

The political ecology of the international white shark and scalloped hammerhead trade: the case of CITES

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Abstract

The critically endangered scalloped hammerhead and vulnerable white shark are both listed on Appendix II of the Convention on International Trade in Endangered Species (CITES), yet only the white shark is showing any population stabilization. This thesis draws on CITES trade data, expert interviews, and content analyses to explain these divergent outcomes and shed light on CITES' strengths and weaknesses. I find that the scalloped hammerhead is a challenging species to manage because it is valuable commercially and for subsistence. My research affirms two themes in political ecology literature on CITES and species loss. First, CITES is limited in its ability to manage species traded from the Global South for various reasons, many of which stem from conditions of socio-economic inequality. Second, the scalloped hammerhead exemplifies a "tragedy of the commodity," which is difficult for CITES to address given that its framework is built on the licensing of species commodification.

Keywords: CITES; scalloped hammerhead; white shark; inequality; capitalism; political ecology

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List of Acronyms

AC	The Animals Committee
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoP	Conference of the Parties
IFS	Introduction from the Sea
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported, and Unregulated (Fishing)
NDF	Non-Detriment Finding
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
RFMO	Regional Fisheries Management Organization
RST	Review of Significant Trade
TRAFFIC	Trade Records Analysis of Flora and Fauna in Commerce
WWF	World Wildlife Fund

Chapter 1.

Introduction

Earth is experiencing unprecedented species loss. Approximately 100 species are lost per day (Broszmitter, 2002). Between 1970-2016, populations of mammals, birds, amphibians, reptiles, and fish declined by roughly 68% (WWF, 2020). Across disciplines and in the popular vernacular, this largely anthropogenic extinction event is now being referred to as the sixth mass extinction (Cellabos et al., 2015; Dawson, 2016; Kolbert, 2015; Leakey & Lewin, 1995; Mitchell, 2020; Rose, van Dooren, & Chrulew, 2017; van Dooren, 2014; Vettese, 2020; Wake & Vredenburg, 2008; Weis, 2018). This rate of loss is alarming because once a species becomes extinct, it can never be brought back. Put simply, each species that leaves our planet represents a loss of multiple species relationships. This narrowing of relationships will cause ripple effects felt for years to come (Rose, van Dooren, & Chrulew, 2017).

Sharks are no exception to this broader trend. Since the 1970s, oceanic shark populations have declined by 71% as a result of fishing (Pacoureaux et al., 2021). Ferretti et al. (2020) explain that over 90% of shark catches are “biologically unsustainable” (p.2), meaning the number of individuals caught exceeds the amount needed to sustain the population. Worm et al. (2013) estimate that around 100 million sharks are killed per year for their fins to supply the shark fin soup industry. In this thesis I focus on two shark species experiencing over-exploitation: scalloped hammerheads and white sharks. The scalloped hammerhead (*Sphyrna lewini*) is listed as “critically endangered” on IUCN’s Red List of Threatened Species, meaning that the shark faces an “*extremely* high risk of extinction in the wild” (IUCN, 2012). It is declining at alarming rates, with one expert calling scalloped hammerheads “one of the most threatened sharks... with the least chance of recovering” (Expert 3, personal communication, 2021; also see Budd et al., 2021). The scalloped hammerhead is considered an apex predator, and declines in the species could have far-reaching consequences as it plays an essential role in ecosystems and the food web (Wells et al., 2018). Another ecologically important species is the white shark (*Carcharodon carcharias*). It is listed as “vulnerable” on the IUCN Red List, meaning that the species also faces a “high risk of extinction in the wild” (IUCN, 2021). However, the situation for the white shark differs from that of the scalloped hammerhead for many

reasons. Despite being listed on the IUCN Red List as vulnerable, white shark populations are now believed to be increasing or stable in most parts of the world (Experts 1 & 2, personal communication, 2021). This thesis explores the differences in protection and recovery for the two shark species.

The proximate drivers of extinction are generally well-established. Human activities including land-use change, overexploitation, habitat loss, climate change, and pollution all influence the extinction and endangerment of species (Bavington, 2010; Cellabos et al., 2015; Dirzo et al., 2014; Mitchell, 2020; Vettese, 2020; Weis, 2018). For shark species, overexploitation is the main driver of extinction (Ferretti et al., 2020). The overexploitation of sharks is relatively well-researched across the scientific community. However, despite there being social science work on sharks related to the discourse used around shark attacks and their vilification more broadly (Gibbs, 2021; Jarvis, 2019), I was unable to find any social science studies on the drivers of decline for the scalloped hammerhead or white shark. Especially lacking are studies focused on explaining shark declines from a governance or political ecology perspective. This is true more broadly across species – drivers of extinction have historically tended to be approached predominantly through scientific study (notable exceptions include: Bavington, 2010; Mitchell, 2020; Vettese, 2020; Weis, 2018). But social scientists are increasingly joining this conversation. Extinction studies is a growing field among social scientists, with scholars attempting to broaden the understanding of species loss. Scholars of this field are largely focused on identifying the underlying political economic structures behind over-exploitation and extinction, such as commodification and governance failures. My research draws on the existing conversations taking place among scholars, particularly political ecologists, studying the extinction crisis and species loss in an attempt to better understand the declines occurring among scalloped hammerhead populations. In particular, I seek to understand the strengths and weaknesses of transboundary shark management.

The transboundary nature of shark life-courses and trade in shark products complicates their management. Migratory species like the white shark and scalloped hammerhead are difficult to manage for a number of reasons. The white shark travels long distances crossing numerous jurisdictional boundaries (Caddell, 2011). The scalloped hammerhead is both coastal and oceanic, and while information pertaining to movement patterns are somewhat uncertain for the species, they do tend to migrate offshore for parts

of their life-history (Coiraton, Amezcua, & Ketchum, 2020). Additionally, the overexploitation that puts the scalloped hammerhead at risk of extinction is often used to supply international trade (Rigby et al., 2019). For these reasons, it is widely recognized that migratory species and species threatened by global trade require international cooperation in the form of international policy and organization (Caddell, 2011; Lascelles et al., 2014).

The main international legal framework in place to protect white sharks and scalloped hammerhead sharks is the Convention on International Trade in Endangered Species (CITES). CITES is an international agreement between signatory nations (“Parties”), where the international trade of threatened and endangered plants and animals is regulated to ensure the survival of the species (CITES, 2021). At present, there are 183 Parties signed to CITES (CITES, 2021). This means that globally, there are 183 countries or regional organizations that oversee and administer the trade of endangered species, like the white shark and scalloped hammerhead, in an attempt to ensure the sustainability of the trade. The CITES website states that it is meant to offer different levels of protection to over 37,000 species (CITES, 2021). Both the white shark and scalloped hammerhead have been listed under Appendix II of CITES since 2005 and 2014, respectively.¹ This means that a certain amount of their trade is authorized through CITES as long as the trade does not threaten their survival. Yet despite the purported protections of CITES, the scalloped hammerhead continues to face declines, while the white shark appears to have stabilized or began recovering (Budd et al., 2021; Experts 1 & 2, personal communication, 2021). I aim to understand how CITES is managing its species in order to understand why these differences in protection occur, and what this suggests about CITES’s strengths and weaknesses.

In addition to CITES, there are a few key international measures in place to conserve and manage white sharks and scalloped hammerheads, including the Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the General Fisheries Commission for the Mediterranean (GFCM). The CMS works to mitigate against obstacles related to migration, but is not in charge of setting quotas on international trade. Since overexploitation is the key driver of decline for the scalloped

¹ These dates mark the year the sharks’ listings came into effect. They were both voted in at CoPs that occurred one year prior to this date, with the white shark being voted in under Appendix II in 2004, and the scalloped hammerhead being voted in under Appendix II in 2013.

hammerhead, I have chosen not to focus on this international agreement. The GFCM is also not in charge of setting quotas for the shark species, and it is only composed of 23 contracting parties, making it less far-reaching than CITES. With the ostensible protections offered by CITES, why are there such drastic differences in recovery outcomes for the scalloped hammerhead and white shark? My research attempts to answer this question by critically analyzing and quantifying trade flows and CITES decisions for the white shark and scalloped hammerhead using the CITES database, along with conducting interviews with experts in these topics.

1.1. CITES

In this section, I introduce CITES by explaining what the Convention does, and how it attempts to manage the trade in endangered and threatened species around the world. In the first part of this section I detail the different Appendices used to categorize CITES-listed species, and discuss the main mechanism in place to protect Appendix II-listed species: Non-Detriment Findings (NDFs). After this, I review the key critiques of CITES discussed in the literature, with an emphasis on political ecologists' critiques.

1.1.1. What is CITES?

The overexploitation and commodification of sharks and their valuable body parts has led to regulatory regimes like CITES attempting to manage the trade. CITES was created to prevent international trade from “contributing to the extinction of commercially exploited species” (Vincent, Sadovy de Mitcheson, Fowler, & Lieberman, 2014, p.3). Accordingly, it has a precautionary order to regulate international trade for species that are currently, or may become, at risk of extinction due to such commerce (Vincent et al., 2014). CITES was first signed in 1973 and then implemented in 1975. It operates by adding species of conservation concern to one of three Appendices. Each appendix offers different levels of protection to the species listed under them. Appendix I lists species that are considered to be the most endangered (and threatened with extinction) among CITES-listed species. For this reason, Appendix I prohibits the trade of these species, unless they are to be imported for non-commercial purposes (for example, for research purposes) (CITES, 2021). Appendix II lists species that are not considered to be immediately threatened with extinction, but that could be if the trade is not monitored. Additionally,

Appendix II includes “look-alike species,” which are “species whose specimens in trade look like those of species listed for conservation reasons” (CITES, 2021). Export of species listed under Appendix II is authorized by granting permits for export or by authorizing re-export certifications (CITES, 2021). Currently, the white shark and scalloped hammerhead are listed under this Appendix. Finally, Appendix III lists species that are managed by individual countries and that require the cooperation of other countries in order to control the trade. These species are considered to be threatened, and a permit is still needed for their trade, but they are not considered to be threatened to the extent of those listed in Appendices I and II (CITES, 2021). A species may be moved between Appendices during the Conference of the Parties (CoP), which is a meeting of the Parties to CITES. Here the Parties can review and implement any changes necessary, dependent on species conservation statuses (CITES, 2021).

In order to obtain a permit for trade of a species listed under Appendix II, a Party must be able to show that “such export will not be detrimental to the survival of that species” (CITES, 2014, p.1). This proof that an export will not harm a species’ population is called a Non-Detriment Finding (NDF). For Appendix II-listed species, Non-Detriment Findings require that a Scientific Authority from each Party monitor the export permits. The Scientific Authority has the duty of advising Parties of when they need to limit exports, particularly when a species’ survival is at risk, or when a species has declined to the point of being unable to perform their role in the ecosystems in which they occur (CITES, 2021). If trade of a species occurs to the point where the species could become eligible to be included under Appendix I, then the Scientific Authority will direct authorities towards the best steps to take so that export permits can be limited. According to the “Non-Detriment Findings Guidance for Sharks,” an NDF should be developed prior to any CITES-listed shark species being fished or landed, specifically if they are going to be exported or introduced from the sea (IFS) (when species are caught on the high seas; explained below) (CITES, 2014). This is because NDFs may be conditional. For example, an NDF might require the implementation of monitoring and control systems to ensure compliance (CITES, 2014). Accordingly, trading shark products internationally from Appendix II-listed species is only permitted when the Management Authority from an exporting Party has issued an export permit. This export permit will only be issued once the Management Authority has demonstrated that the species or shark products were legally acquired, and that an NDF has been produced (CITES, 2014).

Exporting permits operate differently when a species has been caught on the high seas (i.e. outside of a country's jurisdiction). When this occurs, it is considered an "introduction from the sea" (IFS), and either an IFS certificate must be granted, or an export permit must be issued. An export permit would be issued if the species was landed in a different State to the State that the vessel is flagged under, and in this case, the Flag State² must prove that the species was legally acquired and present an NDF. An IFS certificate would be granted if a species was caught in the same State to which the vessel is flagged. In this case, the Flag State would grant an IFS certificate only if an NDF was arranged prior to the species being caught and landed (CITES, 2014).

I have chosen to analyze CITES in relation to the white shark and scalloped hammerhead trade as it is the only international and multilateral agreement in place to protect these sharks that encourages compliance through the use of legal mechanisms (Vincent et al., 2014). In other words, it is the only legally binding multilateral/international measure in place to protect these species (Davidson, Krawchuk, & Dulvy, 2015). All import, export, re-export, and introduction of CITES-listed species from the ocean must be "authorized through a licensing system" (CITES, 2021). One of the key legal mechanisms in place to promote compliance with CITES for species listed under Appendix II is called the Review of Significant Trade (RST). If there is concern that an Appendix II species is being traded unsustainably, the RST can be triggered, forcing Parties to identify problems and solutions to offer effective implementation for the species (CITES, 2021). According to Foster and Vincent (2021), the RST is "directed at ensuring that countries make defensible NDFs and formally monitor exports" (p.2). However, the RST does not address other obligations, like the need for a species to be legally acquired. In general, the RST is employed when there is a concerning pattern in trade records for a given species. When the RST process begins, Parties must justify the basis for their exports for a given species, and if the Party cannot prove that they are taking proper measures to implement sustainable trade, then it is issued official recommendations to increase implementation. If a member State does not implement the recommendations given to them during the RST phase, the CITES Standing Committee can suspend trade for that country (Foster & Vincent, 2021). The Convention is also the most far-reaching agreement in place to protect shark species, as it is made up of 183-member states (CITES, 2021).

² The flag state of a vessel is the country or jurisdiction under whose registration and laws the vessel operates by.

This means that CITES is representative of over 90% of countries worldwide (Vincent et al., 2014). With its extensive reach, I seek to understand how CITES is managing sharks such as the scalloped hammerhead and white shark in order to discern whether they are being protected or not.

It is important to note that CITES's primary objective is to ensure the long-term sustainability of trade in CITES-listed endangered and threatened species. Its overarching goal is *not* to ensure animal welfare or to the survival of species for their own intrinsic value, but rather to ensure that species populations remain healthy enough that their trade can persist. CITES licenses the commodification of species by setting quotas via NDFs, which are, at root, rationalizations of commodification (e.g. that commodifying and trading the species will not deplete its population to the point that trade cannot continue). Based on these NDFs, Parties are issued export permits. The use of commodification to manage over-exploited species is a contradictory mode of management, which I elaborate on in greater detail below.

1.1.2. Critiques of CITES

CITES is imperfect, and its limitations are well-documented and debated in the literature. Cooney et al. (2021), explain that CITES is outdated, and that “the assumption that if an internationally traded species faces a level of biological threat, its conservation will benefit from trade restriction” is actually false (p.2). This is because implementation challenges and impacts on local livelihoods, among other factors, are not considered in the formal CITES listing process (Cooney et al., 2021). Cooney et al. (2021) explain that Parties are only urged to consider the listing criteria and science behind decisions, but fail to consider the impacts a listing may have on other groups (such as local communities who may rely on CITES-listed species for their livelihood). The authors go on to explain that Appendix II (where the white shark and scalloped hammerhead are listed) measures are often inadequately implemented. Trade of Appendix II species is not properly enforced, and the negative impacts of trade are not being controlled accurately (Cooney et al., 2021). This is because Appendix II decisions for listing are made without the consideration or deliberation of key stakeholders, such as local communities, who are needed for proper implementation of species conservation.

Political ecologists such as Duffy (2013) and Roe et al. (2002) have also discussed the difference in power dynamics within CITES processes. Duffy (2013) calls CITES a “one-size-fits-all” agreement, as it favours the interests of Global North countries, who are able to influence the decision-making process with their abundance of resources and power. Similarly, Roe et al. (2002) state that even though each Party has a vote at CoPs, not all Parties have the same voice at these meetings as Northern countries often send more delegates and offer up greater resources than countries in the Global South. In turn, they tend to dominate the decision-making process. Kievit (2000) also critiques CITES for taking a Western protectionist approach to managing the wildlife trade, disregarding the need for sustainable use of certain species to support local livelihoods, foreshadowing Cooney et al.’s (2021) critique above. Additionally, in some cases the failure to properly manage the legal trade of CITES-listed species has resulted in an increase in illegal black-market trade of wildlife (Cooney et al., 2021). One reason for this is that trade income is key to supporting the livelihood of local communities, particularly when they have few or no alternative options (Cooney et al., 2021).

Several studies have also outlined weaknesses associated with NDFs (Castello & Stewart, 2010; Foster & Vincent, 2021). One major limitation of the NDF process is that Parties are not required to be transparent with their findings, as CITES does not require NDFs to be reported or documented anywhere. A study centered on seahorses highlighted the fact that even though exports are to be permitted based on NDFs, many countries exporting seahorses were not offering reliable NDFs (Foster & Vincent, 2021). In other words, the majority of the NDFs for seahorses were not defensible as they were promoting unsustainable trade for the species. Another study focused on a marine fish species called “Arapaima” found that in Brazil it was nearly impossible to produce trustworthy NDFs for the species due to a “lack of monitoring and management capacity, scarcity of information on various topics, and deficiencies in Brazil’s NDF procedures” (Castello & Stewart, 2010, p.50). In this thesis, I will investigate whether similar weaknesses hold true for the scalloped hammerhead shark in comparison to the white shark.

Other scholars (Collard, 2020; Wyatt, 2020) have also critiqued CITES as an effective means for protecting endangered species. Collard (2020) documents how CITES fails to consider animal welfare. In her observations following the exotic pet trade, she has found CITES to be “more of a trade organization than a conservation organization” (Collard, 2020, p.15). She explains that with such mass amounts of animals being traded

around the world (11.6 billion individuals), it is virtually impossible to consider animal welfare, or any of the ethics involved with the trade. CITES, like other management frameworks discussed below (ICCAT, fisheries management), is mostly interested in sustaining collective populations, rather than the health and wellbeing of the individual animals being traded (Collard, 2020). Collard also critiques CITES for neglecting demand management, despite the fact that the wildlife trade is a demand-driven economy. Robinson et al. (2018) support this claim that the wildlife trade is demand-driven through a study on the legal CITES-listed trade in amphibians and reptiles. The authors found that local collectors in Madagascar rarely ever collected animals “opportunistically,” but rather the animals were collected to order to support the international demand (Robinson et al., 2018, p.150).

Additionally, Wyatt (2020) outlines some areas of CITES that could use improvement. One of the issues she discusses is the fact that priority is given to some species over others. Wyatt (2020) states that speciesism tends to be grounded in the “perceived charisma of wildlife,” and that under CITES marine species in particular are not protected to the same extent that terrestrial species (such as elephants, rhinos, and tigers) are (p. 9). The observed charisma of certain shark species is something I explore further in this thesis. Wyatt (2020) also explains that CITES must be implemented properly at the national level in order to effectively manage the trade of wildlife. In order to determine whether or not nations were enforcing compliance with CITES, Wyatt used Canada as a case study. She found that most agencies that played a role in the wildlife trade in Canada were enforcing CITES regulations properly, but that some (the border/customs officers and the Canada Food Inspection Agency), needed further integration of CITES regulations (Wyatt, 2020). These critiques highlight CITES’s weaknesses. My work will investigate the extent to which these critiques hold true for the white shark and scalloped hammerhead under CITES.

1.2. The Scalloped Hammerhead

The scalloped hammerhead (*Sphyrna lewini*) is both a coastal and semi-oceanic pelagic species. It inhabits intertidal and surface waters typically around 275 meters in depth, although it has also been found in waters of up to ~1000 meters (Rigby et al., 2019). It is circumglobal, and it inhabits warm and tropical waters in many regions of the world. Being a mobile species, it is capable of long migrations and is found in many different

ecosystems including estuaries, bays, continental shelves, and offshore pelagic waters (Wells et al., 2018). Adult scalloped hammerheads tend to occupy offshore waters, and when ready to pup, females will migrate to coastal areas (Rigby et al., 2019). Male scalloped hammerheads reach maturity around 140-198cm, while females reach this point at around 200-250cm and 13.2 years in age (Rigby et al., 2019). The gestation period of scalloped hammerheads is anywhere from 9-12 months long (Miller et al., 2014). Juvenile hammerheads tend to stay closer to shore, in shallow coastal ecosystems until they are mature enough to migrate offshore (Wells et al., 2018). Unfortunately, staying close to shore at such a young age puts them at a higher risk of exploitation by inshore fisheries (IOTC. 2013).

The greatest threat that the scalloped hammerhead faces is overfishing, with an estimated 1-3 million scalloped hammerheads (and their counterpart, the smooth hammerhead) killed yearly to support the fin trade (Chapman, Pinhal, & Shivji, 2009). Since their fins offer a high “fin-needle” count, and are quite large in size, they sell for top retail prices (Chapman et al., 2009). Targeted fishing, however, is not the only cause for their decline. The species is caught internationally as both target and bycatch in various fisheries, including commercial and small-scale longlines, purse seines, and gillnet fisheries (Rigby et al., 2019). Industrial pelagic vessels often catch the species as bycatch in both offshore areas and on the high seas. Hammerheads are also caught in coastal areas in longlines, gillnets, trammels, and trawls (Rigby et al., 2019). One of the main issues pertaining to bycatch of the species is that scalloped hammerheads have a high post-release mortality rate when caught; in one study analyzing the vulnerability of different shark species in bycatch, the scalloped hammerhead had one of the lowest survival rates (Gallagher, Orbesen Hammerschlag, Serafy, 2014).

According to the IUCN Red List assessment, scalloped hammerhead populations are critically endangered and continuing to decrease (Rigby et al., 2019). For this reason, the species was voted in under Appendix II of CITES in 2013, with measures coming into effect in early 2014. The main rationale for the hammerhead’s inclusion under this Appendix was that it is overexploited for its fins. The proposal document outlines the dire situation for the scalloped hammerhead, stating that the “declines from the mid-1970s, 1980s, and early 1990s to recent years range from 98%, 89%, and 76-89%, respectively, in the northwest Atlantic” (CITES, 2013, p.1). To exacerbate the situation, scalloped hammerhead life history traits make them particularly vulnerable to depletion (CITES,

2013; IOTC, 2013). The species is relatively long lived, reaching ages of over 30 years old, and they generate relatively few offspring in comparison to other shark species, having fewer than 31 pups a year, a far cry from the hundreds of offspring other shark species (i.e. the blue shark or whale shark) can have at once (IOTC, 2013). The scalloped hammerhead's slow growth combined with its late age of maturity, among other factors, puts them at a higher risk of overexploitation (Wells et al., 2018).

The situation for scalloped hammerheads is dire, and there are many complexities that further complicate the situation for the species. Hammerhead sharks in general are among the many species caught by people living in subsistence communities (Bornatowski, Braga, & Simoes Vitule, 2014). The main reason for catching sharks in local coastal communities is that they provide both a source of income and a source of food (Glaus et al., 2019). In fact, Bornatowski et al. (2014, p.12) explain that "shark meat provides much of the protein requirement for poorer communities." For this reason, many local communities rely on sharks for subsistence. I explore the challenges involved with scalloped hammerhead protection further in this thesis and investigate possible solutions so that local communities will not be negatively impacted by the species' protection.

While it is clear that scalloped hammerhead populations are in decline, the relative influence of the drivers of this decline are not easily distinguishable, as there are many factors at play. In a study done by Nance, Klimley, Galvan-Magana, Martinez-Ortiz, and Marko (2011), the authors used tissue samples to reconstruct the demographic history of the scalloped hammerhead in the Eastern Pacific in order to estimate current and historical population patterns for the species. The results of their research suggest that scalloped hammerheads were likely far more abundant in the past than they are today. However, the authors were unable to determine the exact causes for this decline (Nance et al., 2011). According to the IUCN Red List, the scalloped hammerhead is "caught globally as target and bycatch in commercial and small-scale pelagic longline, purse seine, and gillnet fisheries" (Rigby et al., 2019). While the report states that majority of scalloped hammerhead catch is taken as bycatch, it is unclear whether commercial trade or subsistence use plays a more significant role in their decline. Miller et al. (2014) also attempted to rank the risks and threats to scalloped hammerhead populations around the world in a National Oceanic and Atmospheric Administration (NOAA) report. For the

Northwest Atlantic and Gulf of Mexico populations, at-vessel fishing mortality³ was the most serious threat, with “overutilization by industrial/commercial and recreational fisheries” as moderate risks” (p.iii). For the Central and Southwest Atlantic population and Eastern Atlantic population, overutilization by industrial and commercial fisheries and high at-vessel fishing mortality were considered high risks, with overuse by artisanal fisheries and IUU fishing (among other factors) being considered moderate risks to the survival of the populations. The Indo-West Pacific population was most threatened by overutilization by industrial/commercial and artisanal fisheries, and IUU fishing and high at-vessel mortality, while the leading threat for the Central Pacific population was high at-vessel mortality, with overuse by industrial/commercial fisheries being a moderate threat. And finally, the Eastern Pacific population is most impacted by overutilization by industrial/commercial and artisanal fisheries, along with IUU fishing, high fishing mortality, and the schooling behaviour of the species (Miller et al., 2014). In sum, while there are evidently multiple drivers of decline for different scalloped hammerhead populations, overuse by commercial fisheries plays a large role in nearly all of their declines.

1.3. The White Shark

The white shark (also known as the “great white shark”) (*Carcharodon carcharias*) is a rare migratory species that lives in the sub-polar and tropical waters in both the Northern and Southern Hemispheres (Fisheries and Oceans Canada, 2019). They can be found in the Northwest Atlantic Ocean, Mediterranean Sea, southern Africa, southern Australia, New Zealand, and eastern North Pacific Ocean. Their migration patterns cross numerous jurisdictional boundaries, as they undertake long distance trans-oceanic voyages (Rigby et al., 2019). White sharks tend to occur in depths of around 1,200m, but inhabit many ecosystems including estuaries (Rigby et al., 2019). White sharks can be characterized by their massive size, as they average 16-20 feet in length, and weigh in around 4,000-7,000lbs (WWF, 2021). Male white sharks reach maturity at around 310-410cm, while their female counterparts reach maturity at 400-500cm, and at around 33 years of age (Rigby et al., 2019). A typical juvenile white shark is ~120-150cm when first born. Like the scalloped hammerhead, the white shark has life history characteristics that make it vulnerable to depletion, including its long life-span and low birth rates. According

³ At-vessel mortality is defined as sharks that are dead upon capture.

to the IUCN Red List assessment, a female white shark can live to be anywhere from 30-73 years old, and they tend to have 2-17 pups (Rigby et al., 2019). The white shark also experiences a risk (though low) of being caught as bycatch in fisheries by various fishing equipment, including longlines, setlines, gillnets, trawls, hand-held rod and reel, and fish traps. But unlike the scalloped hammerhead, the white shark has a high post-release survival rate when caught in fisheries and released (Rigby et al., 2019). The species is also targeted in beach protection programs in some regions of Australia and South Africa. Additionally, white sharks are at times targeted by trophy fishing activities for their commercially valuable jaws and teeth (COSEWIC, 2006; Shivji et al., 2005). This often goes hand in hand with bycatch of the species. When a white shark is accidentally captured, unless there are strict live release regulations in place, fisheries will take the shark for its valuable teeth, jaws, and fins to sell on the international market (Martin, 2007; Wildlife Conservation Society, 2004).

The white shark was voted in to be listed under Appendix II of CITES in 2004 – one of the first shark species to be listed, along with the basking shark and whale shark who were listed shortly prior in 2003 – to ensure that the trade in the species' products would be monitored and regulated, and to guarantee the trade does not hinder their chances of survival (CITES, 2004). The Appendix II listing came into effect in 2005. The species is now listed under the IUCN Red List as “vulnerable,” and is considered to be decreasing when compared to its historic levels in two regions: the Northwest Atlantic and the South Pacific. However, it is also considered to be increasing in the Northeast Pacific and Indian Ocean (Rigby et al., 2019). Because the white shark is a rare apex predator, data is limited making it difficult to give absolute population trends. According to Huveneers et al. (2018), abundance estimates for the species often contain uncertainties, and when 43 white shark experts were asked about what research should be prioritized in the future, size and status of white shark populations was considered to be the most pressing research objective. This demonstrates the uncertainty that surrounds white shark research.

Historically, the white shark has been vilified and regarded with fear (Jefferies, 2011, p. 255). In media and Hollywood, sharks in general are portrayed as “man-eaters” [sic] and fearsome predators. Gibbs's (2021, p.646) research states that shark bites are rare, yet interactions between humans and sharks are commonly “framed as “inherently dangerous.” This creates a misleading negative image for sharks (Gibbs, 2021). The white

shark was long the quintessential poster-child for these representations (Jefferies, 2011, p. 255; Friedrich, 2014, p. 3). A quick search of the word “man-eater” in the Merriam-Webster dictionary shows the great white shark as a key example of the term (Merriam-Webster, 2019). Additionally, Hollywood movies, such as the renowned movie *Jaws*, and sensationalized news reports of shark attacks have only contributed to their negative image (Friedrich, 2014, p.3). Over time, however, it appears that this negative image has changed, and more recently, across the literature the white shark is often regarded as a charismatic or iconic species (Albert, Luque, Courchamp, 2018; Meza-Arce et al., 2020). In this thesis, I will explore whether or not the white shark’s representation as a charismatic species has impacted its’ ability to gain protection internationally.

1.4. Political Ecology and the Commodification of Nature

Political ecology excels at identifying systemic drivers (rather than blaming local and proximate forces), and in particular has offered a robust analysis of the systemic drivers of environmental degradation, including inequality and the commodification of nature, two key themes I examine in this thesis. Political ecologists often critically look to these structural drivers of environmental change in order to better understand the power relations and injustices at play. Political ecologists who study the wildlife trade in particular have noted that Global North countries tend to benefit most from the trade, while lower income countries of the South often bear the costs associated with the trade (Duffy, 2013; Liew et al., 2021; Roe et al., 2002). Inequality between nations can even fuel wildlife trade. Liew et al. (2021) found that the wildlife trade network was most connected when wealth inequality was greatest between the countries involved. This was mostly the case when importers had a significant economic advantage over a number of exporters. The authors explain that this connectivity was likely due to wealth disparity. Importers in the Global North are willing to pay premium prices for “resources” in Global South countries, while individuals in lower income countries need to collect and export wildlife goods in order to maintain their livelihoods. I will use the scalloped hammerhead, a species that is both commercially valuable, and relied upon for subsistence and income generation in many Global South countries, in order to determine whether these uneven power dynamics hold true for their trade under CITES.

Capitalism is the second major systematic driver that I turn to in my analysis, with a specific focus on one theoretical approach in particular: the tragedy of the commodity.

The tragedy of the commodity theory flips the famous tragedy of the commons argument on its head, by stating that regulation and privatization have resulted in the overexploitation of commodified species (Telesca, 2020). Garrett Hardin introduced the original tragedy of the commons argument in the late 60s. It holds that individuals are always out to “maximize their short-term gain” by overexploiting the unpriced, uncommodified” commons (Bavington, 2010, p.9). In order to avert this tragedy, Hardin asserts that privatization of the commons is needed. Hardin’s logic that privatization and commodification are key to efficient and sustainable resource use is central to regulatory regimes like CITES. In some cases, this has resulted in more harm than good, as Telesca (2020) demonstrates with the demise of the bluefin tuna (see Chapter 3). This is because the commodification of nature often leads to its depletion, and high demand from the Global North leads to overexploitation in the Global South. This thesis will explore whether this holds true for countries that are Parties to CITES by looking to the scalloped hammerhead, a commercially valuable species.

1.5. Research questions

Broadly, my thesis will investigate how white sharks and scalloped hammerheads are being managed at the transboundary and international level. In order to do so, I will look to the central international organization in place to protect these shark species: CITES.

In my thesis I ask four main research questions:

- 1) Comparing the trade data available in the CITES database, what is the geography and quantity of white shark and scalloped hammerhead trade since their listings on Appendix II?
- 2) Based on the trade data (Q1), expert interviews, and academic literature, what explains the white shark and scalloped hammerhead’s divergent recovery outcomes?
- 3) What do these explanations (Q2) suggest about CITES’ strengths and weaknesses?
- 4) What are the key challenges associated with protecting a species of high commercial and subsistence value, such as the scalloped hammerhead? Are there solutions to these challenges?

1.6. Research Methods

In order to answer the above-mentioned research questions, this thesis will use a combination of CITES database queries, content analyses, and expert interviews to better understand how CITES manages scalloped hammerheads and white sharks, what challenges are involved in protecting these species, and what strengths and weaknesses are associated with CITES processes.

1.6.1. CITES Database Query

I used the CITES database to examine trade flows related to the scalloped hammerhead and white shark. Using this database, I was able to:

- Quantify the number of transactions that took place annually for the scalloped hammerhead and white shark since they were listed under any CITES Appendices (between the years 2001-2021 for the white shark, as it was listed on Appendix III in 2001, and between the years 2012-2021 for the scalloped hammerhead as it was listed on Appendix III in 2012).
- Determine who the dominant importing and exporting countries were for each shark species, which gave me a better idea of which countries were most responsible for their declines (given the demand-driven nature of the wildlife trade);⁴
- Examine the purpose of the trade, which entailed determining whether the transaction of shark products was being traded for commercial, educational, scientific, personal, zoo, or circus or travelling exhibition purposes;
- Look into the transaction trade terms for each species in order to determine what the main threats to each shark were (is it their fins, teeth, jaws, meat, skin or something else?);
- And look at whether the traded shark products came from a captive or wild-caught species by examining the source of trade.

In order to quantify these transactions, I downloaded the data from the CITES database and exported the document into an excel file. From here, I was able to group items together by different categories using individual excel sheets. In order to make the categories easier to work with, I divided them by year. For instance, if I was working on

⁴ Not accounting for the illegal trade.

the purpose of trade (commercial, educational, scientific, etc.), I made a table showing how many transactions occurred that year, and which purpose of trade each transaction fell under. Once I had broken down the data into yearly transactions, I grouped it all together and counted how many transactions fell under each category across all the years. At this point I moved the data over to a word document so that I could create pie charts demonstrating how many transactions were used for commercial purposes, how many were used for scientific purposes, how many were for personal use, or any other category of purpose. I repeated this same methodology for each of the categories (importer, exporter, trade term, and trade source). Finally, I went back through the yearly transactions for each category and added them together by year in order to create a bar graph showing the number of transactions per year since each species was listed. This helped me to determine how the number of transactions changed over time, and whether or not the trade lessened the longer the species was listed under CITES. Examining these trade flows revealed that CITES was continuing to license a significant amount of commercial trade for the scalloped hammerhead, while the white shark was being traded in smaller quantities, often for scientific purposes. It also raised some questions which I explored further in the literature and during my expert interviews.

There are well-documented limitations to the CITES database. Robinson and Sinovas (2018) critique the CITES database for its international and complex nature, which can lead to difficulty in interpreting data. This can be troubling as many studies have been done using the CITES database, and incorrect interpretations of data may lead to flawed policy recommendations or management decisions (Robinson & Sinovas, 2018). One of the confusing elements these authors draw on is the way that export and import data does not always match up. This could be because of countries only reporting data where permits were issued, which may be higher than the actual quantities traded (resulting in a lower quantity of import trade) (Robinson & Sinovas, 2018). Berc, Vrsecka, and Setlikova (2018) also state that the CITES database guide itself discloses that there are inaccuracies in the data. When studying the trade in the Appendix II-listed black bear, they found that only 4% of the records “fulfilled the requirements of a complete trade record with the same trade volumes reported by both importer and exporter” (Berc, Vrsecka, & Setlikova, 2018, p. 113). While using the database I found that export and import data did not always match up, and sometimes the quantities within one transaction were much larger on one side (whether import or export), than on the other side. In order to mitigate

against the discrepancies regarding importer and exporter data, I present both the import and export data separately. This allowed me to account for any inconsistencies between the two.

Another problem with the database is that data can be downloaded as a comparative or gross/net report, and depending on the report a user chooses, there can be potential misinterpretations of the data. For instance, gross and net reports can sometimes overestimate the trade as it simplifies the data and combines the exports and re-exports of species (in turn, sometimes double-counting these species). When retrieving the data from the CITES database, I made sure to select the “csv comma separated” option under output type, and I selected the “comparative tabulations” report type for both shark species to ensure consistency.

Finally, the CITES database does not always use consistent units or terms when reporting data. For example, Robinson and Sinovas (2018) explain that trade of a species may be reported in number of specimens in some cases, and in kilograms in other instances, making it difficult to quantify the data. I also grappled with this issue when using the database. For instance, when looking at the data for the scalloped hammerhead, the fins are sometimes reported in kilograms, grams, and even centimeters cubed. This made it impossible to determine the exact numbers within each transaction to come up with an overall number of fins traded between 2012 and 2021. For this reason, I only looked at the total or yearly transactions (and ignored the quantity and units within each transaction). This still gave me an idea how much CITES-licensed trade was happening for each species. However, it is worth noting that my assessment is more conservative, as some transactions included thousands of kilograms of fins, meat, or other trade terms.

1.6.2. Expert Interviews

In order to answer questions that were not easily answerable using the CITES database or other CITES documentation and scalloped hammerhead or white shark-relevant literature, I performed expert interviews. Expert interviews aim to gather information about a specific topic by focusing on the knowledge of the expert (in my case, CITES and relevant policy experts, such as the IUCN and Shark Specialist Group, as well as scalloped hammerhead and white shark experts). I performed 10 interviews with experts in these fields. The 10 interviewees were chosen due to their expertise in either

CITES, white sharks, or scalloped hammerheads. In some cases, the expert was well-versed in both CITES and a particular shark species (often the scalloped hammerhead). All 10 interviews were set up as semi-structured discussions, in that I guided the conversation with questions, while allowing for new questions to arise during each interview. This made each interview unique as new information came out of each conversation, despite similar questions being asked.

My aim in undertaking these interviews was to gain information from experts on the efficacy of CITES, and on shark trends and their drivers. I began with conducting two interviews with white shark experts. These were extremely valuable, as it led my research in a new direction. These interviews highlighted that I should focus my research on the scalloped hammerhead as well as the white shark. From here, I conducted 8 more interviews with more of a focus on the scalloped hammerhead and CITES (the white shark was still discussed across the final 8 interviews, but much less than the scalloped hammerhead). These interviews gave me behind-the-scenes knowledge about CITES meetings and listing decisions that were not available in the literature. They also answered questions related to uncertainties I had, gaps in data (from the CITES database), and explanations for my findings. Prior to conducting these expert interviews, I filled out the relevant protocols on SFU's Research and Ethics Board portal and was approved. Experts were selected based on their expertise, and based on discussions and referrals by other interviewees. Many of the experts were found while searching through the literature on scalloped hammerheads, white sharks, or CITES. Additionally, the interviews often had a snowball effect in that while interviewing one expert, another expert would come up in conversation and they would either give me their contact information, or would send an introductory email to connect me to the potential interviewee. While most of the interviews were structured like an informal discussion, I still prepared interview questions related to each interviewee's expertise to guide the conversations.

Some of the questions I asked during these interviews were:

- What are your thoughts on the efficacy of CITES and its ability to protect sharks (specifically the scalloped hammerhead and/or white shark)?
- Do you have any insights on the illegal trade (or black market) related to the scalloped hammerhead and/or white shark?

- What do you think the role of poverty and food security is for these shark species? How does this play into the trade in their products?
- Can you think of any strengths or limitations to CITES and their ability to protect either of these shark species?

1.6.3. Content Analysis

To further explain how scalloped hammerheads and white sharks are being managed at the international level, and why, I analyzed CITES documentation and other relevant literature. I looked at all applicable documentation on the CITES website by using the search-bar and typing in either “scalloped hammerhead,” “*Sphyrna lewini*,” “white shark,” or “*Carcharodon carcharias*.” Doing these separate searches on the CITES website brought up all relevant documentation pertaining to the two species, including assessment reports, proposals, listing decisions, and other applicable materials. This, along with analyzing other published literature and conducting expert interviews, allowed me to understand how the two species were first discussed in debates and which countries were most for and against listing decisions. Additionally, examining CITES documentation for both species allowed me to compare and contrast differences and similarities in discussions around their listing decisions, and detect any notable distinctions.

In addition to analyzing CITES documents, I also explored and read through the literature on CITES, scalloped hammerheads, and white sharks. This literature included grey literature, peer-reviewed academic journal articles, and government or NGO reports. Reading through the literature was useful as it helped me to answer questions related to gaps or uncertainties with the data found using the CITES database, and it helped me to come up with well-rounded questions to ask my interviewees. The two main systems I used to search for relevant literature were the SFU library database, and Google Scholar. I was also sent several articles and reports by experts that I interviewed, which was particularly helpful in my research. The content analysis was mainly used to support my database query and expert interviews. It also helped steer my research, and offer answers to questions that were not asked in my interviews.

1.7. Thesis organization

In this thesis I attempt to offer explanations for the white shark and scalloped hammerhead's divergent recovery outcomes, and based on those explanations, I shed light on CITES' strengths and weaknesses. In Chapter 2, I focus on forming answers to my research questions using trade data found on the CITES database query, expert interviews, and at times, CITES documentation and scholarly literature. Chapter 2 begins with a brief overview of the history of shark listings under CITES in order to demonstrate the challenges involved with listing commercially valuable species. Following this, I compare the trade data available on the CITES database for the scalloped hammerhead and white shark in order to better understand the geography and quantity of the trade (my first research question). Then, based on the results of this trade analysis, I use expert interviews to attempt to answer my second research question in section 2.3: what explains the white shark and scalloped hammerhead's divergent recovery outcomes? In the final section of Chapter 2 (section 2.4) I turn to a specific focus on the scalloped hammerhead. Here I delve into the key challenges associated with protecting the scalloped hammerhead – a species of high subsistence and commercial value. I also outline some of the solutions recommended by experts during the interview process for how to better protect the species under CITES.

In Chapter 3 I bring insights in from political ecology to bear on my key findings from Chapter 2 to deepen my analysis of CITES and shark management. The first section of this chapter focuses on debunking conventional narratives of wildlife trade, which tend to place blame on locals in lower income countries of the Global South for species loss. Then, in section 3.2, I turn to the conservation challenges CITES faces with regard to Global North-South power dynamics. Here I offer explanations for why CITES is limited in its ability to manage species traded from the Global South. Many of these reasons stem from conditions of socio-economic inequality. In the final section of Chapter 3 (section 3.3), I focus on outlining how the scalloped hammerhead can be seen as a “tragedy of the commodity.” Since the commodification of nature results in the accumulation of profit, commodification can be seen as a cause for overexploitation. And, since CITES' framework is built on the licensing of species commodification (i.e. through the use of NDFs and export permits), it arguably contributes to species exploitation.

In the conclusion (Chapter 4) I reflect on the key limitations of CITES made clear throughout this thesis, and offer recommendations to these shortcomings. CITES tends to favor Global North countries, while Global South countries are disadvantaged in decision-making processes, and face a variety of barriers with regard to implementation. Furthermore, CITES entire framework is built on the licensing of species commodification. This is a contradictory mode of management, as I outline below. To grapple with these complex limitations, I offer related suggestions in hopes of strengthening CITES as an international organization.

Chapter 2.

Scalloped hammerhead vs. the white shark: comparing and contrasting differences in trade and protection

This chapter begins with a brief history of shark listings under CITES to demonstrate the challenges involved with listing commercially valuable species like the scalloped hammerhead. I preface the chapter with these early efforts to list sharks as it offers important context for the rest of the chapter, including the reluctance on the part of many Parties to list commercially valuable species under CITES. This background section (2.1) combines information collected during the interview process, as well as literature and content analysis of CITES documents. Following this, I outline the results from both the CITES database query and the expert interviews in order to answer my first two research questions: how white sharks and scalloped hammerheads are being managed by CITES, and what explains their divergent recovery outcomes. Then, using the information gathered in the expert interviews, I explore some of the specific challenges involved with protecting the scalloped hammerhead.

2.1. History of shark listings under CITES

2.1.1. Early efforts to list sharks and other marine species

Since the Convention on International Trade in Endangered Species (CITES) came into effect in 1975, it has tended to focus on terrestrial species rather than marine organisms (Vincent et al., 2014). There were “over 1000 animal and plant species” listed on the original CITES Appendices (Vincent et al., 2014, p.4). Of these species originally listed under CITES, only one marine fish was included in the original Convention: the coelacanth. After this, at the first Conference of the Parties, just one more marine fish, the Totoaba, was included on Appendix I.⁵ Following these original listings, it took 26 years for additional marine species to gain protection under CITES, despite many failed

⁵ The only marine species to be listed in the original Appendix II (when CITES first came into effect) was the coelacanth, along with four anadromous sturgeons. Following this, at the first CoP, the Totoaba was listed under Appendix I (Vincent et al., 2014).

proposals. It was not until 2002 that new marine taxa were added to CITES Appendix II.⁶ In 2002, at the CoP12, seahorses and two shark species (the basking shark and the whale shark) were listed under Appendix II. At the following CoP in 2004, the great white shark was listed on Appendix II. All three of these shark species were rejected the first time they were proposed for listing, but accepted the second time they were proposed at a CoP (Vincent et al., 2014). Once these three iconic shark species were able to gain protection under CITES, it became easier for other marine species – and shark species in particular – to receive protection. In fact, their protection under CITES can be considered a turning point for marine listings. One interviewee explained that:

There were obviously several CoPs where sharks weren't listed... nominated, but weren't listed. But, recently the tide seems to have turned, and all the sharks that have been nominated over the last three CoPs have all passed and been listed on Appendix II (Expert 6, personal communication, 2021).

The three iconic sharks – the basking, whale, and white shark – were relatively easy wins for CITES as they were non-threatening to fishing nations, and were seen as charismatic and iconic species that needed to be saved. Accordingly, several interviewees indicated that the three shark species acted as “gateway species,” able to pave the way for future shark listings under CITES. This is explored further later in this section. **Figure 1**, below, shows the history of shark listings under CITES.

⁶ Prior to 2002 there were some Appendix III listings for marine species. However, Appendix III listings do not require the approval of the Conference of the Parties to CITES, and therefore, they are less meaningful and offer less protection than Appendix II listings.

History of Shark Listings under CITES

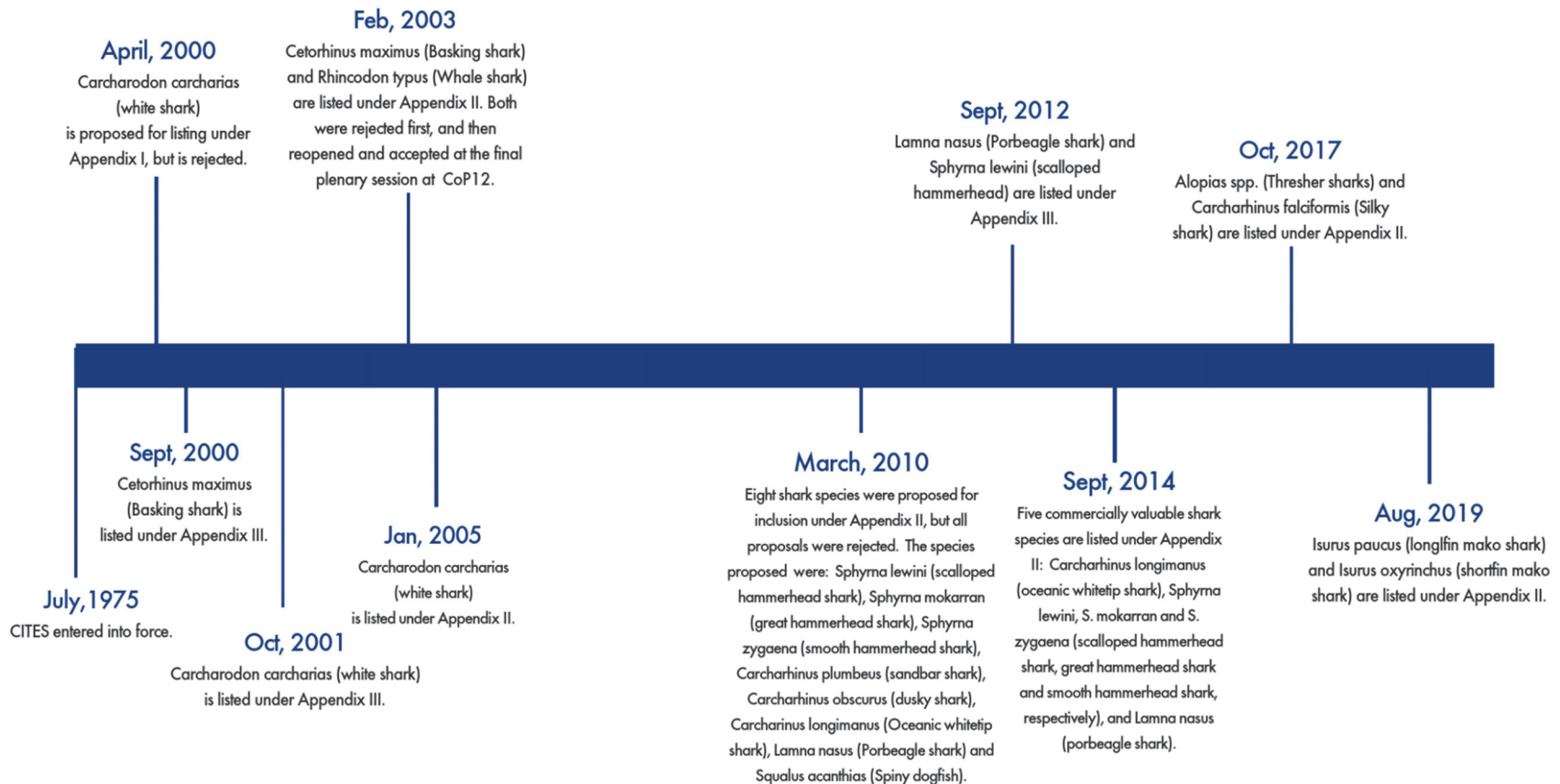


Figure 1. Timeline showing the history of shark listings since CITES came into effect in 1975.

This figure shows the dates for when specific shark species were proposed and either rejected, or effectively listed under CITES. When a species gained protection under Appendix II, I used the date that corresponded to when the listing came into effect. This date is usually the year after the CoP for which it was voted in.

Despite the early successes of the basking, whale, and white shark under CITES, there was heavy opposition from certain countries who believed that CITES did not have a role to play in managing marine species, as they believed that these species should be dealt with by fisheries management organizations (Expert 6, personal communication, 2021). One interviewee explained that for a prolonged period of time, CITES did not think that marine fish were their purview. Since fish and fisheries are managed in other ways, through regional fisheries management organizations (RFMOs) and national fisheries laws, there was an attitude among member Parties that CITES did not need to get involved. The interviewee put it into perspective by stating that:

There's no such thing as the International Commission for the Conservation of Tropical Hardwoods... CITES is the only mechanism for those, whereas for fish, there is the International Commission for the Conservation of Atlantic Tuna and all the other regional management organizations. That whole fisheries management structure already exists, and their purpose is to manage for sustainable fisheries (Expert 5, personal communication, 2021).

This is why for a long time, there was an attitude among people that CITES was not essential for marine harvested species. Throughout the early 1990s, NGOs consistently made efforts to get commercially harvested marine species proposed for listing under CITES, but the proposals always lost.⁷

Across the interviews I conducted, one country was brought up time and time again regarding their opposition to marine species being listed under CITES: Japan. Japan strongly believes that CITES should not manage marine fish species as they are already managed by fisheries management organizations. Some other countries align closely with Japan's thinking in this respect, including Norway and sometimes China (Expert 6, personal communication, 2021). In fact, Klein (2014) explains that Japan, Iceland, Norway, and South Korea are among a few states that have taken reservations out for the basking, whale, and white shark. This means that they are not bound by the requirements of Appendix II, and can continue to trade the species without adhering to CITES

⁷ For example, the Atlantic herring was proposed for listing on Appendix I in 1992 at CoP 8, but was later withdrawn. The Atlantic bluefin tuna was also proposed for listing under CITES in 1992 at CoP 8, as well as in 2010 at CoP 15. The first proposals (for the eastern and western populations) were withdrawn after sufficient backlash, and the second proposal was rejected. Both the Atlantic herring and Atlantic bluefin tuna are prime examples of commercially valuable fish species that failed to get listed in the early days of CITES.

measures.⁸ For the purposes of this paper, I will go into greater detail on the white shark here, as is it one of the main topics of this thesis.

The vote for the white shark at CoP 13 was by a secret ballot. But Japan made it clear that they opposed the listing proposal from the start, along with Santa Lucia, Guinea, and Qatar (Gehring & Ruffing, 2008). When the white shark was proposed for listing on CITES, Japan opposed by arguing that the “available information was insufficient” and that the species did not seem to be endangered (p.143). Japan, Santa Lucia, Guinea, and Qatar also claimed that there was not enough evidence to support the listing, and that “shark-management should be conducted within the framework of the FAO” (the FAO International Plan of Action for the Conservation and Management of Sharks) (Gehring & Ruffing, 2008, p.143). However, there is little information on the white shark because it is a top apex predator with a naturally low abundance, regardless of its declines (Expert 6, personal communication, 2021). To add to this, the white shark is a migratory species that inhabits the deep sea, making assessments for this species both challenging and costly (Gehring & Ruffing, 2008). Even today, with all the national measures and regulations in place, multiple interviewees mentioned that there is a lack of data on white shark populations due to difficulties in monitoring and its rarity in catch data (Experts 1 & 2, personal communication, 2021). When it came time for the actual vote, Japan requested a secret ballot, and the proposal for the white shark to be listed on Appendix II was accepted with 87 votes for, 34 against, and 9 abstentions (Gehring & Ruffing, 2008). Reservations for the white shark were entered by Iceland, Japan, Norway, and Palau (CITES, n.d.). It is clear that Japan strongly opposed the white shark listing under CITES, just as they have for many marine species. In fact, one of the experts that I interviewed who has attended several CITES meetings and specializes in shark research explained to me that Japan is one of the countries that would use international aid as a bargaining tool to persuade countries not to vote for species listings (Expert 6, personal communication, 2021). This demonstrates the great lengths countries are willing to go to in order to influence others to vote in line with them.

While some countries opposed listing marine species due to the belief that CITES should not interfere with fisheries management, others fought hard for their successes

⁸ Republic of Korea (South Korea) entered reservations for the basking and whale shark, not the white shark (CITES, n.d.).

arguing that fisheries management had failed these species, and that CITES *did* have a role to play in their protection (Expert 6, personal communication, 2021). According to one of the interviewees, the EU is a key advocate for CITES being able to manage marine species, asserting that Regional Fisheries Management Organizations (RFMOs) are not doing enough, and that CITES is essential to protecting them. During the conversations around the white shark proposal at CoP13, the Netherlands (“on behalf of the member states of the European Community”), along with Brazil, Ecuador, Kenya, Uruguay, and Thailand all felt that the white shark met the criteria for an Appendix II listing (Gehring & Ruffing, 2008). The EU’s position is supported by academic experts and scientists, who see CITES and fisheries management as compatible (Vincent et al. 2014). Reflecting what nearly all interviewees stressed, Vincent et al. (2014) states that “good fisheries management and a successfully implemented CITES listing should be seen as complementary, rather than as mutually exclusive management options” (p.580).

Despite the early challenges with marine species gaining protection under CITES, it was relatively easy for species like the basking, whale, and white sharks to get listed. In explaining why the basking, whale, and white shark were first to be listed under CITES, one interviewee explains:

With sharks, the conservation NGOs specifically started with species that didn’t have fisheries... like big charismatic things like basking sharks, whale sharks, and white sharks that are popular with ecotourism, they’re charismatic, people love them, and there’s no fishery (Expert 5, personal communication, 2021).

The fact that no fisheries exist exclusively for the three iconic shark species was brought up several times throughout the interviews as one of the main reasons for their initial listing. The three shark species feature relatively little in international trade (compared to other more commercially valuable shark species), so fishers and other commercial interests are not threatened by their listing. These conditions made the basking shark, whale shark, and white shark the perfect candidates to be listed under CITES, as they were comparatively non-threatening, and there was little to lose with their listing (Expert 5, personal communication, 2021).

2.1.2. White shark representation

It is important to note why the white shark listing specifically was a key turning point in getting future shark species listed under CITES. Sharks have historically been vilified in both media and public/policy debates. White sharks in particular have previously been portrayed as man-eaters and animals to be feared (Friedrich, 2014, p. 3; Jefferies, 2011, p. 255). Western media constructs sharks as monsters that specifically go out of their way to hunt humans (Jarvis, 2019). Jarvis (2009) has explained that the way that sharks are represented in media can inhibit shark conservation efforts. Their vilification dates back hundreds of years, long before the famous movie *Jaws* was released. For instance, a highly criticized painting in American art is a painting from the 1700s titled 'Watson and the Shark' (Jarvis, 2019). The painting depicts several people on a boat attempting to save their companion from a shark who appears to be moving toward their friend with its jaws wide open (Jarvis, 2019). It has been suggested that the painting represents the struggle between good vs. evil, or man vs. nature. Jarvis calls the painting a "microcosm of America's modern relationship with sharks" (p.55). While 'Watson and the Shark' demonstrates the early vilification of sharks, the movie *Jaws* played a crucial role in the way sharks – especially white sharks – are perceived by the public. *Jaws* taught people that sharks have no intrinsic value, and that they are man-eating monsters to be feared. One shark expert that I interviewed explained that back in the 80s (which is just after *Jaws* came out), sharks were considered "evil, marauding monsters," and for this reason nobody cared to protect sharks (Expert 5, personal communication, 2021). Another white shark expert conveyed to me that some people go out and target white sharks illegally simply because they do not like sharks in the oceans, and that people are scared of them biting (Expert 2, personal communication, 2021). It is for this reason that some regions have shark control programs that target potentially dangerous species, including the white shark (Expert 2, personal communication, 2021). For example, Gibbs and Warren (2014) explain that in Western Australia, catching and killing sharks is part of a larger "Shark Hazard Mitigation Strategy" (p.2). The strategy encourages catching and killing sharks that are three meters or more in length (most white sharks are over three meters in length), as they are believed to pose an "imminent threat to beachgoers" (Gibbs & Warren, 2014, p.2).

This negative perception surrounding sharks, and white sharks specifically, has slowly changed over time. They are no longer deemed monsters by the public. According to one interviewee, a new perception has developed in the last 20 years that sharks are

“really cool megafauna” that are charismatic and loved by the public (Expert 5, personal communication, 2021). Basking sharks, whale sharks, and white sharks are all popular in ecotourism, and they have started to get better press, which in turn, has granted them greater support and protection in many countries around the world. This interviewee expressed that sharks are almost like whales or dolphins now, or gorillas (if equated to a terrestrial species), in that people no longer want to hunt them (Expert 5, personal communication, 2021). In fact, the white shark is used as an example species by Simpfendorfer et al., (2011) when highlighting that certain high-profile species attract a “disproportionate amount of the attention of researchers... and research funding” (p.524). It is clear, then, that the white shark has evolved from a feared species deserving of eradication, to a celebrated species that is now protected by NGOs and nations across the world.

Gaining the attention of nations and rising to the forefront of conservation agendas is key for protecting species. Once the perception of the white shark changed from monster to a beautiful, charismatic species, it rose to the top of the priority list in many countries. One interviewee who has worked extensively with CITES and marine species explained that a lot of conservation is about public perception. Countries will pay attention to a particular species when their public perception depends on it (Expert 10, personal communication, 2021). So once white sharks started to change in the public eye, countries began adopting measures to protect it. In fact, Shivji, Chapman, Pikitch, and Raymond (2005) even call the white shark the “most widely protected elasmobranch in the world,” as they are protected by national legislation in numerous countries now (p.1035). This was a theme brought up across the interviews as well: white sharks are widely and strongly protected within countries through national legislation. Yet, even though the white shark is managed effectively with state-specific regulations, CITES can be seen as an added layer of protection for the species.

2.1.3. Commercial shark species gain protection under CITES

Despite the controversy around marine listings under CITES, the basking, whale, and white sharks gained protection under CITES, paving the way for further sharks to be listed. One interviewee described these initial shark listings as the “gateway drug to getting sharks listed at CITES... to gently open the door to something that’s very non-threatening to fishing nations and those sorts of things” (Expert 6, personal communication, 2021). In

2013 at the CoP16, and after nine years and various failed proposals, major progress was made for sharks under CITES. Five commercially valuable shark species were included on Appendix II, including the oceanic whitetip (*Carcharhinus longimanus*), the porbeagle shark (*Lamna nasus*), the great hammerhead shark (*Sphyrna mokarran*), the smooth hammerhead shark (*Sphyrna zygaena*), and the scalloped hammerhead shark (*Sphyrna lewini*). These shark listings marked a major milestone for CITES. A CITES press release titled “Stronger protection for five shark species and all manta rays” with the subtitle: “Most comprehensive global effort seen in CITES’ 40-year history to give sharks and manta rays a better chance of surviving in the wild through robust regulation of international trade” outlined the significance of these victories. It stated that:

Although this is not the first listing of sharks in the CITES Appendices, it is the first time that shark species of great commercial value, and traded in high volumes, have been included in Appendix II, thereby requiring verification of the sustainability and legality of the trade. According to FAO, the global reported annual shark catches from 2000 to 2009 ranged between 750,000 and 900,000 tonnes (CITES, 2013).

With commercially valuable shark species gaining protection under CITES for the first time in history, Parties would be required to take real action and put effort towards their conservation. For the purpose of this thesis, I will focus on the scalloped hammerhead in greater detail.

Some of the sharks that were listed at the CoP16 had previously been proposed at other CoPs, but were unsuccessful despite meeting the criteria for an Appendix II listing (Vincent et al., 2014). For example, the scalloped hammerhead was proposed for an Appendix II listing in 2010 alongside seven other sharks,⁹ but was rejected despite the fact that there was sufficient scientific evidence to support the listing. Prior to the scalloped hammerhead’s 2013 listing, PEW Trust released an article outlining the need for an Appendix II listing for the species. The NGO explained that about “1.3 million to 2.7 million scalloped hammerheads and smooth hammerheads are exploited for the fin trade every year” (Pew, 2013). Additionally, a CITES document discussing the proposal to list the

⁹ *Sphyrna lewini* (scalloped hammerhead shark), *Sphyrna mokarran* (great hammerhead shark), *Sphyrna zygaena* (smooth hammerhead shark), *Carcharhinus plumbeus* (sandbar shark), *Carcharhinus obscurus* (dusky shark), *Carcharhinus longimanus* (Oceanic whitetip shark), *Lamna nasus* (Porbeagle shark) and *Squalus acanthias* (Spiny dogfish) were all proposed at CoP 15 in 2010, and all 8 species were rejected.

three hammerhead sharks (scalloped, smooth, and great) at CoP16 explained that in the Mediterranean Sea, there were “suggested declines of a hammerhead shark complex that includes *S. lewini* of up to 99.9% since the early 19th century” (CITES CoP16, Prop.43, 2013). The document went on to highlight that the scalloped hammerhead was likely to be threatened with extinction if their trade did not become regulated (CITES CoP16, Prop.43, 2013). Even with the evident need to list the scalloped hammerhead, the proposal for the three-hammerhead species barely squeezed through at the CoP16. In order for a proposal to be accepted, a two-thirds majority must vote in favor of the listing. In this case, 91 Parties voted in favor of the proposal, 39 against, and 8 abstentions (CITES, 2013) – a narrow pass by just one vote.

With the undeniable scientific evidence of scalloped hammerhead declines, it is surprising that the vote was so close. Yet, the debate surrounding the hammerhead proposal (Prop.43) is notable in that countries were so divided. Ghana, India, and Mozambique did not think that the science was adequate enough to support the proposal for an Appendix II listing, while Argentina, Canada, Maldives, Niger, Seychelles, Somalia, the US, and WCS (Wildlife Conservation Society) supported the proposal (CITES, 2013). Canada felt that an Appendix II listing would be helpful in assisting regional and national measures, while Morocco believed that regional measures were already successful enough. Furthermore, Argentina thought a CITES listing would be useful as RFMOs do not regulate all CITES member countries. On the other hand, Namibia felt that they had strong enough domestic measures, and therefore, opposed the proposal. Namibia emphasized that it would be challenging to distinguish between different hammerhead species (a valid point that was mentioned across the interviews as well). Japan worried that an Appendix-II listing might lead to a de facto trade ban, and, using their age-old debate, felt that the hammerheads should be managed through RFMOs. Nonetheless, regardless of the debates among countries, FAO made it clear that during the Expert Panel deliberations for the proposal, “the panel had agreed that *Sphyrna lewini* met the criteria for inclusion in Appendix II, and the other two species fulfilled the look-alike criteria” (CITES, 2013).¹⁰ Since the countries could not reach a consensus the proposal went to a vote, where China requested a secret ballot. As mentioned, the vote was tight, but the

¹⁰ CITES defines look-alike species as: “species whose specimens in trade look like those of species listed for conservation reasons” (CITES, 2021).

proposal was passed, and the three hammerhead sharks (scalloped, great, and smooth) were listed on Appendix II (CITES, 2013).

This history of shark listings under CITES clearly demonstrates the different characteristics that have shaped the white shark and scalloped hammerhead's protections. The white shark can be understood as a charismatic, gateway species that aided in future shark listings, while the scalloped hammerhead is commercially valuable, traded in large quantities. I now turn to a CITES database query to compare the trade data, and to determine the quantity, nature, and geography of both shark species' trade since their Appendix II listings. The database query also helps me begin to formulate explanations for the white shark and scalloped hammerhead's divergent recovery outcomes.

2.2. Database analysis: trade trends

2.2.1. The white shark

The first database query I conducted was for the white shark. I completed this data analysis during early summer 2021, and at this point the most recent transactions inputted into the database were for 2019. Between 2002 and 2019, there were 183 transactions inputted onto the CITES database for the white shark (see Figure 2 below). In addition to looking at the top importers, exporters, terms, purposes, and sources for the white shark transactions, I looked at the frequency of trade over the years, from 2002-2019. I counted the number of transactions that occurred each year since the shark was listed under CITES. While I would have preferred to quantify the number of sharks in trade on the CITES database, the units of measurements were too varied, making this impossible. This analysis demonstrated that the transactions for the white shark actually tended to increase the longer the species was listed under CITES, (with some fluctuations). Between 2002 and 2004 the white shark was still listed under Appendix III, meaning that not all Parties would have had to obtain an export permit, and therefore not all transactions would show up on the CITES database. Only transactions that came from a country where the species was listed under Appendix III would have had to acquire an export permit. This is likely why the transactions are so low between 2002 and 2004. However, looking at 2005 onwards, the frequency of transactions still increases. The first few years after being listed on Appendix II the number of transactions stay relatively low, with around 5-7 transactions

being made per year. Later on, around 2010, the transactions increase, hitting highs of 18 transactions in one year (this occurred in 2010, 2012, and 2018). On average, there were 10.2 transactions made per year for the white shark between 2002 and 2019.

It is important to note that within each of these transactions, there may be hundreds of derivatives being traded. For instance, in one transaction that took place in 2018, 267 specimens were traded between the US and Canada. While the importer reported the 267 specimens, the exporter reported 20,400 specimens (for the same transaction). This difference demonstrates that there are often discrepancies between exporter and importer reported quantities. For the purposes of my research, I focused on the importer reported quantity to stay consistent. In some cases, as many as 750 teeth were reported in one transaction. This reveals that while some transactions may have included only one specimen or one tooth, others contained hundreds (and sometimes thousands) of parts or derivatives.

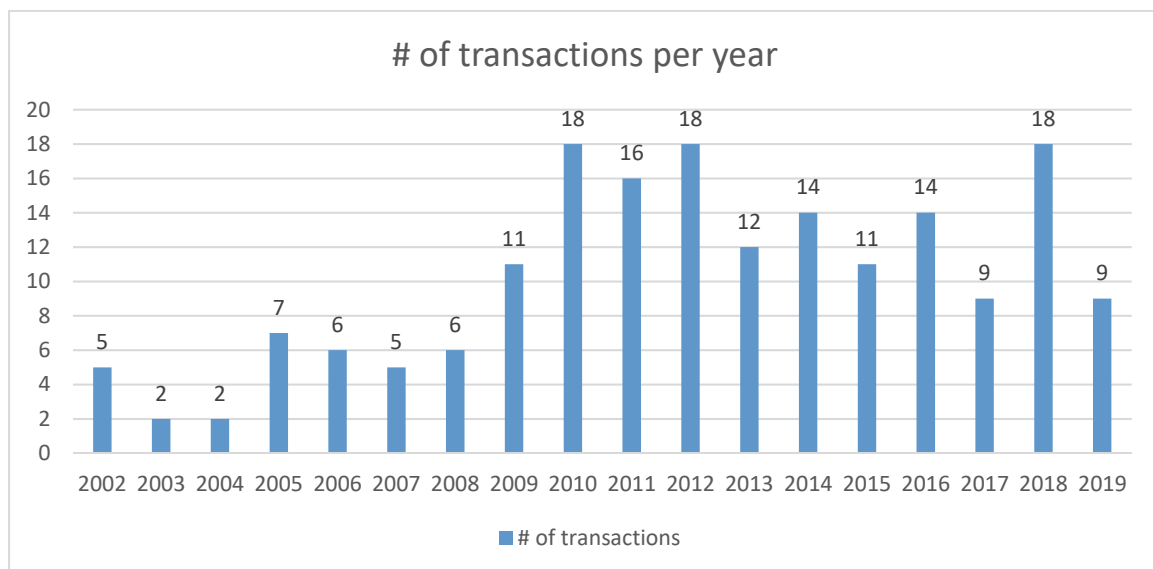


Figure 2. Frequency of CITES transactions for white shark between 2002-2019.

Following the above analysis, I looked at the top importing and exporting countries for white shark products. The number one importer of white shark products was the United States. Out of the 183 transactions, the US made up 68 of the imported transactions. The next highest importer was Australia, with 15 transactions, and then in close third was the UK, with 14 transactions imported (see **Figure 3** for the breakdown of percentages). As for exporting countries, the top exporter for white shark transactions was South Africa, with 38 export transactions. Following South Africa, Australia was the next highest

exporter of white shark transactions. And the US and China tied for third place, with both countries conducting 15 export transactions of white shark products (see **Figure 4** for breakdown).

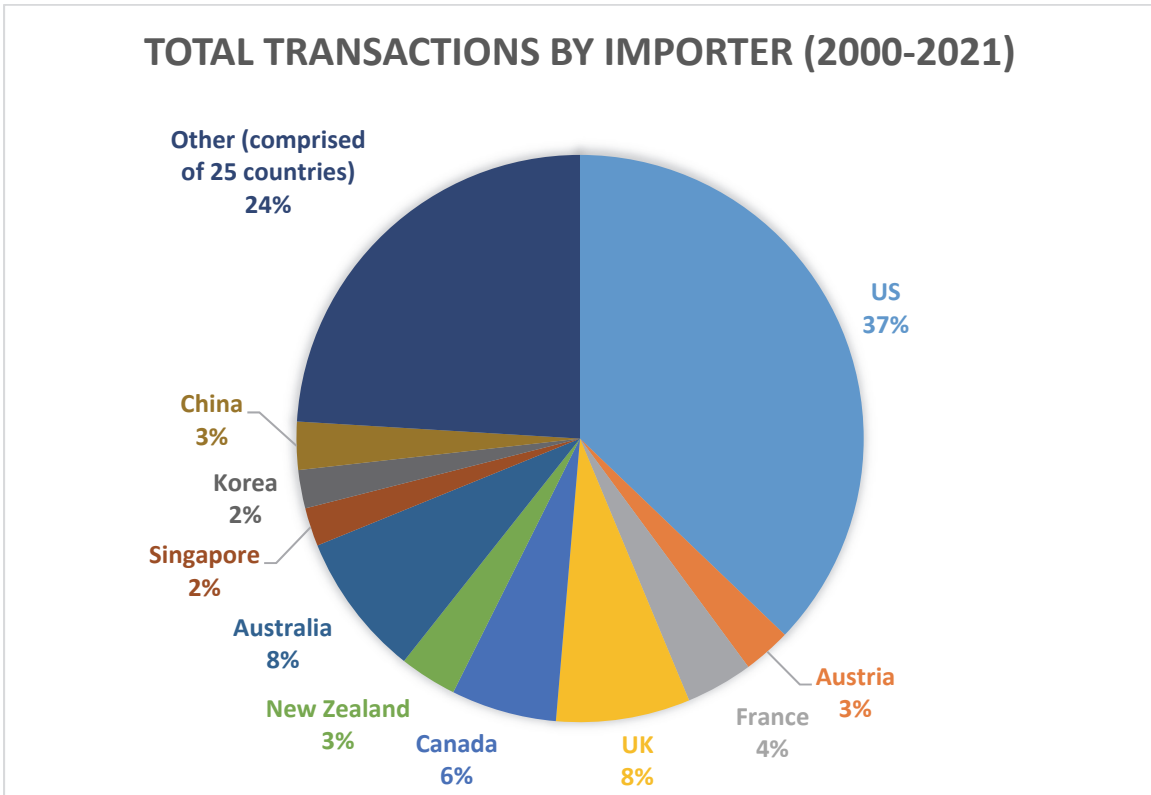


Figure 3. Total CITES transactions by importer for the white shark between 2000-2021.

The “Other” category includes these 25 countries: Belgium, Slovenia, Japan, Poland, United Arab Emirates, Finland, Monaco, Ukraine, Russia, Germany, Hong Kong, Mexico, Turkey, South Africa, Qatar, Chile, Romania, Sweden, Taiwan, Italy, Denmark, Madagascar, Spain, Vietnam, and “Unknown.” **Regions were included in this category if they made 3 or less transactions between 2000-2021.**

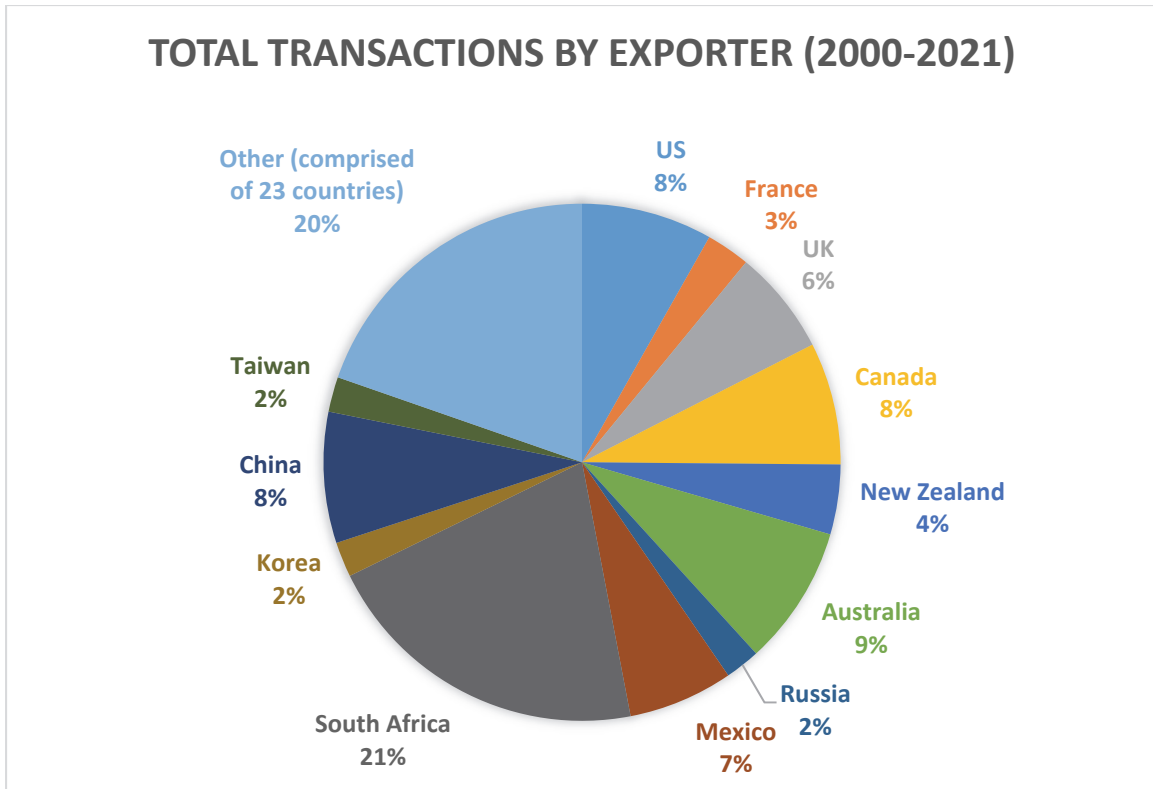


Figure 4. Total CITES transactions by exporter for the white shark between 2000-2021.

The “Other” category includes these 23 countries: Finland, Monaco, Hong Kong, Singapore, Turkey, Qatar, Chile, Romania, Italy, Denmark, Madagascar, Vietnam, Switzerland, Philippines, Thailand, Syrian Arab Republic, Indonesia, India, Nicaragua, Ireland, Ecuador, Oman, and “Unknown.” **Regions were included in this category if they made 3 or less transactions between 2000-2021.**

Following the analysis of top importer and exporter countries, I went on to examine the leading terms, purposes, and sources of trade for white shark transactions. To begin, I looked at the primary trade terms for each transaction. This explains the type of white shark product that was traded most. For the white shark, the number one trade term was “specimens,” with 49 transactions involving this term. However, while most trade terms are self-explanatory, “specimen” could have various meanings. According to the CITES glossary, specimen stands for “any animal or plant, whether alive or dead,” and in the case of Appendix II-listed animal species, it comprises any “readily recognizable part or derivative” (CITES, 2020). This means the transactions including the term “specimen” could stand for a whole white shark, or the transaction may have simply included fins or teeth or some other part of the shark. This is problematic because there is no way to determine the part of “specimen” in trade. The next highest trade term was teeth, with 45

transactions involving white shark teeth. The third most traded term for the white shark was bones, with 37 transactions (see **Figure 5** below for more information on trade terms).

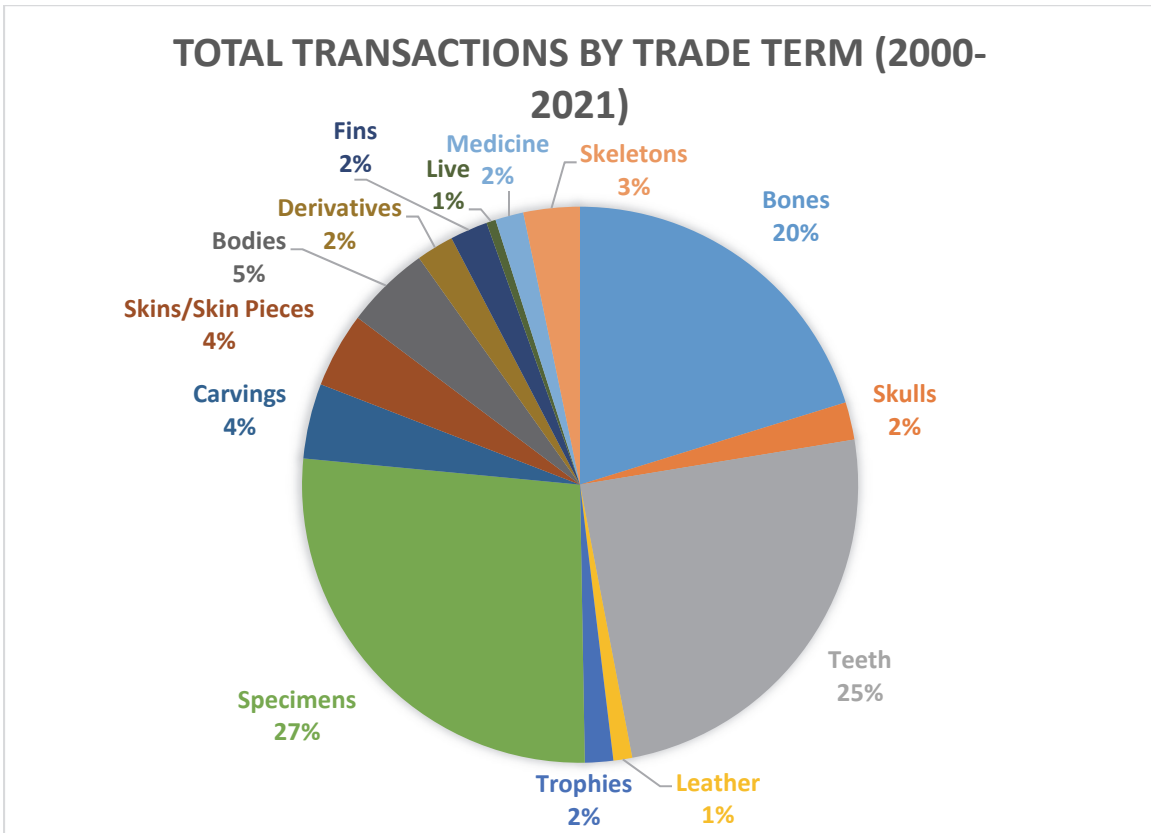


Figure 5. Total CITES transactions by trade term for the white shark between 2000-2021.

The leading purpose of trade for white sharks was for scientific purposes, as 52 of the 183 transactions were used for science. The second most significant purpose for white shark transactions was “circus or travelling exhibitions,” with 40 transactions. During my interviews, I asked one of the experts about this category. They told me that 100% of the transactions that fell under “circus or travelling exhibitions” were the interviewee themselves and their spouse travelling around showing fins to CITES Parties (Expert 1, personal communication, 2021). The expert was training Parties in how to identify the fins of protected CITES-listed species, which is why it fell under this category. Finally, the third most common reason for trade was for commercial purposes, with 32 white shark transactions falling under this category (see **Figure 6** for more information).

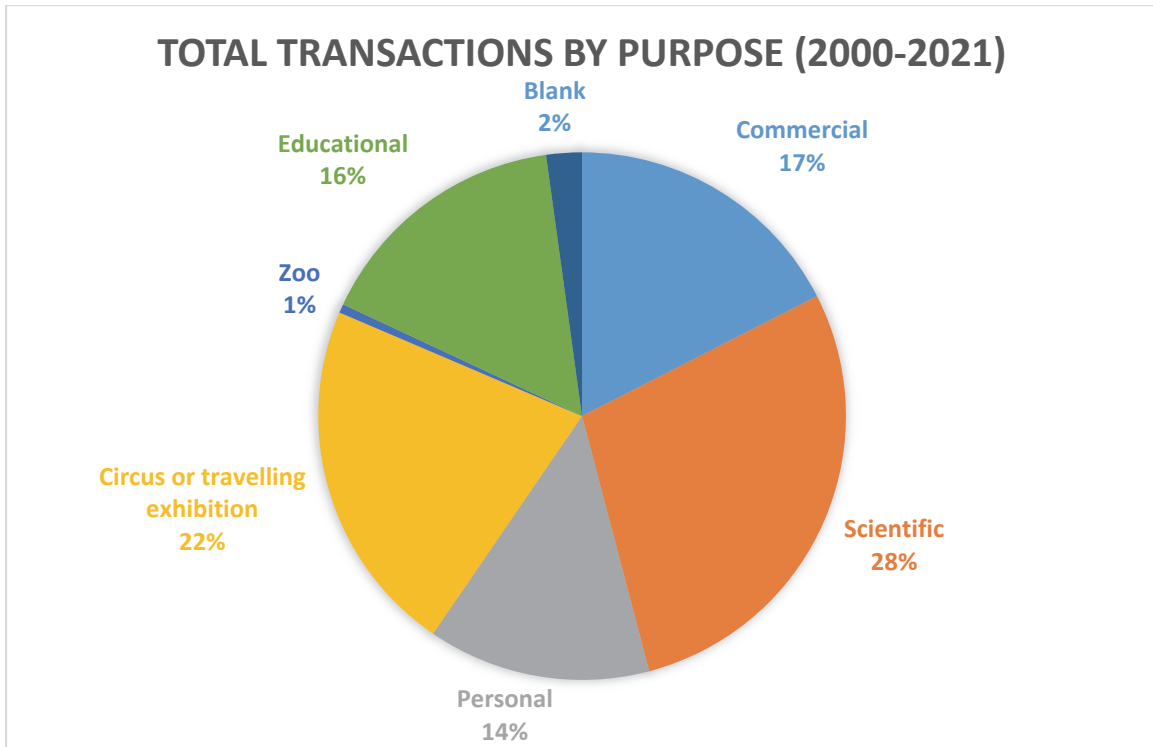


Figure 6. Total CITES transactions by purpose for the white shark between 2000-2021.

The last category I examined was the source of trade for the white shark transactions. This section of the data analysis showed that the dominant source of white shark trade was wild caught, with 111 of the 183 transactions being wild. Following this, the next two most common sources of trade were pre-convention specimens, with 36 transactions, and confiscated or seized specimens, with 30 transactions. According to the CITES glossary, when a transaction’s source states that it is a pre-convention species, it means that the specimen was “acquired before the provisions of the Convention applied to it” (CITES, 2020). Additionally, in the case of confiscated or seized *live* specimen, the shark would have to be returned to the exporting country or brought to a selected rescue center (CITES, 2020). See **Figure 7** for further details on the source of white shark trade.

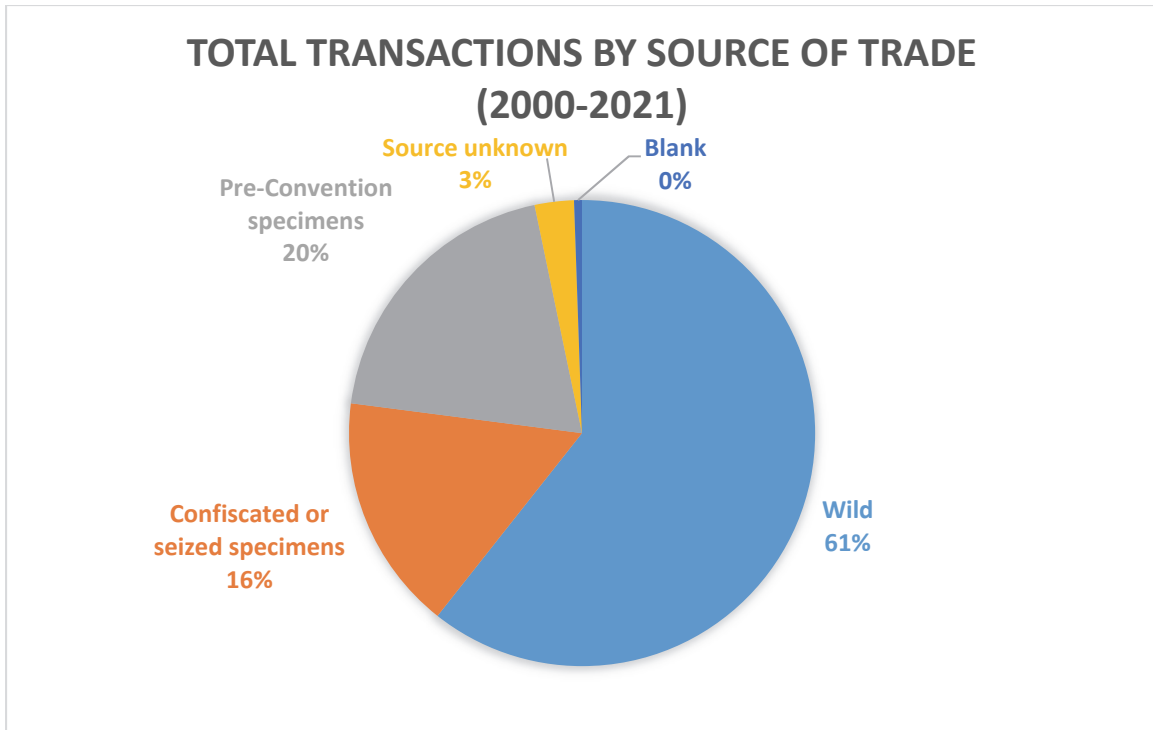


Figure 7. Total CITES transactions by source of trade for the white shark between 2000-2021.

When transaction is reported in the chart as 0%, the transaction was > 0% but <0.5%.

It is worth mentioning that there are errors within the database. During the interview portion of my research, one of the interviewees (whose expertise is in white sharks) pulled up the CITES database trade records to look over them with me. This expert was shocked by two of the trade records for the white shark. One transaction was an export from Oman to Hong Kong involving 2,300kg of white shark fins, while the other surprising transaction was another export from Oman to Vietnam involving 1,150kg of fins. Both transactions consisted of “wild” specimens and were for commercial purposes. The interviewee remarked “that is shocking... that does *not* make any sense... reporting legal sustainable harvest of 2300 kg of white shark fins” (Expert 1, personal communication, 2021). Following our interview, this expert reached out to a lead scientist that works on the fin trade in Oman to ask about these transactions. This individual responded by informing us that there are no white sharks in Oman. They went on to tell us that they have been spotted in Somalia and Sri Lanka on rare occasions (with just one record in each country during the last few decades), but there are zero records for the rest of the Arabian Sea. Because of this, they said it would have been impossible for the reported quantity of fins to have been from the white shark. They said it might be possible that they were re-exports, but

that this was quite unlikely as Oman is not the transit hub for the region. For this reason, the individual explained that the entered data was likely for Mako sharks or numerous shark species lumped together under the guise of white sharks. With no definite answer, it was probable that the data for the white shark was incorrect, and that the export was another species that could pass as a white shark in trade. This suggests that there are errors within the CITES database, and that the transactions for the white shark or scalloped hammerhead may underestimate (or overestimate) the extent of the trade for either species.

2.2.2. The scalloped hammerhead

After conducting the database query for the white shark, I moved on to analyze the CITES data for the scalloped hammerhead. The scalloped hammerhead showed 195 transactions between the years 2012 and 2020, when I examined the database. It was listed under Appendix III in 2012, and 2013 before being moved to Appendix II in 2014. I highlight the Appendix III listing years again as a reminder that not all trade would have had to have acquired an export permit, and therefore, would not have been reported to CITES. However, any legal trade from 2014 onward (when the species was moved to Appendix II) would have been reported on the database (with the exception of countries who have reservations taken out for the species).

To begin my analysis, I looked at the frequency of trade between 2012 and 2019. Initially I had included 2020 in this chart. However, with 2020 showing incomplete data for the year, I decided to remove its transactions from Figure 8. When I began my analysis, the transactions for the year 2020 showed 5 transactions. Shortly after the initial analysis, the transactions had increased to 7. With the data not being complete for the year (as it was still being inputted into the database), I decided it would be best to remove 2020 from this chart. Again, as in my white shark investigation, this analysis did not account for the number of derivatives and parts traded within each transaction. For instance, one of the larger transactions that took place in 2014 involved 29,600 kg of fins being traded from Belize to the US. In another significant transaction that took place in 2017, 82,700.4 kg of scalloped hammerhead meat was traded from Korea to China. This demonstrates that the volumes within each transaction vary greatly, but in many cases involve thousands of kg of scalloped hammerhead parts. Moreover, since the scalloped hammerhead was listed under Appendix III for 2012 and 2013, the transactions are quite low. This is because, as

explained in the white shark section, not all Parties have to obtain an export permit when listed under Appendix III. For this reason, not all scalloped hammerhead transactions would be reported in the CITES database for these years. **Figure 8** below shows that the frequency of the trade for scalloped hammerhead fluctuated over the years, but hit a high of 48 transactions in 2018. Between 2012 and 2019, the average transactions for the scalloped hammerhead equaled to 23.75.

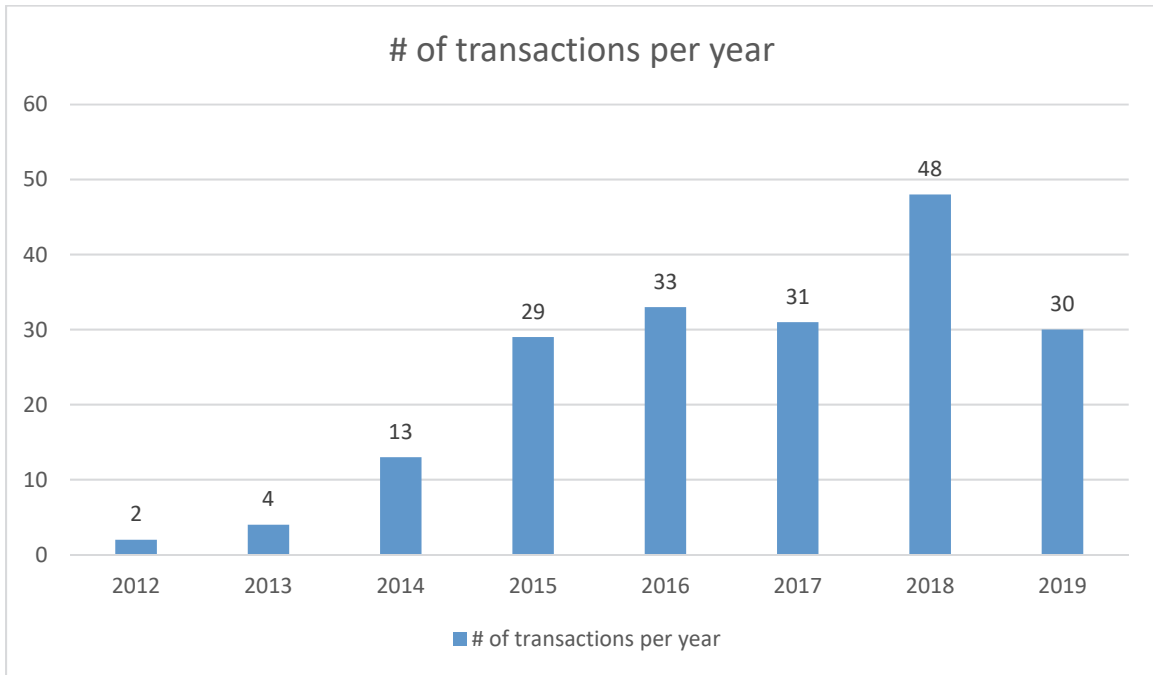


Figure 8. Frequency of CITES transactions for scalloped hammerhead between 2002-2019.

Transactions for the year 2020 were excluded from this graph as the data was incomplete for the year.

Following the frequency of the trade analysis, I moved on to analyze the leading importing and exporting countries for the scalloped hammerhead. From here on out, my analysis includes the 2020 transactions. The few transactions that had been inputted for 2020 at the time of analysis contribute meaningfully to the importer, exporter, trade terms, purpose of trade, and source of trade data. Similar to the transactions for the white shark, the top importing country for the scalloped hammerhead was the United States, with 55 transactions made. In close second, the next country to make the most imports was Hong Kong, with 50 transactions made. These two countries dominated the trade for importer transactions. The third highest importing country was China, as they reported 12 scalloped hammerhead transactions. See **Figure 9** for a breakdown of the importing countries. After

examining the transactions by looking at the importer countries, I moved on to survey the leading exporting countries. The highest exporter for scalloped hammerhead transactions was Australia, with a total of 18 exports. After this, the next country to make the most exports was El Salvador, as they exported 13 scalloped hammerhead transactions. And following this, the next highest exporter was Kenya, with 10 exports made. See **Figure 10** for more details.

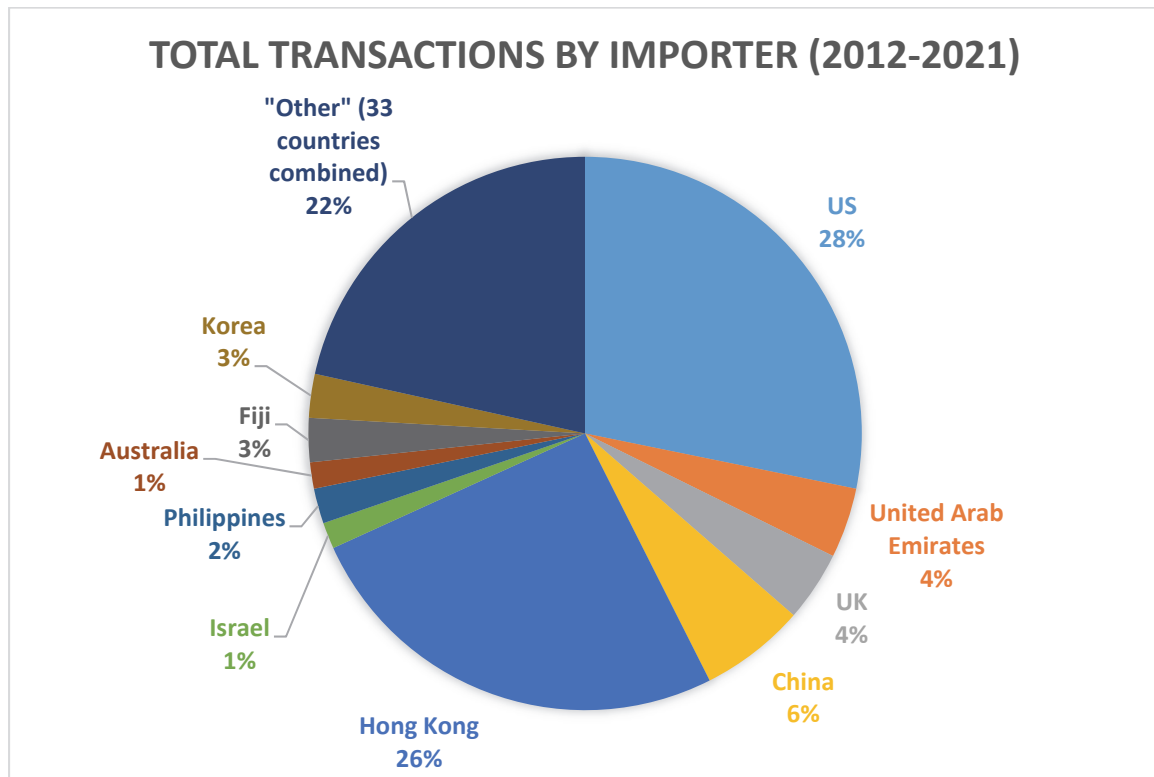


Figure 9. Total CITES transactions by importer for the scalloped hammerhead between 2012-2021.

The “Other” category includes these 33 countries: Brazil, Thailand, Colombia, Singapore, “Unknown,” Ethiopia, Switzerland, Oman, Netherlands, Turkey, Canada, Germany, Dominican Republic, Maldives, Peru, Senegal, South Africa, Cape Verde, France, Mauritania, El Salvador, Bangladesh, Sri Lanka, Russian Federation, Saudi Arabia, Taiwan, Chile, Costa Rica, Kenya, Mexico, Tonga, Vietnam, Italy. **Regions were included in this category if they made 2 or less transactions between 2012-2021.**

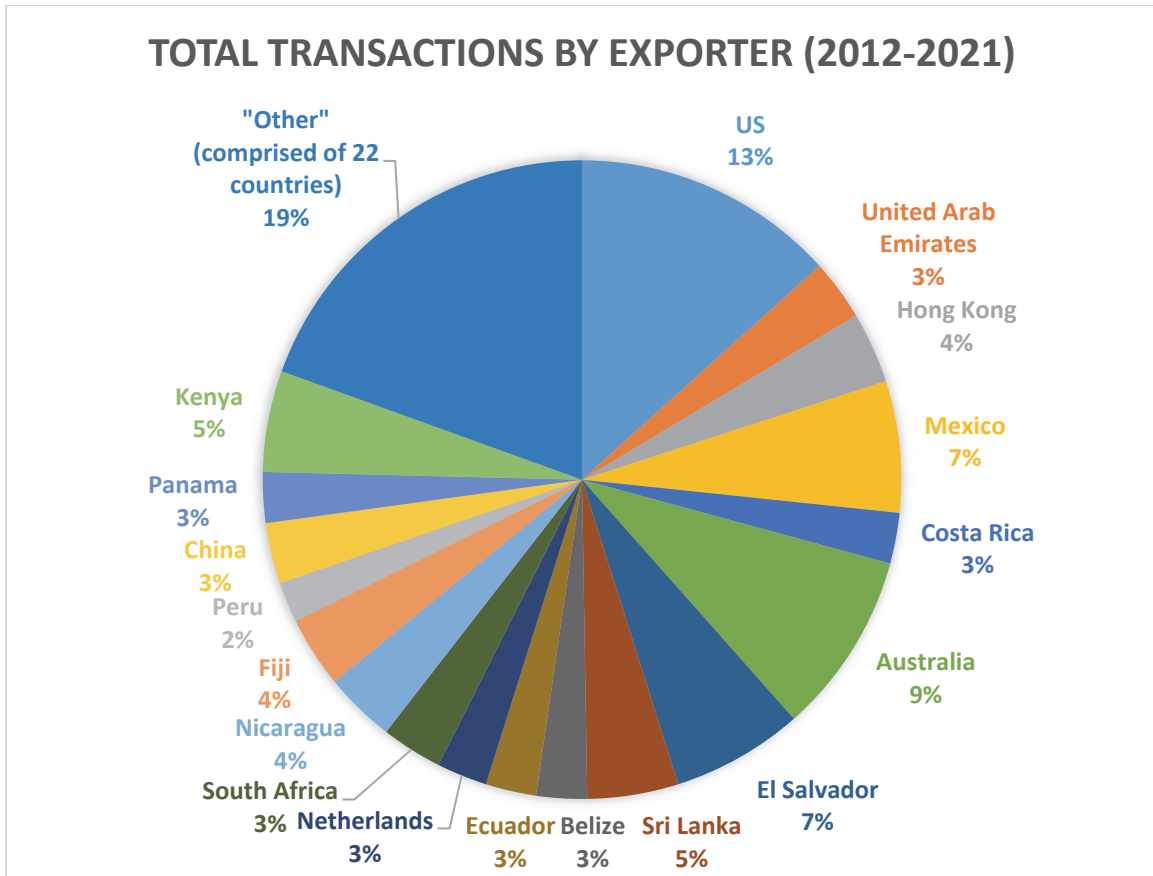


Figure 10. Total CITES transactions by exporter for the scalloped hammerhead between 2012-2021.

The “Other” category includes these 22 countries: UK, Brazil, Chile, Singapore, Seychelles, Korea, Dominican Republic, Senegal, Mauritania, Myanmar, Philippines, Oman, “Unknown,” Yemen, “HS” (an error in the database I believe as it does not correlate to any country), Bangladesh, Trinidad and Tobago, Taiwan, Maldives, Morocco, Columbia, and Cape Verde. Regions were included in this category if they made 3 or less transactions between 2012-2021.

After analyzing the data for leading importing and exporting countries, I moved on to examine the top trade terms, purposes, and sources for scalloped hammerhead transactions. Unsurprisingly, the trade term that dominated across the transactions was fins, as they comprised 117 of the 195 transactions. Following this, the next most common trade term that came up was specimens, making up 42 of the transactions. And the third most common term to show up in the data was the term “live,” meaning live scalloped hammerheads being traded, with a total of 20 transactions. See **Figure 11** for a detailed summary.

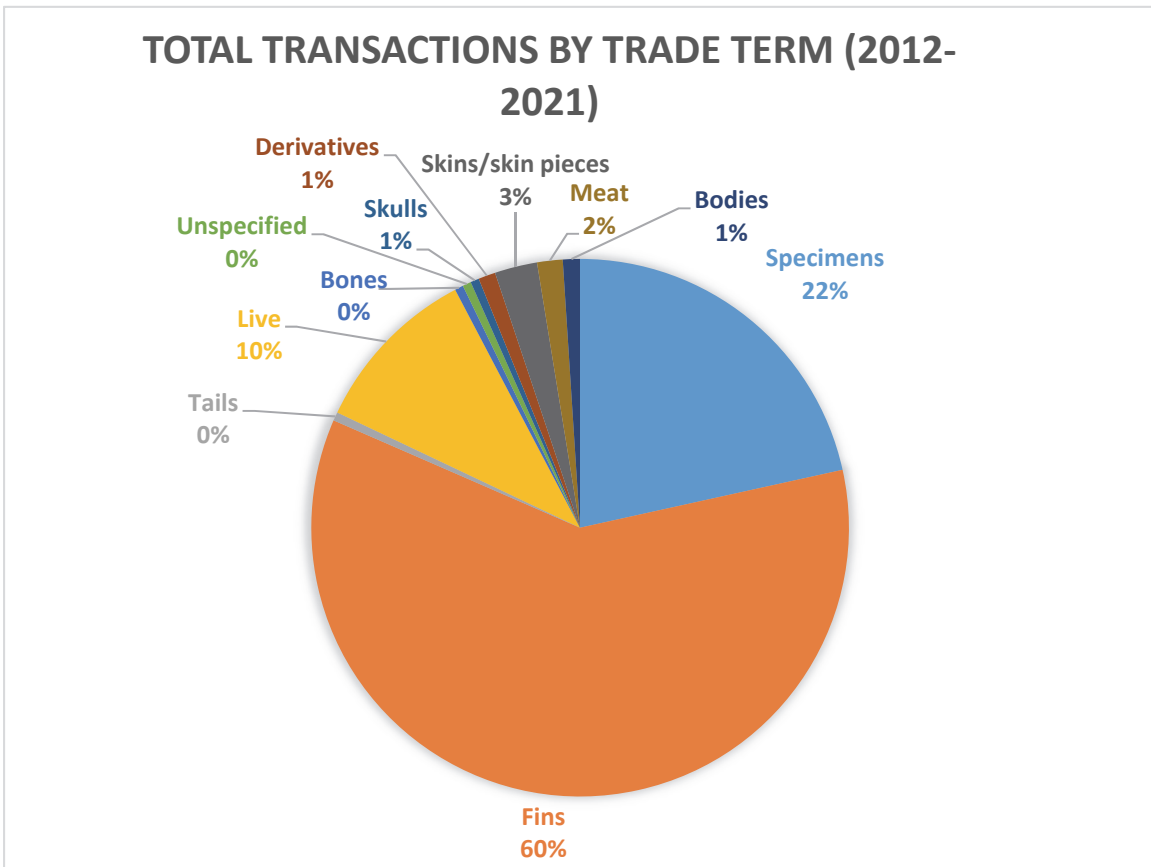


Figure 11. Total CITES transactions by trade term for the scalloped hammerhead between 2012-2021.

When transaction is reported in the chart as 0%, the transaction was > 0% but <0.5%.

The next category I analyzed was the purposes of trade for scalloped hammerhead transactions. I found that the leading motive for transactions was for commercial purposes, as 85 of the transactions were commercial. This was not entirely surprising either, as the scalloped hammerhead is known to be one of the most commercially valuable shark species due to its valuable fins. This was one of the reasons for why their listing under Appendix II was so monumental. The next most common purpose for trade was scientific, with 48 transactions being made to support scientific endeavors. And finally, the third most common reason for trade was for “circus or travelling exhibition” purposes, with 37 scalloped hammerhead transactions falling under this category (see **Figure 12** for more information).

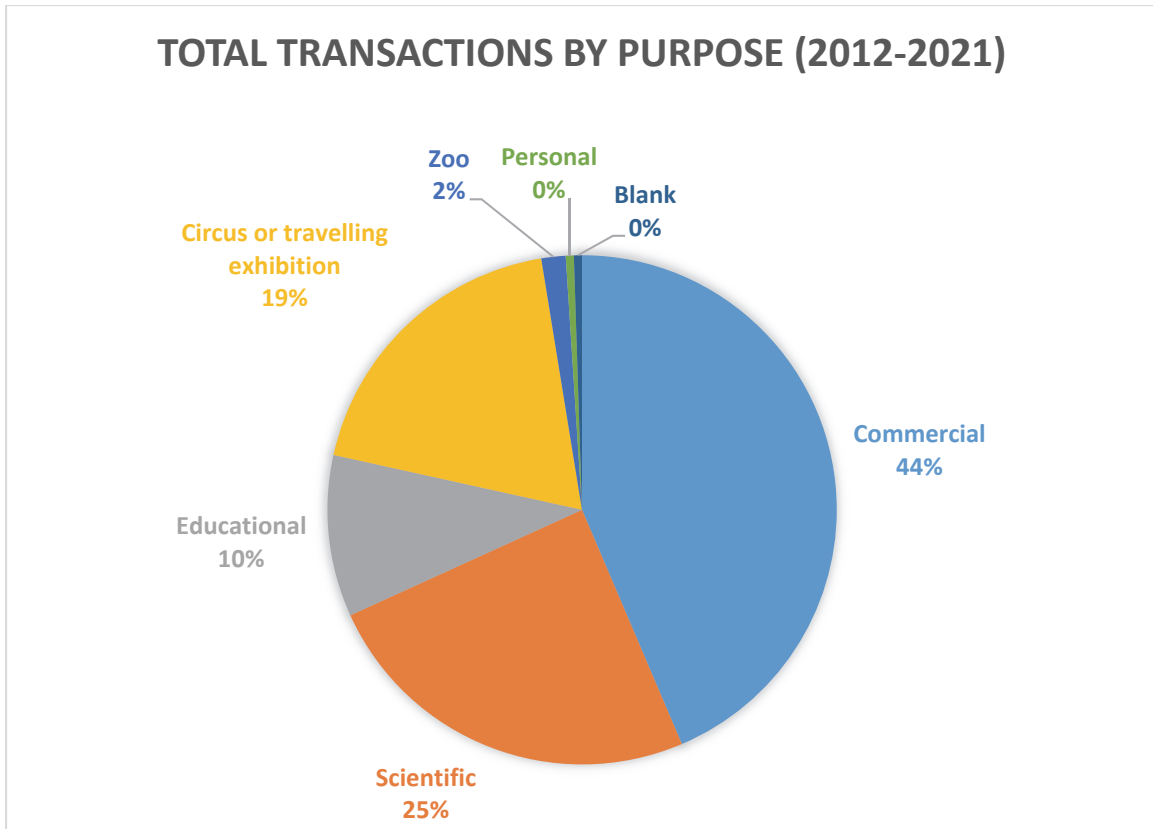


Figure 12. Total CITES transactions by purpose for the scalloped hammerhead between 2012-2021.

When transaction is reported in the chart as 0%, the transaction was > 0% but <0.5%.

The last category I analyzed for the scalloped hammerhead was the source of trade. The leading source of trade across the transactions were wild, with 151 of the 195 transactions being categorized as “wild.” Following this, the next most common source of trade was “pre-convention specimens,” with 30 transactions. And the third most common source of trade was “confiscated or seized specimens,” with 10 transactions falling under this category. The ordering of the top three leading sources of trade for the scalloped hammerhead follows the same pattern as those for the white shark, with “wild” being the most common across the transactions, then “pre-convention specimens” in second, and “confiscated or seized specimens” as the third most frequent source. See **Figure 13** for more information.

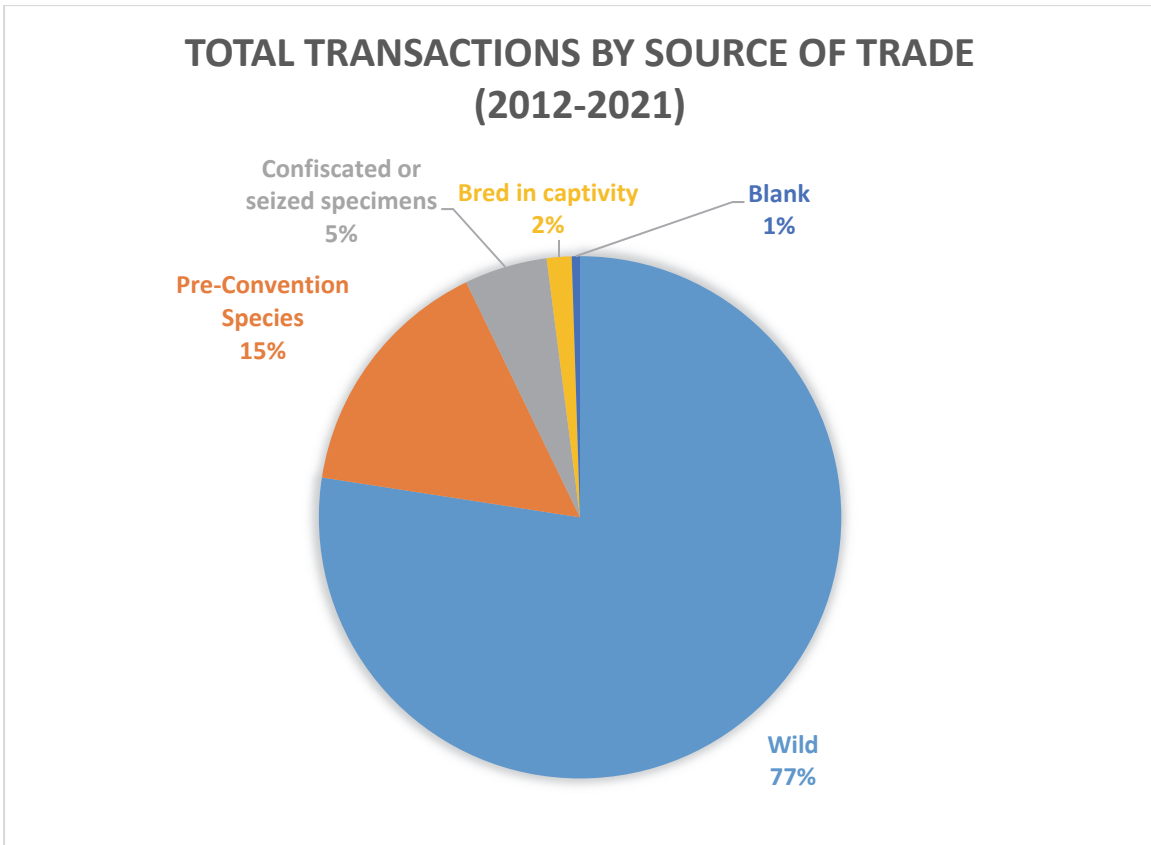


Figure 13. Total CITES transactions by trade term for the scalloped hammerhead between 2012-2021.

The data query for the white shark and scalloped hammerhead demonstrates that the trade for scalloped hammerhead products is significantly higher than that of the white shark. The most notable years for white shark transactions were 2010, 2012, and 2018, with transactions hitting highs of 18 for all three years. For the scalloped hammerhead, on the other hand, the most significant year was 2018, with 48 transactions. To put the differences in trade into perspective, I calculated the average transactions per year for each shark. Between 2002 and 2019, the average transactions per year for the white shark were equal to 10.2 transactions, while the average transactions for the scalloped hammerhead were 23.75 between 2012 and 2019. Thus, the frequency of the trade for the white shark is significantly lower than the scalloped hammerhead. In addition to this, the scalloped hammerhead was listed on Appendix II in 2014, while the white shark was listed in 2005. This is almost a 10-year gap in listings, and yet the scalloped hammerhead still had far more transactions made (with much larger quantities within each transaction) than the white shark, with 190 transactions vs 183 for the scalloped hammerhead and white shark respectively (not including the 2020 transactions for the scalloped

hammerhead). Additionally, the majority of the transactions for the white shark were for scientific purposes, while the scalloped hammerheads transactions were mostly commercial. This is troubling, because the scalloped hammerhead is a critically endangered species, and continues to experience significant declines. With their top purpose being commercial ventures, the question can be raised: is the quantity of CITES-licensed trade in scalloped hammerheads sustainable? Rather than implementing the precautionary principle and halting trade for a critically endangered species, like the scalloped hammerhead, trade continues to be permitted through CITES. It is also notable that this does not account for the countries that have taken out reservations for the species, or the illegal trade, meaning that trade is likely even higher than disclosed on the database.

2.2.3. Limitations of the database query

The above analyses for both the scalloped hammerhead and white shark reveal three major limitations to the CITES database. The first major limitation is that the units that are used vary greatly across the transactions, with no standard set of units required to be used by Parties. Many transactions include no units, while some contain units such as kg, g, ml, and cm³. With such variation, it is impossible to calculate the number of sharks traded on the database. The inability of researchers to use the trade database to quantify the numbers of individual sharks traded raises questions about CITES' ability to do the same. The second major limitation is the fact that the trade term "specimens" covers such a broad range of variables. "Specimens" made up 27% of the trade term transactions for the white shark, and 22% of transactions for the scalloped hammerhead. Yet, the term "specimen" could stand for anything from a derivative of the species to a full body, and anything from a live shark to a dead shark. This further complicates CITES' ability to determine the number of individuals in trade. The final major limitation I would like to address here is the difference between importer reported quantities and exporter reported quantities on the database. As mentioned, many of the shark transactions differed between what the importer reported, versus what the exporter reported. For example, in a scalloped hammerhead transaction that occurred in 2015, 73.04 kg of fins were reportedly exported from Mexico, while the importer (Hong Kong) reported the quantity as 6506.85 kg of fins. Using very rough approximations, this difference could amount to the death of ten to twenty sharks, or up to thousands of individuals. Thus, the three limitations

outlined here challenge CITES ability to protect species like the scalloped hammerhead and white shark, as they are unable to quantify real numbers of species in trade.

Despite these limitations, the results from the database query show clear differences in trade quantities for the white shark and scalloped hammerhead. I now turn to the interview portion of my exploration in order to begin to answer my second research question: what explains the white shark and scalloped hammerhead's divergent recovery outcomes?

2.3. Explanations for the differences in protection

In this section, I outline some of the important themes that came up across the interviews with a focus on the differences in management for the scalloped hammerhead and white shark, and the role of CITES in their management. In particular, the expert interviews highlighted three key themes explaining the differences in recovery outcomes for the shark species: 1) the white shark is better protected by national measures when compared to the scalloped hammerhead, 2) white sharks are rarely caught as bycatch, whereas bycatch poses a serious threat to scalloped hammerhead populations, and 3) the white shark has been listed under CITES longer than the scalloped hammerhead, allowing more time for Parties to implement CITES measures.

2.3.1. White shark is better protected by national measures

As I began analyzing the differences in recovery outcomes, I wondered if the successes for the white shark could be accredited to CITES regulations, or if there were other reasons for their recovery. Many interviewees explained to me that CITES played a small role in the white shark's successes, and that domestic and national measures were much more important. This led to the first, and most commonly discussed theme that came up across interviews: the fact that the white shark is better protected at the national level than the scalloped hammerhead. With the white shark being protected in most national waters, its populations have begun stabilizing and, in some cases, increasing (Experts 1 & 2, personal communication, 2021). One explanation brought up by interviewees for the better protection of the white shark nationally was that it is a charismatic species. More people know about the white shark, and are infatuated by the species, therefore instigating their protection and recovery around the world. Since many countries have state-specific

regulations in place for the species, white sharks are protected regardless of CITES. For instance, if you catch a white shark in Australia, you have to release it by law. But, if national legislation did not exist, and if CITES was the only measure in place to manage the white shark, then you could still target and kill white sharks in many countries as long as you did not send it overseas without a permit for export. This was a theme brought up many times: protection under CITES alone will not save a species. Additionally, one interviewee went so far as to say:

“I would actually probably argue... that CITES’ listings had almost zero to do with the conservation successes with white sharks, simply because international trade has played a very small part in that level of threat... its more about the action several decades ago now to protect them in many parts of the world... before they were listed on CITES” (Expert 6, personal communication, 2021).

Another interviewee mirrored what other experts had explained, by stating that in many countries where white sharks occur in higher numbers, such as Australia, South Africa, or the US, it is illegal to catch and land white sharks (Expert 3, personal communication, 2021). This corresponds with Shivji et al’s (2005) description of the white shark, as the authors call it the “most widely protected elasmobranch in the world,” due to it being strictly protected in many countries (p.1035).

While many interviewees believe the white sharks’ successes should be largely attributed to national and domestic legislations, most experts highlighted that CITES still had some role to play. One interviewee made it clear that many countries are now obliged to look into their shark trade because of CITES (Expert 6, personal communication, 2021). This expert explained that countries that might have just allowed their shark fisheries to operate without any regulation or monitoring prior to a CITES listing, now have certain shark species on their radar, and are obligated to pay attention to these species. This goes hand-in-hand with what Vincent et al. (2014) emphasizes, which is that CITES should be seen as a complimentary tool, or an added layer of protection. So, while CITES may not have had the greatest role to play in protecting the white shark due to the many national and domestic measures in place, it likely helped put the species on the radar for some Parties.

In contrast to the well-protected white shark, the scalloped hammerhead is less protected by national measures around the world. One interviewee emphasized the need

for national protection of the species by stating that “countries need to step up and do something similar to what the great white has been given in terms of protection” (Expert 3, personal communication, 2021). To clarify, they further explained that most countries do not have landing or catch bans for the scalloped hammerhead, and that if we want to protect the species in any meaningful way, these types of national legislation are essential. And, while interviewees mentioned that international trade did not pose a major threat to white shark populations, the same is not true for the scalloped hammerhead. The shark fin market is largely international. So, while CITES had less of a role to play for white shark management, it plays a much more significant role for scalloped hammerheads as they are not well protected nationally, and they are the subject of intensive international trade (Expert 6, personal communication, 2021).

2.3.2. Bycatch poses a greater threat for scalloped hammerheads

The second explanation for the contrast in protection between the scalloped hammerhead and white shark is the different levels of threat bycatch poses. One of the interviewees explained that the white shark is rarely caught in bycatch due to their size and power (Expert 3, personal communication, 2021). If you want to catch a white shark, they explained, you need very specific gear, namely a significant sized hook and chain. The interviewee offered an example from when they were working on a NOAA (National Oceanic and Atmospheric Administration) shark fin cruise just off California. The crew were fishing and tagging sharks in order to collect data about the different species. According to the interviewee, when a hook was pulled back in, it looked as though it had been cut in the middle with bolt cutters. One of the fishermen immediately responded by saying it must have been a great white, because if it had been any other shark, it would have been caught on the line (Expert 3, personal communication, 2021). This story represented what other white shark experts had explained to me, in that it was quite unusual for white sharks to get caught up in fishing gear, as most of the time they are able to break themselves free. One interviewee described this phenomenon as a “size refuge.” White sharks may occasionally get caught in bycatch when they are small or medium sized, but once they hit a certain size, it is highly unlikely they will incidentally get caught in fishing gear.

In contrast, scalloped hammerheads get caught in almost any type of gear. According to interviewees, they get caught in high seas fisheries, coastal fisheries,

industrial fisheries, artisanal fisheries, gillnet fisheries, longline fisheries, and more, and this happens at all life-stages (Experts 3 & 9, personal communication, 2021). Accordingly, numerous interviewees considered bycatch to be the greatest threat for scalloped hammerheads, especially for juveniles. This is because in many island nations (typically in lower income countries), locals accidentally catch juvenile scalloped hammerheads, while attempting to target other fish in subsistence and artisanal fisheries. And, since this tends to occur in lower income islands in the Global South, including Indonesia, Cocos, Galapagos and other islands in the Eastern Pacific where the species aggregates, individuals will often keep the shark for consumption or economic purposes. An interviewee explained that local communities in these regions have various social and economic reasons for keeping secondary catch, as the scalloped hammerhead can act as a form of food security, and the fins can be sold for income (Expert 9, personal communication, 2021). Because the species dies quickly on the hook or in the line (typically within seconds), it also makes sense for citizens of these island communities to retain the shark for socio-economic purposes, rather than releasing the dead shark back into the water. The challenge of avoiding scalloped hammerheads in bycatch was a common theme discussed by interviewees. With bycatch of the hammerhead offering livelihood support for various communities, it is clear that protecting species of subsistence value is a complex issue. I explore this further below.

2.3.3. The white shark has been listed longer under CITES

The third and final explanation discussed during the interviews regarding the differences in protection and recovery outcomes for the white shark and scalloped hammerhead was the length of time that the two species had been listed under CITES. The white shark has been listed under Appendix II since 2005, while the scalloped hammerhead has only been listed since 2014. Numerous experts expressed to me that since the scalloped hammerhead is a slow-growing and long-lived species, it would take time for its populations to rebuild. Interviewees considered 2014 to be fairly recent, and some stated that it could take anywhere from a decade to 20 or 30 years to see if CITES was working for the species. Experts explained that it takes time for Parties to create NDFs, and implement proper regulations to monitor and police the trade. However, one interviewee who has been working on understanding the species composition of shark fin markets in major hubs expressed that they believed that so far, CITES has not been

effective for the scalloped hammerhead (Expert 3, personal communication, 2021). They went on to explain that this was largely due to low-compliance. Yet, they voiced their curiosity of whether or not CITES measures would have a major impact for the species by stating:

But at the same time, even if [CITES] compliance was 100% correct, those sharks are still getting caught in fisheries all over the world. And they're extremely delicate. They stress fast, they die on the hook, on everything and anything very, very fast. So, even if the trade under CITES is over, I wonder if the mortality just by fisheries...even if they just discard them back to sea... if that's going to change. Because, like I said, even if they're not traded, they're getting caught in super large numbers everywhere" (Expert 3, personal communication, 2021).

So, while the scalloped hammerhead has been listed relatively recently, CITES measures have yet to be effective for the species. Though, without effective national measures that prevent them from being caught altogether, the species may not recover. This differs from the case of the white shark, as the species was listed in the early 2000s, giving Parties more time to effectively implement CITES measures, and it is protected comparatively well by national legislation.

The white shark was an important species to examine as it is largely understood as a conservation success story. It was the perfect shark species to compare the scalloped hammerhead against, as I could use the white shark to understand the differences in protection, and to discern what needs to be done in order for the scalloped hammerhead to recover. As is clear from the above explanations for white shark and scalloped hammerhead's divergent recovery outcomes, there are key challenges concerning CITES's management of the scalloped hammerhead. In the remainder of this chapter, I focus on these challenges and potential explanations and solutions to them, before turning to what these challenges suggest about CITES's ability to protect a species like the scalloped hammerhead (Chapter 3). I return to the white shark again in the conclusion (Chapter 4), and the species is brought up occasionally to bolster the argument or help demonstrate a comparison, but generally speaking, it will no longer be discussed in detail.

2.4. Challenges for scalloped hammerhead recovery under CITES

In order to help answer my final two research questions related to CITES' strengths and weaknesses, and the key challenges associated with protecting species of commercial and subsistence value, I turned to expert interviews. Throughout the interviews, two important weaknesses were identified related CITES' ability to protect scalloped hammerheads: 1) the scalloped hammerhead makes up a large component of the illegal fin trade, suggesting low compliance with CITES regulations, and 2) many Parties have yet to produce NDFs for the species due to lack of resources, data, funding, and capacity, *and* the NDFs that *have* been produced are often incomplete or inadequately rooted in scientific evidence. Following the discussion of these challenges, I offer two potential solutions that could help CITES protect scalloped hammerhead populations: listing all hammerhead species, including look-alikes, under Appendix II, and prompting the RST process.

The scalloped hammerhead is a species of high commercial and subsistence value. Because of this added layer of providing socio-economic benefits for local communities, CITES faces additional challenges in protecting the species. I discuss the complex nature of why locals must rely on the scalloped hammerhead in Section 2.4.4, separate from the other two challenges listed above, as there is no easy solution to this situation. These ideas, along with recommendations for how CITES can improve the situation for the scalloped hammerhead and the local communities who rely on it for livelihood impacts, are further developed in Chapter 3 and the Conclusion.

2.4.1. Low compliance with CITES regulations

One of the most common themes brought up during the interviews was the challenge of illegally traded scalloped hammerhead parts. Since the species aggregates in large schools on remote islands, it is difficult for communities to patrol for illegal vessels. It also makes it relatively easy for an illegal long-liner or other vessel to target the species. All interviewees who had expertise related to scalloped hammerheads expressed to me that they believed that illegal fishing for this species was very prominent. To make matters worse, the countries most impacted by illegal fishing and the illegal trade often do not have adequate resources to stop it. Scalloped hammerheads are often initially illegally caught

in low-income, Global South countries, but eventually end up in markets in Hong Kong and China. According to one interviewee who studies the illegal shark fin trade by examining the species composition at shark fin markets in Hong Kong and China, the majority of the volumes of scalloped hammerhead that are coming into these markets are illegal (Expert 3, personal communication, 2021).; i.e. most of the trade that shows up in Hong Kong markets does not contain the proper CITES paperwork (Expert 5, personal communication, 2021). Interviewees also highlighted how several exporting nations formerly known to land CITES-listed shark species were *not* among those to report trading the species, which further suggests low compliance.

Cardenosa et al. (2018) demonstrate non-compliance by observing how common certain CITES-listed shark species are in the fin trade, and by measuring compliance with CITES listings. Hong Kong is one of the top global importers of shark fins, and by looking at the composition of retail markets here, the global shark fin trade can be better understood. Cardenosa et al. (2018) explain that they sampled 46 retail vendor events, which involved 140 different vendors between February 2014 and December 2016, and the scalloped hammerhead and smooth hammerhead “were detected in 100% of events and 66% of vendors at least once” (p.4). Notably, white shark fin trimmings were not detected at all. To add to this, the top five species/complexes found in the fin trimmings between 2014 and 2016 were consistent, with the blue shark showing up the most, then the silky shark, followed by the blacktip species complex, and then the scalloped and smooth hammerheads (p.4). This means that the scalloped hammerhead was one of the most common species found in Hong Kong markets, even after being listed on Appendix II. The quantity of these shark species found during the study did not add up to the number reported on the CITES database. Many of the interviewees stated that they felt that the reported quantities on the database were very conservative, and that the scalloped hammerhead was a leading component of the illegal fin trade. For this reason, Cardenosa et al. (2018) explains that in the first few years of implementation, reporting requirements and compliance with CITES regulations were low for these shark species. Unfortunately, one interviewee disclosed that they do not foresee any changes occurring with regards to better compliance in the years since the initial study by Cardenosa et al. (2018) (Expert 3, personal communication, 2021).

There are a few reasons for why the illegal trade persists. The scalloped hammerhead has a large dorsal fin, which is worth a substantial amount of money in the

fin trade (Expert 5, personal communication, 2021). One interviewee tracked down the price of generic hammerhead fins at Hong Kong markets. The interviewee revealed that at one shop in September 2021, a kilogram of hammerhead fins would sell for about \$1,340 USD (Expert 7, personal communication, 2021). This price would vary depending on the size of the fins, and depending on the different vendors. However, while the price was not specific to the scalloped hammerhead (it could be for great, smooth, scalloped, or another type of hammerhead species), it provides an approximate baseline to understand how much people are willing to pay for hammerhead fins, and offers rationale for why people engage in the illegal trade.

It is also difficult to track the illegal trade from the beginning of the commodity chain. One interviewee explained:

...what we don't know, which would be harder to figure out, is of the fins that we're sampling in Hong Kong, how much of that is actually coming from illegal fisheries... it could be someone, either a Chinese vessel caught the sharks illegally in the Eastern Pacific, or a local Ecuadorian vessel caught them in the Galapagos or whatever and sold them to a Chinese freighter, it goes over to mainland China, it gets transshipped into Hong Kong to be processed, it ends up in the Hong Kong market or back into China. You know, at a certain point in the process there's no way to tell where it came from, so there's no way to know whether it was legal or illegal when it was caught. Once it's a bag of dried fins sitting in a warehouse in Hong Kong, it's very difficult to trace... all we can do is take a fin clip and sequence it and know what species it is... we have no way of knowing how much of it is legal vs illegal. We think a lot of it is illegal because there really isn't that much legal fishing for hammerheads anymore, they're protected in a lot of countries. For example, in Ecuador. The whole of Ecuador is under the National Plan of Action for sharks... You're not allowed to fish for sharks in the Galapagos or the Cocos islands, you know all these places are supposed to be protected, which means that any sharks that come out of there, it's illegal (Expert 5, personal communication, 2021).

While this may seem to contradict what other interviewees mentioned about the scalloped hammerhead being less protected nationally, it is important to note that the scalloped hammerhead is still less-protected nationally when compared to the white shark, who is one of the most well-protected shark species in the world (Shivji et al., 2005). The difficulty in tracing the illegal trade from the origin of the catch poses a real challenge to implementation of CITES legislation, as well as the recovery of the scalloped

hammerhead. Countries affected by illegal shark fishing also often do not have the resources to stop it. It costs a considerable amount of money to send vessels out to patrol the waters, and individuals in these countries are often spread too thin since there is so much coastline, so much more biodiversity, and so many fisheries to manage in many Global South countries (Expert 9, personal communication, 2021). For example, one interviewee explained that in Thailand, just one woman was responsible for implementing CITES for all marine fish (Expert 10, personal communication, 2021).

2.4.2. Defective NDF process

The challenges involved with monitoring compliance and regulating the illegal trade for the scalloped hammerhead go hand-in-hand with a second major challenge brought up during the interviews: the fact that numerous countries have not made appropriate NDFs for the species. Many interviewees mentioned that the lack of resources, insufficient data, and lack of funding played major roles in countries being unable to produce valid NDFs. This is especially true for lower income countries in the Global South, according to the interviewees, as they typically have less data and capacity to monitor. One interviewee explained that without good data on exploitation rates, it can be difficult to do a good NDF (Expert 9, personal communication, 2021). They went on to explain that oftentimes, a country's first NDF might simply explain that they need to put systems in place to collect more data, and then over time, they will slowly improve and refine their NDF to become stronger. However, the interviewee did call this method a "cop-out," in that it does not adequately protect species and can be an easy technique to simply get an NDF done (Expert 9, personal communication, 2021). Another CITES expert I interviewed explained that for seahorses, millions and millions were being legally exported and reported to CITES, but later, when the RST was triggered, it was determined that almost no Party was making a defensible NDF for the seahorse trade (Expert 10, personal communication, 2021). This is because along with the challenges involved with limited resources, Parties are not required to be transparent about how they are doing their NDF (Expert 10). By this, the interviewees mean that NDFs do not need to be posted publicly for others to see on the CITES website. So, trade may continue to be permitted for the scalloped hammerhead, just as it was for seahorses, even though the NDFs are ineffective.

Additionally, the interviewee (Expert 10) explained that the shark NDF framework is modelled off of the seahorse template, and that many Parties had complained (about the seahorse NDF framework) that there were too many steps and too much information to fill out. And, in some cases, countries would simply choose to put a trade ban in place for seahorses, rather than properly implementing Appendix II measures and providing adequate NDFs. This, in turn, can result in a large illegal trade, rather than a poorly regulated legal trade, among other outcomes. Accordingly, the difficulty in completing NDFs can provide further basis for the illegal trade. To put it bluntly, one expert stated “the NDF process could be improved, improved and strengthened... because some NDFs, when you really look into them, they’re kind of BS” (Expert 3, personal communication, 2021). In fact, across the interviews it became clear that for the scalloped hammerhead, the majority of the Parties have not come up with NDFs. This is problematic because without sufficient NDFs, Parties who continue to trade scalloped hammerhead products internationally are contributing to the illegal trade. Additionally, the few Parties that *have* completed NDFs appear to have done them poorly and they likely do not have any real significance for the species at all. This is speculative, but one interviewee did state that “making an argument that you’re sending ‘X’ amount of tonnes of scalloped hammerhead to other countries in a sustainable way is a tough argument to make” (Expert 3, personal communication, 2021). One expert even disclosed that there is suspicion of some permits being issued without sufficient NDFs (Expert 6, personal communication, 2021). Thus, the challenges and deficiencies associated with the NDF process pose real threats to the scalloped hammerhead, and further hamper their chances at recovery.

To summarize, CITES faces two key challenges in protecting scalloped hammerheads: the difficulty in monitoring compliance and regulating the illegal trade, and the lack of completed NDFs for the species. In response to the threat of the illegal trade and defective NDF process, interviewees brought up two potential solutions for CITES. The first relates to the issue of look-alike species in trade, and the second involves triggering the RST process. First, I will cover the look-alike issue.

2.4.3. Experts suggestions: how CITES can improve its management of the scalloped hammerhead

Expert suggestion #1: List all species of hammerhead

Going back to the discussions over whether or not to list the scalloped hammerhead that took place during CoP16, Namibia mentioned that there was difficulty in distinguishing between different hammerhead species. This was further raised during the interviews, as one expert who has worked extensively on scalloped hammerheads, and was critical in gathering the science that determined their critically endangered status, explained to me that there is a need for all hammerheads to be listed under CITES (Expert 4, personal communication, 2021). Despite the major victory of getting the commercially valuable shark species listed at the CoP16 in 2014, there has been little evidence to indicate that these listings were effective in halting declines for these species (Expert 3, personal communication, 2021). The interviewee made it clear that even though the great hammerhead, smooth hammerhead, and scalloped hammerhead are listed on CITES Appendix II now, there are still several other hammerhead species that are not protected under CITES.¹¹ This is alarming, because as Namibia highlighted, it can be challenging to distinguish between different hammerhead species, especially when the trade only involves a fin or small body part (Expert 7, personal communication, 2021).

The interviewee who also raised this concern explained that because six other hammerhead species are not listed under CITES, there is concern that “some of the listed species’ fins are slipping through the trade under the guise of the non-listed species’ fins” (Expert 4, personal communication, 2021). For this reason, some researchers have been pushing an agenda to list all hammerhead species under CITES. Some of the experts that I interviewed mentioned that when they were looking at the catch data for the hammerheads listed on CITES, there were substantial gaps in the data. According to one interviewee, there were big gaps in how many were being traded, how many were caught, and how many were reported as being traded (Expert 4, personal communication, 2021). This coincides with an already-mentioned issue, which is that the illegal trade for the

¹¹ There are nine species of hammerheads: the scalloped hammerhead (*Sphyrna lewini*), great hammerhead (*Sphyrna mokarran*), smooth hammerhead (*Sphyrna zygaena*), winghead shark (*Eusphyrna blochii*), scalloped bonnethead (*Sphyrna corona*), Carolina hammerhead (*Sphyrna gilberti*), scoophead (*Sphyrna media*), bonnethead (*Sphyrna tiburo*), and small-eye hammerhead (*Sphyrna tudes*) (Brennan, 2020).

CITES-listed hammerheads, particularly the scalloped hammerhead, appears to be substantial. Due to the gaps in data and the possibility of look-alike issues, a document was submitted in 2018 at the thirtieth Animals Committee meeting (AC30) in Geneva attempting to get all nine hammerhead sharks listed on CITES Appendix II.

The document advocating for all hammerhead sharks to be listed under Appendix II arose as a follow-up to the issues raised at the twenty-eighth Animal Committee meeting surrounding CITES implementation for hammerheads. At the AC28, the Animals Committee recommended that the Standing Committee recognize the “problems of species identification, look-alike issues, and traceability” for hammerhead sharks (CITES, 2015). To support this recommendation, the AC urged Parties to try to identify hammerheads down to the species level in both landings and fisheries data (CITES, 2015). At the following Animals Committee meeting (AC29) look-alike issues were raised once again (for sharks and rays in general). And finally, at the AC30, all hammerhead sharks were proposed to be listed as a group under Appendix II at the request of WWF International, WWF Pacific and TRAFFIC. The two organizations (WWF and TRAFFIC) had an Australian university (James Cook University) assess available national fisheries data and trade statistics, CITES data, and other applicable information to investigate whether look-alike measures should be implemented to ensure protection of the species.

The university found that hammerhead species not listed under CITES were entering the fin trade, particularly the winghead shark (*Eusphyra blochii*) and bonnethead shark (*Sphyrna tiburo*). As mentioned, hammerhead fins are very similar in appearance, and difficult to distinguish from one another. With the fins of these two species being so similar to the CITES-listed hammerheads, there is risk of a CITES-listed species being traded mistakenly (or deceitfully) as the winghead, bonnethead, or other hammerhead sharks. The university also noted that the products of the six non-listed hammerheads in trade resemble those of the three listed species so much so that enforcement officers are “unlikely to be able to distinguish between them” (CITES, 2018, p.2). They found that the six non-listed hammerhead species are commonly grouped together with the CITES-listed species in trade, which is why it would be helpful to list all the species together for look-alike purposes.

Another issue that emerged from this investigation was that there was possible underreporting of CITES-authorized trade for hammerheads since the Appendix II listing

in 2014 (CITES, 2018). This was likely due to non-CITES species being traded under the guise of CITES-listed hammerhead fins (as mentioned by Expert 4). This mirrors what several experts mentioned in our interviews: that the illegal trade for the scalloped hammerhead was a major, complex issue. Finally, the university revealed that global catches were not being reported to the species-specific level, and that countries were not monitoring their trade effectively. They believed that listing all hammerheads on Appendix II would urge countries to record catch and trade data down to the species-specific level, as this information would be required for Non-Detriment Findings. Given these points, it is clear that in order to adequately protect the hammerhead species currently listed under CITES, efforts must be made to protect the other six hammerhead sharks.

Expert suggestion #2: Trigger the RST process

The second solution to combating the illegal trade for the scalloped hammerhead, and one which appears to be inevitably approaching, is that the Review of Significant Trade (RST) could be triggered for sharks. The RST is the main enforcement mechanism for Appendix II, as it examines the trade for particular species to determine whether it is sustainable or not. If CITES finds that a species is being traded at large volumes or finds a concerning pattern in trade, then the RST can be prompted for that species, and exporting countries will be asked how they are proving sustainability. If a country is unable to demonstrate that they are sustainably trading a species, then they will be recommended techniques to improve this by the Animals Committee (Expert 10, personal communication, 2021). After recommendations for improvement have been issued, the Standing Committee assesses the country's progress on them. If the country has not adequately taken up the recommendations and strengthened the sustainability of the trade for the species in question, then CITES can ban trade with the specific country (or countries). According to one interviewee, once one country gets sanctioned by CITES, everyone else "buckles up," and thinks to themselves "if CITES is going to start doing this, we need to step up because we're next" (Expert 3, personal communication, 2021). Accordingly, in some ways the RST is used as a scare tactic to prompt countries to implement more sustainable trade measures.

One interviewee explained that when CITES has worked well in the past, it was because the RST was triggered, as countries were forced to focus on the sustainability of their trade. Conversely, another interviewee mentioned that the recommendations issued

to Parties under the RST can at times be quite vague with no metrics (Experts 3 & 10, personal communication, 2021). However, as mentioned, one expert (Expert 10) explained that through the RST process, CITES found that millions of seahorses were being exported legally because the NDFs for their trade were so weak. Seahorses are the first marine fish that have gone through the process, and according to two interviewees, sharks are likely next in this process (Experts 3 & 10). One expert explained that if it does not happen for sharks as a whole, then they believe it will be coming soon for the first batch of commercially valuable sharks listed under CITES (the three hammerheads, oceanic whitetip, and porbeagle). Ultimately, the RST process can be seen as a strength of CITES, as it can help combat the illegal trade by prompting better compliance and boosting sustainability measures for specific species. With multiple interviewees expecting the RST to be nearing for sharks, it is clear that sharks are being inappropriately exported. Hopefully the interviewees are correct in that the RST will be triggered soon for shark species, as scalloped hammerhead populations require this extra attention if they are to make any meaningful recovery.

2.4.4. Scalloped hammerhead offers socio-economic benefits to local communities

The third and most complex challenge that CITES faces with regard to scalloped hammerhead populations involves the subsistence and economic value that the species offers to local communities in the Global South. Several interviewees brought up this challenge when discussing the role of CITES in scalloped hammerhead conservation as interviewees felt that neither CITES by itself, nor national measures, nor fisheries management alone, would be able to halt their decline. This is because there are other issues at play such as food security and poverty that are driving fishing activity in countries in the Global South. Scalloped hammerheads spend their juvenile phase inshore, meaning that they are heavily exposed to inshore fisheries. There are many subsistence and artisanal fisheries around the world where people have no choice but to fish for a living in order to eat, or to make income. One interviewee who was living in the Solomon Islands for a few years explained that for the people who live there, fishing is one of the main ways of getting protein (Expert 4, personal communication, 2021). The interviewee explained that individuals in these communities are not necessarily targeting sharks, but if they catch a shark they will still keep it because it is food and they can sell the fins. However, they

emphasized that these local communities should not be blamed for this fishing, as the sharks are often bycatch that they choose to keep for several reasons. They explained:

They don't want to fish out their own resources and have no food so they've got a vested interest as well. But they need to fish, they can't just stop fishing to save the sharks, or save a particular species. It's an imperative for them to eat or to get money for their family. So, a lot of focus is now working on how to work with fishers to conserve their species to make them sustainable... And it's tricky with sharks because it's not their target species. So, you can work with a local village and go "okay if you make this area into a reserve, it's going to help feed your area that you can fish from for longer generations rather than fishing the whole area. And don't fish animals below a certain size, y'know, to let them reproduce." It's a bit trickier when it comes to sharks because they're generally taken as bycatch, but we can do things like ask them not to fish for pregnant females (Expert 4, personal communication, 2021).

This demonstrates the complex nature of protecting shark species like the scalloped hammerhead, as they are difficult to avoid as bycatch.

Not only are scalloped hammerheads hard *not* to catch, but if you are fishing in an area where they aggregate, it is also hard to do any post-capture release care because they typically die within seconds (Expert 9, personal communication, 2021). One of the experts I interviewed who works predominantly in Indonesia, made it clear that large numbers of juveniles are caught in gillnets there and almost always die (Expert 9, personal communication, 2021). Since they are usually caught as juveniles, scalloped hammerheads do not often reach adulthood. And, with the younger and smaller sharks commonly getting caught, the interviewee explained that there is a clear indication of overfishing. I asked this interviewee if she could clarify how often scalloped hammerheads turn up as catch in Indonesia, and she told me that where she works, they are caught almost every day (Expert 9, personal communication, 2021).

I went on to inquire about what happens to the hammerheads once caught as bycatch in Indonesia, and the expert from above explained that local Indonesians will typically make use of the whole animal. The interviewee detailed this by stating:

...in the small-scale gillnet fisheries where it's just juvenile sharks, it's purely local consumption because they're tiny and like the fin has no value in international trade. So, they usually get chopped up and used

in like curry or as fish bowls, or just like any other fish essentially. Um, for the larger individuals, they typically land them whole because they use the whole shark. People eat the meat locally, they use the skin for all kinds of things like shoes, bags and... um, they use the cartilage, and then the fin, especially if it's sort of big, will be cut off and sent into a different supply chain. So basically, the different products from the different sharks typically go through... so it gets landed whole but then there's like separate supply chains for the different products. So, its these kinds of integrated markets where you have local consumption, domestic consumption, and international trade all sort of mixed in together (Expert 9, personal communication, 2021).

This indicates that locals in lower income countries who rely on sharks for consumption are not being wasteful in their practices. Scalloped hammerheads are one of the cheapest available sources of animal protein in Indonesia, which is why people are so dependent on eating the meat (Expert 9, personal communication, 2021). Oftentimes locals are incidentally catching scalloped hammerheads when targeting other species. Once caught, they are making use of an organism that would have otherwise died once released back into the water.

In addition to the challenging nature of scalloped hammerhead catch/bycatch in lower income countries in the Global South, it is worth mentioning that catching this species in Indonesia is legal (Expert 9, personal communication, 2021). This coincides with the discussion that took place in section 2.3 regarding a lack of national measures in place for the scalloped hammerhead (when compared to the white shark). Since CITES only pertains to international trade, it does not regulate the national or domestic markets. This is why it is legal to catch and consume hammerheads locally in Indonesia. However, one of the interviewees mentioned that in Indonesia there is currently a zero quota on international trade in place for hammerhead products (Expert 9, personal communication, 2021). According to this interviewee, there are quotas for domestic landings and trade, but there are no fisheries bans or anything of the like on them, which is why locals are able to make use of scalloped hammerheads for consumption purposes. The interviewee made note that they are quite positive there is still some illegal international trade coming out of Indonesia though, as hammerhead fins may get mixed up with legal products, or they may get stockpiled and kept for a later date in anticipation of the international trade re-opening. To explain this, the interviewee commented:

as I said, at the fishery level it can actually be really hard to not catch them, and so if they've got them and if they're already dead... some people are just, they're hanging onto the fins to see what happens or they might sell them on to a trader and then the trader might try their luck with sending it in a box of other seafood products or something like that (Expert 9, personal communication, 2021).

With catching sharks being legal in places where scalloped hammerheads aggregate, like Indonesia, it becomes even more challenging to conserve and recover their populations. There becomes tension between saving the hammerheads, and providing a form of food security and income to locals who have few other alternatives. It would be unethical to set up catch bans on hammerheads for these reasons. This is why one of the experts I interviewed is currently looking into potential solutions to reducing the threats to scalloped hammerheads, while having relatively little impact on local villagers in Global South countries (Expert 9).

Locals in Indonesia who are targeting sharks for socio-economic purposes (and not catching them incidentally as bycatch) do so because they have few other options. Expert 9 explained that those who participate in this type of shark fishing do it because it is the most profitable option they have. There are no real legal and sustainable alternatives that offer the same financial returns as shark fishing does in Indonesia. And, to add, the locals who target sharks for their fins are not earning much anyways. Earlier I mentioned that in Hong Kong a kilogram of hammerhead fins would sell for about \$1,340 USD. In Indonesia, an individual juvenile hammerhead is worth less than a dollar according to one interviewee (Expert 9, personal communication, 2021). This puts into perspective how dire the circumstances are for Indonesians who rely on scalloped hammerhead products for survival. The interviewee explained that even if the international trade in all shark products were to end tomorrow, people in Indonesia would likely still fish for sharks. To summarize the many intricacies involved with protecting scalloped hammerheads in regions like Indonesia, the interviewee stated:

There's a theory of change out there that like if we stop the international trade, the fishing will stop too. But that's kind of predicated on the idea that the fishing is purely profit-motivated, which isn't entirely the case. So, there's kind of that piece, and that's where you have fishers who are purposely catching sharks, but they're catching them for lots of reasons, not just for international trade. Then you have the kind of bycatch, or like valuable secondary catch, or useful secondary catch fisheries, which are almost entirely unmotivated by CITES and

international trade, and so it literally makes no difference to them. Like these gillnet fisheries that are catching juvenile hammerhead sharks, whether there's international regulations or not will not change that market because it's not for the international trade. And... that requires then local level domestic fisheries management if you want to try and manage those hammerhead shark populations. And it gets even trickier because when you ask people kind of superficially about the hammerheads, they're like "oh yeah it's just bycatch" as though it doesn't matter. But then when you really dig into like okay but what would happen if you didn't catch them, or what would happen if you weren't allowed to catch them, or... you know like would you be willing to release them? You start to realize that actually there are these strong sorts of social and economic drivers for catching them, which includes mostly food, and to some degree income because if they don't eat it themselves, they'll sell it to someone else who will eat it. And again, these people are like really not earning much money at all so every little bit helps (Expert 9, personal communication, 2021).

Thus, as stated by the interviewees, this is a complex issue with no silver bullet solution. Notably, my research and expert interviews suggest that bycatch is an issue that currently falls outside of CITES' mandate. However, the difficulty in protecting the scalloped hammerhead highlights bigger issues at play, namely the fact that CITES is limited in its ability to manage species of subsistence and commercial value. I come back to these limitations in Chapter 3 when discussing the challenges CITES' faces in protecting species traded from the Global South (due to conditions that stem from socio-economic inequality), and when discussing the difficulty in managing a commodified species via a regime built on the licensing of species commodification: CITES.

2.4.5. Conclusion

This chapter has answered all four research questions. It began with a brief overview of the history of shark listings under CITES in order to illustrate the many challenges involved with getting commercially valuable sharks listed. In section 2.2, I presented the results from the CITES database query in order to help answer my first research question: what is the geography and quantity of white shark and scalloped hammerhead trade. Despite the fact that the white shark had been listed under Appendix II for almost a decade longer than the scalloped hammerhead, the trade for the scalloped hammerhead exceeds the transactions made for the white shark. With an average of 10.2 and 23.75 transactions per year for the white shark and scalloped hammerhead

respectively, the trade for the scalloped hammerhead is significantly higher than the white shark.

In section 2.3, I used expert interviews to highlight three major themes which helped to answer my second and third research questions related to the shark's divergent recovery outcomes, and the strengths and weaknesses of CITES. Common explanations brought up during interviews included a difference in: national protections, bycatch threat levels, and time-frames for being listed under CITES. Finally, in section 2.4 I focused exclusively on the scalloped hammerhead in order to build on CITES limitations (Q3), and to understand my fourth and final research question related to the challenges CITES' faces in recovering a species of high commercial and subsistence value. This section made it clear that there is a large illegal trade for the species, suggesting low compliance with CITES regulations, and that the NDF process needs improvement. It also demonstrated a need for all look-alike species to be listed under Appendix II of CITES, and for the RST process to be triggered. And lastly, this section summarized the complex nature of protecting a species that offers livelihood benefits for lower income communities.

As outlined in section 2.4.1, locals in lower income countries of the Global South often have no choice but to turn to hunting and fishing for subsistence and income generation. Unfortunately, with majority of the world's species occurring in these countries, the locals who rely on endangered species for survival purposes are frequently blamed for their declines. This blame is largely misplaced though, as demand in the Global North is what tends to drive biodiversity declines. Through the use of political ecology literature, I explore these subjects further in Chapter 3. I also outline the difficulties and limitations CITES' faces in grappling with inequality issues, as Global South countries are disadvantaged in decision-making processes, and face a variety of barriers with regard to implementation. In order to deepen my analysis of CITES' strengths and weaknesses, as well as potential reforms, I turn to the "tragedy of the commodity" argument in order to explain how the commodification of species under capitalist governance structures has ultimately led to immeasurable declines.

Chapter 3.

CITES, North-South inequality, and the tragedy of the commodity: Insights from political ecology

In this chapter I bring insights from political ecology to bear on my key findings in order to deepen my analysis of CITES and shark management. In particular, this research project has determined two major themes related to scalloped hammerhead and white shark trade, both of which echo themes in political ecology. The first is that certain species' management can be challenged by inequality. Section 3.2 draws on political ecology literature related to other animals in wildlife trade in order to put the information gathered from my expert interviews in conversation with other scholarly work to outline the unequal power dynamics involved in CITES processes. The second major theme detected from this research study is that there are several challenges involved with managing commercially valuable species. In order to dig deeper into this theme, I draw on a key concept in political ecology literature: the tragedy of the commodity (section 3.3). Here I explain that capitalism ultimately depletes non-human nature. This chapter begins with a brief discussion of the conventional narratives of wildlife trade, whereby local communities in Global South countries are blamed for destroying the environment. These narratives blame local proximate forces, ignoring the root problem of the underlying driving force: capitalism. Driving forces of environmental degradation, including inequality and the commodification of particular species, are discussed further in sections 3.2 and 3.3 respectively. Ultimately, this chapter demonstrates a larger issue with regard to the governance of the global wildlife trade: that CITES is attempting to manage the trade of species in a global context that suffers from the maldistribution of wealth and power. Importantly, the inequalities inherent in the global wildlife trade were forged through colonial and imperial relations, and amplified through the deepening of those relations through a capitalist political economic system. While I do not expand on the colonial underpinnings of CITES and capitalist governance as it is outside the scope of this paper, it is an important acknowledgement to make, as it is a root cause of North-South inequalities, and the extinction crisis more broadly.

3.1. The vilification of local communities: who is really to blame?

Local communities in the Global South are often held responsible for biodiversity loss as species are repeatedly extracted from their regions. This is a common theme across the political ecology literature: local communities dependent on subsistence for their livelihood are blamed, vilified, or criminalized for harvesting species/species loss (Hitchcock, Winer, & Kelly, 2020; Gaodirelwe, Motsholapheko, & Masunga, 2020; Masse & Lunstrum, 2016). Thus, conventional narratives of wildlife trade tend to place blame on locals in lower income countries of the Global South. However, this blame is often misplaced. To expand on this, I discuss three major and related points below: 1) trappers are blamed and vilified for trapping wildlife, yet they do so because they have few alternative options; 2) the blame is misplaced, as other actors are often responsible for species loss; and 3) when locals do participate in trapping, they often do so to generate income by feeding international markets.

With environmental degradation at the forefront of many national and international agendas, there has been a violent crackdown on wildlife trappers. For example, in South Africa's Kruger National Park, where poaching is threatening South African rhino populations as it offers high income to those who have few other economic opportunities, the South African state has responded with intense militarization of the park, which, in turn, has resulted in the death of "hundreds of suspected poachers in Kruger and across the region (Lundstrum, 2014; Lunstrum & Giva, 2020, p.3). Masse and Lunstrum (2016) explain that this militarization of conservation practices is "driven and rationalized by discourses of war and national/regional security that transform poaching from a conservation issue into a security issue" and that this "frame[s] the poachers as the enemy in the global war for biodiversity..." (p.229). This demonstrates the way that individuals and communities reliant on species for survival purposes (including for income and food security) are considered the "enemy" or problem with regard to biodiversity loss. In actuality, they are often dependent on poaching or harvesting particular species (whether rhinos or scalloped hammerheads) for survival (Lunstrum & Giva, 2020).

Like rhinos, hammerheads are used in various ways to support the livelihoods of those in many Global South countries, and as a result, locals are blamed for their declines. However, the fishing that occurs in Global South waters is not always performed by

residents of these countries. In a study done by Chapsos, Koning, and Noortmann (2019), the authors found that “the impoverishment and disenfranchisement of local fishing communities is considered by many investigations as a causal factor that enables IUU fishing and other associated crimes” (Chapsos, Koning, & Noortmann, 2019, p.18). In other words, foreign vessels often capitalize on disadvantaged local fishing communities, as these communities tend to have fewer regulations in place to monitor IUU fishing. So, while the locals in these communities are typically blamed for species declines in their regions, Chapsos, Koning, and Noortmann show that this blame is misdirected, and should be targeted at illegal foreign vessels. Furthermore, in Madagascar, another region that relies heavily on sharks for both subsistence and commercial uses, the majority of sharks that are caught within their EEZ from illegal fishing activities (whether as target or bycatch) are not landed on the island (Baker-Medard & Faber, 2020). Baker-Medard and Faber (2020) explain that “shark harvests in Madagascar’s waters occur both due to targeted catch and bycatch from primarily foreign-based industrial fishing companies” (p.4). This illegal fishing contributes to shark declines, and takes away the communities’ ability to provide for themselves, offering “no nutritional benefit to the Malagasy people” – the local islanders in Madagascar (p.5). Not only then are the Malagasy blamed for shark catches that they played no part in, but their livelihood is also negatively impacted. This demonstrates a common phenomenon in environmental politics, which is that “powerful actors are able to reap the benefits from environmental goods while shifting environmental burdens to marginalized or poorer actors” (Scheidel et al. 2020, p.3).

Conventional narratives of wildlife trade and species loss that place blame on individuals and communities in Global South countries are also misplaced because the wildlife trade is a demand-driven economy. While many rural communities in the Global South depend on wildlife for subsistence and income, according to Roe, Mulliken, Milledge, Mremi, Mosha & Grieg-Gran (2002, p. V), a significant portion of products, are “ultimately destined for foreign markets” as the typical flow of wildlife trade moves from Global South to Global North countries. Like Roe et al. (2002), Robinson et al. (2018) state that in order to supply the trade, wildlife is usually removed from countries that are both rich in biodiversity, and that experience high levels of poverty (p.144). This is problematic, as the “threats to species and habitats are driven by economic activity and consumer demand locally and globally by economic actors far removed from the place of origin” (Robinson et al., 2018, p.144). To better understand conservation incentives,

Robinson et al. (2018) centered their study on the trade chains involved with supplying the legal (CITES-listed) herpetofauna trade (amphibians and reptiles) in Madagascar. They found that local collectors in Madagascar rarely ever collected animals “opportunistically.” Rather, the animals were “collected to order” for export, with detailed descriptions of what was required for the species, sex, and quantity (p.150). This further supports the notion that the wildlife trade is a demand-driven economy. Additionally, Robinson et al. (2018) state that the local collectors and intermediaries for the herpetofauna trade in Madagascar receive only a small proportion of the export price, while the exporters themselves benefit most. This also lowers the local’s incentives to conserve wildlife through sustainable harvesting, as they are receiving little benefit (Robinson et al., 2018). Robinson et al. (2018) and Roe et al. (2002) make it clear that while locals are often blamed for species declines, the blame is misplaced. In fact, demand in far-away Global North countries is what often drives the market, as is the case with the scalloped hammerhead (the US being the top importer). The rest of this chapter uses a political ecology literature to challenge the narrative that locals are to blame through a deeper explanation of the systematic drivers of species loss. Below I analyze the substantial pressures and expectations placed on Global South countries in relation to CITES, and draw on the fundamental challenges inherent in capitalism by outlining the tragedy of the commodity.

3.2. Conservation challenges and CITES: pressures placed on the Global South.

Using the case of the scalloped hammerhead, my research shows that CITES is limited in its ability to manage species traded from the Global South for various reasons, many of which stem from conditions of socio-economic inequality. Political ecologists who study the wildlife trade in relation to inequality have noted that the decision-making process favours countries in the Global North, as they have more pull due to influence and resources (Roe et al., 2002; Duffy, 2013). Cooney et al. (2021) explain that the CITES listing process does not account for livelihood impacts, as Parties are only urged to consider the listing criteria and science behind listing decisions. In doing so, they fail to consider the impacts a listing may have on other groups, such as local communities who may rely on CITES-listed species for their livelihood. Furthermore, in a study done by Liew et al. (2021), the authors found that the global wildlife trade network was “more highly

connected [...] when wealth inequality [...] between participating nations/territories was greater,” and that the trade network is more linked when importers have a significant economic advantage over a large range of exporters (p.2). This is largely due to the wealth disparity, as importers are willing to pay premium prices for certain exports. These studies (Cooney et al. 2021; Liew et al. 2021) demonstrate the inequality that take place under CITES. Below I outline four major limitations to CITES that proceed from this socio-economic inequality. First, the Global South is underrepresented at CITES meetings, and disadvantaged in decision-making processes. Second, increased controls on international trade tend to have negative consequences for those dependent on harvesting species for livelihood security. Third, CITES is a Global North institution, created by and for the benefit of wealthy Northern countries, and because of this, the power dynamics have been uneven from the outset. And fourth, CITES does not provide adequate support to those who face livelihood impacts. To conclude this section, I use the scalloped hammerhead to demonstrate these major limitations, and to show that inequality limits CITES’ ability to manage the species.

Roe et al. (2002) make clear that Global South countries are disadvantaged during CITES decision-making processes, as the species they rely on for their livelihood may get listed despite their heavy opposition. The authors state that “while each Party has one vote, it would not be accurate to say that each Party has the same voice at CoPs” (p.28). Roe et al. (2002) discloses that countries from the Global South are often underrepresented at CITES meetings, likely due to a lack of resources. The authors give the example of CoP 11, where 35 delegates from the US attended, while only 2 from Burkina Faso, 4 from India, and 11 from Zimbabwe attended. This means that the US would have a far wider reach during the meetings, as their delegates could be in multiple meeting rooms at once, working on persuading others to vote in line with them. Furthermore, non-range states in the Global North will often propose species for listing under Appendix I, while countries in the Global South strongly oppose their listing (Roe et al., 2002). Unfortunately for the more rural countries in the South, the Global North governments generally have more resources to invest in CITES proposals, and therefore, have a better chance of getting species listed under Appendix I (Roe et al., 2002). Appendix I listings are likely to have negative impacts on local communities in the Global South, as their regions are where the species tend to occur, and they may rely on them

for livelihood impacts.¹² In fact, the authors state that it is typically the poorest households that are most reliant on these resources (Roe et al., 2002). Roe et al. (2002) explain that there has even been an increase in cases where importing countries take it upon themselves to decide whether or not the trade in Appendix II species is sustainable, without consulting the exporting country (and often without complete data). This leads to the need for stricter domestic measures in exporting countries as they have often not made adequate NDFs (Roe et al., 2002). So, the importing countries are making decisions that have no real effect on them, while exporting countries are burdened with a loss of income from the trade, and a need for new measures to monitor the trade. Clearly, this places the Global South at a disadvantage, as the flow of trade tends to move from the Global South to the Global North.

In addition to being disadvantaged during CITES decision-making processes, Roe et al. (2002, p. 43) highlight the fact that increased controls on international trade tend to have negative consequences for those dependent on harvesting species for livelihood security. The authors provide an interesting example of the Goffin's Cockatoo (also known as the Tanimbar corella) being moved from Appendix II to Appendix I, resulting in an international trade ban in 1992. The bird species was considered an agricultural pest in the Indonesian Tanimbar islands, as it would damage farmer's maize crops. Before being listed on Appendix I, a Chinese family employed people in the villages to trap the birds during the maize harvest season in March and April. These trappers made a substantial amount of money catching the birds considering the scarce economic opportunities in the region. The local farmers whose crops incurred damages from the cockatoo birds would make up for this loss by trading the trapped birds internationally. However, since the Appendix I listing, this important source of income generation has been lost. Now, instead of trading the birds internationally, the cockatoos are simply killed. Roe et al. (2002) state that "information indicates that the trade in Goffin's Cockatoos did not present a threat to the species at the time the CITES Appendix I proposal was put forward, and further, that if there had been a conservation concern, banning trade was not necessarily the best way to address it" (p.45). The birds are continuing to be killed by local farmers despite the export ban, signifying that there are other factors at play besides market forces. In this case, the CITES Appendix I listing for the Cockatoos was a lose-lose scenario, in that the

¹² Appendix I entails an almost complete trade ban, with trade being permitted only in exceptional circumstances.

local communities lost their compensation from the trade, and the species itself continued to decline despite the trade ban. This demonstrates one reason for why a trade ban is often an ineffective conservation strategy.

Other scholars have highlighted the ways that CITES intersects with North-South power dynamics (Challender, Harrop, & MacMillan, 2015; Kievit, 2000). Kievit (2000) states that CITES, as it was originally conceived “took its lead from Western, protectionist approaches to wildlife [management] and did not allow a role for sustainable use in conservation” (p.89). Furthermore, Duffy (2013) explains that there are “clear inequalities between North and South in terms of access to resources and power... Southern actors do not join global governance arrangements from an equal starting point” (p.224). This means that from the outset, countries in the Global South were disadvantaged with regard to CITES legislation as it is a Global North institution. Duffy (2013) states that CITES terms were created to favour the private interests of Global North conservation NGOs, and criticizes it calling it a “one-size-fits-all” policy (p.228). Like Roe et al. (2002), Duffy explains that CITES is one-sided, as dominant countries can create policies for species that they do not have to manage within their own borders. Throughout her paper she focuses on the power dynamics involved in the ivory trade to reveal that conservation NGOs are more than mere lobbyists. Rather, Duffy clarifies that NGOs are actually engaged in governing, as they are made up of experts who inform the decision-making process (Duffy, 2013). Mirroring the case of the Cockatoo in Indonesia, CITES implemented an ivory ban in 1989 without considering the interests of the local rural communities who rely on ivory for income generation. This ban resulted in an increase in elephant populations in South Africa, which led to increased human-wildlife conflicts. In turn, ivory began to stockpile in South Africa due to culling operations by locals protecting their landscape, and a resource that could benefit the community’s livelihood was being left to waste due to “an ill-informed international decision” at CITES (p.234).

The above-mentioned cases illustrate the fact that CITES does not provide adequate support to those who face livelihood impacts. Baker-Medard and Faber (2020) touch on this by communicating that the Global South is under-resourced, and therefore lack management plans for species they export. The authors go on to state that international measures like CMS and CITES act as top-down approaches, in that they offer a framework for monitoring shark fishing, yet they do not support countries who lack enforcement capacity and data (Baker-Medard & Faber, 2020). This demonstrates that

countries in the Global South face real and challenging barriers in terms of both participating and implementing CITES legislation. This can be seen through the case of the scalloped hammerhead, specifically. The species tends to occur in the Global South. Yet, with CITES measures being designed and governed by Global North countries, many of the requirements of CITES are unattainable for Global South countries. For this reason, exporting countries are unable to participate meaningfully in CITES processes, and the scalloped hammerhead pays the costs.

Similarly, Mathur (2009) explains that Parties are often unable to complete the key requirements of CITES such as NDFs as they lack funding, making it difficult to monitor species' statuses and exploitation rates. Because of this, she later states that Parties should support CITES implementation by pledging resources, funds, and expertise when necessary. Providing the example of *Harpagophytum* spp. (devil's claw), Mathur (2009) outlines the livelihood debate surrounding the species, explaining that the plant species was proposed for listing in 2000 (CoP11), but was later withdrawn. The proposal stirred up a debate regarding the livelihood of devil's claw harvesters in poorer communities who depend on the species for income. Following this debate, in 2004 the livelihood topic returned at CoP13, and Resolution Conf.8.3 was amended, stating: "Recognizing that implementing CITES-listing decisions should take into account potential impacts on the livelihoods of the poor" (Mathur, 2009, p.295). Mathur (2009) critiques this clause, stressing that the new paragraph simply recognizes that listing decisions have livelihood impacts on the poor, "without enumerating any further" (p.295). Furthermore, Mather discusses the fact that in 2007, at CoP14, the budget and Strategic Vision for 2008-2013 were up for adoption. She explains that an attempt was made to include livelihoods and wellbeing in the Strategic Vision, yet gradually this was revised and the issues lost their meaning as they became "diluted" over time. The author states "it seems that Parties are unwilling to commit or take a strong stance on how to incorporate livelihood implications" (p.295). This indicates the difficulty in grappling with livelihood impacts under CITES, as subtle attempts have been made with no effective outcomes.

In addition to being unable to adequately implement the Convention due to a lack of resources and support from the Global North, Abensperg-Traun (2009) explains that there are virtually no incentives or benefits for rural communities to implement wildlife conservation measures. With the Global South having the highest biodiversity levels, and in turn, the majority of CITES-listed species, they face greater pressures from the

Convention. This, coupled with the fact that many countries in the Global South have few resources, makes it difficult for such countries to develop and enforce policies pertaining to CITES (Abensperg-Traun, 2009). It cannot be expected that CITES implementation would be their primary goal when they face other more serious challenges daily.

The above-mentioned limitations of CITES coincide with the weaknesses discussed during my expert interviews. Numerous interviewees mentioned the same challenges, in that countries in the Global South are unfairly disadvantaged in CITES-decision-making processes. One interviewee explained that CITES decisions are dominated by politics and influence, and highlighted the fact that some countries will go so far as using international aid as a bargaining tool (Expert 6, personal communication, 2021). Another interviewee explained that some countries will offer up hundreds of thousands of dollars for implementation activities to get species listed (Expert 10, personal communication, 2021). Additionally, as discussed in the South African ivory example (Duffy, 2013), CITES measures do not necessarily halt the decline of species when the motivations are not trade-related. In the case of the South African elephant, ivory began to stockpile when the trade ban went into effect (see pages 55-56).

This same scenario can be seen for the scalloped hammerhead. One interviewee expressed to me that despite the international trade ban on scalloped hammerhead products in Indonesia, the species can still be caught legally, and is typically consumed for its meat. Because of this, some locals have decided to stockpile scalloped hammerhead products for later in the event that the export ban lifts (Expert 9, personal communication, 2021). This reflects what many scholars stated in the literature, in that trade bans and limits on export quotas via CITES do not necessarily translate into fewer mortalities for certain species. One expert conveyed to me that “there’s a theory of change out there that if we stop the international trade, the fishing will stop too... [but that’s] predicated on the idea that the fishing is purely profit-motivated, which isn’t entirely the case” (Expert 9, personal communication, 2021). With local island nations in the Global South relying on scalloped hammerheads for food security and income generation, they do not have the option to simply stop fishing. One scholar, Abensperg-Traun (2009) summarizes the need for CITES to consider livelihood impacts, as he explains that the use of species by rural communities is not a choice, but rather it is an imperative. For this reason, he asserts “species conservation can thus only be successful if it considers the elementary needs of the local rural communities in developing countries, which are the

majority” (p.950). This reflects what numerous experts stated during my interview process, with one interviewee explaining that CITES has now begun to recognize this, and is starting to focus on working with fishers to conserve their species in a way that works for both parties (Expert 4, personal communication, 2021). She explained that this area still needs a lot of work, but that many global conservation organizations have started to put funding towards working with local communities to ensure that fishing is being done sustainably (Expert 4, personal communication, 2021).

Another theme brought up during the interviews that reflects what many other scholars have highlighted is the fact that CITES is a Global North institution, designed by and for the benefit of those specific countries. One interviewee expressed that in addition to the Global South lacking resources, monitoring capacity, funding, species expertise, and having far more biodiversity, the official languages of CITES are French, Spanish, and English (Expert 10, personal communication, 2021). This means that the information that Parties should be referring to within CITES legislation is both published and produced in these languages, placing countries in Southeast Asia and other regions at an even greater disadvantage with regard to both the decision-making process, and implementation.

Evidently, my research confirms the arguments in the literature pertaining to CITES and countries in the Global South. This demonstrates that while the conventional narratives of wildlife trade and species loss place blame on locals in these specific countries, the responsibility should land on the countries who designed these institutions and benefit most from them. As mentioned, trade flows largely move from Global South to Global North countries. With CITES being a Global North institution, countries in those regions should offer aid to Parties with implementation barriers in the form of resources and funding. Recommendations are discussed further in the conclusion.

3.3. Tragedy of the Commodity

In this section I discuss how the scalloped hammerhead resembles a tragedy of the commodity – where it is experiencing depletion in large part due to its high commercial value, which CITES not only does little to curb, but arguably further solidifies. This section draws on three major arguments. First, using Telesca’s (2020) case study of the bluefin tuna, I discuss the way that management regimes like ICCAT (the International

Commission for the Conservation of Atlantic Tunas) and CITES operate on the licensing of species commodification. These organizations can result in declines (rather than protection) for economically valuable species, as profit is sought above all else. Telesca (2020) argues that bluefin tuna are overexploited due to commodification by management regimes like ICCAT, and for this reason the species can be considered a “tragedy of the commodity.” I extend this argument to the scalloped hammerhead and its management under CITES. Second, I discuss the way that fisheries managers reduce complex beings down to standardized biological assets in order to allow for easier management to support the international trade. Bureaucrats and scientists attempt to place species into easily manageable boxes by assigning them numbers and units. CITES manages the scalloped hammerhead (and other species) similarly. Management like this tends to fail, as species are dynamic, social creatures whose biology is in constant flux. This leads to the third major argument in this section, which is that sharks (and nature more broadly) are fictitious commodities that are never entirely controllable. Capitalists seek to continually maximize profit from commodity production, but fictitious commodities’ production is not under perfect capitalist control. Nature operates by its own biological rhythm, and it is in this case, finite. This is why organizations (like CITES) that attempt to regulate the buy, sell, and trade of nature continually fail to manage species by their own agendas. Using these related points, this section ultimately argues that capitalism depletes non-human nature.

One important theme can be identified through this research: the glaring difference between managing a commercially valuable species, the scalloped hammerhead, versus a lesser commercially valuable species, the white shark. In addition to being a key component of subsistence communities, the scalloped hammerhead is a clear example of a species that has been overexploited due to the very high commercial value of its fins. Subsistence fisheries and commercial fisheries are both deeply implicated in the species’ decline. And, while both fisheries play a significant role in different populations’ declines, it is unclear whether one poses a greater threat than the other (when populations are taken together as one). As mentioned in the introduction (section 1.2), overutilization by industrial/commercial fisheries played an important role in nearly all of the separate scalloped hammerhead populations’ declines (Miller et al., 2014). It is clear, then, that the species’ high economic value is a main factor that challenges CITES’ ability to manage it. This challenge is not limited to the scalloped hammerhead. Likewise, the bluefin tuna has been commodified and exploited for its meat, as it is considered to be a highly sought-

after delicacy for the sushi industry (Telesca, 2020). Both species are now threatened with extinction because of their commodification. Drawing on the case of the bluefin tuna, this section outlines how species' commodification has led to overexploitation and extreme biodiversity loss.

In discussing the commodification of the bluefin tuna, Telesca (2020) draws on the concept of the “tragedy of the commodity,” a flip on the famous tragedy of the commons argument. The tragedy of the commons argument holds that individuals are always out to “maximize their short-term gain” by “overexploiting the unpriced, uncommodified” commons (Bavington, 2010, p.9). Garrett Hardin (1968) introduced the famous argument in 1968 to explain that common-pool resources should be privatized and/or regulated by the state, as individuals always act in their own self-interest resulting in over-consumption of the commons. He asserted “freedom in the commons brings ruin to all” (Hardin, 1998, p.1). Hardin thought that by privatizing common pool ‘resources’ (including living, breathing animals), making them individual or state property, people would be unable to take from these areas freely (Bavington, 2010; Telesca, 2020; Vettese, 2020).¹³ However, in many cases these new regulations have resulted in intensified exploitation. Many scholars have therefore contested Hardin’s argument, discussing extinction as the outcome of the very process for which Hardin advocates: privatization of the commons (Bavington, 2010; Campbell, 2007; Dawson, 2016; Telesca, 2020; Vettese, 2020).

The Atlantic bluefin tuna has declined rapidly due to managed overfishing, as well as illegal and unregulated fishing (Telesca, 2020). According to Telesca (2020, p.xiv), mere decades ago bluefin tuna fish were massive in size (measuring around twelve feet in length), and they swam in large schools to make their yearly migrations across the sea. Now, the bluefin tuna is a critically endangered species, with their population continuing to decline (IUCN, 2019). Drawing on this case, Telesca (2020) flips the “tragedy of the commons” argument on its head and diagnoses the collapse of the bluefin tuna as a “tragedy of the commodity.” The tragedy of the commodity holds that commodification drives overexploitation. This is because commodification involves turning nature into a commodity that can be bought and sold for profit. With the ability to accumulate profit, nature then becomes overexploited. In other words, profit is sought above all else, and

¹³ It is worth noting that Hardin has been critiqued for this claim, as people did not take freely from the commons. Rather, people who used commons or were involved in these systems had relations of obligation to each other and non-human nature.

the costs to nature are externalized. This tragedy of the commodity can therefore be extended through organizations like CITES (and the International Commission for the Conservation of Atlantic Tunas (ICCAT), as outlined below) that attempt to manage species as commodities via their trade.

The International Commission for the Conservation of Atlantic Tunas (ICCAT) is an intergovernmental organization comprised of 52 Contracting Parties intended to conserve and manage tuna and tuna-like species in the Atlantic (ICCAT, 2021). Like CITES, ICCAT has been used as a tool to authorize economic growth by permitting nations to exploit tuna and tuna-like species. This growth has been achieved through both regulation and privatization of the sea. In order to alleviate the “tragedy of the commons” (in this case, unregulated overfishing), it was agreed that regulation and privatization was needed. For this reason, Exclusive Economic Zones (EEZs) were created. Telesca (2020) states that “EEZs allowed nation-states to claim for the first time in world history one-third of the ocean as their national property” (p.81-82). This meant that a state could claim exclusive rights to the ocean and its resources 200 nautical miles off the countries’ coast. This application of property rights meant that any species within a nation-state’s EEZ turned into “stocks” to be managed by setting “catch quotas” for different countries (p.99). With the high price tags that bluefin tuna offer, this privatization resulted in further commodification and exploitation for their species.

The commodification of species under management regimes like CITES and ICCAT operates on standardized quota systems that treat nature as easily-manageable machines. Through the use of quota systems, these organizations ultimately reduce complex species down to standardized biological assets. Scholars such as Bavington (2010) and Telesca (2020) have discussed the failures of management regimes with a specific focus on fisheries management. In his book *Managed Annihilation: An Unnatural History of the Newfoundland Cod Collapse*, Bavington (2010) questions the usefulness of management regimes as he highlights the way that fisheries management limits our “ability to imagine alternative forms of organizing relationships with nature” (p.8). Bavington explains that management regimes fail to consider the actual lived experiences of species living in a dynamic and changing world (p.46). Species are managed in terms of population statistics, rather than considering them as complex individuals. By focusing on fish (and other species) in terms of population data, they are reduced from living sentient beings, down to standardized biological assets to be managed, making it easier

to buy, sell, and trade species like cod, bluefin tuna, the scalloped hammerhead and the white shark internationally.

Like Bavington, Telesca (2020) critiques ICCAT for its use of fisheries management to manage bluefin tuna “stocks,” which has ultimately resulted in their near extinction. Telesca chronicles the beauty and charisma of the bluefin tuna, offering picturesque descriptions of the species gliding through the water in large schools. She then contrasts these descriptions with the way the species are reduced down from a social creature to a simplified commodity to be traded at the international scale. Telesca makes it clear that ICCAT member states were more interested in the profits that could be accrued through the commodification and trade of tuna, than the animal welfare or survival of the species. She asserts “ICCAT member states have faithfully executed the task assigned them by international law: to fish as hard as possible so that national economies can grow” (p.4). To elaborate, she later she goes on to state that

“fisheries scientists were not the guardians of the sea restraining the industrial expansion...the science produced... was grafted onto a conception of marine conservation intent on securing the inventory of fish for the growth of export markets, not to ensure an ocean full of giant bluefin tuna and other creatures of the sea” (p.157).

In both the case of the bluefin tuna, and the cod fishery collapse, fisheries management turned living beings into commodities to be managed through catch quotas so that countries could profit off their trade. Management regimes that operate on the licensing of commodification accordingly reduce complex, sentient beings to nothing more than numbers to be controlled by humans (Telesca, 2020). Thus, Telesca states that commodification is a key driver of bluefin tuna declines. Bluefin tuna do not fit into an easily manageable box, as they are dynamic, social creatures whose biology is in constant flux. Despite this, scientists and bureaucrats continue to manage tuna in this standardized machine-like way, assigning the species various numbers and units, which ultimately has resulted in their demise. This type of management is similar to how CITES manages the scalloped hammerhead and white shark (along with other CITES-listed species). Just like fisheries management, CITES operates on the licensing of commodification. And, just like cod and bluefin tuna, the scalloped hammerhead has experienced a tragedy of the commodity because of this type of management. As seen in Chapter 2, shark species are reduced down to numbers on a chart on the CITES database. Parties are issued export

permits based on NDFs in order to keep track of their quotas. Rather than attempting to regulate the trade in any meaningful way for CITES-listed species (i.e. through demand management or advocating for animal welfare), CITES issues permits to trade endangered and threatened species for profit, consequently leading to their declines.

Despite significant efforts by regimes like CITES and ICCAT to manage species for trade on the international market, species are never entirely controllable, as they are “fictitious commodities” (Polanyi, 1944). Fictitious commodities, including labor, land (i.e. nature), and money are not originally “produced for sale on the market” (Polanyi 1944, p.79). Despite being bought and sold, labour, land and money are not produced in the first instance for sale. They operate by their own independent dynamics apart from the market system. For this reason, they are never fully able to be transformed into perfect commodities (Polanyi, 1944). This is the case for species like the white shark and scalloped hammerhead too. Sharks do not reproduce themselves in order to abide by market demands. They operate by their own unique biological rhythm. Their production as commodities is not perfect under capitalist control. For this reason, organizations that attempt to regulate the purchase, sale, and trade of nature via standardization processes, like ICCAT and CITES, continually fail to manage species by their own agendas.

Returning to Telesca’s discussion of the bluefin tuna, while allegedly attempting to “manage” tuna populations, ICCAT actually promoted overfishing. This is because the entire goal of conservation is to preserve “stocks” to ensure the continuity of economic expansion into the future (Telesca, 2014). ICCAT is committed to securing tuna in order to grow export markets, not to preserving the long-term continuity of the endangered bluefin tuna (Telesca, 2020). Thus, Telesca (2020) states that “regulatory regimes in the name of marine conservation have helped to realize the sixth mass extinction now under way in the new planetary epoch termed the Anthropocene” (p.xiv). The commodification of living species, such as the bluefin tuna and the scalloped hammerhead, is directly caused by capitalist governance structures, as capitalism depends on the “ongoing transformation of socio-natures for profit” (Garlick & Symons, 2020, p.300). Like ICCAT and the bluefin tuna, CITES can be seen as a conservation regime that has resulted in further commodification for the scalloped hammerhead. With scalloped hammerhead populations in such a critical state, arguably *any* trade endangers them further. This, coupled with the fact that local communities in lower income countries need to rely on the species for subsistence uses, creates further problems for their protection. Thus, CITES

has likely helped push the scalloped hammerhead to the brink of extinction. And while Parties to the Convention are only supposed to permit trade when it is not detrimental to the survival of a species, capitalist countries repeatedly neglect the extinction crisis in order to accumulate capital. Consequently, many countries end up licensing unsustainable trade.

Throughout the interviews, one of the most commonly discussed explanations for why there are differences in protection between the white shark and scalloped hammerhead was the fact that commercial interests were at play for the scalloped hammerhead. The scalloped hammerhead offers high market value, while the white shark does not. It is for this reason that Parties continue to trade the species, despite the unsustainable nature of the trade. Capitalist expansion invariably trumps environmental and biodiversity goals. The two cannot be realized at once, as capitalists achieve monetary gain at the expense of the environment. The differences in protection for the two shark species can thus be attributed to the fact that capitalism is incompatible with sustainability (Parenti, 1997). The white shark offers little to no financial incentive to capitalists, which is why its populations have begun stabilizing. On the other hand, the scalloped hammerhead offers high economic value, which is why it is being commodified and traded at unsustainable levels. As mentioned by Nattrass (2021), “commodification is an essential feature of capitalist expansion” (p.97). With capitalist commodification being the leading cause of the environmental crisis, it seems ironic that CITES and other international trade regimes try to use commodification as a mode of protection. These organizations attempt to regulate trade through the very thing that has led to its tragedy: commodification. With the high commercial value that some species offer, Parties have a vested interest in the trade. For this reason, it would be more effective to work towards ending demand for the wildlife trade, rather than “regulating” the trade through authorizing commodification.

Other scholars have highlighted that capitalism often contradicts itself (Dawson, 2016; Longo, Clausen, & Clark, 2015; Parenti, 1997). It continuously destroys the very thing it needs in order to obtain capital accumulation: nature. Parenti (1997) explains:

With its never-ending emphasis on exploitation and expansion, and its indifference to environmental costs, capitalism appears determined to stand outside nature. The essence of capitalism, its *raison d’être*, is to convert nature into commodities and commodities into capital, transforming

the living earth into inanimate wealth. This capital accumulation process wrecks havoc upon the global ecological system. It treats the planet's life-sustaining resources (arable land, groundwater, wetlands, forests, fisheries, ocean beds, rivers, air quality) as dispensable ingredients of limitless supply, to be consumed or toxified at will. Consequently, the support systems of the entire ecosphere – the planet's thin skin of fresh air, water, and top soil – are at risk (p.154-155).

Thus, rather than individuals exploiting the commons for their personal gain at the local level (refer to tragedy of the commons argument), wealthy nations capitalize on these commons. Nation-states are the largest capitalist enterprises around, and they often use environmental legislation (like CITES) to their advantage to further economic development goals (M'Gonigle & Takeda, 2013). This goes hand in hand with the fact that CITES is a Global North institution that works in favour of these countries. Wealthy countries are able to benefit from CITES by plucking resources (like the scalloped hammerhead) from the Global South, without having to experience any of the costs associated with this exploitation. Protecting the environment is virtually never prioritized when economic development is an option, even under the guise of environmental policies like CITES. As can be seen through the case of CITES, the capitalist framework (i.e. commodification) in which environmental problems (such as biodiversity loss) arise is also the one that is often used to attempt to resolve them. In doing so, the problem – in this case, scalloped hammerhead declines – typically worsens.

As is clear, while CITES ostensibly intends to protect species of capitalist interest, the regulatory regime has actually permitted the trade of certain species, resulting in further exploitation by capitalist nations. This can be seen through the case of the scalloped hammerhead. The top importer of scalloped hammerhead products via CITES was the United States. This is also verified by Liew et al. (2021), who explain that around “421,696,531 wild-caught (CITES-listed) animals were traded between 1998 and 2018,” and that the US was the leading importer for this trade, while the top exporters were Indonesia, Jamaica, and Honduras (p.11). Given the demand-driven nature of wildlife trade, the US is where the shark trade's engine lies. Thus, while conventional narratives of the wildlife trade and environmental destruction place blame on local proximate forces, such as individuals in the Global South, this blame is misplaced. Biodiversity loss driven by the commodification of nature is a broader problem endemic to capitalist social relations. Using CITES, Global North countries are able to exploit natural resources from

the Global South without facing any consequences within their own borders. For this reason, environmental destruction and biodiversity loss should be understood as a demand problem of the Global North rather than a problem of the Global South.

It is important to be clear that with the case of the scalloped hammerhead, and other species that both support the livelihoods of local communities and are commercially valuable, there is not one simple explanation. While the underlying root driver of species loss is capitalism and species commodification, there are other important factors driving this loss including subsistence hunting and fishing. Species are not being lost solely to commodification. They are also used to support survival measures and food security for communities who must rely on them. Additionally, species are not only used as a means for capital accumulation in wealthy nations. They are also sold locally to generate income for individuals and communities at a small-scale in order to earn a living. Hence, with numerous variables at play, species loss is not being universally driven by one force. However, market demand exists predominantly in Global North countries. In the case of the scalloped hammerhead, even when its fins are sold at the local level, they often find their way into the international trade and their profits are materialized in wealthy nations. Evidence suggests that CITES' measures for the scalloped hammerhead have thus far been ineffective due to compliance issues (interviews). With the high profitability of scalloped hammerhead products, the illegal trade continues to thrive and products are traded despite their unsustainability. It is unlikely that CITES compliance will be strengthened with such high demand for scalloped hammerhead products. For this reason, in the concluding chapter I suggest that Parties focus on demand management in order to grapple with scalloped hammerhead declines.

Many scholars of the extinction crisis have called for a “radical political transformation” (Dawson, 2016, p.17; Mitchell, 2020). While it is clear that capitalist development is the root driver of the extinction crisis, a radical change of the system seems far-reaching to most. Dawson (2016) expands on this by saying:

It has been said that it is easier to imagine the end of the world than to envisage the overthrow of capitalism. I would respond to this aphorism from dark times that it is easier to imagine the end of capitalism than it is to articulate any other genuine solution to the extinction crisis. If capitalism is the ultimate cause and prime engine of the extinction crisis, surely, we can

only conclude that we may find hope in challenging its baleful power with all means at our disposal (p.99).

This quote by Dawson coincides with what others have mentioned, in that it does not make sense that commodification and capitalism be considered both the problem *and* solution to the extinction crisis, as is the case under CITES. It is the devaluation of non-human life underpinning the way humans interact with the environment (and thus, underpinning management regimes) that leads to extinction. For this reason, the best solution would be for present political systems to be replaced or radically transformed. As put by Telesca (2020), in order to resolve the extinction crisis, the “predatory and exterminatory regime of value” that current capitalist systems are built on must be broken down (p.34). The extinction crisis cannot be resolved within the same capitalist culture that caused it (Dawson, 2016, p.17). However, a radical change of the system often seems impractical and unimaginable in our current mode of existence. For this reason, to work towards a quicker resolution for the scalloped hammerhead under CITES I suggest a focus on demand management. This is discussed further in the conclusion.

Chapter 4.

Conclusion

4.1. CITES limitations and recommendations

The focus of this thesis was to understand how the white shark and scalloped hammerhead are being managed at the transboundary and international level by looking to the main international organization in place to protect these sharks: CITES. With the extinction crisis well under way, it is important that central organizations like CITES are attempting to intervene and slow species loss, or even recover species, rather than allow loss to spiral unchecked. The findings of this research and the broader literatures suggest that CITES faces significant challenges in doing so. This section draws on some of the Convention's key limitations and then offers related suggestions in hopes of strengthening CITES as an international organization.

While CITES is strong in selected areas, such as when the RST process gets prompted, there are several limitations to the Convention that have been highlighted throughout this study. One of the main limitations of CITES is that it is comprised of different member States that willingly sign up to the Convention, and each of these Parties has different motivations and interests at play. Nations with more political power and funding tend to have greater influence over listing decisions and terms. This is because CITES is a Global North institution made by and for the benefit of the wealthy and powerful nations. As outlined in sections 3.2 and 3.3, countries in the Global North are often the greatest importers of CITES-licensed trade. Not only this, but also the entire institution was designed by powerful actors in these countries, making implementation easy and compatible with their customs. On the other hand, the majority of the world's biodiversity exists within countries in the Global South. For this reason, Global South countries are disadvantaged with regard to CITES implementation and decision-making processes. Without adequate resources, monitoring capacity, funding, species expertise, and with CITES documents predominantly being in English, French, and Spanish, many Global South countries are unable to participate meaningfully in CITES processes. This goes hand-in-hand with the fact that CITES does not provide adequate support to those who face livelihood impacts. With many lower income countries relying on wildlife for survival

purposes, CITES listing decisions can have a detrimental impact on their livelihood (as outlined in section 3.2). While CITES has made surface-level attempts to include the issue of livelihood impacts into their scope, no real changes have been made. The inability to provide support to Global South countries (i.e. the ones that supply the global wildlife trade), can lead to low compliance and the unsustainable harvesting of species like the scalloped hammerhead.

The second major limitation goes hand-in-hand with the above-mentioned discrepancies between Global North and South power dynamics pertaining to CITES. Due to the many challenges' countries in the Global South face, such as a lack of resources, data, and funding, Parties are often unable to complete NDFs for CITES-listed species. Numerous interviewees highlighted the fact that the NDF process was relatively weak as Parties are not required to be transparent about how they do their NDFs, and they are not required to post the completed documents publicly for others to see. Some Parties do voluntarily submit their NDFs for public posting, but this is not often the case. Being hidden from the public not only means that they cannot be critiqued or reviewed by other experts, but it means that Parties that may need extra help completing their NDFs cannot take notes from other Parties that have completed successful NDFs. As mentioned by Mathur (2009), Parties are often unable to complete the key requirements of CITES, such as NDFs, because they lack funding, making it challenging to monitor species statuses and exploitation rates. Furthermore, when NDFs are getting done, several interviewees mentioned that they are being done poorly with little significance for the species (see page 44 for the seahorse story). And, when completing NDFs becomes too challenging, some Parties will implement a trade ban instead (Expert 10, personal communication, 2021). This only creates further issues, as was outlined in section 3.2 with the case of the Goffin's Cockatoo in the Indonesian Tanimbar islands, and the case of the ivory trade ban in South Africa. It is clear, then, that the NDF process needs to undergo some serious improvements if CITES is to be enforced properly by all Parties.

Finally, the third major limitation of CITES is that the entire framework is built on the licensing of species commodification. As discussed in section 3.3, it does not make sense that commodification would be considered both the problem *and* solution to species loss. With such high market demand for so many endangered species, like the scalloped hammerhead, it is no wonder CITES struggles to manage its' species. However, Parties to the Convention appear to be permitting trade even when it is detrimental to the survival

of the species. This is because capitalist countries have a vested interest in the wildlife trade, as they are able to profit from it without seeing any of the costs. Biodiversity goals under regulatory regimes like CITES are then neglected, as economic growth is prioritized. Despite the conflicting nature of CITES attempting to “protect” species that it inherently relies on in order to maintain itself, I suggest two key recommendations to strengthen the Convention. While I agree with scholars who have expressed the need for a radical change of the political system, the suggestions I make are the next-best alternative solutions.

The first major recommendation I propose is for CITES to require countries in the Global North to provide funding and resources to those in the Global South. Throughout the interviews, various experts told me that several conservation organizations are realizing that there is a need to support countries in the Global South with their implementation of CITES measures. Because of this, many NGOs are starting to fund research initiatives and beginning to work in local communities to help them with CITES processes (Expert 4, personal communication, 2021). Accordingly, it seems as though some Parties have started to make attempts to aid countries in the Global South with developing and implementing their CITES measures. However, I suggest that Global North countries should offer further funding to those in the Global South by way of paying into a fund, and then having CITES distribute the wealth among lower-income countries. I propose the use of a fund as it eliminates the risk of further power imbalances among Global North-South countries, as the capital could not be used in a negative way (i.e. to influence other countries in decision-making processes). With CITES decision-making being driven by those in the North, and much of the profit from the trade materializing in those nations, I believe Global North countries have an obligation to take on more responsibility by offering significantly more funding to those in the South. Clearly a lack of resources is one of the biggest challenges that countries in the South face, along with several added pressures. With greater funding, I believe they would be able to solicit more local participation, implement improved monitoring techniques, gather better data on CITES-listed species, and improve enforcement mechanisms. Additionally, the added capital would be able to support training programs to ensure authorities are able to identify between look-alike species. I anticipate that increased funding would help countries in the Global South with their enforcement of CITES policies in many capacities.

The second recommendation that I propose for the improvement of CITES is a key focus on demand management. With CITES operating on the commodification of species, commercially valuable species like the scalloped hammerhead become overexploited as nations overlook the unsustainability of the trade. This problem is inherent in capitalism, as capitalists are reliant on the ongoing transformation of nature into profit. Some may suggest a trade ban for species of high commercial value, but this often has unintended consequences including a potential increase in black market or illegal trade, and negative socio-economic impacts at the local level for those reliant on particular species for subsistence. For this reason, a more viable solution would be to work on reducing the demand for species like the scalloped hammerhead. This recommendation stems from a suggestion offered by Collard (2020), as she responds to the exotic pet trade, a major component of the international wildlife trade. According to Collard (2020), in 2016 CITES “adopted a decision to encourage its parties to provide the financial and technical support necessary to promote and facilitate the implementation of demand-reduction strategies” (p.137). When CITES Parties reported back on how they implemented this new decision, it was clear that China and Vietnam had made real gestures towards reducing demand for ivory and rhino horn through the use of workshops and campaigns (Collard, 2020). On the other hand, the US reported that it had worked on training initiatives to improve law enforcement at its borders, while also offering “funding for demand reduction in other countries; and raising awareness among American consumers travelling abroad” (p.137). Thus, despite being one of the world’s top importing countries for wildlife products, the US focused its demand management strategies on other regions. If there is to be any meaningful decline in the commodification of wildlife species like the scalloped hammerhead, it needs to start in places like the US.

Furthermore, Nijman (2010) explains that the demand for wildlife has increased due to its link to economic growth. As is clear from the case of the scalloped hammerhead, this demand has put a strain on wildlife populations. In discussing the rhino horn trade, Lunstrum and Giva (2020) also call for a multi-faceted response to the trade, with one of their suggested responses including the reduction of “user-end demand” (p.1). Lunstrum and Giva explain that the market demand for rhino horn stems largely from the wealthier parts of Asia. The authors clarify that the trade is driven by economic inequality, as there are substantial economic differences between the supply and demand points of the trade. This coincides with the fact that Global North countries are able to pluck resources from

the Global South to in order to capitalize on species commodification, without having to face any consequences. Lunstrum and Giva (2020) state that while reducing demand may not completely abolish the economic differences between the two counterparts, it will remove the capital from the supply chain, which will reduce incentives to hunt and fish. This will result in fewer material gains in Global North countries. In other words, the authors believe there is a potential for demand management to aid in reducing economic inequality between the Global North and South, which could ultimately improve some of the above-mentioned limitations of CITES (power dynamics, ability to complete NDFs, etc.). Importantly, Lunstrum and Giva (2020) emphasize the need for demand reduction approaches to be culturally sensitive and coordinated within user-end regions rather than imposed by external parties. I agree with the authors, as it is clear that top-down enforcement within CITES has come with various challenges. In order to be effective, demand management strategies should be pursued as a bottom-up approach, working with nations at the local level within their own borders.

Species loss and declining wild animal abundance are occurring at unprecedented levels globally. It is important that international environmental governance regimes like CITES are working to combat the overexploitation of endangered species, rather than endorsing it. The scalloped hammerhead has been managed internationally by CITES under Appendix II since 2014, yet it is still experiencing rapid declines. Conversely, the white shark has been managed under CITES Appendix II since 2005, and has made steady recoveries. This research has demonstrated that different protections are afforded to different species based on a variety of factors, one of which is their commercial value. This research has also demonstrated that CITES is limited in several capacities, which is why I recommend a focus on demand management, as well as greater funding for the Global South. Utilizing data queries, expert interviews, and content analyses, this study has revealed the many challenges involved with the recovery of scalloped hammerhead populations. As top predators in the ocean, their survival is essential to the functioning of ocean ecosystems. Thus, it is imperative that CITES improves upon its limitations, as numerous species, and local communities that rely on them for survival, depend on it.

4.2. Study limitations and future directions

As with any research study, this thesis has its limits. A key limiting factor in this study was the inconsistent nature of the transactions recorded on the CITES database.

My original goal was to quantify the number of various shark species traded each year, But, as outlined in Chapter 2 (section 2.2.3: limitations of the database query), the database reports transactions in various units and the term “specimen” represents a broad range of entities, meaning it was impossible to say how many sharks made up each transaction. An additional complicating factor was the difference between importer and exporter reported quantities within the same transaction. The limitations of the database challenge CITES ability to protect species like the scalloped hammerhead and white shark, as it is impossible to quantify real numbers of species in trade. These limitations should be addressed by CITES so that better management of CITES-listed species can be achieved. I suggest the removal of the term “specimens” altogether, as Parties would be forced to disclose the exact shark product in trade. I also suggest the use of standardized units, so that CITES officials and researchers can (roughly) calculate the number of CITES-listed species trade. As for the discrepancies in importer and exporter reported quantities within transactions, I suggest better monitoring. When a discrepancy is exceptionally large, I propose that CITES officials investigate the transaction further.

This study was also limited in its scope. As mentioned briefly at the beginning of Chapter 3, the challenges involved with CITES’ governance of the global wildlife trade stem from a longer history of colonial and imperial relations. CITES attempts to manage the trade of species in a global context that suffers from a maldistribution of wealth and power. These inequalities that are inherent to the global wildlife trade were forged on colonial and imperial relations many years ago, and are amplified through the deepening of these relations under CITES today. While I outline the power dynamics that take place between Global North and South countries under CITES, I do not historicize these inequalities. I was unable to expand on the colonial underpinnings of CITES (and capitalist governance more broadly) as it would have required a different approach, and ultimately would have resulted in a different thesis.

This thesis is unique in that it is one of the only studies specifically focused on the white shark and scalloped hammerhead from a political ecological perspective. There is a need for further work in this realm. While it is clear that scalloped hammerhead declines have steepened in recent years (Nance et al., 2011), it is unclear whether this is the result of a change in threat levels over time. It is clear from this study that the commercial trade and subsistence fisheries play a large role in scalloped hammerhead declines. But are these fisheries relatively new? Have local communities in Global South countries always

relied on scalloped hammerheads for survival purposes? When did this begin, and why? Has there been a growth in commercial use for the species recently? These are questions that are out of the scope of this research study. However, future research is needed in order to better understand the root-drivers of decline for the species. Specifically, there is a need for political ecology-informed work that historicizes and seeks to understand the root drivers of the scalloped hammerhead trade.

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