

**An Analysis of the Practicality and Feasibility of a Toronto
Shark Fin Ban**

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Abstract

Shark populations around the globe have seen precipitous declines due to human exploitation. The shark fin trade has been one of the primary drivers in these declines, a trade that operates to meet the demands for the Chinese delicacy, shark fin soup. The soup is primarily served at formal events such as banquets and weddings where it is considered a display of wealth to guests. Though there have been some marked declines in the market for shark fin in China, consumption has become increasingly globally widespread fueling an epidemic that continues to this day. Far too frequently statistics on shark fin being traded are nearly impossible to accurately quantify and there is a lack of knowledge of what species are being traded. Knowledge of the market for shark fin, and shark products is needed in order to properly assess what management measures are needed for shark populations, and for the commodities being traded. This research will assess the market for shark fin at a global, federal, and local level. Governance responses, such as regional or municipal bans have emerged as a means to address the shark fin trade in countries where limited action has been taken by higher levels of government. Though relatively little is known on the impacts that these bans have on shark fin importations, they still may provide a means of spreading awareness and stimulating action. This study analyzes the practicality and feasibility of a Toronto shark fin ban; the second largest hub for shark fin trade in Canada.

Abbreviations

BOLD	Barcode of Life Data Systems
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
DFO	Fisheries and Oceans Canada
EEZ	Exclusive Economic Zone
FAO	Food and Agricultural Organization of the United Nations
FARGA	Fair and Responsible Governance Alliance
GTA	Greater Toronto Area
ICCAT	International Commission for the Conservation of Tuna
IPOA	International Plan of Action
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated, Unreported
MP	Member of Parliament
NDP	New Democratic Party
NPOA	National Plan of Action
RFMO	Regional Fisheries Management Organization
TCBA	Toronto Chinese Business Association
WTO	World Trade Organization

Chapter 1: Introduction

Management problem and research rationale

The trade in fins sourced from sharks is a major driver of shark mortality globally. In recent years, various policies and regulations have been introduced as a means to combat the shark finning epidemic— the extremely wasteful practices of keeping fins, and discarding the carcass (Clarke *et al.*, 2007). Many countries, including the United States and the European Union, have implemented regulations that require the whole shark carcass to be landed before fins may be removed (so called ‘fins-attached’ rule) (Fowler *et al.*, 2010). This practice encourages full use of the landed shark and in theory contributes to lowering total shark mortality, as fishermen will be able to land fewer sharks (Fowler *et al.*, 2010). For over two decades Canada has been a supporter of initiatives to conserve populations of shark in national waters. The act of ‘shark finning’ has been banned since 1994, and Fisheries and Oceans Canada (DFO) has released a National plan of action (NPOA) for the conservation and management of sharks that is meant to ensure the sustainable use of sharks in Canadian waters (DFO, 2007). The NPOA is a good step in the right direction for the management of sharks in Canada, but with few active directed shark fisheries, it only can achieve so much and it does not account for shark fin imports.

Despite federally mandated conservation and management goals that promote the long-term sustainable use of sharks within national waters, the shark fin trade continues to thrive within Canadian borders (DFO, 2007; Dent & Clarke, 2015). Canada has emerged as one of the world leaders in shark fin imports— as of 2015, Canada imported the 11th most shark fins by volume, and the 4th most shark fins from a value standpoint (Dent & Clarke, 2015). Presumably these shark fins go to meet the demand for the large Asian-Canadian communities that account for up to 5 percent of the total population (~1.56 million people) (“Canada Population 2018”, 2018). According to Food and Agricultural Organization of the United Nations (FAO) statistics, Canada ranks as the highest importer of shark fins among non-Asian nations (Dent & Clarke, 2015). Over a span of eleven years, Canada reported average imports of 106 tons

(~0.6% of global total) of shark fin per annum valued at \$5.6 million USD (Dent & Clarke, 2015). Many of these fins may have unsustainable origins as a recent study from Vancouver reported that several species of endangered shark, as well as species listed on Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I & II are present in Canadian markets (Steinke *et al.*, 2017). Localized efforts in the form of bans on shark fins have emerged around the globe as a popular conservation strategy in recent times. In the United States, eleven states have passed laws to ban the possession, sale, and distribution of shark fins (Pers. Comm. David McGuire, 2018). In Canada, there have been various attempts to ban this commodity at municipal scales, to varying levels of success; Brantford, Ontario was successful at implementing a local shark fin ban, while a larger city, Toronto, passed a law only for it to be repealed by provincial courts. Municipal bans could have the potential to influence consumption at a broad scale especially when dealing with large municipalities that are responsible for the majority of shark fin soup consumption.

Research question and objectives

The main objective of this paper is to assess the practicality and feasibility of a shark fin ban in the municipality of Toronto. This is addressed by answering the following two research questions:

1. What is the current composition of the shark fin market in Toronto?
2. Where have municipal bans been successful and what were the enabling conditions? Are these conditions replicated in Toronto?

To answer these questions, this research will analyze shark species composition, through the collection of fins throughout the shark market in Toronto, and subsequent DNA analysis. This research will also assess successes and failures of past municipally-led shark fin bans in an attempt to identify barriers and opportunities for implementation of a commodity ban. It is expected that the results of this study may help inform on contemporary shark management efforts in Canada, leading to improved shark conservation efforts and raised awareness surrounding this issue.

Paper outline

This paper is organized into four chapters. The first chapter provides an introduction of the management problem, as well as a background on sharks and their importance, an overview of the shark fin trade, and the various management and governance strategies in place for shark populations. Chapters two and three will be treated as individual studies, each having their own methodology, results, and discussion. Chapter two will detail an analysis on the shark fin market in Toronto based on genetic testing of shark fins bought in the Toronto area. Chapter three will explore the feasibility of municipal shark fin bans in Canada based on results of key informant interviews. Through these key informant interviews, the feasibility of a shark fin ban in Toronto will be assessed, drawing on participant experience and perceptions of previous ban successes and failures. Lastly, Chapter four will present the conclusions on the feasibility and practicality of a Toronto shark fin ban, particularly as it pertains to the current state of the shark fin market, and the implications of a possible federal ban going forward.

Background

Sharks, shark fins, and the making of a luxury market

Sharks are a group of cartilaginous fish of the class *chondrichthyes* that have occupied ecological niches in the world's ocean for over 400 million years (Velez-Zuazo & Agnarsson, 2011). After rapid adaptive radiation during the Devonian period, they have filled many positions atop the food chain and assume the role of apex predators in many ecosystems. There are currently around 1,200 known species of living chondrichthyans or shark-like species, consisting of rays, skates, chimaeras; and of these, around 400 species may be classified as 'sharks' (Velez-Zuazo & Agnarsson, 2011). It has been widely documented that shark populations around the globe have experienced precipitous declines because of human exploitation— some estimates indicate that up to 90% of top predator biomass has been removed from ecosystems (Myers and Worm, 2003). Broadly, shark mortality can be attributed to two main

sources: as non-targeted bycatch and targeted catch from shark finning (Musick *et al.*, 2000). Bycatch is the catch of a species that is not explicitly targeted by a particular fishery; in this case, longlining for tuna or billfish is commonly regarded as the highest source of shark bycatch mortality but sharks are generally caught in many fisheries, including trawls, gillnets, and driftnets (Williams and Schaap, 1992). Sharks are particularly vulnerable to bycatch because of their unique physiological characteristics: many sharks are obligate ram ventilators, meaning they must maintain a steady flow of water over their gills, so when hooked they may suffocate before they are even brought on board (Musick *et al.*, 2000).

The practice of shark finning involves the removal of all fins of value, while the shark carcass is often thrown back into the water. Sharks that may survive the initial finning process then have no chance of survival without the fins essential to keeping them buoyant in the water column (Clarke *et al.*, 2007). Although accurate numbers are nearly impossible to quantify, estimates indicate that anywhere between 26 million and 72 million sharks are killed each year for the shark fin trade (Clarke *et al.*, 2007). These two sources of mortality are not necessarily mutually exclusive, as shark bycatch can often be an easy means for fishermen to increase profits; shark fins do not occupy much space, are extremely valuable, and the bulky carcasses can be easily discarded (Clarke *et al.*, 2007). Unique life history characteristics among fishes make sharks extremely vulnerable to the effects of overfishing— much of the reason their populations have seen such substantial declines. Sharks generally reach sexual maturity much later than most fish, have long gestation periods, and much lower fecundity, often only producing one or two pups every year or two (Schindler *et al.*, 2002)

As mentioned, shark finning is the practice of removing the fins from a shark— but to what end? Over the past half century, shark fins have become a highly lucrative commodity and the demand for these luxury goods has allowed for the development of many legal and illegal trade markets (Clarke, 2004). Demand for shark fins is routed far deeper in history as they have been consumed for almost a millennium in the form of shark fin soup (Vannuccini, 1999). Evidence of shark fin consumption in soup is present in writings from the Ming Dynasty (1368-1644), and shark fin has been considered by the Chinese as one of the eight treasured foods from the sea for centuries (Vannuccini, 1999). During the

Qing Dynasty (1644-1911), shark fin soup became a mainstay at banquets and other formal events such as weddings. Shark fin soup may have earned its place in society because of its difficulty to source—the risk involved to catch a shark served as an expression of respect (Vannuccini, 1999). Today, serving shark fin soup is recognized as an expression of respect to guests, not because of the danger involved in catching shark, but because of its luxury status. Today, it continues to be served at banquets, weddings, and other formal events as a sign of status; shark fin soup is very expensive, owing to the steep price for fins, and may cost upwards of \$100 dollars per bowl (Fabinyi *et al.*, 2012).

China continues to be a main hub for shark fins— trade data suggest that the shark fin trade reached its peak in China in 2003 when 6,960 tonnes of shark fins were processed in Hong Kong (Clarke, 2004). While declines in trade have been noted, various sources propose that China is still responsible for at least 30% of the trade for shark fins and likely account for nearly that proportion of shark fin consumption (Clarke, 2008; Lack & Sant, 2011). Despite China's high consumption of shark fins, they do not account for a large proportion of global shark catch and are not one of the 'top 20' countries by percentage of global shark catch (Lack & Sant, 2011). Because demand in China is so high, source countries are responsible for exporting enormous volumes of shark fin, and these countries may not have the capacity to implement sustainable fishing practices (Lack & Sant, 2009).

The shark fin trade has had measurable impacts on populations throughout the globe, but it is far from the only thing leading to population declines. The demand for shark meat, and other shark products have seen marked increases over the past decade. Shark meat has traditionally been a source of protein in many parts of the world for millennia, playing a role in food security in low income countries, and even seeing high consumption in European countries such as France, and Italy (Vannuccini, 1999; Schiller, 2018). As previously mentioned, shark finning has been condemned internationally as an inhumane and wasteful practice and there have been efforts to encourage full utilization of landed sharks. The FAO has gone so far as to release a document outlining the various uses of shark products, from shark meat, to cartilage, to liver oils (Musick, 2002). Laws requiring the full landing and use of shark have been among the factors that have contributed to an increase in shark meat and shark-derivative consumption over the

past decade—ultimately having impacts opposing conservation goals (Dent & Clarke, 2015). The consumption of shark meat is considerably more widespread than the consumption of fins, making increased consumption a concerning trend for shark populations worldwide. To make matters worse, little is known about the trade of derivative products such as shark oil as most trade statistics are restricted to shark meat and fins (Dent & Clarke, 2015). More stringent import regulations and monitoring are needed for a more complete picture on the trade of these products.

As indicated by trade data, shark fin soup has seen a decline in popularity in China over the past decade, but still has been gaining popularity throughout other Asian countries (Denyer, 2018). Estimates indicate that the trade of shark commodities approaches a value of \$1 billion U.S. dollars (USD) per annum (Dent & Clarke, 2015). Furthermore, globalization and emigration has allowed consumption to spread throughout Asia and to the rest of the world. Despite this globalization, knowledge regarding the intricacies of the trade are relatively ambiguous as much of the trade goes unreported, and lax regulations allow for less than accurate trade data (Clarke *et al.*, 2007). Action is still needed to ensure that conservation goals for sharks are met whether management measures are through governments, RFMOs, or through market and trade-based endeavours at local or national scales.

The importance of sharks

Global declines in shark populations may ultimately have a large impact on ocean ecosystems, and overall ocean health. In many ecosystems, sharks play an important role as an apex predator, removing unfit and unhealthy fish from populations, and exerting some degree of top-down control over populations (Baum & Worm, 2009). The loss of apex predators has been a widespread impact of human expansion throughout the globe, causing cascading effects in marine, terrestrial, and freshwater ecosystems (Estes *et al.*, 2011). The declines of shark populations are well documented around the globe, with estimates that shark biomass is only about 10% of what it was prior to the development of industrialized fishing (Myers & Worm, 2003). This could have huge implications for ecosystems and fisheries around the world, as

effects are likely to be widespread, especially considering the ubiquitous nature of sharks throughout the world's oceans.

Trophic cascades are thought to be a primary ecosystem response to the removal of apex predators such as sharks (Myers & Worm, 2007). Though they have been documented in every biome on earth, the degree to which cascading effects are felt varies significantly from ecosystem to ecosystem (Estes *et al.*, 2011). The theory behind trophic cascades is relatively simple, though their effects are exceedingly difficult to quantify, and may at times be even too discrete to identify because of the large spatial and temporal scales involved. When apex predators are removed, prey, in this case generally piscivorous mesopredators, are released from predation and their populations will increase. This in turn may significantly reduce the abundance of planktivorous fish, which consequently will increase the abundance of herbivorous fish; this process will continue all the way down the food chain (Myers *et al.*, 2007). This model, however, is relatively simplistic and does not account for the intricate connectedness of all species within a food web, such as in complex oceanic ecosystems. With respect to sharks, there are documented cases of top-down control, as well as shark-removal induced trophic cascades, though much is largely subject to debate (Myers *et al.*, 2007; Grubbs *et al.*, 2016). Some argue that effects of a trophic cascade are as simple as a slight restructuring of species abundances within an ecosystem (Jennings & Kaiser, 1998). Others posit that effects of trophic cascades may be considerable enough to have impacts on the atmosphere because of changes made to the carbon sequestration process (Estes *et al.*, 2011). We can be certain, however, that excessively large amounts of shark biomass are being removed from oceans throughout the globe, having some impact on ocean ecosystems.

Reef ecosystems provide a means to study potential cascading effects in coastal ecosystems. Reef sharks provide a good case for study as they are generally found in shallower waters and have smaller, more isolated home ranges than larger pelagic sharks (Papastamatiou *et al.*, 2010). As such, removal of reef sharks from a reef ecosystem may mimic a treatment group when compared to a control reefs where sharks were not removed. Coral reef ecosystems are incredibly diverse, and as such, many direct and indirect connections are present between species. It has been suggested that speciose ecosystems are less

vulnerable to trophic cascades as consumption is so differentiated that effects of predator removal are buffered (Strong, 1992). The traditional trophic cascade model suggests a ladder, whereas the reef ecosystem is a web with high connectivity, and long chains of interacting species (Strong, 1992). While this buffering effect may be true to some degree, a possible trophic cascade was documented in reefs off the coast of Australia. This experiment compared two isolated reef atolls, one within a marine protected area, the other where fishing was permitted and consequently associated with large shark declines (Ruppert et al., 2013). This experiment lent itself in support of the mesopredator hypothesis, whereby abundance of mesopredators saw a significant increase in ecosystems where top predators were absent (Ruppert et al., 2013). Where sharks were lacking, herbivorous fish abundance was also low, further supporting the hypothesis that this was in fact a trophic cascade; since piscivorous mesopredators had increased, they had subsequently increased predation on herbivores (Ruppert et al., 2013).

There is a relative lack of information regarding trophic cascades involving sharks in pelagic ecosystems—perhaps due to the nature of the expansive open ocean with processes happening over large spatial and temporal scales. That said, open ocean ecosystems are quite vulnerable to commercial fishing, as the high seas provide access to all countries with fishing capacity while regulations are difficult to enforce, and rates of Illegal, Unreported, and Unregulated (IUU) fishing are high (Cullis-Suzuki & Pauly, 2010). There is some evidence to suggest that the removal of blue sharks (*Prionace glauca*) through fishing did not have any significant impact on ecosystem structure or function (Schindler et al., 2002).

Because there is a considerable overlap in the diet and distribution of many pelagic shark and tuna species, cascading effects from the removal of one species may be buffered by the presence of others (Strong, 1992). In this case, yellowfin tuna (*Thunnus albacares*) may compensate for the removal of blue shark by occupying a similar top predator role; their high rate of predation, that is 4 to 5 times that of the blue shark, per capita, as well as their tolerance to higher fishing exploitation may also play a role in this buffering process (Schindler et al., 2002). Despite this, there were concerns that effects of fishing on slow growing species, such as shark, may in fact have larger effects on food web processes. If exploitation rates of tuna ran too high, cascading effects through the food web could be substantial. As this study was

conducted on blue shark, who have relatively short life spans and high fecundity relative to most pelagic sharks, documented effects may give more conservative estimates than what may be seen at an ecosystem level (Schindler et al., 2002). This food web lends itself in support of the mesopredator hypothesis, whereby declines of shark, tuna, and billfishes throughout the 20th century have coincided with an increased abundance of smaller fishes— most notably in a documented 100-fold increase in pelagic stingray abundance (Ward & Myers, 2005). Consequences of cascading effects in pelagic ecosystems at near- and far-field scales are still largely unknown. As such, it is likely best to proceed with a precautionary approach when fishing shark in pelagic ecosystems.

Current global shark governance & management

The decline of shark populations (and in some cases collapses) have been well documented. Many of these declines have been quite rapid and a direct result of overfishing; In the Northeast Atlantic fishing pressure is thought to have led to over a 75% decline in large coastal and oceanic sharks, while in the Pacific, many larger species have seen declines of over 50% (Baum *et al.*, 2003; Clarke *et al.*, 2012). While many of these stock assessments are currently outdated, and are subject to various degrees of uncertainty it is quite clear that shark populations around the globe are dwindling. This has been noted by governments and governance bodies alike, and there are various management plans in place to mitigate these declines.

IPOAs

Federal management responses have been forthcoming, but with various degrees of success. In 1999, the International Plan of Action (IPOA) for the Management of Sharks was introduced by the FAO as an international initiative to establish conservation and management goals for nations that fish sharks (FAO, 1999). Guidelines for the creation of a NPOA for sharks are outlined in the document through guiding principles of participation, sustaining stocks, and nutritional and socio-economic considerations (FAO, 1999). The terms of the agreement, however, are not binding and participation is voluntary. Though many of the countries in the ‘top 20’ producers group may have a NPOA in place, it does not

necessarily mean that sustainable management practices are implemented (Lack & Sant, 2011). Currently, seven countries from the 'top 20' lack NPOAs which is generally indicative of poor management practices (Lack & Sant, 2011). Furthermore, data suggest that the implementation of IPOA-sharks has contributed rather little to improved shark management globally and shark kills are largely unregulated within nation's exclusive economic zones (EEZs) and on the high seas (Lack & Sant, 2011; Clarke *et al.*, 2007). Additionally, even when management practices are in place, the high value of shark fins promotes the development of illegal trade markets for this lucrative product (Fabinyi, 2011). Canada currently has a NPOA that has been in effect since 2007 (DFO, 2007). Its aim is to increase knowledge and research on sharks in Canadian waters in order to ensure their long-term use and conservation. Some of the measures in place are ecosystem-based and precautionary approaches, bycatch reduction, as well as an enhancement of conservation and education efforts (DFO, 2007).

Regional Fisheries Management Organizations (RFMOs)

There are many governing bodies, beyond governments, that play a role in the global management of shark stocks. Many Regional Fisheries Management Organizations (RFMOs) have emerged over time since the United Nations Convention on the Law of the Sea (UNCLOS) and the UN Fish Stocks Agreement in order to manage international fisheries beyond EEZs in a sustainable manner (European Commission, 2017). RFMOs are responsible for the management of shared stocks, which may include transboundary stocks, or in the case of sharks and tunas, highly migratory species. Sharks are often a large proportion of bycatch, particularly in tuna fisheries where longlines are used as sharks are very vulnerable to this gear type (Lewison *et al.*, 2004). In some cases, shark are targeted species in these RFMOs and are commercially important. For example, blue shark is the fourth most prized catch in fisheries in the International Commission for the Conservation of Atlantic Tunas convention areas (ICCAT), and sharks accounted for 12% of all reported catches in 2013 (Oceana, 2013). Management measures have been put in place to varying degrees in order to mitigate the impacts of international fisheries on shark populations, but there are often competing economic interests that override the interests

of conservation (Ecology Action Centre, 2017). Canada itself is party to 6 RFMOs which includes organizations governing Atlantic and Pacific regions, as well RFMOs focused on the sustainable exploitation of tuna and salmon stocks (DFO, 2011). Canada prides itself as a leader in fisheries management and encourages the implementation of stronger enforcement and more accountable decision-making (DFO, 2011).

Conservation Bodies

In regards to conservation, there are a few organizations or treaties that play important roles in the management of shark populations and shark commodities: The International Union for Conservation of Nature (IUCN) plays critical role in evaluating status of populations (IUCN, 2018); CITES regulates what animal and plant products may be traded (CITES, 2018); The Convention on the Conservation of Migratory Species of Wild Animals (CMS) is an environmental treaty that works to conserve and ensure the sustainable use of migratory species (CMS, 2018). Canada is a participating member in both IUCN and CITES, having their own IUCN committee, and having ratified the CITES treaty in 1975 (IUCN, 2018; CITES, 2017). Canada, is however, a non-party to CMS despite 126 countries being signatory to the convention (CMS, 2017).

The IUCN, founded in 1948, is an organization that encourages and assists societies of the world to conserve biodiversity and ensure ecological sustainability (IUCN, 2018). The IUCN Red List assesses the conservation status of species worldwide, highlighting taxa that are threatened with extinction; as of 2014 about a quarter of all sharks and rays are threatened with extinction (IUCN Red list; Dulvy *et al.*, 2014). Though the IUCN is a critical source of data on the status of many species worldwide, they are ultimately a consultant on practices to implement and do not have decision-making power.

CITES is a multilateral treaty that aims to protect endangered species or plants that are threatened through trade (CITES, 2018). There are currently 19 species of shark protected under CITES (CITES, 2016). Though signature to CITES by countries is voluntary, the stipulations of the treaty are binding and

non-compliance can leave parties open to trade sanctions (Sand, 2013). Enforcement of CITES with regards to the shark fin trade is extremely difficult as fins are difficult to identify to a species level.

CMS works to cooperate with other NGOs and international organizations in order to ensure migratory species, and their habitats are conserved (CMS, 2018). Working alongside IUCN Red List, CMS lists species on two appendices, each appendix having its own obligations for countries party to the convention (CMS, 2018). Appendix I constitutes endangered migratory species, with party states responsible to ensure that taking of listed species is prohibited (CMS, 2018). Appendix II lists vulnerable migratory species conserved through regional or global agreements by party states within range of listed species (CMS, 2018). Many large pelagic sharks are highly migratory and as such 35 unique species of shark and ray are afforded some level of protection under CMS (CMS, 2018).

Workings of the shark fin trade: The Canadian Context

The workings of the global shark fin trade are still not well understood despite a body of literature that has been accumulated on the subject. According to FAO documents, the largest issue regarding understanding the trade is a result of data availability or lack thereof (Dent & Clarke, 2015). Even when data are available, there are many gaps in knowledge including: large discrepancies between reported captures and actual captures, a lack of species specific reporting, a lack of distinguishment between commodity types (fins, meat, dried fin, frozen fin, etc.), and double counting when reporting re-imports or re-exports. This is all exacerbated by the fact that in many places, shark finning is illegal and the commodity enters legal markets from unknown supply chains (Dent & Clarke, 2015).

For almost three decades, Canada has been an active supporter of shark conservation efforts. In 1994, the *Fisheries Act* was amended to ban the practice of shark finning in Canadian waters. The National Plan of Action has been in place for 11 years, and provides measurable goals and actions for the conservation of sharks within Canada's jurisdiction. Canada collects data for stock assessments, makes efforts to reduce bycatch, and complies with RFMOs in order to improve shark management and conservation (DFO, 2007). These efforts seem to fall short when Canada's import regulations allow for a

shockingly high level of complicity in the global shark fin trade. As previously mentioned, Canada ranks as the 11th largest importer of shark fins in the world by weight, and the 4th highest importer by value as of 2015 (Dent & Clarke, 2015). Despite condemnation from local and global communities the shark fin trade continues to thrive within Canadian borders. Furthermore, Canadian import data from recent years would suggest that the demand for shark fins is not decreasing, but increasing (Figure 1).

Hong Kong is the central hub for the global shark fin trade, being not only the largest trader, but also a large consumer of the commodity (Dent & Clarke, 2015). From 2000-2011, Hong exported an average of 6,594 tonnes of shark fin worth approximately \$110,152,000 USD— 38% of the global market. Hong Kong shark fin imports in that same time period commanded 62% of the world's market, importing an average 10,480 tonnes of shark fin (Dent & Clarke, 2015). Hong Kong is however not a producer of shark fin and outgoing trade consists almost entirely of re-exported shark fins. The majority of exports from Hong Kong are unprocessed fins, but dried and processed fins are sold for the highest price. Canada has little capacity for processing shark fin, and as such these premium fins are predominantly what gets imported (Dent & Clarke, 2015). This largely explains why Canada was the 4th highest importer in terms of value, but only the 11th highest shark fin importer in terms of volume. Prices for exported 'dried, processed' fins varied considerably over time: in 2007 lows of \$28 USD/kg, to highs of \$116 USD/kg in 2012 (Dent & Clarke, 2012).

In recent years, Canada's shark fins imports have been increasing. The year 2017 marked the first time since 2009 that over 180,000 kg of shark fin product were imported into the country (Figure 1) (Statistics Canada, 2017). In the past, Canada imported dried and frozen fins under separate commodity classifications, but in 2012 they were aggregated into a non-specific category— HS code 030571 (Dent & Clarke, 2015). Today, three commodity codes exist for trade records: HS code 030571- Fish fins, heads, tails, maws, and other edible fish offal: shark fins; HS code 030292- Shark fins, fresh or chilled; HS code 030392- Shark fins, frozen; the bulk of which is listed under HS code 030571. Recently, Canada's main trading partners for shark fin imports have been China, Hong Kong, and Trinidad & Tobago; in years past Spain and Australia have also contributed to large proportions of Canada's imports (Statistics Canada,

2017). Because of the aggregated commodity code and a general lack of clarity regarding the types of shark fin being imported, Canada's trade statistics do little to clarify the state of Canada's shark fin markets beyond raw volume and value numbers.

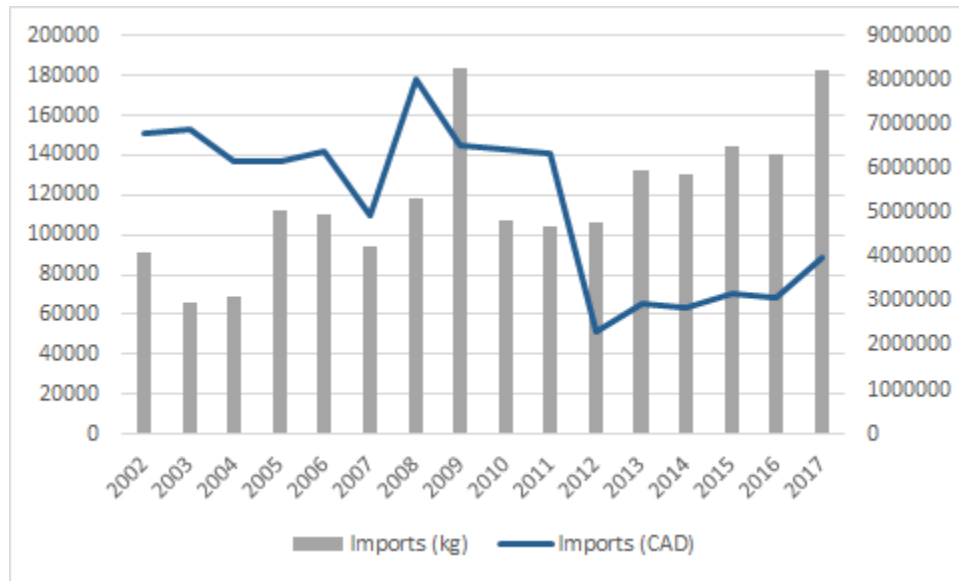


Figure 1. Canadian import statistics for shark fin. Left axis indicates imports by volume (kilogram) whereas right axis refers to imports by value (CAD).

These statistics are concerning when paired with a recent Vancouver-based study analyzing 71 shark fins from Vancouver markets, which found high proportions of species of conservation concern (Steinke *et al.*, 2017). In total, 20 species of shark were identified in the study. Among them were two species of endangered hammerhead shark, the great hammerhead (*Sphyrna mokarran*) and the scalloped hammerhead (*Sphyrna lewini*). Furthermore, 10 of the 20 species identified are listed under CITES, 7 of which are shark species heavily implicated in the shark fin trade (Steinke *et al.*, 2017). Despite the relatively small sample size compared to the totality of Canadian markets, if the sample is representative of the market, this research is concerning. There have been many Canadian municipalities that have tried to ban shark fin sales within city limits as a conservation measure, and as a moral condemnation of the practice.

Consumption theory

When investigating markets for shark fin, consumption is important to consider as shark fins ultimately end up in the luxury dish, shark fin soup. ‘Conspicuous consumption’, a phenomenon by which demand for a commodity increases due to increasing commodity price remains relevant as ever in today’s society— and especially relevant to trends seen in the consumption of shark fins globally (Mason, 1998). Conspicuous consumption has been posited by sociologists as a behaviour by which publicly acquiring or consuming luxury goods acts as a display of wealth, and can help a consumer solidify, or further, their social status by means of consuming socially visible goods (Mason, 1998). Biologists have theorized that this conspicuous consumption may initiate an ‘extinction vortex’, whereby a species becomes increasingly more rare due to consumption, leading to increased prices for the commodity, in turn making it even more desirable to the consumer (Courchamp *et al.*, 2006). It is likely that conspicuous consumption has played a substantial role as a driver of the market for shark fins, and by extension a driver of the decline in global shark populations.

Conspicuous consumption has been studied in an attempt to understand consumer behaviour. It meets the criteria of a ‘Nonfunctional demand’ in that a large portion of the demand for said commodity is derived from qualities not inherent to the product itself; this is in juxtaposition to a ‘Functional demand’, where the demand for a commodity is largely derived by the utility or qualities of that product (Leibenstein, 1950). Conspicuous consumption operates under the principle that a commodity being ‘conspicuously consumed’ has a price that may be divided into two categories: a real price, and a conspicuous price. The real price is the price that the consumer has actually paid for the commodity, whereas the conspicuous price is the price that others think the consumer paid for the commodity— in reality, there may be considerable disparity between the two (Leibenstein, 1950). Shark fin soup is mainly seen at grandiose events such as banquets, or weddings, where serving it is seen as a sign of wealth— while shark fin soup is expensive to serve, people attending the event may think the host has paid more than what they have in reality. Conspicuous consumption has, more recently, been linked to ecological systems as it has been acknowledged that overexploitation of living resources may have extreme

consequences for global biodiversity (Courchamp *et al.*, 2006). Data suggests that many populations of sharks around the globe are currently being depleted, suggesting that the ‘extinction vortex’ phenomenon may be responsible, in part.

‘The Bandwagon Effect’ is another noteworthy economic theory pertinent to the consumption of shark fin. Also a subsidiary of ‘Nonfunctional demand’, the ‘bandwagon’ effect stipulates that the demand for a commodity increases with the consumption of that product (Leibenstein, 1950). In tandem with conspicuous consumption, the bandwagon effect may cause more and more people to serve shark fin soups at their weddings, or other large social gatherings. This is likely in-part responsible for the large boom in shark fin consumption that arose in the late 20th century, as shark fin soup became a trendier commodity to consume. In recent years, there has been some degree of social taboos that have begun to surround the popular item. Social taboos work in opposition to the bandwagon effect such that there becomes a degree of social pressure to avoid the consumption of a particular commodity (Leibenstein, 1950). Social taboo regarding shark fin has become increasingly apparent over the last decade, contributing to its decline in consumption in China. There have been many campaigns throughout China to move away from the dish, including celebrity awareness campaigns, bans from shipping companies, and government denunciation (Denyer, 2018). Sadly, this taboo has been offset by the increased popularity of the dish throughout the rest of Asia, as well as a growing number of wealthy Chinese.

City-led regulations

Municipalities are the lowest level of government in Canada, but despite this, they still play an important role in addressing issues at smaller scales (Municipal Act, 2001). Municipalities are created by the province and are expected to provide responsible and accountable government within their jurisdiction (Municipal Act, 2001). There have been instances where municipalities have enacted new bylaws to not only force change within their jurisdiction but at broader scales as well. For example, in 1999, Toronto implemented a progressive law at the time which saw smoking banned in many public venues including restaurants, bars, billiard halls, casinos (Statistics Canada, 2008). Soon after, similar bylaws were enacted

in other municipalities in Ontario and beyond, e.g. Ottawa (2001), Hamilton (2002), Kingston (2003), Halifax (2003) (Statistics Canada, 2008). In 2006 the government in Ontario taking cues from municipalities enacted the Smoke Free Ontario Act (2006), banning smoking in the same public places as the original Toronto bylaw (Statistics Canada, 2008). Large cities such as Toronto may play a leadership role in forcing issues that may affect the province, or country more broadly.

Chapter 2: Market Analysis

Introduction:

Sharks as a group have a circumglobal distribution, and as such are sourced from numerous countries (Clarke, 2004). Because shark fins are sourced from so many different countries, there is a considerable diversity of species that may be present in a given market. In Canada, where large quantities of imported fins come from Hong Kong and China, two of the largest re-exporters, things are further obscured (Dent & Clarke, 2015). When shark fins arrive in Canada, there are relatively few ways to distinguish the fins to a species level, and yet this can be extremely important for assessing conservation status for species therein, but it is exceedingly difficult to do accurately (FAO, 2016). Over the past few decades genetic testing has emerged as a reliable means to assess the species composition of shark fin markets. Recent work done by Steinke *et al.* (2017) identified a number of species of conservation concern from markets in Vancouver. To what extent are the Vancouver results representative of other markets in Canada? It is possible that Toronto, the second largest hub for shark fins in Canada, would also have a number of threatened species in its markets. Shark fins were bought from the Toronto and Greater Toronto Area to test this hypothesis. To assess ban practicality, a DNA analysis of Toronto-bought shark fins was conducted in order to establish some baseline sample of species distribution in Toronto markets.

Methodology

Locating shark fin vendors

In order to find shark fins for the study, many stores that were prospective shark fin vendors were visited in June and July, 2018, in investigations prior to purchasing. Stores were located through Google Maps, using a search for 'Dried seafood' as it is primarily specialty Chinese dried seafood stores that sell this commodity. More than a dozen different vendors were visited, 4 of which sold shark fin products. It is possible that a higher proportion of these stores sold shark fin, but language barriers and taboo regarding

shark fin may have prevented further success. Stores confirmed to be selling shark fin commodities were then visited and fins were ultimately acquired from four different specialty dried seafood stores located throughout Toronto and the Greater Toronto Area (GTA). Every fin type available was purchased from each store in order to get as comprehensive of a sample as possible for study. Approximately 70 fins were purchased in all.



Figure 2. Containers of shark fin from one purchase location

Genetic testing

Altogether, 31 fin samples were used for DNA sequencing at the University of Guelph. Two to three fins were purchased from each container at stores (pictured above). As fins from the same containers looked nearly identical, it was assumed that they came from the same species and replicates were not sequenced.

Sequencing was done by Dr. Dirk Steinke and his team at the Centre for Biodiversity Genomics at the University of Guelph. Fins were sequenced using Barcode of Life Data Systems (BOLD), a technology invented at the University of Guelph. BOLD technology is particularly useful for shark fins as only a fragment of tissue is needed to identify species so long as DNA remains intact. A piece of the shark sample was subsampled using sterile techniques and lysed overnight at 56C in 90µL of vertebrate lysis buffer and 10µL of ProteinaseK. DNA was extracted using a validated spin column DNA extraction protocol (using EconoSpin spin columns (Epoch life science)). 50 µL of lysate plus 100 µL of binding mix was added into the EconoSpin spin column and centrifuged for 2 minutes. 180 µL of protein wash buffer was added and centrifuged for 2 minutes. 750 µL of wash buffer was added and centrifuge for 5 minutes. EconoSpin spin column was air dried for 20 minutes to evaporate residual ethanol and eluted in 50 µL of double distilled water (HyClone).

The target genetic marker (barcode region of the mitochondrial DNA) was amplified using Polymerase Chain Reaction (PCR) with C_FishF1t1/C_FishR1t1. Thermocycling conditions are as follows, 94C for 2 min; followed by 40 cycles of 94C for 30 seconds, 52C for 40 sec, and 72C for 60sec; with a 10 min 72C extension. PCR recipe: 6.25µL 10% Trehalose (Sigma); 2µL double distilled water (HyClone); 1.25uL 10X Platinum buffer (Invitrogen); 0.625µL 50mM MgCl₂ (Invitrogen); 0.125uL 10uM C_FishF1t1 primer; 0.125µL 10uM C_FishR1t1 primer; 0.0625µL 10 mM dNTP mix; 0.06µL Platinum Taq (Invitrogen); 2µL DNA per sample, for a total of 12.5µL reaction.

PCR was followed by cycle sequencing with a standardized commercially available BigDye Terminator v3.1 kit. Cycle sequencing recipe: 2 µL 5X ABI buffer; 0.25 µL BigDye; 1µL double distilled water (HyClone); 5µL 10% Trehalose (Sigma); 1µL 10um primer; 2µL diluted PCR product (8µL of PCR product diluted with 40µL of double distilled water (HyClone)). Separate cycle sequencing reactions are done for forward and reverse primers using M13F and M13R primers. Thermocycling conditions are as follows, 96C for 1 min; followed by 35 cycles of 96C for 10 seconds, 55C for 5 sec, and 60C for 2min 30sec; with a 5 min 60C extension.

Sequencing reactions were analyzed by high-voltage capillary electrophoresis on an automated

ABI 3730xL DNA Analyzer. DNA sequences recovered from the unknown samples were compared against the species sequence reference library in the Barcode of Life Data System (BOLD) accessible at <http://www.boldsystems.org/>

Assessing Conservation Concerns

After receiving genetic testing results, shark fin samples could be identified to a species level. All species found in DNA sampling were assessed based on conservation status using the internationally acknowledged status' from IUCN and CITES. IUCN status is broken into nine distinct categories based on different criteria (Table 1). IUCN has evaluated the conservation status of over 63,000 species and uses a multitude of criteria to assess population status including: population size, number of mature individuals, generation length, etc., in an expert-driven process (IUCN Red List, 2001). CITES evaluates which endangered animals, or endangered animal products, are being traded, ensuring that this trade does not threaten the survival of species.

Table 1. Criteria constituting each IUCN Category (IUCN, 2001)

IUCN Red List Status	Criteria
<i>Extinct (EX)</i>	No reasonable doubt that the last individual of a species has died
<i>Extinct in the Wild (EW)</i>	Species known only to survive in captivity
<i>Critically Endangered (CR)</i>	Species facing an extremely high risk of extinction in the wild
<i>Endangered (EN)</i>	Species facing a very high risk of extinction in the wild
<i>Vulnerable (VU)</i>	Species facing a high risk of extinction in the wild
<i>Near Threatened (NT)</i>	Species close to qualifying for a threatened category in the near future
<i>Least Concern (LC)</i>	Widespread and abundant taxa
<i>Data Deficient (DD)</i>	Inadequate information to make an assessment of extinction risk
<i>Not Evaluated (NE)</i>	Species has not been evaluated against criteria

Results

Results from 26 of 31 fin samples were discernible to species level with a BOLD match of 99.82% or higher. Some fin samples did not have useable DNA, likely due to conditions fins were subjected to throughout processing and shipping processes. DNA may deteriorate for a variety of reasons, but this is likely because of the drying process, or bleaching of fins that sometimes occurs to improve their aesthetic (Vannuccini, 1999). Fin samples were from 13 unique species covering 6 families of shark, and 1 family of ray (Figure 2). In terms of conservation status, the distribution included 6 samples from 3 near threatened species, 12 samples from 6 different vulnerable species, 5 samples from 2 endangered species, and 2 samples from 2 data deficient species. Furthermore, 9 of the 26 samples were from species listed under CITES Appendix I or II; this covered 3 species from CITES Appendix II and 1 species from CITES Appendix I.

Table 2. IUCN and CITES Statuses of Shark and Ray Species Present in Study

<i>Species</i>	IUCN	CITES
Pelagic thresher <i>Alopias pelagicus</i>	Vulnerable	CITES Appendix II -Effective 04/10/2017
Knifetooth sawfish <i>Anoxypristis cuspidate</i>	Endangered	CITES Appendix I -Effective 13/09/2007
Pige eye shark <i>Carcharhinus amboinensis</i>	Data deficient	N/A
Silky shark <i>Carcharhinus falciformis</i>	Vulnerable	CITES Appendix II
Bull shark <i>Carcharhinus leucas</i>	Near threatened	N/A
Blacktip shark <i>Carcharhinus limbatus</i>	Near threatened	N/A
Shortfin mako <i>Isurus oxyrinchus</i>	Vulnerable	N/A
Longfin mako <i>Isurus paucus</i>	Vulnerable	N/A
Blacks potted smoothhound <i>Mustelus punctulatus</i>	Data deficient	N/A
Blue shark <i>Prionace glauca</i>	Near threatened	N/A
White-spotted guitarfish <i>Rhincobatus australiae</i>	Vulnerable	N/A
Smoothnose wedgefish <i>Rhincobatus laevis</i>	Vulnerable	N/A
Scalloped hammerhead <i>Sphyrna lewini</i>	Endangered	CITES Appendix II

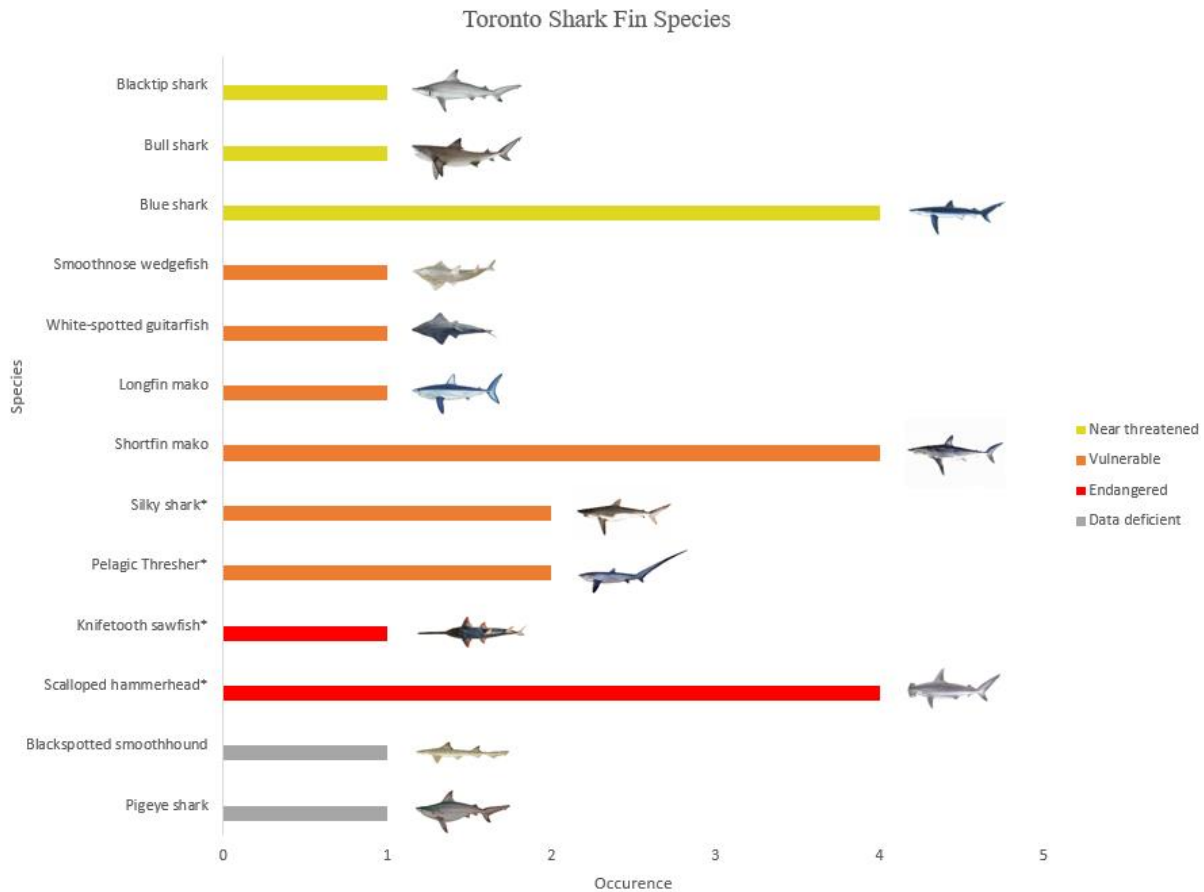


Figure 3. Figure showing the occurrence of species found in markets in Toronto and surrounding area (n=26). Colour of bars indicates IUCN conservation status. CITES-listed species are indicated by asterisk.

Table 3. Raw results for shark fin identification with %BOLD match

Query ID	Best ID	Common Name	% BOLD match
CCDB-ST03160	Anoxypristis cuspidata	Knifetooth sawfish	99.84
CCDB-ST03162	Isurus oxyrinchus	Longfin mako shark	100
CCDB-ST03163	Carcharhinus amboinensis 100	Pigeye shark	100
CCDB-ST03164	Mustelus sp. zpl 00058	Smooth-hounds	100
CCDB-ST03165	Carcharhinus leucas	Bull shark	99.85
CCDB-ST03166	Prionace glauca	Blue shark	100

CCDB-ST03167	Failed		
CCDB-ST03168	<i>Isurus paucus</i>	Longfin mako shark	100
CCDB-ST03169	Failed		
CCDB-ST03170	<i>Sphyrna lewini</i>	Scalloped hammerhead	100
CCDB-ST03171	<i>Carcharhinus falciformis</i>	Silky shark	100
CCDB-ST03172	<i>Rhynchobatus australiae</i>	White-spotted guitarfish	100
CCDB-ST03173	<i>Rhynchobatus australiae</i>	White-spotted guitarfish	99.82
CCDB-ST03174	<i>Prionace glauca</i>	Blue shark	100
CCDB-ST03175	<i>Isurus oxyrinchus</i>	Longfin mako shark	100
CCDB-ST03176	<i>Prionace glauca</i>	Blue shark	100
CCDB-ST03177	<i>Isurus oxyrinchus</i>	Longfin mako shark	100
CCDB-ST03178	<i>Prionace glauca</i>	Blue shark	100
CCDB-ST03179	<i>Rhynchobatus cf. laevis</i> KKB2014	Wedgefishes	99.85
CCDB-ST03180	Carcharhiniformes	Ground sharks	100
CCDB-ST03181	<i>Prionace glauca</i>	Blue shark	100
CCDB-ST03182	<i>Sphyrna lewini</i>	Scalloped hammerhead	100
CCDB-ST03183	<i>Carcharhinus falciformis</i>	Silky shark	100
CCDB-ST03184	<i>Sphyrna lewini</i>	Scalloped hammerhead	100
CCDB-ST03185	<i>Sphyrna lewini</i>	Scalloped hammerhead	100
CCDB-ST03186	Failed		
CCDB-ST03187	<i>Alopias pelagicus</i> 100	Pelagic thresher	100
CCDB-ST03188	<i>Alopias pelagicus</i> 100	Pelagic thresher	100
CCDB-ST03189	<i>Isurus oxyrinchus</i>	Longfin mako shark	100
CCDB-ST03190	Failed		

Discussion

Results indicate that there is trade of a high proportion of species of conservation concern in the Toronto area. None of the fin samples returned species of least concern, while threatened species made up 17 of the 26 samples. Nine of the 26 samples were from CITES-listed species (4 species in total) indicating that Canada, who is party to CITES, should not even be importing these fins. Although a small sample size, if it representative of the Toronto market generally, these results suggest worrisome proportions of vulnerable species and species of concern. Results from this study are comparable to the work done by Steinke *et al.* (2017), who found a high proportion of species of concern in Vancouver markets (Table 1). That study identified 20 unique species of shark from 71 fin samples; 12 of these species were threatened, and 7 of them were from CITES-listed species (Steinke *et al.*, 2017). It is likely that this trend of trade in vulnerable species is consistent throughout Canadian shark fin markets. Beyond the initial point of landing, it is usually unclear what species shark fins belong to and after processing shark fins essentially become a trade product separate from the shark they came from (FAO, 2016). China and Hong Kong have been Canada's main trading partners for shark fin over the past half-decade, each consistently ranking among the top 4 importers and exporters of shark fin globally (Dent & Clarke, 2015). Neither China, nor Hong Kong rank among the top 20 shark capturing countries and as such a substantial portion of the shark fin exported by these countries are re-exports, particularly in Hong Kong (Dent & Clarke, 2015). This lack of traceability makes it impossible to understand if the countries where shark fishing and finning is occurring, the original product origin, have shark management measures in place.

Table 4. Table comparing proportions of threatened and CITES species from Vancouver study conducted by Steinke *et al.* (2017), to this study.

	Vancouver study	Toronto study
<i>Threatened samples</i>	53/71= 74.6%	16/26= 61.5%
<i>Threatened species</i>	12/20= 60%	8/13= 61.5%
<i>CITES-listed samples</i>	38/71= 53.5%	9/26= 34.6%
<i>CITES-listed species</i>	7/20= 35%	4/13= 30.7%

Unfortunately, the current international methods for dealing with the trade of endangered species, CITES, is not adequate in preventing shark fins from entering Canada, and there are few other management measures that would be able to prevent the importation of shark fins sourced from threatened species given Canada's primary trade partners for this commodity. The FAO has released a thorough guide that attempts to identify shark species based on their fins, in theory allowing for more stringent monitoring and enforcement for importation (FAO, 2016). This guide identifies many variables for species identification: which fin is this on the shark body?; which measurements are important?; how big was this shark?. This guide provides an overview of the identification of 16 different species of commercial importance in the shark fin trade (FAO, 2016). However, the diversity of species traded in the fin trade far exceeds that of those covered in this guide; for the purposes of this study, identification of 5 of 13 species may have been possible, but 8 species would have been unidentifiable including 2 species listed under CITES. Genetic testing provides a means of reliably identifying fins to species level but tests may be costly, and it is not feasible to DNA barcode all fins entering the country— results of such tests may take as long as 3 weeks. Recent research by Cardenosa *et al.* (2018) has developed a fast and reliable genetic test that is capable of identifying a number of most prevalently traded CITES species. This technology provides the closest thing to a feasible means of screening fins being imported into Canada

and should be considered in order to meet CITES requirements. Alternatively, importing shark fins from the United States may provide a means of importing sustainably sourced shark fins. The U.S. has established shark fisheries that have traditionally been well managed— at least 10 of these fisheries have been eco-certified for at least some level of sustainability (Shiffman & Hueter, 2017). Whether an eco-certification guarantees the ‘sustainability’ of that species is up for debate (Miller and Bush, 2015), but it is at the very least a step in the right direction: Canada would know where these species are sourced from, and from what species the fins come. Unfortunately, the politics of trade is extremely complicated and a shift of this kind may not be a favourable political move. China is currently Canada’s second largest trading partner and a trade embargo on shark fins may prove detrimental for diplomatic relations (Statistics Canada, 2018).

Given that the Toronto market is selling shark fins of endangered or threatened species, that the CITES process is not working, and that dealing with the identification (by sight or by genetic testing) of fins when they arrive in Canada is problematic, alternative interventions may be necessary. One potential intervention could be a city-wide ban on shark fin. The municipal ban was a piece of legislation that provided a means of combating consumption ultimately lowering Toronto and the GTA’s impact on foreign shark populations.

Conclusion

Though consumption of shark fin in Toronto alone represents less than 1% of total consumption of shark fin worldwide, it does not diminish its importance as a player in the global shark fin trade. Evidently there are high quantities of shark fins destined for Toronto and the surrounding area, as evidenced by the fact that ~40% of Canadian shark fin imports are to Ontario (Dent & Clarke, 2015). Though the sample used for genetic testing was small, it was random and does provide a snapshot of the market in the Greater Toronto Area— high proportions of vulnerable species are being traded. The consumption of these shark fins continues to be perpetuated by ‘conspicuous consumption’, a process by which consumers of shark

fin soup attempt to achieve or maintain status or social standing (Hamilton & Tilman, 1983). Shark fin soup is primarily consumed at weddings or banquets, and as the fins come at a steep price the buyer is perceived as wealthy, whether or not that is truly the case (Fabinyi, 2011). Sharks are being driven toward extinction because their fins have become such a valuable commodity; presumably the more rare fins become, the more individuals will be willing to pay to acquire them, further perpetuating the cycle. This ‘extinction vortex’ proposed by Courchamp *et al.* (2006) has been linked to the severe declines in several non-shark species, such as the Napoleon wrasse and white abalone— meanwhile prices for these commodities have escalated considerably. It appears as though this feedback cycle will continue unless actions are taken to diminish consumption. A next avenue of investigation is thus to what extent conspicuous consumption can be tackled by banning the sale of shark fins at a municipal level.

Chapter 3: Toronto Shark Fin Ban Analysis

Introduction

In 2010, Hawaii became the first U.S. state to locally ban the sale, possession, and distribution of shark fins (Sakahara, 2011). Since then, numerous states have enacted similar legislation. There has been some contention as to the practicality of shark fin bans in the United States, with many scientists claiming that a ban would in fact undermine sustainable shark fisheries (Shiffman & Hueter, 2017). The United States has many targeted shark fisheries meaning that many landed sharks' fins would be wasted rather than put to use—in direct opposition to the full utilization of shark (Shiffman & Hueter, 2017). The situation in Canada, however, is much different as there are no real targeted shark fisheries beyond a recreational blue shark fishery on the east coast and a currently inactive dogfish fishery (“Shark fisheries”, 2018). That means that the trade in shark fins in Canada is overwhelmingly imported shark fins—the conservation status of which is largely unknown. In 2011, municipal bans emerged as localized means to condemn and combat the shark fin trade in Canada. Brantford, Ontario was the first municipality to enact a bylaw prohibiting the sale, possession, and consumption of shark fin but soon after many other municipalities followed including Toronto, the capital of Ontario. Shortly after the Toronto ban was implemented, a lawsuit in opposition to the ban successfully resulted in the ban being repealed by the Superior Court of Ontario (Kari, 2012). In this research, the feasibility of municipal bans is assessed through the identification of opportunities and barriers to successful ban implementation.

Methodology

To determine feasibility of a municipal shark fin ban key informant interviews were conducted in order to assess enabling conditions for successful bans that have occurred in the past, as well as to understand what went wrong in the initial Toronto bid for a ban.

Key informant Interviews

To address issues of feasibility, city councillors, members of parliament, and members of the senate involved with shark fin bans were recruited and interviewed. These semi-structured interviews were to serve several purposes: 1) To provide background regarding how local bans on shark fin in Canada began, and subsequently spread; 2) To help identify barriers to the implementation of bans, and identify why past bans were unsuccessful; 3) To provide insight as to how bans of this kind should proceed in the future in order to ensure successful implementation; and 4) To provide insight as to how policy and legislation could be enacted in Canada, and shed some light on how different levels of government look at the same issue. Interview candidates were initially selected with a focus based on involvement in Toronto and Brantford bans, but became more far reaching in order to increase breadth of data collection.

The researcher worked to recruit participants during the month of June, 2018, sending emails to 11 individuals (MAP ethics #08, Appendix A). Follow up emails were sent after 7-10 days if no response was received. Of the 11 recruitment emails, 5 participants agreed to take part in the study. Interviews lasted between thirty and sixty minutes, and took place in July and August 2018. One interview took place in person, and the remaining four taking place over the phone. There were 2 city councillors, 1 member of federal parliament, 1 member of the senate, and 1 former provincial cabinet minister. Despite the different levels of government that the different participants were involved in, questions remained the same. Interview questions can be found in Appendix B.

Interview analysis

Information from interviews was taken and formatted into a timeline of events spanning from May of 2011, the implementation of the first ban in Brantford, to the present (2018). Throughout the timeline, important events that constitute opportunities, or barriers are documented. Important events in the timeline are prefaced by quotations of significance from interviewees. Any information that was not provided in the interviews was supplemented through media releases, journal articles, government websites, or case law in order to ascertain a complete picture of what transpired.

Results

The results here are presented in chronological order to provide a narrative account of the events leading up to the decision in Toronto regarding a municipal shark fin ban. A respondent's quote is given at the beginning of each paragraph to set the stage for the subsequent text. A summary of the timeline can be found in Figure 3.

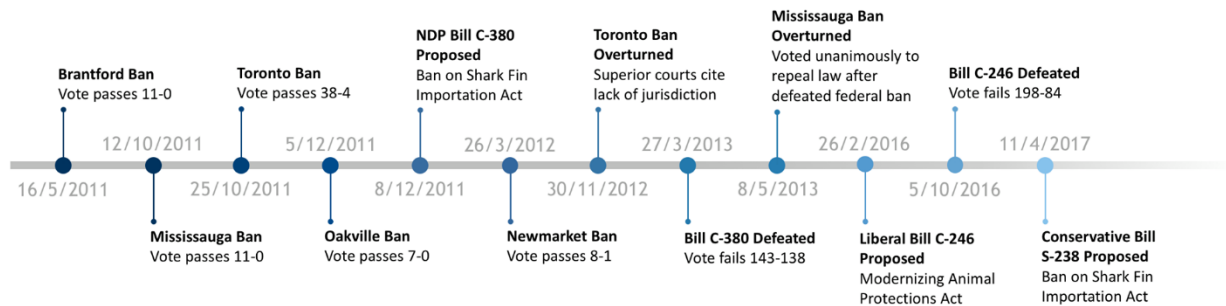


Figure 4. Timeline outlining major shark fin ban events at municipal and federal levels

May 2011: The Brantford Ban

‘They had talked to politicians at Ottawa and Queens Park about whether or not an appetite to do this at the Federal and Provincial level and they had found that there wasn’t.’

In 2011, amid global calls of conservation concern for the protection of shark populations, Brantford, Ontario emerged as the first municipality in Canada to ban the sale, possession, and consumption of shark fins (Leung, 2011). A small municipality of 134,000 people, almost a thousand kilometres from the nearest ocean, Brantford did not seem like a likely candidate to assume a leadership position on this issue. Months prior to this development, WildAid Canada, an environmental organization, had consulted with politicians at provincial and federal levels of government to see whether or not there was interest in implementing a shark fin import ban. At this point legislation banning the sale, possession, and consumption of shark fin had already been enacted in Hawaii and Washington State so there was some precedent (Sakahara, 2011). A respondent indicated that there was not a positive response from these levels of government, so WildAid decided to start locally. While Toronto, the central hub for shark fin in Ontario, was the ideal target of a shark fin ban, interviewees indicated that there was a consensus that it

should not be the first place to attempt a ban. Toronto is a diverse metropolis formerly featuring a city council with 44 members (it has since been reduced to 25 councillors) (Gray, 2018): Not only would it be difficult to sway a significant portion of city councils to back the ban, but there was also likely to be significant push back from some communities. A former politician from Brantford working alongside WildAid decided that Brantford might be a municipality that would accept the idea of a shark fin ban—start small before taking a larger city like Toronto.

‘...if Brantford does this, you’ll get worldwide media attention and celebrated by the environmental community everywhere, and it’s not really costing you anything.’

According to respondents, there were a number of factors that contributed to Brantford being the first of its kind to pass this type of bylaw. The ban was in part facilitated by the fact that Brantford did not have a market for shark fin. Brantford has a very small Chinese community, and to the knowledge of respondents, there were not even any restaurants serving the Chinese delicacy. Introducing a ban on shark fin would therefore have very little pushback from local constituents. Furthermore, Brantford has a small municipal council of 10 councillors and one mayor, and it can be much easier to pass bylaws in a smaller city. Enforcement of this new law would also be rather easy and cost-effective. Whenever an inspection would take place in a restaurant or grocery store, checking for shark fin would be added to the list of requirements at only a negligible amount of added time or expense to the municipality. With relatively little downside to the ban, there was also considerable gain to be had for a small city like Brantford. Brantford would be celebrated for environmental awareness, and could potentially receive worldwide media attention.

‘If you look at the history of regulating smoking in Canada, all of that started at the municipal level and then was later taken up by provinces and federal governments. So based on the way it worked on smoking we thought we could do it the same way for shark fins.’

In the past municipalities have assumed leadership positions on environmental conservation and public health. The bylaw banning shark fin in Brantford had been designed to closely resemble the bylaws that initially banned smoking in public areas in the mid-2000s. According to respondents, smoking bans

started municipally and later worked their way through higher levels of government, until it was ultimately banned by the federal government in 2010. The hope was that banning shark fin at the municipal level may force higher levels of government to take action and enforce it themselves.

'I think it was a moral condemnation. Saying this is a wrongful practice, and that we want to make a statement. It's obviously impractical to ban.'

Despite the fact that banning shark fin in Brantford was going to have very little impact on Canada's importation levels, respondents pointed to it being a clear case of a city thinking globally and acting locally. By banning the sale, possession, and consumption of shark fins, Brantford was taking a definitive stance of condemnation against shark finning and the sale of shark fins. Some of the politicians involved in creating the bylaw knew that there may be jurisdictional issues surrounding the ban but went through with it regardless. Although the Brantford shark fin ban would have limited conservation impact in isolation, its impact was amplified by the fact that eventually prompted action in at least a dozen municipalities across Canada.

June-October 2011: Toronto Follows Suit

'They turned the mic to [Councillor De Baeremaeker] and said, are you aware that Brantford has done this? What do you think of Toronto doing this? And to our delight, he didn't give a wishy-washy answer, he said what Brantford has done is wonderful, I'm going to introduce this to Toronto City Council.'

Brantford passed their shark fin bylaw May 16th, 2011, and as planned, the world took notice (Leung, 2011). Less than a month later, city councillor Glenn De Baeremaeker, a known environmentalist, proposed a shark fin ban of his own for Toronto. Not often does a small town like Brantford set the example for a metropolis like Toronto, exemplified by this news headline: 'Glenn De Baeremaeker proposes city-wide shark fin ban, taking a cue from... Brantford?' (Toronto Life, 2011). Passing a ban bylaw and implementing it would prove much more difficult in a large city like Toronto.

'Well we have more diversity, and a bigger population and its way harder to crack. We have 44 councillors and a mayor, and it's hard to get support for any unanimous vote.'

Unlike Brantford, Toronto was, and continues to be a major hub for shark fin in Canada. This means that among other concerns, there was likely to be much more pushback from Chinese-Canadian communities, and there would have to be at least 23 of 44 city councillors backing the ban, not to mention there would have to be actual enforcement of this new law. Chinese-Canadians (the primary consumers of shark fin soup) make up a substantial proportion of Toronto's demographic. Relative proportions have remained consistent over the past decade with people of Chinese descent accounting for ~10% of the population (Statistics Canada, 2011). Furthermore, there are many regions of Toronto with relatively dense Chinese-Canadian populations. Individuals seeking re-election in constituencies with high proportions of Chinese-Canadians may choose to oppose any motion to ban shark fin for political gain. Enforcement would also prove to be a challenge with an introduction of a new shark fin bylaw. Shark fin soup is sold all across the city in Chinese restaurants, banquet halls, and other Asian restaurants. A quick yelp review confirms that there are at least 11 restaurants scattered throughout the city that continue to serve the delicacy in 2018 and it has been reported that consumption was much more widespread prior to any talk of a ban ("Best shark fin soup", 2018). To add to logistical problems, respondents disclosed that city staff were not cooperative when creating the new law, allowing for loopholes or the potential for overreaching jurisdiction and ineffective bylaw drafting.

'Now it started to turn into a big thing. All of the environmental groups lined up, Humane Society International came on board. A group had coalesced around the filmmaker Rob Stewart, and they became known as the Fin Free Movement.'

While municipal politicians were working on drafting the bylaw, momentum and awareness were building around the city. Environmental groups were campaigning around the city to promote the shark fin ban and condemn the cruel practice of shark finning. Respondents indicated that central to it all was filmmaker Rob Stewart who had released the film *Sharkwater* in 2006— much of the reason that the shark fin trade had come into the spotlight as an environmental issue. Through the environmental group,

‘United Conservationists’ the ‘Fin Free Movement’ was started and continues to work on shark conservation to this day (“About fin free”, 2016).

‘Now in Toronto, because that’s where the trade is centred, well Toronto and York Region. This is where a big counter movement started up. So basically the shark fin distributors and the larger restaurants. They hired a lobbyist who was based in Chinatown— they started organizing against us.’

Pushback from Chinese restaurant owners serving shark fin soup was largely anticipated after the proposal of the ban. When the day to vote on the ban arrived, there was a large protest in front of city hall to oppose the proposed bylaw. The Toronto Chinese Business Association (TCBA) had issues with the bylaw arguing that the city was overreaching its jurisdiction and that it should really be a federal issue (“Toronto council bans shark fin products”, 2011). Interviewees recalled that over 300 people showed up to the protest although it was later revealed that many of these demonstrators were employees of restaurants serving shark fin soup that had been paid to be there. The impacts of this counter-movement would however have lasting effects on the success of the ban.

‘And because we create a demand for the product, you eliminate the demand, you eliminate the supply. And I think Canada has already made gestures by banning shark finning in Canadian waters. So that’s a very important initiative but they also don’t ban the importation of shark fins... so you’ve created this massive loophole, so I think you can go one step further.’

On October 25th, 2011, Toronto City Council successfully passed a bylaw that would ban the sale, possession, or consumption of shark fin; the vote was 38-4. For bylaws to pass in Toronto, 50% of the vote plus one is required, but this vote saw near unanimous support. Among those voting against the motion was then Mayor Rob Ford who felt that it was not the city’s prerogative to ban the commodity (Alcoba, 2011). This was a huge step forward for the Fin Free Movement and for shark conservation in Canada. Although the ban passed in October of 2011, it would not take effect until September 2011 to allow for stores selling shark fin or shark fin product to clear their stock (O’Toole, 2011). Though Toronto took a cue from Brantford to ban the commodity, the big city could now take a bigger leadership role in a worldwide movement.

July 2011-March 2012: Gaining Momentum

'After Brantford and before the Toronto vote, suddenly all hell broke loose. We were contacted by a councillor in Oakville, one in Mississauga, one in Newmarket, one in Durham region, London, and so a number of other motions were introduced in other municipalities and it took off. Suddenly there were proposals to ban shark fin all over the place.'

While Toronto was preparing a city report for their shark fin bylaw, there were many other municipalities that followed in wake of the Brantford ban. According to a respondent, councillors from various municipalities around Toronto and beyond were contacting WildAid with the intention of implementing municipal bans of their own. On October 12th, 2011 Mississauga unanimously (11-0) passed a bylaw banning the sale, possession, and consumption of shark fins (Mississauga City Council, 2011). On December 5th, 2011 another unanimous vote (7-0) saw Oakville pass their own ban (Mendel, 2011). March 26th, 2012, a shark fin ban in Newmarket passed with near unanimous support (8-1) (McKeown, 2012). Almost as planned, municipalities all around Toronto were taking action to condemn the trade and consumption of shark fins. Beyond the greater Toronto area (GTA), other municipalities were also taking action, and before long there over a dozen municipalities across three provinces having implemented near identical bylaws. In Ontario these included Brantford, Toronto, Mississauga, Oakville, Newmarket, Pickering, London; in Alberta Calgary implemented a ban, and finally, in British Columbia, bans were implemented in Abbotsford, Coquitlam, Nanaimo, Port Moody, North Vancouver, Maple Ridge (Pogas, 2012).

December 2011: Federal Action

'If the laws gonna have teeth, it has to come from the federal government.'

It was not only members of the Chinese Canadian restaurant owners' community who felt that municipalities may be overreaching their jurisdiction. Interviewees commented that many federal politicians felt that municipalities did not really have the authority to be implementing a ban of this kind, despite the fact that they continued to go through with it. In reality, even some of those leading the

creation of bans at the municipal level were reportedly aware of the weaknesses of implementing this kind of bylaw. One of the main goals of these initiatives, however, was to make it an issue at higher levels of government. And as anticipated, the action of all these municipalities had drawn the attention of federal politicians and really made it a federal issue.

'I think it was Fin Donnelly who decided to take his federal bill forward before the Toronto bylaw was struck down, but we were back and forth with Fin letting him know what was going on in Toronto. But he was determined to go forward with it regardless of what happened at the municipal level.'

On December 8th, 2011 New Democratic Party (NDP) Member of Parliament Fin Donnelly introduced a private members bill, the 'Ban on Shark Fin Importation Act'. The legislature stood to amend the Fish Inspection Act and would prohibit any further importation of shark fins into Canada ("Bill C-380", 2011). If this act was passed into law, Canada would become the first country in the world to ban the importation of this valuable and controversial commodity. Within 7 months of Brantford banning the sale of shark fins, there was already federal legislature with the potential to end the bulk of shark fin trade in Canada. There were however a few obstacles standing to prevent the passing of this bill into law. For one, it was a private member's bill, which do not normally get passed into law as they do not necessarily reflect the greater interests of the party. Furthermore, this bill was proposed while a Conservative majority was in power in parliament, an even more unlikely time for such a bill to pass. None-the-less, Fin Donnelly proceeded with his bill.

November 2012- May 2013: Municipalities Overreaching Jurisdiction

'I think the real value of what we did at the municipal level, is that we made it an issue. We got it on everyone's radar. We got everyone talking about it. It paved the way for federal legislation. But I think long-term, was it ever going to be a satisfactory outcome? To have municipalities fighting about it? Probably not. But it was a good way to get the debate started.'

Following the Toronto vote, members of the Toronto Chinese Business Association created The Fair and Responsible Governance Alliance (FARGA) in an attempt to take down the bylaw that would put an end to shark fin sales in Toronto (Puzic, 2012). In July of 2012, FARGA filed a lawsuit against the city of

Toronto stating that the city was overreaching their jurisdiction as a municipality and could not implement a bylaw of this kind. The lawsuit claimed that the bylaw invoked by the City of Toronto did not serve a ‘municipal purpose’ and rather had ulterior motive. In November 2012, Judge Robert Spence ruled on *Eng v. Toronto* and overturned the municipal bylaw on grounds of *ultra vires* which is to say that it is beyond the city’s legal power and authority (Eng v. Toronto, 2012). This was a decisive moment in the progression of municipal bans, as a bylaw of this kind in Toronto had ultimately been the goal of these efforts. Furthermore, other municipalities that had enacted bylaws of this kind were left with hard decisions to make; if the Toronto bylaw was overreaching, it was likely that all of the other bans were too. In May of 2013, Mississauga City Council unanimously voted to repeal the bylaw that they had enacted over a year prior (Grewal, 2012). It was evident that municipalities were not the proper level of government to be dealing with decisions of this kind, especially after the Toronto Ban was repealed. Instead, lending support to bills at the federal level seemed to be the best way to enact change.

March 2013: Faltering at the Federal Level

‘We could have made history back in 2013, but that vote was a heartbreaking loss by only 5. So that was mistake number 1, trusting Ottawa to get it done.’

More than a year after it was first proposed by Federal MP Fin Donnelly, Bill C-380 was defeated at its second reading 143 votes to 138 (Pogas, 2013). Despite every opposition member voting for a ban on shark fin importation, the conservative majority government proved to be too strong in opposition. Respondents indicated that the then Harper government had gone so far as to advise key advocates from Toronto that they didn’t need to come to Ottawa to lobby because they were allegedly going to support the NDP bill— a betrayal of trust that proved to be pivotal. According to respondents there were however some legitimate flaws in Donnelly’s bill. For one, the bill stood to ban the importation of shark fin, but did not ban the exportation of the commodity. This would make the legislation open to a World Trade Organization (WTO) challenge. This was the first of several federal bills that would be contemplated on this subject.

February 2016- October 2016: Bill C-246

'You've now got a liberal majority government and every liberal member voted for the Fin Donnelly bill. If you introduce a bill that's almost identical to Donnelly's you should be good to go. Unfortunately, Nate included all kinds of animal cruelty stuff in his bill.'

In February of 2016, while the Liberal government held majority in federal parliament, Liberal MP Nathanael Erskine-Smith proposed Bill C-246. The 'Modernizing Animal Protections Act' would have stood to make amendments to the Criminal Code, the Fisheries Act, the Textile Labelling Act, the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act and the Canada Consumer Product Safety Act ("Bill C-246", 2016). In sum, it looked to ban the importation of shark fins into Canada, to close loopholes in animal cruelty laws, and to ban the sale of cat and dog fur in Canada. At this time, interviewees thought that circumstances were favourable for a ban of this kind to pass into law as it was a liberal majority government, and NDP MPs who had voted in favour of Bill C-380 would likely support it. Unfortunately, this bill did not receive support from the Liberal government largely because it would have received much opposition from factory farming and more rural constituents. It was defeated in October of 2016 198 votes to 84— the second bill of its kind to die in the House of Commons (Maloney, 2016).

April 2017- Present: Bill S-248

'Well if we ever have a chance of going with it, its now. You've got a majority Liberal government and all the Liberal members in opposition voted for the Donnelly bill in 2012 so they've already set a precedent.'

In April 2017, Conservative Senator Michael MacDonald introduced the 'Ban on Shark Fin Importation and Exportation Act'. Unlike the other bills that have been proposed to ban the importation of shark fins, this bill was proposed by a senator, and as such had to pass the Senate before going to the House of Commons. According to interviewees, this is the most refined bill of its kind and contextually has the highest chance of success. There is currently a Liberal majority, led by a Prime Minister who has been

commended as an environmentalist, despite a few miscues—liberals in the past had backed Bill C-380. The bill has been introduced by a Conservative senator and the Conservative Party was the largest obstacle in the way of Bill C-380. Finally, the NDP, Bloc Quebecois, and Green parties had all also backed Bill-380. Evidently this simplistic view of things fails to acknowledge political dynamics that are at play, but the precedent has been set for a successful bill. As of October 23rd 2018, Bill S-238 has passed the Senate and will enter the House of Commons for further debate.

Discussion

The purpose of this research was to evaluate the feasibility of a municipal shark fin ban in Toronto, while identifying potential barriers and opportunities for a ban of this kind. Interviewing politicians involved with these processes at multiple levels of government allowed for the identification of various opportunities and barriers such that feasibility could ultimately be evaluated. This discussion will be divided into two sections: one identifying opportunities and enabling circumstances for bans, one identifying barriers to the implementation of bans.

Opportunities:

While both Brantford and Toronto are municipalities in the same region of Ontario, the opportunities that allowed for the creation of a shark fin bylaw are considerably different between the two of them. Brantford is by definition, a medium sized city on the cusp of becoming a ‘large urban centre’ (Statistics Canada, 2011). It had a population of 94,269 at the time of ban implementation and has since seen some moderate growth (Statistics Canada, 2016). Being a medium-sized city, it had a great opportunity with the shark fin ban. It was small enough that there would not be considerable pushback when attempting to implement a ban of this kind—especially given its small Chinese population and that there were no restaurants serving shark fin soup at the time. On the other hand, having a population

verging on becoming a large urban centre allowed for Brantford to take a leadership role among Ontario municipalities in a way that a smaller municipality may not have been able to. Being a smaller city Brantford has a small municipal council when compared to that of larger Ontarian urban hubs.

The ‘political win’ of a shark fin ban cannot be understated when evaluating the success of the Brantford ban. When it came to convincing city councillors that the ban was an initiative worth pursuing, simply weighing the costs and benefits of a ban of this kind was enough. Costs to the municipality would be minimal: there would be negligible community pushback, and no extra effort or expense would have to be put forth in terms of regulating or enforcing the ban. Benefits far outweighed any costs as Brantford had an opportunity to be celebrated by the environmental community and potentially even receive worldwide media attention. Similar initiatives had been taken up by States in the U.S. so it was a logical time to pursue a ban. Furthermore, no ban of this kind had been implemented at a municipal level in North America. If another municipality pursued a ban first, Brantford introducing a ban of its own would be much less impactful. The council and mayor saw these benefits and Brantford quickly took the opportunity to become an environmental leader in this regard. Despite the fact that Brantford effectively banned a commodity that it had no trade in, the political initiative was a great success. To date, the ban still stands.

There were plenty of opportunities present for the implementation of a shark fin ban in Toronto as well. Brantford had just led the way for other municipalities to introduce similar bylaws. The bylaw had in fact been introduced as a model for cities like Toronto. But Toronto, unlike Brantford, had and continues to have a major trade in shark fins, whether in grocery stores, dried seafood stores, restaurants, or banquet halls. Canada, as previously mentioned is the 11th highest importer of shark fins in the world by volume (Dent & Clarke, 2015). Approximately 40% of these imports are bound for Ontario, where they presumably are primarily shipped to Toronto and the surrounding area (Dent & Clarke, 2015). Of Canadian cities where a ban on shark fin sale, consumption, and possession was going to potentially impact national imports, Toronto or Vancouver were the two most important traders. The fact that

Toronto was a major trader of shark fin was an opportunity to enact a ban, but also proved to be a significant barrier to its success.

At the time of proposal, there was a large political will to get the ban implemented. Led by city councillors De Baeremaeker and Wong-Tam, Toronto, like Brantford, wanted to play a leading role in environmental stewardship of shark populations. As an urban metropolis, and the 4th largest city in North America, Toronto wanted to encourage other municipalities, and other levels of government to enact bans of this kind. In fact, when enacting their shark fin ban, Toronto City Council adopted the following stipulations among others: “That City Council request that the federal government introduces regulations on the importation of shark fins and derivative products”; “That City Council request the provincial government under the Endangered Species Act, the Fish and Wildlife Conservation Act, the Ontario Society for the Prevention of Cruelty to Animals, and the Environmental Protection Act, provide protection to shark populations”; “That City Council request municipalities in the Greater Toronto Area to give consideration to implementing similar pieces of legislation on the sale, possession, and consumption of shark fin” (Toronto City Council, 2011). There was evidently a strong political will to get this done, and to stimulate action at both near and far fields.

Part of the reason Toronto was able to initially enact a ban of this kind was because shark fin soup, in theory, was seen a public health risk and may have ‘adverse impacts on the health, safety and well-being of persons’ (*Eng v. Toronto*, 2012). As apex predators, sharks are particularly susceptible to effects of bioaccumulation (Man *et al.*, 2014), a process by which toxin concentrations increase with increasing trophic level— levels of toxins, particularly mercury, which may be negligible in organisms such as zooplankton accumulate in top predators like sharks, tuna and billfishes. In studies, samples of shark fin have been found with concentrations of mercury considered unsafe for human consumption by the standards of Health Canada (Man *et al.*, 2014). When proposing and implementing legislature, bylaws must have a ‘municipal purpose’ or else it falls outside of the jurisdiction of the city and may be null (*Stronger City of Toronto for a Stronger Ontario Act*, 2006). Though the bylaw was mainly being implemented as a means to help global shark conservation efforts, the ‘health risk’ element provided a

‘municipal purpose’ for the ban.

Beyond immediate health risks to citizens of Toronto, the ban was also implemented under stipulations that shark fin consumption affected the ‘economic, social, and environmental of the City of Toronto’ (Toronto City Council, 2011). The rationale being that Toronto as a city consumes ocean fish living in the same ecosystems as sharks; if the ecosystems were degraded due to the overexploitation of sharks, Toronto would be responsible for some of the ‘massive, cascading, and irreversible ecological changes’ potentially impacting future consumption of ocean fish (*Eng v. Toronto*, 2012).

Barriers:

When discussing barriers to the implementation of this bylaw, Toronto provides a more compelling case for study as Brantford was largely devoid of barriers. One of the largest opportunities for the ban, the large market of shark fin trade, was also a significant barrier. At the time of the ban (2011), Toronto and the surrounding area had a total population of 5,521,235— 594,735, or ~10% of which were of Chinese descent (Statistics Canada, 2011). The Chinese Community in Toronto is tight knit and there are many organizations that promote the social and economic well-being of Chinese-Canadians living in Toronto, exhibited by organizations such as ‘The Confederation of Toronto Chinese Canadian Organizations’ (The Confederation of Toronto Chinese Canadian Organizations, 2018). Among them, the TCBA is a major non-profit that promotes economic well-being of Chinese businesses and acts as a liaison between businesses and various levels of government (“About us”, 2014). When the ban was initially proposed in September of 2011, there was significant push back from the TCBA on behalf of restaurant owners serving the delicacy, as they insisted that this ban was not a municipal issue. After the bylaw was successfully passed by the city council, the TCBA formed another organization, FARGA, and proceeded to file a lawsuit against the City of Toronto. They cited a lack of jurisdiction as the primary argument against the ban. Like environmental organizations that rallied for the ban to be put into place,

there were counter demonstrators in efforts to send a message to city council. The lawsuit filed by FARGA against the City of Toronto eventually made its way through the court system to the Ontario Superior Court of Justice.

Though the pushback from the Chinese Community was a huge driving force in the process of repealing the shark fin bylaw, the ban ultimately failed because the city was in fact overreaching its jurisdiction implementing a ban of this kind. *Eng v. Toronto* (2011) was heard by Judge Robert Spence on November 5th, 2012 and the ban was overturned on several counts. The city of Toronto has the prerogative to deal with ‘municipal issues’, although ‘municipal issues’ are not explicitly defined in the *Stronger City of Toronto, Stronger Ontario Act* (2006) (From this point referred to as the *City of Toronto Act*). The *City of Toronto Act* (2006) states, among other things, that “The powers of the City under this or any other Act shall be interpreted broadly so as to confer broad authority on the City to enable City to govern its affairs as it considers appropriate...”. There had been a previous court case, *Shell Canada Products Ltd. v. Vancouver*, which had established jurisprudence for a municipality overreaching its jurisdiction. In that case, the city council of Vancouver had imposed a ban on doing business with Shell Canada. The purpose of this ban was to pressure Shell to divest from South Africa as a moral condemnation of the Apartheid regime that was in place at the time (*Shell Canada Products Ltd. v. Vancouver*, 1994). Courts decided that as this ban provided no tangible benefit to the city or its people, the bylaw was *ultra vires* and of no cause and effect.

In Toronto, two of the primary reasons to justify the ban’s municipal purpose were deemed to be void resulting in no force and effect. As was mentioned, the Toronto bylaw was implemented because “the consumption of shark fin and shark fin product may have an adverse impact on the health, safety and well-being of persons, and on the economic, social and environmental well-being of the city of Toronto” (Bylaw No. 1247, 2011). In the case of ‘health, safety and well-being of persons’, it could not be proven that the consumption of a single bowl of shark fin soup would have adverse impacts on a given person’s health; despite the potential toxic effects of excessive shark fin soup consumption over time, the ban applied to just a single bowl of shark fin soup and there are many food products that can be harmful to

health if consumed in excess over time (*Eng v. Toronto, 2011*). The preamble of ‘economic, social, and environmental well-being of the city of Toronto’ mainly pertained to the environmental aspect and the bylaw was implemented to prevent the extinction of sharks. The main rationale behind this claim was that once the ocean had been depleted of sharks, there would no longer be shark fins for consumption and oceans would be deprived of a top predator causing irreparable harm to ecosystems that provide Toronto with food (*Eng v. Toronto, 2011*). While there is truth to this claim, declines of shark population were largely overstated by city council— it was claimed that at current rate of harvest, sharks would be extinct in 10 to 20 years (*Eng v. Toronto, 2011*). While sharks are the most threatened group of animals in the world, there is was a negligible chance that they would reach extinction, as an entire group in 20 years, not to mention 10 (Dulvy *et al.*, 2014). An added consideration was that because the bylaw prohibited possession and consumption, police could, in theory, acquire warrants to enter houses— a significant breach of privacy (*Eng v. Toronto, 2011*). For all of the above reasons the court settled in favour of the applicants (FARGA) and concluded that the bylaw was unenforceable.

After the Toronto decision, there was a considerable halt in the momentum that had been building in municipalities and at a federal level. On February 21, 2013 the city of Toronto decided against appealing the decision made in the superior court, and has since preferred to lend support to federal initiatives (City of Toronto, 2013). Shortly thereafter in May of 2013, the city of Mississauga unanimously voted to repeal their ban that closely resembled that of Toronto because of similar jurisdictional issues (“Mississauga Shark Fin By-law Repealed”, 2013). Mississauga had kept its ban in place after the Toronto ban was overturned while awaiting the status of Bill C-380 in the House of Commons which was defeated in March of 2013 (Grewal, 2013). Mississauga, like Toronto, had received considerable pushback from the Chinese-Canadian community spearheaded by the Mississauga Chinese Business Association (“Shark fin ban riles business association”, 2011). Other municipalities that had implemented similar bylaws throughout Ontario did not repeal their bans as the pushback was considerably less.

Chapter 4: Discussion and Conclusion

Shark populations around the globe are seeing substantial declines, in large part because of the perpetuation of the shark fin trade (Clarke *et al.*, 2007). Though there is a substantial body of work that has been accumulated on the shark fin trade, gaps in information and data due to the globalization of the market for shark fin are extremely prevalent (Dent & Clarke, 2015). These gaps in knowledge make proper management of sharks and shark fin commodities extremely difficult, especially when a large proportion of shark fins are sourced from IUU fishing (Dent & Clarke, 2015). Many countries have introduced NPOAs as a means of implementing more sustainable management measures for shark populations within EEZs; these plans have however fallen short of their goals and there is no evidence to suggest that NPOAs have led to effective management of shark fisheries (Lack & Sant, 2011). Canada has done its part to improve the management of sharks within national waters (DFO, 2007). Shark finning has been banned since 1994 in Canadian waters and the NPOA aims to ensure sustainable management of sharks within Canadian jurisdiction (DFO, 2007). Despite this, Canada has a high level of complicity in the shark fin trade as evidenced by trade statistics where it ranks 11th highest in terms of volume and 4th highest in terms of value globally (Dent & Clarke, 2015). Recent research has suggested that high proportions of shark fin in Vancouver are sourced from vulnerable and CITES-listed species (Steinke *et al.*, 2017). Municipal bans have emerged as conservation strategy to influence consumption at a local level, but as has been discussed, their implementation has seen various levels of success. The main objective of this paper was to assess the practicality and feasibility of a shark fin ban in the municipality of Toronto.

As is evidenced through genetic testing of shark fins from Toronto and the surrounding area, Toronto would be a practical place to implement a ban on shark fin commodities because the market contains species of concern. The proportion of vulnerable, endangered, and CITES-listed species is alarming and based on similar results found by Steinke *et al.* (2017) it is likely that the trade in these species is extensive across Canada. While there has been progress in monitoring techniques to screen fins

that are being imported, Canada needs to be driven to implement them and enforce the stipulations of CITES. Until then, it will be nearly impossible to discern what species' shark fins imported into Ontario belong to, although it seems safe to operate under the assumption that many of the species are in fact threatened. In 2011, 40% of shark fins imported into Canada were bound for Ontario, and if this trend continues to this day Ontario continues to import ~70,000 kg of dried and frozen shark fins annually (Statistics Canada, 2017). Over the past decade, extensive awareness has been raised, through NGOs and local governments, regarding the harmful impacts of shark finning, both from a moral and ecological standpoint. Despite this, it is clear that consumption continues to this day. Trade data would suggest that in recent years, consumption has increased in terms of volume and value since marked declines around 2011-2012; 2017 was the first year since 2009 where Canada imported over 180,000 kg of shark fin (Statistics Canada, 2017).

A municipal ban provides a practical means to forcibly reduce consumption through legislation, ultimately reducing Toronto's impacts on foreign shark populations. It would however, not be without fault as residents in Toronto would be able to visit neighbouring municipalities to acquire the same delicacy. In order to truly curb consumption in Toronto, bans would need to be implemented in nearly all of the surrounding area.

A lack of feasibility is ultimately what prevented the long term implementation of the municipal ban in Toronto. When the first Brantford ban was designed, it prohibited the sale, consumption, and possession of shark fins. This ban overreached the jurisdiction of the municipality, but because there was no pushback from the community it was allowed to stand. As other municipalities introduced similar legislation, the flaws of the Brantford ban remained and left the bylaw open to appeal. As evidenced by the Superior Court of Ontario case, the bylaw was of no force and effect and as such could not be enforced. Though there is little political will to pursue a ban at the municipal level anymore, there are two important things of note. Firstly, a ban encompassing sale, consumption, and possession of shark fin is unfeasible but the city of Toronto has clear jurisdiction over regulations and licensing requirements of restaurants and could in theory take an approach of this kind to reduce consumption (City of Toronto,

2018). Secondly, the attention and coverage that the municipal bans generated, attracted federal attention, meaning that at this point, the focus of shark fin legislation has shifted federally where jurisdiction is no longer in question.

The intention of the municipal bans had always been to spur action at provincial or federal levels. Within a period of 7 months, the Brantford bylaw triggered action at a federal level when Bill C-380 was proposed by Federal MP Fin Donnelly. Despite this, 7 years later federal legislature has failed to be passed into law and the shark fin trade continues to flourish within Canadian borders. These bills have failed for a variety of reasons: Bill C-380 was introduced at a time when there was not a favourable political climate and the design of the bill itself was open to a challenge from the WTO; Bill C-246 failed, in part because it included regulations beyond the importation of shark fins and tried to accomplish too much. Beyond these facts, private members bills seldom pass into law as they do not necessarily reflect the views of the party as a whole. Bill S-238 is a unique bill in large part because it originated in the senate, whereas the others originated in the House of Commons. On October 23rd, 2018 Bill S-238 passed the senate and will now be considered in the House of Commons. The political climate is favourable as the bill was introduced by conservative senator Michael MacDonald and will likely see the support of the Conservative party.

Meanwhile, the Liberal and NDP parties were almost unanimously supportive of past bills to ban the importation of shark fin, particularly Bill C-380. Barring a political maneuver to prevent the passing of Conservative legislature, circumstances look promising for the bill. Beyond the political climate, Bill S-238 is a more stringent bill and not open to a WTO challenge as it bans the exportation as well as the importation, something that Bill C-380 failed to do. It is possible that the Prime Minister would oppose the bill as banning the importation of commodities is a sensitive process. For example, Canada has attempted to prevent other countries from banning the importation of seal fur as there are similar moral concerns regarding how these furs are harvested; to date there has been an amendment that permits the trade in seal fur that has been harvested traditionally by indigenous peoples (European Commission,

2017). Because Canada trades so heavily with China, it is unlikely that an importation ban on one commodity would influence relations, but the dynamics of politics cannot be underestimated.

Looking forward, there are some innovative means of reducing Canada's consumption of shark fins beyond a ban on their importation. There are some organizations such as 'Happy Hearts Love Sharks' that have promoted shark fin soup-free weddings by providing prize incentives; if couples vowed to go fin free for their wedding banquet they were entered to win a grand prize of an all expenses paid vacation, valued at over \$10,000. The 2012 campaign of 'Happy Hearts Love Sharks' saved 3,495 bowls of shark fin soup from being served, but the campaign has since ceased (Happyheartsovesharks, 2018).

Organizations in Canada such as Oceana, Team Sharkwater, and Humane Society International, continue to raise awareness regarding the fin trade in Canada and have been campaigning in support of Bill S-238. Various petitions have been started online in order to garner support for the bill and there are several that have over 50,000 signatures (Change.org, 2018). Ultimately there has to be support from the people of Canada to force the hand of the federal government and the impact of NGO campaigns can be considerable for spreading awareness and reducing consumption.

In terms of monitoring and enforcement, new technologies that may be able to detect CITES species as they are entering our country, such as that presented by Cardenosa *et al.* (2018) would be integral to reducing Canada's impacts on shark populations should Bill S-238 fail to pass the House of Commons. It provides a means of identifying fins from sharks that are the most threatened by the shark fin trade—including many endangered species. Although there is considerable diversity in the fin trade in terms of shark species that are traded, CITES species provide a treaty-based foundation for enforcement, beyond morality. Enforcement has long been a concern for CITES, but there some enforcement mechanisms such as the threat of trade sanctions through embargoes for uncooperative states (Sand, 2013). Being able to identify CITES-listed species at the border would at the very least hold Canada accountable to the stipulations of CITES and prevent further trade in these species. Ultimately, the federal government needs to take initiative to reduce Canada's impact on foreign shark populations whether if it's through the introduction of new legislation, or through stricter monitoring and enforcement.

In conclusion, it is evident that large quantities of shark fin in the Greater Toronto Area are sourced from vulnerable, endangered, and CITES-listed species. This high proportion of species of conservation concern indicates that Toronto would be a practical place to implement a ban on shark fin commodities. Due to the overreaching jurisdiction of the initial Toronto ban, and the action that has been taken at a federal level, municipalities seem content to lend their support to federal legislature. While an all-encompassing ban on the sale, consumption, and possession of shark fin is not feasible within municipal jurisdiction, a more refined bill that acknowledges the limitations of municipal power is certainly feasible. While consumption of shark fin in Canada is relatively small compared to global consumption, Canada still plays an important role in perpetuating the shark fin trade (Dent & Clarke, 2015). Federal legislature in the form of Bill S-238 provides a means to end the importation of shark fin into Canada which would dramatically lower Canada's impact on foreign shark populations. While it has been posited that blanket bans may undermine sustainable shark fisheries (Shiffman & Hueter, 2017), the outlook of shark fin markets in Canada begs action. Canada has promoted itself as an environmental leader when it comes to shark management (DFO, 2007), and it is clear that some form of management measure is needed to ensure that a more sustainable future for Canada's use of sharks and shark commodities.

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Appendices

A- Ethics Approval

Marine Affairs Program

DALHOUSIE UNIVERSITY

Marine Affairs Program Ethics Review Standing Committee

Letter of Approval

July 14, 2018

Dear Scott,

MAPERSC #: MAP2018-08

Project Title: Addressing the Canadian Shark Fin Trade at a Local Level

Effective date: July 14, 2018

Expiry date: July 14, 2019

The Marine Affairs Program Ethics Review Standing Committee has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans. This approval will be in effect until the date indicated above. This approval is subject to the conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,

A handwritten signature in blue ink that reads "Aporta". The signature is written in a cursive style and is underlined with a single horizontal line.

Claudio Aporta, Chair

B- Interview questions

Interview questions:

- i) How familiar are you with initiatives to locally ban the sale, possession or consumption of shark fins? (i.e. in Toronto, Brantford)
 - a. In Toronto, provincial courts ruled that the issue was not a municipal one, despite the fact that municipalities set standards on regulations and licensing requirements- do you agree with this ruling?
 - b. Do bans of this sort have any place in municipal rule?
- ii) When do you think such an extreme measure as a ban is necessary?
 - a. Is it always a practical step to take?
 - b. Are there particular circumstances where a local ban should not be implemented?
 - c. In the case of Brantford, no restaurant had been serving shark fin soup in the municipality and yet a ban was still implemented— what purpose do you believe this serves?
- iii) Is it feasible to implement a municipal ban on a commodity such as shark fins? Are there cases where it would be completely unachievable?
 - a. Is a blanket ban such as the prohibition of sale, trade, and consumption as feasible as one that is perhaps less restrictive? Is there perhaps a better middle ground?
 - b. What would make Toronto different from a municipality like Brantford when implementing this type of ban?
- iv) What do you think is the biggest obstacle in place to introduce these types of bans?
 - a. What conditions would enable for these obstacles to be surmounted?
- v) Do you think that Canada's regulation on importations should reflect our environmental stances?
- vi) Do you know of any other such initiatives to ban a commodity like shark fins?
 - a. Were they successful?