TRAFFIC

REPORT

SHARK FIN AND MOBULID RAY GILL PLATE TRADE

In mainland China, Hong Kong and Taiwan

JUNE 2016

Joyce Wu

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

The designations of geographical entities in this publication, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of TRAFFIC or its supporting organizations concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views of the authors expressed in this publication are those of the writers and do not necessarily reflect those of TRAFFIC, WWF or IUCN.

Published by TRAFFIC
Taipei Office 3F.
No. 92, Ln 106, Sec. 3,
Bade Road, Songshan District,
Taipei City 105, Taiwan

ISBN no:

UK Registered Charity No. 1076722
Suggested citation: Wu, J. (2016). *Shark fin and Mobulid Ray gill plate trade - In mainland China, Hong Kong and Taiwan.* TRAFFIC, Cambridge UK

Front cover photograph: Seafood shop(s) in Hong Kong
Photo credit: Joyce Wu

SHARK FIN AND MOBULID RAY GILL PLATE TRADE

In mainland China, Hong Kong and Taiwan

Joyce Wu

Seafood shop(s) in Hong Kong

This report was published with the kind support of

The Rufford Foundation
www.rufford.org

Shark fins with skin

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS USED IN THE REPORT

AFCD	Agriculture, Fisheries and Conservation Department, CITES Management Authority in Hong Kong Special Administrative Region (SAR)
BOFT	Bureau of Foreign Trade, Taiwan, compatible CITES Management Authority in Taiwan.
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
China CITES MA	The Endangered Species Import and Export Management Office, CITES Management Authority in People's Republic of China.
CNY	Chinese Yuan
CSD	Census and Statistics Department, which keeps import and export data for the Hong Kong SAR
FAO	Food and Agriculture Organization of the United Nations
NDF	Non-detriment Findings
IUCN	International Union for the Conservation of Nature
TRAFFIC	The Wildlife Trade Monitoring Network, a strategic alliance of IUCN and WWF
UNEP-WCMC	World Conservation Monitoring Centre, United Nations Environment Programme
USD	United States Dollar
WCPFC	Western and Central Pacific Fisheries Commission

ACKNOWLEDGEMENTS

This report was made possible with financial support from an anonymous donor, while the Wildlife Conservation Society (WCS) helped support the administration of the grant.

Many people provided support to this report. The author would like to express thanks to all those who helped to make this report possible by providing advice as well as sharing their knowledge on the subject.

The author gratefully acknowledges the Agriculture, Fisheries and Conservation Department, Hong Kong SAR, Stan Shea from Bloom Association in Hong Kong, and many traders and shopkeepers in mainland China, Hong Kong and Taiwan for providing information. The author would also like to thank Yu Xiao and Ling Xu from TRAFFIC for their help with the market survey and data collection, as well as Andy Cornish from WWF International and Erika Reuter from WCS for their review of the draft report.

The author would especially like to thank the reviewers from TRAFFIC: Glenn Sant, Yannick Kuehl, Richard Thomas, Julie Gray, Wilson Lau, Ling Xu and Fei Zhou for their comments and advice on improving draft versions of this report, as well as Sean Lam and Rita Chang for their great support.

EXECUTIVE SUMMARY

Despite shark fin being a "traditional" Chinese product, the trade and marketing of it (and to a lesser extent manta gill plates) changes rapidly depending on where and how profits can be made. Almost every aspect that the research has looked at is dynamic in a way that would have been difficult to predict from the first study (Clarke 2004) ten years or so ago.

Mainland China, Hong Kong and Taiwan have had a long and varied history in the trade of shark fins. Together they account for more than 90% and 70% of the global import and (re)export, respectively, between 2005 and 2011, based on FAO import data[1]. Recent declines in the global trade have also been reflected in the import and (re)export[2] of shark fin from these three countries and territories. However, possible illegal shark fin trade could indicate that the trade decline of mainland China, Hong Kong and Taiwan may not be as substantial as the official data have recorded. Given the lack of knowledge about the scale of under-reporting in mainland China, it is possible that the extent of the decline may be much lower than available data suggest. This report takes a comprehensive look at how the shark fin trade is changing in the three study areas, and provides recommendations to stakeholders to improve compliance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and increase traceability of the trade in shark fins and mobulid ray gill plates.

CITES trade

Based on the CITES species trade data between 2003 and 2013 (Annex 1), global reported shark fin imports and (re)exports were 7,720.7 kg and 1,495.6 kg, respectively. During this period, Hong Kong reportedly accounted for 90% of global reported CITES shark fin imports. This is largely explained by Hong Kong's import of 6,933.4 kg of Basking Shark *Cetorhinus maximus* fins from Norway during 2005, 2008, 2009 and 2102, with only 9 kg of this re-exported to Malaysia in 2006. The next largest importer was Spain, which only reported 602 kg of Porbeagle Shark fin *Lamna nasus* imports during the same period, which pales in comparison to Hong Kong's record on CITES-listed shark fin trade. Singapore, the other important global hub for the shark fin trade, only reported 68 kg of shark fin (Basking Shark) imports in the same period.

Hong Kong's dominance of CITES-listed shark fin trade is not surprising considering it handled 50% of the global shark fin trade (Clarke 2004), and imports shark fin from more than 100 countries

[1] FAO FishStatJ March 2015. http://www.fao.org/fishery/statistics/software/fishstatj/en
[2] (re)export included export and re-export

and territories. Hong Kong re-exports around 50% of its imported shark fin, with more than 60% of this going to mainland China.

As one of the top five shark catchers globally, 70% of Taiwan's shark fin export was to Hong Kong between 2005 and 2014. Taiwan has been identified as one of the hotspots for some of the world's most threatened shark species (Brautigam *et. al.* 2015). However, surprisingly there is no record of exports from Taiwan to Hong Kong of CITES-listed shark fin species.

Customs trade

Overall there are significant declines in the shark fin trade recorded in all three countries and territories based on the officially recorded Customs data. A reduction in shark fin imports and (re)exports began to appear in 2005, and was especially pronounced from 2009 onwards. Hong Kong and Taiwan's decline in shark fin trade was moderate in comparison with mainland China. Hong Kong's imports and Taiwan's exports of shark fin were both stable between 2005 and 2011, but dropped significantly in 2012 and 2013, and remained at low levels in 2014. Trade between Hong Kong and mainland China followed a similar pattern.

Between 2005 and 2014, around 86% of the shark fin that Taiwan exported went to Hong Kong (70%, 5,269 t) and mainland China (16%, 1,209 t). However, the annual export of shark fin from Taiwan to Hong Kong and mainland China followed similar declines in the most recent years, from 2012 to 2014. Exports to mainland China were especially low, dropping to less than 26 t in 2013 and 15 t in 2014.

Hong Kong's shark fin (re)exports to mainland China started decreasing in 2005, and dropped significantly in 2010. The (re)export trade from Hong Kong, however, has been somewhat offset by increases in trade with Viet Nam. Viet Nam has since become Hong Kong's largest shark fin exporting receiver during 2010, 2013 and 2014. This trade reached a peak in 2010, but has slowed down in the latter years. Likewise, Viet Nam has replaced mainland China as the largest importer of Hong Kong's sea cucumber (re)export since 2004 (To and Shea 2012). It is possible that Viet Nam is not the final place of consumption or processing destination, but could instead be used as a transit point for re-routing wildlife products, e.g. to mainland China.

The Customs records of mainland China, Hong Kong and Taiwan for the shark fin trade are not recorded in coding systems that are easily compared. Taiwan uses 11-digit Custom codes for five different shark fin commodities. Hong Kong and mainland China both use an eight-digit Customs code system, shark fin in mainland China is considered as one commodity and aggregated into a

single Customs category, while Hong Kong separates raw and processed shark fin into five different shark fin commodities. Due to these differences, the total (gross) annual import and (re)export volumes of shark fin, without separating different commodities, from mainland China, Hong Kong and Taiwan were used for comparison.

The import and (re)export data comparison reveals that Hong Kong's system of capturing trade data is more thorough than those used by mainland China and Taiwan. Hong Kong reported higher volumes of trade with Taiwan, regardless of imports and (re)exports (Annex 6). The differences were especially large for trade from Hong Kong to Taiwan. This may be because of Taiwan's import tariff, which provides less incentive to report accurately compared with Hong Kong, which is a free trade port.

A similar pattern was also found for the trade between Hong Kong and mainland China. Hong Kong reported much higher export volumes (around 46 times that of mainland China's reported import volume) to mainland China. However, Hong Kong reported fewer imports from mainland China than were recorded by the China Customs as being exported to Hong Kong from mainland China.

A major crackdown on the shark fin industry was taken in mainland China at the end of 2012 because of the violation of import tariff regulations (Anon., 2014d). This case indicated that some shark fins (re)exported from Hong Kong to Viet Nam eventually entered mainland China.

Online markets

Only a limited amount of shark fin advertisements and sellers were detected due to the "No shark fin sales" policies of several e-commerce platforms. Some shark fin e-commerce stores were found on business to business (B2B) websites which had the ability to handle large inventories of shark fin and shipments. There were more advertisements of mobulid ray gill plates found on websites which may be due to a lack of related restrictive policies of the e-commerce platforms for this product, recognizing shark fin is on the prohibition list. However, most of the advertisements and sellers of mobulid ray gill plates were on consumer to consumer (C2C) e-commerce websites. The sellers and consumers of mobulid ray gill plates tend to deal in small amounts of product at any one time. Most mobulid ray e-commerce shops were located in southern China and sellers in Hong Kong are likely to be serving the southern China market as well. In contrast, shark fin e-commerce shops are located along the whole coast of mainland China. In total, 85% of all e-commerce shops with identified locations are situated near or south of Shanghai; 79% of those shops are found in Guangdong Province.

An earlier survey found that Guangzhou was the centre for mobulid ray gill plates trade (Heinrichs *et al.* 2011). Based on the geographic distribution of e-commerce shops, it appears as though the market for mobulid ray gill plates is limited to four coastal provinces in southern China, especially in Guangdong, and most likely consumed by households as a tonic, as opposed to being consumed in restaurants and hotels. Shark fin consumption is still relatively robust along the coastal cities, and may start to expand to inner cities along the Yangtze River. Of the 144 e-commerce shops with known locations, 140 were located in the coastal provinces in mainland China from northeast to southeast China, with the other four shops located in inner provinces: Shenyang of Liaoning, Datong of Shanxi, Wuhan of Hubei and Chengdu of Sichuan (Figure 13).

Physical market

This survey showed that shark fins are still commonly available in mainland China, Hong Kong and Taiwan, even with rising levels of awareness about the unsustainable exploitation of sharks globally and the government of mainland China's No Shark Fins policy[3]. Most of the premises that sell shark fin also offer other products, such as dried seafood and high-priced Chinese medicines. The shark fin premises in Guangzhou/Shenzhen and Hong Kong provided a higher variety of shark fin categories[4], on average 3.3 and 3.4 shark fin categories respectively, than stores in Beijing/Shanghai (3) and Taiwan (2.5). Shark fins accounted for a higher percentage of the goods sold within premises in mainland China (34% in Beijing/Shanghai and 39% in Guangzhou/Shenzhen) than those in Hong Kong (18%) and Taiwan (21%). These dried food stores in Hong Kong and Taiwan are therefore less reliant on selling shark fins for their income. In general, prices for shark fins were higher in Taiwan and Hong Kong than in mainland China.

Based on the responses from shopkeepers, the fins available in Taiwan and Hong Kong are mainly from locally processed sources, 81% and 76% respectively. The figures seem higher for the existing processing factories, especially in Hong Kong. This may result from the fact that part of the processing, such as drying, is conducted in Hong Kong. In contrast, 37% and 14% of shark fin types found in Beijing/Shanghai were processed in Guangdong and Hong Kong, respectively. Only 3% of shark fin categories offered in Guangzhou/Shenzhen were processed in Guangdong, 3% were processed in other locations in mainland China, and none were processed in Hong Kong or Taiwan.

[3] The general policy for official receptions, the purpose of which is anti-corruption, was launched at the end of 2012, when Xi Jinping took the position as the president of China. A more detailed policy came out in December 2013 to ban official expenditure on shark fins, birds' nests and protected wildlife products.

[4] "Category" of shark fins refers to the different shark fin products available in the shops. It is not equal to species of shark, but is instead a combination of species, fin position and even quality or size of shark fin. Some frequently available categories included *Jin Shan*, *Yan Jian, Hai Hu* and *Gou* (caudal).

Sixty-seven percent of shark fin categories sold in Taiwan were primarily sourced in Taiwan (as opposed to "imported"). In contrast, only a limited proportion of shark fin categories available in Beijing/Shanghai (4%) and Guangzhou/Shenzhen (6%) were sourced in China. At the same time, only 11% of shark fin categories found in Beijing/Shanghai and 2% of those found in Taiwan were imported from Hong Kong. Only 1% of shark fin categories found in Hong Kong were claimed to be imported from Taiwan.

Jin Shan Fin[5] was the most commonly reported shark fin type by interviewees in Hong Kong (83% of surveyed shops) and Beijing/Shanghai (77% of surveyed shops). A common trade route for this type of shark fin is for it to be imported, or to have transited from San Francisco, USA, regardless of the species. In Beijing/Shanghai, 20%, of shark fin categories were claimed to be imported from the USA. In Hong Kong, the main importing countries were the USA (27%), Mexico (16%) and Latin America (30%) (according to the shopkeepers). However, the high visibility of *Jin Shan* Fins in stores and the shopkeepers' claim of origin of these products do not match with import data kept by Customs in both mainland China and Hong Kong. Imports from the USA for shark fins to mainland China is equal to 1,060 t, or only 9% of the trade[6], while for Hong Kong it is 16,659 t, or 19% of the trade[7].

In general, shopkeepers did not have knowledge of the corresponding species for 85% of shark fin categories; this percentage was especially high in Beijing/Shanghai (94%). Shopkeepers in Beijing/Shanghai and Hong Kong only identified shark fin categories of one (Blue Shark) and two species (Tiger Shark and Blue Shark), respectively. Shopkeepers in Guangzhou/Shenzhen identified shark fin categories of four species (Tiger Shark, Silky Shark, Ocean Whitetip Shark and Blue Shark). Shopkeepers in Taiwan identified shark fin categories to three species and one genus (Blue Shark, Silky Shark, Ocean Whitetip Shark and Guitarfish). The species information claimed by the shopkeepers does not reflect the full breadth of shark species in the trade, as conveyed through trade data. It is not known how accurate shopkeepers are in their claims about the species being sold, but may be a reflection of the indifference of the market to the specificity of the product, that some shark species can replace another within the shark fin trade. While Clarke *et al*. found 14 species from 40% of auctioned shark fins, in terms of weight, in Hong Kong in early 2000 (Clarke

[5] *Jin Shan* Fin (Gold Mountain Fin) is the Chinese name given to shark fins that were traditionally sourced from the USA and Latin America and imported/transited via San Francisco (Lin, 2010), which is called "Old Gold Mountain" in the Chinese language, because of its gold mining history. *Jin Shan* Fins are valued highly in shark fin markets due to their high quality. The sanitary requirements are considered superior in the USA, therefore only shark fin, frozen and dried, which met the sanitary requirements of the USA enters San Francisco. As a result, *Jin Shan* Fins which are transited or (re)exported from San Francisco have become a symbol of good quality.

[6] 0.12% (14 t) from the USA, 0.38% (44 t) from Canada, and 8.55% (1,002 t) from Latin America

[7] 0.7% from Canada, 2.3% from the USA and 16% from Latin America countries.

et al., 2006), the difference may be due to Clarke's findings being based on trader interviews and this report's findings being based on interviews with retail outlets.

Similar to online markets, the physical markets that offer mobulid ray gill plates for sale were more concentrated in southern China. Of the markets that sold mobulid ray gill plates in Hong Kong, their product diversity, price category and range were lower than those in Guangzhou and Shenzhen.

The following recommendations are made in relation to shark fins and mobulid ray gill plates, which are relevant to stakeholders in mainland China, Hong Kong and Taiwan:

- Hong Kong, as the largest shark fin trading hub, handling up to 40% of global shark fin trade from more than 100 countries/territories, as well as roughly 90% of imports in CITES-listed species between 2003 and 2013, recorded in UNEP-WCMC's CITES Trade Database. However, large inconsistencies in the data exist between trade volume recorded by UNEP-WCMC and those recorded by Hong Kong Customs and Excise Department (7 t compared to 85.823 t during the 11 year period, respectively). Hong Kong, as well as the top 20 shark fin (re)exporting countries/territories, should improve their monitoring and reporting of the shark fin and manta ray gill plate trade to ensure it meets basic reporting requirements under CITES. This could include periodically examining the CITES as well as Customs data with trade partners to identify the possible gaps. To identify/label CITES shark fins and manta ray gill plates separately from mixed species shipments to increase the accuracy of information reporting and recording on the species and volume, as well as issuing appropriate CITES documents for trade.

- Mainland China and Taiwan should ensure that all sharks and rays harvested by and landed in their jurisdictions are legally acquired, traded with the correct species name and with appropriate documents. It is advised that a traceability system for CITES listed shark and ray species could be developed and applied from harvest to the point of first export in all shark and ray catching countries/territories.
- The responsible CITES authorities in mainland China, Hong Kong and Taiwan should enhance awareness of regulations on the shark fin and manta ray gill plate trade to other relevant authorities, such as Customs, quarantine and coastguard, in order to increase the detection of illegal trade. Relevant trainings, including species and products identification, should also be provided if necessary.

- Increase awareness of regulation and product identification among the shark fin and manta ray gill plate trading and processing industries in mainland China, Hong Kong and Taiwan, to increase the support and compliance to CITES by the shark fin industries. Product identification and regulation awareness training should be provided to frontline officers if necessary.
- Register all merchants on the physical and e-commerce markets that are involved in the trade of CITES-listed shark species, and require documented evidence of legal sourcing.
- Increase the knowledge of shopkeepers and e-commerce companies on the CITES regulations, e-commerce policy and legal sourcing practices of shark fins and manta ray gill plates, as well as the importance of correctly labelling information as to the species and origin of the fins and gill plates to enable informed consumer choice.
- Monitor domestic markets and e-commerce websites to verify the legality of shark fins and mobulid ray gill plates available on the market, including the use of correct labelling of species and origin of the products.
- The relevant authorities in mainland China (China CITES MA), Hong Kong (AFCD) and Taiwan (BOFT) should improve the accuracy of their record keeping and reporting of the trade of CITES-listed sharks and mobulid rays to the CITES Secretariat.
- Introduce Customs codes in mainland China and Taiwan to distinguish between raw and processed, as well as dried and frozen shark fins, which would help to enhance trade monitoring.
- Enhance the monitoring and patrolling of trade routes such as between Hong Kong and Viet Nam (and possibly to other countries/territories, e.g. mainland China), especially in the detection of illegal trade in shark fin and mobulid ray gill plates, as well as to research and quantify related trade levels and to develop target strategies to combat illegal trade.
- Authorities in mainland China, Hong Kong and Taiwan should co-operate, including through regular exchange and setting up a joint task force, in order to ensure the legality of trade in shark fin and mobulid ray gill plate.
- Furthermore, the Customs and trade authorities in mainland China and Taiwan need to examine the procedure of trade management and data recording to understand the reason for their trade data reporting lower volumes than their trade partners. This should help clarify whether illegal trade is a component of the overall trade.
- The relevant authorities, such as trade, commerce and fisheries, in mainland China, Hong Kong and Taiwan should conduct regular inventories of shark fins and mobulid gill plates to understand the availability and consumption volume in their jurisdictions, and to verify if the volume unreasonably exceeds the sum of imports and harvests.
- Evidence-led consumer behaviour change approaches should be applied to reduce demand for shark fins and mobulid ray gill plates products in target markets.

- Mainland China's anti-corruption measures, including the ban of shark fin consumption in official receptions, may have contributed to a decrease in consumption and consequently a reduction of availability in the market. This example shows that government-led policy interventions can contribute to decreased consumption and should be explored further.

BACKGROUND AND INTRODUCTION

The life history traits of sharks and rays, which are generally long-lived, mature late and have few offspring, make them particularly vulnerable to over-exploitation. As top predators, sharks play a critical role in ocean ecosystems. Marine sharks and rays are highly threatened, with populations of many coastal and offshore species in serious decline. According to a comprehensive 2014 study (Dulvy *et al*., 2014), around 25% of all sharks, rays and chimera species (Chondrichthyes) are threatened with extinction due primarily to overfishing, whether targeted or incidental.

The 16th Conference of the Parties to CITES in 2013 resulted in the listing of seven species of commercially exploited shark species in Appendix II of CITES (Annex 1). They are: Oceanic Whitetip Shark *Carcharhinus longimanus*; Porbeagle *Lamna nasus*, three Hammerhead sharks *Sphyrna lewini*, *S. mokarran* and *S. zygaena*, and manta rays *Manta alfredi, M. birostris*. The listing of the above species did not come into effect until September 2014, delayed by 18 months to enable Parties to resolve the related technical and administrative issues. Countries and territories have to record the trade of CITES species according to their national regulations and report the records annually to the CITES Secretariat.

CITES regulates international trade in threatened species, whether it involves live or dead specimens or their parts and derivatives (CITES, 2016). CITES includes species in three Appendices, according to the degree of protection they need. Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival. Appendix III includes species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade (CITES, 2016).

The current overfishing of sharks is driven in large part by global trade of their highly-valued products (Dulvy *et al*., 2014). These products include fins, meat, leather, liver oil and, cartilage; and in the case of manta/devil rays; gill plates. Demand for shark fin is driven by the use of shark fin as a traditional delicacy and that for ray gill plates due to their use as a tonic medicine (Whitcraft *et al.* 2014). Due to its high price, consumption of shark fins also denotes high social status. In Hong Kong, for example, shark fin is most commonly consumed at wedding and birthday banquets (Anon., 2011a). It is this aspect that has gained the most attention as a driving cause for shark population declines.

Mobulid Ray gill plate usage

Mobulid Rays (蝠鱝, 鰧鱼, 角鰧, 黑鰧, 角燕) are considered medicinal animals in the Chinese Medicinal Animal Book, dating back to 1983 (Anon. ed., 1983). Two species, *Mobula japonica* and *Manta birostris* were included under Mobulidae in the book. The gill plate and brain of the Mobulid Ray are considered to be medicinal ingredients. The gill plates of both species are believed to have detoxification and anti-inflammatory functions and are used to treat exanthema. They are also used to treat child measles and boils (Anon. ed., 1983).

According to advertisements on e-commerce websites, in addition to detoxification and anti-inflammatory properties, mobulid ray gill plates also have anti-cancer and prolactin functions. Many advertisements recommend putting mobulid ray gill plates into a stew with other common ingredients for a couple of hours before drinking as a tonic to strengthen the body—a non-traditional medicinal use.

General shark fin processing procedures

Fresh or frozen fins go through various stages to end up with dried processed fins – which is the commodity usually found in retail and wholesale dried food markets in mainland China, Hong Kong and Taiwan. These processing stages include drying, soaking in hot water, removing scales, skins and bones, bleaching and drying for package (Mundy *et al*. 2015).

It is estimated that fresh shark fins lose around 75% of their weight after drying, and another 65-70% after the removal of scales, skin, bone and meat (Anon. 2013a).

Shark fin processing factories started to move from Hong Kong to mainland China, such as Jiangmen in Guangdong, from 1986 onwards (Kwong, 2013). Because of air and water pollution, the regulation relating to "offensive trades"[8] was applied to shark fin processing in 1986 (Kwong, 2013).

This research is intended to increase understanding about the current market dynamics of shark fins and mobulid ray gill plates in mainland China, Hong Kong and Taiwan, in order to improve compliance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and increase traceability of the trade in shark fins and mobulid ray gill plates. A current problem of shark and mobulid ray consumption is that most of the supply in the market are unsustainable, untraceable and sometimes illegal.

[8] "Offensive trades" is a term related to polluting business activities. A Schedule of Offensive Trades was declared based on Section 48 of the Public Health and Municipal Services Ordinance and Declaration of Offensive Trades Notice. http://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/ch9/ch9_app_6-2b.htm

METHODOLOGY

CITES trade data[9] on eight species and two genera of sharks and rays (Annex 1), from 2003 to 2013, were accessed and downloaded from the CITES website on 15th October 2015[10]. There were no records for the trade in ray species. Four species of shark and one unspecified species of sawfish were traded by mainland China, Hong Kong and Taiwan between 2003 and 2013. The most recent CITES shark and ray listings did not come into effect until September 2014 and hence information on their trade would not be expected over this period of available data (Annex 1). It is possible that some Parties have not yet reported their 2014 CITES trade data.

Records of shark fin trade data from mainland China, Hong Kong and Taiwan from 2005 to 2014 were purchased from mainland China's Customs[11], and obtained from Hong Kong's Census and Statistics Department (CSD) and Taiwan's Bureau of Foreign Trade, respectively. As there were no Customs codes specific to mobulid ray, mobulid ray gill plates or any fish gill plates in mainland China, Hong Kong and Taiwan (Annex 2), no further analysis on mobulid ray gill plate trade was conducted based on Customs data. Hong Kong, but not mainland China or Taiwan, has clearly separated exports from re-exports in the Customs data. Therefore, in this analysis, the term "(re)export" is used to refer to the trade involving export and re-export.

Mainland China has only one Customs code to record shark fin product trade. There is no separate Customs code for different shark fin commodities. The code was amended in 2012, to change the description from "dried shark fin (Customs code 03055920)" to "shark fin (Customs code 03057100)". Mainland China has two other Customs codes starting with 1604 for preserved/prepared shark fin products. Preserved/prepared products reported under 1604 are processed products, the recorded trade volume, in weight, may include other ingredients and packages. The trade data from these two codes were not included in this research to avoid any double counting. According to Dent and Clarke (2015), mainland China started to record the trade of frozen shark fins from May 2000, but under the same code as frozen shark meat. It is therefore not possible to estimate the share of frozen shark fin from the trade of frozen shark meat for mainland China. At the time of publishing this report, mainland China did not yet have a specific Customs code for frozen shark fins.

[9] CITES trade data from trading partners were used for Taiwan, which is not a Party to the Convention.
[10] The CITES Trade Database was developed and is maintained by UNEP-WCMC on behalf of the CITES Secretariat, and can be accessed via the CITES website http://trade.cites.org/.
[11] China Cuslink Company, Ltd

Hong Kong also uses eight-digit Custom codes, but the coding system is not equivalent to mainland China's system. Hong Kong has Customs codes for five different commodities of shark fins, which are dried shark fin with cartilage, dried shark fin without cartilage, shark fin, salted shark fin with cartilage and salted shark fin without cartilage (Annex 2). The Customs code for "shark fin" (0305-7190) was created in 2012 to record trade for shark fin commodities not elsewhere specified or indicated (NESOI). Hong Kong Customs codes also separate raw and processed shark fins. Hong Kong's Customs data were obtained from the Census and Statistics Department (CSD), which keeps import and (re)export data for Hong Kong SAR. According to Clarke (2002), shark fins with cartilage, commodity description in the Hong Kong Customs coding system, are considered raw and unprocessed material, and shark fin without cartilages are considered processed (with skin, cartilage and meat removed). Clarke (2002) also reported that the Customs code description of "shark fins salted or in brine, but not dried or smoked" actually covers "frozen" shark fins. Hong Kong changed some of its shark product codes in 2012, including the re-classification of wet shark fins as frozen shark meat (Anon. 2014b). To get around this for the purpose of analysis, the frozen shark meat code had to be adjusted for the years 2012 to 2014 in order to capture the proportion that is salted (frozen) shark fin with cartilage (Eriksson and Clarke 2015). Dent and Clarke (2015) reported that HKCSD confirmed, in November 2013, that shark fin traders are advised to report frozen shark fins as frozen shark meat rather than as salted shark fins. "Dogfish and other sharks, frozen, excluding fillets, livers and roes" is the full description for frozen shark meat, which did not exclude the "fins" and was the only shark related Customs code in Hong Kong with "frozen" in the code description. This may be the reason for HKCSD's advice to traders. However, Hong Kong has reinstated separate commodity codes for frozen shark meat and frozen shark fins since January 2015 (Dent and Clarke, 2015). Hong Kong also has two Customs codes starting with 1604 for preserved/prepared shark fin products. The trade data from these two codes were not included for this research to avoid being double counted.

While the codes for the five shark fin commodities in Hong Kong were included for analysis with mainland China's and Taiwan's data, only the data for raw (with cartilage) shark fins were used to identify trade trends. This is to avoid double counting, since the same piece of shark fin can cross a border twice, once when raw and again when processed. Trends in Hong Kong's shark fin trade are particularly revealing as it represents 50% of the global shark fin trade (Clarke 2004). Trade trends for shark fin in Hong Kong can therefore be used as an indicator of changes in global demand. The volumes of frozen shark fins were factored for water content when comparing the trade trends in Hong Kong, using a conversion rate of 0.25 (Clarke 2002). A conversion rate of 0.325 (Anon. 2013a) was used to estimate the production of processed dried shark fins from raw dried fins.

Taiwan has Customs codes for five different commodities of shark fins, which are chilled, frozen, dried, salted and smoked shark fins (Annex 2). Taiwan uses 11 digit Customs codes. The Customs code for "smoked shark fin" was only created in 2013. Taiwan's Customs codes do not separate between raw and processed shark fins. The Customs codes for all five shark fin products were modified in 2009 and/or 2013 (Annex 2). The trade records for different Customs codes of all shark fin products were obtained for this research. Taiwan's Customs data were obtained from the Bureau of Foreign Trade in Taiwan. Taiwan also has three Customs codes starting with 1604 for preserved/prepared shark fin products. The trade data from these three codes were not included in this research to avoid being double counted. FAO shark fin trade data between 2005 and 2011 were obtained from FishStatJ to understand the data reporting from mainland China, Hong Kong and Taiwan. The most updated FAO shark trade data were available only up to 2011, before the release of this report.

Searches of seven Chinese-language e-commerce websites were conducted between April and October 2015, to document the shark fins and mobulid ray gill plates availability on e-commerce platforms. The surveyed websites included the two Chinese language business-to-consumer (B2C), one Chinese consumer-to-consumer (C2C), three Chinese business-to-business (B2B) and one English language B2B websites (Table 9).

To understand the shark fin and mobulid ray gill plate markets in mainland China, Hong Kong and Taiwan, 150 dried food product retail outlets from seven cities were selected for quantitative market surveys between May and June 2015 (Table 1). A range of publications, especially in Chinese, on the trade in shark fin and mobulid ray gill plates in mainland China, Hong Kong and Taiwan were reviewed to identify key locations for the survey to plot the trade in this region. Qualitative surveys, including in-depth interviews with sixteen managers or owners from shark fin trading/wholesaling/retailing companies, were also conducted. Both quantitative and qualitative surveys were conducted by professional market surveyors, working with a pre-designed survey questionnaire (Attachment 1). For the quantitative market surveys, trained market surveyors posed as potential buyers to collect information on shark fin and mobulid ray gill plate trade, including product categories, price, species used, origin, etc. Information on shark species and shark fin were recorded based on the responses of interviewees, but not the judgement of surveyors. Eight cities were selected for market surveys based on the information related to high-end consumption, high population density, and the prevalence of a high number of shark businesses: Beijing, Shanghai, Guangzhou, Shenzhen and Puqi[12] in mainland China, Hong Kong as well as Taipei and Kaohsiung in Taiwan.

[12] Only quantitative surveys were conducted in Shenzhen; and only qualitative surveys were conducted in Puqi.

Table 1. Number of shops visited for quantitative survey and managers interviewed for qualitative survey

Cities	Number of shops quantitatively surveyed	Number of staff qualitatively interviewed
Beijing	15	2
Shanghai	15	2
Puqi	0	2
Guangzhou	30	3
Shenzhen	15	0
Hong Kong	30	3
Taipei	30	2
Kaohsiung	15	2
TOTAL	150	16

Note: The quantitative survey was not taken in Puqi, because only a limited number of shops remains in operation. The qualitative interview was not conducted in Shenzhen because of its close location and comparable business operation patterns as in Guangzhou.

Puqi is a small coastal city in the southeast of Zhejiang Province, which has been processing sharks since the early 1980s. Since 2004, however, it has become the main shark processing centre in mainland China, handling 90% of shark processing in mainland China (Anon. 2014a). Most of the sharks processed in Puqi were supplied from Shandong and Fujian in mainland China, as well as from Southeast Asia, Europe and America. According to the China Shark Industry Report (Anon., 2013a), the processing industry in Guangdong focused more on shark fin processing, while Puqi was capable of processing the whole shark; Puqi is famed for its capacity to process many different parts of a shark, including fin, cartilage, skin, meat, oil and head etc.

The shark processing industry in Puqi has decreased significantly in recent years. There were only three processing factories left in 2014 (Anon. 2014c); compared with 21 factories processing 7,000 t per year in 2008 (Anon. 2014a). A shark processing company from Puqi claimed, on the company's introduction, that their products were supplied to Zhejiang, Guangdong, Fujian and Shandong Provinces in mainland China, as well as Hong Kong, Taiwan, Sri Lanka, Japan and Singapore (Anon. 2015a).

The shark processing industry in Puqi reached peak production in 2009 and 2010, and started to fall in 2011 (Sun 2014). A journalist from Hong Kong, who visited Puqi in May 2011, released findings

and images of the shark industry. This report generated a lot of criticism about the shark industry in Puqi; people there claimed that the reduction in production in Puqi was a direct consequence of the report (Sun 2014).

Ida Road in Guangzhou was considered the largest dried seafood wholesale market in Asia (Anon., 2013a). A trader claimed that the dried seafood trade in Ida Road accounted for 70% of the national trade volume more than 10 years ago, but had decreased to less than 10% of that volume in recent years (Anon., 2012b).

The average monthly currency exchange rate in April 2015[13] between Chinese Yuan, Hong Kong dollars and Taiwan dollars, compared with the US dollars, as well as the average monthly exchange rate in June 2012 between Chinese Yuan and US dollars were obtained from online sources[14].

[13] In April 2015, one Chinese Yuan was equal to USD 0.1636, one Hong Kong Dollar was equal to 0.1290 USD and one Taiwan Dollar was equal to USD 0.0327. In June 2012, one Chinese Yuan was equal to USD 0.1579.
[14] http://www.oanda.com/currency/historical-rates/

RESULTS

CITES trade data

A total of two full genera and an additional eight species of sharks and rays are listed in CITES Appendix I and II (Annex 1). There was no record in the UNEP-WCMC database, where the CITES data are hosted, of the trade in any ray species, but the rays and a number of shark listings did not come into effect until September 2014 so they may not appear in the available data sets. Four species of shark and one genus of sawfish (*Pristis* spp) were traded by mainland China, Hong Kong and Taiwan between 2003 and 2013. In total, mainland China, Hong Kong and Taiwan imported shark species from eight countries and (re)exported to four countries. However, only Hong Kong reported imports of the fins (6,933.4 kg) – Basking Shark *Cetorhinus maximus* fins from Norway – and reported the (re)exportation (9 kg) of fins from this same species to Malaysia. Mainland China and Taiwan recorded trade in shark meat or live sharks, but not in fins. Singapore reported that a further 39 unknown units of Basking Shark fins, originating from New Zealand, were re-exported to Hong Kong in 2007, but Hong Kong did not report their import. Globally, after Hong Kong, the next largest importer of fins from CITES-listed species was Spain, which reported only 602 kg of Porbeagle Shark *Lamna nasus* fins imported from Japan during the same period.

Based on the import declarations in the UNEP-WCMC managed CITES trade database, mainland China only reported the importation of 6 kg of Basking Shark derivatives from Australia between 2003 and 2013 (Table 2). However, the USA (2 pieces of skin), UK (1 carving), Norway (700 kg of meat) and Germany (3 teeth of Appendix I *Pristis* spp.) all declared exports of shark products to mainland China between 2003 and 2013 (Table 2). Mexico reported exports of 40 specimens[15] of Whale Shark *Rhincodon typus* to Taiwan in 2009, but these were not reported as imports by Taiwan[16]. Hong Kong had declared imports of some fins, skin and specimens of Basking Shark and Great While Shark *Carcharodon carcharias* from Norway (6,933 kg of Basking Shark fins), UK (1 piece of Basking Shark skin) and South Africa (87 Great White Shark specimens), while Norway and Singapore reported exports of 2,855 kg and 39 unspecified units of Basking Shark meat and fins, respectively, to Hong Kong.

[15] According to CITES annual reports guideline, the term "specimen" is scientific specimens, includes blood, tissue (e.g. kidney, spleen, etc.), histological preparations, preserved museum specimens, etc.
[16] Although Taiwan has regulations for compliance with CITES trade requirements, Taiwan is not a Party to CITES and does not report its CITES species trade.

Table 2. CITES listed shark species imported into mainland China, Hong Kong and Taiwan

Year	App	Taxon	Importer	Exporter	Origin	Importer reported quantity	Exporter reported quantity	Term	Unit
2003	II	*Cetorhinus maximus*	CN	AU	ID	6		derivatives	kg
2005	**II**	***Cetorhinus maximus***	**HK**	**NO**		**5,538**		**fins**	**kg**
2005	**II**	***Cetorhinus maximus***	**HK**	**NO**			**2,855.4**	**meat**	**kg**
2005	II	*Cetorhinus maximus*	CN	US	XX		2	skin pieces	
2007	**II**	***Cetorhinus maximus***	**HK**	**SG**	**NZ**		**39**	**fins**	
2007	**II**	***Cetorhinus maximus***	**CN**	**NO**			**700**	**meat**	**kg**
2008	**II**	***Cetorhinus maximus***	**HK**	**NO**		**700**		**fins**	**kg**
2009	**II**	***Cetorhinus maximus***	**HK**	**NO**		**119.1**	**200**	**fins**	**kg**
2009	II	*Rhincodon typus*	TW	MX			40	specimens	
2011	II	*Cetorhinus maximus*	HK	GB	XX	1		skins	
2011	II	*Carcharodon carcharias*	HK	ZA		87		specimens	
2011	II	*Cetorhinus maximus*	CN	GB	XX		1	carvings	
2011	I	*Pristis spp.*	CN	DE	XX		1	teeth	
2012	**II**	***Cetorhinus maximus***	**HK**	**NO**		**576.3**	**605.6**	**fins**	**kg**
2012	I	*Pristis spp.*	CN	DE	XX		2	teeth	

Source: UNEP-WCMC CITES trade data, 2003-2013

Note: The records of export and re-export were not separated. Even though information on the countries/territories of "origin" was recorded in the CITES trade data, there is some inconsistency as the origin of some species was not within their distribution range, for example, Cetorhinus maximus *from Indonesia.*

Hong Kong had greater reported imports of CITES shark products than mainland China and Taiwan. In contrast, records suggest that (re)exports were greater in mainland China, where many small quantities of Basking Shark, Great White Shark and Whale Shark specimens to the USA and South Korea were declared by these importing countries (although without corresponding declarations from mainland China), compared with Hong Kong's only record of (re)export of 9 kg of Basking Shark fins to Malaysia in 2006 (Table 3). Taiwan (re)exported some Great White Shark

products (12,519 unspecified units of bones[17] and 1 carving) and six live Whale Shark (6 live sharks) to the USA.

Table 3. CITES listed shark species (re)exported from mainland China, Hong Kong and Taiwan

Year	App	Taxon	Importer	Exporter	Origin	Importer reported quantity	Exporter reported quantity	Term	Unit
2003	II	*Cetorhinus maximus*	US	CN			1	carvings	
2004	II	*Cetorhinus maximus*	US	CN	XX	1		skin pieces	
2004	III	*Carcharodon carcharias*	US	TW		12,519		bones	
2005	II	*Rhincodon typus*	US	TW		2		live	
2006	**II**	***Cetorhinus maximus***	**MY**	**HK**	**XX**		**9**	**fins**	**kg**
2006	II	*Rhincodon typus*	US	TW		2		live	
2007	II	*Carcharodon carcharias*	US	CN	XX	5		teeth	
2007	II	*Rhincodon typus*	US	TW		2		live	
2008	II	*Carcharodon carcharias*	NZ	HK	XX	1		bones	
2009	II	*Cetorhinus maximus*	US	CN		20		derivatives	g
2009	II	*Carcharodon carcharias*	US	CN	XX	4		teeth	
2009	II	*Carcharodon carcharias*	US	TW	XX	1		carvings	
2010	II	*Rhincodon typus*	US	CN		6		derivatives	
2012	II	*Rhincodon typus*	US	CN			3	bodies	
2012	II	*Carcharodon carcharias*	US	CN	XX	1		bones	
2012	II	*Carcharodon carcharias*	US	CN	XX	1		bones	
2013	II	*Rhincodon typus*	US	CN		1		specimens	
2013	II	*Carcharodon carcharias*	KR	CN	BR		1	specimens	
2013	II	*Sphyrna lewini*	US	HK		6		specimens	

Source: UNEP-WCMC CITES trade data, 2003-2013

Note: Some species could be naturally occurring in EEZs as well as on the high seas and be landed by countries with distant water fleets.

[17] This probably should be cartilage and not bone as sharks only possess cartilage. However, cartilage is not yet a recommended term to describe products in CITES annual reports.

Discrepancies in data from importing and (re)exporting countries and territories are not uncommon in UNEP-WCMC's CITES trade database. The database shows that only Hong Kong (of the three study areas) had imported and (re)exported shark fins of CITES listed species (Basking Shark), while both mainland China and Hong Kong had imported shark meat.

Mainland China only imported Basking Shark and an unspecified sawfish species, but (re)exported Basking Shark, Great White Shark and Whale Shark products.

The USA reported imports of six specimens of Scalloped Hammerhead Shark *Sphyrna lewini* from Hong Kong in 2013, although the listing for three Hammerhead Sharks were only in effect from September 2014. It is not clear why the USA reported their CITES-listed shark species trade before the listing date, however such practice has happened for other species.

Hong Kong reported 90% (6,933.4 kg) of all shark fin imports from CITES-listed species (7,720.7 kg) between 2003 and 2013. Basking Shark *Cetorhinus maximus* was the only CITES-listed species that Hong Kong reported and Norway was the only country with which Hong Kong had reported trade in its shark fins. Conversely, the shark fins that Norway reported to export to Hong Kong (805.6 kg) only accounted for 12% of Hong Kong's import report from Norway (6,933.4 kg). Hong Kong also (re)exported 9 kg of Basking Shark fins to Malaysia in 2006, which was not reported by Malaysia.

FAO FishStatJ trade data

The most recent FAO FishStatJ[18] trade data were available up to 2011. FAO's record of shark fin imports and (re)exports for mainland China, Hong Kong and Taiwan were, on the whole, in accord with import and (re)export data kept by the Customs of mainland China, Hong Kong and Taiwan, except in a few cases (Annex 3a and 3b).

FAO and Hong Kong Customs data matched well. FAO's records were slightly higher than Hong Kong Customs data for the (re)export in 2006, with a 0.05% or 3 t difference. As with Hong Kong, the FAO and Taiwan Customs data matched well, except imports in 2007, 2010 and 2011. FAO's records were slightly lower than Taiwan Customs data. The data difference for Taiwan and FAO were between 2-10 t, less than 0.1% difference. The mainland China FAO and Customs data also matched well in general. Some small gaps for the import in 2010 (FAO record was about 25 t higher) and export in 2011 (FAO record was about 6 t lower). The import record of 2010, FAO's data was about 20% (25 t) more than mainland China's Customs records.

[18] FishstatJ Global commodities production and trade, ver. 2014-03-06.

FAO data showed that, in general, global annual imports and (re)exports were high in 2005, then slowly decreased towards 2011 (Annex 3b). The share of mainland China's import to global import was 22% in 2005, decreased to 15-19% between 2006 and 2008, 6% in 2009, then further decreased to 1% in 2010 and 2011. On the other hand, the import shares of Hong Kong and Taiwan to global annual import were increasing gradually (Annex 3b). The actual import volume of Hong Kong was stable (between 9,358 t and 10,348 t) from 2005 to 2011, but the global share of imports was increasing gradually from 67% in 2005 to 81% in 2011. Taiwan's global import share increased from 3% in 2005 to 10% in 2011, with the actual import volume tripling (increasing from 434 t in 2005 to 1,260 t in 2011). According to FAO data, in total, mainland China, Hong Kong and Taiwan accounted for 91-93% of global shark fin annual import and 63-77% of global shark fin (re)export each year (Annex 3b). According to Hong Kong's re-export data, mainland China and Viet Nam have significantly under-reported their annual shark fin imports to FAO. Such under-reporting does make it difficult to understand the volume and role that different countries/territories play in the global shark fin trade, although it does help to avoid the problem of double counting, given that the same shipment of shark fins can be transited through borders more than once. According to the estimation by Dent and Clarke (2015) based on the Customs data of major shark fin trading countries/territories, the estimated global shark fin imports were 11% to 18% higher than FAO recorded between 2005 to 2011, the estimated annual (re)export were 5% to 146% higher during the same period.

According to the estimation by Dent and Clarke (2015), the global shark fin import decreased slightly from 2005 to 2014, but the (re)exports increased slightly and peaked in 2007 (23,408 t) (Annex 4). Based on Dent and Clarke's estimation (2015), mainland China, Hong Kong and Taiwan's global share of shark fin trade was lower, accounting for 78-84% of global annual import and 31-47% of global annual (re)export (Annex 4). The annual shark fin import share (percentage) of mainland China, Hong Kong and Taiwan to the estimated world import was close between the FAO and Dent & Clarke (2015) estimation (Annex 3b and 4). The shark fin (re)export share of mainland China to the rest of world was also similar between the FAO and Dent & Clarke estimation. However, the share of shark fin (re)export of Hong Kong and Taiwan to the rest of world was significantly lower for the Dent & Clarke estimation between 2007 and 2011 (Annex 3b and 4). This is because the FAO recorded global annual imports were close to the Dent & Clarke (2015) estimation, but FAO's (re)export data were significantly lower than the Dent & Clarke (2015) estimation, especially between 2007 and 2011 (Annex 3b and 4).

Customs trade data

There are no Custom codes specifically designed for mobulid ray gill plates, or any fish gill plates, in mainland China, Hong Kong and Taiwan. Thus, no analysis on the mobulid ray gill plate trade, based on Customs data, was possible.

Mainland China's shark fin imports and (re)exports

Mainland China has only one Customs code to record the shark fin product trade, there are no separate Customs codes for the different shark fin commodities. In total, mainland China imported around 11,727 t and (re)exported 4,143 t of shark fins between 2005 and 2014 (Table 4).

Table 4. The total import and (re)export of shark fins in mainland China (kg), 2005-2014

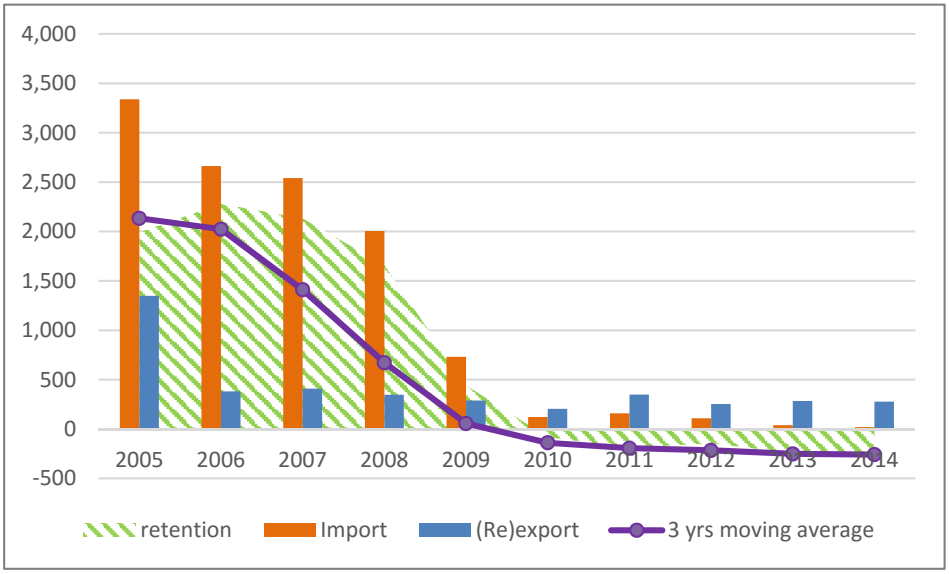
	Import (kg)	(Re)export (kg)
Shark fins	11,727,045	4,143,137

Source: Mainland China Customs data, 2005-2014

In general, mainland China's shark fin imports and (re)exports decreased between 2005 and 2014 (Figure 1). During these 10 years, mainland China's shark fin imports decreased dramatically from more than 3,338 t in 2005 to slightly more than 120 t in 2010. After a small increase to more than 159 t in 2011, the shark fin import has further declined to less than 20 t in 2014 (Annex 3). Compared with the previous year, imports declined by 20% in 2006, another 20% in 2008, and finally at a much greater scale with more than 60% decrease in 2009 and 80% in 2010.

Mainland China's shark fin (re)export volumes were around 1,350 t in 2005, falling dramatically to around 382 t in 2006, and remaining at low levels, between approximately 200 and 400 t, until 2014 (Figure 1 and Annex 3a). Mainland China's annual import volumes of shark fins were higher than (re)export volumes between 2005 and 2009, but this trend was reversed from 2010 to 2014.

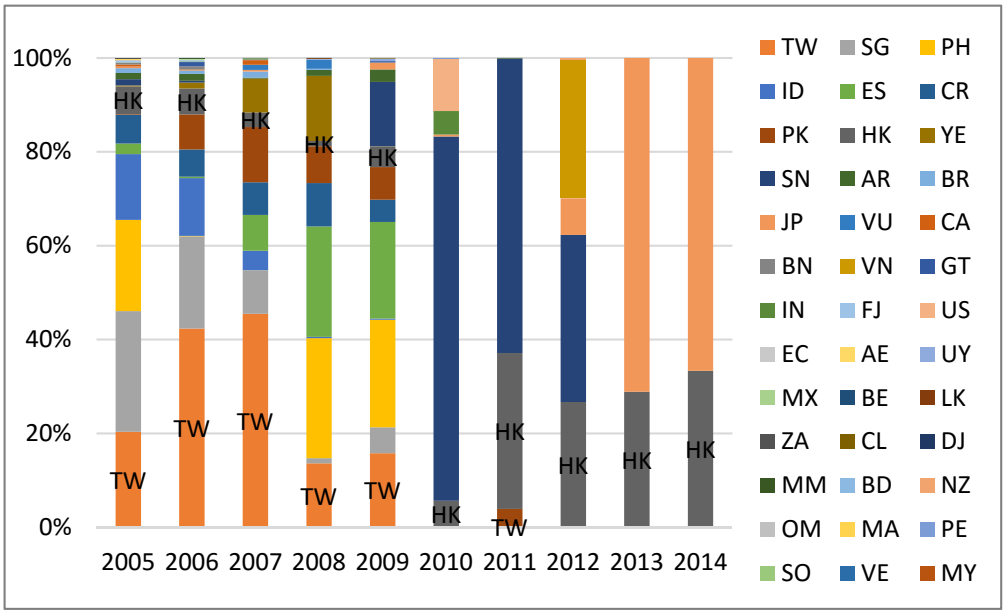
Figure 1. Mainland China shark fins annual import, (re)export and retention (t), 2005-2014



Source: Mainland China Customs data, 2005-2014

From 2005 to 2014, mainland China imported shark fins from a total of 39 countries/territories. Taiwan (3,350 t, 29%), Singapore (1,679 t, 14%), the Philippines (1,331 t, 11%), Indonesia (909 t, 8%) and Spain (900 t, 8%) were the top five suppliers, which together accounted for 70% of mainland China's shark fin imports. Hong Kong ranked 8th, accounting for 5% (585 t) of mainland China's shark fin imports over the 10-year period. During the first five years of this period, mainland China sourced its shark fins from a total of 36 (15-27 annually, 21 in average) countries/territories, but imports originated from only a total of 11 (2-6 annually, 4 in average) countries/territories between 2010 and 2014 (Figure 2). Mainland China imported only 1-6% of shark fins annually from Hong Kong between 2005 and 2010, but this increased to 27-33% between 2011 and 2014. The most consistent trade partners of shark fins to mainland China, those with which it traded for eight or more years, include Hong Kong, Japan and Senegal. The majority of imports from the top five supplying countries/territories occurred in the first five years.

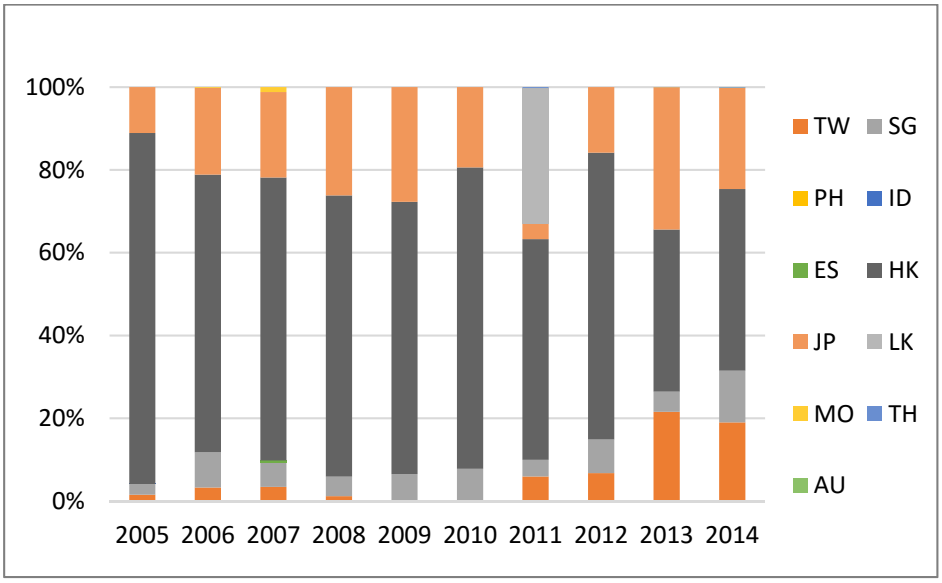
Figure 2. The percentage of shark fins imported by mainland China, from different supplying countries/territories



Source: Mainland China Customs data, 2005-2014

Over this same period, mainland China (re)exported shark fins to only nine countries/territories (Figure 3). Around 69% (2,848 t) of shark fins were (re)exported from mainland China to Hong Kong, 18% (743 t) to Japan, 5% (225 t) to Singapore, 5% (204 t) to Taiwan and 3% (114 t) to Sri Lanka. (Re)exports from mainland China to Hong Kong decreased sharply from 1,144 t in 2005 to 256 t in 2006, and further decreased to 148 t in 2010. The (re)export from mainland China to Hong Kong had risen slightly in 2011 and 2012, then reduced again to 122 t in 2014. Mainland China (re)exported relatively constant amounts of shark fins to Japan between 2005 and 2009. (Re)export volumes declined during the years 2010 to 2012, but recovered to earlier levels in 2013 and 2014, but not as high as in 2005. The (re)exports from mainland China to Taiwan increased slightly during 2013 and 2014. Incidental and mostly low level (re)exports from mainland China to Sri Lanka, Macau, Spain, Thailand and Australia occurred between 2005 and 2014. Mainland China (re)exported shark fin to Sri Lanka only in 2011 (114 t).

Figure 3. The percentage of shark fins (re)exported by Mainland China to different destination countries/territories, 2005-2014



Source: Mainland China Customs data, 2005-2014

Mainland China's Customs data showed that it had imported large amounts of shark fins from numerous countries/territories, only 5% (585 t) in total in ten years were imported from Hong Kong, which seems to refute the common impression that most of the shark fins imported by mainland China were transited through Hong Kong. However, Hong Kong's Customs data reveal that mainland China may be under-reporting the amount of shark fin imports received from Hong Kong, with higher export figures reported by Hong Kong (27,267 t, adjusted with frozen meat) than are recorded by mainland China as its imports from Hong Kong. This discrepancy is likely to have occurred because importers in mainland China avoided tariffs by declaring commodities as "for processing" (Clarke 2002), a classification which was not included in the mainland China Customs statistics.

According to mainland China's Customs data, its shark fin imports not only decreased in volume but were also sourced from fewer countries/territories over time. Dent and Clarke (2015) reported that the decreasing shark fin trade observed in mainland China could be a result of the decreased demand, trade reporting practices and increased domestic production, or a combination of the above.

Taiwan's shark fin imports and (re)exports

Taiwan has Customs codes for five different commodities of shark fin, which are chilled, frozen, dried, salted and smoked shark fins. However, these Customs codes do not separate the raw vs. processed shark fin. Overall, Taiwan imported around 8,732 t and (re)exported around 7,574 t of shark fins between 2005 and 2014 (Table 5). More than 99% of the shark fins that Taiwan imported and exported were either frozen or dried. Around 85% of the imported shark fins were frozen and more than 66% of (re)exported shark fins were dried (Table 5). Taiwan imported 22,182 kg of chilled shark fin, or less than 0.3% of the total, and exported 6,991 kg, or around 0.09%, over the 10-year period. Taiwan only imported and (re)exported very small amounts of salted shark fins from mainland China (6 kg) and to Saudi Arabia (840 kg). The smoked shark fin code was created in 2013, and resulted in no trade records over this study period.

Table 5. Taiwan import and export volumes of different types of shark fin (kg)

Commodities	Import	Export
Chilled	22,182 (0.25%)	6,991 (0.09%)
Frozen	7,399,020 (84.73%)	2,563,345 (33.84%)
Dried	1,310,826 (15.01%)	5,002,866 (66.05%)
Salted	6 (0.00%)	840 (0.01%)
Smoked	0 (0%)	0 (0%)
Total	**8,732,034**	**7,574,042**

Source: Taiwan Customs data, 2005-2014

Taiwan imported shark fin from a total of 60 countries/territories between 2005 and 2014, trading with between 17 and 32 suppliers annually. The top ten suppliers were Spain (1,627 t, 19%), mainland China (1,343 t, 15%), Indonesia (922 t, 11%), Costa Rica (733 t, 8%), Trinidad and Tobago (621 t, 7%), Pakistan (614 t,7%), Singapore (440 t, 5%), Suriname (398 t, 4.6%), Gambia (389 t, 4.5%) and El Salvador (286 t, 3.3%), which account for 85% of Taiwan's total shark fin imports[19]. Taiwan only imported 440 t and 60 t of shark fin from Singapore and Hong Kong, respectively, or 5% and 0.7% of Taiwan's total imports between 2005 and 2014. While Taiwan imported shark fin from at least 25 countries/territories each year between 2008 and 2012, the number of supplying countries/territories dropped significantly in the most recent years, from 29 in 2012 to 17 in 2013 and 2014.

Mainland China (624,248 t in total) was Taiwan's largest supplier of dried shark fin over the 10-year period, gradually increasing from 26 t in 2005 to 117 t in 2011, and then dramatically dropping to 53 t in 2012 and 38 t in 2014.

[19] The top five suppliers accounted for 60% of Taiwan shark fins import.

Indonesia (287 t) and India (184 t) ranked as Taiwan's second and third dried shark fin suppliers, respectively, over ten years, although trade with India ceased in 2013.

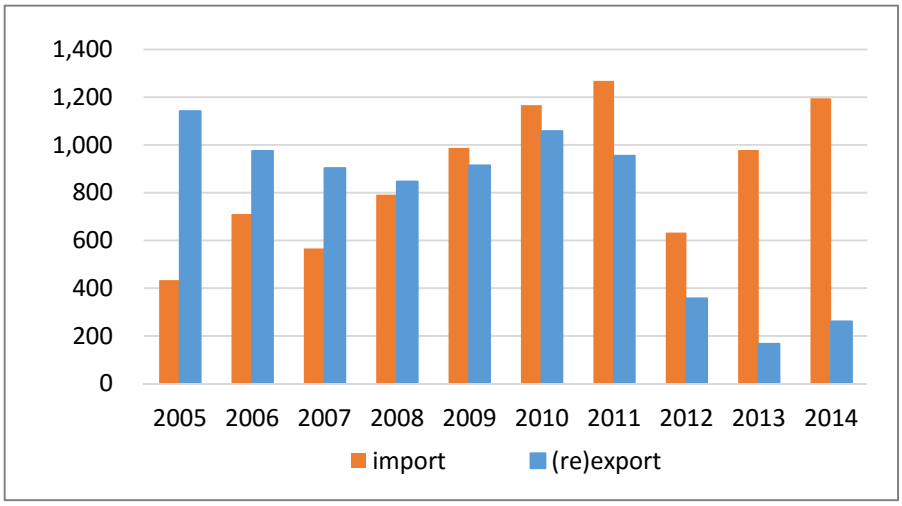
Taiwan's imports of frozen shark fins were typically less than 200 t from any one country/territory, except on a few occasions. The exceptions include more than 200 t of frozen shark fins from Costa Rica (215 t in 2006), El Salvador (215 t in 2006), Panama (203 t in 2008 and 237 t in 2009), Gambia (333 t in 2010) and Spain (309 t in 2013 and 574 t in 2014). Taiwan imported between 32 t to 155 t of frozen shark fins annually from Spain between 2005 and 2012, but these imports increased significantly to 309 t in 2013 and 573 t in 2014.

Taiwan exported shark fins to a total of 18 countries/territories between 2005 and 2014, but only to 6 to 12 importing countries/territories annually. The top five destinations – Hong Kong (70%, 5,268 t), mainland China (16%, 1,208 t), Singapore (8%, 635 t), Japan (4%, 339 t) and Fiji (1%, 50 t) – accounted for 99% of Taiwan's raw shark fin exports.

Although Fiji ranks fifth among Taiwan's shark fin total (re)export recipient countries/territories between 2005 and 2014, it imported shark fins from Taiwan on relatively few occasions (2007, 2009 and 2011). Minor trade partners include the UK, Netherlands, USA, Malaysia and Australia, which imported between 779 and 7,692 kg of shark fins from Taiwan in the same ten-year period.

Taiwan's annual shark fin imports increased between 2005 and 2011, fell dramatically, by around half, in 2012 before increasing again in 2013 and 2014 (Figure 4). The annual (re)export volume for all shark fin commodities had a slower rate of decline between 2005 and 2008, but increased in 2009 and 2010 (Figure 4). After 2010, the annual (re)exports decreased rapidly until 2013 and only recovered slightly in 2014. Taiwan's annual imports were lower than exports between 2005 and 2008, but reversed from 2009 to 2014 (Figure 4). The import volumes had increasingly outpaced export volumes since 2009, reaching a peak in 2013 and 2014.

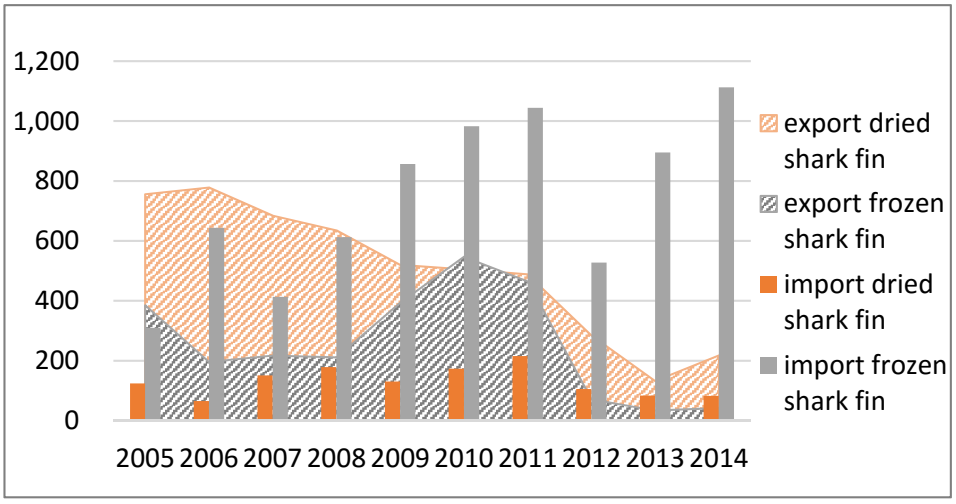
Figure 4. Taiwan shark fin annual import and (re)export (t), 2005-2014



Source: Taiwan Customs data, 2005-2014

Frozen shark fin accounted for around 85% of the total import volume, and frozen shark fin import trends matched the pattern of shark fin imports overall (Figure 4 and 5). Taiwan's annual imports of dried shark fin fluctuated between 82 to 216 t, which peaked in 2011 followed with a more than 50% drop in 2012, and a continued decrease in 2013 and 2014. Dried shark fin (66%) was the main commodity reported among Taiwan's shark fin exports, while frozen shark fin accounted for one-third of export volumes between 2005 and 2014. The export volume of frozen shark fin peaked in 2010 and 2011, but fell dramatically in 2012 and remained at low levels in 2013 and 2014 (Figure 5).

Figure 5. Taiwan annual shark fin import & export for dried & frozen shark fin (t), 2005-2014



Note: The chilled (<0.3% for ten years) as well as salted (<0.01% for ten years) shark fin were traded in small amounts and not in every year.

With the exception of 2005, Taiwan imported more frozen shark fins than it exported over the ten-year period. The gap between Taiwan's annual import and export of frozen shark fins has increased gradually over the ten-year period.

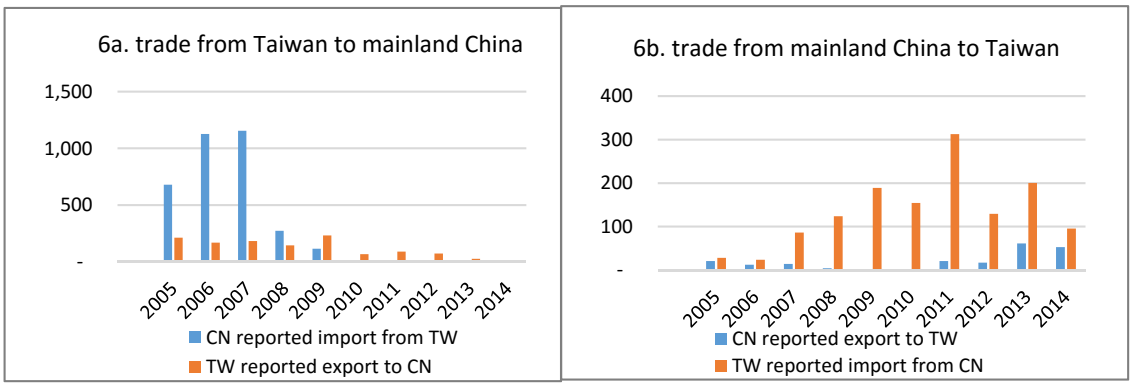
Of the top ten suppliers of Taiwan's shark fin imports, four were in Asia (38%), four in the Americas (23%), one in Europe (19%) and one in Africa (5%). In contrast, 98% of Taiwan's total shark fin exports were to just four importers in Asia (mainland China, Hong Kong, Singapore and Japan), 86% of these to Hong Kong and mainland China.

The decreasing export of frozen shark fin from Taiwan may be the result of lower demand in Taiwan's key export markets, such as Hong Kong and mainland China. The decreasing import by the main global shark fin importers could explain why Taiwan has gradually imported and retained more frozen shark fin. It is not clear to what extent shark fin consumption in Taiwan plays a role in the increases in imports and decreases in exports in recent years. A report in 2012 claimed that the owners of fishing vessels piled up shark fins in their freezers, but are not selling them because of the reducing market demand and decreasing price (Lu, 2012). This suggests that a growing shark fin market in Taiwan is unlikely to be the driver of the observed changes in Taiwan's imports and exports. Taiwan's shark fin exports to mainland China have fluctuated but, overall, show a decreasing trend including a 70% decrease in exports to mainland China between 2009 and 2010.

Comparing the trade volumes recorded by Taiwan and mainland China, regardless of the direction of trade, importers reported higher volumes than exporters did (Annex 5). For the trade from Taiwan to mainland China, mainland China's reported import volume was 2.77 times Taiwan's reported exports volume. For the trade from mainland China to Taiwan, Taiwan's import volume records were 6.6 times China's reported export volume. The data also showed that in earlier years, especially from 2005 to 2007, the shark fin trade between mainland China and Taiwan was dominated by exports from Taiwan to mainland China, but this changed in 2010 when China began exporting more than it was importing to Taiwan (Figure 6).

It is not clear if higher import declarations were due to stricter import inspections on both sides for the bilateral trade. It is equally not clear if there was any connection between the under-reporting of shark fin export volumes by mainland China and Taiwan and IUU shark fisheries. Obviously, traders would be motivated to under-report their export volumes if shark fin without appropriate catch documents were in the trade mix.

Figure 6. The import and (re)export reported for the trade between mainland China and Taiwan (t), 2005-2014



Source: Mainland China and Taiwan Customs data, 2005-2014

Hong Kong's shark fin imports and (re)exports

In order to compare data with mainland China as well as with Taiwan, Hong Kong's five shark fin commodities (raw and processed) were included in the shark fin trade analysis. The frozen shark fin data were adjusted[20] by including the frozen meat component. The water content in frozen fins compared with dried fins was not factored into the analysis.

Hong Kong was handling around 50% of the world's total shark fin exports (Clarke 2004). However, more recent data indicate that Hong Kong probably only accounted for 20-40% of the global shark fin export between 2007 and 2011 due to the significantly increased export share of Thailand[21] (Dent & Clarke 2015). Hong Kong however remains the largest global shark fin importer (Dent & Clarke 2015). Therefore, Hong Kong's trade patterns can be, and are still, somewhat representative of changes in global trade. In order to avoid double counting, only the raw (with cartilage) shark fin data were analysed to assess for trade trends over time. The volumes of frozen shark fin imported and (re)exported by Hong Kong were adjusted, factoring in its water content, before it was used to reveal Hong Kong's trade trends over time. A conversion rate of 0.25 for water content was used (Clarke 2002). Hong Kong's shark fin imports and (re)exports were around 88,738 t and 43,829 t, respectively, between 2005 and 2014 (Table 6 and Figure 7). These figures have been adjusted to include frozen shark meat, but do not factor in its water content. The main commodity in Hong Kong's shark fin trade was raw (with cartilage) shark fins, accounting for 97% of total import and 91% of total (re)export volumes (Table 6). More than half (54%) of the raw shark fin that Hong Kong imported and (re)exported was in frozen form. Most of the processed fin (without cartilage) that Hong Kong imported (92%) and (re)exported (74%) was in dried form.

[20] Trade volumes of frozen shark meat between 2012 and 2014 were included as frozen raw shark fin.
[21] Thailand probably accounted for 34-56% of global export between 2007 and 2011. (Dent & Clarke 2015)

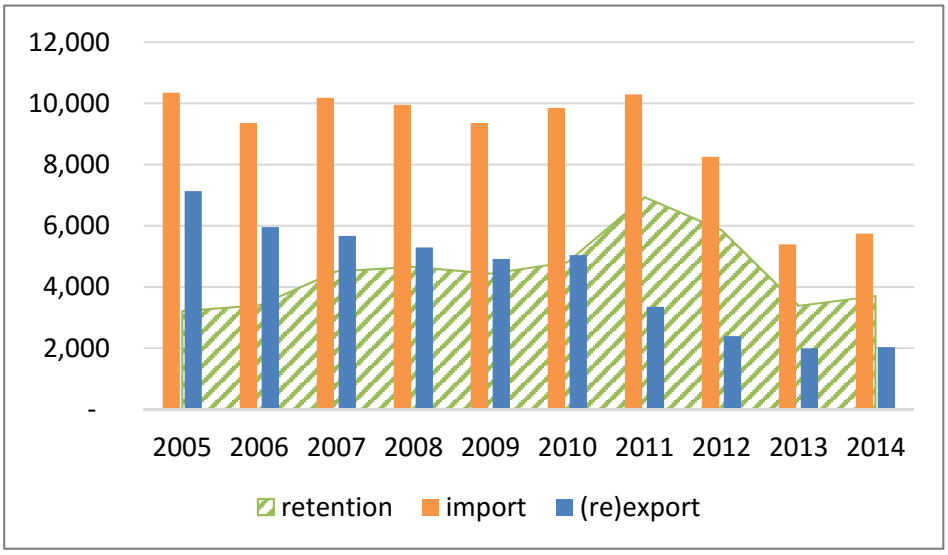
Table 6. Hong Kong adjusted (but not factored) all shark fins import and (re)export (kg), 2005-2014

Shark fin types	Import	(Re)export
dried shark fin with cartilage	*39,631,495 (44.66%)*	*18,652,410 (42.44%)*
frozen shark fin with cartilage	*35,487,519 (39.99%)*	*18,143,430 (41.28%)*
*frozen shark meat**	*10,700,081 (12.06%)*	*3,205,015 (7.56%)*
shark fin	*4,503 (0.01%)*	*26,194 (0.06%)*
Subtotal of raw shark fin	**85,823,598 (96.71%)**	**40,027,049 (91.35%)**
dried shark fin without cartilage	*2,675,823 (3.02%)*	*2,796,417 (6.36%)*
frozen shark fin without cartilage	*238,913 (0.27%)*	*1,006,461 (2.29%)*
Subtotal of processed shark fin	**2,914,736 (3.29%)**	**3,802,878 (8.65%)**
Adjusted Total	**88,738,334**	**43,829,927**

Source: Hong Kong CSD, 2005-2014

Note: Hong Kong changed some of its shark products Customs coding system in 2012 and re-classified wet shark fins as frozen shark meat. The data for frozen shark meat, between 2012 and 2014, were adjusted to show trade trends more accurately in the frozen shark fin trade.

Figure 7. Hong Kong total shark fin annual import, (re)export and retention (t), 2005-2014



Source: Hong Kong Customs data, 2005-2014

Note: Hong Kong changed some of its shark products Customs coding system in 2012 and re-classified wet shark fins as frozen shark meat. The data for frozen shark meat, between 2012 and 2014, were adjusted to show trade trends more accurately in the frozen shark fin trade.

Raw & Processed Fins

Based on the frozen meat and fin category of the Customs data (adjusted but not factored for water content), Hong Kong imported raw and processed shark fins from 115 countries/territories between 2005 and 2014. Spain (27%, 24,082 t), Singapore (12%, 10,530 t), Taiwan (10%, 8,458 t), Indonesia (6%, 5,690 t), United Arab Emirates (5%, 4,167 t), Costa Rica (3%, 2,572 t), Yemen (3%, 2,400 t), Mexico (2%, 2,162 t), the US (2%, 2,032 t) and Japan (2%, 1,791 t) were the top ten suppliers for Hong Kong's shark fin imports, accounting for 72% of Hong Kong's total import volumes (the top five accounted for 60% of the total import volume). Imports from Hong Kong's top ten supplying countries were more likely to be raw than processed shark fins. Only 708 t (0.8%) of shark fin was reported to have been imported from mainland China, making mainland China the 22nd largest shark fin supplier to Hong Kong. More than 71% of the shark fin that Hong Kong imported from mainland China was processed shark fin.

Based on the adjusted but not factored Customs data, Hong Kong (re)exported shark fins to 31 countries/territories between 2005 and 2014. Mainland China was the largest recipient, accounting for 62% (27,147 t) of Hong Kong's total (re)export volumes, followed by Viet Nam (21%, 9,227 t), Japan (4%, 1,841 t), Taiwan (4%, 1,746 t) and Singapore (3%, 1,343 t), which together accounts for 94% of Hong Kong's total (re)exports[22]. Most shark fin that Hong Kong (re)exported to Viet Nam (99.7%), mainland China (94%), Japan (77%), Taiwan (77%), Singapore (76%) and Thailand (91%) was raw, as opposed to processed, shark fin. However, it is not clear if some or all of these imported raw shark fins were processed in these importing countries/territories. For example, research has found that Singapore does not process fins for export (Boon, 2016).

Trade reporting gaps between Hong Kong and mainland China, Taiwan

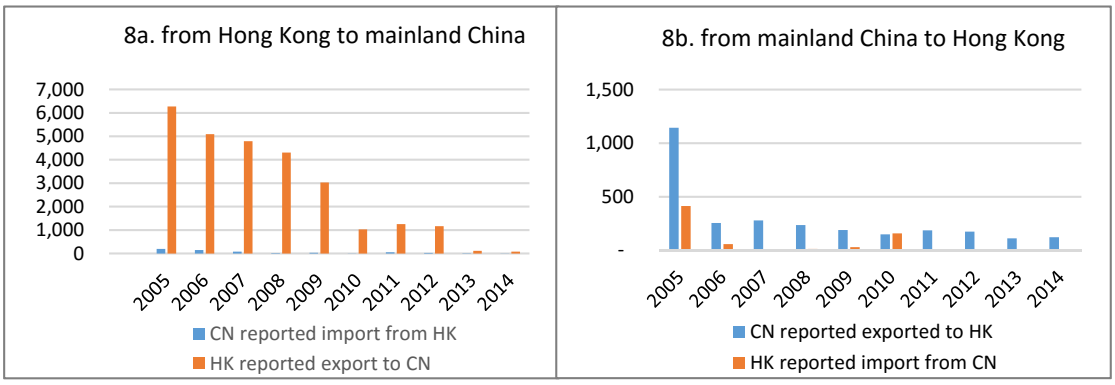
In contrast to the reporting pattern observed between mainland China and Taiwan, exporters in the shark fin trade between mainland China and Hong Kong reported higher volumes of trade than importers. For trade between Hong Kong and mainland China, Hong Kong consistently reported higher export volumes than mainland China reported as imports throughout the ten-year period, from 2005 to 2014 (Figure 8a). In the reverse direction, mainland China declared higher export volumes than Hong Kong declared as imports, in nine out of ten years, with the exception of 2010 (Figure 8b).

[22] Top ten importers accounted for 99% of Hong Kong's (re)export. Macau, Thailand, South Korea, the USA and Canada ranked 6th to 10th.

According to Clarke (2002), importers in mainland China avoided tariffs by declaring commodities as "for processing". This particular classification was not included in the mainland China Customs statistics, thus resulting in a large discrepancy between Hong Kong's exports to mainland China and mainland China's imports from Hong Kong. Such practices apparently still exist. These trade reporting discrepancies were, however, decreasing due to the reduction in re-exports from Hong Kong. With Hong Kong's free port status, it is not clear why Hong Kong recorded fewer imports compared with mainland China's (re)export volumes in the trade from mainland China to Hong Kong.

Clarke (2002) found that the trade data discrepancies were less significant for the southbound trade (from mainland China to Hong Kong). This is also evident in the trade records between 2005 and 2014.

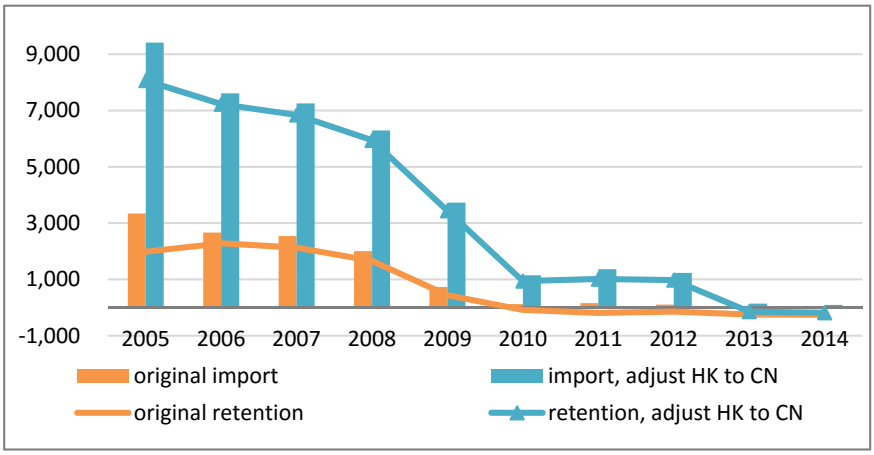
Figure 8. The import and (re)export reported for the trade between Hong Kong and mainland China (t), 2005-2014



Source: Hong Kong and mainland China Customs data, 2005-2014

In total, Hong Kong reported the re-export of 27,127 t (adjusted with frozen meat) of shark fin to mainland China from 2005 to 2014, in volumes between 83 t and 6,273 t annually. After replacing mainland China shark fin import from Hong Kong with Hong Kong's re-export data, mainland China's shark fin total imports increased from 11,727 t to 38,270 t between 2005 and 2014 (Figure 9 and Annex 7). Adjusting for the volume Hong Kong (re)exported to mainland China, mainland China's shark fin imports still showed a large decrease from 2005 to 2010, which then remained stable for two years until 2012, followed by another decrease in 2013 and 2014. The shark fin retention in mainland China (import minus export), largely increased between 2005 and 2009; the negative retention between 2010 to 2012 became positive after adjusting the original annual import with Hong Kong's (re)export to mainland China (Figure 9). However, the adjusted retention in 2013 and 2014 was still negative. Mainland China's own fishing (inshore and high seas) and stocks from earlier years are possible sources of shark fin to fill the gap for this negative retention.

Figure 9. Mainland China shark fin import and retention (t), original as well as adjusted with Hong Kong's re-export to mainland China, 2005-2014



Source: Customs data for mainland China and Hong Kong, 2005-2014

Data included the raw and processed fin commodities, but were not factored with water content

Since 2008, residents in the designated border zone in mainland China have been subject to a zero import tariff if the import value is equal or less than CNY8,000 per person per day (Anon. 2008). This was part of a general policy to boost trade, applied all along the Chinese border.

In November 2012, Customs in Jiangmen investigating a 2010 seafood smuggling case uncovered an illegal trade in shark fin from Viet Nam through Guangxi to Guangdong (Anon. 2013b and 2014d). Ten suspects from two companies, one trading and one processing, were apprehended; 357 t of frozen shark fins (212 t, 59% of total seized products), sea cucumber (3.3 t), fish bone (27 t) and others, worth CNY1.19 trillion in total, were confiscated in late 2012. The trading company, with investment derived from Hong Kong[23], worked with several shark fin traders to under-report the import value of shark fins for over ten years (Anon. 2014d). Further investigation of this case found that this trading company was involved in the smuggling of more than 11,531 t of shark fins, sea cucumbers and other seafood, worth CNY1.13 trillion, between May 2005 and December 2012 (Anon. 2014d). The processor was involved in smuggling 676 t of shark fin and other seafood, worth CNY 62.5 million, between March 2009 and November 2012 (Anon. 2014d). This processor had under-reported by as much as 87.5% of the import value of approximately 72 t of shark fin (Anon. 2014d). The trading company was fined CNY200 million for violation of tariff regulations, and eight out of the ten suspects were sentenced to imprisonment for three to twelve years (Chen *et al.* 2014).

[23] It is not clear if this company was owned and/or 100% invested from Hong Kong. Many shark fin processors in Hong Kong have moved their factories to Jiangmen, Guangdong since 1986 after the regulation relating to "offensive trades" was applied to shark fin processing in Hong Kong.

According to Customs data, mainland China imported 11,668 t of shark fins between 2005 and 2012, 567 t of those were from Hong Kong. Mainland China did not report shark fin imports from Viet Nam during the study period, 2005-2014, other than 32 t in 2012. Hong Kong reported (re)exports of 26,931 t and 6,436 t of shark fins (raw, processed and adjusted with frozen meat) to mainland China and Viet Nam, respectively, between 2005 and 2012.

If Viet Nam's shark fin import is adjusted using Hong Kong's (re)export data, Viet Nam potentially imported at least 6,436 t of shark fin between 2005 and 2012. Even though the shark fin case in Jiangmen demonstrated that large amounts of shark fins were smuggled into mainland China via Viet Nam between 2005 and 2012, only 212 t of shark fins were actually seized. This would account for approximately 3% of the shark fin (re)exported from Hong Kong to Viet Nam over the same period. The remaining amount (re)exported to Vietnam could potentially have been consumed domestically or (re)exported to other countries (including potentially mainland China), or purchased by foreign tourists as souvenirs. Although mainland China was considered to be the largest shark fin market (Dent & Clarke, 2015), there is not sufficient information to estimate how much shark fin is entering mainland China from Viet Nam.

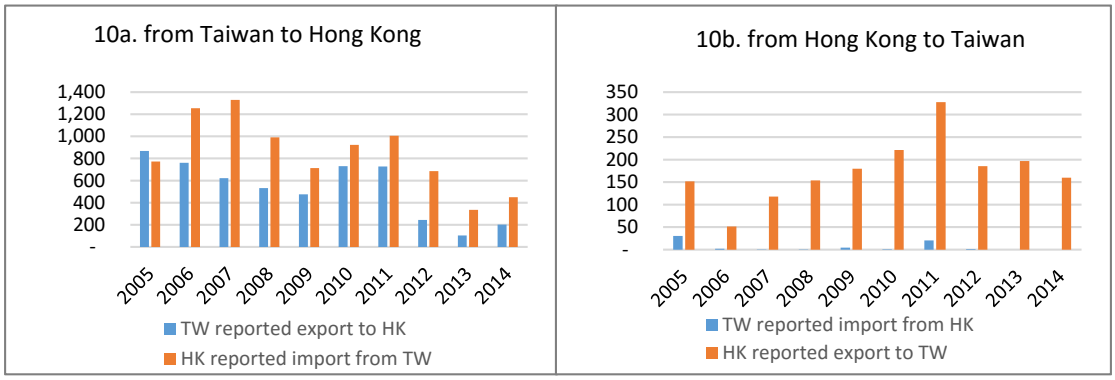
Trade reporting between Hong Kong and Taiwan

Regardless of the direction of trade between Hong Kong and Taiwan, Hong Kong's reported trade volumes were higher than Taiwan's declared volumes in 19 out of 20 cases, from 2005 to 2014 (Figure 10a and 10b).

The Hong Kong-Taiwan reporting discrepancies were greater when Taiwan was the importer than when Taiwan was the exporter. In 2005, the only exception, Taiwan reported higher export volumes than Hong Kong's declared imports. Clarke (2002) observed the same pattern through trade trend research and suspected that the import tariff in Taiwan may be encouraging under-reporting of its imports (Clarke 2002).

Although the trade from Hong Kong to Taiwan gradually increased, peaking in 2011, it was consistently less than the trade from Taiwan to Hong Kong during the ten-year period.

Figure 10. Reported import and (re)export trade between Hong Kong and Taiwan (t), 2005-2014



Source: Hong Kong and Taiwan Customs data, 2005-2014

Processed Fins

On average, only 3% of shark fins Hong Kong imported were processed fins. The proportion was higher in 2005 (more than 10%), and fell to 0.2% to 5% annually between 2006 and 2014. Spain (26%, 749 t), mainland China (17%, 504 t), Singapore (11%, 315 t), Taiwan (7%, 192 t) and the Philippines (6%, 185 t) were the top five suppliers for Hong Kong's processed shark fin imports. However, it is not clear if some or all of the fins were processed in these supplier countries/territories or elsewhere. For example, research has found that Singapore does not process fins for export (Boon, 2016). Mainland China and the Philippines were the only two suppliers that were not top ranking suppliers in Hong Kong's overall shark fin imports, but were significant players in the supply of processed fin to Hong Kong. Around 71% of shark fin that Hong Kong imported from mainland China was processed fin. About 92% of the imported processed shark (not factored) fins from mainland China to Hong Kong were in dried form, with the remaining 8% in frozen form. Around 9% (3% to 16% annually) of the shark fins that Hong Kong (re)exported were processed fins; 74% of these processed (re)exported shark fins (not factored) were in dried form. Mainland China (43%, 1,615 t), Japan (11%, 424t), Taiwan(11%, 406t), South Korea (9%, 345t), Singapore (8%, 321t), the USA(7%, 258t), Canada(5%, 173t), Macau (3%, 121t), Thailand (1%, 46t) and Malaysia(1%, 33t) were the top ten importers of Hong Kong's processed shark fin. South Korea (87%), USA (75%) and Canada (74%) were the only three of these importing countries which imported more processed fins than raw fins from Hong Kong.

Raw Fins

Hong Kong's import and (re)export of raw shark fins (adjusted and factored) were around 51,183 t and 24,016 t, respectively, between 2005 and 2014 (Table 7). Of this, 77% of total import and 78% of total (re)export volumes were in a dried form (Table 7). Around half of raw shark fins that Hong Kong imported, including dried and frozen forms, were subsequently re-exported to other countries/territories.

Table 7. Hong Kong adjusted and factored raw shark fin import and (re)export (kg), 2005-2014

Raw shark fins	Import	(Re)export
dried shark fin with cartilage	**39,631,495 (77.43%)**	**18,652,410 (77.67%)**
frozen shark fin with cartilage	*35,487,519*	*18,143,430*
*frozen shark meat**	*10,700,081*	*3,205,015*
subtotal of adjusted & factored frozen shark fin	**11,546,900 (22.56%)**	**5,337,111 (22.22%)**
shark fin, NESOI	**4,503 (0.01%)**	**26,194 (0.11%)**
Adjusted & factored Total	**51,182,898**	**24,015,715**

Source: Hong Kong CSD, 2005-2014

Note: Hong Kong changed some of its shark products Customs coding system in 2012 and re-classified wet shark fins as frozen shark meat. The data for frozen shark meat, between 2012 and 2014, were used to adjust frozen shark fin trade.

NESOI: Not Elsewhere Specified or Included

When the water content in raw, frozen shark fins was factored in, Hong Kong's top suppliers of raw shark fin imports shifted slightly. Spain (15%, 7,449 t) remains the largest raw shark fin supplier to Hong Kong, followed by Taiwan (10%, 5,002 t), Singapore (8%, 4,061 t), the United Arab Emirates (8%, 3,985 t), Indonesia (7%, 3,681 t), Yemen (5%, 2,394 t), Mexico (4%, 2126 t), Peru (3%, 1607 t), Japan (3%, 1400 t) and Brazil (3%, 1399 t), which together account for 65% of Hong Kong's raw shark fin imports between 2005 and 2014.

When the data were adjusted and factored, both USA and Costa Rica dropped out of the list of the top ten suppliers of Hong Kong's raw shark fin imports, and were replaced by Peru and Brazil. USA (67%) and Costa Rica (73%) supplied a high percentage (before factoring for water content) of raw fin in frozen form to Hong Kong, but 99-100% of raw shark fin exported from Brazil and Peru was in dried form.

On average, and before factoring for water content, frozen raw fin accounted for 54% of all raw fin imported by Hong Kong between 2005 and 2014. Spain (91%) and Singapore (80%) exported a high percentage of frozen raw fin to Hong Kong, while Taiwan (53%) and Indonesia (46%) exported a moderate percentage of frozen raw shark fin.

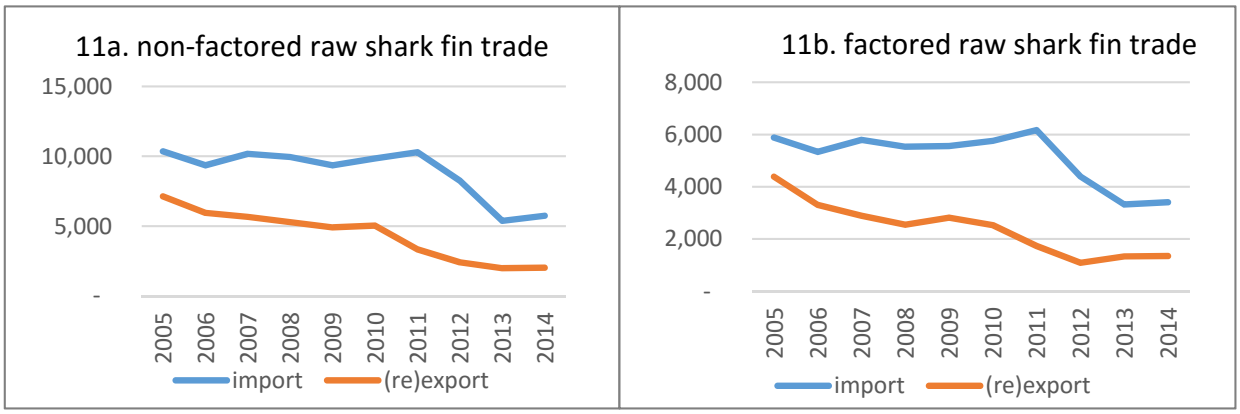
With water content factored in, the top five importers of raw shark fin (re)exports from Hong Kong also changed slightly. Mainland China (57%, 13,781 t) was still the largest market for Hong Kong's raw shark fin (re)exports, followed by Viet Nam (28%, 6,754 t), Japan (5%, 1,308 t), Taiwan (2%, 546

t), and Macau (2%, 461 t), together accounting for 95% of Hong Kong's total raw shark fin (re)exports between 2005 and 2014.

Before factoring in the water content, 61% and 79% of raw shark fin that Hong Kong re-exported to mainland China and Taiwan, respectively, were in frozen form. The higher percentage of raw shark fin that Hong Kong re-exported to Viet Nam (65%) and Japan (90%) were in dried form. On average, before factoring in water content, frozen raw fin accounted for 53% of all raw fin re-exported from Hong Kong between 2005 and 2014.

Comparing the import and (re)export data for factored and non-factored raw shark fin shows that, though largely similar, there are some notable differences (Figure 11). The non-factored and factored data showed stable raw shark fin imports from 2005 to 2011, decreasing in 2012 and 2013, and recovering a little in 2014. (Re)exports for the non-factored data revealed a mild decrease from 2005 to 2010, with a more significant decrease from 2011 to 2014. However, the factored data showed that (re)exports decreased significantly from 2005 to 2008 and from 2010 to 2012, while keeping stable in 2009, 2013 and 2014.

Figure 11. Hong Kong annual raw shark fin import and (re)export (t), 2005-2014



Source: Hong Kong CSD, 2005-2014

Shark fins retained in Hong Kong

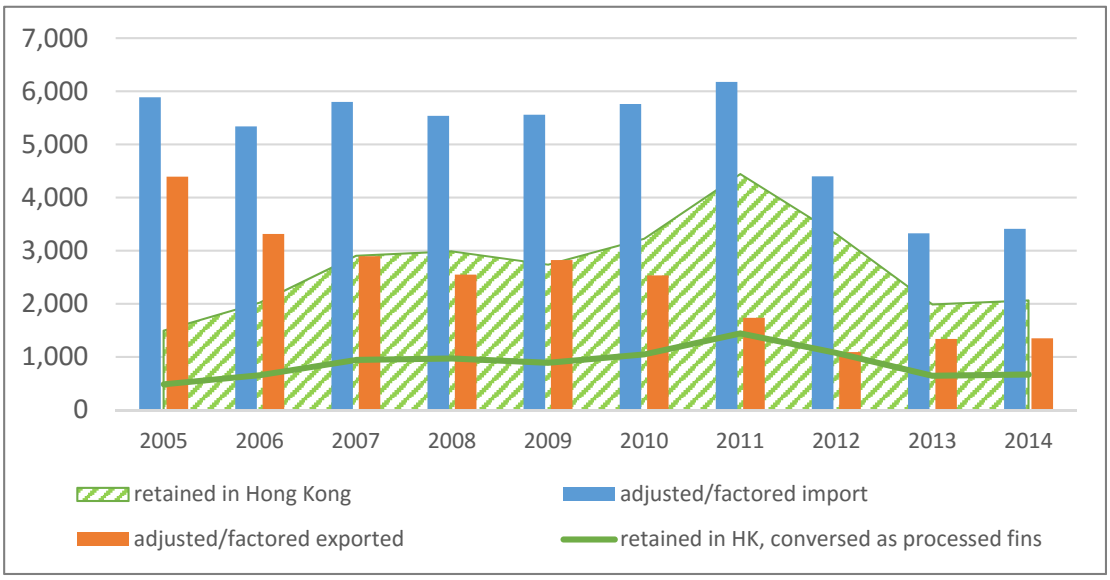
Comparing the import and re-export volumes for adjusted and factored raw shark fin shows that Hong Kong was increasingly retaining more shark fin over the period from 2005 to 2011 (Figure 12). The retained shark fins could be, but are not exclusively, consumed domestically. In addition to possible illegal trade, some shark fins could be brought across Customs control border legally, without declaration, by tourists. However, this trend changed in subsequent years, with retention decreasingly significantly, by 26% in 2012 and 40% in 2013 (Table 8). These figures are equivalent to 1,495 t of dried raw fins retained in Hong Kong in 2005, with volumes increasing to

4,441 t in 2011, and subsequently falling to 3,308 t in 2012, and kept at a low of around 2,000 t in 2013 and 2014.

A conversion rate of 0.325 was used to estimate the production volume of processed dried shark fin from raw dried fin (Anon., 2013a). After applying the conversion rate, some 8,820 t of processed dried shark fin could have been produced in Hong Kong from its raw form between 2005 and 2014. The amount of raw shark fin retained in Hong Kong was equivalent to around 486 t of processed dried shark fin in 2005, which peaked in 2011 at around 1,443 t, then declined by 26% to 1,075 t in 2012, and another 40% fall to 646 t in 2013.

According to the conversion rates given by the China Shark Industry report (Anon., 2013), 8,820 t of dried processed shark fin, after being soaked in water, is equivalent to 22,049 t of food ingredient shark fins, which is ready for cooking.

Figure 12. Annual changes of Hong Kong raw shark fins import, re-export and retention (t), 2005-2014



Note: Raw shark fins data were adjusted and factored

A China Shark Industry report (Anon., 2013a) indicated that raw fresh/frozen shark fins must go through two stages before being sold as processed dried shark fin. The first step includes a dehydration procedure, where the shark fin loses 60-70% in weight. The second processing stage includes removing the skin, cartilage and meat, which turns the raw dried shark fin into processed dried shark fins. It will lose a further 65-70% of weight during this second stage process. Processed dried shark fins are the most typical form that is sold at dried seafood wholesale and retail shops in Hong Kong, mainland China, Taiwan and many other Asian countries. Thus, 1 kg

of raw fresh/frozen shark fins equates to 0.09 – 0.14 kg of processed dried shark fins. The 60-70% of weight loss given by the China Shark Industry Report (2013) is close to estimations of 70-79% given by Hong Kong traders (Clarke 2002). Factors of 0.25[24] and 0.325 were used to normalise shark fin weights in the first and second stages of shark fin processing, respectively.

The China Shark Industry report also claimed that 1 kg of processed dried shark fins, after soaking in water, yields 2.5 kg of "food ingredient" shark fins, enough for a serving for 10 people (an average of 250 g of shark fin ingredient per individual). This figure for an individual serving seems very high, as research has found that the average shark fin wet weight in a bowl of shark fin soup in Hong Kong is less than 50 g (WWF-Hong Kong unpublished data) (WWF-Hong Kong unpublished data).

According to the China Shark Industry Report (Anon., 2013a), a survey in June 2012 showed that sharks harvested from the near shore were landed with fins and internal organs intact, while sharks caught on the high seas were landed without internal organs. The auction price for landed sharks with fins attached was around CNY 20,000 per t (USD 3,158/t), and around CNY 13,000 - 15,000 per t (USD 2,053 - 2,369/t) for sharks without fins. While a shark's fins only make up approximately 5% of its weight, these fins accounted for an incongruously large proportion (25-35%) of the value of each shark, by weight.

The report also stated that the monetary value of shark fins depends on the size, quality and the fin position from the sharks. The most valuable shark fins come from the lower parts of a shark's caudal fin, which could yield prices around CNY 2,000 per kg (USD 316/kg). A pelvic and dorsal fin of standard quality can cost around CNY 300 – 1,000 per kg (USD 47-158/kg); however ones of lower quality can cost less than CNY 100 per kg (USD 16/kg).

The report also found that in mainland China, 75% of shark fins were used by restaurants and hotels, 15% by small wholesalers and 10% were purchased by individuals. Those shark fins which went to small wholesalers were eventually sold to restaurants and hotels. Only a certain group of the population who came from the coastal area of Guangdong were familiar with shark fin cuisine preparation, and hence would buy shark fins to cook at home.

[24] A lower conversion rate for first stage process was used to keep consistent with several published reports and to avoid over-estimation of the possible available amount for consumption.

Table 8. Hong Kong raw shark fins import, (re)export and estimated retention (kg), 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Adjusted/factored import	5,887,061	5,336,705	5,798,486	5,535,517	5,558,389	5,759,196	6,174,597	4,397,998	3,325,104	3,409,845	51,182,922
Adjusted/factored exported	4,392,172	3,313,117	2,895,655	2,549,537	2,821,726	2,533,656	1,733,743	1,090,189	1,337,580	1,348,341	24,045,525
Retained in Hong Kong	**1,494,889**	**2,023,588**	**2,902,831**	**2,985,980**	**2,736,664**	**3,225,541**	**4,440,853**	**3,307,809**	**1,987,524**	**2,061,505**	**27,137,397**
Conversed as processed fins	485,839	657,666	943,420	970,443	889,416	1,048,301	1,443,277	1,075,038	645,945	669,989	8,819,654
Soaked in water	1,214,597	1,644,165	2,358,550	2,426,108	2,223,539	2,620,752	3,608,193	2,687,595	1,614,863	1,674,972	22,049,135

Online survey

Searches of seven e-commerce websites based in mainland China were conducted between April and October 2015, in order to document the availability of shark fins and mobulid ray gill plates in the e-commerce market. The surveyed websites included three Chinese language business-to-business (B2B), two Chinese language business-to-consumer (B2C), one Chinese language consumer-to-consumer (C2C), and one English language B2B websites (Table 9).

Table 9. E-commerce websites in mainland China monitored for shark fins and mobulid ray gill plates advertisements

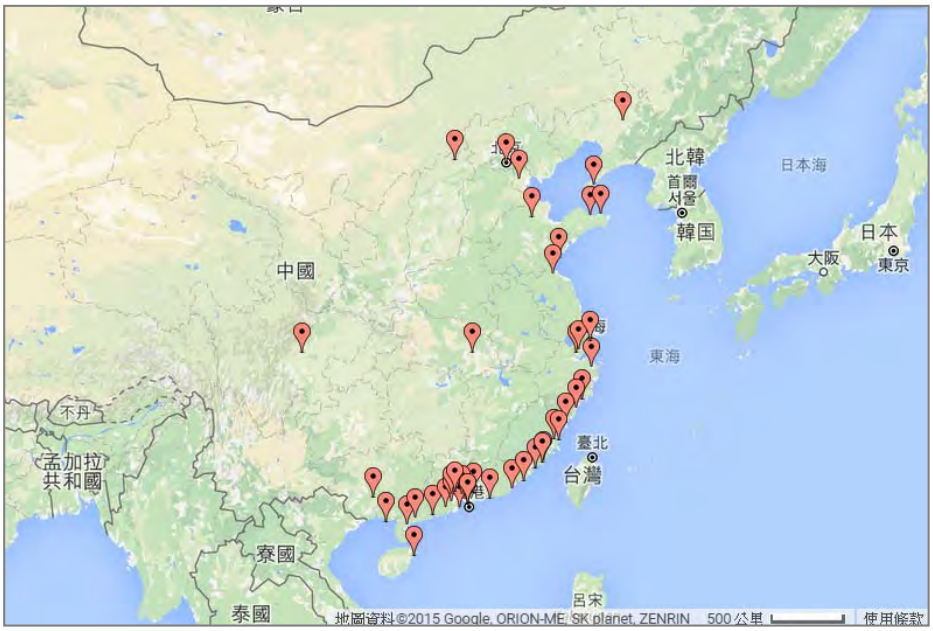
Websites	Language	Target markets	No. of adverts of shark fins	No. of adverts of mobulid ray gill plates
#1	Chinese	B2B, Domestic market and Chinese speakers around the world	7 adverts 5 shops	0
#2	Chinese	B2B, Domestic market and Chinese speakers around the world	14 adverts 11 shops	0
#3	Chinese	B2B, Domestic market and Chinese speakers around the world	50 adverts 39 shops/sellers	0
#4	English	B2B, global market	0	0
#5	Chinese	B2C, Domestic market and Chinese speakers around the world	9 adverts 6 shops	8 adverts 6 shops
#6	Chinese	B2C, Domestic market and Chinese speakers around the world	0	0
#7	Chinese	C2C, Domestic market and Chinese speakers around the world	0	124 adverts 90 sellers

In total, 212 different advertisements for shark fins and mobulid ray gill plates were found, representing 156 e-commerce shops/sellers on four websites. The online survey did not detect a single shop/seller offering both shark fins and mobulid ray gill plates, and only one shark fin shop,

located in Guangzhou, had cross-posting advertisements on more than one e-commerce website. Ninety sellers (57%) were found on the surveyed C2C website, 55 shops (35%) were found on the three B2B websites surveyed, and 12 shops (8%)[25] were found on the B2C website. There were a total of 60 e-commerce shops (39%) offering shark fins for sale, while 96 shops/sellers (61%) sold mobulid ray gill plates. Ninety (95%) mobulid ray gill plate sellers were found on a C2C e-commerce website, while six shops were found on a B2C website. Many advertisements did not provide images of the shark fin or mobulid ray gill plate products. A few advertisements had images of the fin's skeletal structure, although this may represent low grade shark fins or fins of bony fish. Only eleven shops specified the species name and/or country of origin.

Of the 156 e-commerce shops/sellers, 144 were located in 41 cities in mainland China, five were in Hong Kong, and seven shops did not specify their location (Figure 13). One-hundred and forty shops were located in the coastal provinces from northeast to southeast China, with the other four shops located in inner provinces: Shenyang of Liaoning, Datong of Shanxi, Wuhan of Hubei and Chengdu of Sichuan. Eighty-eight percent (126/144) of the e-commerce shops of known location were in provinces around or south of Shanghai.

Figure 13. E-commerce shops found in 42 cities in mainland China and Hong Kong provided shark fins and mobulid ray gill plates for sale.



Source: Map data ©2015 Google

Guangdong was the province with the largest number of online shops offering shark fins and mobulid ray gill plates (95 shops), equivalent to 66% of the shops in mainland China with known

[25] Half (6) of B2C shops sold shark fins, the rest sold manta ray gill plates

locations, followed by Shandong (8%, 11 shops), Fujian (6%, 8 shops) and Guangxi (6%, 8 shops). Only four and three e-commerce shops were located in the two largest cities, Beijing and Shanghai, respectively. Shark fin B2C e-commerce shops were only found to be located in 6 cities: Dairen, Tianjin, Jiaxing, Changle, Quanzhou and Guangzhou.

Eleven shops (7%) that sell shark fins had made specific claims about the species or country of origin of its products. Two shops located in Fujian and Guangxi claimed their shark fins were locally sourced, from Fujian and Beihai, respectively (Table 10). Another shop in Fujian claimed its shark fins came from the Pacific Ocean. Three shops located in Guangdong claimed their shark fins originated from Sri Lanka, South Africa, Thailand and Indonesia. One shop in Hubei also claimed its fins came from Thailand. A shop in Sichuan claimed that its fins were sourced from Europe. One shop located in Zhejiang claimed its fins were Blue Sharks, with images of the fin's skeletal structure. One of the shops in an unknown location had claimed that its shark fins came from Canada, while another claimed its fins were Oceanic Whitetip Shark *Carcharhinus longimanus* and Elephant Shark from Cameroon.

An advertisement for fins from Elephant Sharks that were caught in Cameroon was found on a Chinese language B2B website (with a product description in English). The "Elephant Shark fins" was described in the text of the advert. It is not clear what species "Elephant Shark" would be; while Basking Sharks *Cetorhinus maximus* are known as elephant sharks in the Chinese language, the Basking Shark is not found in Cameroonian waters according to the IUCN Red List's range map[26].

There were 90 sellers from the surveyed C2C website and six shops from a B2C website which offered dried mobulid ray gill plates for sale. One online shop claimed its dried mobulid ray gill plates came from Sri Lanka; another claimed its dried mobulid ray gill plates were Spinetail Devil Ray *Mobula japonica*, Giant Mobulid Ray *Mobulid birostris* and Pigmy Devil Ray *Mobula diabolis*. Two shops located in Guangzhou and Hong Kong claimed their dried mobulid ray gill plates came from Indonesia and the Philippines, respectively. Three out of five sellers, located in Hong Kong, claimed they provided "shopping service"[27] and their mobulid ray gill plates were purchased from a famous dried food products company in Hong Kong. Such "shopping service" advertisements were likely targeting consumers in mainland China.

[26] http://maps.iucnredlist.org/map.html?id=4292.

[27] People who purchase the sought-after products in a location with a lower price and/or sufficient supply, and resell those purchases for profit.

The observation of the e-commerce websites suggested that the market for mobulid ray gill plates was more concentrated in southern China, from Guangxi and Guangdong up to Fujian and Zhejiang Provinces. In general, e-commerce shops tend to serve consumers near their location to keep the package delivering time and cost at a manageable level. Most of the shops/sellers (83, or 86%) of shops selling mobulid ray gill plates were located in Guangdong, while two other sellers in Guangxi offered shipments from Guangdong, and three sellers in Hong Kong offered a "shopping service" to target consumers in southern China. The "shopping service" is used commonly by many Chinese consumers, especially for purchasing commodities from abroad. There was only one e-commerce seller found in Zhejiang, located near the shark processing centre (Puqi).

It appears as though most mobulid ray gill plates were stored in Guangdong, since many of the e-commerce sellers were in Guangdong and offered delivery from there. However, some products, perhaps to boost its image of quality, were claiming that the product was purchased and delivered from Hong Kong.

Table 10. Locations of E-commerce shops/sellers offering shark fins and mobulid ray gill plates

Locations	**Number of shops**		**Origin of products**
	shark fins	**mobulid ray gill plates**	
Beijing	4	0	na
Shanghai	3	0	na
Tianjin	2	0	na
Fujian	6	2	One claimed fins were sourced from Fujian and another claimed fins were from the Pacific Ocean.
Guangdong	12	83	Three claimed shark fins from Indonesia; Sri Lanka/South Africa and Thailand, respectively. One claimed gill plates from Sri Lanka, another one claimed from Indonesia
Guangxi	3	5	One claimed shark fins from Beihai. Two claimed shipping from Guangdong.
Hainan	1	0	na
Hubei	1	0	Thailand
Jiangsu	1	0	na
Liaoning	3	0	na
Shandong	11	0	na

Shanxi	1	0	na
Sichuan	1	0	Europe
Zhejiang	4	1	One claimed from Blue Shark, with the image of bony structured fins.
unknown	7	0	One claimed from Cameroon (Elephant Shark and Oceanic Whitetip Shark), the other claimed from Canada.
Hong Kong	0	5	One claimed from the Philippines, the 2nd one claimed from Hong Kong, Macau and Taiwan. The other three claimed from the 2nd shop that sourced from Hong Kong, Macau and Taiwan.

Note: na – not available.

Several B2C and C2C websites have adopted a *No Shark Fin* advertisement policy since 2009 (Anon., 2012c). As a result, only a limited number of shark fin advertisements were found. However, mobulid ray gill plates were offered on a few websites.

Mobulid ray gill plates were only found to be offered for sale on surveyed B2C and C2C websites, and were not listed on any of the surveyed B2B websites. That the majority (83 shops/sellers, 87%) of the observed mobulid ray gill plate shops/sellers were located in Guangdong Province may indicate that the popularity of mobulid ray gill plates was not yet widespread, and that the consumption was limited to household preparation of health tonic, not yet as a culinary cuisine found in restaurants. The rest of the online mobulid ray gill plate sellers were located in Guangxi (5), Fujian (2) and Zhejiang (1) Provinces, as well as in Hong Kong (5). In contrast, no C2C e-commerce sellers/shops offered shark fins for sale, and only 10% (6 out of 60) of the shops offering shark fins for sale were found on B2C websites. The rest (90%) of shark fin e-commerce shops were B2B shops targeting restaurants and retailers. This may indicate that the shark fin market in mainland China is still significant enough to support these B2B shops, and that links between suppliers and buyers were also steady. None of the available information revealed the true source of imports of mobulid ray gill plates available in China, nor the species being sold. While shark fins were noted to have been sourced from Asia, Europe, Africa and North America, and to include species of Blue Shark *Prionace glauca*, Oceanic Whitetips Shark *Carcharhinus longimanus* and "Elephant Shark," such information on source and species was often not provided at all on e-commerce sites, and where it was provided, its authenticity could not be verified. Some shark fin sellers in Fujian and Guangxi claimed that their fins came from local provinces or the Pacific Ocean; it is possible that while these fins were processed locally, they were either harvested by Chinese flagged vessels or imported.

Market survey

Shark fins

One-hundred and fifty dried food shops from seven cities in mainland China (4), Hong Kong (1) and Taiwan (2) were selected for quantitative market surveys[28] (Table 1). Sixteen managers or owners from shark fin trading/wholesaling/retailing companies in seven cities[29] were interviewed as part of a qualitative survey. The main shark fin commodities offered for sale in these cities were processed dried shark fins. These processed dried fins are easy to store for a long time and had been processed to such a stage that individual restaurants were capable of preparing it further as a cooking ingredient. Although the processed dried shark fins were further sorted into different categories of commodities based on the species, fin positions, size, grades and supply locations, and for sale at different prices, there is no unified standard for these categories across different markets and locations.

The shark fins in the market were classified into different "**categories**" with different prices based on properties such as the species, processing locations, "**fin positions**" (such as dorsal, pectoral and caudal fins), size and grades of fins (Lin 2010), although some categories of fins could come from more than one species of shark. For example, the name used for a given category might refer to a particular fin position, such as the caudal fin, rather than the species. Sometimes shark fins of the same species and same fin positions but in obviously different sizes may be classified as different categories with different prices.

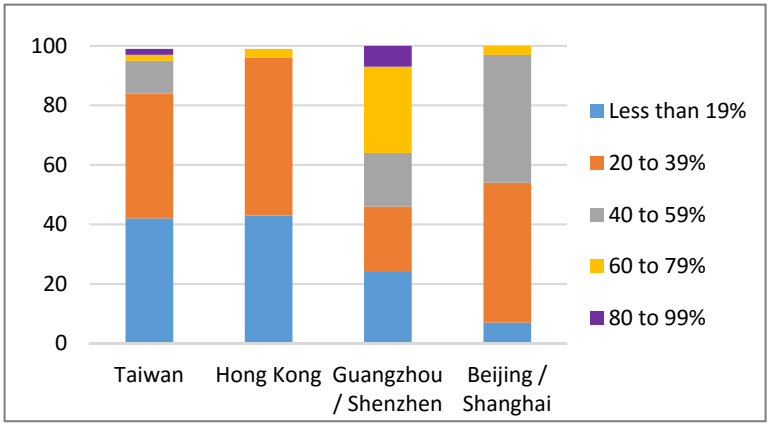
Other dried seafood, valuable Chinese medicine (such as ginseng) and other dried food (such as Shiitake mushroom) were also commonly found in shops selling shark fins. In mainland China, shark fins were estimated[30] to account for 34% and 39%, by volume, of the commodities that were available in the surveyed shops located in Beijing/Shanghai and Guangzhou/Shenzhen, respectively. Shark fins accounted for a smaller proportion of commodities in shops in Taiwan (21%) and Hong Kong (18%). A small number of shops surveyed in Taiwan (20%) and Hong Kong (10%), respectively, which have shark fins accounted for more than 40% of the total commodities in the shops (Figure 14). On the other hand, around 50% of shops surveyed in mainland China which had shark fins accounted for more than 40% of the total commodities in the shops (Figure 14).

[28] The seven cities for quantitative interviews were Beijing, Shanghai, Guangzhou, Shenzhen, Hong Kong, Taipei and Kaohsiung.

[29] The seven cities for qualitative interviews were Beijing, Shanghai, Guangzhou, Puqi, Hong Kong, Taipei and Kaohsiung.

[30] The share of shark fin relative to the other commodities in the shops was estimated visually based on the shelf space of shark fins taken up in the front of shops, but did not include the storage area in the back of shops.

Figure 14. The estimated share of shark fin relative to the other commodities in the shops

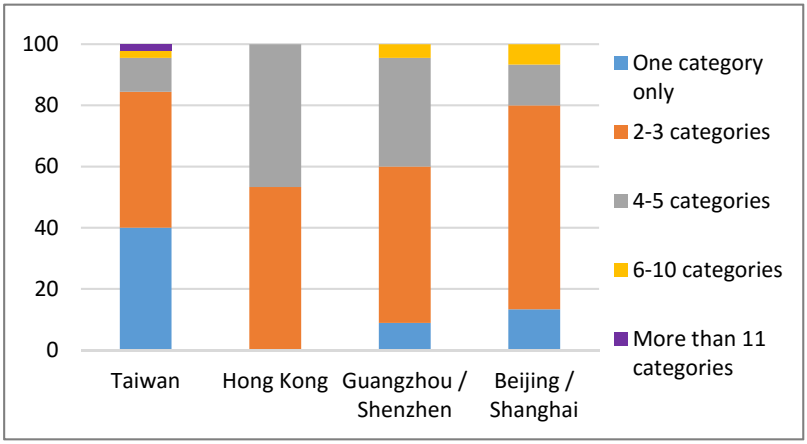


Note: The share of shark fin relative to the other commodities in the shops was estimated visually based on the shelf space of shark fins taken up in the front of shops, but not include the storage area in the back of shops

On average, Beijing and Shanghai shops offered three categories of shark fins for sale. Hong Kong (3.4) and Guangzhou/Shenzhen (3.3) offered more than three categories of shark fins, and shops in Taiwan offered 2.5 categories of shark fins for sale. In total, only eight categories of shark fins were found in Beijing/Shanghai, many more categories of shark fin were found in Hong Kong (24), Taiwan (30) and Guangzhou/Shenzhen (46).

In total, nearly 80% of the surveyed shops which sold shark fin offered between two and five categories of fins for sale (Figure 16). In Taiwan, a large percentage (40%) of shops only offered one category of shark fin for sale, 56% offered between two and five categories of shark fins, and the rest (4%) of the shops offered at least six categories of shark fins for sale. At the same time, Taiwan was the only surveyed location in which some shops (2%) offered more than 11 categories of shark fins. In Hong Kong, all shops provided two to five categories of shark fins for sale (Figure 15). In Guangzhou/Shenzhen, only 9% of shops sold one category of fin, 87% of shops offered two to five categories of shark fins, with the rest (4%) providing six to ten categories of shark fins. In Beijing and Shanghai, 93% of shops offered one to five categories (13% provided only one type) of shark fins, with the rest (7%) of the shops providing six to ten categories of shark fins (Figure 16).

Figure 15. Number of shark fin categories available in the shops



In general, stores in mainland China, Hong Kong and Taiwan could not name the corresponding species for 85% of the shark fin categories sold. Stores in Taiwan and Guangzhou/Shenzhen stocked a higher number of shark species, among those fin categories identified to the species level, than stores from Hong Kong and Beijing/Shanghai.

In contrast to their relative lack of knowledge of species, stores in mainland China, Hong Kong and Taiwan were generally able to differentiate between categories of fins originating from different fin positions on a shark (e.g., caudal, dorsal or others). In total, traders were able to recognize 89% of shark fin categories for any fin position. Most shark fins on sale were caudal fins (31%) and dorsal fins (30%).

Qualitative interviewees felt that the production process, from fresh to dried shark fins, was simple and has little impact on the quality of the final product. Mainland China, Hong Kong and Taiwan all have their own processing industries to supply domestic markets. Around 94% of shark fin re-exported from Hong Kong to mainland China were raw, while 71% of shark fins that Hong Kong imported from mainland China were processed. It is possible that most of the processed shark fin Hong Kong used was processed in mainland China. Shark fin processing in Hong Kong was either at a smaller scale or only involved part of the procedure, such as the dehydration step from fresh to dried raw fins as well as another drying step before packing. The steps of soaking, removing scales, bones and bleaching to make the raw fins into processed fins probably took place in factories in mainland China (Stan Shea, Bloom Hong Kong, *in litt.* to Joyce Wu, Jan. 2016).

More than 90% of surveyed shops in Hong Kong, Guangzhou, Shenzhen and Taiwan claimed that shark fins can be stored for three years or longer after purchase; however, 30% of surveyed shops in Beijing and Shanghai suggested shark fins can only be kept for less than three years after purchase.

According to the survey, stockpiling was happening when shark fin demand was high or stable, or when demand was on the increase. During those times, wholesalers and retailers ordered large amounts of fins at relatively lower prices. Due to declining restaurant demand, stockpiling is no longer seen as a good option, but some large companies still have stockpiled inventory left over from the past. A shorter storage life after purchase was found among Beijing and Shanghai shops, and may be due to a tendency to obtain their shark fin stock from wholesalers in Guangzhou where the product may have been held for some time already, rather than directly from processors.

Mainland China Market Overview

Seventy-five stores were surveyed in four cities in mainland China: Guangzhou (30), Shenzhen (15), Beijing (15) and Shanghai (15). All surveyed stores were wholesalers which usually sell products to retailers and restaurants, but also provide service to individual consumers. These stores also stocked products other than dried shark fins, including dried seafood, other dried foods and high-priced Chinese medicine.

Stores in Guangzhou/Shenzhen stated that their shark fins were obtained from processors in Guangdong Province, and were national-level wholesalers, supplying shark fins to restaurants and local wholesalers throughout the whole of mainland China. The wholesalers in Beijing and Shanghai obtained their shark fins from Guangzhou and were only responsible for shark fin distribution within their cities or provinces.

In-depth qualitative interviews in Puqi revealed that processors in Puqi sourced fresh and frozen shark fins from trading companies, and sold the processed fins to retailers in the nearby provinces. The China Shark Industry Report (2013a) stated that processers in Guangdong focused on shark fin processing, while factories in Puqi could process whole sharks. Nationwide, wholesalers in China claimed their shark fins were obtained from processors in Guangdong, and Puqi claimed to process 90% of sharks in mainland China (Sun 2014). It is possible that compared with the amount of shark fin processed in Guangdong the amount of shark fin processed in Puqi is much smaller. Puqi is more famous for other shark products, but not shark fins.

Guangzhou and Shenzhen

Stores in Guangzhou and Shenzhen also provided other dried food and high-price Chinese medicine for sale. On average, shark fins accounted for around 39% of commodities, in terms of volumes, at the stores in Guangzhou/Shenzhen.

In total, 46 categories[31] (on average, 3.3 per shop) of shark fins were found in the shops in Guangzhou and Shenzhen. *Ya Jian* fins (牙揀翅=Blue Shark Fins, see the box below: *Some commonly found shark fin categories*) and *Pectoral* fins (青片翅) were the most common categories of fins, found in 38% and 29% of shops in Guangzhou and Shenzhen, respectively. Caudal fins and pelvic fins were the main fin position found in Guangzhou and Shenzhen. *Hai Hu* fins (海虎翅) were the most expensive fin categories sold in Guangzhou and Shenzhen. Meanwhile, *Jin Shan* fins (金山翅) in Guangzhou and Shenzhen were cheaper than other surveyed cities.

In Guangzhou/Shenzhen and Beijing/Shanghai, there was no knowledge of the species of shark fins stocked for 86% and 94% of categories, respectively. Stores in Guangzhou/Shenzhen suggested that their shark fins were from four species, namely Tiger Shark *Galeocerdo cuvier*, Silky Shark *Carcharhinus falciformis*, Blue Shark *Prionace glauca*, and Oceanic Whitetip Shark *Carcharhinus longimanus*. In terms of knowledge of fin positions, stores in Guangzhou/Shenzhen recognized caudal fins (32%) and pelvic fins (29%), but could not identify the rest of their stock to a fin position.

There was limited knowledge about where the shark fins sold in stores in Guangzhou/Shenzhen had been captured (56%), processed (55%) or imported from (38%). Of the shark fin pieces that could be identified to source of capture, processing and import, a range of source locations were articulated. They include ones that were captured in Australia (11%), Indonesia (6%), mainland China (5%), USA (4%) and others; those processed in Australia (8%), Indonesia (6%), the USA (6%), Latin America (5%) and others; and those imported from Indonesia (12%), Australia (8%), Latin America (7%), USA (6%) and others. Stores claimed some categories of shark fins were captured (5%) and processed (6%) in mainland China.

Beijing and Shanghai

In general, the commodity variety in shops in Beijing and Shanghai was lower than shops in other surveyed cities. On average, shark fins accounted for 34% of commodities in shops in Beijing and Shanghai, but in more than half (54%) of the surveyed stores in Beijing/Shanghai shark fins comprised less than 30% of the stocked commodities. Furthermore, in about 97% of stores in Beijing/Shanghai, shark fins represented less than 50% of the visible stocked commodities.

At least eight categories (average three in each shop) of shark fins were found in stores in Beijing and Shanghai. *Jin Shan* Fins (金山翅) and *Ya Jian* Fins (牙揀翅=Blue Shark fin) were the most

[31] "Category" of shark fins refers to the product type of the shark fin available in the shops. It is not equal to species of shark, "category" is a combination of species, fin position and even quality or size of shark fin. Some frequently available categories included *Jin Shan*, *Yan Jian*, *Hai Hu* and *Gou* (caudal).

common categories of fins (found in 77% and 73% of stores, respectively) found in surveyed stores in Beijing and Shanghai. *Hai Hu* Fin (海虎翅) was the most expensive category of fins sold in Beijing/Shanghai.

About 94% of shark fin categories in Beijing/Shanghai could not be linked to any species by shopkeepers, while those that can be recognized (6%) came from only one shark species, Blue Shark *Prionace glauca*. In Beijing and Shanghai, dorsal (41%) and pectoral (24%) fins were most frequently sold, and only 1% of shark fin categories were not recognizable by fin positions.

The majority of stores in Beijing/Shanghai had no knowledge of where a product was captured (55%), processed (49%) or imported from (71%). Where known, only a limited range of locations were identified: captured in USA (42%) and Spain (3%); processed in Guangdong (37%) and Hong Kong (14%); and imported from USA (20%) and Hong Kong (11%). None of the shops in Beijing/Shanghai claimed that their shark fin stock had been captured in mainland China.

Some commonly found shark fin categories

***Jin Shan* Fins (金山翅)**

Jin Shan Fin (Gold Mountain Fin) was the Chinese name given to shark fins that were traditionally sourced from the USA and Latin America and imported/transited via San Francisco (Lin, 2010), which is called "Old Gold Mountain" in the Chinese language, because of its gold mining history. *Jin Shan* Fins are valued highly in shark fin markets due to their high quality. The sanitary requirements were considered superior in USA, therefore only shark fin, frozen and dried, which meet with the sanitary requirements of USA can enter San Francisco. As a result, *Jin Shan* Fins which are transited or (re)exported from San Francisco have become a symbol of good quality. *Jin Shan* Fins was available in Hong Kong since 1970s when traders in Hong Kong started to import their shark fins by air transportation (Kwong, 2013).

Jin Shan Fins were highly visible in most of the surveyed shops in Hong Kong (25 shops, 83%) and Beijing/Shanghai (23 shops, 77%), but not as much in Guangzhou/Shenzhen (6 shops, 13%) and Taiwan (5 shops, 11%). In total, 15 categories of shark fin were named with *Jin Shan*, but in different sizes and prices. Out of the total, 14 categories were *Gou* Fin, the rest were named as dorsal fin. Twelve categories were found in Hong Kong (USD 103 – 591 /kg), five in Guangdong/Shenzhen (USD 83-209 /kg), three in Taiwan (USD 267 - 431 /kg) and one in Beijing/Shanghai (USD 206 /kg). Stores in Hong Kong claimed that *Jin Shan* Fins were captured and imported from Latin America (36%), Australia (29%) and USA (24%); but 80% of stores stated that *Jin Shan* Fins were processed in Hong Kong. Most of the stores in Beijing/Shanghai where *Jin Shan* fins were available did not know the capture (61%), processing (57%) and export source (57%)

of the fins. Some stores, however, claimed that the fins were harvested (39%) and imported (22%) from USA. There were no shops in Beijing/Shanghai that claimed *Jin Shan* Fins were processed in USA, with some identifying Guangdong (30%) and Hong Kong (13%) as locations where they were processed.

Only limited numbers of shops in Guangzhou/Shenzhen (6) and Taiwan (5) offered *Jin Shan* Fins. In Guangzhou and Shenzhen, stores claimed *Jin Shan* Fins were harvested in Australia, Indonesia, Singapore and the Pacific Ocean, but processed locally. In Taiwan, shops with *Jin Shan* Fins claimed that they were processed locally after harvesting in Taiwan, Hong Kong and other oceans.

Clarke found that around 40% of the auctioned fin in early 2000, in terms of weight, in Hong Kong shark fin market comes from 14 shark species (Clarke *et al*. 2006). However, more than 50%, by weight, of auctioned shark fins were traded with no specific categories. Hong Kong shark fin auctions represent 20% of all Hong Kong imports (Clarke *et al*. 2004). Clarke also found that for the shark fin trade labelling systems there are several taxa contained in one market category or many market categories are used for one taxon (Clarke *et al*. 2006). *Jin Shan* Fin was not one of the trade categories described in Clarke *et al*.'s reports published in 2004 and 2006. In addition to the challenge of shark fin trade labelling systems described by Clarke *et al.* (2006), surveys conducted at different points (auction vs wholesale/retail) along the supply chain could also be a reason for assigning different trade categories.

***Ya Jian* Fins (牙揀翅)**

Ya Jian Fins are the fins of Blue Shark, and were commonly found at stores in mainland China, Hong Kong and Taiwan. They were reportedly supplied from Japan, the Philippines, Indonesia, South Korea, Brazil and several countries in Africa (Lin, 2010). In Taiwan, *Ya Jian* Fins are called Water Shark Fins. A relatively high percentage of surveyed stores in Beijing/Shanghai (73%, 22), Hong Kong (67%, 20), Taiwan (51%, 23) and Guangzhou/Shenzhen (38%, 17) offered *Ya Jian* Fins for sale. According to the quantitative survey, *Ya Jian* Fins are composed mainly of either dorsal fins (56%) or caudal fins (22%) and pectoral fins (14%). *Ya Jian* Fins were claimed to be sourced from fisheries in USA, Latin America and Australia, but also imported from Indonesia and Africa. *Ya Jian* Fins were thought to be processed in Hong Kong, Guangdong and other places in mainland China, Latin America and Australia. Clarke *et al*. (2006) found that *Ya Jian* fin was the most commonly found trade category, accounting for 18% of fins auctioned, by weight, in the Hong Kong market. After DNA testing, *Ya Jian* Fin is highly concordant with Blue Shark. At least seven categories of *Ya Jian* Fin can be found, four in Guangdong/Shenzhen (USD 62-123/kg), three in Taiwan (USD 382-668/kg), one in Hong Kong (USD 124/kg) and one in Beijing/Shanghai (USD 67/kg).

***Gou* Fins (勾翅)**

Gou Fin is the lower parts of caudal fins, regardless of the shark species (Lin, 2010). However, the survey found that caudal fin was not the only part of fins used as *Gou* Fin. Dorsal fins (32%), pectoral fins and pelvic fins were also used to make *Gou* Fins. Although most of the stores did not know the shark species for their *Gou* Fins, some were claimed to be sourced from Tiger Sharks, Silky Sharks, Blue Sharks, Guitarfish, Great White Sharks, Oceanic Whitetip Sharks and others. *Gou* Fins sold in Taiwan often specified the species's common name, such as "Blue Shark *Gou* Fins" or "Silky Shark *Gou* Fins." Lin (2010) suggested that restaurants and hotels tend to purchase more pelvic and dorsal fins and fewer caudal fins. Thus, *Gou* Fins (caudal fins) commonly remained on the shop premises. In total, 29 categories of shark fin found in the market survey were named with *Gou* Fin, including 14 categories of *Jin Shan Gou* Fin. Fourteen found in Guangzhou/Shenzhen (USD 26 - 209/kg), eleven found in Hong Kong (USD 99 - 591/kg), six found in Taiwan (USD 100 – 546/kg), and only one found in Beijing/Shanghai (USD 235/kg). *Gou* fin was also not described as one of the trade categories by Clarke *et al.* (2006).

***Hai Hu* Fin (海虎翅)**

Hai Hu means "Marine Tiger" in the Chinese language. *Hai Hu* Fins are from Dusky Shark *Carcharbinus obscurus* harvested from Viet Nam, Indonesia, Australia, Middle East and Pacific Ocean of South America (Lin, 2010). Forty-four percent of the *Hai Hu* fins found in mainland China, Hong Kong and Taiwan (combined) were claimed to be fins of Tiger Shark, however only 6% was claimed as being sourced from Dusky Sharks. Only one category of Hai Hu fin was found, in Hong Kong (USD 429/kg), Guangzhou/Shenzhen (USD 247/kg) and Beijing/Shanghai (USD 239/kg), but not in Taiwan. Clarke *et al.* (2006) has reported that *Hai Hu* fin was one of the 14 trade categories and accounted for 1.7% of fins auctioned in the Hong Kong market. Clarke also reported that many traders in Hong Kong have associated Tiger Shark with *Hai Hu* fins. However, the DNA test found that *Hai Hu* is concordant with Dusky Shark, but not Tiger Shark.

Hong Kong Market Overview

Thirty shark fin retail outlets in Sai Ying Pun (西營盤) were surveyed. All of these shops also sold other dried seafood and high-price Chinese medicine, such as Ginseng. The average volume of shark fins available in these shops was estimated to be less than 18%. In 96% of those shops which sell shark fins, the fins accounted for less than 30% of commodities seen in the shops. Most of the customers were local residents; there were very few buyers from mainland China, and restaurants and caterers in Hong Kong tend to make their orders directly from either trading companies or processors.

On average, more than three categories (3.4) of shark fins commodities were available in the shops, and in total 24 categories were found. Around 83% and 67% of surveyed shops in Hong Kong carried *Jin Shan* Fins (金山翅) and *Ya Jian* Fins (牙揀翅=Blue Shark fins), respectively, in stock. Caudal and dorsal fins were the fin position that were most prevalent in Hong Kong. *Jin Shan* Fins (金山翅) and *Hai Hu* Fins (海虎翅) were the most expensive commonly found shark fin categories offered. A rarely found shark fin category *Gu Pian* Fin, supposed to be fins from Great Hammerhead Shark *Shpyrna mokarran* was found in Hong Kong. It cost USD 134/kg on average.

In Hong Kong, 82% of shark fins categories were sourced from unknown species. This may be due to fact that the names used for the product categories are not associated with species names, and perhaps also because there are no active shark fisheries in Hong Kong. Of the categories where species could be identified, mainly Tiger Sharks (14%) and Blue Sharks (2%) were recognized. In Hong Kong, as in Taiwan, dorsal (39%) and caudal (41%) fins were the most commonly sold fin positions.

Surveyed stores in Hong Kong tended to claim that most of their shark fins were processed domestically (76%), but some were processed in Latin America (11%), mainland China (8%), USA (6%), Australia (4%) and others. This differed with the reported capture and import locations. Shops in Hong Kong claimed their shark fins were captured in the USA (30%), Latin America (30%), Australia (19%), Mexico (16%) and others. Imports were sourced from Latin America (30%), USA (27%), Australia (20%), Mexico (16%), Spain (10%), Africa (8%) and others (according to shopkeepers). Compared with stores in Taiwan and mainland China, very few shops in Hong Kong were unable to name the location of capture, processing and import source of their shark fin stock. However, as the veracity of this information was not confirmed, this should not be interpreted to mean that the shops in Hong Kong are necessarily able to provide more accurate source location information.

Taiwan Market Overview

Forty-five dried food shops were surveyed in Taipei (30) and Kaohsiung (15). These were wholesalers, but they also sell to individual customers. These shops provided various commodities for sale, including different types of dried seafood, other dried food (such as Shiitake mushroom) and some valuable Chinese medicine (such as ginseng). On average, shark fins accounted for 21% of the commodities in the shops. In 84% of the shops, shark fins were less than 30% of the commodities sold in the shops. In 95% of the shops, shark fins made up less than 50% of the commodities sold in the shops.

In Taiwan shops, on average, around 30 in total and 2.5 categories per shop of shark fins could be identified. Blue Shark fins (水勾翅) (51%) and Silky Shark caudal fins (黑鯊勾翅) (36%) were the main categories of shark fins sold in Taiwan. *Jin Shan* Fins (金山翅) were the most expensive shark fin categories commonly found in Taiwan. In Taiwan, there were some other expensive but rarely available shark fin categories, such as *Long Wen* Fin (龍 翅). *Long Wen* Fin is supposed to be sourced from guitarfish (*Rhinobatidae*). Three categories of *Long Wen* Fin found in Taiwan, costing around USD 618 – 1,392/kg. In general, shark fin prices in Taiwan were higher than those in Hong Kong and China.

In Taiwan, stores had no knowledge of the species for 76% of their shark fin categories. The rest came from Blue Shark (9%), Silky Shark (6%), Guitarfish (4%) and Oceanic Whitetip Shark (3%). In Taiwan, dorsal (52%) and caudal (35%) fins were the fin positions most frequently identified.

High percentages of shark fins available in Taiwan were processed (81%) and obtained (61%) domestically. Stores in Taiwan claimed that their shark fins were obtained from the processing plants in Kaohsiung, and sold mostly to restaurants and caterers. Out of the total, 44% of shark fin categories found in the stores of Taiwan were not identified to capture locations, and the rest were captured in Taiwan (31%), Latin America (11%), Africa (7%) and others.

Price of shark fins

On average, Silky Shark caudal fins (USD 380/kg), Blue Shark caudal fins (USD 371/kg) and *Jin Shan* Fins (USD 339/kg) were the most expensive categories of shark fins commonly found in this survey. Silky Shark caudal fins and Blue Shark caudal fins were only available in Taiwan and Guangzhou/Shenzhen, and not sold in Hong Kong, Beijing and Shanghai.

Jin Shan Fin was most expensive in Hong Kong (USD 489/kg), followed by in Taiwan (USD 431/kg), Beijing/Shanghai (USD 206/kg) and Guangzhou/Shenzhen (USD 151/kg). *Jin Shan* fin was the most readily available fin, and could be found in 83% of surveyed stores in Hong Kong, 77% of surveyed stores in Beijing/Shanghai, 13% of stores in Guangzhou/Shenzhen and 11% of stores in Taiwan. *Gou* Fins were also available in all markets. The cost of *Gou* Fins (multiple species) were the most expensive in Taiwan (USD 414/kg), followed by Guangzhou/Shenzhen (USD 161/kg), Beijing/Shanghai (USD 148/kg) and Hong Kong (USD 129/kg).

On average, the upper prices of shark fins were higher in Taiwan (USD 28 – 1,391/kg) and Hong Kong (USD 99 - 591/kg) and lower in mainland China (USD 26 - 419/kg). There were a few exceptions, however, where a few categories of shark fins both available both in Hong Kong and mainland China were more expensive in mainland China than in Hong Kong. The price of shark

fin is decided by many criteria, including species, size and fin position. *Long Wen* Fins found in Taiwan were expensive (USD 1,391/kg, USD 835/kg, and USD 618/kg), but large size Blue Shark fin was also expensive (USD 668/kg).

Shopkeepers claimed that fin position (61%) and grade (45%) of shark fins were the first two criteria that most determined the price of shark fins. The species of shark was considered the third most important criteria. In Beijing and Shanghai, species were not an important factor in the price charged. However, fin positions and species, and not grades, influenced prices in Guangzhou and Shenzhen. In Hong Kong, in addition to the fin positions, grades and species, other characteristics such as size, export location and fineness of shark fins were also criteria that affected the price charged.

The price of shark fins in different cities was not only based on the cost of purchasing the stock, but also on the cost for running the business, consumer preferences for shark fin categories, available quantities and business competition. The survey found that, on average, stores in mainland China had higher percentages of shark fin products displayed on their premises (34% in Beijing/Shanghai and 39% in Guangzhou/Shenzhen) than did those in Hong Kong (18%) and Taiwan (21%). This may indicate that stores in mainland China relied more heavily on shark fins for revenue generation and had larger volumes of stock displayed than those in Taiwan and Hong Kong. It could also explain why the price of shark fins was, in general, lower in mainland China than in Hong Kong and Taiwan.

Overall, shopkeepers were not able to recognize 85% of shark fins categories by species. However, the majority (89%) of shark fins categories could be distinguished by fin positions. *Gou* Fins account for 21% of all categories of fins available in mainland China, Hong Kong and Taiwan, and are also reported to be the most frequently (31%) sold in physical markets in mainland China, Hong Kong and Taiwan. *Gou* Fins from Silky Shark and Blue Shark were the two most expensive categories of shark fins, and the *Jin Shan Gou* Fins ranked third.

It was said that dorsal and pectoral fins were mostly used by restaurants and hotels, while caudal fins were more visible in the wholesale and retail premises (Lin, 2010). Lin (2010) also found that consumers were more likely to only know about *Jin Shan Gou* Fins. Physical market surveys revealed that "fin position" is the most important criteria for the price difference in mainland China, Hong Kong and Taiwan. This might be due to the high presence of *Gou* Fins, and the higher demand for *Gou* Fins from consumers.

There was high visibility of *Jin Shan* Fins in stores in Hong Kong (83%), Beijing/Shanghai (77%), Guangzhou/Shenzhen (13%) and Taiwan (11%). While Customs data indicate that imports from USA only accounted for 0.12%, 2.3% and 0.05% of total imports in mainland China, Hong Kong and Taiwan, respectively, shopkeepers identified 30% (Hong Kong) and 40% (Beijing/Shanghai) of shark fin categories as captured in the USA. It is therefore likely that the information regarding the origin and transit countries/territories of shark fins at the storefront is not accurate, and that statements by shopkeepers were made to fulfil the preference of consumers.

Suppliers

Based on the quantitative survey, stores in Taiwan claimed that most (67%) of their shark fin categories were sourced from within Taiwan, with only limited categories of shark fin being supplied from Latin America (3%), Hong Kong (2%) and Australia (1%). A substantial 28% of shark fin categories had no information where the product was supplied from. In contrast, only 1% of shark fin categories in Hong Kong did not have information, based on the response of shopkeepers but not labelling, about where the product was supplied from. Shark fins in Hong Kong were imported from Latin America (30%), USA (27%), Australia (20%), Mexico (16%), Spain (10%), Africa (8%), Indonesia (4%) and others (according to shopkeepers). Most (62% in Beijing/Shanghai and 38% in Guangzhou/Shenzhen) shark fin categories in mainland China did not have information about the products' import source. In Beijing and Shanghai, 20% and 11% of shark fin categories were imported from USA and Hong Kong, respectively. In Guangzhou and Shenzhen, shark fin categories were imported from Indonesia (12%), Australia (8%), Latin America (7%), USA (6%), Spain (3%) and Africa (3%).

Capture Areas

Similar to import information, only 2% of shark fin categories in Hong Kong did not have information on the capture location, but most shark fin categories in Taiwan (44%) and mainland China (55%) did not have such information available. Stores in Hong Kong claimed their shark fins, in terms of categories, were captured in the USA (30%), Latin America (30%), Australia (19%), Mexico (16%) and others. Shark fins, in terms of categories, in Taiwan were captured in Taiwan (31%), Latin America (11%), Africa (7%) and others. In Beijing and Shanghai, 42% shark fin categories were captured in the USA (42%). Although most of stores in Guangzhou and Shenzhen also did not state the capture areas for their shark fins, the information that was available showed the shark fins on offer in these two cities were captured from a diversity of areas, such as Australia (11%), Indonesia (1%), mainland China (5%) and the USA (4%).

Processing Areas

Most stores in mainland China were also not aware about where shark fins were processed, but the majority of stores in Hong Kong (100%) and Taiwan (88%) were able to provide this information. There were 81% and 76% of shark fin categories in Taiwan and Hong Kong, respectively, which were processed locally. Some stores in Hong Kong also claimed that their fins were processed in Latin America (11%), mainland China (8%), USA (6%), Australia (4%) and Africa (3%). Shark fins, in terms of categories, offered in Guangzhou and Shenzhen were processed in Australia (8%), USA (6%), Indonesia (6%), Latin America (5%), Africa (3%) and mainland China (6%), but not in Hong Kong. Stores in Beijing and Shanghai stated that their shark fins, in terms of categories, were processed in Guangdong (37%) and Hong Kong (14%). It is possible that shark fin processing, from frozen/fresh fins to processed fin, takes place in multiple locations, such as Hong Kong and Guangdong. Hong Kong is at least involved in the sun-drying step to dehydrate the fresh fins to the dried raw fin, as well as another drying step before packaging (Stan Shea, Bloom Hong Kong, *in litt.* to Joyce Wu, Jan. 2016).

Mobulid ray gill plates

None of the surveyed stores in Taiwan were found to offer mobulid ray gill plates for sale, and only three stores in Beijing and Shanghai supplied mobulid ray gill plates. Thirteen stores in Hong Kong and nine stores in Guangzhou/Shenzhen were found to offer mobulid ray gill plates for sale. In 92% of the 13 stores in Hong Kong, shopkeepers claimed that the gill plates were sourced from 魔鬼魚[32] (could be Devil Rays, *Mobula* spp.); these gill plates were sold for USD 138/kg on average. The rest (8%) of the stores in Hong Kong sold gill plates at an average cost of USD 278/kg, but did not recognize the species. Mobulid ray gill plates were categorized into more categories for sale in Guangzhou than Hong Kong. The nine stores in Guangzhou and Shenzhen provided *Xu* gill plates (徐鱼腮) (89%, USD 87/kg), *Jiao Yan* gill plates (角燕鱼腮) (11%, USD 350/kg), and Top-Level *Hua* gill plates (顶级花腮) (11%, USD 156/kg) as well as small gill plates (小鱼腮) (11%, USD 73/kg). All three stores in Beijing and Shanghai did not categorize their gill plates, and charged USD 125/kg.

In addition to the quantitative survey, the qualitative survey found only one interviewee in Guangzhou which sold mobulid ray gill plates at the retail level. Other interviewees who did not sell mobulid ray gill plates considered it to be a low-price tonic ingredient.

[32] The commodity name was either provided verbally by shopkeepers or written in Chinese. The genus and species of the commodity cannot be verified without further investigation.

Based on the market survey and observations from e-commerce websites, the market for mobulid ray gill plates was predominantly found in southern China. E-commerce shops/sellers tend to locate close to their consumers to provide timely and cost effective service. The majority (86%) of the e-commerce shops or sellers advertising gill plates were located in Guangdong. The product variety and prices charged for mobulid ray gill plates in the Guangzhou physical market were higher than those in Beijing, Shanghai and Hong Kong. This indicates that Guangdong was both the centre of the trade and a more mature market for mobulid ray gill plates. This finding also matched with an earlier mobulid ray gill plate survey in 2014 (Heinrichs, 2014).

Although e-commerce sellers for mobulid ray gill plates in Hong Kong tend to target consumers in southern China, most consumers of the processed dried shark fins from retail outlets in Hong Kong were local residents, and not tourists from China.

DISCUSSION AND CONCLUSIONS

The Customs data showed that the legal import and (re)export of shark fins decreased significantly in mainland China and Hong Kong in recently years. Viet Nam replaced mainland China as the major destination for shark fins (re)exported from Hong Kong in 2010, 2013 and 2014. Market surveys in different cities in mainland China, Hong Kong and Taiwan also indicated that shark fin availability is limited, wholesalers and retailers tend to lower their inventory to respond to fast changes in the markets.

Seizure cases of shark fin, frozen seafood and others in mainland China could indicate that some shark fins (re)exported to Viet Nam from Hong Kong or elsewhere might be (re)exported to mainland China. This case, in addition to the Hong Kong (re)export data, had re-emphasized that the shark fin imports recorded by the Customs of mainland China were under-reported. The variety of processed dried shark fins available in the dry food markets in mainland China, Hong Kong and Taiwan indicated that the markets are still in good shape but not dwindling.

In general, the information and trade data for manta ray gill plate are extremely limited. However, advertisements found over the e-commerce websites in mainland China and the price variation for different categories of gill plates indicate that there is a risk that the demand for mobulid ray gill plates has increased, since the number of observed e-commerce sellers increased significantly from 30 shops in 2013 to 90 in 2015.

As expected, there were no records (UNEP-WCMC CITES data) of trade in any CITES listed mobulid rays between 2003 and 2013, the listings did not come in to effect until 14th September 2014. Over the same period, Hong Kong reported 90% (6,933.4 kg) of all trade in CITES-listed shark species for shark fins (the global total reported over this period was 7,720.7 kg). Basking Shark was the only species reported, and Norway was the only country that Hong Kong reported imports from. Norway, however, had only reported 12% of the Basking Shark fins that Hong Kong imported (805.6 kg in 2005 and 2008). Hong Kong also (re)exported 9 kg of Basking Shark fins to Malaysia in 2006, but this trade was not reported by Malaysia.

It may be too early to conclude that these data discrepancies indicate that the trade was illegal. They do, however, raise the issue of inconsistent data management and trade monitoring of imports and (re)exports of shark products in Hong Kong, even though it has reported a higher frequency and volume of trade than its trade partners. The data were especially surprising given that Hong Kong handles around 50% of the global shark fins trade (Clarke 2004), and imports fins from more

than a hundred countries/territories, and yet only reported trade in a single CITES-listed species, with two countries, over the entire ten-year period. Improved monitoring of the shark fin trade for CITES compliance is needed, including the identification of CITES-listed shark species and the issuing of appropriate CITES documents for trade. Such improvements are necessary not only in Hong Kong but also among at least the top 20 shark fin trading countries/territories.

Mobulid ray gill plates

There appears to be no demand for mobulid ray gill plates in Taiwan, and only limited demand in Beijing and Shanghai. Guangzhou, in contrast, seems to be at the centre of the trade for mobulid ray gill plates, with a more diverse selection and a wider range of prices exhibited. Guangzhou is furthermore the location for the majority (87%) of the C2C e-commerce shops advertising the sale of gill plates. While there were some mobulid ray gill plates for sale in Hong Kong, local demand for these was likely to be limited and could well be serving consumer demand in Guangdong and other places in mainland China; there were only five sellers located in Hong Kong, and three of those provided "shopping services" to mainland China.

Most of the e-commerce in mobulid ray gill plates is marketed directly to consumers; the majority of the observed advertisements were posted on C2C websites, and there were no sellers found among the surveyed B2B websites. It therefore seems likely that the popularity of gill plates is limited to household consumption, as opposed to restaurants, hotels or caterers. Information found through online searches showed that most of the key messaging for mobulid ray gill plates focuses on its use as an ingredient for tonic, rather than as a delicacy. Information was available on how to prepare and cook mobulid ray gill plates, but no information was found about where and which restaurants and/or hotels serve mobulid ray gill plate dishes. An interviewed trader also commented that the mobulid ray gill plates were a tonic ingredient. Although mobulid ray gill plates were found to be traded by shark fin traders (Hilton 2014), it is not known if mobulid ray gill plate sales will replace profits from shark fins sales. The market survey showed that unit prices for mobulid ray gill plates (USD 87–350) and commonly available shark fins (USD 85–380) were similar; however, some rarely available shark fin can fetch as much as USD 1,392 per kg and the scale of the market for shark fins is currently much larger and broader. The drivers for demand for mobulid ray gill plate and shark fin are quite different. Shark fins are consumed as a symbol of social status throughout the whole of mainland China, Hong Kong and Taiwan, on the other hand, mobulid ray gill plates does not appear to be associated with social status, and is not used for gifting to others. The mobulid ray gill plates are considered a tonic and mainly consumed in southern China. Furthermore, the recent focus on shark conservation and anti-corruption concerns has driven down the market for shark fins but has not affected the market for mobulid ray gill plates.

There was no capture, import/export or other documented data to estimate the scale of the mobulid ray gill plates market in mainland China. A repeated physical market survey in 2013-2014 found the mobulid ray gill plates available in Guangzhou had doubled, compared with the survey in 2011 (Whitcraft *et al.* 2014). An online survey in 2013 stated that 30 online sellers offered mobulid ray gill plates for sale (Whitcraft *et. al.* 2014). The current study found 90 sellers on the same C2C e-commerce website offering mobulid ray gill plates for sale, as well as a further six shops on a B2C e-commerce website. With these limited data, it is difficult to conclude how much the market in Guangzhou or southern China has expanded since 2013. However, there is a risk that the demand for mobulid ray gill plates has increased, given the number of observed e-commerce sellers increased significantly (from 30 to 90 shops). Furthermore, because the cost of expansion to other cities and regions in mainland China via e-commerce enterprises is low, there is the risk that gill plates will be increasingly marketed in other locations. The continuous expansion of trade of mobulid ray gill plates will put heavy pressure on mobulid ray populations which have very low reproduction rates and are experiencing unsustainable fishing globally (Dulvy *et al.* 2014).

To ensure effective monitoring of trade in CITES-listed species, e-commerce sellers should be required to comply with all the rules/regulations that apply for physical markets. For CITES-listed species, this means a requirement for importers and (re)exporter, as well as domestic sellers from online or physical markets, to provide evidence that their products were legally sourced. Without such documentation, the sale of products from CITES-listed species, including mobulid ray gill plates, on e-commerce websites should be prohibited (CITES AC28 Doc. 17.1.1 Annex 3., 2015). Mainland China requires valid CITES export and import permits for the legal importation of CITES-listed shark and manta ray species and their products. The management and registration of pre-Convention stocks of shark and manta ray products in mainland China is under development (2015d). All requirements for import, (re)export and domestic trade in CITES-listed species must apply not only to the premises in the physical markets but also to the e-commerce shops, if the trade in CITES-listed shark and mobulid ray species is to be effectively monitored.

The demand for mobulid ray gill plates is likely to be all from the international trade, but the lack of specific Custom codes means the trade cannot be tracked, and which is worrying given the vulnerability of the species (CITES CoP 16 Proposal 46 Rev. 2).

Shark fins

In contrast to mobulid ray gill plates, 90% of e-commerce shops advertising shark fins were found on B2B websites, only six shops were found to offer shark fins for sale on a B2C website, and none on C2C websites. This is due to the "No Shark Fin" policies of certain websites. It is important for website platform managers to continue strictly to monitor all of their e-commerce websites.

In general, the physical markets selling shark fin in mainland China, Hong Kong and Taiwan showed distinct characteristics. Stores in mainland China displayed a high percentage of shark fin (39% for Guangzhou/Shenzhen and 34% for Beijing/Shanghai) among the commodities on their premises and offered a medium to high diversity of shark fin categories for sale (an average of 3 categories for Beijing/Shanghai and 3.3 categories for Guangzhou/Shenzhen). Stores in Hong Kong also provided a high diversity of shark fins categories (3.4), but shark fin was much less prevalent (18%) among the offered commodities. Shops in Taiwan had both a low percentage (21%) of shark fin commodities and low diversity of shark fin categories (2.5). However, in terms of the total number of shark fin categories that can be found in different markets, only eight categories of shark fins were found in Beijing/Shanghai. A greater number of categories of shark fin were found in Hong Kong (24), Taiwan (30) and Guangzhou/Shenzhen (46).

Although 40% of stores in Taiwan only offered one type of shark fin, 4% displayed more than 5 categories of shark fin for sale. While none of the shops in Hong Kong offered only a single type of shark fin for sale, neither did any offer more than five categories. In mainland China, only 9-13% of shops offered only one type of shark fin, while 4-7% shops offered more than five categories of shark fin for sale.

This indicated that most of the shops in Taiwan sold similar commodity categories of shark fin, with only a few of them selling more diverse and less replicated shark fin categories. However, most shops in Guangzhou, Shenzhen and Hong Kong offered more diverse and less replicated shark fin categories. The shops in Beijing and Shanghai were somewhat in between.

More than 90% of the surveyed stores in Taiwan, Hong Kong and Guangzhou/Shenzhen claimed that shark fins can be stored for at least three years after purchase. Only 70% of stores in Beijing/Shanghai made the same claim, with the rest claiming that, after purchase, shark fins can only be stored for two years. This difference is likely to be due to the sourcing of shark fins sold in Beijing and Shanghai from wholesalers in Guangzhou/Shenzhen, where the fins may already have been stored for some time, rather than directly from processors, thereby limiting the remaining shelf life of the fins once they reach the retailers in Beijing/Shanghai.

Qualitative surveys also confirmed that stockpiling tended to occur in the past, when market prospects were more optimistic, but such behaviour has declined in tandem with the declining demand of recent years. Most of the stores are only placing new orders when their inventory is running out, to avoid the uncertainty of the market.

Any stockpiling of shark fins which may have occurred after the launch of the anti-corruption policy in China may not happen as the processed dried fins at the retail or wholesale level in the consumption market, but could instead happen as the raw frozen fins in the shark fisheries countries. For example, a 2012 report claimed that the owners of fishing vessels piled up shark fins in their freezers but did not sell those due to declining market demand and decreasing price (Lu 2012). Also, the observed increase in shark fin imports in recent years in Taiwan may indicate that shark fin stockpiling has happened as raw frozen fins in the shark fisheries entity rather than as the processed dried fins at the consumption side.

Mainland China's trade in shark fins, which included imports of shark fins from 36 countries/territories and (re)exports to nine countries/territories, declined between 2005 and 2014. For both import and (re)export volumes, trade in the first four years (2005-2008) accounted for 90% of the ten-year total imports (11,727 t) and (re)exports (4,143 t). Mainland China imported shark fins from a progressively smaller share of countries, down to 11 between 2009 and 2014 from a total of 36 between 2005 and 2008. Clarke (2004) reported that mainland China imported shark fins from, on average, 21 countries/territories each year between 1996 and 2002. This figure was much lower than for Hong Kong, which imported shark fins from more than 80 countries each year from 1996 to 2002. Mainland China imported 29% (3,350 t) and 5% (585 t) of their shark fins from Taiwan and Hong Kong, respectively. Taiwan and Hong Kong ranked 1st and 8th amongst exporters of shark fin to mainland China from 2005 to 2014. However, the imports of shark fins from Taiwan almost all occurred in the first five years (2005-2009), while the imports from Hong Kong run throughout the ten-year period. Hong Kong Customs data suggest that mainland China had significantly under-reported their shark fin imports, however this is probably due to the practice of excluding those commodities intended "for processing". Mainland China's total shark fin imports increased from 11,727 t to 38,270 t between 2005 and 2014, if Hong Kong's (re)export figure was used to adjust mainland China's import record (Figure 9 and Annex 7).

Market surveys in mainland China found that *Jin Shan* Fin can be found in 77% of shops in Beijing/Shanghai. *Jin Shan* Fin is so named to demonstrate that it was transited/exported from San Francisco, with the connotations of better processing quality in or before entering into San Francisco and the implication of better quality and a longer storage time. The observed presence of these fins in stores contrasted with official import figures, where only 9% (1,060 t)[33] of shark fins were imported from the USA, Canada and Latin America, i.e. those from which they might reasonably have expected to have been sent to San Francisco for processing or transit. Some stores in Hong Kong claimed that *Jin Shan* Fins were imported from Australia and processed locally.

[33] 0.12% (14 t) from the US, 0.38% (44 t) from Canada, and 8.55% (1,002 t) from Latin America

Hong Kong's Customs data have recorded shark fins imported from Australia, however it seems unlikely that shark fins originally from Australia would have transited through San Francisco. It is possible that the term "*Jin Shan* Fin" is presently used to refer to one category of shark fin, and is no longer related to the origin or processing location.

The high visibility of *Jin Shan* Fins in the market, and its discrepancy with official import volumes, is not only indicative of consumer behaviour that has little basis in rationality, but also reveals a problem with the mislabelling and overpricing of shark fin products. At the same time, information on the species and origin of shark fin were concealed under the category of *Jin Shan* Fin and further resulted in the challenge of understanding and tracking them to sustainable sources. Indeed, *Jin Shan* Fins were the most expensive category of fins in Hong Kong and the second most expensive in Beijing/Shanghai for commonly found shark fin categories.

Hong Kong's annual imports and (re)exports of shark fins were relatively stable in the early years, but also experienced a large decrease in 2011 and 2012. Hong Kong imported shark fins from 115 countries/territories and exported those to 31 countries/territories. In total, Hong Kong only imported 16,659 t (19%) of shark fins sourced from Canada, USA and Latin America (i.e. those with the likelihood of being transited in San Francisco and, thus, being entitled to use the name of the popular *Jin Shan* Fins). However, the high proportion of *Jin Shan* Fin observed in the surveyed stores in Hong Kong (83%) did not comfortably match with the low import volume of shark fins (potentially) transited via San Francisco. Although the likelihood of mislabelling does not necessarily violate any import and (re)export regulations, it is good practice to ensure proper labelling of products, with species and origin, at all points along the trade chain. This would also ensure that consumers are not misled and well-informed when they purchase shark fin products. At the same time, appropriate labelling will also facilitate the monitoring and tracking of species use and origin, as well as further help to estimate the sustainability of used shark species. A ten year global sharks and rays conservation strategy has pointed out that responsible trade is one of the key to reverse the trend of shark and ray decline (Brautigam *et al*. 2015). Implementing CITES effectively, collecting and reporting accurate trade information, adopting an adequate traceability system, as well as implementing FAO Responsible Trade Guidelines are the essential elements to reach the goal of responsible trade.

Hong Kong's (re)exports to mainland China decreased significantly in 2009 and 2010, but this was offset by steady increases in (re)exports from Hong Kong to Taiwan from 2007 to 2010. (Re)exports to Taiwan experienced a further significant increase in 2011, before returning to earlier levels in 2012-13. (Re)exports from Hong Kong to some other neighbouring countries/territories, including Viet Nam, Singapore and Macau, also increased sharply in 2009. This suggests a shift in

(re)exports from mainland China to Viet Nam, which is especially evident in 2010 trade figures. The increased (re)export to Singapore and Macau in 2009 did not persist, except for an increase in 2012.

2009 appears to be the turning year for shark fins trade in mainland China (Figure 9). That year, there was a significant reduction of (re)export from Hong Kong to mainland China and Viet Nam became an alternate destination for Hong Kong's (re)exports of large quantities of previously imported shark fins. The shark fin retained in mainland China (adjusted with Hong Kong's export data) dropped from 3,438 t in 2009 to 942 t in 2010. On the other hand, the shark fin (adjusted and factored) retained in Hong Kong were around 889 t in 2009 and increased to 1,048 t in 2010. This indicated that Hong Kong was outpacing mainland China in retaining more shark fins since 2009.

This is inconsistent with the conclusion that mainland China is the world's foremost shark fin consumer market (Dent & Clarke, 2015). The consumption of shark fin in mainland China could be much higher than estimated here through supply from its own fleets, unrecorded trade, such as e-commerce, tourist souvenirs and smuggling.

Recent events in China that have impacted shark fin trade

There are many possible actions that, individually or in combination, can influence the amount of consumer market-based trade in shark fin at any given time, whether it be through influencing consumer choice, impacting the availability of product at restaurants/hotels, changing carriage policies within the transportation industry, or establishing regulations. Some recent actions include:

- A Chinese lawmaker, Ding Liguo (丁立國), deputy to the National People's Congress, proposed in March 2011 that the country's top legislature should ban the trade of shark fin (Ma, 2011).
- A Hong Kong reporter visited Puqi in Zhejiang Province in May 2011, one of the largest shark processing centres in China, and exposed Puqi's role in China's shark processing business.
- Wenzhou in mainland China launched a more detailed anti-corruption policy in July 2012, to specify the ban of shark fin, abalone, Liaoning sea cucumber and others in the government banquets (Anon. 2012a).
- Mainland China launched an anti-corruption policy (Eight Rules & Six Bans) on 4th December 2012 to restrict the spending of public money on luxury banquets (Anon. 2013c).
- Mainland China's anti-corruption policy (National Reception Policy for Party and Government Authorities) was advanced at the end of 2013, with more details such as the ban of shark fin, birds nest and protected wildlife, including at government banquets (Anon. 2013d).

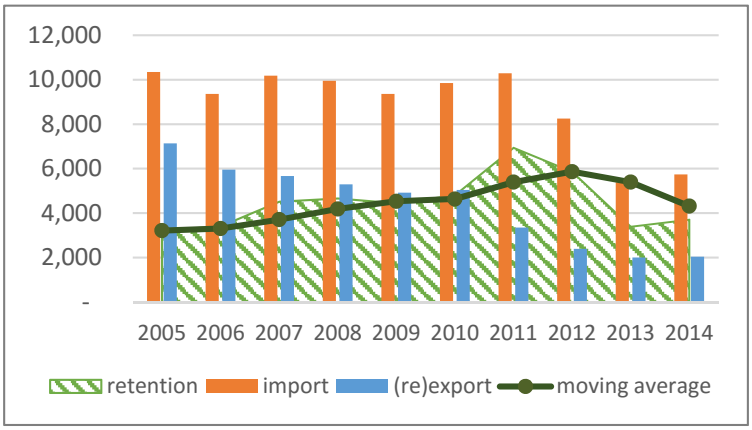
Analysis of Hong Kong's Customs data, after they were adjusted and factored for water content, shows that Hong Kong's retained supply of shark fins progressively increased from 2005, peaked in 2011, and then decreased in 2012 and 2013 before appearing to stabilize in 2014. The retention of shark fin (adjusted and factored) in Hong Kong in 2014 was 25% lower than that in 2009. The peak in 2011 was due to slight increases in imports with concurrent significant decreases in (re)exports. Significant declines in imports in 2012 and 2013 reduced the amount of shark fin retained. In 2014, Hong Kong's import and (re)export of shark fins (adjusted and factored) did not exhibit any obvious changes from the volumes reported in 2013.

Interviews with traders suggest that most consumers of processed dried shark fins in Hong Kong were local residents rather than tourists or parallel traders[34] from mainland China. There are good independent data to show that shark fin consumption in Hong Kong has been in decline. A consumer survey conducted by a university in 2014 showed that shark fin consumption in Hong Kong at wedding banquets and during the Chinese Lunar New Year had decreased by around 20%, compared to 2009 levels (Anon., 2015b). Because these data only indicate shark fin consumption levels in 2009 and 2014, and not in the intervening years, it is not clear if shark fin consumption had gone through a similar increase and decrease as the pattern of retention reflects.

For a place like Hong Kong that almost has no shark fisheries, the import minus re-export (=retention) can serve as a proxy for domestic consumption. Because of the processed shark fin storage time is at least three years. A three-year moving average based on the annual retention in Hong Kong was calculated to show larger-scale trends in annual consumption in Hong Kong (Figure 16). This moving pattern still showed the increase from 2009 to 2012, followed with a slow decline in 2013 and 2014.

[34] Residents from Shenzhen and Hong Kong purchase sought after commodities in Hong Kong to bring them to Shenzhen for sale. http://www.scmp.com/topics/parallel-trading

Figure 16. Hong Kong shark fin import, (re)export, retention and three-year moving average (t), 2005-2014



Source: Hong Kong Customs data, 2005-2014

Hong Kong's (re)exports to mainland China declined just as trade with various other neighbouring countries/territories increased, including Viet Nam, Singapore, Macau and Taiwan. Therefore, one possible explanation for the shift in trade between Hong Kong and mainland China is that the trade may have simply been directed to a transit point elsewhere, before being re-directed to mainland China. Hence, the declining trends in trade between the two may not truly represent an overall reduction in imports to mainland China, and shark fin consumption in mainland China may not have changed as much as the Hong Kong-China trade seems to suggest.

Viet Nam has replaced mainland China as the largest importer of Hong Kong's sea cucumber exports since 2004 (To and Shea 2012) and, while the reason behind a change in trade routes may be different for sea cucumbers and shark fins, a similar consignment route is evident. A group of companies, based in Hong Kong and Shenzhen, were specialized to handle shipments and documents for the transport of commodities from Hong Kong to mainland China. These companies used to ship commodities directly between Hong Kong and mainland China, but – according to companies interviewed for this research – increasing volumes of cargo are now being transported via Viet Nam. Cargos from around the world could be shipped to Viet Nam directly or via Hong Kong, and then transported from Viet Nam to Guangxi in mainland China by land via unregulated or less well-regulated border points. Phone interviews revealed that, after cargo arrives in Guangxi, air transportation can be arranged to anywhere in mainland China. This transport route could not only avoid import tariffs and VAT from mainland China, but also other complex paperwork and consignment inspections that may be required for high profile products such as shark fins. The cases of smuggled shark fin, foreign sourced seafood and "zombie" beef (or rotting meat) revealed that large amounts of import tariffs (one to two thousand Chinese Yuan for every metric tonnes of commodities) can be saved if products are imported into mainland China via

the border of Viet Nam and Guangxi (Lee 2015 and Lau 2015). The moving of commodities from one side of the border to the other is also efficient, product volumes as high as 35 t cargo can be transferred across the border within two hours by dozens of locals (Lee, 2015).

A news report in 2013 claimed that high priced frozen seafood arrived in mainland China through the border of Guangxi and Viet Nam (Lin *et al*. 2013). Around one to two thousand metric tonnes of expensive frozen seafood arrived Guangzhou daily.

A decades-old frozen beef scandal in 2015 also revealed the smuggling route between Viet Nam and mainland China (Lau, 2015 and Lee 2015). In June 2015, Chinese Customs seized more than 100,000 t of frozen beef and other meat across 14 provinces in mainland China. It was said some of meat was more than 40 years old and had been smuggled into Guangxi via Hong Kong. The frozen meat went through Hong Kong, then Haiphong and Mong Cai in Viet Nam. The cargo was opened in Mong Cai, commodities were transferred by locals across the border to Dongxing in Guangxi and further to other locations in mainland China (Lau, 2015 and Lee, 2015).

Dent and Clarke (2015) found that Hong Kong has not only become less important as a re-exporter to mainland China, but also that Thailand has replaced Hong Kong as the main (re)exporter of fins, primarily exporting to Japan and Malaysia (Dent and Clarke 2015). This is based on the official Customs records from mainland China and Hong Kong. However, the traders from Hong Kong are still actively organizing shark fin trade to mainland China from around the world, therefore the border trade of mainland China with her neighbouring countries requires close examination, especially the southern border with Viet Nam that has been used for shark fin smuggling.

Taiwan's shark fin imports experienced two waves of increases, with the first occurring between 2005 and 2011. A second occurred after a 50% reduction in imports during 2012, after which imports increased again between 2012 and 2014. A shark fin import regulation was enacted on 1st June, 2012 in Taiwan, to only allow shark fin imports from legal sources with relevant documentation (such as vessels registered with Regional Fisheries Management Organizations (RFMOs)). The new regulation also prohibits the shark fin re-export from non-RFMO countries (member or co-operating non-member). It was said the new regulation and accompanied inspection caused the import decrease in 2012 (Dr K.K. Wu from Kaohsiung Ocean University in litt. to Joyce Wu). The import in 2013 and 2014 had increased gradually to the level of 2010 and 2011 when importers became familiar with the new shark fin import regulation, however the main suppliers have changed. In 2010, Gambia was the largest supplier for Taiwan's shark fin import, accounting for 29% of total annual import, followed by mainland China (13%), Indonesia (12%) and Trinidad and Tobago (11%). Mainland China (25%) became the largest source for Taiwan's shark

fin import in 2011, followed by Suriname (14%) and Spain (14%). Spain became the largest supplier for Taiwan's shark fin import in 2013 and 2014, accounting for 32% and 49%, respectively. Mainland China only supplied 21% and 8% of shark fin for Taiwan's annual shark fin imports in 2013 and 2014, respectively. The significantly increased supply from Spain may be because Spanish traders were able to provide relevant documents which match with Taiwan's shark fin import regulation.

Taiwan shark fin exports remained relatively stable between 2005 and 2011, but after a decrease in 2012, exports remained at low levels in 2013 and 2014. Taiwan imported shark fins from 60 countries/territories, and exported to 18 countries/territories. The significant drop in (re)exports from Taiwan since 2012 may be as a result of the anti-corruption policy launched in mainland China as well as the crackdown on some shark fin processors in mainland China because of tax evasion (Dr K.K. Wu from Kaohsiung Ocean University in litt. to Joyce Wu). It is not known how much of the large amounts of retained shark fin have been sold in Taiwan for domestic consumption, and if any of these were smuggled to mainland China or elsewhere.

In Taiwan since 2000 some NGOs have called for a ban on the serving of shark fin at banquets hosted by government departments. At least some banquets have followed the call and no longer serves shark fins. In 2013, the Fisheries Agency of Taiwan promoted the utilization of the whole shark, including the fins, which attracted a lot of public criticism (Anon., 2013e). Despite the public criticism of current Taiwan Government policy, the government has not restricted its policies to reflect these publicly held views. A survey in 2011 found that 71 out of surveyed 76 high-end hotels in Taiwan offered shark fin menus for wedding banquets (Anon., 2011b).

The shark fins that Taiwan imported from Hong Kong fluctuated greatly from year to year. Nearly half of all shark fins that Taiwan imported from Hong Kong over the ten-year period were imported in 2005 alone, and a further 34% were imported in 2011. Taiwan's shark fin imports from mainland China exhibited an increasing trend, with two significant periods of increase in 2011 and 2013. Taiwan's shark fin imports from Spain increased around 67% from 2010 to 2011, and increased again in 2013 and 2014. This increase in Taiwan's imports was a likely result from the newly-launched shark fin import regulation, and somewhat offsets Hong Kong and mainland China's decreasing imports.

Hong Kong continues to be the largest trading hub for shark fins, supplying mainland China, which is the largest consumer market in the world (Dent & Clarke, 2015). Taiwan has long been one of the largest (ranking 4th worldwide) shark catchers. This fact itself can tell how they are relying on each other for their shark fin business. Hence mainland China is the largest consumer with Hong Kong

a hub and Taiwan a major supplier. However, the official recorded data have not always fully revealed these close links. The complexities of shark fin trade routes may obscure such links, while clandestine illegal trade adds further difficulties in understanding and managing a legal and sustainable shark fin trade.

As discussed above, Taiwan's increase in shark fin imports from 2012 to 2014 meant a return to the original level; the decreased shark fin (re)export during the same period was partly, if not all, due to the reduced price and government crackdowns in mainland China. It is not clear whether or how much the observed increases of shark fin retention in recent years in Taiwan would move to the domestic consumption. A report in 2012 claimed that the owners of fishing vessels stockpiled shark fins in their freezers, but were not selling those because of declining market demand and decreasing prices (Lu 2012). This indicates that in addition to promoting shark fin consumption in places such as Taiwan and other Chinese ethnic markets other than Hong Kong and mainland China, fishing vessel owners have also passively stockpiled raw shark fins. Taiwan's shark fin exports to mainland China also fluctuated, but with an overall decreasing trend, including a more than 70% decrease between 2009 and 2010.

In September 2015, Greenpeace found a Taiwan-flagged vessel illegally fishing in the Western Pacific Ocean without appropriate fishing licences and violating the 5% shark fin ratio rule (Anon., 2015c). This violated Western Central Pacific Fisheries Commission (WCPFC) requirements. The shark fins found on the vessel included Blue Shark, Silky Shark and two CITES Appendix II species, namely Scalloped Hammerhead and Porbeagle Shark. If the two CITES-listed shark species (Scalloped Hammerhead and Porbeagle Shark) had been exported, it would more than likely violate the issuing of CITES Export Permits. This incident shows that there is a risk that fins from CITES-listed shark species are mixed with other shark species for sale domestically, and for export. It is important for Taiwan, as a top-ranked shark catcher, to consider developing a traceability system to identify and monitor CITES-listed shark species – at least from the point of harvest to the point of export – to avoid illegal CITES trade which could jeopardize shark conservation (Mundy and Sant, 2015).

RECOMMENDATIONS

Shark fin and mobulid ray gill plates were commonly seen and sold in physical markets in mainland China, Hong Kong and Taiwan, and advertised in online markets in mainland China, despite the conservation concerns for these species, ongoing awareness-raising work and mainland China's anti-corruption policy.

Mainland China, Hong Kong and Taiwan may account for more than 90% and 70% of the global import and (re)export, respectively, between 2005 and 2011, based on FAO import data. However, possible illegal shark fin trade could indicate that the trade decline of mainland China, Hong Kong and Taiwan may not be as severe as the official data shows. Large amounts of shark fins and mobulid ray gill plates in the physical and virtual markets were grouped by various price categories, however the information on species, origin and processing locations of the products were largely lacking or cannot be confirmed.

Hong Kong, as the largest shark fin trade hub, reported 90% of all CITES shark fins imported between 2003 and 2013, recorded in UNEP-WCMC. However, it is only less than 7 t in 11 year, compared with the 85, 823 t of raw shark fin recorded by Hong Kong between 2005 and 2014. Hong Kong has imported its shark fin from more than 100 countries/territories, on the other hand the CITES listed species of shark fin that Hong Kong imported were all from Norway.

The report recommends a number of actions regarding trade in shark fin and mobulid ray gill plates, for the attention of stakeholders in mainland China, Hong Kong and Taiwan:

- Hong Kong, as the largest shark fin trading hub, handling up to 40% of global shark fin trade from more than 100 countries/territories, as well as roughly 90% of imports in CITES-listed species between 2003 and 2013, recorded in UNEP-WCMC's CITES Trade Database. However, large inconsistencies in the data exist between trade volume recorded by UNEP-WCMC and those recorded by Hong Kong Customs and Excise Department (7 t compared to 85.823 t during the 11 year period, respectively). Hong Kong, as well as the top 20 shark fin (re)exporting countries/territories, should improve their monitoring and reporting of the shark fin and manta ray gill plate trade to ensure it meets basic reporting requirements under CITES. This could include periodically examining the CITES as well as Customs data with trade partners to identify the possible gaps. To identify/label CITES shark fins and manta ray gill plates separately from mixed species shipments to increase the accuracy of information reporting and recording on the species and volume, as well as issuing appropriate CITES documents for trade.

- Mainland China and Taiwan should ensure that all sharks and rays harvested by and landed in their jurisdictions are legally acquired, traded with the correct species name and with appropriate documents. It is advised that a traceability system for CITES listed shark and ray species could be developed and applied from harvest to the point of first export in all shark and ray catching countries/territories.
- The responsible CITES authorities in mainland China, Hong Kong and Taiwan should enhance awareness of regulations on the shark fin and manta ray gill plate trade to other relevant authorities, such as Customs, quarantine and coastguard, in order to increase the detection of illegal trade. Relevant trainings, including species and products identification, should also be provided if necessary.
- Increase awareness of regulation and product identification among the shark fin and manta ray gill plate trading and processing industries in mainland China, Hong Kong and Taiwan, to increase the support and compliance to CITES by the shark fin industries. Product identification and regulation awareness training should be provided to frontline officers if necessary.
- Register all merchants on the physical and e-commerce markets that are involved in the trade of CITES-listed shark species, and require documented evidence of legal sourcing.
- Increase the knowledge of shopkeepers and e-commerce companies on the CITES regulations, e-commerce policy and legal sourcing practices of shark fins and manta ray gill plates, as well as the importance of correctly labelling information as to the species and origin of the fins and gill plates to enable informed consumer choice.
- Monitor domestic markets and e-commerce websites to verify the legality of shark fins and mobulid ray gill plates available on the market, including the use of correct labelling of species and origin of the products.
- The relevant authorities in mainland China (China CITES MA), Hong Kong (AFCD) and Taiwan (BOFT) should improve the accuracy of their record keeping and reporting of the trade of CITES-listed sharks and mobulid rays to the CITES Secretariat.
- Introduce Customs codes in mainland China and Taiwan to distinguish between raw and processed, as well as dried and frozen shark fins, which would help to enhance trade monitoring.
- Enhance the monitoring and patrolling of trade routes such as between Hong Kong and Viet Nam (and possibly to other countries/territories, e.g. mainland China), especially in the detection of illegal trade in shark fin and mobulid ray gill plates, as well as to research and quantify related trade levels and to develop target strategies to combat illegal trade.
- Authorities in mainland China, Hong Kong and Taiwan should co-operate, including through regular exchange and setting up a joint task force, in order to ensure the legality of trade in shark fin and mobulid ray gill plate.

- Furthermore, the Customs and trade authorities in mainland China and Taiwan need to examine the procedure of trade management and data recording to understand the reason for their trade data reporting lower volumes than their trade partners. This should help clarify whether illegal trade is a component of the overall trade.
- The relevant authorities, such as trade, commerce and fisheries, in mainland China, Hong Kong and Taiwan should conduct regular inventories of shark fins and mobulid gill plates to understand the availability and consumption volume in their jurisdictions, and to verify if the volume unreasonably exceeds the sum of imports and harvests.
- Evidence-led consumer behaviour change approaches should be applied to reduce demand for shark fins and mobulid ray gill plates products in target markets.
- Mainland China's anti-corruption measures, including the ban of shark fin consumption in official receptions, may have contributed to a decrease in consumption and consequently a reduction of availability in the market. This example shows that government-led policy interventions can contribute to decreased consumption and should be explored further.

REFERENCES

Anon. (Ed). (1983). Chinese Medicinal Fauna Book, II Tianjin Science and Technology Press, Tianjin, China. 中国药用动物志编（1983）中国药用动物志. 天津科学技术出版社，天津，中国.

Anon. (2008). State Council Response on promoting economic and trade development in border areas.《国务院关于促进边境地区经济贸易发展问题的批复》. http://www.mofcom.gov.cn/sys/print.shtml?/b/g/200812/20081205973610.

Anon. (2011a). Survey on shark consumption habits and attitudes in Hong Kong. Bloom. Hong Kong. http://www.ssrc.hku.hk/files/reports/conservation/Survey-on-shark-consumption-habits-and-attitudes-in-Hong-Kong_April-2011.pdf.

Anon. (2011b). The estimation of shark fin consumption for wedding banquets at high-end hotels in Taiwan. EAST. Taiwan. http://www.east.org.tw/FCKupload/File/2011-ISSUES/20110616.pdf

Anon. (2012a). Shark fin and Maotai ban for the official banquet in Wenzhou. People. 6 July. http://politics.people.com.cn/n/2012/0706/c70731-18455297.html.

Anon. (2012b). Shark fins consumption cost 100 million a day, industry association doesn't consider it's a waste. Sina News, 4 September. http://news.sina.com.tw/article/20120904/7758517.html

Anon. (2012c). Websites ban sale of bear gall, shark fins. 1Hangzhou.com, 12 March. http://www.chinadaily.com.cn/m/hangzhou/e/2012-03/12/content_14966768.htm.

Anon. (2013a) China Shark Industry Report. China Aquatic Products Marketing and Processing Association (Eds). China Agriculture Publisher, Beijing. 69pp. 中国鲨鱼产业报告（2013）中国水产流通与加工协会组编，中国农业出版社，北京。69 页。

Anon. (2013b). Shark fin smuggling in Guangxi at the border of China and Viet Nam (footage). China Central Television (CCTV), 8 January. 实拍广西中越边境走私犯深夜搬运鱼翅 http://v.qq.com/cover/7/7ne4ow9tqw3mop4.html?vid=l0011j6j0mc.

Anon. (2013c) Eight Rules and Six Bans of China. China.com, 23 January. 中央『八项规定』、『六项禁令』http://news.china.com/focus/fdpzlf/11135258/20130123/17649773.html

Anon. (2013d). Official reception regulation advanced. Sina New 8 December. 中央严管公务接待升级：禁燕窝鱼翅高档酒. http://news.sina.com.cn/c/2013-12-08/182428918097.shtml

Anon. (2013e). Eat shark fin? Fisheries Agencies promote whole shark consumption. 18th December. 鱼翅可吃？ 渔業署登廣告教你吃全鯊.

https://tw.news.yahoo.com/%E9%AD%9A%E7%BF%85%E5%8F%AF%E5%90%83-%E6%BC%81%E6%A5%AD%E7%BD%B2%E7%99%BB%E5%BB%A3%E5%91%8A%E6%95%99%E4%BD%A0%E5%90%83%E5%85%A8%E9%AF%8A-025759344.html.

Anon. (2014a). The Decline of Puqi, Zhanjiang, the Shark Processing Centre : reduced to 3 industries from more than 20. China News, 25 February. http://www.chinanews.com/sh/2014/02-25/5878705.shtml .

Anon. (2014b). State of the Global Market for Shark Commodities: Summary of the Draft FAO Technical Paper. CITES Animals Committee 27, Information Paper 14. http://www.cites.org/sites/default/files/eng/com/ac/27/E-AC27-Inf-14.pdf

Anon. (2014c). Zhanjiang Yueqing denied as the largest slaughter house of sharks in China, but a processing plants. Sina News, 21 February. http://dailynews.sina.com/bg/chn/chnpolitics/phoenixtv/20140221/15205482304.html

Anon. (2014d). Operation 11.12 – shark fin smuggling import: underreport the import value, smuggled seafood worth CNY 1.19 billion. Nandu.com, 25 July. “11.12”进口鱼翅走私专案:报低价格走私 11.9 亿海味 http://www.hfdsb.gov.cn/News/jsjs/201407/20140725094726_22341.html.

Anon. (2015a) Company introduction - Haideli shark products Ltd. Co. http://www.ch-food.com/?p=zshow&id=24262 Viewed 22 October.

Anon. (2015b). Survey on Shark Consumption Habits and Attitudes in Hong Kong. Bloom Association (Hong Kong) and the Social Science Research Centre of the University of Hong Kong. http://www.bloomassociation.org/en/wp-content/uploads/2015/04/Shark-Sociological-Survey-2015-Press-Kit.pdf

Anon. (2015c). Suspicious of the harvest for fishing vessel SDC 888 the missing of illegal harvest. 21 September. http://www.greenpeace.org/taiwan/zh/press/releases/oceans/2015/illegal-fish-disappear/

Anon. (2015d). Guangdong on-site inspection for pre-Convention stock on the products of CITES listed shark and mobulid ray specie. 广州专员办（濒管办）对广东企业鲨鱼和蝠鲼“公约前所获”库存产品进行现场核查. http://www.forestry.gov.cn/main/443/content-717372.html

Boon, P. (2016). The shark and ray trade in Singapore. TRAFFIC. Petaling Jaya, Selangor, Malaysia.

Brautigam, A., Callow, M., Campbell, I.R., Camhi, M.D., Cornish, A.S., Dulvy, N.K., Fordham, S.V., Fowler, S.L., Hood, A.R., McClennen, C., Reuter, E.L., Sant, G., Simpfendorfer, C.A. and Welch, D.J. (2015). Global Priorities for Conserving Sharks and Rays: A 2015-2025 Strategy.

Chen. J., and Huang, L. (2014). Fined with 200 million for smuggled more than ten thousand tonnes

of shark fins and seafood. Guangzhou Daily, 30 October. 江门特大走私案:走私鱼翅上万吨被罚 2 亿. http://news.dayoo.com/guangzhou/201410/30/73437_38653356.htm.

CITES. (2016). How CITES Works. https://cites.org/eng/disc/how.php. Viewed 30 January.

Clarke, S. (2002). The trade in Asian Dried Seafood: Characterization, Estimation and Implications for Conservation. WCS Working Paper No. 22, December 2002.

Clarke, S. (2004). Shark Product Trade in Hong Kong and Mainland China and Implementation of the CITES Shark Listings. TRAFFIC East Asia, Hong Kong, China. www.traffic.org/species-reports/traffic_species_fish16.pdf

Clarke et. al. (2004). Estimates of shark species composition and numbers associated with the shark fin trade based on Hong Kong auction data. J. Northw. Atl. Fish. Sci., 35:453-465.

Clarke et. al. (2006). Identification of shark species composition and proportion in the Hong Kong shark fin market based on molecular genetics and trade records. Conservation Biology, 20 (1): 201-211.

Dent, F. and Clarke, S. (2015). State of the global market for shark products. Rome, FAO. 187pp.

Dulvy et al. (2014), Diagnosing the dangerous demography of manta rays using life history theory. PeerJ 2:e400; DOI 10.7717/peerj.400

Dulvy et. al. (2014). Extinction risk and conservation of the world's sharks and rays. eLife 3:1-34. doi: 10.7554/eLife.00590

Eriksson and Clarke (2015). Chinese market responses to overexploitation of sharks and sea cucumbers. Biological Conservation 184:163-173.

Hilton, P. (2014). Shutting Down the Manta Trade. iLCP. 11 November. http://voices.nationalgeographic.com/2014/11/11/shutting-down-the-manta-trade/

Heinrichs, S., Omalley, M., Medd, H. & Hilton P. (2011). The Global Threat to Manta and Mobula Rays. Shark Savers & WildAid. http://www.mantarayofhope.com/downloads/The-Global-Threat-to-Manta-and-Mobula-Rays.pdf

Kwong, Y. T. (ED). (2013). Hong Kong dried seafood purchase guide. Wanlibk. Hong Kong. Pp176.

鄺裕棠 (2013) 香港海味採買圖鑑。萬里機構 飲食天地出版社。176 頁。

Lau, M. (2015). 'Illegal smuggling routes' exposed after rotting meat from the 1970s seized by Chinese customs. South China Morning Post, 24 June. http://www.scmp.com/news/china/society/article/1825584/smugglers-also-shipping-frozen-beef-china-through-india-and

Lee D. (2015). Hundreds of thousands of zombie meat sold throughout China, some were more than 40 years old. 10 万余吨"僵尸肉"销全国 部分"肉龄"达 40 年. XiHuan Net, 23 June.

http://news.xinhuanet.com/food/2015-06/23/c_127941265.htm

Lin, C.Z. (2010). Fine Dried Seafood. Wanlibk. Hong Kong. Pp159. 林長治（2010）鮑參翅肚燕窩大全。萬里機構 飲食天地出版社。159 頁。

Lin, X.l., Zhang, B.R., Du, M. and Li, D.l. (2013) Foreign seafood reach Guangzhou after detoured for tens of thousands of miles. Guangzhou Daily, 24 August. 辗转万里洋海鲜偷偷摸摸进广州. http://gzdaily.dayoo.com/html/2013-08/24/content_2366094.htm.

Lu. K.C.. (2012). China ban shark fins – Somalia pirates lost their jobs. Business Weekly Vol. 1304. http://www.businessweekly.com.tw/KArticle.aspx?id=48471&p=3 呂國禎（2012）中國禁魚翅 索馬利亞海盜也失業。商業週刊 vol 1304。

Ma, S. (2011). Chinese billionaire lawmaker urges legislation against shark fin trading. Xinhua. 9 March.

McKie, R. (2009). Shark fin ban ends cruel slaughter. The Guardian, 11 October. http://www.theguardian.com/environment/2009/oct/11/uk-shark-finning-ban-extinct

Mundy, V. and Sant, G. (2015). Traceability systems in the CITES context: A review of experiences, best practices and lessons learned for the traceability of commodities of CITES-listed shark species. TRAFFIC report for the CITES Secretariat.

Sun. J. (2014). The rise and fall of Chinese "The Cove". World Journal, 9 June. http://yp.worldjournal.com/view/full_story/25262502/article-%E4%B8%AD%E5%9C%8B%E7%89%88-%E6%B5%B7%E8%B1%9A%E7%81%A3-%E7%9A%84%E8%88%88%E8%A1%B0

To, A.W.L. and Shea, S.K.H. (2012). Patterns and Dynamics of Bêche-de-mer Trade in Hong Kong and Mainland China: Implications for Monitoring and Management. TRAFFIC Bulletin 24:65-76.

Tong, C.L. (2015). Greenpease visits Taiwan Fisheries Agency to reveal the illegal shark fishing. Liberty Times, 11 September. http://news.ltn.com.tw/news/life/breakingnews/1441610

Whitcraft, S., O'Malley, M. & Hilton P. (2014). The Continuing Threat to Manta and Mobula Rays. WildAid. US. http://wildaid.org/sites/default/files/resources/The%20Continuing%20Threat%20to%20Manta-Mobula%20Rays_2013-14%20Report_FINAL.pdf

Annex

Annex 1. CITES listed Shark species

Species	**Common Name**	**CITES Appendix**	**Effective Date**
Cetorhinus maximus	Basking shark	II (previously III since 13/09/00)	13/02/2003
Rhincodon typus	Whale shark	II	13/02/2003
Carcharodon carcharias	Great white shark	II (previously III since 13/09/00)	12/01/2005
Pristidae spp. (7 species)	Sawfishes	I	13/09/2007
Lamna nasus	Porbeagle shark	II (previously III since 13/09/00)	14/09/2014
Carcharinus longimanus	Oceanic whitetip shark	II	14/09/2014
Sphyrna lewini	Scalloped hammerhead	II (previously III since 13/09/00)	14/09/2014
Sphyrna mokarran	Great hammerhead shark	II	14/09/2014
Sphyrna zygaena	Smooth hammerhead shark	II	14/09/2014
Mobulid spp.	Mobulid rays	II	14/09/2014

Source: CITES website, https://cites.org/eng/prog/shark/history.php.

Annex 2. Customs codes of shark fins in mainland China, Hong Kong and Taiwan, 2005-2014

Codes	Description	Valid Year	Import tariff and VAT
Mainland China Customs codes for shark fins			
03055920	dried sharks' fins	Until 2011	● 15% for MFN (Most-Favoured Nation) ● 80% for other nations ● 13% VAT
03057100	shark fin	Since 2012	
Hong Kong Customs codes for shark fins			
03055950	dried shark fin with cartilage	Till 2011	The is no import tariff or VAT (value added tax) for import of shark fin into Hong Kong
03057111		Since 2012	
03055960	dried shark fin without cartilage	Till 2011	
03057112		Since 2012	
03056930	salted shark fin with cartilage	Till 2011	
03057121		Since 2012	
03056940	salted shark fin without cartilage	Till 2011	
03057122		Since 2012	
03057190	shark fin, NESOI	Since 2012	
03038100	frozen shark	Only include data since 2012 for this research	
Taiwan Customs codes for shark fins			
03041030005	chilled shark fin	Until 2008	● 0% for PA, GT, NI, SV, HN ● 1.8% for NZ ● 5.6% for SG ● 17.5% for other nations (include WTO members and reciprocal relationship nations)
03041930006		2009/01/01 - 2013/11/29	
03028993007		Since 2013/11/29	
03055920008	dried shark fin	Until 2013/11/29	● 0% for PA, GT, NI, SV, HN ● 1.8% for NZ
03057120002		Since 2013/11/29	

			● 5.6% for SG ● 7% for WTO members and reciprocal relationship nations ● 9% for other nations
03049030008	frozen shark fin	Until 2008	● 0% for PA, GT, NI, SV, HN ● 1.8% for NZ ● 5.6% for SG ● 17.5% for other nations (include WTO members and reciprocal relationship nations).
03049930009		2009/01/01 - 2013/11/29	
03038993006		Since 2013/11/29	
03056920006	salted shark fin	Until 2013/11/29	● 0% for PA, GT, NI, SV, HN, SG ● 2.3% for NZ ● 9% for WTO members and reciprocal relationship nations ● 10% for other nations
03057130000		Since 2013/11/29	
03057110004	smoked shark fin	Since 2013/11/29	● 0% for PA, GT, SV, HN, SG, NZ ● 3% for NI ● 30% for WTO members and reciprocal relationship nations ● 40% for other nations

NESOI: not elsewhere specified or indicated

Note: GT: Guatemala, HN: Honduras, NI: Nicaragua, NZ: New Zealand, PA: Panama, SG: Singapore, SV: El Salvador,

Annex 3a. The Customs recorded shark fins import and (re)export of mainland China, Hong Kong and Taiwan (kg).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mainland China recorded Customs data										
Import	3,338,418	2,662,063	2,541,789	2,004,889	730,740	121,969	159,415	108,692	39,433	19,637
(Re)export	1,349,032	381,468	409,334	347,010	288,763	204,184	348,721	252,395	284,093	278,137
Hong Kong recorded Customs data										
Import	10,348,142	9,362,486	10,183,381	9,949,556	9,358,825	9,852,609	10,292,421	3,319,964	2,659,522	2,711,347
(Re)export	7,134,417	5,958,610	5,669,590	5,293,375	4,919,370	5,041,358	3,353,751	867,719	1,196,989	1,189,733
Taiwan recorded Custom data										
Import	433,651	710,684	566,295	791,893	987,847	1,166,472	1,268,291	633,065	978,772	1,195,058
(Re)export	1,141,357	974,745	902,838	846,161	913,806	1,057,742	953,536	356,684	166,183	260,150

Source: Customs records from mainland China, Hong Kong and Taiwan.

Annex 3b. FAO recorded shark fins import and (re)export of mainland China, Hong Kong and Taiwan (t), 2005-2011

	2005	2006	2007	2008	2009	2010	2011
FAO recorded mainland China shark fins import and (re)export							
Import	3,338 (22%)	2,662 (19%)	2,542 (18%)	2,005 (15%)	731 (6%)	147 (1%)	159 (1%)
Export	1,349 (11%)	381 (4%)	409 (4%)	347 (4%)	289 (3%)	204 (2%)	343 (5%)
FAO recorded Hong Kong shark fins import and (re)export							
Import	10,348 (67%)	9,363 (67%)	10,183 (71%)	9,950 (72%)	9,358 (79%)	9,852 (82%)	10,293 (81%)
(re)export	7,134 (57%)	5,962 (60%)	5,670 (60%)	5,294 (58%)	4,919 (56%)	5,043 (51%)	3,354 (45%)
FAO recorded Taiwan shark fins import and (re)export							
Import	434 (3%)	708 (5%)	564 (4%)	792 (6%)	988 (8%)	1,156 (10%)	1,260 (10%)

(re)export	1,141 (9%)	974 (10%)	903 (9%)	846 (9%)	913 (10%)	1,051 (11%)	954 (13%)
FAO recorded global shark fins import and (re)export							
Import	**15,370**	**14,046**	**14,320**	**13,781**	**11,880**	**12,031**	**12,654**
(re)export	**12,458**	**9,862**	**9,513**	**9,083**	**8,738**	**9,941**	**7,393**

Source: FishstatJ, 2015.

Note: China's record did not separate the export from re-export.

Most of (re)export from Hong Kong were actually re-export.

Most of (re)export from Taiwan were actually export.

Annex 4. The shark fin import and (re)export (t), mainland China, Hong Kong, Taiwan and estimated world trade 2005-2011

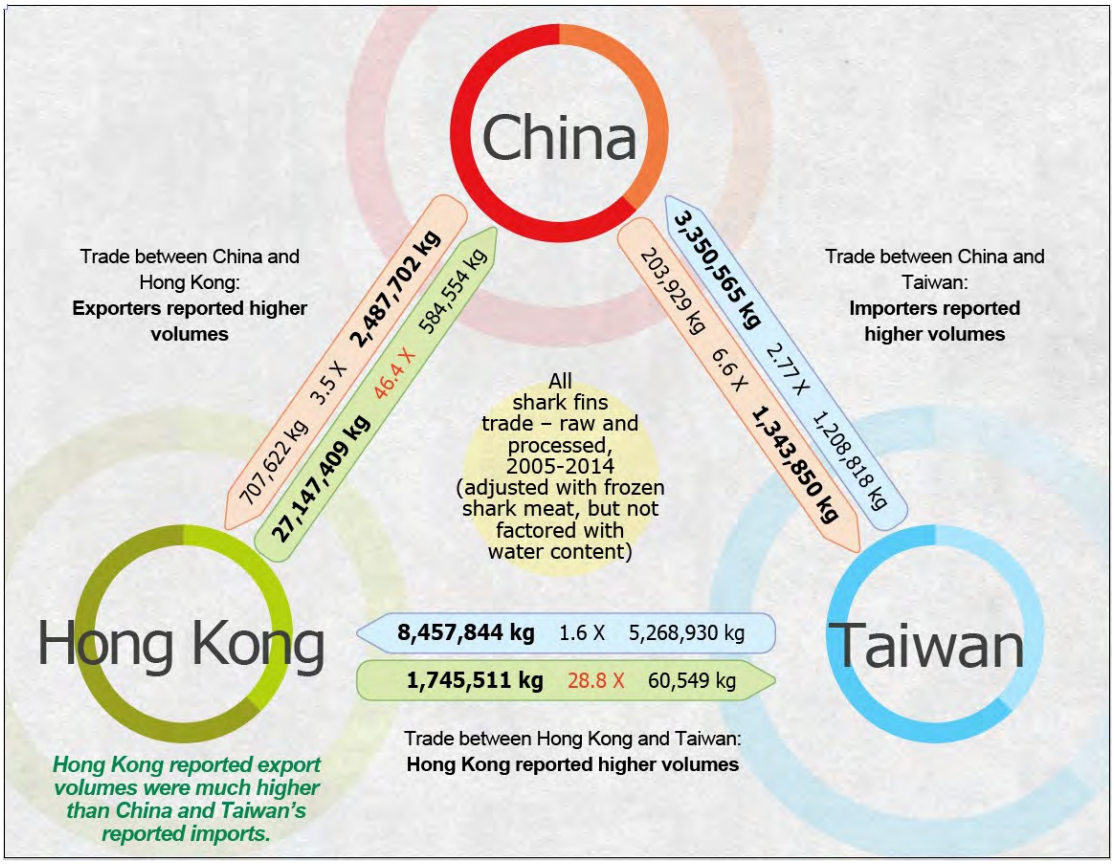
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Mainland China shark fins import and (re)export							
Import	3,416 (20%)	2,662 (16%)	2,546 (15%)	2,019 (13%)	732 (5%)	182 (1%)	161 (1%)
(re)export	1,398 (11%)	571 (5%)	552 (2%)	394 (3%)	382 (3%)	314 (2%)	489 (3%)
Hong Kong shark fins import and (re)export							
Import	10,395 (59%)	9,365 (58%)	10,192 (60%)	9,950 (66%)	9,356 (70%)	9,873 (73%)	10,293 (74%)
(re)export	*7,132 (54%)*	*5,963 (55%)*	*5,670 (24%)*	*5,300 (38%)*	*4,875 (36%)*	*5,043 (30%)*	*3,354 22(%)*
Taiwan shark fins import and (re)export							
Import	434 (2%)	711 (4%)	573 (3%)	796 (5%)	978 (7%)	1,157 (9%)	1,260 (9%)
(re)export	1,241 (9%)	1,048 (10%)	1,015 (4%)	916 (7%)	975 (7%)	1,145 (7%)	1,065 (7%)
Estimated World shark fins import and (re)export							
Import	**17,492**	**16,270**	**16,877**	**15,177**	**13,327**	**13,538**	**14,004**
(re)export	**13,124**	**10,844**	**23,408**	**13,958**	**13,690**	**16,980**	**15,077**

Source: Dent & Clarke (2015)

Annex 5. Seven e-commerce websites monitored for shark fins and mobulid ray gill plates in mainland China, 2015

Websites	Language	Target markets
#1	Chinese	B2B, Domestic market and Chinese speakers around the world
#2	Chinese	B2B, Domestic market and Chinese speakers around the world
#3	Chinese	B2B, Domestic market and Chinese speakers around the world
#4	English	B2B, global market
#5	Chinese	B2C, Domestic market and Chinese speakers around the world
#6	Chinese	B2C, Domestic market and Chinese speakers around the world
#7	Chinese	C2C, Domestic market and Chinese speakers around the world

Annex 6. Shark fin import and (re)export between mainland China, Hong Kong and Taiwan.



Source: Customs data for mainland China, Hong Kong and Taiwan, 2005-2014.

Note: Hong Kong changed some of its shark product codes in 2012, including the re-classification of wet shark fins as frozen shark meat. To get around this for purpose of analysis, the frozen shark meat code had to be adjusted for the years 2012 to 2014 in order to capture the proportion that is salted (frozen) shark fin with cartilage.

Annex 7. Mainland China shark fin import adjusted with Hong Kong's (re)export to mainland China (t).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
original mainland China import	3,338	2,662	2,542	2,005	731	122	159	109	39	20	11,727
adjust with Hong Kong (re)export to mainland China	9,414	7,610	7,252	6,290	3,727	1,146	1,363	1,230	142	96	38,270

Source: Customs data of mainland China and Hong Kong, 2005-2014.

NOVEMBER 2016

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

For further information contact:
Joyce Wu
TRAFFIC
Taipei Office 3F.
No. 92, Ln 106, Sec. 3,
Bade Road, Songshan District,
Taipei City 105, Taiwan

Telephone: + (886)(2) 25795826
Fax: + (886) (2) 25796036
E-mail: traffictaipei@traffic.org
Website: www.traffic.org
(Chinese) www.wow.org.tw

UK Registered Charity No. 1076722,
Registered Limited Company No. 3785518.

TRAFFIC
the wildlife trade monitoring network
is a strategic alliance of
WWF
IUCN