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REPORT

SEPTEMBER 2018

SEEING RED

Precious coral trade in East Asia

Hiromi Shiraishi





TRAFFIC REPORT

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TRAFFIC
the wildlife trade monitoring network





Corallium rubrum

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OVERVIEW AND RECOMMENDATIONS

While various conservation and management measures have been introduced in different countries/territories, there are many difficulties in achieving sustainable use



OVER 40 SPECIES
in the family Coralliidae



80,000 PIECES
of raw *Corallium* corals were imported
globally between 2011–2015

Corallium japonicum
was the dominant species in trade within
imports of raw coral between 2011–2015





OVER 200

Chinese vessels were caught illegally harvesting coral in 2014



2,240 JEWELLERY

exporting companies in Hong Kong using coral



Top quality corals are usually processed in Japan and lower quality corals tend to be exported to Taiwan. Processors from mainland China also have recently begun to buy corals.

RECOMMENDATIONS SUMMARY



SUSTAINABLE MANAGEMENT

Central and local fisheries authorities across East Asia, in collaboration with fishermen, fisheries associations, traders, coral trade associations, researchers are urged to implement measures addressing traceability, data collection and awareness raising issues.



REGIONAL CO-OPERATION

Fisheries authorities across East Asia, in collaboration with local governments, fishermen, fisheries associations, traders and coral trade associations, are urged to develop mechanisms to discuss coral related issues, introduce Customs codes, and standardise data collection



EFFECTIVE IMPLEMENTATION OF CITES LISTING

Relevant CITES committees and meetings, in co-operation with range States are encouraged to consider alternative provisions, raise awareness and standardise implementation of an Appendix III listing.

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ABBREVIATIONS AND ACRONYMS

AFCD	Agriculture, Fisheries and Conservation Department, Hong Kong SAR
BOFT	Taiwan POC's Bureau of Foreign Trade
Cap.	Chapter number of Hong Kong SAR Ordinances (Legislation)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoP	Conference of the Parties
Dead Colony	Precious coral harvested dead
EEZ	Exclusive economic zone
GFCM	General Fisheries Commission of the Mediterranean
HKTDC	Hong Kong SAR Trade Development Council
Hong Kong SAR	Hong Kong Special Administrative Region of the People's Republic of China
JCCI	Japan Chamber of Commerce and Industry
Living Colony	Precious coral harvested live
Mainland China	People's Republic of China
METI	Ministry of Economy, Trade and Industry
Precious coral	Species in family Corallidae (in this report)
Red coral	In this report, Red Coral refers to <i>Corallium rubrum</i> and <i>C. japonicum</i> whereas in Chinese "Red Coral (红珊瑚)" also includes other <i>Corallium</i> corals such as <i>C. elatius</i> , <i>C. konojoi</i> and <i>C. secundum</i>
spp.	Species
Taiwan POC	Taiwan Province of China
US	United States of America
VMS	Vessel monitoring system



red coral for sale on display in Beijing, China



EXECUTIVE **SUMMARY**

SEEING RED

There are more than 40 species in the family Coralliidae, which comprises three genera (*Corallium*, *Hemicorallium* and *Pleurocorallium*). Precious corals have been harvested and traded internationally since as early as pre-dynastic Egypt, valued by diverse cultures around the world. Precious corals in the Coralliidae family are distributed throughout the world's tropical, subtropical and temperate oceans, but in only two areas, the Mediterranean Sea and the northern Pacific Ocean, are they commercially exploited.

Their slow rate of renewal as well as the high demand because of their commercial and cultural importance have made *Corallium* corals vulnerable to over-exploitation. Concerns about over-exploitation and the impact of international trade on *Corallium* corals led to proposals to include the species in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) at the 14th Conference of the Parties (CoP14) in 2007 and CoP15 in 2010, which were rejected or withdrawn. Meanwhile, mainland China included four *Corallium* species, Aka Coral *C. japonicum*, Momo Coral *C. (Pleurocorallium) elatius*, White Coral *C. (Pleurocorallium) konojoi* and Angel Skin Coral *C. (Pleurocorallium) secundum* (hereafter referred to as CITES-listed *Corallium* corals) in CITES Appendix III, from 1st July 2008.

While various conservation and management measures have been introduced in different countries/territories, there are many difficulties in achieving sustainable use of the species concerned

Including a lack of knowledge about populations and their biology, and ongoing illegal harvest. In addition, recently there have been indications of rising demand and prices in mainland China, which has led to an increase in the trade price of raw materials in Japan and Taiwan POC where the species are harvested. However, there are still many knowledge gaps with regards to the current status of the trade and market of *Corallium* spp. harvested in East Asia.

This report presents analysis, research findings, trade data and information into precious coral production, in an attempt to provide an overview of the changing trade in CITES-listed precious corals after the above mentioned species were listed in CITES Appendix III in 2008. Data sources used include global production data from the Food and Agriculture Organization (FAO), the CITES Trade Database, Taiwan POC's CITES trade data, Customs statistics for Japan and Taiwan POC, in addition to literature and internet research, stakeholder interviews and physical market surveys.

According to the CITES Trade Database and Taiwan POC CITES trade data, total global imports of CITES-listed raw *Corallium* corals were 210 t and ~80,000 pieces between 2011 and 2015. Imports of raw coral (by weight) reached ~145 t in 2011, after which imports declined considerably, with 5 to 15 t being traded during 2013–2015. Additionally, more than 20,000 pieces of raw coral were imported globally in both 2011 and 2012, although the annual number of imported raw corals has declined since 2013, with

4,600–9,000 pieces being traded annually during 2013–2015. Therefore, the trade in raw coral imports during 2011–2015 appears to be declining.

Of the total raw coral imports between 2011 and 2015, *C. japonicum* (Aka Coral) was the dominant species in trade, accounting for 61% by weight with ~129,000 kg and 37% by number of pieces with approximately 27,000 pieces. The main exporter of raw corals was Japan, by weight and number of pieces, although the quantities involved varied depending on the year. Taiwan POC was the main importer of raw CITES-listed *Corallium* corals between 2011 and 2015.

Japan and Taiwan POC's Customs data suggest that the value per kilogramme of coral materials exported from Japan to Taiwan POC may have increased gradually from 2007 and reached a peak at around USD12,000–12,700/kg in 2013, after which the price dropped in 2015 before increasing again in 2016 to around USD9,000/kg. Although CITES listings are sometimes said to lead to increased prices and illegal trade, it was not clear what impact—if any—the CITES listing of *Corallium* corals, which came into effect in 2008, had on trade.

The data analysed for this report show that the trade and demand for CITES-listed *Corallium* corals has changed over the last decade, but this is not fully reflected in the available CITES and other trade data. This could be due to a number of factors, including the inconsistent application of Appendix III CITES listings, unreported trade as personal or household effects, and illegal and unreported trade. As such, uncertainties surrounding actual traded quantities and dynamics for CITES-listed *Corallium* corals exist.

Although previous studies and media reports suggest that demand for *Corallium* corals has increased in mainland China in recent years, leading to higher prices for unworked corals, available data did not clearly support this. According to CITES trade data, mainland China has reported fewer imports of *Corallium* corals; ~40 kg and 231 pieces during 2008–2015, most of which were imported from Japan (100% by weight and 75% by number of pieces). According to Japan Customs, the total amount of unworked coral exported from Japan to mainland China was only ~120 kg and annual exports did not show any increase between 2008 and 2016.

While Taiwan POC CITES trade data and Customs data suggested that a significant amount of CITES-listed *Corallium* corals could have been exported from Taiwan POC to mainland China in the last decade, neither showed this to be increasing. Taiwan POC CITES export data, derived from the quantity for which certificates were issued, showed that annual exports of unworked *Corallium* corals from Taiwan POC to mainland China exceeded 2,700 kg in 2011, after which they declined and ranged from 990 kg to 1,300 kg during 2012–2015. As the trade between mainland China and Taiwan POC is not recorded in the CITES Trade Database, a potentially considerable trade between these markets may be obscured.

Market surveys in Japan, Taiwan POC and Hong Kong SAR revealed that Chinese tourists from mainland China may play an important role as consumers of precious coral products. Such tourists can bring the products back to mainland China with receipts to verify purchases. As movement of specimens as personal or household effects is rarely reported, it is unknown to what extent precious coral products are transferred from each country/territory to mainland China in this fashion. This makes it difficult to analyse the trade, demand and consumption of precious corals.

Many traders who were interviewed during the market surveys mentioned that *Corallium* corals, especially Red Coral, are becoming scarce, although some of the sellers may have done so to promote the rarity appeal of their precious coral products. It is important to raise awareness about *Corallium* corals and pertinent international and national regulations in relevant countries/territories. Developing a traceability system for precious coral products could help to prevent illegally sourced or traded products from entering the market and also deepen understanding of the need for sustainable use of precious coral resources.

Production data may not be accurate due to under/misreporting of harvest production and illegal coral harvesting in the Northwest Pacific Ocean, driven by the high prices precious corals fetch. Considering that landing data and trade records are often used as proxies for actual population status, owing to the difficulties in monitoring wild populations, the accuracy of these data needs to be improved so as to contribute meaningfully to the monitoring and sustainable use of precious corals.

The discrepancy between production and trade data is clearly shown in the trade in *C. secundum*, which seems to be unreported and/or misreported. Harvest of *C. secundum* has not been reported to FAO since 1990, except for 7 kg by Taiwan POC in 2015 and 2016. However, 11.4 t and ~50,500 pieces of raw *C. secundum* were recorded as taken from the wild, according to the CITES Trade Database and Taiwan POC CITES trade data, between 2008 and 2015. Japan and Taiwan POC, which were specified as important sources, are urged to investigate if harvest production is properly reported by the fishermen and to FAO.

The report highlighted the importance of utilising trade data in addition to harvest regulation, monitoring of harvests and reporting of CITES-listed *Corallium* spp. Accurate data for harvesting of live colonies by species and a system to use these data for resource management is essential in order to achieve sustainable use of *Corallium* corals.



OVER 40 SPECIES
in the family Coralliidae

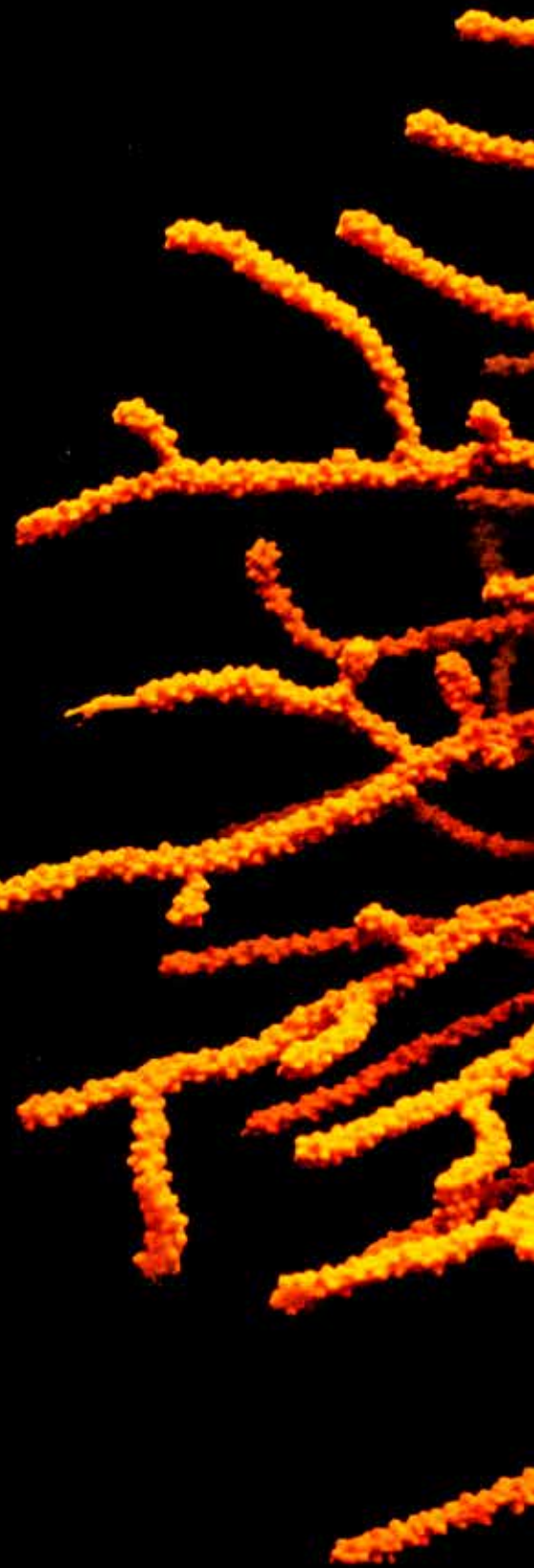
80,000 PIECES
of raw *Corallium* corals were
imported globally between
2011–2015

Corallium japonicum
AKA Coral, was the dominant
species in trade within
imports of raw coral between
2011–2015

At the same time, considering that harvest data can be flawed due to under-reporting, misreporting and illegal harvesting as well as difficulties in resource management, trade data can also be an essential indicator of trade in high-priced specimens such as precious corals. Having Customs codes differentiating *Corallium* corals from non-*Corallium* corals, or species-specific Customs codes would be vital to achieve this. Monitoring of live colonies of *Corallium* corals is of importance for conservation and sustainable use of these species.

As knowledge of the populations and conservation status of *Corallium* corals is limited, there is an urgent need for research in range and harvesting States to gain a better understanding of these issues. Until science-based harvesting management measures are possible, precautionary approaches towards management of precious coral harvesting activities should be adopted.

It is vital that Japan, mainland China, Taiwan POC and Hong Kong SAR consider their respective and changing roles in the exploitation and trade of these precious resources while strengthening their information sharing, liaison on harvesting management measures, co-operation in monitoring, control and surveillance in the Northwest Pacific Ocean. The report concludes with recommendations for sustainable use of CITES-listed *Corallium* spp., co-operation and co-ordination among the region and effective implementation of the CITES listing.





CHAPTER 1

INTRODUCTION

INTRODUCTION

The family Coralliidae comprises three genera (*Corallium*, *Hemicorallium* and *Pleurocorallium*) with more than 40 species in total (Tu *et al.*, 2016). Precious corals in the Coralliidae are distributed throughout the world's tropical, subtropical and temperate oceans, but in only two areas, the Mediterranean Sea and the northern Pacific Ocean, are they commercially exploited (Iwasaki *et al.*, 2012).

Mediterranean Red Coral *Corallium rubrum* has been widely used in the Mediterranean region where it inhabits shallow waters to the deep sea (5–600 m), while several Coralliidae species have been widely used in the northern Pacific Ocean: Aka Coral *Corallium japonicum*, Momo Coral *C. (Pleurocorallium) elatius*, White Coral *C. (Pleurocorallium) konojoi* and Angel Skin Coral *C. (Pleurocorallium) secundum*¹ (Chang *et al.*, 2013, Tu *et al.*, 2016). Precious corals are long-lived with slow growth rates and low reproductive rates and little is known about the life-history characteristics of many species (FAO, 2009; Tsounis *et al.*, 2010).

Precious corals have been harvested for 5,000 years and valued by diverse cultures around the world (Tsounis *et al.*, 2010). While precious corals have been exploited for centuries in the Mediterranean, industrial-scale exploitation of *C. rubrum* began during the 16th Century (Cattaneo-Vietti and Bavestrello, 2010). The number of vessels harvesting precious corals rose to 1,200 in 1864, but declined by the early years of the 20th Century owing to a combination of reduced demand during World War I and imports of Japanese coral (Tsounis *et al.*, 2010). Harvesting of *Corallium* precious corals rose during the 1870s in Japan and 1920s in Taiwan POC, mostly of *C. japonicum*, *C. elatius*, *C. konojoi* and to a lesser extent *C. secundum* in inshore and offshore waters (Liverino, 1983 cited in Tsounis *et al.*, 2010; Huang and Ou, 2010). In the 1960s and 1970s coral harvesting by Japan and Taiwan POC expanded into the high seas following the discovery of large beds of *C. secundum* and Midway Deep-sea Coral *Corallium* sp. nov. around the Emperor Seamounts. However, this harvesting ended in the 1990s due to the declining price of corals and resource depletion (Chang *et al.*, 2013; Fisheries Agency of Japan, 2008).

¹ This report follows the taxonomy used in the CITES Appendices.



5,000 YEARS
of coral harvesting by
cultures across the world



JAPAN AND TAIWAN POC
expanded coral harvesting into the
high seas in the 60s and 70s

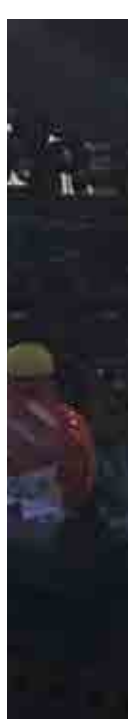
Corallium precious corals have been traded internationally since as early as pre-dynastic Egypt, primarily in the form of beads. Italy has historically been the centre of harvest, wholesale and carving of *Corallium* corals, with products exported to India, China, the Middle East and West Africa for centuries (FAO, 2007; Torntore, 2009). Processing activities spread from the Mediterranean to East Asia, with Taiwan POC becoming a dominant processor, accounting for 80% of global *Corallium* production during the late 1960s to 1970s (Torntore, 2009). FAO (2009) concluded that the US was the dominant consumer of all precious corals from 2001 to 2008 according to trade records.

The slow rate of renewal plus the high demand because of their commercial and cultural importance have made *Corallium* corals vulnerable to over-exploitation, which has been a major conservation concern. Other threats to *Corallium* populations include destructive fishing techniques such as bottom trawling (Parrish and Baco, 2007; Witherell and Coon, 2001), and damage through entanglement in lost fishing gear (Bo *et al.*, 2014; Boavida *et al.*, 2016). Global climate change may cause an increase in seawater temperature (Cerrano *et al.*, 2000) and ocean acidification, which may become further threats to the survival of precious corals (Iwasaki, 2014). In March 2017, *C. japonicum*, *C. elatius* and *C. konojoi* were listed as Near Threatened on the Red List of Threatened Species in Japan (Ministry of Environment, Government of Japan, 2017).

Concerns about over-exploitation and the impact of international trade on *Corallium* corals led to proposals to include the species in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) at the 14th Conference of the Parties (CoP14) in 2007 and CoP15 in 2010, which were rejected or withdrawn. Meanwhile, mainland China included four *Corallium* species, Aka Coral *C. japonicum*, Momo Coral *C. elatius*, White Coral *C. konojoi* and Angel Skin Coral *C. secundum* (hereafter referred to as CITES-listed *Corallium* corals) in CITES Appendix III, from 1st July 2008 (CITES, 2008).

In addition to harvesting bans on *Corallium* corals in mainland China and several other countries, various conservation and management measures have been introduced in different countries/territories. In the Mediterranean, the General Fisheries Commission for the Mediterranean (GFCM) issued recommendations in 2011 and 2012 as temporary measures, including banning harvesting of *C. rubrum* at less than 50 m depth and the establishment of a legal minimum size for harvest (7 mm diameter at the trunk) (GFCM, 2011; GFCM, 2012). Management measures that have been used in Japan and Taiwan POC include rotational harvest, establishment of protected areas and closed seasons, setting of harvest quotas and limiting the number of harvesting vessels/licences (Huang and Ou, 2010; Iwasaki, 2014). Previous studies have indicated that harvested populations could return to pre-harvesting levels after 10–20 years (Iwasaki *et al.*, 2012).

However, there have been concerns that the introduced management measures have been insufficient to achieve sustainable use of the species concerned. Although the need for management of harvests to estimate the maximum sustainable yield (MSY) is widely appreciated (Chen, 2012; Iwasaki and Suzuki, 2008), it is difficult to achieve in this case because of a lack of knowledge about the population and biology of *Corallium* corals. Indeed, landing data and trade records are used as a proxy to monitor the population status of *Corallium* corals in many countries/territories (CITES, 2017). In addition, illegal harvesting is an ongoing concern for *Corallium* corals in the Mediterranean (e.g. Boavida *et al.*, 2016)



and the Pacific (e.g. Anon., 2015a; Anon., 2017a). For example, from late October to early November 2014, more than 200 Chinese vessels were observed near the Ogasawara Islands and Izu Islands in Japan, allegedly harvesting coral illegally. Several arrests were made by the Japan Coast Guard (Anon., 2014; Yoshida, 2014; Japan Coast Guard, 2015). In mainland China, illegal harvest of precious corals is prevalent in Fujian, Guangdong and Zhejiang provinces and the China Coast Guard seized 140 illegal vessels, detained 80 suspects and seized 224.41 kg of Red Coral between March 2014 and May 2015 (Anon., 2015a).

Prices for unworked precious corals have varied through time, depending on demand. Precious coral markets have long existed in countries including India and mainland China, especially for religious and cultural uses in the Tibet Autonomous Region. Recently there have been indications of rising demand and prices in mainland China (Chang, 2015; Sidell, 2015; Nishimura and Sato, 2015; Anon., 2015a). The trade price of raw materials increased considerably in Japan and Taiwan POC where the species are harvested; the average unit price of precious corals auctioned in Kochi prefecture rose from JPY230,000 (USD2,125) per kg in 2005–2009 to JPY1,980,000 (USD20,288) per kg in 2013 and over JP1,600,000 (USD 14,098) per kg in 2014–2015 (Sakita, 2016). In Taiwan POC, the price was eight times higher in 2014 compared to 2009 (Tang, 2014). At the same time, mainland China began processing precious corals for the global market (Torntore, 2009), which would also have influenced the market trade dynamics.

Despite indications suggesting increased demand for precious corals in East Asia, there is a lack of information regarding the current status of the trade and the market. This report aims to provide an overview of the production, trade and market for precious corals, with a focus on CITES-listed *Corallium* corals harvested and traded in East Asia. It includes analysis of data to depict more accurately the changing trade in precious corals. The report findings were used to develop recommendations for further research, monitoring, regulation and management of precious corals to ensure the long-term sustainable use of these species. Since several Decisions were adopted concerning a review of precious corals in international trade [Order Antipatharia/family Coralliidae] at CITES CoP17 in October 2016, the results of this research are expected to provide valuable information to help inform discussions at future CITES CoPs and relevant Committees.



precious coral for sale on display in Beijing, China

CHAPTER 2

METHODS



OUR SURVEY METHODS

The various sources of *Corallium* production and trade data/information analysed for this report are summarised below (Table 1). It should be emphasised that double or multiple counting is very likely to be a factor when looking at the total quantities of all commodities being traded (FAO, 2007). This is because precious corals are known to be traded internationally before and after they have been processed. Additionally, precious corals which were harvested years ago could be traded for their raw material or as second-hand or antique objects. Therefore, discrepancies in trade volumes and/or between catch and trade data do not necessarily suggest illegal trade and/or harvest.

In addition to multiple counting, under-reporting and misreporting should also be taken into consideration when interpreting the available catch and trade data. For example, most exports of CITES-listed *Corallium* corals from Japan are considered not to be recorded on the CITES database as certificates of origin are issued by the Japan Chamber of Commerce and Industry and the records are not reported to the Japanese Management Authority (METI, *in litt.* to TRAFFIC, October 2017). Additionally, there appears to be a considerable amount of misreporting in CITES trade data—for example, some countries report Italy or other European countries as the country of origin, but only four Pacific *Corallium* species are listed in the CITES appendices (Table 1). Mariculture of *Corallium* corals has been attempted in Japan, but is still in the experimental stage (Japanese precious coral traders, *pers. comm.* to TRAFFIC, February 2017; NHK, 2018); therefore, source codes C and A are likely misused (see CITES trade data and East Asia Customs data).

Species	Common name	Distribution	Colour
<i>Corallium elatius</i>	Momo Coral, Pink Coral	Japan to northern Philippines; Indonesia and Viet Nam	Light red, salmon, orange, pink; interior core white
<i>Corallium japonicum</i>	Aka Coral, Red Coral	Okinawa to Bonin Islands of Japan	Dark to very dark red, blood red; interior core white
<i>Corallium konojoi</i>	White Coral, Shiro Coral	Japan to northern Philippines; Viet Nam	White; white with red or pink spotting
<i>Corallium secundum</i>	Midway Coral, Angel Skin Coral	Hawaii to the Milwaukee Banks in the Emperor Seamounts	White, spotted pink, light pink

Table 1
Distribution and colour of CITES-listed *Corallium* species.

Source: Cooper et al. (2011)



In this report, the terms “coral” and “precious coral” are used to describe species in the family Corallidae, unless otherwise specified, and the term “Red Coral” refers simply to both Shading Coral *Corallium rubrum* and Aka Coral *C. japonicum*, although in Chinese the term “Red Coral (红珊瑚)” also includes other *Corallium* spp. such as Momo coral *C. elatius*. Note that although Mediterranean Red Coral *C. rubrum* is not listed in CITES Appendix III, it is often traded alongside those species.

production data

Global *Corallium* (described as “Aka coral *C. japonicum*”, “Angel skin coral *C. secundum*”, “Momo, boke magai, misu coral *C. elatius*”, “Shiro, white coral *C. konojoi*”, “Midway deep-sea coral *Corallium* sp. nov.” and “Sardinia coral *C. rubrum*” on the FAO website) harvest data for 1950–2016 were downloaded in July 2018 from the “Global Production 1950–2015” dataset <http://www.fao.org/fishery/statistics/en>.

CITES-related trade data

The import of any specimen of the four *Corallium* corals listed in Appendix III of CITES requires presentation of a certificate of origin from all States except mainland China or an export permit from mainland China, the Party which listed the species (CITES Article 5-3). For re-exports of CITES-listed *Corallium* corals, a certificate issued by the re-exporting State shall be accepted by the importing State as proof that the specimen is either being re-exported without modification or has undergone some processing (CITES Article 5-4). Non-detriment findings are not required for exports/imports of Appendix III listed species (CITES Article 5-2).

CITES trade data for *Corallium* corals were extracted in August 2017 from the CITES Trade Database managed by UNEP-WCMC² for the period 2008–2015. At the time of writing, the most recent annual data available were for 2015, however these are likely to be incomplete as not all CITES Parties had submitted their 2015 reports at the time of writing (CITES, last updated 22nd November 2017³). Japan, mainland China and Hong Kong SAR (through mainland China) submitted all of their reports for 2008–2015. Trade records between mainland China and Taiwan POC, and mainland China and Hong Kong SAR are not reported to CITES by mainland China (L. Xu, TRAFFIC, *in litt.*, December 2017).

Although Taiwan POC is not a Party to CITES, Taiwan POC has adopted domestic measures to implement CITES and issued/obtained export permits and certificates of origin. As the annual reports of Taiwan POC are not available on the CITES Trade Database, Taiwan POC CITES trade data for the period 2011–2015 were obtained from the Bureau of Foreign Trade, Ministry of Economic Affairs of Taiwan POC (BOFT). As the CITES Trade Database lacks trade data for Taiwan POC for the period 2008–2010, data for the period 2011–2015 were mainly used for the analysis in this report.

The analysis focused on raw corals and carvings, the two most traded types, and thus excluded other commodity types such as derivatives, leather products and shells. All CITES trade descriptions and totals include all purposes (e.g. commercial, personal) and sources (wild) unless otherwise specified. Data reported in milligrammes and grammes were converted to kilogrammes and included in the analysis. Importer reported data were mainly used for the analysis as exporter reported data can be derived from

² United Nations Environment World Conservation Monitoring Centre

³ Annual reports of CITES Parties: https://cites.org/sites/default/files/annual_reports.pdf (accessed 12.01.2018)

the quantity for which the permits or certificates were issued, not from the actual number of specimens traded. When Taiwan POC CITES trade data were incorporated with CITES trade data, the units and terms were interpreted as follows: COR, raw corals; CAR, carvings; LPS, leather products (small); KGM and KGS, kg; GRM, g; and PCE, number of pieces.

Trade records were typically reported by weight or as number of pieces, making it difficult to compare the total volumes in any given year. Although the guidelines for the preparation and submission of CITES annual reports⁴ note that the preferred unit for coral carving is kg, several transactions were recorded in number of pieces, especially after 2013. The guideline recommends that trade in raw or unworked coral shall be recorded by number of pieces only if the coral specimens are transported in water (i.e. they should otherwise be recorded in kg). Although *Corallium* corals are rarely transported in water⁵, the “number of pieces” was regularly used as the unit for raw (unworked) corals in trade, particularly by the US, Switzerland and Italy.

Coral related terms, including “live coral” and “dead coral”, are defined in CITES Resolution Conf. 11.10 (Rev. CoP15)⁶ “Trade in stony corals”. However, these terms are not necessarily suitable for precious corals as the harvest and trade patterns are different (Table 2). The trade term “COR (Raw corals)” is therefore interpreted as “raw coral materials including living (coral harvested live; *seiki* in Japanese) and dead colonies (coral harvested dead; *kare* in Japanese)” in this report, considering precious corals are rarely transported as living specimens.

CITES Resolution Conf. 11.10 (Rev. CoP15)		Precious Corals
Live coral	Pieces of live coral transported in water and that are identifiable to the level of species or genus	Living colonies (coral harvested live)
Dead coral	Pieces of coral that are dead when exported, but that may have been alive when collected, and in which the structure of corallites (the skeleton of the individual polyp) is still intact	Dead colonies (coral harvested dead)

Table 2
Definitions of live coral and dead coral

Source: left: CITES Resolution Conf. 11.10 (Rev. CoP15) and right: Cooper et al. (2011).

The source of species traded was analysed/highlighted only when of interest: in theory they should all have been either “W” (specimens taken from the wild), “O” (pre-Convention), “I” (confiscated or seized specimens) or “U” (source unknown). Considering there is no commercial mariculture of CITES-listed *Corallium* species (Japanese precious coral traders, *pers. comm.* to TRAFFIC, February 2017), data giving the source as “C” (animals bred in captivity), “R” (ranchered animals) or “A” (artificially propagated plants) are likely to be misreporting, although they were also included in the analysis.

There were trade records of *Corallium* spp. from various countries of origin, some of which might be

⁴ <https://cites.org/sites/default/files/notif/E-Notif-2017-006-A.pdf>

⁵ Seawater much cooler than surface water is required to keep *C. japonicum* alive (The Japan Coral Association, *in litt.* to TRAFFIC, (September 2017)).

⁶ <https://cites.org/sites/default/files/document/E-Res-11-10-R15.pdf>

misreported. Although CITES-listed *Corallium* spp. are distributed widely in the Pacific (Table 1), mainland China, Japan and Taiwan POC are the only countries/territories to have reported harvest production to FAO and thus be the origin of international trade. However, as many as 23 countries/territories were recorded as the origin in the CITES Trade Database. All these records were included in the analysis except for one record where the taxon was recorded as *C. rubrum* (as it is not a CITES-listed species).

East Asia Customs data

Customs import data for corals for Japan and Taiwan POC were downloaded in April 2017 from the following sources: Ministry of Finance, Trade Statistics of Japan <http://www.customs.go.jp/toukei/info/>; Taiwan POC Bureau of Foreign Trade <http://cus93.trade.gov.tw/FSCE000F/FSCE000F>.

As of April 2018, there are no specific Harmonized System codes (HS codes) for any types of *Corallium* or precious coral products. Under the HS Nomenclature (2017 edition), the most relevant commodity codes are HS0508.00 for “Coral and similar materials, unworked or simply prepared but not otherwise worked; shells of molluscs, crustaceans or echinoderms and cuttle-bone, unworked or simply prepared but not cut to shape, powder and waste thereof” and the more general HS code which includes worked corals (HS9601.90)⁷. However, Japan and Taiwan POC have adopted more detailed Customs codes than these global HS codes and partially differentiate “coral” from other marine crustacean products (Table 3). However, no Customs code is specific to *Corallium* spp. and may include precious coral and non-precious coral.

	Customs Code	Commodity
Japan	0508.00.10.0	Coral (only used for imports)
	0508.00.20.0	Coral (only used for exports)
	9601.90.10.0	Worked Bekko ⁸ and coral, and articles of Bekko or coral (only used for imports)
Taiwan POC	0508.00.11.00-4	Coral and similar materials
	0508.00.12.00-3	Powder and waste of coral and similar materials (including for Chinese medicine)
	9601.90.41.00-7	Worked coral materials
	9601.90.42.00-6	Articles of coral

Table 3

Japan and Taiwan POC Customs codes and descriptions for trade in coral (Valid in April 2018).

Source: Ministry of Finance, Trade Statistics of Japan; Taiwan POC Bureau of Foreign Trade

illegal fishing and seizure data

Illegal fishing cases and seizure data were obtained through government reports, press releases, media reports and interviews with stakeholders. Additionally, CITES trade data with source code “I” were analysed. It was not mandatory for Parties to report their seizure data to CITES until 2016 and therefore it is difficult to assess seizure levels from CITES Trade data alone. Most of the seizure records in the CITES trade data base were reported by the US, who report seizures under source code “I” in their CITES

⁷ <http://www.wcoomd.org/en/topics/nomenclature/instrument-and-tools/hs-nomenclature-2017-edition/hs-nomenclature-2017-edition.aspx>

⁸ Bekko refers to shell and shell products made of Hawksbill Turtle *Eretmochelys imbricata*.

annual reports. Nevertheless, these data may have aggregated within the database and may not present the actual number of seizures.

other sources

Scientific publications, government reports, press releases, classified advertisements, company websites, social media sites and blogs in English, Japanese and Chinese were searched for information on recent precious coral harvests, trade and sales in Japan, mainland China, Taiwan POC and Hong Kong SAR. Some specific stakeholders were also contacted for further details on legislative frameworks and precious coral trade patterns.

Where price information is provided, average annual exchange rates for Japanese Yen (JPY) and Chinese Yuan (RMB) to US Dollars (USD) were taken from the World Bank: <https://data.worldbank.org/indicator/PA.NUS.FCRF> up to 2016 and the conversion rate for 1st September 2017 was obtained from <https://www.oanda.com/fx-for-business/historical-rates> for 2017.

physical market surveys

Brief market surveys were conducted in four cities; Tokyo, Japan, Beijing, mainland China, Taipei, Taiwan POC and Hong Kong SAR from February to April 2017 to gain an insight into the current status of commercial trade in precious corals as a comprehensive market survey was not possible for the purposes of this report, nor were previous market survey data available for comparative purposes

Online market surveys were not carried out as it was considered difficult to detect fake corals compared to physical market surveys, nevertheless it is recognised that e-commerce is an important sales channel. Although online jewellery sales were considered to account for 4–5% of the global market in 2014, this proportion varied considerably depending on region, brand and types of jewellery, and is expected to increase to 10% by 2020 (Dauriz *et al.*, 2014). E-commerce is expected to grow rapidly in some countries including mainland China and more jewellery brands have focused on online retail (HKTDC, 2018).

Tokyo (Japan)	Eleven department stores Two duty free shops One area with a high concentration of jewellery shops
Beijing (mainland China)	Five jewellery markets One street with many independent jewellery shops One area with a high concentration of department stores
Taipei (Taiwan POC)	Jianguo Holiday Jade Market Two precious coral shops
Hong Kong SAR	Jade Market Jewellery Shops in Yau Tsim Mong District

Table 4
Cities where physical market surveys were conducted.

Table 4 shows the number of markets and department stores visited. During the surveys data recorded included product types and prices, species sold, origin and product processing countries, while information on the main buyers and other aspects were obtained through informal interviews with traders. All the interviews were conducted by native speakers.

Below is a geographical representation of physical survey locations.



王府井百货

“亲信干政”事件关键人物

ANEL

CHAPTER 3

LEGISLATION



HISTORICAL AND CURRENT LEGISLATION CONTROLLING PRECIOUS CORAL HARVEST AND TRADE IN EAST ASIA

(JAPAN, MAINLAND CHINA, TAIWAN POC, AND HONG KONG SAR)

The following section gives information on the historical situation and legislation controlling precious coral harvest and trade in Japan, mainland China, Hong Kong SAR and Taiwan POC. Fisheries active on the high seas of the Northwest Pacific are managed by the North Pacific Fisheries Commission (NPFC) (with some exceptions), which came into effect in July 2015. As of December 2017, Japan, mainland China and Taiwan POC (Chinese Taipei) were among the members of the NPFC⁹. Direct fishing of the orders Alecyonacea, Antipatharia, Gorgonacea (including Coralliidae) and Scleractinia is prohibited by Article 13(5) of the Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean¹⁰.

These orders have been designated as indicator species for Vulnerable Marine Ecosystems (VMEs) (NPFC, 2016; NPFC, 2017), with the Scientific Committee designated to address bycatch issues (Article 10-4 (f) of the Convention). Currently, the NPFC stipulates within the resolution on VMEs (CMM 2016-05 For Bottom Fisheries and Protection of VMEs in the Northwestern Pacific Ocean) that if bottom fishing vessels encounter cold water corals (Orders Alcyonacea, Antipatharia, Gorgonacea, and Scleractinia) of more than 50 kg in one gear retrieval, the vessel shall not resume fishing activities and must relocate more than 2 nautical miles from the area (CMM 2016-05)¹¹. The following sections therefore focus on harvest in waters of coastal countries/territories.

Japan

In Japan, precious coral fisheries are regulated at the prefecture level, through the Fishery Adjustment Rule and the Regional Fishery Adjustment Commission of each prefecture, based on the National Fishery Act and the Fisheries Resources Protection Law.

Currently precious coral is harvested in seven prefectures (Kochi, Nagasaki, Kagoshima, Okinawa, Tokyo (Ogasawara), Ehime, and Wakayama). Harvesting figures reported by Japan to FAO might be underestimated as they are based on trade records reported by the trade association (The Fisheries Agency of Japan, *pers. comm.* to TRAFFIC, July 2017). Local governments do not report annual harvests to the Fisheries Agency of Japan as this is not required by law (Kochi Prefecture, *pers. comm.* to TRAFFIC, February 2017). In 2015, the Fisheries Agency of Japan instructed relevant local governments not to increase the total harvesting effort for corals in any prefecture, to specify fishing areas by designating closed conservation areas and to prohibit coral harvesting if there is no existing harvesting (The Fisheries Agency of Japan, *in litt.* to TRAFFIC, November 2017).

Although there are no nationwide statistics on the number of vessels harvesting precious corals, available

⁹ https://www.npfc.int/about_npfc

¹⁰ <https://www.npfc.int/npfc-convention>

¹¹ <https://www.npfc.int/active-conservation-and-management-measures>

OVER 200

Chinese vessels were caught
illegally harvesting coral in 2014

350 FISHING LICENCES

were issued in Kochi prefecture in 2011
alone, increased from 160 in 2009

A CHINESE VESSEL

was found off Nagasaki in Japan's
Exclusive Economic Zone in July 2017

56% of MEMBERS

of the Japan Coral Association
attend every quarterly auction

data suggest that harvest pressure is increasing in recent years. The number of vessels with fishing licences increased from 160 in 2009 to over 350 in 2011 in Kochi prefecture (Kochi prefecture, *in litt.* to TRAFFIC, March 2016) and 50 in 2014 to over 120 in 2017 in Wakayama prefecture (Wakayama prefecture, *pers. comm.* to TRAFFIC, October 2017). Although various measures, including establishment of protected areas, a closed season, and introduction of rotational harvesting have been implemented in some prefectures, the proportion of live colonies harvested and traded are feared to have increased in recent years compared to the past.

Although stock assessments have not been carried out, the Fisheries Agency of Japan has undertaken coral monitoring using a remotely operated vehicle (ROV) in Ogasawara and Okinawa in 2015 respectively and in southwest Kyushu in 2017. Each of these surveys observed the existence of *Corallium* spp. as well as abandoned fishing gear and damaged corals, although there was no severe damage to *Corallium* spp. and other species or ghost fishing observed (Fisheries Agency of Japan, 2015a; 2015b; 2017a).

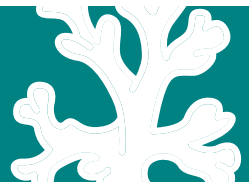
In addition to potential over-exploitation by Japanese fishing vessels, illegal harvest of precious corals by foreign vessels has become a serious concern in recent years. In 2014, more than 200 Chinese vessels were reportedly illegally harvesting precious corals off Ogasawara Island, which led to 10 vessel seizures and the arrests of five captains (Japan Coast Guard, 2015). The number of reported Chinese vessels subsequently reduced, which was attributed to stricter monitoring, a considerable increase in fines in Japan and strict law enforcement in mainland China (Japan Coast Guard, 2015). However, illegal harvesting by Chinese vessels continues to be reported around Okinawa and Kyushu. For instance, a Chinese vessel was found off Nagasaki in Japan's Exclusive Economic Zone (EEZ) in July 2017 (Fisheries Agency of Japan, 2017b).

Precious corals harvested by fishermen are usually traded at auctions conducted by the Japan Coral Association about four times a year. The Association has strict rules: only members can participate in the auction, and to become a member, individuals/organisations must be

Japanese, have been involved with precious corals (e.g. trade and/or processing) for more than two years and be endorsed by two existing members (Japan Coral Association, *pers. comm.* to TRAFFIC, February 2017). Of the 95 members in total (as of February 2017), approximately 54 attend every auction (Japan Coral Association, *pers. comm.* to TRAFFIC, February 2017). Currently only corals harvested in Japan are auctioned. Fishermen usually keep their precious corals for about six months to one year until they have sufficient to be worthwhile auctioning. Selling precious corals through the auction is not compulsory, but most fishermen choose this process as they know it fetches the highest price (Japan Coral Association, *pers. comm.* to TRAFFIC, February 2017).

Following an auction, substantial quantities of raw materials are exported to Taiwan POC (Chang, 2015). As non-Japanese people are not able to join the auction (unless they have an accredited office operating in Japan), Taiwan POCese traders tend to buy corals from Japanese traders (Japan Coral Association, *pers. comm.* to TRAFFIC, February 2017).

|| *Top quality corals are usually processed in Japan and lower quality corals tend to be exported to Taiwan POC. Chang (2015) points out that processors from mainland China also have recently begun to buy corals.*



Certificates of origin for CITES Appendix III listed species are issued by the Japan Chamber of Commerce and Industry (JCCI) and not by the Ministry of Economy, Trade and Industry (METI), the CITES Management Authority in Japan. This is based on the International Convention Relating to the Simplification of Customs Formalities and Protocol of Signature (Geneva, 3rd November 1923) and Chambers of Commerce and Industry Act. The JCCI is not required to report detailed records of issuance of certificates of origin, nor give species-specific information (METI, *in litt.*, to TRAFFIC, October 2017).

Therefore Japan's export records of *Corallium* spp. in the CITES Trade Database are considered significant under-estimates. In Kochi prefecture in April 2017, the Japan Coral Association began examining applications for certificates of origin to accompany auction records prior to them being sent to the JCCI as a means of gaining a better understanding about exports (Japan Coral Association, *in litt.* to TRAFFIC, September 2017).



Mainland China

Precious corals in the genus *Corallium* have been protected in mainland China as category I national fauna under the *Law of the People's Republic of China on the Protection of Wildlife*¹² since 1988.

The Chinese government regulates coral harvesting under the *Administration of the People's Republic of China on the Usage of Aquatic Wildlife*¹³ which has prohibited all *Corallium* coral harvesting since 1999. Coral vessels are also not allowed to operate within the EEZ between Japan and mainland China (Fisheries Agency of Japan, *pers. comm.* to TRAFFIC, November 2017). Therefore, all specimens of *Corallium* in trade in mainland China are, in theory, imported. However, illegal harvest of *Corallium* is a serious issue in mainland China; according to media reports, in 2017, Guangdong Maritime Police seized three vessels illegally harvesting, arrested a total of 32 suspects, and seized nearly 70 kg of Red Coral (Anon., 2017b).

In 2008, the Chinese government asked the CITES Secretariat to include four species of *Corallium* in CITES Appendix III¹⁴ and alerted its trading partners that assistance was needed to manage international trade in these species. Since the listing came into force in July 2008, export permits are needed to export the CITES-listed *Corallium* species from mainland China (or re-export certificates for re-exports). The *Administration of the Import and Export of Endangered Wild Fauna and Flora*¹⁵ was enacted in September 2006 and stipulates regulations concerning the import, export and re-export of CITES-listed species. For imports (including imports from Hong Kong SAR and Taiwan POC), importers need import permits issued by the National Endangered Species Import and Export Management Office (CITES Management Authority of mainland China)¹⁶ in addition to certificates of origin. When specimens are traded as personal or household effects (CITES Article VII paragraph 3; CITES Resolution Conf. 13.7 (Rev. CoP17)), CITES documents are not required. Nevertheless, when Customs officials find *Corallium* coral products at immigration posts, individuals are asked for documentation such as shop receipts to prove the products originated from other countries/territories (Y. Xiao, TRAFFIC, *in litt.*, May 2018).



CORALLIUM HARVESTING LICENCES

**has been prohibited in mainland China
since 1999**



FOUR SPECIES

**were submitted for inclusion in CITES
App. III in 2008, coming into force in July**

¹² http://www.npc.gov.cn/npc/xinwen/2016-07/04/content_1993249.htm (in Chinese); <http://en.pkulaw.cn/display.aspx?cgid=54992&lib=law> (older version)

¹³ http://www.moa.gov.cn/zwl/m/zcfg/nybgz/201401/t20140113_3737659.htm (in Chinese)

¹⁴ CITES Notification to the Parties No. 2008/027 (<https://cites.org/sites/default/files/eng/notif/2008/E027.pdf>)

¹⁵ http://www.gov.cn/flfg/2006-05/17/content_283018.htm (in Chinese)

¹⁶ <http://www.cites.gov.cn/ShowIndex/ShowNews.aspx?sort=t1&id=8219> (in Chinese)

Domestic trade in *Corallium* corals is regulated by the *Law of the People's Republic of China on the Protection of Aquatic Wildlife*¹⁷ and the *Law of the People's Republic of China on the Protection of Wildlife*. Under these laws, permits are required to sell, acquire and use aquatic wild animals of category I national fauna, including CITES-listed *Corallium* corals (Article 26 of the *Law of the People's Republic of China on the Protection of Aquatic Wildlife*) (Figure 1).



Figure 1

Permits required under the *Law of the People's Republic of China on the Protection of Wildlife*.

The *Law of the People's Republic of China on the Protection of Wildlife* was last amended in July 2016 and came into force in January 2017. The latest amendment requires that any protected animal and its products bear a special mark (Article 26). However, the special marking system has not yet been applied to *Corallium* coral products (Y, Xiao, TRAFFIC, *in litt.*, May 2018).

¹⁷ http://www.moa.gov.cn/zwlwm/zcfg/ffg/200601/t20060120_539617.htm (in Chinese)



The jewellery market in mainland China accounted for more than 50% of global jewellery retail sales in 2014, worth some USD80.7 billion

red coral jewellery for sale in Beijing

the jewellery market in mainland China

The jewellery market in mainland China accounted for more than 50% of global jewellery retail sales in 2014, worth some USD80.7 billion (Anon., 2015b). Gold jewellery was the most popular, responsible for more than 50% of jewellery consumption (Anon., 2015b). A survey carried out by the Hong Kong SAR Trade Development Council (HKTDC) in 2014 suggested that Chinese consumers mainly purchase jewellery at department stores, although buyers from independent shops and chain stores are rising (HKTDC, 2018).

Chinese people buy Red Coral products for various reasons; according to Chang (2015), they tend to buy luxury goods as gifts or to show off, rather than for investment purposes. Red Coral has collection and ornamental values and also a strong health care function (Anon., 2017c).

In Chinese, “Red Coral (红珊瑚)” includes all species in the genus *Corallium* (红珊瑚属) regardless of their colour. In March 2017, Aka Coral (阿卡) *C. japonicum* was the most expensive, followed by Momo Coral (莫莫) *C. elatius* and Shading Coral (沙丁) *C. rubrum* (Anon., 2017d; Table 5).

The white spots in Aka Coral make it suited to and commonly fashioned into rings. Momo Coral is carved into relatively large ornaments or beads and costs about the same as medium quality Aka Coral. Shading Coral is suitable for creating balls as the branches are relatively thin and there is no white core (Anon., 2017d).

Species	Price
<i>C. japonicum</i>	RMB2500–5000/g, (USD381–761)/g
<i>C. elatius</i> (Anon., 2017)	RMB700–1200/g, (USD107–183)/g
<i>C. rubrum</i>	RMB300–600/g, (USD46–91)/g

Table 5

Average price of Aka, Momo and Shading Coral in mainland China as of March 2017.

Source: Anon. (2017d).

Hong Kong SAR

***Corallium* species are not found in Hong Kong SAR's domestic waters (Morton and Morton, 1983). Thus, all *Corallium* specimens in the Hong Kong SAR market must be imported.**

Hong Kong SAR regulates the trade in CITES-listed species, including the four *Corallium* species listed in CITES Appendix III, through the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586). Importers in Hong Kong SAR are required to obtain an export (or re-export) permit, if importing a specimen originating from mainland China of one of the four CITES-listed *Corallium* species. If importing specimens of the CITES-listed *Corallium* species originating from somewhere other than mainland China, a Country of Origin Certificate must be produced for inspection by the Agriculture, Fisheries and Conservation Department (AFCD) at Hong Kong SAR's border control points.

Re-exports of specimens of the four CITES-listed *Corallium* species from Hong Kong SAR also require the relevant documentation issued by AFCD to be presented prior to departure. If the specimen originates from mainland China, then a re-export permit is required, otherwise, a Country of Origin Certificate is necessary. The import and re-export requirements also apply to specimens in transit.

The trade in CITES-listed *Corallium* species is exempted from the import and re-export documentation requirements if it is intended for non-commercial purposes. Under the Protection of Endangered Species of Animals and Plants (Exemption for Appendices II and III Species) Order (Cap. 586, section 47(2), (4) and (5)), CITES Appendix III specimens are considered personal or household effects, if worn or carried by a person or included in their personal baggage, or transported as part of a household move. A licence is not required for the possession and trade of the four CITES-listed *Corallium* species domestically.

Although the precise number of precious coral processors in Hong Kong SAR is unclear, there are 322 jewellery manufacturing companies as of December 2017 (Census and Statistics Department, 2018) and 2,240 jewellery exporting companies as of December 2016 (HKTDC, 2017). The city's trade hub status is helped by its tax-free policy, and preferential tariffs when trading with mainland China. Under the *Mainland and Hong Kong SAR Closer Economic Partnership Arrangement*, products of Hong Kong SAR origin can be imported tariff free into mainland China. For jewellery products, moulding and/or assembling must be carried out in Hong Kong SAR for them to be considered as originating in the city (Hong Kong SAR Business Annual, 2013).

**ALL *CORALLIUM*
in Hong Kong SAR markets
is imported**

**322 JEWELLERY
manufacturing companies in
Hong Kong SAR**

**2,240 JEWELLERY
exporting companies in
Hong Kong SAR**

Despite being a major centre for trade in precious corals, more often than not processing is conducted outside of Hong Kong SAR. Much of the manufacturing has shifted to mainland China, with Hong Kong SAR dealers either outsourcing the work or building factories there (HKTDC, 2017). Panyu and Dongguan in Guangdong Province were identified as locations where precious coral processing takes place, following interviews with jewellery wholesalers and manufacturers. With production largely occurring in the mainland, the Hong Kong SAR offices of major jewellery manufacturing companies tend to specialise in the marketing, distribution and export sides of the business, according to traders interviewed, although some value-added processing has been retained in Hong Kong SAR, such as product design (HKTDC, 2017). Hong Kong SAR's jewellery making industry as a whole is comparable to world-class European manufacturers in gem-setting and design skills (HKTDC, 2017).

Taiwan POC

Coral harvesting in Taiwan POC started during the Japanese Colonisation Period in the early 1920s and peaked between 1930 and 1940, and between 1960 and 1980.

Taiwan POC's precious coral harvesting has repeated a "boom-and-bust" cycle with the discovery of new coral beds followed by intensive harvesting. This led to the introduction of a series of regulations to reduce the number of coral harvesting vessels in 1989 (Huang and Ou, 2010; Chen, 2012). The number of vessels with harvesting licences apparently decreased to three in 2007, when there were 96 vessels operating illegally (Huang and Ou, 2010). Taiwan POC introduced new harvesting regulations in January 2009 with the *Regulation for Coral Fisheries Vessels*¹⁸, which has been amended five times until September 2017.

All vessels involved in coral harvesting must now be licensed and fitted with vessel monitoring system (VMS) devices to ensure they are harvesting from the five designated areas. Furthermore, a total allowable catch (TAC) for vessels harvesting precious corals was set at 200 kg per year with a limit of 120 kg per year for the exports per vessel (Wu and Takahashi, 2009). The amendment set the annual total harvest quota at 6 t per year since 2014.

Taiwan POC's annual precious coral production reported to FAO ranged from 2.5 to 3.7 t between 2009 and 2015, significantly lower than the total harvest quota (i.e. 12 t then 6 t per year since February 2014). Although imposing quotas may prevent excessive harvesting, the government in Taiwan POC should be consulted to determine whether the overall total and individual quotas have been set based on scientific evidence to ensure the sustainability of precious coral supplies. Additionally, according to Jeng (2014), there are discrepancies between harvest volumes recorded in fishermen's logbooks and landing data (Table 6).

¹⁸ <http://www.fa.gov.tw/cht/LawsCentralFisheries/content.aspx?id=35&chk=9e8a9cad-9153-4474-b86b-6ae801bb71e4¶m=> (in Chinese)

2.5–3.7 TONNES

Taiwan POC's coral
production reported to the
FAO between 2009–2015

200 KG PER YEAR

is the total allowable catch
limit set per vessel, with a
limit of 120 kg yearly export

USD 7,500/KG

the average price for raw
coral materials in 2014 in
Taiwan POC

Year	Reported harvest from logbooks (a)	Landings (b)	(b) - (a)
2009	2356.1 kg	3233.0 kg	876.9 kg
2010	1551.7 kg	2905.8 kg	1354.1 kg
2011	2454.7 kg	3209.3 kg	754.6 kg
2012	2684.6 kg	3248.7 kg	564.1 kg

Table 6
Harvest of precious corals in Taiwan POC according to logbook and landing data, 2009–2012. Source: Jeng (2014)

The harvest of precious corals is reported by species and by the condition of the harvested colonies: live colony, dead colony and fossilised colony (Chen, 2012). The landing of precious corals is allowed at two ports for verifications and traded through a designated fishery association auction, negotiation or public bidding. Data on trade are then sent to the government (Chang *et al.*, 2013). It should be noted three non-CITES-listed species (*Corallium carusrubrum*, *C. sulcatum*, *Paracorallium inutile*) are also harvested and traded in Taiwan POC (Jeng, 2014).

The import and (re)export of CITES-listed *Corallium* corals are regulated by the *Regulations on Import and Export of Endangered Species of Wild Fauna, Flora and Related Products*, which controls the import and (re)export of CITES-listed species in Taiwan POC. Valid CITES export permits/certificates or certificates of origin issued by export partners are required for the import of all CITES-listed *Corallium* corals. The Bureau of Foreign Trade (BOFT), the competent Management Authority in Taiwan POC, is responsible for the implementation of this trade regulation and issuing permits/certificates for exports of *Corallium* corals from Taiwan POC and certificates of origin. All the CITES documents are retrieved by Customs at the time of import and submitted to the BOFT for data entry.



Precious corals are mainly processed in Taipei and YiLan, which is one of the landing ports for precious corals located in north-eastern Taiwan POC. The peak period in YiLan was in the 1990s when there were approximately 480 coral vessels and more than 20 wholesalers; currently there are only 50 vessels and five wholesalers. The number of coral processors has also declined over a decade due to various reasons, including a decline in coral harvest and issues concerning product development (Anon, 2018). As of April 2017, 53 businesses from the precious coral industry were members of the Taiwan POC Jewellery Industry Association¹⁹. Many of them play more than one role in the supply chain, as processors, wholesalers, retailers and traders.

According to Chang (2015), mainland Chinese tourists have become increasingly important customers in Taiwan POC in the last five years, who bring the products back to mainland China. This led to a boom in the precious coral market in Taiwan POC, which became more than 2–3 times higher than the last historical peak back in the late 1970s to early 1980s (Chang, 2015; Jeng, 2014). As most coral shops target tourists from mainland China, they tend to be located in sightseeing areas in Taipei, Taitung, Hualian and Kaohsiung, working alongside the tourist industry to promote and sell coral items. Some large coral companies have shops in hotels and department stores, while other businesses maintain independent shops near sightseeing areas to attract tourist groups from mainland China (J. Wu, TRAFFIC, *in litt.*, April 2017).

Processing companies and traders also take coral products from Taiwan POC with CITES documents to mainland China and Hong Kong SAR for exhibitions, some of which are sold to Chinese/Hong Kong SAR customers (Chang, 2015). The average price for raw materials skyrocketed from USD900/kg in 2009 to USD7,500/kg in 2014 in Taiwan POC (Tang, 2014) and Chang (2015) attributes this surge to the increasing number of Chinese tourists and booming Chinese economy with the associated rise of materialism and conspicuous consumption.

¹⁹ <http://www.TaiwanPOCjewelry.org.tw/front/bin/home.phtml>

mainland Chinese tourists have become increasingly important customers in Taiwan POC in the last five years, who bring the products back to mainland China





CHAPTER 4

PRODUCTION

PRECIOUS CORAL PRODUCTION AND TRADE

production

According to FAO Global Production, the global harvest in *Corallium* precious corals dramatically increased from the 1960s due to the harvest of *Corallium* sp. nov. (Midway Deep-sea Coral) by Japan and later by Taiwan POC too (Figure 2).

Japan and Taiwan POC started reporting harvesting of *C. elatius* and *C. japonicum* in 1983. The global *Corallium* harvest reached a peak of 445 t in 1984, dominated by *Corallium* sp. nov. and *C. secundum*, after which the harvest of these two species declined dramatically in the late 1980s. The annual global *Corallium* harvest, consisting of four species, *C. rubrum* in the Mediterranean and *C. elatius*, *C. japonicum* and *C. konojoi* in the Pacific, has ranged from 27 to 80 t since 1990. Harvest of *C. elatius*, *C. japonicum* and *C. konojoi* increased suddenly from ~10 t in 2011 to 29 t in 2012, after which it decreased to around 20 t in 2013–2014 and to ~8 t in 2016.

Although *C. secundum* is historically the most harvested species among the four CITES-listed species, its production has not been reported to FAO since 1990 apart from in Taiwan POC, which reported 0.005 t and 0.002 t of harvest for 2015 and 2016 respectively. *Corallium elatius* is the second most harvested species after *C. secundum*, with a fluctuating harvest that reached a peak of 26.5 t in 2012. Taiwan POC accounted for 83% of reported global harvest in the CITES-listed *Corallium* corals between 1983 and 2016, followed by Japan.

Mainland China reported harvest of *C. elatius*, ranging from 12–20 t annually during 2012–2014, which was considerably larger than the annual harvest of Taiwan POC and Japan (~5.5 t each). The harvest of *C. japonicum* reached a peak in 1983 and 1984 at around 10 t, after which the annual harvest was reported at a fairly constant ~3 t until 2016. Japan was responsible for 73% of global *C. japonicum* harvest between 1983 and 2016, followed by Taiwan POC (26%).

Corallium konojoi is the least harvested species; the global annual harvest has been less than 1 t until at least 2016, with the main producers being Japan (68%) and Taiwan POC (24%). The total reported catch of CITES-listed *Corallium* corals between 2008 and 2016 was ~130 t.



445 TONNES
the peak of *Corallium*
production occurred in 1984



TAIWAN POC
was the only reporter of *C.*
secundum production to the
FAO since 1990



JAPAN
was responsible for 73%
of global *C. Japonicum*
production

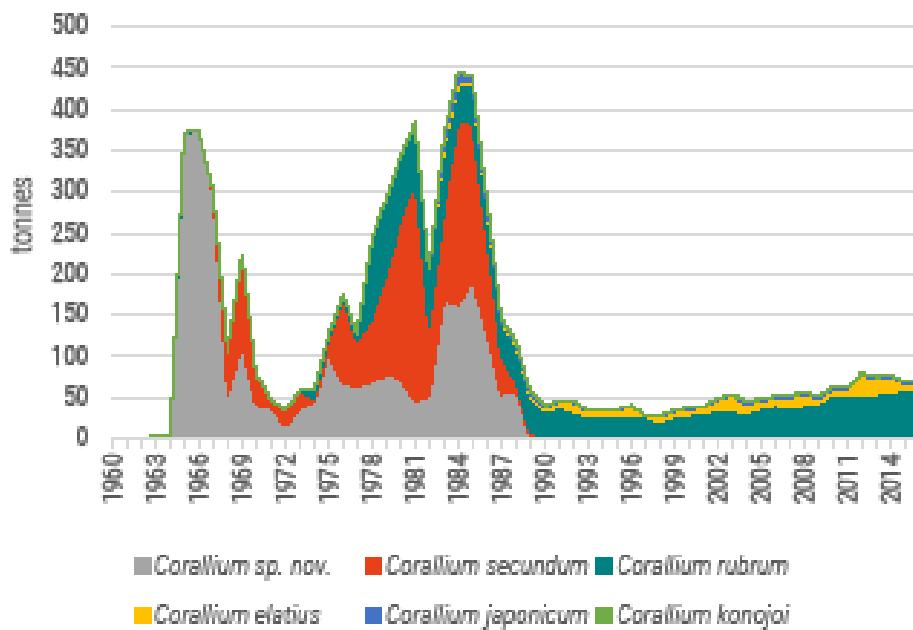


Figure 2a
Global production of *Corallium* corals harvested in the Pacific.
Source: FAO Global production

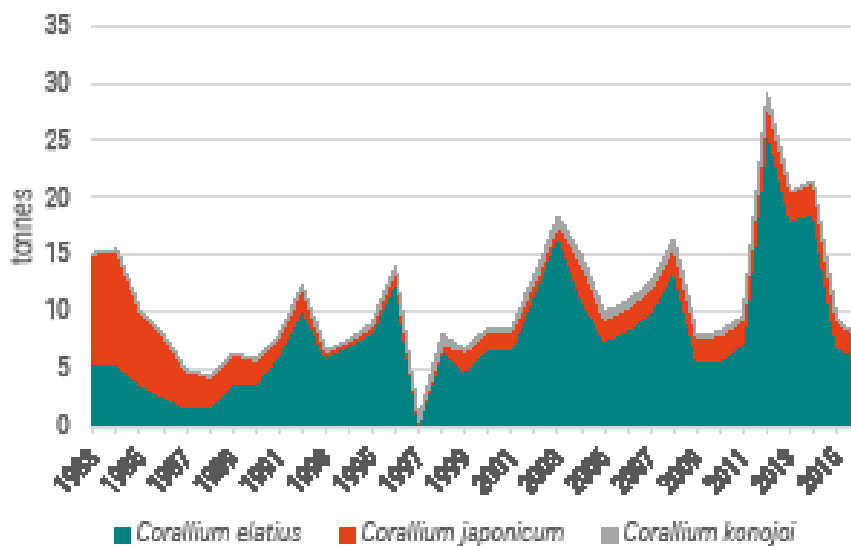


Figure 2b
Global production of *Corallium* corals *C. elatius*, *C. japonicum* and *C. konojoi*.
Source: FAO Global production

FAO production data for precious corals include both live colonies and dead colonies, which obscures the true impact of harvesting activities that varies, depending on whether colonies were live or already naturally dead when harvested. For instance, even if global harvesting of precious corals is stable or declining, production from live colonies may still have increased. As noted above, since fishermen in Taiwan POC and Japan partially report their harvests under these categories, the authorities should consider the merits of a mechanism to collect these data separately and make them publicly available.

As explained earlier, the harvest of *Corallium* corals is prohibited in mainland China by law. Nevertheless, mainland China did report precious coral harvest for *C. japonicum*: ~0.36 t, *C. sp. nov.*: ~0.4 t, *C. elatius*: ~20 t and *C. konojoi*: ~0.3 t annually between 2011 and 2016. The reason for this contradiction needs to be clarified with the Chinese authorities.

According to production data, the volume of CITES-listed *Corallium* corals harvested and brought to market annually is ~30 t during 1996–2016. However, it is uncertain to what extent illegally harvested corals entered the market each year. Also, specimens do not necessarily enter the market immediately after harvesting. For instance, Japanese fishermen usually keep unworked coral for one year or more until they have sufficient to sell at auction (Japan Precious Coral Protection and Development Association, pers. comm. to TRAFFIC, February 2017).

CITES trade in precious corals

Trade data records from UNEP-WCMC’s CITES Trade Database that pertain to *Corallium* precious corals and CITES trade data from Taiwan POC were analysed. As the latter were only available for 2011–2015, the analysis focused on this period.

According to the above data, total global imports of CITES-listed *Corallium* corals between 2011 and 2015 were ~220,000 kg and ~145,000 pieces. Raw corals were the most frequently recorded product type (~210,000 kg and ~72,000 pieces), followed by carvings (~8,700 kg and 63,000 pieces). Less than 5,800 pieces were reported to be traded as jewellery during the period. Of the total raw corals imports which were reported at the species level, *C. japonicum* accounted for 61% by weight (~129,000 kg) and 38% by number of pieces (approximately 27,000 pieces), followed by *C. elatius* and *C. secundum* (Figure 3). Only 2 kg and 30 pieces of raw corals were reported at the genus level (i.e. *Corallium* spp.), the rest were reported at the species level.

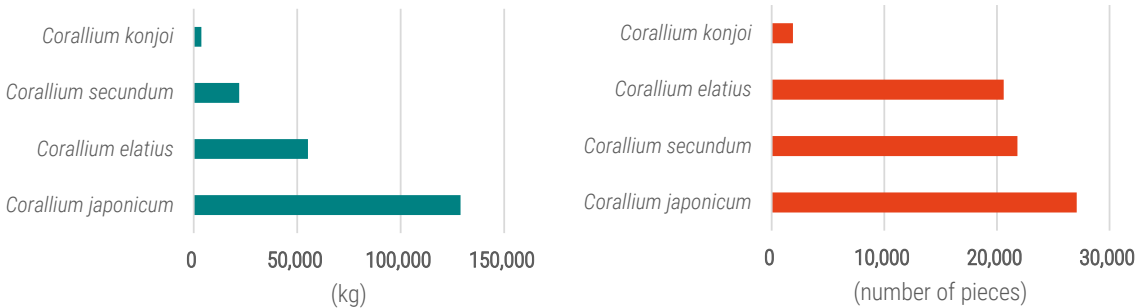


Figure 3
Global imports of raw *Corallium* corals by species, 2011–2015.

Note: Trade reported at the genus level was excluded.
 Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data.

As Figure 4 shows, imports of raw corals (by weight) reached 145,000 kg in 2011, after which imports declined considerably and fluctuated from 5,000 kg to 15,000 kg during 2013–2015. Since CITES trade data from 2008 to 2010 do not include Taiwan POC import data, it is unknown whether imports increased dramatically in 2011 over previous years or not. By number of pieces, imports of raw corals reached a peak at ~27,500 pieces in 2012, after which they declined dramatically, down to 4,500–9,000 pieces during 2013–2015. For carvings, the number of pieces imported reached more than 18,000 in 2012, after which gradual declines were seen, to around 5,900 pieces in 2015. Imports of carvings by weight were 4,300 kg in 2011 and declined to 240 kg in 2015. Although there have been fluctuations in imports of raw corals and carvings, imports seem to have decreased over the years (Figure 4). Both raw corals and carvings are recorded in units of kg and number of pieces, which makes it extremely difficult to carry out any in-depth analysis of accurate quantities in trade.

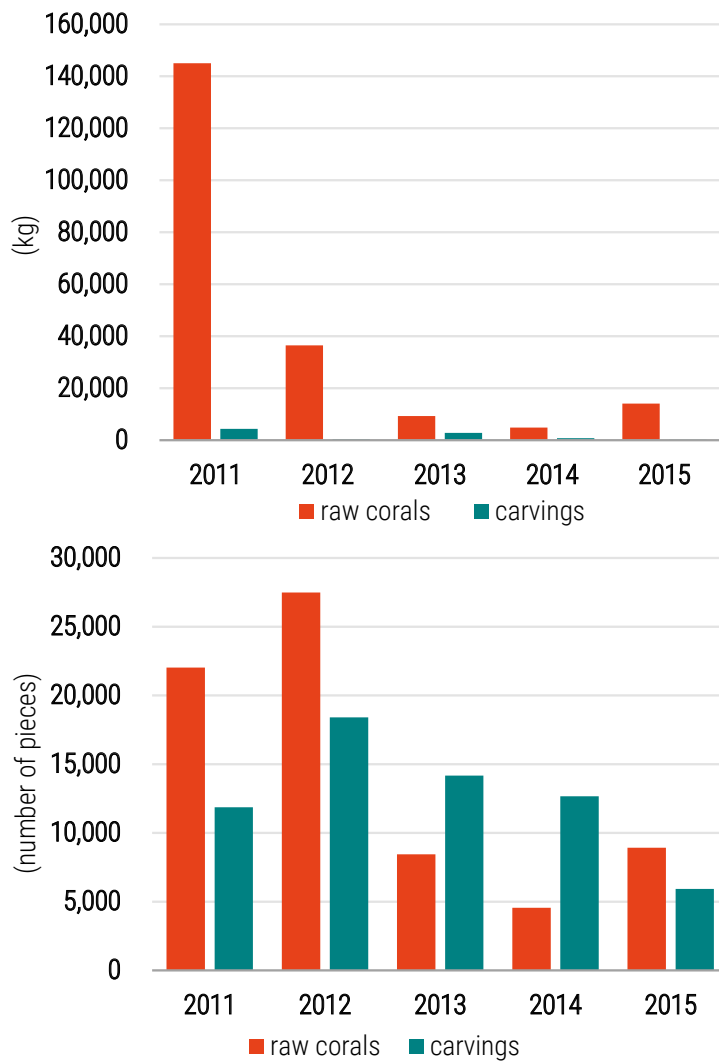


Figure 4
Global imports of CITES-listed *Corallium* corals by weight and number of pieces, 2011–2015.

Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data

220,000 KG
global imports of CITES-listed *Corallium* between 2011–2015

~72,000 PIECES
of raw coral were imported globally between 2011–2015

C. japonicum
accounted for 61% of the total raw coral imports by weight

The main exporters of raw corals between 2011 and 2015 were Japan (67%) followed by Hong Kong SAR (17%) (kg) by weight and Hong Kong SAR (38%) and Japan (32%) by the number of pieces. Taiwan POC was the dominant importer of raw corals by weight and the number of pieces, accounting for 87% and 75% respectively. As for carvings, Italy was the leading exporter by weight (44%), followed by Spain (29%) and Taiwan POC (20%); Taiwan POC was the dominant exporter by the number of pieces (58%). Carvings were mainly imported by the US (60%) and Italy (19%) by the number of pieces and by the US (41%) and Taiwan POC (30%) by weight.

According to CITES Trade Database and Taiwan POC CITES trade data, total imports of raw corals between 2011 and 2015 with source code "W" (taken from the wild) accounted for 83% by weight (more than 174,000 kg) and 90% by number of pieces (64,000 pieces). Less than 10% (12,000 kg and 6,400 pieces) was traded as pre-Convention specimens with source code "O". There were imports with source code "U" (unknown) (~2,500 kg; 64,000 pieces) and more than 20,000 kg of raw corals were recorded without any source code during the period.

There were substantial discrepancies between exporter and importer reported data. For instance, whilst importer data suggest that Japan may be the leading exporter of raw corals, exporting ~140 t and ~23,000 pieces between 2011 and 2015, Japan's exporter data suggest otherwise, with no exports of raw corals reported. Japan's reported exports of carvings (145.5 pieces) were significantly lower than importer reported quantities (4,776 pieces).

Few exports were reported from mainland China, which listed four *Corallium* corals in CITES Appendix III in July 2008. Seventy pieces of *Corallium* corals were exported from mainland China as raw corals, carvings and jewellery during 2011–2015, all of which were for non-commercial trade (circus or travelling exhibition or scientific purposes) with the source code "O" (pre-Convention). This suggests that mainland China rarely issues export permits or re-export certificates for commercial trade in the listed *Corallium* corals. However, a number of countries/territories did report commercial imports of *Corallium* corals from mainland China, mainly as raw corals and carvings. Germany, Taiwan POC and Switzerland collectively reported 31 kg of raw corals and 0.6 kg of carvings imported from mainland China for commercial purposes between 2011 and 2015.

Although previous studies and media reports suggest mainland China was the major consumer of *Corallium* corals (Chang, 2015; Nishimura and Sato, 2015), it reported little trade to CITES between 2011 and 2015. Mainland China imported only 31 kg and 79 raw coral pieces and 4 kg and 138 carvings, as well as 4 kg of coral derivatives and five pieces of jewellery during this period. More than 78% of these products were imported from Japan (100% of those reported by weight) with no imports from Taiwan POC or Hong Kong SAR. However, trade between mainland China and Hong Kong SAR is not recorded in the CITES Trade Database, thus a potentially considerable trade between the two jurisdictions may be obscured as a result. Traders in Hong Kong SAR interviewed during this study suggested that much of the raw coral imported into Hong Kong SAR is processed in factories on the mainland, which is not reflected in CITES trade data.

According to Taiwan POC CITES export data, which is based on the quantity for which permits or certificates were issued, not on the actual number of specimens traded, mainland China was the main destination by weight, responsible for 45% of all raw coral exports during 2011–2015 totalling ~7,300 kg. By number of pieces, exports to the US were responsible for 68% of raw coral exports between 2011 and 2015 with ~38,000 pieces.

Aka Coral *Corallium japonicum*

According to the CITES Trade Database and Taiwan POC CITES trade data, ~130,000 kg and ~28,500 pieces of raw *Corallium japonicum* coral and coral products were imported globally from 2011 to 2015.

Of the total, imports of raw coral accounts for more than 99% by weight and 96% by number of pieces. Taiwan POC was the dominant importer of *C. japonicum* raw coral, accounting for 99% of all imports by weight, with 128,000 kg, around 90% of which (~114 t) were imported in 2011. Taiwan POC was the main importer of raw coral by the number of pieces too, responsible for 88% of global imports with ~24,000 pieces, followed by the US (~3,100 pieces) during 2011–2015 (Figure 5).

By weight, imports of raw corals reached a peak of ~114,000 kg in 2011, after which they gradually decreased to 1,334 kg in 2014 and increased again to ~7,200 kg in 2015. The large quantity of imports in 2011 was largely due to imports by Taiwan POC (113,182 kg), however, this total is anomalous and may have been misreported. By number of pieces, imports fluctuated over the years, increasing slightly from ~9,800 pieces in 2011 to ~12,000 pieces in 2012, after which they declined considerably to between 970 and ~3,200 pieces in 2013–2015.

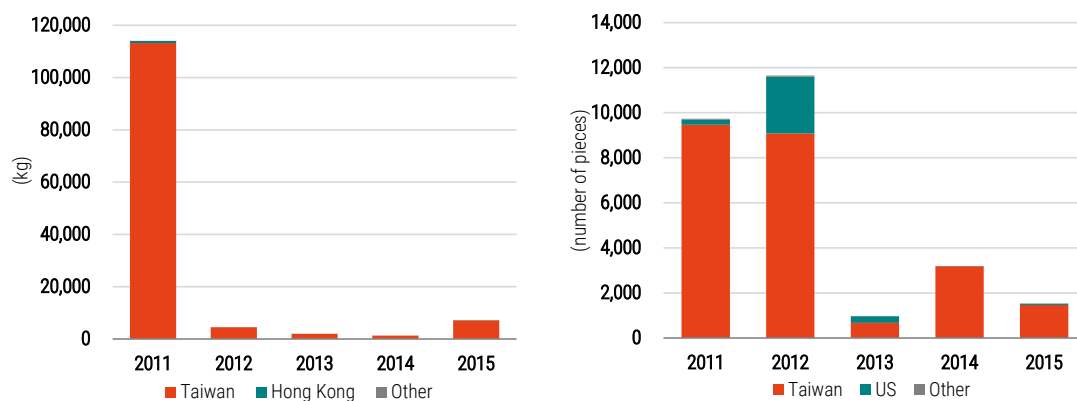


Figure 5
***Corallium japonicum* raw coral imports by weight (left) and number of pieces (right), 2011–2015.**

Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data.

A major exporter of *C. japonicum* raw corals was Japan, accounting for 91% by weight (~117,500 kg) and 55% by number of pieces (~14,900 pieces) during 2011–2015. Other exporters by number of pieces included Hong Kong SAR (33%; ~9,100 pieces) and Taiwan POC (11%; ~3,000 pieces). Most raw materials were reported as originating from Japan which accounted for 99% of imports with reported origins by weight (~117,800 kg) and 95% by number of pieces (~19,900 pieces) of *C. japonicum* raw coral during 2011–2015. Countries/territories not in the Pacific were also reported as the origin of exports, including Italy, Germany, Jordan and Namibia, which is unlikely given the geological distribution of *C. japonicum*. It is unknown whether the raw corals were actually *C. rubrum* or whether the country of origin was misreported.

Whilst *C. japonicum* was the most traded raw coral species among the four CITES-listed corals, imports of carvings were scarce compared to other species with only 81 kg and ~1,100 pieces reported.

Momo Coral *Corallium elatius*

According to the CITES Trade Database and Taiwan POC CITES trade data, approximately 60,000 kg and 40,000 pieces of *Corallium elatius* coral and coral products were imported globally from 2011–2015.

Imports of raw coral accounted for 92% by weight (~55,200 kg) and 51% by number of pieces (~20,700 pieces), with the latter followed by carvings (42%; ~16,800 pieces). Figure 6 shows that a large amount of raw coral was imported in 2011 and 2012 compared to subsequent years. By weight, raw coral imports increased significantly from ~14,000 kg in 2011 to 26,500 kg in 2012, after which it fell to ~7,000 kg in 2013. Of the total number of imports of raw corals during 2011–2015, imports into Taiwan POC accounted for 84% by weight (~46,400 kg) and 82% by number of pieces (~16,900 pieces).

Whilst Taiwan POC was a leading importer until 2013, Italy overtook that position in 2014, rising to ~3,000 kg of imports in 2015. By number of pieces, imports of raw materials increased from 7,500 pieces in 2011 to over 10,000 pieces in 2012, after which they decreased dramatically to fewer than 1,000 pieces in 2013. Hong Kong SAR was the dominant exporter of raw *C. elatius*, accounting for approximately 48% by weight (~26,400 kg) and 46% by number of pieces (~9,500 pieces).

Globally, ~5,000 kg and ~17,000 pieces of *C. elatius* carvings were imported between 2011 and 2015

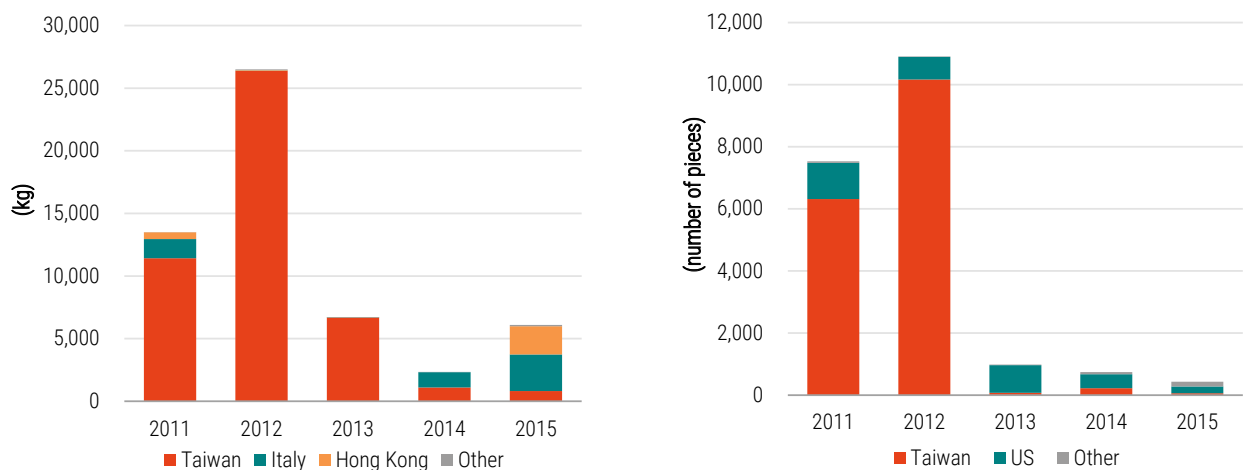


Figure 6
Corallium japonicum raw coral imports by weight (left) and number of pieces (right), 2011–2015.

Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data.

Globally, ~5,000 kg and ~17,000 pieces of *C. elatius* carvings were imported between 2011 and 2015. Imports fluctuated and the main importers changed considerably over the years. The annual global imports exceeded 2,000 kg in 2011 when the US reported over 1,800 kg of imports and 2013 when Taiwan POC recorded over 2,400 kg of imports, while other years recorded less than 300 kg (Figure 7). By number of pieces, Italy was the leading importer (accounting for 43% with ~7,300 pieces), followed by

Japan (19%, ~3,300 pieces) and the US (18%, ~3,100 pieces). A substantial number of carving imports by Italy and Japan led to a surge in global imports in 2012 (~7,800 pieces). The main exporters of carvings were Spain (2,500 kg, 50%) and Italy (2,000 kg, 41%) by weight and Italy (~5,300 pieces; 31%) and Taiwan POC (~4,200 pieces; 25%) by number of pieces.

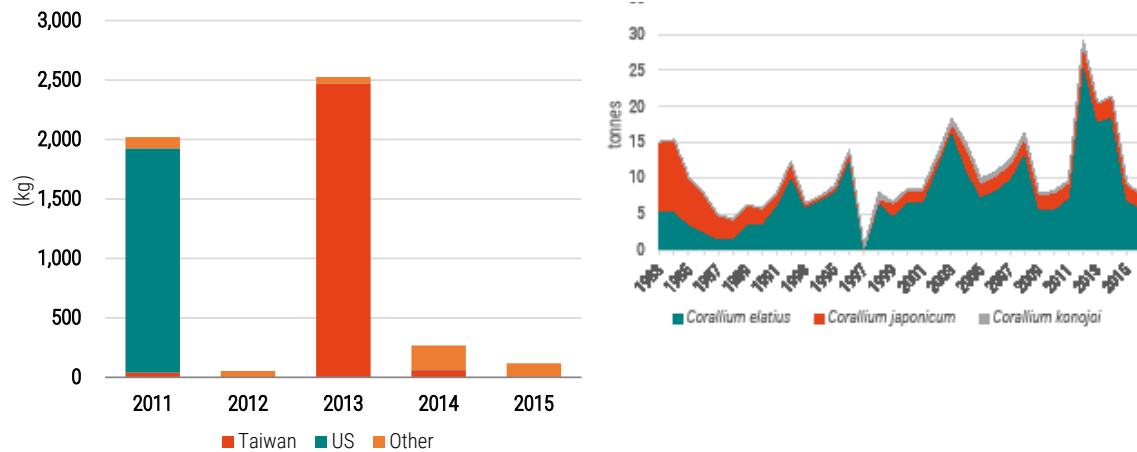


Figure 7
Carved *Corallium elatius* imports by weight (left) and number of pieces (right), 2011–2015.

Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data.

Of imports of *C. elatius* raw corals with reported origins, most originated in Japan (81% by weight; ~37,000 kg) and Taiwan POC (52% by number of pieces; ~10,100 pieces). Other source countries/territories included Italy, mainland China, Spain and Germany. More than 96% of carvings (both by weight and number of pieces) originated from Japan and Taiwan POC combined.

White Coral *Corallium konojoi*

According to the CITES Trade Database and Taiwan POC CITES trade data, approximately 4,400 kg and 40,000 pieces of *Corallium konojoi* coral and coral products were imported globally from 2011–2015.

Imports of raw corals accounted for ~3,700 kg (84%) of all imports by weight and imports of carvings by number of pieces (33,000) accounted for 83% of all imports. Imports of raw coral exceeded 1,800 kg and 1,000 pieces in 2011, after which they declined dramatically and varied between 400–800 kg and 50–320 pieces during 2012–2015. Of total imports of raw corals, Taiwan POC and Hong Kong SAR were the major importers by weight between 2011 and 2015, accounting for 52% (1,900 kg) and 46% (1,700 kg) respectively, while Taiwan POC was responsible for 83% of raw coral imports by number of pieces (1,560 pieces). Raw *C. konojoi* corals were mainly exported from Japan and Hong Kong SAR, both by weight and number of pieces. Annual imports of carvings varied between 7,000 pieces and 9,700 pieces during 2011–2014 and declined considerably to 30 pieces in 2015. The US was a dominant importer of carvings by number of pieces with 32,000 pieces (97%), while Italy (~380 kg, 58%) and Japan (~240 kg, 37%) were the main importers by weight.

Of total imports where the country/territory of origin was stipulated, 51% of raw corals originated from Taiwan POC by weight (~300 kg), while 98% came from Japan by number of pieces (~1,530 pieces) during 2011–2015. The main country of origin for carvings was Japan both by weight (278 kg; 96%) and number of pieces (~12,400 pieces; 94%).

25,000 KG

of *Corallium secundum* products
were imported globally between
2011–2015

ITALY

was the leading importer of
raw coral, accounting for
68% of global imports

Taiwan POC

was the main exporter,
accounting for 69% by
weight of global volumes

HARVESTING

has not been reported to the
FAO since 1990, apart from
Taiwan POC

~3,500 PIECES

of raw *C. secundum* corals
originated from mainland
China between 2011–2015

Angel Skin Coral *Corallium secundum*

According to the CITES Trade Database and Taiwan POC CITES trade data, approximately 25,000 kg and 34,500 pieces of *Corallium secundum* coral and coral products were imported globally during 2011–2015, with raw corals accounting for 88% by weight (~22,000 kg) and 63% by number of pieces (~21,900 pieces) of all imports.

Annual raw coral imports exceeded 15,000 kg in 2011, after which they fell to 5,000 kg in 2012 and to less than 500 kg from 2013–2015. Italy was the leading importer of raw coral, accounting for 68% (~15,000 kg) of the total due to large imports in 2012 (Figure 8). By number of pieces, global annual imports of *C. secundum* raw coral increased over the years apart from in 2014; imports reached their highest point in 2015 with 6,800 pieces while fewer than 600 pieces were imported in 2014. The US and Taiwan POC were the main importers, responsible for more than 99% of raw coral imports during 2011–2015. The main exporters of raw *C. secundum* coral were Taiwan POC, accounting for 69% by weight (>15,000 kg), and by number of pieces Hong Kong SAR (38%, 8,200 pieces) and Taiwan POC (31%, 6,700 pieces).

Between 2011 and 2015, ~3,000 kg and 12,000 pieces of carvings were imported globally. By weight, imports of carvings reached nearly 2,000 kg in 2011, after which they declined dramatically, with less than 400 kg imported between 2012–2015. The US was the main importer by weight, accounting for 56% with 1,670 kg due to the large volume of imports in 2011. The number of carvings imported fluctuated between 2011 and 2015, exceeding 3,000 pieces in 2012 and 2015 and varying between 1,400–1,900 pieces in other years. Italy was the leading importer (40%; 4,800 pieces), followed by Switzerland (31%; ~3,800 pieces) and the US (20%; ~2,400 pieces). Italy was also the dominant exporter of carvings, responsible for 60% by weight and 42% by number of pieces of global imports with ~1,800 kg and ~5,100 pieces. Other important exporters included Taiwan POC, Switzerland and Japan.

According to FAO (2017), harvesting of *C. secundum* has not been reported since 1990, apart from Taiwan POC, which reported 5 kg and 2 kg of catch production in 2015 and 2016 respectively. However, imports of 6,010 kg and ~20,400 pieces of raw *C. secundum* coral were recorded with the source code "W" in the CITES Trade Database and Taiwan POC CITES trade data (i.e. allegedly taken from the wild following the CITES Appendix III listing by mainland China that began in July 2008). Even though these totals may include double counting, there is clearly a large discrepancy between harvest and trade data. Of the total raw *C. secundum* coral imports with source code "W" with a declared origin, some 99% by weight (~2,000 kg) and 79% by pieces (~13,600 pieces) originated from Japan or Taiwan POC (Figure 9). In addition, 24 kg and ~3,500 pieces of raw *C. secundum* corals reportedly came from mainland China between 2011 and 2015.

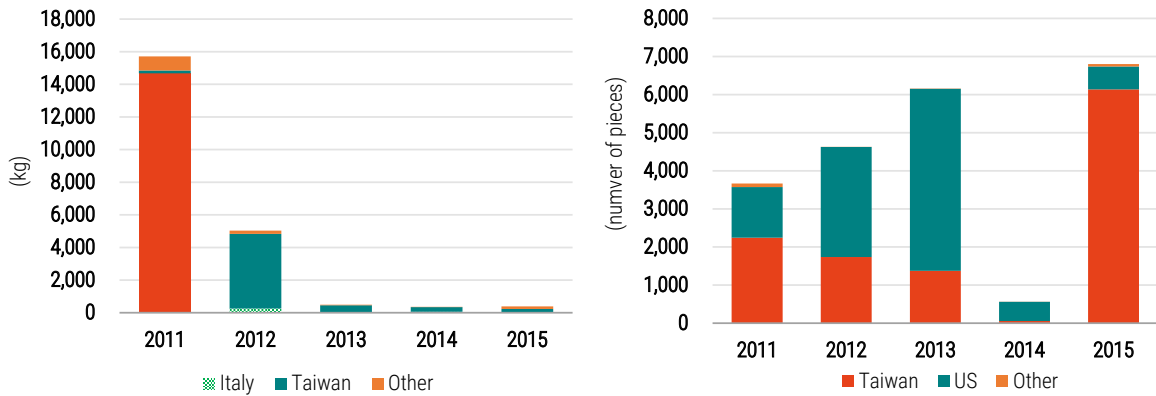


Figure 8
Raw *Corallium secundum* coral imports by weight (left) and number of pieces (right), 2011–2015.

Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data.

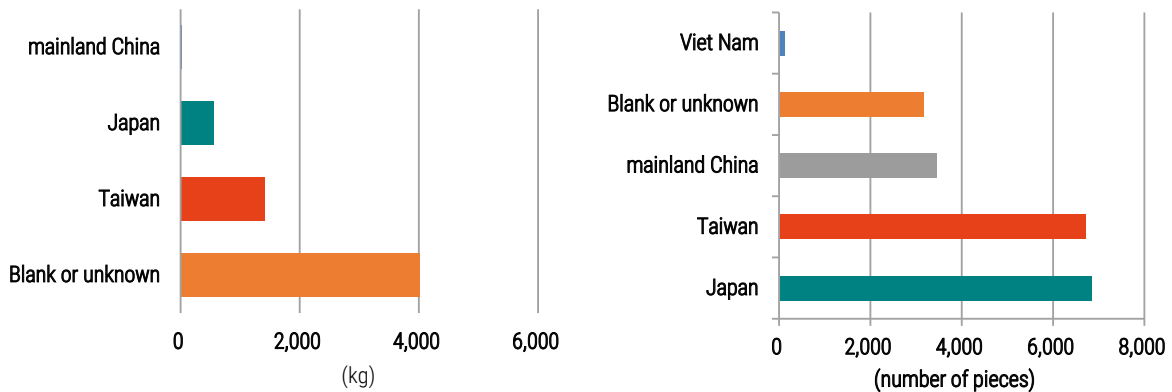


Figure 9
Origin of imported raw *Corallium secundum* corals with source code “W”, 2011–2015.

Source: UNEP-WCMC CITES Trade Database, Taiwan POC CITES trade data.

coral trade – Customs data and CITES data

Japan Customs data

According to statistics from Japan Customs, Japan exported unworked coral to 11 countries/territories between 2007 and 2016.

Although the main destination by weight was the US, accounting for more than 60% (~280,000 kg) of total imports over the decade, the export value to the US was not high and it is believed that these exports were mainly non-*Corallium* corals. As Figure 10 shows, the volume of unworked coral exports to Taiwan POC, Hong Kong SAR and mainland China²⁰ reached over 12,000 kg in 2008, after which it declined gradually with some fluctuations between 2009 and 2016. Although CITES Appendix III listing by mainland China of four *Corallium* corals came into force on 1st July 2008, trade data do not suggest any substantial changes in export volume of unworked coral prior to and after the listing.

²⁰ Although Japan also exports unworked coral to the Republic of Korea, these exports were excluded from this analysis as the unit price was very low therefore presumably included non-*Corallium* coral exports

Exports to Taiwan POC accounted for 87% of the total exported to Taiwan POC, Hong Kong SAR and mainland China. Exports of unworked coral to mainland China were few, just 128 kg during 2007–2016. Although the CITES Trade Database indicates that mainland China imported 14.5 kg and 5 kg of coral from Japan in 2012 and 2014 respectively, no exports were recorded by Japan Customs in these years, possibly because they were below the cut-off value of JPY200,000 per importation to be included in the General Trade Statistics. The 2015 figures were similar between Japan Customs and CITES annual data reported by mainland China with 12 kg and 13 kg respectively.

Comparison of reported exports with production volumes (Figure 10) suggests export volumes exceeded Japan’s annual *Corallium* catch production reported to FAO apart from in 2013 and 2014, although the discrepancies varied depending on the year. While *Corallium* harvest was 4,600 kg in 2008, recorded exports to Taiwan POC, Hong Kong SAR and mainland China were over 12,000 kg, more than double the production records. There are several possible explanations for discrepancies. Firstly, FAO’s coral catch production reported by Japan might be under-reported as noted above. Secondly, it could be a reflection of trade in stockpiled unworked corals previously harvested. Thirdly, trade data may include exports of non-*Corallium* corals and/or re-exports of *Corallium* corals. Finally, export statistics may include *Corallium* corals from illegal, unreported and unregulated (IUU) sources. However, details cannot be confirmed.

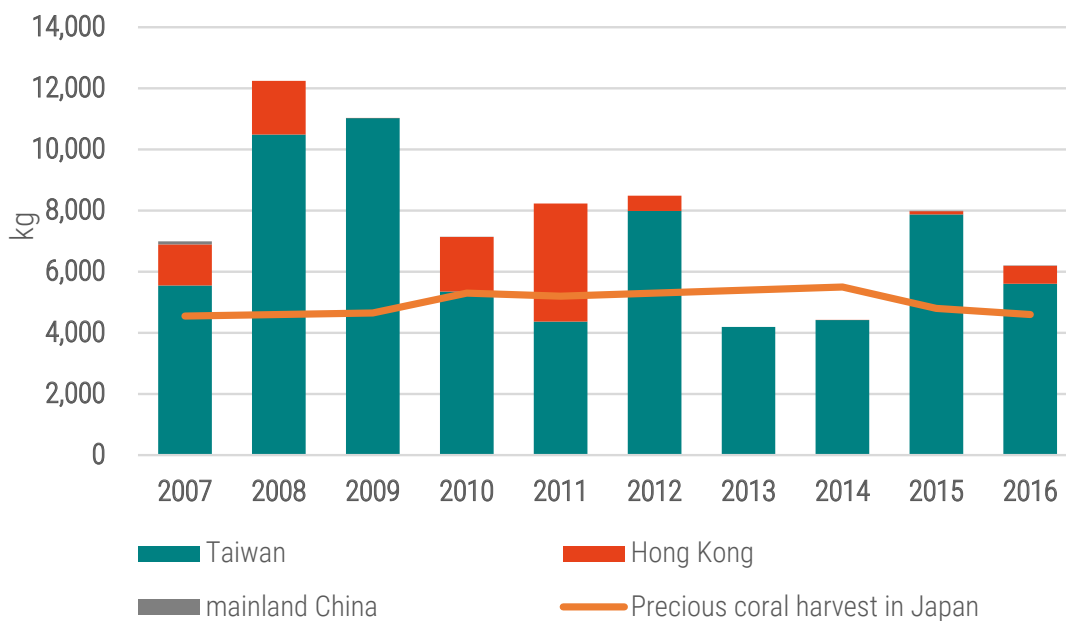


Figure 10
Unworked coral exports from Japan to Taiwan POC, Hong Kong SAR and mainland China, kg, 2007–2016.

Note: Data may include non-*Corallium* corals.

Source: Japan Customs, FAO Fisheries Production

The export value to Taiwan POC, Hong Kong SAR and mainland China increased gradually from JPY1.2 billion (USD10 million) in 2007 to JPY 7.3 billion (USD60 million) in 2015 (Figure 11). It reached a peak in 2015, falling slightly to JPY6.3 billion (USD58 million) in 2016. The unit price for unworked coral exported to these countries/territories increased from JPY170,000 (USD1,444) in 2007 to over JPY1.2 million (USD11,300–12,300) in 2013 and 2014, after which it declined slightly to JPY1 million (USD8,200–9,200) in 2015 and 2016.

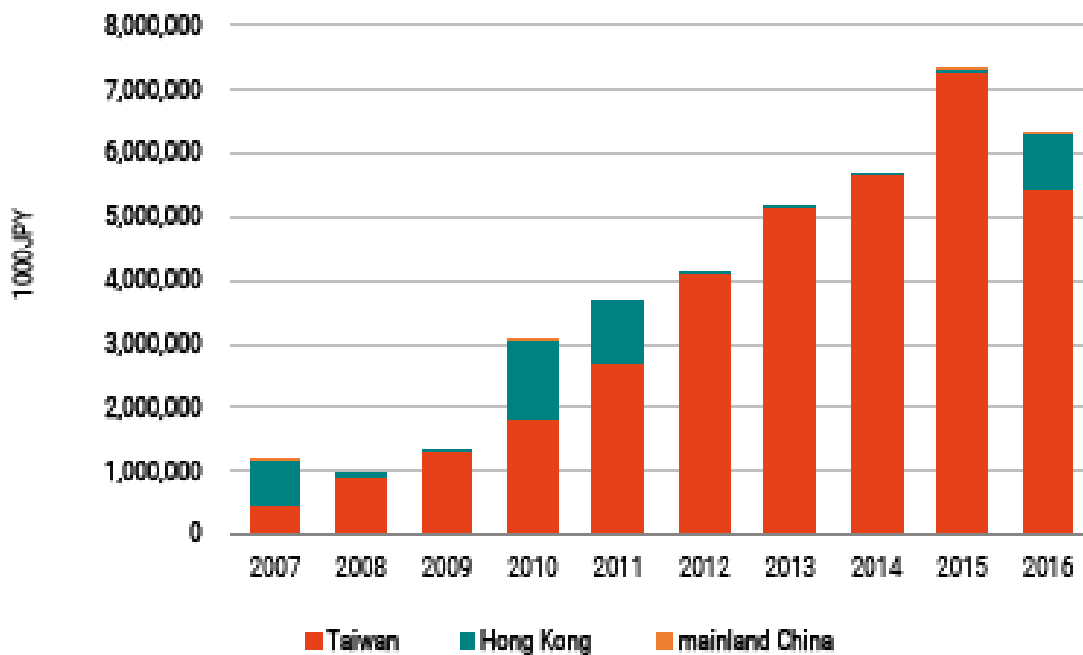


Figure 11
Unworked coral exports from Japan to Taiwan POC, Hong Kong SAR and mainland China, 1000JPY, 2007–2016.
 Note: Data may include non-*Corallium* corals.
 Source: Japan Customs

Taiwan POC Customs data

Taiwan POC has four Customs codes related to coral namely “coral and similar material”, “powder and waste of coral and similar material (including for Chinese medicine)”, “worked coral material” and “articles of coral”, which may include trade in non-CITES listed *Corallium* corals.

Taiwan POC imported ~14,700 t of “coral and similar material” and other coral products during 2007–2016, and exported ~185 t, hence Taiwan POC is a net importer of corals. Of the four categories, imports of “coral and similar material” accounted for over 99% of all imports between 2007 and 2016 by weight, with those from the Philippines (~14,300 t) accounting for over 98% of the total in this category. According to the CITES Trade Database and Taiwan POC CITES trade data, there were no recorded imports/exports of *Corallium* corals between the Philippines and Taiwan POC between 2011 and 2015. All the imports from the Philippines were considered to have been non-*Corallium* corals during this period. The other main exporters of “coral and similar material” during 2007–2016 were Italy and Japan.

In value terms, “coral and similar material” accounted for 78% of all coral related product imports during 2007–2016. Imports in this category rose sharply from USD16 million in 2010 to USD60 million in 2011, after which they were relatively stable, reaching a peak value of USD67 million in 2015 (Figure 12). Japan was the largest exporter by value of this coral category to Taiwan POC, followed by Italy, so most likely the majority were *Corallium* corals. Figure 12 also indicates the import value from Japan rose sharply in 2011, reaching a peak in 2015.

By weight, the imports from Japan ranged from 4,700–10,500 kg, the peak in 2009.

Figure 12 suggests that imports have repeated a cycle of increasing and decreasing every three years. Imports from Italy increased significantly during 2007–2011, reaching over 21,000 kg by 2011, after which they gradually declined to ~2,800 kg in 2016. While imports from Italy exceeded those from Japan during 2009–2015, those from Japan surpassed Italy’s in 2016.

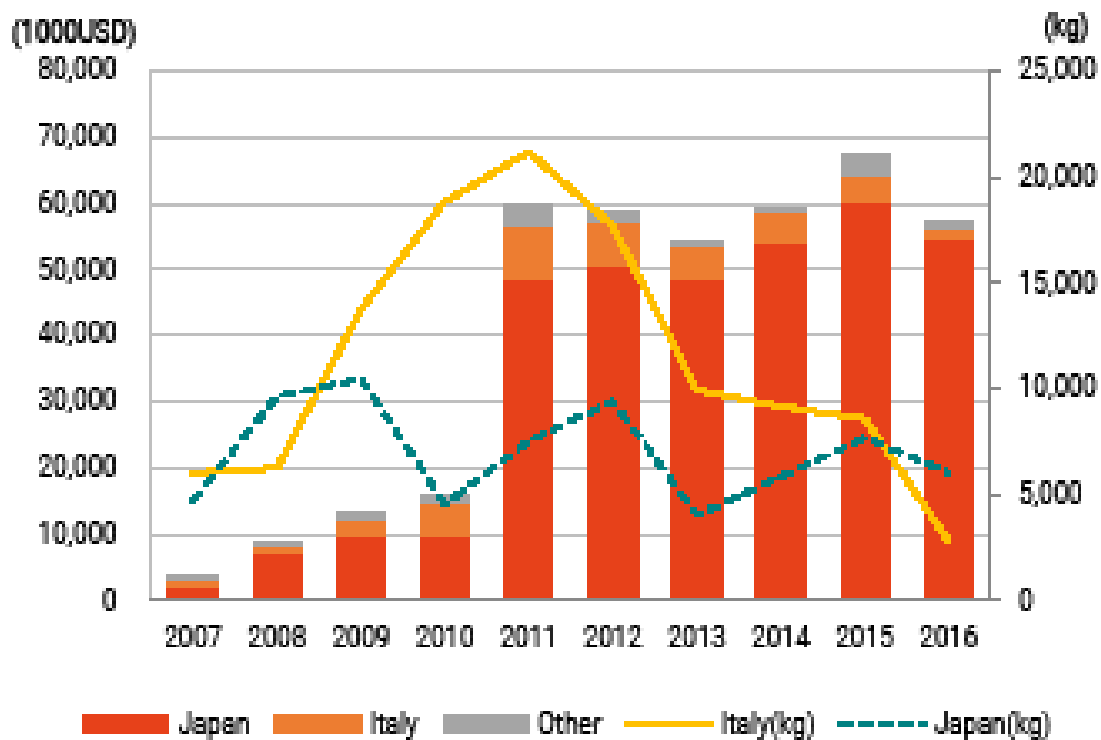


Figure 12
Imports of “coral and similar material” into Taiwan POC (kg, USD1000), 2007–2016.

Note: Data may include non-*Corallium* corals.

Source: Taiwan POC Customs

Although it is not known what coral materials are included in “powder and waste of coral and similar material (incl. for Chinese medicine)”, Taiwan POC also recorded imports under that Customs code mainly from Japan during the period. Imports in this category from Japan exceeded 6,000 t during 2006–2017 with a peak of 1,100 t in 2009, after which it declined for several years but increased again to ~600 t in 2016.

Exports of “coral and similar material”, “powder and waste of coral and similar material (including for Chinese medicine)”, “worked coral material” and “articles of coral” from Taiwan POC have declined from 41 t in 2007 to 8 t in 2016 over the decade with some fluctuation. Exports in “coral and coral material” accounted for 77% of all exports during the period. Japan was the leading importer of coral and similar material as Taiwan POC exported 31 t in 2015 while no export was recorded in 2016. Exports of “worked coral materials” reached a peak at ~4,700 kg in 2008, after which it declined considerably to less than 100 kg during 2012–2014, and increased again up to 500 kg in 2016. This decrease is mainly as exports to Viet Nam, which was the dominant destination until 2009, ceased in 2009 and began being recorded as “coral and similar material”. Exports of “articles of coral” from Taiwan POC declined from 9,600 kg in 2007 to less than 950 kg in 2016 with Japan the main destination, followed by Italy between 2007 and 2016.

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	2011	2012	2013	2014	2015
Customs data (coral and similar material)	7,531	9,393	4,018	5,824	7,675
Taiwan POC CITES trade data (raw <i>Corallium</i> corals)	117,462	4,936	3,773	1,627	5,975

Table 7

Comparison between Taiwan POC Customs data and CITES trade data for coral imports from Japan (kg), 2011–2015.

Source: Taiwan POC Customs data, Taiwan POC CITES trade data

Coral trade between Japan and Taiwan POC

Trade data between Japan and Taiwan POC were examined as previous research and anecdotal information suggested much unworked coral harvested in Japan is exported to Taiwan POC. Japan and Taiwan POC have similar commodity codes for unworked corals although the details are slightly different: “unworked coral (0508.00.20.0)” for Japan and “coral and similar material (0508.00.11.00-4)” for Taiwan POC.

As Figure 13 shows, the data recorded by Japan Customs and Taiwan POC Customs showed a similar trend in the volume of unworked corals from Japan to Taiwan POC. The discrepancies ranged from 170 kg to 3,200 kg, with the largest gap in 2011 when Japan Customs recorded ~4,400 kg of exports and Taiwan POC Customs 7,500 kg of imports.

The import/export value of unworked coral showed a similar trend between the two Customs datasets (Figure 13), gradually rising to a peak of USD12,000 in 2013 as the amount of coral traded between Japan and Taiwan POC fell that year and remained low in 2014. The import/export price dropped a little in 2015 and 2016 but was still higher than prior to 2012.

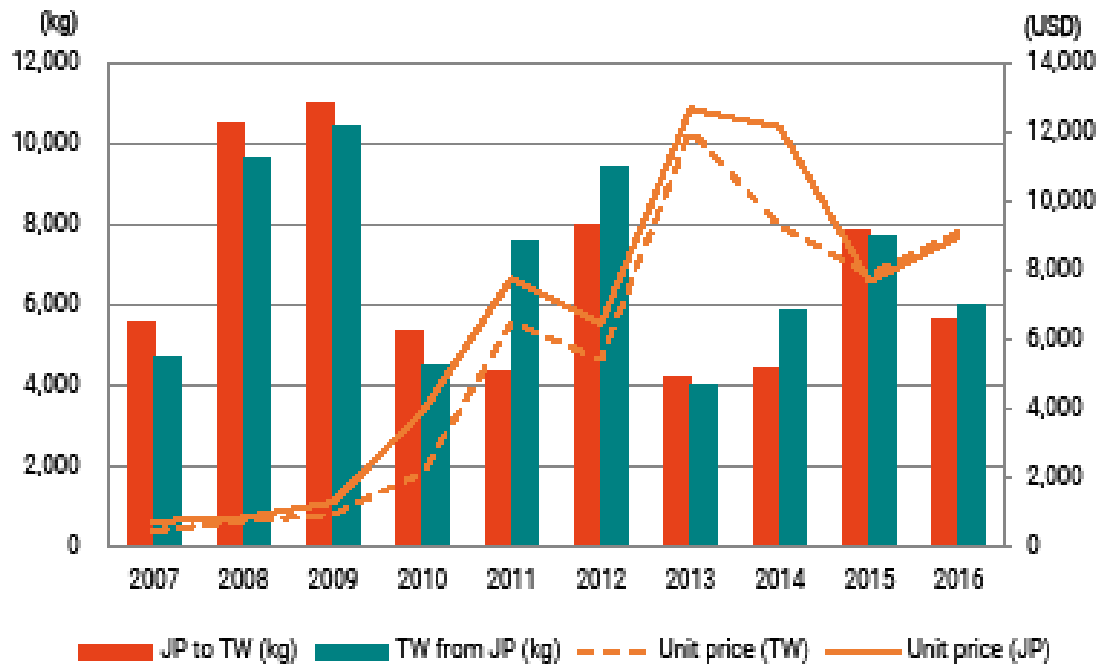


Figure 13
Customs data comparison for coral trade between Japan and Taiwan POC.

Source: Japan Customs and Taiwan POC Customs

According to Japan Customs statistics, although more than half of the coral materials were exported from Japan to Taiwan POC by sea during 2007–2009, the proportion decreased gradually and was surpassed by other forms of transport in 2010. Exports by air from Japan to Taiwan POC accounted for more than 70% during 2012–2016. By area, exports from Kansai (e.g. Osaka and Kobe), which is close to harvesting areas, were dominant until 2011, after which exports from areas such as Kanto (e.g. Tokyo and Yokohama) increased.

Annual exports of more than 2 t of coral materials were declared at Tokyo Customs in 2012 and 2015. Additionally, since 2012 exports have been recorded from new areas such as Fukuoka, Matsuyama (since 2014) and Uwajima (since 2015), which may suggest that some coral materials were traded directly without going through auction and exported to Taiwan POC after the coral price rose.



Coral trade between Taiwan POC and mainland China

Although previous studies and media reports claim that demand for *Corallium* corals has increased in mainland China and most of them are shipped from Taiwan POC after processing (Chang, 2015; Nishimura and Sato, 2015), Taiwan POC Customs data between 2007–2016 as well as Taiwan POC CITES trade data did not indicate exports to mainland China have substantially increased.

Of exports in three of the four categories to mainland China, those of “coral and similar material” were largest both in terms of weight and value. Taiwan POC’s export in this category increased from 2,000–3,300 kg during 2009–2011 to ~8,600 kg in 2012, after which exports declined considerably and varied between 500–1,050 kg during 2013–2016. Although the reasons behind big fluctuations between 2012 and 2013 are unknown, they may be linked with the anti-corruption policy launched in Wenzhou, mainland China, in mid-2012 that became national policy after Chinese President Xi Jinping announced a crackdown on corruption among government officials in November 2012. The export value of corals in this category increased considerably during 2014–2016.

To estimate the volume of CITES-listed *Corallium* corals, the raw coral exports recorded in the Taiwan POC CITES trade data were compared with exports in the category “coral and similar material” in the Customs export data. As the volumes in the Taiwan POC trade data exceed those in the Customs export data in every year except 2012 (Figure 14), many of the exports in 2011, and 2013–2015 may have referred to CITES-listed *Corallium* corals. According to Taiwan POC CITES trade data, exports of unworked *Corallium* corals to mainland China ranged annually from 990 kg to 2,800 kg during 2011–2015 (Table 8), however, imports by mainland China from Taiwan POC are not recorded in the CITES Trade Database

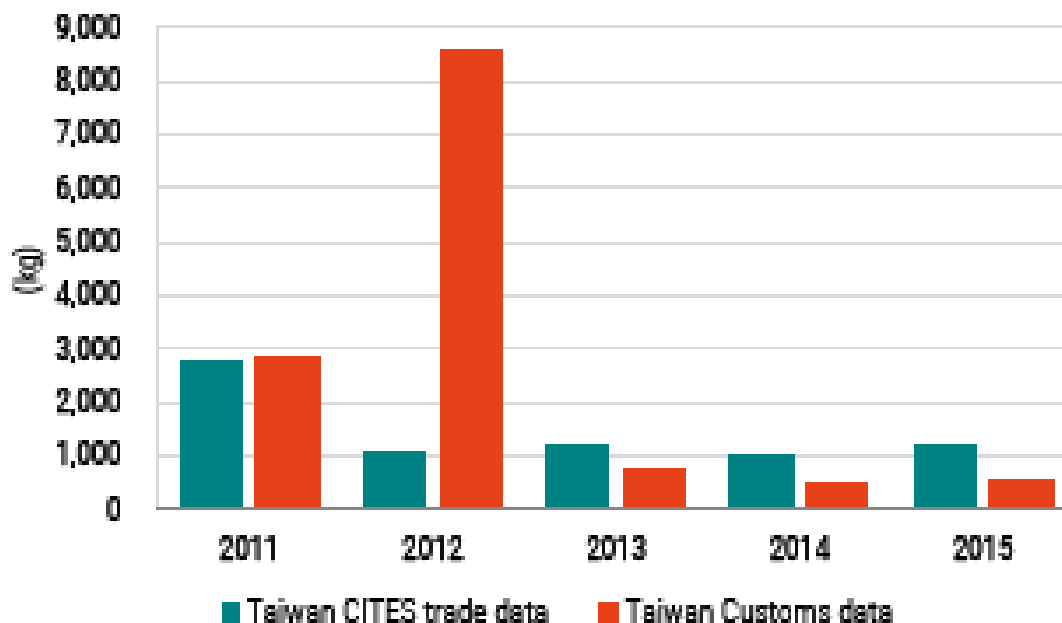


Figure 14

Raw coral and coral material exports from Taiwan POC to mainland China (Taiwan POC CITES trade data kg, 2011–2015).

Note: Taiwan POC CITES trade data are derived from the quantity for which certificates were issued, not actually traded. Coral material exports may include non-CITES-listed *Corallium* species and non-*Corallium* corals.

Source: Taiwan POC Customs, Taiwan POC CITES trade data.

2011	2012	2013	2014	2015	Total
2,794 kg	1,084 kg	1,231 kg	992 kg	1,190 kg	7,291 kg

Table 8

Unworked coral exports from Taiwan POC to mainland China, derived from the quantity for which certificates were issued (kg), 2011–2015.

Source: Taiwan POC CITES trade data

Annual exports of “worked coral materials” and “articles of coral” fluctuated between 2007 and 2016, ranging from 0 kg to 140 kg; exports of “worked coral materials” were 136 kg in 2010 and 120 kg in 2011, after which they declined dramatically to 6 kg in 2012 rising slightly in the following years to ~75 kg. Exports of “articles of coral” reached a peak in 2011 with 103 kg, after which they gradually declined to 35 kg in 2014 and increased up to 100 kg in 2015–2016.

Coral trade between Taiwan POC and Viet Nam

According to Wu and Takahashi (2009), Viet Nam may have a role as a processor, with some Taiwan POCese processors managing their processing factories there²¹.

Taiwan POC Customs data suggest that Taiwan POC exports coral as unworked material or semi-worked coral and imports semi-worked coral from Viet Nam. According to Taiwan POC Customs data, Taiwan POC exported coral to Viet Nam mainly as “worked coral materials” until 2009, after which they were replaced by exports of “coral and similar material”. Exports peaked at around 4,230 kg and ~USD490,000 in 2012 and gradually declined to less than 2,500 kg. Conversely, Taiwan POC imported corals mainly as “worked coral materials” with the volume much lower than exports (Figure 15). Although the volume of imports was relatively constant during 2007–2016, ranging between 1,000–1,600 kg, the import value increased gradually, reaching a peak of around USD2.5 million in 2014. Viet Nam has been the top exporter of worked coral materials to Taiwan POC by volume since 2006.

According to the CITES Trade Database and Taiwan POC CITES trade data, however, there was only one record of trade in *Corallium* corals between Taiwan POC and Viet Nam during 2008–2015 when Taiwan POC exported 0.5365 kg of raw *C. secundum* coral in 2015. Viet Nam has not reported any imports or exports of *Corallium* corals as of April 2017, apart from one export (of 96 kg of raw *C. elatius* coral to Japan) in 2011 (Viet Nam had submitted annual reports up to 2016 as of 26th July 2018). Of note, other countries/territories reported 16 records of trade in *C. secundum* and *C. konjoi* where Viet Nam was the country of origin. Viet Nam does not report any catch production to FAO.

²¹ http://dartorycoral.com/dar_en/about.htm

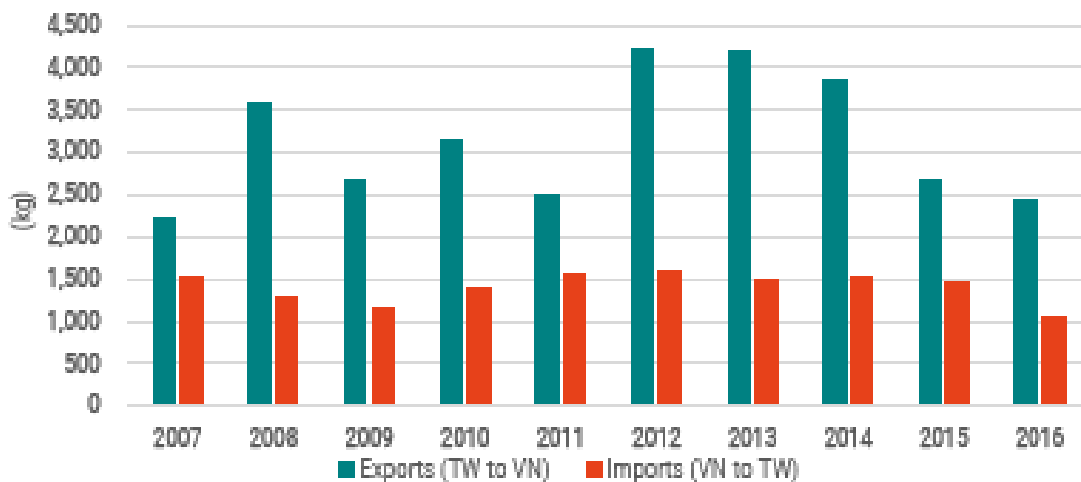


Figure 15

Coral exports and imports between Taiwan POC and Viet Nam, 2007–2016

Note: Exports include “coral and similar material” and “worked coral materials” while imports are as “worked coral materials”; data may include non-*Corallium* corals.

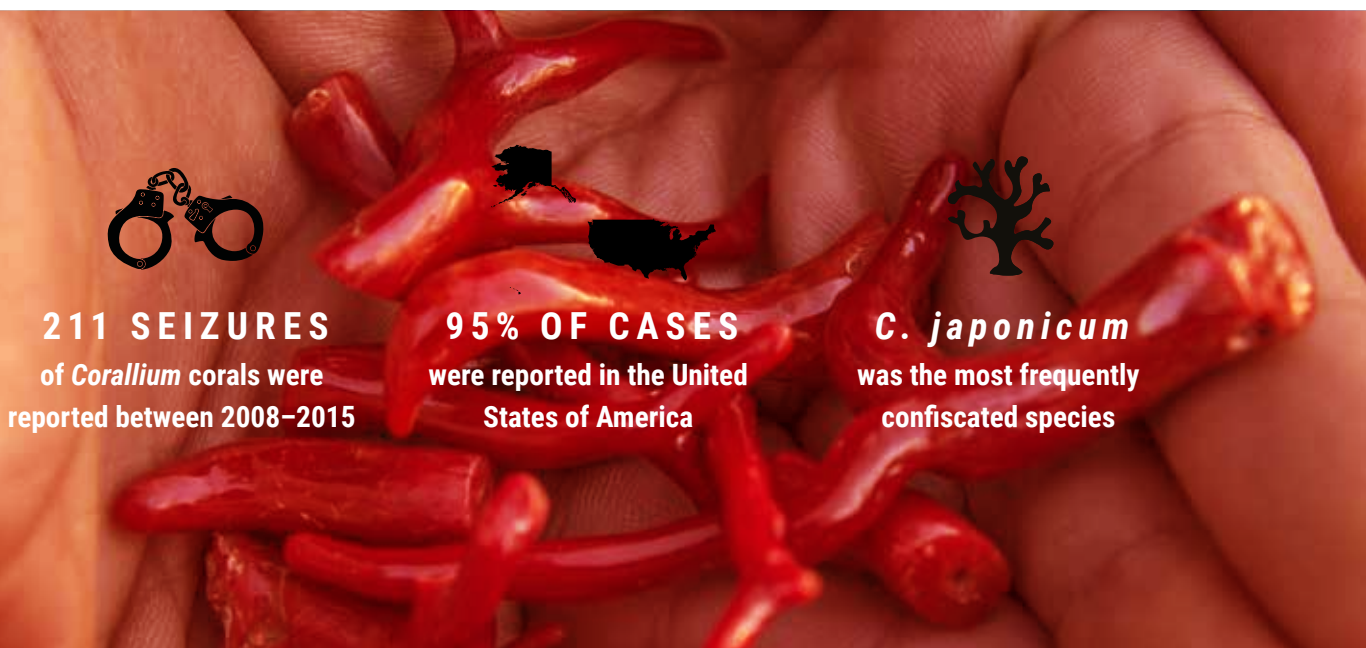
Source: Taiwan POC Customs

Corallium seizures

According to the CITES Trade Database²², there were 211 trade records of seizures or confiscations of *Corallium* corals between 2008–2015, representing a total of approximately 870 kg and 67,400 pieces.

The majority of cases (201, 95%) were reported by the US (192 during import and 9 during export). The weight and number of seizures fluctuated over the years, reaching a record high of ~800 kg and ~45,200 pieces in 2012. Raw corals accounted for 90% by weight (781 kg) and 76% by number of pieces (~52,000 pieces). By weight, *C. japonicum* was the most frequently confiscated species, accounting for 83% (722 kg) between 2008 and 2015 and *C. secundum* was responsible for 60% of seizures by number of pieces (~40,700 pieces) (Figure 16). Of the raw coral confiscations with the country of origin were recorded, 89% (~41,200 pieces) originated from Japan.

²² As it was not mandatory for Parties to CITES to report seizures until 2016, most of the seizure data are not included in the CITES Trade Database (see Methods).



211 SEIZURES
of *Corallium* corals were
reported between 2008–2015



95% OF CASES
were reported in the United
States of America



C. japonicum
was the most frequently
confiscated species

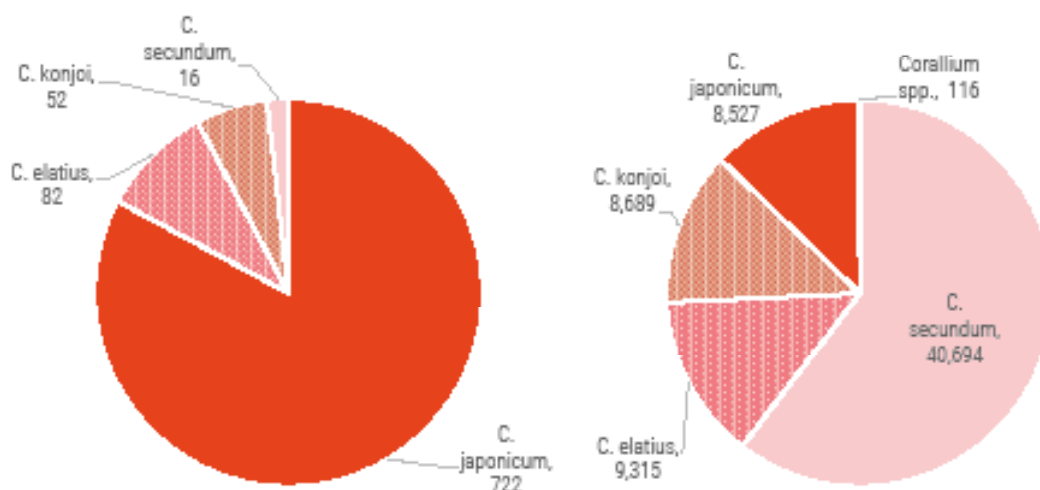


Figure 17
Weight (left) and number of pieces (right) of seized *Corallium* corals by species, 2008–2015.

Source: UNEP-WCMC CITES Trade Database

According to Japan Customs, there were 10 cases of “acknowledgement of abandonment” between 2008 and 2016—this is a procedure whereby an individual who owns the products abandons them voluntarily to the Japanese government if Customs finds appropriate documentation is missing but determines stricter measures (e.g. prosecution) are not needed. It was not possible to calculate a total weight/number of pieces involved in these 10 cases as the units used were different. All of them were seized either due to a lack of export permits or certificates of origin when imported. These corals were exported from mainland China (5 cases), Italy (2 cases), Republic of Korea, Taiwan POC and Hong Kong SAR (1 case each). They were composed of dead coral (4), accessories (4) and specimens (2). Half of them were sent by post and the rest was shipped by commercial cargo. The biggest case was 127 kg of *Corallium* corals found in 2010.

In mainland China, according to media reports, there were at least 38 seizures between 2008 and 2016, representing a total of 156.7 kg and more than 1,500 products/materials. The weight of seized specimens was considerably higher in 2013 over earlier years, at around 57 kg and a peak of 861 pieces seized in 2015 (Table 9). In September 2016, Huanggang Port Customs seized 30 Red Coral products from tourists returning from Taiwan POC intending to process and sell them in mainland China (Anon., 2016).

	2010	2011	2012	2013	2014	2015	2016	Total
Number of cases	1	2	3	9	9	7	6	38
Number of seized products				6	296	861	30	1,533
Amount of seized coral (kg)	20.0	2.1	7.8	56.6	56.2	10.9	3.0	156.7

Table 9
Red Coral seizures in mainland China, 2010–2016.

Source: Media reports

Additionally, an illegal import of *C. konjoi* (50 g) was intercepted at the Hong Kong SAR border without the relevant documentation in 2012. The specimen came on an air consignment from Egypt, together with dried seahorse specimens. The forwarding agent was delivering the consignment to a client in mainland China, according to investigations by Hong Kong SAR's AFCD, but no prosecution was initiated (AFCD, *pers. comm.* to TRAFFIC, March 2017).



CHAPTER 5
MARKET SURVEY

PHYSICAL MARKET SURVEY RESULTS

Japan (Tokyo)

Eleven department stores, two duty free shops and Okachimachi, an area with a high concentration of jewellery shops in Tokyo, were surveyed for *Corallium* coral items in March and April 2017.

Due to the limited timeframe available for the survey, a restricted number of shops were visited and items counted. Of the 36 jewellery shops surveyed, 58% (21 shops) were offering *Corallium* coral products for sale in March 2017. For most of them (19 shops), coral was one of various kinds of jewellery sold (others included pearls, diamonds and gemstones). The main product types were earrings, necklaces and rings and all of these shops offered Red Coral products (species mostly unknown).

The price varied between JPY3,000 (small earrings) to JPY9,800,000 (*C. japonicum* ball) depending on the colour, size of the coral and/or whether the products had diamonds. Generally products made from *C. rubrum* (non-CITES-listed species) were less expensive. For instance, while a *C. rubrum* necklace was JPY45,000, a *C. japonicum* necklace was JPY75,000 (Figure 18). There were also shops selling second-hand coral and other products.

Figure 18

Red Coral necklaces for sale at a jewellery shop in Okachimachi, Tokyo (March 2017).

Left: made from *C. rubrum* (Shading Coral); right: from *C. japonicum* (Aka Coral)



58% OF STORES
were offering *Corallium* coral
products for sale

MAIN PRODUCT
types were earrings,
necklaces, and rings

HARVESTED IN JAPAN
all stores claimed their *C. japonicum*
products were harvested in Japan

There were two shops whose main products were made from *Corallium* corals, one of them specialising in business wholesale retailing that was not visited. The other shop offered rings, earrings, and balls (loose coral) made of corals coloured red, pink and white. According to the shop staff, who spoke fluent Japanese but seemed to be from elsewhere in East Asia, the products for sale had originated from and been processed in Japan. They said the demand for Red Coral had increased over the past 3–4 years in mainland China.

Of the 11 department stores surveyed, four (36%) had a jewellery stall offering coral products. Staff in one store said they had few coral products such as rings, necklaces and earrings and did not usually put them on display. Although there were ~30 coral products in one of the stores, the rest displayed fewer than 10 items each. One shopkeeper said they used to sell coral products decades ago but not any more as their popularity had declined and they do not match the clothes of modern Japanese people. There were also several stalls at two department stores that offered coral products at an event for a limited period of time (one to two weeks).

Two duty free shops surveyed offered coral products at three jewellery stalls. One shopkeeper said 70–80% of their customers were visitors to Japan. Another explained that pearl products are more popular than coral products for Chinese tourists as a souvenir from Japan. Among the coral products, those with larger pieces and which looked like “branches” were the most popular for these customers. Two stalls mentioned that receipts for these products are needed when Chinese citizens return to mainland China.

The species/colours of *Corallium* corals being offered for sale at the markets/stores were *C. japonicum*, *C. rubrum*, *C. elatius* and *C. konojoi*. Although some shopkeepers were not sure whether their products were made from *C. japonicum* or *C. rubrum*, all of them said that *C. japonicum* is harvested in Japan. They differentiated the two kinds by colour and price. Two shopkeepers claimed that the price of *C. japonicum* is rising due to increasing demand for jewellery in mainland China and/or depletion of resources. Most shops/stalls mentioned their products were processed in Japan including *C. rubrum* items from the Mediterranean. Staff in one department store implied their products were processed in Hong Kong SAR.

The price of coral products varied significantly depending on the colour and size of the coral, design and other decorations (e.g. with diamonds), ranging from JPY3,000 (USD27) to JPY1,500,000 (USD13,618). Although several shopkeepers said the price of coral products was rising, one trader said the price had not changed in recent years. Another shopkeeper, who owned a family-run company to process corals, claimed that the price of raw material had got so high that they were only processing raw material bought sometime in the past.

According to the shopkeepers, although the main customers were Japanese, the number of people visiting from abroad, especially from mainland China, had increased in recent years.

Many traders said that Red Coral accessories are suitable for women of 60 years or older in Japan, although some designed products were suitable for younger people. There is a custom to give a “red item” to celebrate 60th birthdays in Japan, and Red Coral items are gifted as such. Several shops had staff who could speak both Chinese and Japanese. One shopkeeper said that Chinese business people used to buy coral products until April 2016 when a new Chinese tax policy on products purchased abroad was implemented.

Mainland China (Beijing)

Five jewellery markets, one street with many independent jewellery shops and one area with a high concentration of department stores in Beijing were surveyed for coral items in February 2017.

Of the ~1,800 jewellery stalls and shops surveyed in the five markets, 1.2% (20 shops) were offering precious coral items for sale, ten (50%) of them offering a variety of jewellery including coral, while eight (40%) were selling only coral products and two were selling only ivory and coral products. Of the 14 department stores surveyed, 35.7% (five stores) contained stalls offering coral products.

The species/colour of *Corallium* coral offered for sale at the markets/stores were *C. japonicum* (Aka Coral), *C. elatius* (Momo Coral) and *C. rubrum* (Mediterranean Red Coral; Shading Coral), with a few pale pink coloured corals, *C. konojoi* (White Coral) and old coral items. Shopkeepers were usually unsure about the origin of Red Coral products, however some mentioned that their company imported the products from Taiwan POC or Japan, and some knew Aka Coral was from Japan, Momo Coral from Taiwan POC, Shading Coral from Italy, and Pink and White corals from Taiwan POC.

The shopkeepers said the products were processed in various places including Taiwan POC, Japan, Suzhou, Shenzhen and Beijing. Although there appeared to be stalls with their own workshops that could process corals, most of the coral specialist shops had their own factories/suppliers. These processing factories tended to be located outside Beijing due to high labour costs in the city.

The market survey found Aka Coral to be the most expensive, followed by Momo Coral and Shading Coral. The unit price of Aka Coral ranged from RMB100 (USD15)/g to over RMB10,000 (USD1,522)/g. The larger and darker corals were, the more expensive they became. The price also varied depending on their shape; balls tended to be more expensive than other shapes due to the low yield ratio during processing. The price of final products varied considerably as some were decorated with gold, diamonds and/or had elaborate designs.



20 OF ~1,800
shops and stalls surveyed offered
precious coral products for sale

35.7% OF DEPARTMENT STORES
stores surveyed contained stalls
offering coral products

SPECIES ON OFFER
were *C. japonicum* (Aka Coral), *C.*
elatius (Momo Coral) and *C. rubrum*
(Mediterranean Red Coral; Shading Coral)



Red Coral products for sale at a jewellery market in Beijing

Although the price of Momo Coral was generally lower than Aka Coral, their price ranges overlapped, depending on the size and quality of the pieces. The price of Shading Coral was not comparable with that of Aka Coral and Momo Coral pieces as the size of Shading items (e.g. rosary beads) was usually much larger than pieces made from the other two.

Several traders said that the price also varies depending on the age of the products; the newer the item is, the more expensive it tends to be. For example, one stall was offering two similar Red Coral rosaries; one, which it said was purchased about 3–4 years ago was priced at RMB8,500 (USD1,294) while the other more recently purchased one was RMB20,000 (USD3,045).

Most shopkeepers said the price is rising and was expected to continue to do so in the future. One trader claimed the price had increased by 20–30% a year, while another insisted the price had doubled every three years. However, one shopkeeper said the price had peaked one or two years ago and had been gradually falling subsequently. Speculative purchasing had led to the price increase but the bubble had burst.

Almost all of the shopkeepers said the price was rising as the raw materials, especially Aka Coral, were becoming rare. One shopkeeper added that the increase was also due to exchange rates (i.e. weak Chinese currency). Although changes in demand were rarely mentioned, two shopkeepers noted that the anti-corruption campaign by the Chinese government, which began in November 2012, had led to a slight decrease in demand.

Most shopkeepers noted that consumers tend to purchase Red Coral products as gifts, and all shopkeepers said that Red Coral products are suitable for all ages as there are various designs. One shopkeeper said daughters buy for their mothers and vice versa, while another said Beijing is the largest market in mainland China. Yet another said people from outside Beijing mainly purchase Red Coral products and that as disposable income rises, people buy luxury items such as coral products. Some traders noted demand in Red Coral in Beijing is related to religious (i.e. Buddhist) beliefs.

Most coral specialist shops displayed the permit required under the Wildlife Protection Law to sell *Corallium* products (see Figure 1, section 3.2), although antiques and other jewellery shops with smaller numbers of coral products did not mention the permit. Some shopkeepers with a permit said that shops without permits might be selling fake items. One shopkeeper who did not seem to have a permit knew it was illegal to sell coral products without one, but insisted small-scale trade is acceptable.

Taiwan POC (Taipei)

Jianguo Holiday Jade Market and two precious coral shops in Taipei were visited in February and April 2017. Jianguo Holiday Jade Market is a large market open on weekends. More than 800 stalls sell a variety of commodities including jade, ivory, Chinese teapots, gemstones, and agarwood.

Owing to the limited timeframe available for the survey, the number of shops visited was limited; approximately 20 stalls were found to be selling *Corallium* coral products. Of these, 10 were only offering precious coral products, most of which were *Corallium* corals, with a very limited number of black and/or golden corals. In four stalls, roughly half of the commodities were *Corallium* corals, and in five jewellery stalls other jewellery was dominant but some coral products were found.

Coral products with different colours and of various types were found during the survey in Jianguo Holiday Jade Market. According to traders, Aka and Momo corals are the main *Corallium* corals offered in the market, while some Shading, White and very few Angel Skin corals were also observed. Most of the *Corallium* products were various sizes of loose beads or necklaces/bracelets made from beads. Coral twigs, which can be used as pendants for necklaces, bracelets, accessories and ornaments, were also found; Aka and Shading coral twigs were only polished whereas Momo Coral twigs (~10 cm) were polished and curved. Large carvings were rarely seen in the market.

Shopkeepers did not clearly mention who their main customers were, although during the survey, a citizen from Taiwan POC and young female tourists from mainland China were the main buyers of coral products at Jianguo Holiday Jade Market and at a coral jewellery shop respectively.

Most of the semi-worked products, such as beads, twigs, carved Momo twigs were sold by weight. Sellers separated their products into various

JIANGUO

Holiday Jade Market was surveyed, known to sell commodities including jade, ivory, and agarwood

20 STALLS

were found to be selling *Corallium* coral products in Jianguo market

CUSTOMERS

from Taiwan POC and mainland China were observed buying coral products

SEMI-WORKED

products, such as beads, twigs, and carved twigs were sold by weight

INDEPENDENT SHOPS

selling coral products were also visited, whose products were priced much higher than in the market



categories based on the colour, species, size and shape, and offered them at different unit prices. While Aka Coral with a dark red colour fetched up to TWD10,000 (USD332) per gramme, semi-worked Momo Coral ranged from TWD300 (USD10) to TWD500 (USD17) per gramme.

Two independent shops famous for *Corallium* jewellery products were also visited. One a store specialising in *Corallium* jewellery and the other a shop that also offered pearl jewellery. Both shops had been in the *Corallium* jewellery business for a long time with chain stores in Taipei and other cities in Taiwan POC. Both shops targeted tourists. Aka, Momo and Shading coral products were found in both shops. Necklaces and bracelets were the most common products. Most of the *Corallium* items were in classical styles; some were simply made with coral beads or were of various shapes of cabochon *Corallium* with a precious metal. The price of *Corallium* items in these two shops was much higher than in the Jianguo Holiday Jade Market. One Aka cabochon pendant 1.5 cm long was priced at more than TWD60,000 (USD1,994). Shopkeepers in these shops said they could issue certificates to prove the products were genuine; for instance, they could guarantee their products were Aka Coral, not Shading or Momo corals.







CHAPTER 6
CONCLUSIONS

CONCLUSION AND DISCUSSION

This report provides a brief overview of the trade in CITES-listed and some other *Corallium* species in East Asia, based on available production and trade data and physical market surveys. While Customs data suggest the price of unworked *Corallium* corals rose over the past five years, data sources examined for this report, as well as physical market surveys, showed no clear consumption changes in the region.

According to the CITES Trade Database and Taiwan POC CITES trade data, total global imports of CITES-listed raw *Corallium* corals were 210 t and ~80,000 pieces between 2011 and 2015. Imports of raw coral (by weight) reached ~145 t in 2011, after which imports declined considerably, with 5 to 15 t being traded during 2013–2015. Additionally, more than 20,000 pieces of raw coral were imported globally in both 2011 and 2012, although the annual number of imported raw corals has declined since 2013, with 4,600–9,000 pieces being traded annually during 2013–2015. Therefore, the trade in raw coral imports during 2011–2015 appears to be declining. Of the total raw coral imports between 2011 and 2015, *C. japonicum* (Aka Coral) was the dominant species in trade, accounting for 61% by weight (~129,000 kg) and 37% by number of pieces (~27,000 pieces). The main exporter of raw corals was Japan, by weight and number of pieces, although the quantities involved varied depending on the year. Taiwan POC was the main importer of raw CITES-listed *Corallium* corals between 2011 and 2015.

CITES trade data, as well as Japan and Taiwan POC's Customs data indicated no clear trend in the weight of unworked coral traded over the years, while exports from Japan to Taiwan POC seem to be in a cyclical wave of higher to lower trade every three years. This implies that traders and processors may not regularly export/import as precious coral materials can be kept for years.

Japan and Taiwan POC's Customs data suggest that the value per kilogramme of coral materials exported from Japan to Taiwan POC may have increased gradually from 2007 and reached a peak at around USD12,000–12,700/kg in 2013, after which the price dropped in 2015 before increasing again in 2016 to around USD9,000/kg. In Taiwan POC, the average transaction price for raw materials reportedly increased from USD900/kg in 2009 to USD7,500/kg in 2014 (Tang, 2014), with a similar trend in prices of imports from Japan (USD930/kg in 2009 to USD9,300/kg in 2014). Although CITES listings are sometimes said to lead to increased prices and illegal trade, it was not clear to what extent the CITES listing of *Corallium* corals, which came into effect in 2008, had any impact on trade; exports of unworked coral from Japan to Taiwan POC doubled in 2008 compared to the previous year, and although the export value also increased from 2007 to 2008, it increased considerably after that (2010–2016).

Although previous studies and media reports suggest that demand for *Corallium* corals increased in mainland China in recent years leading to higher prices for unworked corals, available data did not clearly support this. According to CITES trade data, mainland China has reported fewer imports of *Corallium* corals; ~40 kg and 231 pieces during 2008–2015, most of which were imported from Japan (100% by weight and 75% by number of pieces). According to Japan Customs, the total amount of unworked coral exported from Japan to mainland China was only ~120 kg and annual exports did not show any increase between 2008 and 2016.

While Taiwan POC CITES trade data and Customs data suggested that a significant amount of CITES-listed *Corallium* corals could have been exported from Taiwan POC to mainland China in the last decade, neither showed this to be increasing. Taiwan POC Customs data suggest that exports of coral and coral products from Taiwan POC to mainland China exceeded 26,000 kg between 2007 and 2016, although it was in decline over the years. Mainland China was the leading destination of “coral and similar material” from Taiwan POC during 2009–2012 with exports reaching a peak in 2012 at ~8,600 kg, after which trade fluctuated from 490 kg to 1,100 kg between 2013 and 2016, although it is unknown to what extent Taiwan POC Customs export data include trade in non-*Corallium* corals and non-CITES-listed *Corallium* corals (e.g. *C. rubrum*). Taiwan POC CITES export data, derived from the quantity for which certificates were issued, showed that annual exports of unworked *Corallium* corals from Taiwan POC to mainland China exceeded 2,700 kg in 2011, after which they declined and ranged from 990 kg to 1,300 kg during 2012–2015. As the trade between mainland China and Taiwan POC is not recorded in the CITES Trade Database, a potentially considerable trade between these markets may be obscured. The scale of unreported and/or illegal imports into mainland China is also unknown.

Market surveys in Japan, Taiwan POC and Hong Kong SAR revealed that tourists from mainland China may play an important role as consumers of precious coral products

Such tourists can bring the products back to mainland China with receipts to verify purchases. As movement of specimens as personal or household effects is rarely reported, it is unknown to what extent precious coral products are transferred from each country/territory to mainland China in this fashion. This makes it difficult to analyse the trade, demand and consumption of precious corals.

Although Japan and Taiwan POC’s Customs data and CITES trade data are not completely comparable, analysis revealed that there are large discrepancies between these datasets, suggesting some trade was misreported, unreported or illegal. For instance, according to Taiwan POC’s CITES reports, more than 100,000 kg of raw *Corallium* corals were imported from Japan in 2011. However, Taiwan POC Customs data suggest Taiwan POC’s imports of “coral and similar material” in 2011 was less than 8,000 kg, while Japan Customs recorded that Japan exported less than 4,500 kg of unworked corals to Taiwan POC in 2011.

limitations of a CITES Appendix III listing

As discussed in a document submitted at the 17th Conference of the Parties (CoP17) to CITES (CITES, 2016), Appendix III is the least used and most poorly understood of the CITES appendices.

This study found that although the CITES Appendix III listing of *Corallium* corals enabled the listing Party (i.e. mainland China) to prevent or limit exploitation of the species involved and to record trade in listed species, there are some difficulties and technical limitations.

Firstly, implementation of CITES Appendix III is different from other CITES appendices for some Parties. Furthermore, data collected on the trade in CITES Appendix III listed species in the CITES Database may not be as comprehensive. Certificates of origin, but not CITES export permits, are issued by the

Japan Chamber of Commerce and Industry but detailed records of issuance of certificates of origin (e.g. issuance numbers and species-specific information) are not required by the CITES Management Authority. Therefore, the data Japan submits as annual reports may lack a considerable number of trade records.

Analysis of trade data and market surveys suggests that while CITES-listed *Corallium* corals are widely traded as jewellery, trade in such jewellery is rarely recorded in the CITES Trade Database. Less than 5,800 pieces were reported to be traded as jewellery between 2011 and 2015. The reasons behind this, and whether the industry or authorities have set out guidelines for trade in processed CITES-listed *Corallium* corals, should be investigated.

In addition, previous studies and the findings of this survey suggest that a significant amount of *Corallium* corals are traded as personal or household effects. As the purpose of CITES Appendix III is to control the commercial trade in specimens that first appear in international trade from the country that listed the species in CITES (Resolution Conf. 9.25), monitoring of the movement of specimens as personal or household effects is outside the scope of the Convention unless it undermines the purpose of the regulation (e.g. hiding illegal trade). Therefore, the trade in *Corallium* corals could be significantly larger than trade statistics indicate.

Another issue is that current provisions for corals under CITES pertain to stony corals (in the orders Helioporacea, Milleporina, Scleractinia, Stoloniifera, and Stylasterina) listed in CITES Appendix II and these provisions do not apply to *Corallium* corals, whose biology, harvest and trade is quite different. For example, the definitions of “raw coral”, “live coral” and “dead coral” under CITES Resolution Conf. 11.10 (Rev. CoP15) do not apply to *Corallium* corals as currently it is likely that unworked dead *Corallium* corals are traded as “raw corals”, a category under which stony corals are rarely traded.

In addition, analysis of CITES trade data and Taiwan POC’s CITES-related data revealed that both weight (kg) and number of pieces are frequently used as the units of measure for CITES-listed *Corallium* corals, which makes analysis of the quantities in trade difficult to determine. The Guidelines for the preparation and submission of CITES annual reports, which was produced following Resolution 11.10 (rev CoP15), states that the number of pieces is the preferred unit of measure, and that weight (kg) should be used as an alternative unit for raw coral. Although major implementation issues may not have arisen, it is recommended that the relevant CITES Committees and Parties consider whether provisions and explanations for *Corallium* corals are needed as well as definitions and preferred units of measure (e.g. raw corals: weight (kg) and carvings: number of pieces).

At CITES CoP17, Parties approved Decisions to direct the Standing Committee to consider the development of guidance on the application of Appendix III CITES listings, which includes possible guidance for exporting and importing countries with respect to the effective implementation of Appendix III listings and measures to address suspected illegal international trade in Appendix III-listed specimens (Decision 17.303-305²³). It is expected that the issues presented in this report would be discussed at relevant CITES meetings, leading to effective implementation of such listings.

²³ <https://cites.org/eng/dec/valid17/81897>

role of Customs data for sustainable use of *Corallium* corals

Trade data play an important role for resource management as these are used as a proxy for monitoring populations of *Corallium* corals (CITES, 2017) and complement harvest data which can be flawed due to under-reporting, misreporting and illegal harvesting.

Customs data can also be an essential indicator of trade in high-priced specimens such as precious corals. Currently no countries/territories have Customs codes differentiating *Corallium* corals from non-*Corallium* corals, or species-specific Customs codes. Although Japan and Taiwan POC have some coral-specific Customs codes, the definitions of these codes are not clear (e.g. the difference between “coral and similar material” and “worked coral materials” in Taiwan POC) and Customs codes in one country/territory are not necessarily comparable to codes found in others.

In addition to differentiating *Corallium* corals to species level and from non-*Corallium* corals, monitoring of live colonies of *Corallium* corals is of importance for conservation and sustainable use of these species. It would be a considerable challenge, however, to expect Customs officers to be able to identify and differentiate between live and dead colonies, which limits the ability to use trade regulations and enforcement as a tool to achieve conservation goals. This highlights the importance of harvest regulation, monitoring of harvests and reporting of them. Accurate data for harvesting of live colonies by species and a system to use these data for resource management is essential in order to achieve sustainable use of *Corallium* corals. There is a concern that current harvesting management of *Corallium* corals is insufficient and should be better informed, using the best available scientific information.

Whilst catch production reported to FAO during 2008–2015 was 122 t globally, the CITES Trade Database and Taiwan POC’s annual reports showed that more than 174 t of raw corals of CITES-listed *Corallium* spp. were taken from the wild after the listing came into force in 2008 and were traded between 2011 and 2015. Aside from the possibility of double or multiple counting of the same item, this discrepancy between production and trade data implies there could be under reporting in catch production and/or the occurrence of illegal harvest and trade.

This is more clearly shown in the trade in *Corallium secundum*, which seems to be unreported and/or misreported. Harvest of *C. secundum* has not been reported to FAO since 1990, except for 7 kg by Taiwan POC in 2015 and 2016 (FAO, 2018). However, 11.4 t and ~50,500 pieces of raw *C. secundum* were recorded as taken from the wild, according to the CITES Trade Database and Taiwan POC CITES trade data, between 2008 and 2015. Japan and Taiwan POC, which were specified as important sources, are urged to investigate if harvest production is properly reported by the harvesters and to FAO.

Many traders who were interviewed during the market surveys mentioned that *Corallium* corals, especially Red Coral, are becoming scarce, although some of the sellers may have done so to promote the rarity appeal of their precious coral products. Conversely, several shopkeepers in Beijing were unaware of where Red Corals originate, nor whether a permit was required to sell precious coral products in mainland China. It is clearly important to raise awareness about *Corallium* corals and pertinent international and national regulations in relevant countries/territories. Developing a traceability system for precious coral products could help to prevent illegally sourced or traded products from entering the market and also deepen understanding of the need for sustainable use of precious coral resources.



conclusions

In conclusion, the market survey data collected and analysed for this report indicate that the trade and demand for CITES-listed *Corallium* corals has changed over the last decade, but this is not fully reflected in the available CITES and other trade data.

This could be due to a number of factors, including the inconsistent application of Appendix III CITES listings, unreported trade as personal or household effects, and illegal and unreported trade. As such, many uncertainties surrounding actual traded quantities and dynamics for CITES-listed *Corallium* corals exist. Additionally, harvest production data may not be accurate due to under/misreporting of harvest production and illegal coral harvesting in the Northwest Pacific Ocean, driven by the high prices precious corals fetch. Considering that landing data and trade records are often used as proxies for actual population status, owing to the difficulties in monitoring wild populations as noted at the 29th Meeting of the CITES Animals Committee (CITES, 2017), the accuracy of these data needs to be improved so as to contribute meaningfully to the monitoring and sustainable use of precious corals.

As knowledge of the populations and conservation status of *Corallium* corals is limited, there is an urgent need for research in range and harvesting States to gain a better understanding of these issues.

Until science-based harvesting management measures are possible, precautionary approaches towards management of precious coral harvesting activities should be adopted.

It is vital that Japan, mainland China, Taiwan POC and Hong Kong SAR consider their respective and changing roles in the exploitation and trade of these precious resources while strengthening their information sharing, liaison on harvesting management measures, co-operation in monitoring, control and surveillance in the Northwest Pacific Ocean. This report concludes with specific recommendations for authorities in East Asia and CITES to enhance harvesting management, research and conservation activities, and the monitoring and traceability of trade of *Corallium* corals.



CHAPTER 7

RECOMMENDATIONS



DATA ON *CORALLIUM* HARVEST

Collect, record and make publicly available data on harvest of *Corallium* corals at the species level and differentiate live colonies and dead colonies for the purpose of harvesting dependent stock monitoring and relevant management. Harvest data on *Corallium* corals are of importance considering the difficulty in monitoring populations and the fact that landing data and trade records are used as proxies for population studies. Currently, however, harvest production data appear to be inadequate and data collection needs to be improved. Current issues include under-reporting, the lack of a scheme for collecting nationwide harvest data, and differentiating between live and dead colonies.



SURVEY *CORALLIUM* RESOURCES

Allocate resources and carry out research into *Corallium* coral resources. Further research into *Corallium* coral resources is important as it would eventually lead to stock assessment and harvesting management based on scientific information. Fisheries authorities as well as local governments should take responsibility for allocating resources to undertake research regularly in cooperation with research agencies and academics.

TRADE DATA VS. HARVEST DATA

Collect and utilise trade data (available from auctions, domestic trade, export and import), including trade between mainland China and Hong Kong SAR and mainland China and Taiwan POC, to complement resource management and monitoring by comparing with harvest data. Trade data are important and are typically used as a proxy for monitoring populations of *Corallium* corals. Collection of harvest data is essential as noted above, but it can be flawed due to under-reporting, misreporting and illegal fishing. Trade data could also be used to help verify harvest data. Additionally, understanding the trade dynamics allows precautions to be taken when assessing the demand and risk in illegal fishing and trade of *Corallium* corals.

sustainable Management of *Corallium* corals

Central and local fisheries authorities across East Asia, in collaboration with fishermen, fisheries associations, traders, coral trade associations, researchers are urged to:



TRACEABLE TRADE

Encourage traceable trade in *Corallium* corals back to their source.

Building a traceability system for *Corallium* corals back to their source could prevent illegally sourced and/or traded *Corallium* corals from entering the supply chain. It could also raise awareness of the scale of illegal trade.



AWARENESS RAISING

Raise awareness among consumers, including tourists, in collaboration with CITES authorities in destination countries/territories, regarding the rules for importing CITES-listed *Corallium* coral products and their transportation across borders, in co-ordination with retailers, Customs, and tour operators and airlines. As *Corallium* corals are widely traded and regulated by CITES, informing consumers and retailers about relevant regulations and the necessity for sustainable use of these species is critical to ensuring legal trade.

regional co-operation and co-ordination

Fisheries authorities across East Asia, in collaboration with local governments, fishermen, fisheries associations, traders and coral trade associations, are urged to:



DISCUSSION PLATFORM/MECHANISM

Develop a platform/mechanism to discuss coral related issues on a regular basis (e.g. annually) among East Asian countries/territories (Japan, mainland China, Taiwan POC and Hong Kong SAR), who are encouraged to cover issues concerning:

- **Coral harvest production and illegal harvesting**
- **Co-ordinated management of coral harvesting**
- **The development of a co-ordinated surveillance and enforcement regime to eliminate IUU fishing**

Co-operation and co-ordination in East Asia is essential for better resource management as illegal fishing is said to be prevalent, *Corallium* spp. are traded extensively between these countries/territories and the scale of illegal trade is unknown. Coral harvest in the waters of countries/territories is not discussed at the North Pacific Fisheries Commission (NPFC). Sharing information on fisheries (including illegal fishing) and trade would encourage better management and motivate counterparts in each country/territory to address certain issues.



STANDARDISED DATA COLLECTION

Develop and share standardised methods for harvest data collection (e.g. whether live or dead colonies, date of harvest and quantities traded at auctions. Harvest data on *Corallium* corals are important for stock monitoring and management.



INTRODUCE CUSTOMS CODES

Discuss introducing specific Customs codes for *Corallium* corals, separating worked and unworked material and ensure the standardised coral codes are introduced globally or at least across East Asia. Trade data are important as they are typically used as a proxy for monitoring populations of *Corallium* corals. Comparison of production, import and export data can provide insights into how circumvention of official trade controls occurs, and/or the existence of IUU fishing. However, currently there are no standardised HS-6 commodity codes for coral or *Corallium* corals and coral-specific Customs codes in Japan and Taiwan POC are not compatible.



INFORMATION EXCHANGE

Exchange experiences and information between *Corallium* coral range States, especially for *C. rubrum*, and with Regional Fisheries Management Organisations such as the General Fisheries Commission of the Mediterranean (GFCM) to ensure conservation and management measures are complementary. Information from range States should be shared and utilised for conservation of *Corallium* corals distributed in the North-western Pacific.

effective implementation of CITES listing

Relevant CITES committees and meetings, in co-operation with range States are encouraged to:



ALTERNATIVE PROVISIONS

Consider whether alternative provisions are needed for *Corallium* corals as well as the definition and preferred units of measurement (e.g. raw corals: weight (kg) and carvings: number of pieces). The current provisions for corals under CITES are for stony corals (in the orders Helioporacea, Milleporina, Scleractinia, Stolonifera, and Stylasterina) listed in CITES Appendix II, not for *Corallium* corals whose biology, harvest and trade are quite different.



RAISE AWARENESS

Raise awareness and provide information to CITES Parties and importers/exporters regarding *Corallium* corals, to alert Customs authorities to possible inaccuracies and misdeclaration of non-range States as “countries of origin.” The characteristics of *Corallium* corals seem to be less well known to CITES Parties compared to other corals listed in CITES Appendix II. Additionally, although many countries/territories are recorded as the country of origin on the CITES database, CITES-listed *Corallium* corals are only distributed in the Pacific.



STANDARDISED IMPLEMENTATION

Ensure the standardised implementation of the CITES Appendix III listing through developing guidance on the application of such listings. Implementation of CITES Appendix III is different to other CITES appendices for some Parties (e.g. issuance of certificates of origin and reporting) and the CITES Trade Database seems not to reflect the full scale of trade in *Corallium* corals

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