonesia under *Governmental Regulation 7/1999*, prohibiting all export of wild-sourced animals.

During the Snake Day reptile survey a total of 162 Indonesian reptiles were documented as wild-sourced. Of all wild-sourced reptiles 89% (145 animals) was sold by a single Dutch reptile shop. As the majority of the species offered by this particular shop originated from Indonesia it suggested the likelihood of a recent shipment from Indonesia to the Netherlands. The other 17 wild-sourced reptiles were sold by vendors from Germany, Hungary, the Netherlands and the United Kingdom. The species presented in this report are therefore very likely an underrepresentation of the species and quantities actually imported into the Netherlands during the study period as imports via other EU Member States may have also reached the Dutch market. The fact that wild-sourced reptiles were sold at Snake Day by vendors from eight different countries emphasizes the fact that when the trade of a single EU country is analysed, trade within the entire EU should be taken into account.



Figure 8 : Green Tree Pythons *Morelia viridis* for sale by a Czech vendor at Snake day (2015) showing both adults and juveniles from various localities.

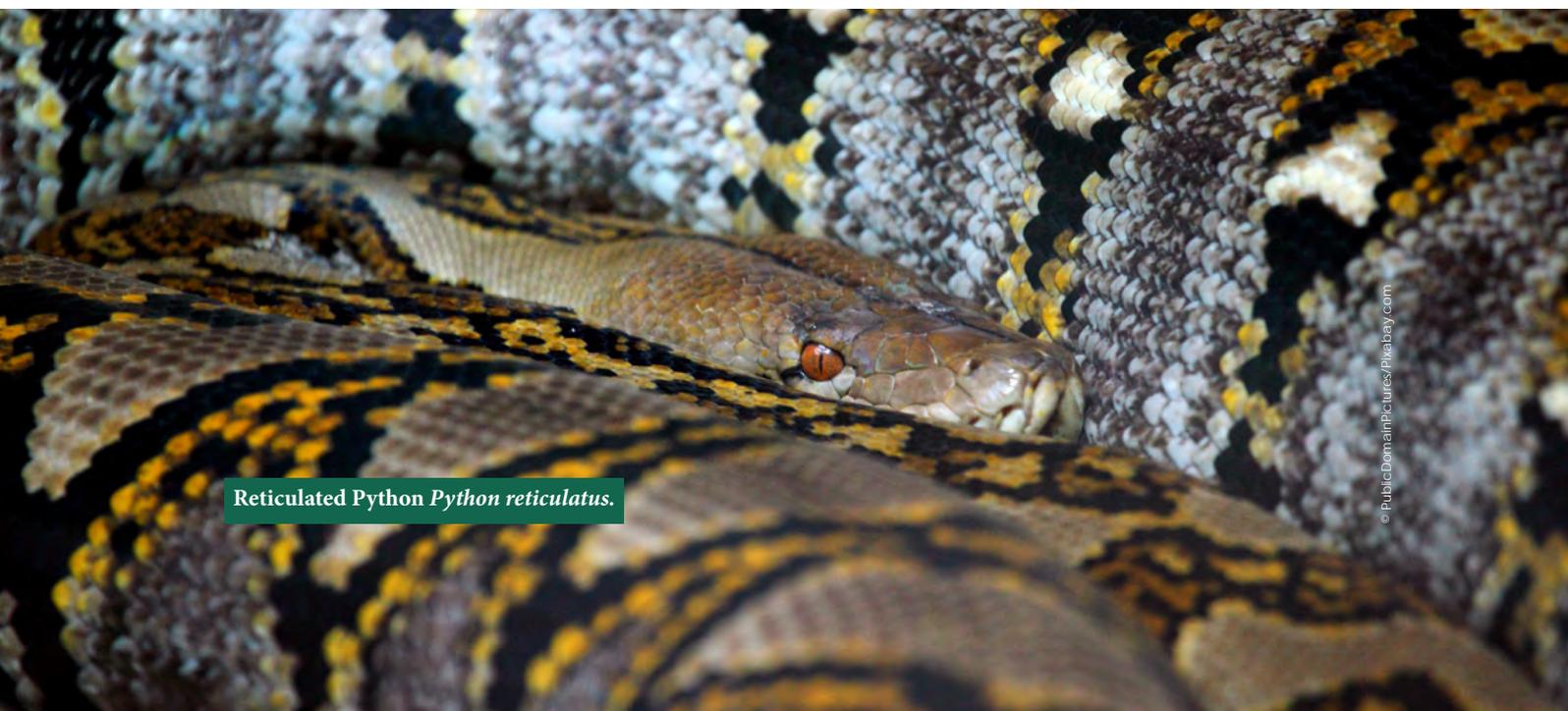
Table 6. Imported reptile species and their corresponding source in the period 2003-2013.

Captive-bred: source code 'C', and Captive-born: source code 'F' and Wild-sourced: source code 'W', 'NL' refers to the reported quantity by the Netherlands, and 'ID' to the reported quantity by Indonesia. IUCN categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), and Least Concern (LC). CITES corresponds to their CITES Appendix listing, where 'N' means not listed on CITES. EU corresponds to the species's EU Annex listing, with * meaning that there is an EU or CITES suspension for trade in wild-sourced animals, ** a positive EU decision, *** no significant trade anticipated by the EU and **** a negative EU decision on trade in wild-sourced specimens. ^a refers to species which were only listed on EU-Annex D till 2004. Source: UNEP-WCMC CITES Trade Database and UNEP (2016).

Taxon	Captive-bred	Captive-born	Wild-sourced	ID	NL	Native	IUCN	CITES	EU
Asiatic Soft-shell Turtle <i>Amyda cartilaginea</i>			18	18		Y	VU	II	B*
Papuan Olive Python <i>Apodora papuana</i>			22	19	10	Y	-	II	B
Viper Boa <i>Candoia aspera</i>			192	182	94	Y	-	II	B
Mozambique Girdled Lizard <i>Cordylus mossambicus</i>			15	15		N	VU	II*	B*
Rhodesian Girdled Lizard <i>Cordylus rhodesianus</i>			15	15	15	N	-	II	B*
Transvaal Girdled Lizard <i>Cordylus vittifer</i>			20	20		N	-	II	B*
Amboina Box Turtle <i>Cuora amboinensis</i>			335	335	124	Y	VU	II	B*
Asian Leaf Turtle <i>Cyclemys dentata</i>			70	70		Y	NT	II	B
Radiated Ratsnake <i>Elaphe radiata</i>			17		17	Y	LC	N	D
Panther Chameleon <i>Furcifer pardalis</i>	6			6		N	LC	II	B*
Spiny Turtle <i>Heosemys spinosa</i>			10	10		Y	EN	II	B*
White-lipped Python <i>Leiopython albertsii</i>		8	174	169	64	Y	-	II	B
Sulawesi Forest Turtle <i>Leucocephalon yuwonoi</i>			6	6		Y	CR	II	B*
Water Python <i>Liasis fuscus</i>		2		2		Y	LC	II	B*
Macklot's Python <i>Liasis mackloti</i>			25	25	10	Y	-	II	B

Srub Python <i>Morelia amethystina</i>	6	10	78	90	24	Y	LC	II	B**
Diamond Python <i>Morelia spilota</i>		8	54	62	3	Y	LC	II	B
Green Tree Python <i>Morelia viridis</i>	819			789	571	Y	LC	II	B
Tanimbar Python <i>Morelia nauta</i>			1	1	1	Y	-	II	B
Javan Spitting Cobra <i>Naja sputatrix</i>			10	10		Y	LC	II	B**
Malayan Flat-shelled Turtle <i>Notochelys platynota</i>			10	10		Y	VU	II	B*
King Cobra <i>Ophiophagus hannah</i>		16	16	32	8	Y	VU	N	B
African Helmeted Turtle <i>Pelomedusa subrufa</i>			10	10		N	LC	II	-
Oriental Ratsnake <i>Ptyas mucosus</i>			10	10		Y	-	II	B**
Borneo Short-tailed Python <i>Python breitensteini</i>			97	92	40	Y	LC	II	B
Brongersma's Short-tailed Python <i>Python brongersmai</i>		10	202	206	44	Y	LC	II	B
Sumatran Short- tailed Python <i>Python curtus</i>		6	153	128	85	Y	LC	II	B
Reticulated Python <i>Python reticulatus</i>	45	7	248	255	89	Y	-	II	B
Black Marsh Turtle <i>Siebenrockiella crassicollis</i>			64	64		Y	VU	II	B*
Blue-tongued Skink <i>Tiliqua scincoides^a</i>			45		45	Y	-	N	-
Red-eyed Crocodile Skink <i>Tribolonotus gracilis</i>			33		33	Y	-	N	D
Blue-tailed Monitor <i>Varanus doreanus</i>			90	86	25	Y	-	II	B
Dumeril's Monitor <i>Varanus dumerilii</i>			4	4		Y	-	II	B*

Gould's Monitor <i>Varanus gouldii</i>	6	6		6	6	Y	-	II	B
Mangrove Monitor <i>Varanus indicus</i>	21			21	11	Y	LC	II	B
Peach-throated Monitor <i>Varanus jobiensis</i>			2	2		Y	LC	II	B*
Quince Monitor <i>Varanus melinus</i>		14		14	6	Y	-	II	B
Argus Monitor <i>Varanus panoptes</i>	6			6		Y	-	II	B
Emerald Tree Monitor <i>Varanus prasinus</i>	52			51	41	Y	-	II	B
Rough-neck Monitor <i>Varanus rudicollis</i>			214	201	63	Y	-	II	B
Crocodile Monitor <i>Varanus salvadorii</i>				2		Y	-	II	B*
Water Monitor <i>Varanus salvator</i>			290	268	183	Y	LC	II	B
Spotted Tree Monitor <i>Varanus similis</i>				2		Y	-	II	B
Asiatic Water Snake <i>Xenochrophis piscator</i>			20	20		Y	-	II	C
Sunbeam Snake <i>Xenopeltis unicolor</i> ^a			4		4	Y	LC	II	-
Pacific Ground Boa <i>Candoia carinata</i>			146	108	56	Y	LC	II	B*



Reticulated Python *Python reticulatus*.

Table 7. Observed reptile taxa at the annual Snake Day in Houten, The Netherlands in 2015. Captive-bred: source code 'C', and Captive-born: source code 'F' and Wild-sourced: source code 'W'. CITES refers to their CITES Appendix listing, where 'N' means not listed on CITES. EU corresponds to the species IUCN categories: Endangered (EN), Vulnerable (VU) and Least Concern (LC).

Species	Male	Female	Sex Unkwn.	Source	Price (€) Indiv.	Price (€) Pair	IUCN	CITES	Venomous
Oriental Whipsnake <i>Ahaetulla prasina</i>			29	W	22,5 - 32,5	35 - 55	LC	N	
Papuan Python <i>Apodora papuana</i>	3	4		F/W	500-700	1250-1300	-	II	
Mangrove Snake <i>Boiga dendrophila</i>			5	W	90	165	-	N	X
Mangrove Snake <i>Boiga dendrophila melanota</i>			2	C			-	N	X
Brown Tree Snake <i>Boiga irregularis</i>	1	1		C	500		-	N	X
Paulson's Bevel-nosed Boa <i>Candoia paulsoni</i>	2	4		C/W	100-340	400	LC	II	
Common Pipe Snake <i>Cylindrophis ruffus</i>			25	W	45	80	LC	N	
Painted Bronzeback <i>Dendrelaphis pictus</i>			15	W	25	45	-	N	
Red-tailed Racer <i>Gonyosoma oxycephalum</i>			7	C/W	90-110	160	LC	N	
White-lipped Python <i>Leiopython albertisii</i>	2	2		C/W	290-450	960	LC	II	
Macklot's Python <i>Liasis mackloti</i>	1	1					-	II	
Tanimbar Python <i>Morelia nauta</i>	6			C	350		-	II	
Scrub Python <i>Morelia amethystina</i>	4	2	1	W	190-600	390-1300	LC	II	
Carpet Python <i>Morelia spilota harissoni</i>		1		C	100		LC	II	
Green Tree Python <i>Morelia viridis</i>	14	13	25	C/F	230 - 750		LC	II	
Javan Spitting Cobra <i>Naja sputatrix</i>	2	1	2				LC	II	X
Golden Spitting Cobra <i>Naja sumatrana</i>	2	2		C		600	LC	II	X
Brown Kukri Snake <i>Oligodon purpurascens</i>				W	55	100	LC	N	
King Cobra <i>Ophiophagus hannah</i>	1	1		C	300-900	500	VU	II	X
Red Mountain Ratsnake <i>Oreocryptophis porphyraceus laticinctus</i>	1	1		C	150		-	N	
Keeled Ratsnake <i>Ptyas carinatus</i>	3	3		W		1100	LC	N	

Indo-Chinese Ratsnake <i>Ptyas korros</i>	2	1	2	W	40-70	70	-	N	
Borneo Short-Tailed Python <i>Python breitensteini</i>			29	C	90		LC	II	
Brongersma's Short-tailed Python <i>Python brongersmai</i>	1	1	1	C/W	110-270	490	LC	II	
Reticulated Python <i>Python reticulatus</i>	1	1		W	190 -250		-	II	
Giant Blue-tongued Skink <i>Tiliqua gigas gigas*</i>	1	1					-	N	
White-lipped Pit Viper <i>Trimeresurus albolabris</i>	2	2		C	25-30	50	-	N	X
Mangrove Pit Viper <i>Trimeresurus purpureomaculatus</i>			2	C		160	LC	N	X
Sumatran Pit Viper <i>Trimeresurus sumatranus</i>	4	5		C	1200	1300-2300	LC	N	X
Temple Pit Viper <i>Tropidolaemus laticinctus</i>	1			C	50		-	N	X
Bornean Keeled Green Pit Viper <i>Tropidolaemus subannulatus</i>	2	2	4	C		400-500	LC	N	X
Sunbeam Snake <i>Xenopeltis unicolor</i>			25	W	35	60	-	N	

CONCLUSIONS

The aim of this study was to get insights into the import-export relationships between Indonesia and the Netherlands to better understand the role of the Netherlands as an importing country, and Indonesia as a major exporter of wildlife. When taking the highest quantities reported to the UNEP-WCMC CITES Trade Database, almost 550 000 live animal specimens were imported from Indonesia by the Netherlands between 2003-2013, comprising birds, coral, fish, mammals, molluscs and reptiles. Of all live animals traded between the two countries 98% comprised coral specimens, followed by fish (1.02%) and reptiles (0.69%). The results show that the Netherlands plays a significant role in the import of wild animals from Indonesia. Significant trade was documented in particular in coral, fish and reptile species. Compared to the observed quantities for corals, the quantities traded for reptiles seem relatively minor. However, the total quantity traded is likely to be a lot higher since less than 8% of the world's reptiles are currently listed under CITES, compared to all stony corals, blue corals, organ pipe corals and fire corals being listed in the CITES Appendices. The reptile survey showed that true reptile trade is likely much higher, as trade in 18 non-CITES listed reptile species was documented. Therefore this report likely underestimates the true traded quantities for this species group. The European suspension on the import of wild birds is apparent because only a few bird trade records are mentioned in the data. Even though signs are positive that for several species groups (e.g. molluscs and fish) animals reported as captive-bred are indeed captive-bred, the significant trade in taxa like coral and certain reptile species suggest that at least a part of the wildlife imported by the Netherlands is likely fraudulently declared as captive-bred or captive-born. While only a small percentage of the reptiles imported were reportedly captive-bred, this does include species like the Green Tree Python for which laundering has been documented. This report also highlights several issues of concern.

Large discrepancies were observed between the quantities reported by Indonesia and the Netherlands. Indonesia reported the export of 456 658 animal specimens while the Netherlands reported the import of 343 992 animal specimens. The two countries reported the same import/export quantities for only 41 records. For 496 of the 1146 reported trade transactions, the Netherlands did not report any quantity at all, and 132 had no reported quantity by Indonesia. The discrepancies mentioned in the report can be caused by differences in reporting; i.e. permits issued versus actual trade. Although there are several reasons which can explain discrepancies in the data it cannot be excluded that no permits were issued in the 132 cases where no exporter quantity was documented. The observed differences between the importer- and exporter-reported quantities calls for a careful interpretation of the trade reported to the database, taking into account certain caveats. The majority of the imported species are native to Indonesia, although a few non-native reptile species were exported by Indonesia as well. CITES trade data indicated trade in five reptile species and eight coral species in contravention of EU trade suspensions in place. However, almost all such trade was only reported by Indonesia, making it possible that these were not actually imported by the Netherlands; Indonesia bases their trade reports to CITES on permits issued and not actual trade levels. For one (coral) species, trade was reported by both Indonesia and the Netherlands despite an EU negative opinion, followed by a trade suspension, being in place. For several other species that were reportedly traded between the two countries, EU and/or CITES trade suspensions or negative opinions were in place but trade in those species was limited to the years before the suspensions became effective. The fact that trade was reported by both Indonesia and the Netherlands for species while EU import restrictions were in place shows that more effort is required from the Dutch authorities to ensure that all EU import restrictions are taken into account.

Analysis of coral trade demonstrated that trade was conducted at both a species and genus level, and even at the order level. For only a few genera trade the genus level is accepted according to CITES regulations. Analysis of trade data revealed that trade was reported at the genus level for several

genera for which trade at this level was not found to be appropriate. Moreover, the coral trade data show that live coral is documented in kilogrammes, while the regulations state that live coral needs to be traded as the number of specimens. Both the Netherlands and Indonesia reported trade in kilogrammes instead. Even though coral trade, and in particular coral trade from Indonesia (e.g. UNEP-WCMC, 2014b), has received quite a bit of attention through UNEP-WCMC publishing several reports, a number of issues as raised in this study still need to be addressed.

In addition, this report shows that trade suspensions can lead to a sudden increase of trade in captive-bred specimens, as has been shown for the trade in Common Seahorse (UNEP-WCMC, 2014a), and potentially fraudulently declared as such. The issue of fraudulently reporting wild-sourced specimens as captive-bred or ranched has been recognized by the EU in the past. Concerns with regards to the potential detrimental effects of this practice have been raised by the EU in 2011 (*SC61 Doc. 27*). Although CITES requires that a NDF is made, to ensure that the export of the specimen is not detrimental to the survival of the species, it is unclear how these are conducted by the Government of Indonesia.

The reptile survey also demonstrated the difficulties in analysing trade for a single European country. The EU single market enables traders to transport specimens between EU countries with virtually no documentation requirements. This has become apparent through the survey of the annual Snake Day in Houten (2015). Even though there are no EU import restrictions for the observed species, the presence of Indonesian species at vendors from eight different EU countries shows that the EU single market should be taken into account when studying wildlife trade within the EU. Providing more evidence that the true quantities and reptile species imported and traded within the Netherlands are therefore likely to be higher and some species imported into the Netherlands may be destined for other EU Member States.

RECOMMENDATIONS

In light of the findings Indonesia and the Netherlands should increase compliance with CITES requirements by providing more accurate information on the actual numbers of wildlife traded. The large discrepancies between importer and exporter mentioned quantities undermine the usefulness of the UNEP-WCMC CITES trade database.

To ensure that trade in live animal species is not occurring to the detriment of wild populations in Indonesia, the Government of Indonesia should:

- Increase transparency of the process under which the government conducts Non-Detriment Findings in order to evaluate issued harvest and trade quotas for CITES-listed species;
- The CITES Management Authority of Indonesia should take into account the viable production capacity and economic viability of any commercial captive breeding/mariculture facility when authorizing their operations and should continuously monitor and inspect their operations in order to prevent laundering of wildlife;
- Initiate regular dialogue with the European Commission and individual EU Member States to prevent, discuss or lift trade suspensions and negative opinions;
- Ensure that exported quantities do not exceed the quantities for which permits have been granted;
- Improve compliance with the CITES requirements regarding the documentation of trade in coral species, both for specimens and trade in kilogrammes, and should not issue export permits for taxonomic levels for which trade has not been found appropriate by CITES as mentioned in CITES Notification No. 2003/020 and 2013/035;

To ensure fraudulently exported wild-sourced specimens are not imported into the Netherlands and into the EU common market, and to ensure that the import of live animal species from Indonesia is not detrimental to the survival of wild populations the Government of the Netherlands and the European Commission should consider the following priorities:

- The CITES Scientific Authorities of the Netherlands/ European Commission should take steps to take into consideration scientific evidence regarding possible false declarations of captive breeding before issuing import permits. Systematic requests for detailed information should be made to exporting countries on captive breeding facilities (including for captive-born specimens) and steps taken to monitor breeding facilities to prevent laundering of wild specimens.
- The Netherlands should take steps to record coral trade more accurately, and consider refusing imports which are incorrectly documented, i.e. with trade terms LIV instead of COR;
- The European Commission and the Netherlands should consider refusing the imports of species for which quotas have been set at genus or higher taxonomic level, unless the use of higher taxonomic levels is accepted by the CITES Parties (e.g. CITES Notification No. 2003/020 and 2013/035).
- The scale of trade in certain taxa, such as corals and reptiles, should be recognized and EU law enforcement efforts should be enhanced to respond more effectively to fraudulent and illegal imports at EU points of entry;
- The enforcement authorities of the Netherlands, in particular the Netherlands Food and Consumer Product Safety Authority (NVWA), should increase regulatory vigilance over commercial events (e.g. reptile trade fairs) that bring together vendors/buyers from various EU Member States in order to prevent the import of species into the Netherlands for which trade restrictions are in place, but likely entered the EU via other Member States (possibly those with weaker enforcement capacities);
- To ensure a co-ordinated response to illegal and unsustainable trade, EU Member States should pursue a more consistent law enforcement effort across the EU, guided by the effective implementation of the EU Action Plan against Wildlife Trafficking. This could include exchange of information obtained by regular monitoring of key EU wildlife fairs and markets (physical and online), which could provide early warnings for emerging trends and potential illegal trade;
- The European Commission should consider improving co-operation on a scientific and/or enforcement level between Indonesia and the EU (including the Netherlands) for example through inviting representatives of the Indonesian Government to the Scientific Review Group (SRG). Such co-operation could include study exchanges, exchange of scientific information and underlying methodologies or joint enforcement operations that target Indonesian wildlife traded onto the EU consumer market.

REFERENCES

- Allen, G. R. (2008). Conservation hotspots of biodiversity and endemism for Indo-Pacific coral reef fishes. *Aquatic Conservation: Marine and Freshwater Ecosystems* 18:541-556.
- Altherr, S. (2014). *Stolen Wildlife - Why the EU needs to tackle smuggling of national protected species*. Pro Wildlife, Munich, Germany.
- Asian Turtle Trade Working Group. 2016. *Notochelys platynota*. The IUCN Red List of Threatened Species 2016: e.T14856A97374195. Downloaded on 18 July 2016.
- Auliya, M. (2003). *Hot trade in cool creatures: a review of the live reptile trade in the European Union in the 1990s with a focus on Germany*. TRAFFIC Europe, Brussels, Belgium.
- Auliya, M., Altherr, S., Ariano-Sanchez, D., Baard, E.H., Brown, C., Brown, R.M., Cantu, J.C., Gentile, G., Gildenhuys, P., Henningheim, E. and Hintzmann, J. (2016). Trade in live reptiles, its impact on wild populations, and the role of the European market, *Biological Conservation* <http://dx.doi.org/10.1016/j.biocon.2016.05.017>
- BirdLife International (2012). *Psitttrichas fulgidus*. The IUCN Red List of Threatened Species 2012.
- Bruckner, A. W., and E. Borneman (2006). Developing a sustainable harvest regime for Indonesia's stony coral fishery. Pages 1692-1697 in Proceedings of the 11th International Workshop on the trade in stony corals: Development of Sustainable Management Guidelines
- Burke, L., K. Reytar, M. Spalding, and A. Perry (2011). *Reefs at risk revisited*: World Resources Institute., Washington, DC., USA
- Center for Ocean Solutions (2009). *Pacific ocean synthesis - scientific literature review of coastal and ocean threats, impacts and solutions*. The Woods Center for the Environment, Stanford University, Stanford, USA
- CITES (2008). Overview of coral products in trade and relevant Resolutions / Decisions for implementation of CITES provisions in EU. Inf 8. Animals Committee 22. Lima, Peru.
- CITES (2015). CITES Biennial report 2013-2014. Cites Management Authority of the Netherlands Authority, The Hague, The Netherlands.
- Crook, V., and L. Musing. 2016. Analysis of EU Member State CITES Biennial Reports 2013-2014. Report prepared for the European Commission
- Dawes, J. A., L. C. Lim, and L. Cheong (1999). *The Dragon Fish*. Kingdom Books. Havant, United Kingdom.
- Dirhamsyah (2005). Analysis of the Effectiveness of Indonesia's Coral Reef Management Framework. University of Wollongong, Wollongong, Australia
- Ellis, S. (2000). *Nursery and grow-out techniques for giant clams (Bivalvia: Tridacnidae)*. Center for Tropical and Subtropical Aquaculture Waimanalo, Hawaii, USA.
- Engler, M., and R. Parry-Jones (2007). *Opportunity or threat: the role of the European Union in global wildlife trade*. TRAFFIC Europe, Brussels, Belgium.
- European Commission (2007). Bird imports. European Commission Nr. 318/2007/EC, Brussels, Belgium
- European Commission (2015). *Roadmap: EU Action Plan Against Wildlife Trafficking*. European Commission Env E2, Brussels, Belgium
- European Commission and TRAFFIC (2015). *Reference Guide to the European Union Wildlife Trade Regulations*. Brussels, Belgium.
- European Commission (2016). Commission launches Action Plan to crack down on wildlife trafficking. Date: 26 february 2016. Retrieved from: http://europa.eu/rapid/press-release_IP-16-387_en.htm
- Foster, S., and A. Vincent (2004). Life history and ecology of seahorses: implications for conservation and management. *Journal of Fish Biology* 65:1-61.
- Foster, S., S. Wiswedel, and A. Vincent (2014). Opportunities and challenges for analysis of wildlife trade using CITES data—seahorses as a case study. *Aquatic Conservation: Marine and Freshwater Ecosystems*. DOI:10.1002/aqc.2493
- Gibbons, J. W., D. E. Scott, T. J. Ryan, K. A. Buhlmann, T. D. Tuberville, B. S. Metts, J. L. Greene, T. Mills, Y. Leiden, and S. Poppy (2000). The Global Decline of Reptiles, Déjà Vu Amphibians Reptile species are declining on a global scale. Six significant threats to reptile populations are habitat loss and degradation, introduced invasive species, environmental pollution, disease, unsustainable use, and global climate change. *BioScience* 50:653-666.
- Gong, S.-P., A. T. Chow, J. J. Fong, and H.-T. Shi (2009). The chelonian trade in the largest pet market in China: scale, scope and impact on turtle conservation. *Oryx* 43:213-216.
- Government of the Netherlands (2014). Global approach to tackle elephant and rhino poaching. Date: 13 February 2014. Retrieved from: <https://www.government.nl/latest/news/2014/02/13/global-approach-to-tackle-elephant-and-rhino-poaching>

- Hua Yue, G., Y. Li, L. C. Lim, and L. Orban (2004). Monitoring the genetic diversity of three Asian arowana (*Scleropages formosus*) captive stocks using AFLP and microsatellites. *Aquaculture* 237:89-102.
- Iskandar, D. T., and W. R. Erdelen (2006). Conservation of amphibians and reptiles in Indonesia: issues and problems. *Amphibian and Reptile Conservation* 4.
- Jones, R. (2008). *CITES, corals and customs: the international trade in wild coral*. Advances in coral husbandry in public aquariums: 351-361.
- Koldewey, H. J., and K. M. Martin-Smith (2010). A global review of seahorse aquaculture. *Aquaculture* 302:131-152.
- Kusmana, C. (2011). Forest resources and forestry in Indonesia. *Forest Science and Technology* 7:155-160.
- Lenzen, M., D. Moran, K. Kanemoto, B. Foran, L. Lobefaro, and A. Geschke (2012). International trade drives biodiversity threats in developing nations. *Nature* 486:109-112.
- Lovich, J. E., R. A. Mittermeier, P. C. H. Pritchard, A. G. J. Rhodin, and J. W. Gibbons (2000). Powdermill Conference: trouble for the world's turtles. *Turtle and Tortoise Newsletter* 1:16.
- Lyons, J. A., and D. J. Natusch (2011). Wildlife laundering through breeding farms: illegal harvest, population declines and a means of regulating the trade of green pythons (*Morelia viridis*) from Indonesia. *Biological Conservation* 144:3073-3081.
- McCord, W. P., J. B. Iverson, and N. Boeadi (1995). A new batagurid turtle from northern Sulawesi, Indonesia. *Chelonian Conservation and Biology* 1:311.
- McNeely, J. A., P. Kapoor-Vijay, L. Zhi, L. Olsvig-Whittaker, K. M. Sheikh, and A. T. Smith (2009). Conservation biology in Asia: the major policy challenges. *Conservation Biology* 23:805-810.
- Milieu Ltd, and Orbicon Consulting (2006). *Study on the enforcement of the EU Wildlife Trade Regulations in the EU-25*. Brussels, Belgium.
- Mittermeier, R. A. (1997). Megadiversity: Earth's biologically wealthiest nations. In CEMEX Conservation Books Series Volume: 5. Prado Norte, Mexico
- Natusch, D. J., and J. A. Lyons (2012). Exploited for pets: the harvest and trade of amphibians and reptiles from Indonesian New Guinea. *Biodiversity and Conservation* 21:2899-2911.
- Ng, P. L., and H. H. Tan (1997). Freshwater fishes of Southeast Asia: potential for the aquarium fish trade and conservation issues. *Aquarium Sciences and Conservation* 1:79-90.
- Nijman, V. (2010). An overview of international wildlife trade from Southeast Asia. *Biodiversity and Conservation* 19:1101-1114.
- Nijman, V., and C. R. Shepherd (2009). *Wildlife trade from ASEAN to the EU: Issues with the trade in captive-bred reptiles from Indonesia*. TRAFFIC Europe Report for the European Commission, Brussels, Belgium.
- Nijman, V., and C. R. Shepherd (2015). *Adding up the numbers: an investigation into commercial breeding of Tokay Geckos in Indonesia*. TRAFFIC Southeast Asia, Petaling Jaya, Malaysia.
- Nijman, V., C. R. Shepherd, Mumpuni, and K. L. Sanders. (2012). Over-exploitation and illegal trade of reptiles in Indonesia. *Herpetological Journal* 22:83-89.
- Nijman, V., and S. Stoner (2014) *Keeping an ear to the ground: monitoring the trade in Earless Monitor Lizards*. TRAFFIC Southeast Asia, Petaling Jaya, Malaysia.
- Ó Criodáin, C. (2007). *Study on the Effectiveness of the EC Wildlife Trade Regulations*. TRAFFIC Europe report for the European Commission, Brussels, Belgium.
- Pieters, J. (2016). Researcher: Netherlands a key link in poaching, illegal wildlife trade. NLTimes. Date: 9 February 2016. Accessed through: <http://www.nltimes.nl/2016/02/09/researcher-netherlands-a-key-link-in-poaching-illegal-wildlife-trade/>
- Platt, S. G., R. J. Lee, and M. W. Klemens (2001). Notes on the distribution, life history, and exploitation of turtles in Sulawesi, Indonesia, with emphasis on *Indotestudo forstenii* and *Leucocephalon yuwonoi*. *Chelonian Conservation and Biology* 4:154.
- Raymakers, C. (2001). *Review of trade in live corals from Indonesia*. TRAFFIC Europe Report for the European Commission, Brussels, Belgium.
- Reksodihardjo-Lilley, G., and R. Lilley (2007). *Towards a sustainable marine aquarium trade: An Indonesian perspective*. SPC Live Reef Fish Information Bulletin 17:11-19.
- Revol, B. (1995). Crocodile farming and conservation, the example of Zimbabwe. *Biodiversity and Conservation* 4:299-305.
- Riyanto, A. (2006). Notes on Exploitation, Population Status, Distribution, and Natural History of the Sulawesi Forest Turtle (*Leucocephalon yuwonoi*) in North-Central Sulawesi, Indonesia. *Chelonian Conservation and Biology* 5:320-323.

- Rowley, J. J., D. A. Emmett, and S. Voenn (2008). Harvest, trade and conservation of the Asian arowana *Scleropages formosus* in Cambodia. *Aquatic Conservation: Marine and Freshwater Ecosystems* 18:1255-1262.
- RVO (2016). CITES-soorten in Nederland en de EU. Accessed on 20 March 2016 through <https://mijn.rvo.nl/cites-soorten-in-nederland-en-de-eu>
- Scaps, P., V. Dennis, S. Berhimpston, and F. Runtukahu (2007). *Zooxanthellate Scleractinian corals of the northern coast of Sulawesi*. National Museum of Natural History, Smithsonian Institution, Washington DC., USA
- Shea, G., A. Allison, and O. Tallwin. 2016. *Varanus jobiensis*. The IUCN Red List of Threatened Species 2016: e.T178029A21647160.
- Shepherd, C. R. (2010). Illegal primate trade in Indonesia exemplified by surveys carried out over a decade in North Sumatra. *Endangered Species Research* 11:201-205.
- Shepherd, C. R., and B. Ibarondo (2005). *The trade of the Roti Island snake-necked turtle Chelodina mccordi, Indonesia*. TRAFFIC Southeast Asia, Petaling Jaya, Malaysia.
- Siswomartono, D (1998). Review of the policy and activities of wildlife utilization in Indonesia. *Mertensiella* 9:27-31.
- Sodhi, N. S., L. P. Koh, B. W. Brook, and P. K. L. Ng (2004). Southeast Asian biodiversity: an impending disaster. *Trends in Ecology & Evolution* 19:654-660.
- Soehartono, T., Mardiasuti, A. (2002). CITES – Implementation in Indonesia. Nagao NEF, Jakarta, Indonesia
- Spinks, P. Q., R. C. Thomson, B. Hughes, B. Moxley, R. Brown, A. Diesmos, and H. B. Shaffer. 2012. Cryptic variation and the tragedy of unrecognized taxa: the case of international trade in the spiny turtle *Heosemys spinosa* (Testudines: Geoemydidae). *Zoological Journal of the Linnean Society* 164:811-824.
- Stuart, B. L., A. G. J. Rhodin, L. L. Grismer, and T. Hansel (2006). Scientific description can imperil species. *Science* 312:1137-1137.
- Theile, S., A. Steiner, and K. Kecse-Nagy (2004). *Expanding borders: New challenges for wildlife trade controls in the European Union*. TRAFFIC Europe, Brussels, Belgium.
- Timotius, S. (2009). *A review on ornamental coral farming effort in Indonesia*. Pages 12-14 in Proceedings of International Ocean Science, Technology, and Policy Symposium.
- Tissot, B. N., B. A. Best, E. H. Borneman, A. W. Bruckner, C. H. Cooper, H. D'Agnes, T. P. Fitzgerald, A. Leland, S. Lieberman, and A. M. Amos (2010). How US ocean policy and market power can reform the coral reef wildlife trade. *Marine Policy* 34:1385-1388.
- Tittensor, D. P., C. Mora, W. Jetz, H. K. Lotze, D. Ricard, E. V. Berghe, and B. Worm (2010). Global patterns and predictors of marine biodiversity across taxa. *Nature* 466:1098-1101.
- UNEP (2016). The Species+ Website. Compiled by UNEP-WCMC, Cambridge, United Kingdom. Available at: <http://speciesplus.net/>
- UNEP-WCMC (2007). *Indonesia: A review of trade in CITES- listed species*. UNEP-WCMC, Cambridge, United Kingdom
- UNEP-WCMC (2013a). *EU wildlife trade 2011: Analysis of the European Union and candidate countries' annual reports to CITES 2011*. Cambridge, United Kingdom.
- UNEP-WCMC (2013b). *A guide to using the CITES trade database*. Cambridge, United Kingdom.
- UNEP-WCMC (2014a). *Analysis of the impact of EU decisions on trade patterns. Report 3: shifts in sources of specimens and purposes of trade*. UNEP-WCMC, Cambridge, United Kingdom
- UNEP-WCMC (2014b). *Review of corals from Indonesia (coral species subject to EU decisions where identification to genus level is acceptable for trade purposes)*. UNEP-WCMC, Cambridge.
- UNEP-WCMC (2015a). *EU wildlife trade 2012: Analysis of the European Union and candidate countries' annual reports to CITES 2012*. Cambridge, United Kingdom.
- UNEP-WCMC (2015b). *EU wildlife trade 2013: Analysis of the European Union and candidate countries' annual reports to CITES 2013*. Cambridge, United Kingdom.
- van Balen, S., I. W. A. Dirgayusa, I. M. W. Adi Putra, and H. H. T. Prins (2000). *Status and distribution of the endemic Bali starling Leucopsar rothschildi*. *Oryx* 34:188-197.
- van Krevelt, A. (2007). *Het product 'biodiversiteit': De mondiale, EU- en Nederlandse handel in CITES-soorten*. Wereld Natuur Fonds, Zeist, The Netherlands.
- van Uhm, D. (2009). *Illegale Dierenhandel en de rol van Nederland*. Master thesis Utrecht University, Utrecht, The Netherlands.
- Vincent, A., S. Foster, and H. Koldewey (2011). Conservation and management of seahorses and other Syngnathidae. *Journal of Fish Biology* 78:1681-1724.
- Vincent, A. C. J. (1996). *The International Trade in Seahorses*. TRAFFIC International, Cambridge, UK.

- Vinke, T., and S. Vinke. (2015). Can illegal be legal within the European Union? *Schildkröten im Fokus* 1:1-6.
- Wabnitz, C. (2003). *From ocean to aquarium: the global trade in marine ornamental species*. UNEP/Earthprint.
- Wells, S. M. (1997). *Giant clams: Status, trade and mariculture, and the role of CITES in management*. IUCN-The World Conservation Union.
- Wilkinson, C. (2008). *Status of Coral Reefs of the World: 2008*. Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre. Townsville, Australia 296.
- Wood, E., K. Malsch, and J. Miller. (2012). *International trade in hard corals: review of management, sustainability and trends*. Pages 9-13 in Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia.
- Yuwono, F. B., and W. Erdelen (1998). *The trade of live animals in Indonesia*. *Mertensiella* 9:9
- Zhou, Z., and Z. Jiang (2004). International trade status and crisis for snake species in China. *Conservation Biology* 18:1386-1394.

APPENDIX

Table 8. Number of live coral specimens imported into the Netherlands from Indonesia and their corresponding source in the period 2003-2013. Captive-bred: source code 'C', Captive-born: source code 'F' and Wild-sourced: source code 'W'. 'NL' refers to the reported quantity by the Netherlands, and 'ID' to the reported quantity by Indonesia. EU refers to the species's EU Annex listing, with * meaning that there is an EU suspension for trade in wild sources during the study period, ** a positive EU decision, *** no significant trade anticipated by the EU and **** a negative EU decision on trade in wild-sourced specimens. ^a EU Trade suspension came into place in 2005, before this a negative EU opinion. ^b since 2007, ^c since 2004, prior a negative opinion, ^d negative opinion between 2007-2011, suspension since 2012, ^e suspension since 2006, a negative opinion since 2003, ^f since 2010, ^g since 2007, ^h a negative opinion in place between 2003-2005 followed by an EU suspension. IUCN Red List categories : Vulnerable (VU), Near Threatened (NT), Least Concern (LC) and Data Deficient (DD). Source: UNEP-WCMC CITES Trade database and Species+.

Taxon	Captive-bred	Captive-born	Wild-sourced	ID	NL	IUCN	CITES	EU
Starry Cup Coral <i>Acanthastrea echinata</i>			21	21	9	LC	II	B
<i>Acropora austera</i>		80		80		NT	II	B**
<i>Acropora divaricata</i>		535		535		NT	II	B**
<i>Acropora formosa</i>		7178	3927	8161	3918	NT	II	B**
<i>Acropora gomezi</i>		561		561		DD	II	B**
<i>Acropora horrida</i>		418		418		VU	II	B**
<i>Acropora humilis</i>		1028	1908	1880	1908	NT	II	B**
<i>Acropora hyacinthus</i>		65	1781	1404	1684	NT	II	B**
<i>Acropora jacquelineae</i>		80	20	100		VU	II	B**
<i>Acropora kimbeensis</i>		141		141		VU	II	B**
Bluetip Coral <i>Acropora loripes</i>		80		80		NT	II	B**
<i>Acropora millepora</i>		467	75	467	75	NT	II	B**
<i>Acropora nana</i>		378		378		NT	II	B**
<i>Acropora prostrata</i>		85		85		DD	II	B**
<i>Acropora rosaria</i>		177		177		DD	II	B**
<i>Acropora secale</i>		371		371		NT	II	B**
<i>Acropora tenuis</i>		2443	617	2443	617	NT	II	B**
Bush Coral <i>Acropora valida</i>		355		355		LC	II	B**
<i>Alveopora spongiosa</i>		70	122	182	89	NT	II	B
<i>Blastomussa wellsi</i>			6	6		NT	II	B*
Elegant Coral <i>Catalaphyllia jardinei</i>		30	43	73		VU	II	B*
<i>Caulastraea echinulata</i>			3703	3552	1913	VU	II	B
Candycane Coral <i>Caulastraea furcata</i>		20		20		LC	II	B
<i>Caulastraea tumida</i>		10	3031	2804	2211	NT	II	B
Pacific Rose Coral <i>Cynarina lacrymalis</i>			6	6		NT	II	B ^a
<i>Cyphastrea decadia</i>		75		75		NT	II	B ^{***b}
Lesser Knob Coral <i>Cyphastrea serailia</i>			64	64	11	NT	II	B
<i>Diploastrea heliopora</i>		30	62	81	30	NT	II	B
Flat Lettuce Coral <i>Echinophyllia aspera</i>		368		360	73	LC	II	B
Leafy Hedgehog Coral <i>Echinopora lamellosa</i>		2213	145	1939	969	LC	II	B
<i>Echinopora mammiformis</i>		75		75		NT	II	B
<i>Eguchipsammia fistula</i>			4556	4528	3635	-	II	B*
Hammer Coral <i>Euphyllia ancora</i>	20	4544	10 423	14 535	8699	VU	II	B ^{****}
White Grape Coral <i>Euphyllia cristata</i>		100	234	334	50	VU	II	B ^{****}
Frogspawn Coral <i>Euphyllia divisa</i>		100	7	107	43	NT	II	B ^{****}
<i>Euphyllia glabrescens</i>	25	13 609	8564	21 569	9974	NT	II	B ^{****}
Branching Anchor Coral <i>Euphyllia paraancora</i>		60		60		VU	II	B ^{****}
<i>Euphyllia yaeyamaensis</i>		110		110	59	NT	II	B ^{****}
Knob Coral <i>Favia pallida</i>		20	1374	1300	788	LC	II	B

Honeycomb Coral <i>Favites abdita</i>		1425	1313	630	NT	II	B
Larger Star Coral <i>Favites chinensis</i>		2398	2243	994	NT	II	B
Mushroom Coral <i>Fungia fungites</i>		3995	3778	2227	NT	II	B**
<i>Fungia moluccensis</i>		3097	2795	1403	LC	II	B**
<i>Fungia paumotensis</i>		2131	2008	1063	LC	II	B**
<i>Galaxea astreata</i>	1169	1497	2572	1068	VU	II	B**
Starburst Coral <i>Galaxea fascicularis</i>	765	5184	5671	2924	NT	II	B**
<i>Goniastrea pectinata</i>		411	320	153	LC	II	B
<i>Goniastrea retiformis</i>		182	166	70	LC	II	B
<i>Goniopora lobata</i>	219	8631	8751	3965	NT	II	B***
<i>Goniopora minor</i>		7579	7579	4202	NT	II	B**
Flowerpot coral <i>Goniopora stokesi</i>		12 516	12 086	6242	NT	II	B**
Mushroom Coral <i>Heliofungia actiniformis</i>		6188	5767	4973	VU	II	B ^d
Blue Coral <i>Heliopora coerulea</i>	120	299	371	109	VU	II	B**
Slipper Coral <i>Herpolitha limax</i>		208	201	78	LC	II	B
<i>Hydnophora exesa</i>	666	3439	3862	1995	NT	II	B**
<i>Hydnophora microconos</i>		167	167	51	NT	II	B ^{ec}
<i>Hydnophora rigida</i>	3831	779	3995	1801	LC	II	B
<i>Lobophyllia corymbosa</i>		5563	5471	2830	LC	II	B**
Teeth Coral <i>Lobophyllia hemprichii</i>	10	3057	2764	2152	LC	II	B**
Ruffled Coral <i>Merulina ampliata</i>	2488	2020	4386	2169	LC	II	B**
<i>Montastrea annuligera</i>		763	689	279	NT	II	B
<i>Montastrea valenciennesi</i>		724	663	203	NT	II	B
<i>Montipora digitata</i>	453	72	453	72	LC	II	B
Leaf Coral <i>Montipora foliosa</i>	1647	1105	2031	1078	NT	II	B
<i>Montipora millepora</i>	293		293		LC	II	B
<i>Montipora verrucosa</i>	259	343	406	343	LC	II	B
<i>Mycedium robokaki</i>	90		90	12	LC	II	B
Leaf Coral <i>Pavona cactus</i>	75	40	75	40	VU	II	B
Carnation Coral <i>Pectinia lactuca</i>	198	689	759	538	VU	II	B**
Pearl Bubble Coral <i>Physogyra lichtensteini</i>	40	4336	4376	2658	VU	II	B*** ^f
Bladder Coral <i>Plerogyra sinuosa</i>		72	72		NT	II	B*
Jasmine Coral <i>Plerogyra turbida</i>		31	31		NT	II	B*
Cauliflower Coral <i>Pocillopora damicornis</i>	5134	1389	5702	1831	LC	II	B**
Antler Coral <i>Pocillopora eydouxi</i>	360		340	191	NT	II	B**
<i>Pocillopora verrucosa</i>	8596	1807	9118	2449	LC	II	B**
Sea Mole Coral <i>Polyphyllia talpina</i>		2691	2669	1097	LC	II	B
Finger Coral <i>Porites cylindrica</i>	2828	2036	4261	1995	NT	II	B*** ^g
<i>Porites lichen</i>	778	310	950	730	LC	II	B
<i>Porites lobata</i>		56	35	56	NT	II	B
Hump Coral <i>Porites lutea</i>		10	8	5	LC	II	B
<i>Porites nigrescens</i>	2318	817	2716	1202	VU	II	B
<i>Seriatopora caliendrum</i>	1.575	73	1315	806	NT	II	B
Needle Coral <i>Seriatopora hystrix</i>	5.552	766	5734	1483	LC	II	B**
Cluster Coral <i>Stylophora pistillata</i>	7841	986	7805	2499	NT	II	B***
<i>Symphylia agaricia</i>		352	332	147	LC	II	B
Crater Coral <i>Trachyphyllia geoffroyi</i>		286	286	278	NT	II	B ^h
Orange Cup Coral <i>Tubastraea coccinea</i>		308	289	39	-	II	B**
Organ-pipe Coral <i>Tubipora musica</i>	80	2778	2841	1618	NT	II	B**
Pagoda Coral <i>Turbinaria mesenterina</i>	1205	4083	4718	2480	VU	II	B
<i>Turbinaria patula</i>		10		10	VU	II	B
Bowl Coral <i>Turbinaria peltata</i>	1284	6866	7405	4047	VU	II	B*** ^g
Yellow Scroll Coral <i>Turbinaria reniformis</i>	861		655	333	VU	II	B

TRAFFIC, the wildlife trade monitoring network, is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

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