

Mozambique's Battle to Protect its Marine Resources

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Mozambique, a former Portuguese colony, boasts one of the richest and diverse collections of marine species along the African coast. The nation is plagued by a seriously indebted economy where 70 percent of its population lives below the poverty line.¹ With such contrasting national characteristics, it should be no surprise that Mozambique's coastal waters are being pillaged by international profiteers capitalizing upon the valuable and unsupervised resources. These destructive practices are severely depriving Mozambique's fragile economy of tens of millions of dollars each year and threaten the sustainability of this fragile marine ecosystem.²

Mozambique's nearly 2000 mile coastline on the southern edge of East Africa, just north of South Africa, is a complex system of bays, inlets, estuaries, coral reefs, beaches and other diverse types of ecosystems. It is largely protected from the open Indian Ocean further to the east by the island nation of Madagascar, and the Mozambique Channel separating Mozambique from Madagascar. The Channel is roughly 250 miles at its narrowest point, and stretches nearly the entire length of Mozambique's coastline, except for the extreme northern and southern tips of the country, where it directly touches the Indian Ocean.³

The Southern African region is an area of special importance for elasmobranchs, the subclass including sharks, rays, and skates. For example, Mozambique's coastal waters, are home to nearly two hundred different shark species,

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¹ Paula S. Afonso, *Country Review: Mozambique*, in REVIEW OF THE STATE OF WORLD MARINE CAPTURE FISHERIES MANAGEMENT: INDIAN OCEAN, FAO FISHERIES TECHNICAL PAPER No. 488, 415 (Cassandra De Young ed., 2006), available at

<http://www.fao.org/docrep/009/a0477e/a0477e10.htm#bm36>.

² *Id.* at 415, 418, 422.

³ *Id.*

including two of the most charismatic and environmentally valuable species: the white shark (*Carcharodon carcharias*),⁴ and the whale shark (*Rhinocodon typus*).⁵ The health of the Southern African marine ecosystem is extremely vital to the white and whale sharks in particular, because of their high population densities within these waters. Additionally, the large concentration of shark populations contributes greatly to the impoverished nation's economy through various tourism activities.⁶

Despite the critical importance of sharks to this part of the world, Mozambique is still losing the battle to effectively protect their marine resources. Highly migratory sharks, such as those found in Mozambique, are particularly difficult to monitor and protect as they often move in and out of protected waters. Such movement makes them vulnerable to a range of threats when outside the bounds of legal protection.⁷ Moreover, effectively monitoring shark populations is very difficult due in part to the immense geographic scale of marine ecosystems and the relative lack of knowledge regarding many species' population dynamics.⁸ Legislation and regulations alone are insufficient to ensure their safety and survival.

Part I of this paper provides a background regarding the vulnerability and importance of whale sharks and white sharks in Mozambique's marine ecosystem. Part II discusses several of the major threats that sharks and other marine species face within Mozambique's waters. Part III discusses and analyzes the effectiveness of

⁴ Ramon Bonfil et al., *Transoceanic Migration, Spatial Dynamics, and Population Linkages of White Sharks*, 310 *SCIENCE* 100 (2005).

⁵ J.M. Brunnschweiler et al., *Deep-Diving Behaviour of a Whale Shark *Rhinocodon typus* During Long-Distance Movement in the Western Indian Ocean*, 74 *J. OF FISH BIOLOGY* 706, 706 (2009), WWF E. AFR. MARINE ECOREGION, *THE EASTERN AFRICAN MARINE ECOREGION VISION: A LARGE SCALE CONSERVATION APPROACH TO THE MANAGEMENT OF BIODIVERSITY* 19 (2004), available at

<http://www.worldwildlife.org/what/wherewework/coastaleastafrica/WWFBinaryitem7685.pdf>.

⁶ WWF, *supra* note 5, at 17. Tourism in the area has proved something of a double-edged sword, bringing with it additional development and degradation of key coastal resources. See *id.* at 17, 27, 31

⁷ Bonfil et al., *supra* note 4, at 103.

⁸ Julia K. Baum et al., *Collapse and Conservation of Shark Populations in the Northwest Atlantic*, 299 *SCIENCE* 389, 389 (2003).

international and regional provisions applicable to sharks and other marine species within Mozambique. Finally, Part IV includes several theories for improving the protection of sharks.

I. THE IMPORTANCE OF SHARKS

The continued presence of sharks in the marine ecosystem is integral, not only to marine life, but also to our own ability to thrive in the terrestrial ecosystem. Sharks have existed for over 400 million years with very little evolutionary change.⁹ Their durability and evolutionary prowess has enabled them to outlast the dinosaurs, making them a critical part of the marine ecosystem and an excellent indicator of the health of our oceans.¹⁰

Currently, though, there is great cause for concern as sharks are disappearing from our oceans at alarming rates. One study shows that between 1986 and 2000 almost all shark species suffered a population decline of at least 50 percent and some species were even found to be on the brink of total depletion.¹¹ Subsequently, many shark species are killed faster than they can reproduce to sustain their populations.¹²

The drastic change in shark population is attributed to various factors. Shark populations are unable to absorb sudden and drastic changes in their ecosystem because of their extremely sensitive biology. Large terrestrial animals with similar biological characteristics are known to be especially vulnerable to extinction; thus, the same premise presumably applies to large aquatic animals.¹³

⁹ WILDAID, OCEANA, END OF THE LINE? *Global Threats to Sharks* 4 (2007), available at http://na.oceana.org/sites/default/files/reports/EndoftheLine_Spread_sm1.pdf.

¹⁰ *Id.* at 4.

¹¹ *Id.* at 4.

¹² MATTHEW D. POTENSKI, THE SHARK RESEARCH INSTIT., OPERATION WHALE SHARK, PROPOSAL FOR STUDY OF WHALE SHARK BEHAVIOR IN TANZANIAN WATERS 4 (2006), http://www.sharks.org/expedition_pdfs/kairoswhalesharkproposal.pdf.

¹³ Ransom A. Myers & Boris Worm, *Extinction, Survival or Recovery of Large Predatory Fish*, 360 PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOC'Y B 13, 15 (2007).

As apex predators, sharks are rather scarce and vulnerable to extrinsic interference.¹⁴ Human interference with the natural balance of the ocean causes the global elimination of up to 100 million sharks annually.¹⁵ More than 90 percent of the decline in marine predator abundance can be attributed to man's exploitation of the ocean and marine species.¹⁶

Sharks are not an infinite resource. The elimination of tens of millions every year suggests population recovery will take several decades once depleted.¹⁷ If these destructive practices continue, sharks will likely be among the first marine extinctions attributable to human interference.¹⁸

A. VITALITY TO THE MARINE ECOSYSTEM

Most shark species are the top or "apex" predator within their ecosystem and therefore have little competition or natural predators.¹⁹ As an apex species, sharks help maintain the health of their ecosystem by consuming lower animals on the food chain and control lower species' population density.²⁰ Additionally, sharks assist in controlling spatial distribution, promoting the genetic fitness of other species, and increasing species diversity within ecosystems.²¹

Removing or suppressing apex predators in marine ecosystems can create unpredictable consequences cascading down the food web.²² In marine ecosystems where apex predators are removed, changes in the biomass occur as a result of

¹⁴ *Id.*

¹⁵ E. GRIFFIN ET AL., *OCEANA, PREDATORS AS PREY: WHY HEALTHY OCEANS NEED SHARKS* 3 (2008), [http://na.oceana.org/sites/default/files/reports/Predators as Prey FINAL FINAL1.pdf](http://na.oceana.org/sites/default/files/reports/Predators%20as%20Prey_FINAL_FINAL1.pdf).

¹⁶ Nicholas K. Dulvy et al., *Coral Reef Cascades and the Indirect Effects of Predator Removal by Exploitation*, 7 *ECOLOGY LETTERS* 410, 410 (2004).

¹⁷ J.D. Stevens et al., *The Effects of Fishing on Sharks, Rays and Chimeras (Chondrichthyans), and the Implications for Marine Ecosystems*, 57 *ICES J. OF MARINE SCI.* 476, 477 (2000).

¹⁸ WILDAID, *supra* note 9, at 3.

¹⁹ GRIFFIN ET AL., *supra* note 15, at 5.

²⁰ Ransom A. Myers et al., *Cascading Effects of the Loss of Apex Predatory Sharks from a Coastal Ocean*, 315 *SCIENCE* 1846, 1847 (2007).

²¹ GRIFFIN ET AL., *supra* note 15, at 5.

²² Dulvy, *supra* note 16, at 410.

increase of lower species' populations.²³ In ecosystems where apex predators are suppressed, the behavioral responses of prey items change—greater competition for limited resources arise and the once-prey are more likely to reproduce, keeping their weak genes in the gene pool.²⁴ These factors can create unpredictable consequences cascading down the food web.²⁵

One example of marine ecosystem devastation is in the Atlantic waters where the population of eleven of the great-shark species (shark species over two-meters in length) has significantly decreased in the past thirty-five years.²⁶ The decline of predator abundance in this area resulted in the drastic increase of the shark's primary prey species, the cownose ray.²⁷ The increased population of cownose rays led to the destruction of a hundred-year-old scallop fishery, crushing the area's economic livelihood and increasing the price of scallops by several dollars a pound.²⁸ This is only example of drastic top-down effects that are likely to occur in other marine ecosystems when apex predators are wiped out.²⁹

B. VULNERABILITY TO DESTRUCTIVE FISHING PRACTICES

Sharks, as a k-selected species, are biologically vulnerable to any type of environmental interference. K-selected species are typically slow growing, attain reproductive maturity later in life, have a low number of offspring per birth, and are relatively long lived.³⁰ With regard to whale sharks, research suggests that both males and females become mature in excess of nine meters total length, which may not be reached until approximately thirty years of age.³¹ Scientists believe that female white sharks begin to reach reproductive maturity around four to five meters total length,

²³ Stevens et al., *supra* note 17, at 488.

²⁴ GRIFFIN ET AL., *supra* note 15, at 14.

²⁵ Dulvy, *supra* note 16, at 410.

²⁶ Myers et al., *supra* note 20, at 1848.

²⁷ *Id.*

²⁸ *Id.* at 1848-1849.

²⁹ *Id.* at 1850.

³⁰ Stevens et al., *supra* note 17, at 476-477.

³¹ J.G. Colman, *A Review of the Biology and Ecology of the Whale Shark*, 51 J. OF FISH BIOLOGY 1219, 1225 (1997).

attained around twelve to fourteen years of age.³² Male white sharks begin to reach maturity around 3.5 to 4.1 meters total length, at approximately nine or ten years of age.³³ Additionally, both whale sharks and white sharks are believed to segregate by size and sex until the time for reproduction.³⁴ In areas of overexploitation, populations would be slow to recover, if at all, due to a lack of reproductively mature males and females in the same area.

The behavioral characteristics of these two shark species make them exceptional targets for destructive fishing practices. For example, concentrated population areas can mean easy targets, and easily overfished populations. Whale sharks and white sharks are both epipelagic, meaning they spend most of their time in the upper-part of the water column.³⁵ In Mozambique, the highest concentrations of whale sharks are within a narrow twenty squared km coastal corridor.³⁶ There is relatively little research on white shark population dynamics within Mozambique; however, white sharks are known to be prevalent in developed coastal areas where there is a higher probability of shark and human interaction.³⁷ Researchers evaluating white shark populations in the Farallon Islands off the coast of California determined that white sharks could easily be overfished and an entire population destroyed by the elimination of as few as four

³² Leonard J.V. Compagno et al., *Threatened Fishes of the World: Carcharodon carcharias (Linnaeus, 1758) (Lamnidae)*, 50 ENVTL. BIOLOGY OF FISHES 61, 61 (1997).

³³ *Id.*

³⁴ Rachel T. Graham & Callum M. Roberts, *Assessing the Size, Growth Rate and Structure of a Seasonal Population of Whale Sharks (Rhincodon typus Smith 1828) Using Conventional Tagging and Photo Identification*, 84 FISHERIES RES. 71, 77 (2007); John G. Casey & Harold L. Pratt, *Distribution of the White Shark, Carcharodon carcharias, in the Western North Atlantic*, 9 MEMOIRS OF THE S. CAL. ACAD. OF SCI. 5, 13 (1985).

³⁵ POTENSKI, *supra* note 12, at 10; Adam Witt, *The Biology, Conservation and Management of the Great White Shark, Carcharodon carcharias*, 345L BIOLOGY 15 (2004).

³⁶ Simon J. Pierce & Andrea D. Marshall, *Threatened Marine Species and Conservation Research in Inhambane Province, Mozambique*, <http://www.opwall.com/Expeditions/Southafrica/South%20African%20research%20programme/Threatened%20marine%20species%20and%20conservation%20in%20Inhambane%20province.pdf>.

³⁷ Compagno et al., *supra* note 32, at 62.

mature white sharks.³⁸ Research also shows that both white sharks and whale sharks are highly migratory species capable of undertaking extensive transoceanic migrations.³⁹ Thus, threats of overfishing and depletion often follow them to other ecosystems where the sharks migrate.

There are five geographic clusters where whale sharks are known—Gulf of Mexico, Northwest Atlantic Ocean, Western Indian Ocean, Northwest Pacific Ocean and Eastern Indian Ocean. While whale shark movements vary throughout the seasons, research suggests that their movements are consistent with tracking the highest concentrations of plankton patches.⁴⁰ One study also indicates that the whale sharks migrate in and out of these regions and mate with individuals outside of their home ranges. However, the research shows no clear geographic clustering among the five main geographic regions,⁴¹ demonstrating that wide ocean expanses do not impede whale shark migration.⁴²

Whale sharks' highly migratory behavior often exposes them to danger, especially within the Indian Ocean. Researchers recently determined that whale sharks migrating between the Seychelles and Mozambique travel through a stretch of under-protected fisheries in the northern Indian Ocean where they are particularly subject to being targeted and killed.⁴³ In neighboring South Africa, there has been an 83% percent decrease in whale shark aerial sightings in less than ten years, suggesting this

³⁸ David G. Ainley et al., *Dynamics of White Shark/Pinniped Interactions in the Gulf of the Farrallones*, 9 MEMOIRS OF THE S. CAL. ACAD. OF SCI. 109, 117 (1985).

³⁹ D. Rowat & M. Gore, *Regional Scale Horizontal and Local Scale Vertical Movements of Whale Sharks in the Indian Ocean of Seychelles*, 84 FISHERIES RES. 32 (2007); Bonfil et al., *supra* note 4, at 100.

⁴⁰ Hua-Hsun Hsu et al., *Satellite Tracking of Juvenile Whale Sharks, *Rhincodon typus*, in the Northwestern Pacific*, 84 FISHERIES RES. 25 (2007). For example, the whale sharks' range extends upwards of 16,000km in the Indian-Pacific Ocean. A. L. F. Castro et al., *Population Genetic Structure of Earth's Largest Fish, the Whale Shark (*Rhincodon typus*)*, 16 Molecular Ecology 5183, 5188 (2007).

⁴¹ Castro, *supra* note 40, at 5186.

⁴² *Id.* at 5190.

⁴³ Rowat, *supra* note 39, at 38.

migratory pattern could be contributing to their population decline.⁴⁴ The whale shark's ability to survive such dramatic population decreases is suspect because of its reproductive biology.⁴⁵

Scientists recently discovered that white sharks are one of the most migratory shark species.⁴⁶ While the purpose of undertaking pelagic, or oceanic migrations is unclear, research indicates this behavior may be for breeding purposes.⁴⁷ One of the most astounding transoceanic migrations was by a 3.8 meter female white shark. This shark swam 20,000 km coast-to-coast from South Africa to Australia and back to the original tagging site at the southern tip of South Africa in just under nine months, making it the fastest known transoceanic return migration of any marine species.⁴⁸

As a highly migratory species, it comes as no surprise that white sharks migrate from protected home ranges to areas where they are not legally protected. In Mossel Bay, South Africa, a 2.8-meter female shark fitted with a satellite tag swam north to Mozambique, outside of the South African Economic Exclusive Zone where white sharks are legally protected, and returned to Mossel Bay after 162 days.⁴⁹ This migratory behavior exposes the shark to increased threats while in unprotected waters and makes the implementation and enforcement of regulations protecting these species very difficult.⁵⁰

C. SHARKS' IMPORTANCE TO MOZAMBIQUE'S ECONOMY

Every year nearly five-million tourists are drawn to the Mozambican coastal region of Inhambane to encounter some of the world's most dynamic marine species.⁵¹ Mozambique's recent civil war and widespread poverty have decimated terrestrial animal populations and eliminated a large portion of the "safari tourism" industry.

⁴⁴ POTENSKI, *supra* note 12, at 4.

⁴⁵ Colman, *supra* note 31, at 1219.

⁴⁶ Witt, *supra* note 35, at 4.

⁴⁷ Burney J. Le Boeuf, *Hunting and Migratory Movements of White Sharks in the Eastern North Pacific*, 58 NAT'L INST. OF POLAR RES. 97 (2004).

⁴⁸ Bonfil et al., *supra* note 4, at 100.

⁴⁹ *Id.* at 102.

⁵⁰ *Id.* at 103.

⁵¹ Pierce, *supra* note 36, at 1.

Consequently, Mozambique relies heavily on their marine resources for eco-tourism as a way to support the economy.⁵²

The whale shark tourism industry is quickly growing, as people are willing to travel around the world just for an opportunity to swim with the gentle giants. This market generates millions of dollars for local economies, as individuals are willing to pay hundreds of dollars for a single encounter.⁵³ Because of the increasing interest in swimming with sharks around the world, it is no surprise that a single shark is worth far more alive through tourism than it is worth dead on the market.

It is difficult to accurately determine the worth of a single shark due to various methods of calculation. A self-proclaimed conservative Australian study determined that each shark in their tourism industry was worth AU\$282,000 (approximately US\$250,000).⁵⁴ On the other hand a study in Belize determined that a single whale shark was worth US\$2,094,340 to their tourism industry.⁵⁵ The value of a single whale shark in Mozambique has not yet been conclusively evaluated despite the fact that nearly one-third of all known whale sharks in the world have been identified in this area.⁵⁶

D. HIGH DEMAND IN THE ILLEGAL SHARK TRADE

The lucrative black market trade in shark parts is prevalent around the world. Virtually no shark species is immune; evidence indicates that products from white sharks and whale sharks, both protected species under the Convention on International Trade in Endangered Species (CITES), are internationally traded.⁵⁷ While some

⁵² *Id.* at 7.

⁵³ See BRAD NORMAN & JAMES CATLIN, *Economic Importance of Conserving Whale Sharks* 12 (2007), <http://www.whalesharkfest.com/pdf/economicimportance.pdf>.

⁵⁴ *Id.* at 14. Note that the conservative Australian calculation does not take into account that one shark may visit several locations during a season and thus increase its value.

⁵⁵ *Id.*

⁵⁶ Pierce, *supra* note 36, at 4.

⁵⁷ S. CLARKE, TRAFFIC E. ASIA, *Shark Product Trade in Hong Kong and Mainland China and Implementation of the CITES Shark Listings* 5

regulations are in place prohibiting this practice around the world, inconsistent enforcement and relatively light punishments provide little deterrence in comparison to the high return for shark fins and other parts on the black market.⁵⁸ This is evidenced by the fact that shark finning has risen 400% over the last decade and a half.⁵⁹

Finning is a very cruel practice where fishermen cut the dorsal, pectoral and caudal fins off a usually live shark and then dump the carcass back into the ocean, leaving the shark to bleed to death.⁶⁰ Additionally, this practice is largely wasteful as anywhere from 95-99% of the shark is discarded.⁶¹ Compounding this problem is the fact that the detached fins do not take up much space, which gives fishermen the ability to kill large numbers of sharks at a time.⁶²

The Asian market for shark fins, especially in Hong Kong and Mainland China, has greatly increased both the demand for and value of sharks.⁶³ Whale shark fins in particular are very valuable and a single fin is worth up to US\$57,000.⁶⁴ In order to supply the largely Asian demand, fishermen engage in "finning" all around the world.

II. THREATS TO SHARKS WITHIN MOZAMBICAN WATERS

While intimately related, there are at least five major definable threats to sharks within Mozambique's waters, outline in sections A through E, below. First is illegal fishing, which broadly defined includes unreported and unregulated fishing as well. Second are incidental catches of white and whale sharks, also called "bycatch," which result from, in a quite literal sense, the casting of too broad a net. Third, many fishing vessels are able to avoid effective regulation by the flying of and rotation between various nations' flags. Fourth, recent contracts between Mozambique and EU nations grant broad rights to Mozambique's fisheries with little complimentary incentive or

(2004), http://www.traffic.org/species-reports/traffic_species_fish16.pdf.

⁵⁸ M. LACK & G. SANT, TRAFFIC INT'L, *Confronting Shark Conservation Head On!* (2006),

http://assets.panda.org/downloads/sharks_head_on.pdf.

⁵⁹ NORMAN & CATLIN, *supra* note 53, at 3.

⁶⁰ WILDAID, *supra* note 9, at 20.

⁶¹ *Id.* at 22.

⁶² *Id.*

⁶³ CLARKE, *supra* note 57, at 1716.

⁶⁴ NORMAN & CATLIN, *supra* note 53, at 7.

resources for regulation and enforcement. Finally, the large demand for, and concomitant investment in, the resources of Mozambique from various nations, especially China, has effectively provided a disincentive to effective regulation.

A. ILLEGAL FISHING

Mozambique relies heavily upon marine resources for sustenance, employment, and their economy. The nation's fishing industry is comprised of three main divisions: artisanal, semi-industrial and industrial.⁶⁵ Artisanal fishing employs over 58,000 fishermen and provides a food supply for a substantial portion of the population.⁶⁶ Fishermen mainly use handlines, beach seines, and gillnets along the coast to harvest fish, shrimp, and, in certain areas, sharks.⁶⁷ The semi-industrial fishing sector is comprised of mostly Mozambican companies that are largely unable to fish far beyond the coast due to limited capabilities.⁶⁸ The industrial fishing sector, the most lucrative, is conducted in large part through joint ventures with foreign companies, which are focused on exporting lobster, shrimp, and tuna.⁶⁹

While some of the fishing activities conducted in Mozambican waters are legal, "Illegal, Unreported and Unregulated" (IUU) fishing is prevalent. The Food and Agricultural Organization of the United Nations adopted the following internationally recognized definitions of IUU fishing:

Illegal fishing refers to activities:

- conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations; or
- conducted by vessels flying the flag of States party to a relevant regional fisheries management organisation (RFMO) but operating in contravention of the conservation and management measures adopted by that organisation and by which the States are bound, or relevant provisions of the applicable international law; or

⁶⁵ Afonso, *supra* note 1, at 417.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

- conducted in violation of national laws or international obligations, including those undertaken by co-operating States to a relevant RFMO.

Unreported fishing refers to fishing activities:

- which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or
- undertaken in the area of competence of a relevant RFMO which have not been reported or have been misreported, in contravention of the reporting procedures of that organisation.

Unregulated fishing refers to fishing activities:

- in the area of application of a relevant RFMO that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organisation, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation; or
- in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.⁷⁰

IUU fishing threatens marine ecosystem sustainability by overfishing, causes severe environmental damage and threatens the global food supply.⁷¹ The estimated losses resulting from illegal catches around the world is between US \$10 billion and US \$23.5 billion,⁷² with a loss of approximately US \$1 billion in Sub-Saharan Africa alone.⁷³

⁷⁰ U.K. DEP'T FOR INT'L DEV. & MARINE RESOURCES & FISHERIES CONSULTANTS , POLICY BRIEF 8, ILLEGAL, UNREPORTED AND UNREGULATED FISHING, Box 1 (2009), http://www.mrag.co.uk/Documents/PolicyBrief8_IUU.pdf.

⁷¹ See David J. Agnew et al., *Estimating the Worldwide Extent of Illegal Fishing* 4 PLoS ONE 1, 1 (2009).

⁷² *Id.* at 4.

⁷³ U.K. DEP'T FOR INT'L DEV., PROGRAMME BRIEF & UPDATE No. 1, PROGRAMME OF SUPPORT TO TACKLING IUU FISHING IN SOUTHERN AFRICA 4 (2007),

Estimating the true global effect from IUU fishing is difficult because the industry is covert and there is a significant gap in reporting. However, it is likely that the true catch level is three-times more than what is legally permitted.⁷⁴ The global increase in overfishing is a product of many factors including: world population growth, widespread degradation of habitat, growth in fishing technology, the size of fishing fleets, and the failure of regulators to say “no” to overfishing.⁷⁵

Developing nations with poor governance structures, such as Mozambique, are especially vulnerable to illegal fishing.⁷⁶ The types of common IUU in the Southern African region include: misreporting catches, fishing in restricted areas, use of harmful fishing practices, by-catch, fishing by non-licensed vessels within nation’s economic exclusive zones (EEZ), inconsistency between implemented policies and operational practices,⁷⁷ and illegally targeting sharks.⁷⁸

IUU fishing also undermines both national and regional efforts to conserve delicate fish stocks and discriminates against fishers that act in accordance with applicable regulations.⁷⁹ A wide range of direct and indirect consequences result in from regions falling victim to these practices. Direct economic losses include a reduction in catches that could have been taken by the coastal state or licensed

http://www.imcsnet.org/imcs/docs/tackling_iuu_fishing_southern_africa.pdf.

⁷⁴ ENVTL. JUST. FOUND., *PIRATES & PROFITEERS: HOW PIRATE FISHING FLEETS ARE ROBBING PEOPLE AND OCEANS 2* (2005), available at http://www.ejfoundation.org/pdf/pirates_and_profiteers.pdf.

⁷⁵ Will Martin, *Fisheries Conservation and Management of Straddling Stocks and Highly Migratory Stocks under the United Nations Convention on the Law of the Sea*, 7 GEO. INT'L ENVTL. L. REV. 765 (1994-1995).

⁷⁶ Agnew et al., *supra* note 71, at 4.

⁷⁷ U.K. DEP'T FOR INT'L DEV., *supra* note 73, at 4.

⁷⁸ STOP ILLEGAL FISHING, VOL. 2 MAIN REPORT, STUDY AND ANALYSIS OF THE STATUS OF SOUTH AFRICAN DEVELOPMENT COMMUNITY, IUU FISHING IN THE SADC REGION AND AN ESTIMATE OF THE ECONOMIC, SOCIAL AND BIOLOGICAL IMPACTS 48 (2008), <http://www.illegal-fishing.info/uploads/SIFstatusofIUUfishinginsadcregionestimateESBivol2eng.pdf>.

⁷⁹ David J. Doulman, *Illegal, Unreported and Unregulated (IUU) Fishing*, FOOD & AGRIC. ORG. OF THE U.N. FISHERIES & AQUACULTURE DEP'T (2005), <http://www.fao.org/fishery/topic/3195/en> (last updated May 27, 2005).

vessels.⁸⁰ This reduces the nation's gross national product and deprives the coastal state of revenue from landing fees, license fees, and taxes, which are imposed upon legal fishing operations.⁸¹

Indirect consequences of IUU fishing arises from lost income, employment, and a reduction in food security.⁸² In nations such as Mozambique, where fish is a substantial source of protein, local fishermen and illegal fishing operations directly conflict over the resources.⁸³ The extensive environmental consequences are also quite severe. Overfishing can result in damage to target fish stocks, which result in a decrease in an ecosystem's overall productivity and biodiversity.⁸⁴ Additionally, the use of prohibited fishing gear in protected areas can harm vulnerable habitats and result in the incidental capture of threatened species including turtles, sharks and marine mammals.⁸⁵

B. BYCATCH

Sharks, including whale sharks and white sharks are particularly vulnerable to becoming incidental catches or "bycatch" in areas where IUU fishing occurs.⁸⁶ The exact rate of shark mortality attributed to bycatch is unknown because many fisheries have inadequate record keeping protocols, and thus many sharks caught and possibly finned go unrecorded and unnoticed.⁸⁷

For example, in long-line tuna fisheries, which are present in Mozambique, shark bycatch is believed to play a considerable role in the financial aspect of both legal and illegal operations.⁸⁸ Fishermen lack incentive to release sharks once captured because of the high value of their fins and meat coupled with the added pressure of increased operating costs and declining catch rates.⁸⁹ This practice is prevalent around the world,

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.* at 3.

⁸⁴ *Id.* at 2.

⁸⁵ *Id.*

⁸⁶ M. LACK & G. SANT, *ILLEGAL, UNREPORTED AND UNREGULATED SHARK CATCH: A REVIEW OF CURRENT KNOWLEDGE AND ACTION* 8 tbl.1 (2008), http://www.traffic.org/species-reports/traffic_species_fish30.pdf.

⁸⁷ WILDAID, *supra* note 9, at 19.

⁸⁸ LACK & SANT, *supra* note 86, at 12.

⁸⁹ *Id.*

as bycatch sharks in many instances are finned rather than released.⁹⁰ In the Philippines, for instance, whale sharks caught as bycatch were recorded as routinely released until their economic value increased and fishermen began killing the sharks to export their fins and meat.⁹¹ The practice is not focused solely on whale sharks; the high value of white shark fins, jaws, and teeth also leads to increased capture through bycatch and illegal fishing in identified white shark populations.⁹²

The movement toward killing bycatch sharks rather than releasing them is extremely alarming. It is difficult to tell how many sharks are captured or killed as a result of these fishing practices due to inadequate record keeping, especially in Mozambique. However, estimates in Australian waters alone report around 100 to 440 white shark captures a year.⁹³

In Mozambique, sharks are a common bycatch with such large numbers of vessels engaging in long-lining. The East African coast has one of the highest concentrations of illegal long-lining vessels in the world, with some estimates indicating that approximately two hundred international vessels operate within the nation's Economic Exclusive Zone (EEZ).⁹⁴ Long-lines are used in all of the world's oceans and require hundreds of baited hooks to be deployed for the target species. Marine life ranging from seabirds, turtles, dolphins, whales, and sharks all fall victim to long-line bycatch.⁹⁵ More specifically, long-lining is one of the largest contributors to both whale shark and white shark mortality as both species spend considerable time swimming near the surface, where there is a higher likelihood of encountering long-lines.⁹⁶

⁹⁰ WILDAID, *supra* note 9, at 19.

⁹¹ POTENSKI, *supra* note 12, at 14.

⁹² ENV'T AUSTL., DEP'T OF THE ENV'T, WATER, HERITAGE AND THE ARTS, WHITE SHARK (CARCHARODON CARCHARIAS) RECOVERY PLAN 12 (2002), available at <http://www.environment.gov.au/coasts/publications/gwshark-plan/pubs/greatwhiteshark.pdf>.

⁹³ ENV'T AUSTL., *supra* note 92, at 11.

⁹⁴ See FOUNDATION FOR THE PROTECTION OF MARINE MEGAFUNA, *Shark Finning and Illegal Fishing*, <http://marinemegafauna.org/sharkfinning>, (last visited Oct. 17, 2010).

⁹⁵ WILDAID, *supra* note 9, at 19.

⁹⁶ See ENV'T AUSTL., *supra* note 92, at 11; A. Peter Kimley et al., *Movements and Swimming Behavior of Three Species of Sharks in La Jolla Canyon, California*, 63 ENVTL. BIOLOGY OF FISHES 117, 131

C. FLAGS OF CONVENIENCE

In order to increase fishing presence and circumvent penalties for illegal fishing, fishermen will often utilize “Flags of Convenience” (FOC) or “Flags of Non-Compliance” (FONC).⁹⁷ The practice of purchasing rights to fly a foreign flag, or FOC, is an attractive option for fleets looking to avoid government regulations, decrease operating costs, and mask fishing history.⁹⁸ The utilization of FOCs and lack of effective flag state control is one of the central contributors to IUU fishing.⁹⁹ FOCs are increasingly prevalent, due to low cost and relative ease of obtaining them. The registration process can be quickly accomplished over the internet¹⁰⁰ and some countries will allow their flag to be flown for as little as a few hundred dollars.¹⁰¹

Fishing operations engaging in illegal fishing will re-flag or “flag hop” multiple times in a season to evade and confuse authorities.¹⁰² In international waters, fishing regulations only apply to countries that are members of Regional Fisheries Management Organizations (RFMOs).¹⁰³ Thus, if a vessel were to re-flag to a nation that is not a member of an RFMO then the vessel could fish without being held to the agreed management measures.¹⁰⁴ Consequently, many countries whose flags are used as FOCs are not members of RFMOs and thus, vessels are generally presumed to be beyond the reach of international law.¹⁰⁵

Franz Fischler, a former European Commissioner for fisheries, said that “[f]lags of convenience are the scourge of today’s maritime world. This practice affects both fisheries and transport, although oil spills, given their spectacular dimension, mobilise

(2002); POTENSKI, *supra* note 12, at 10; Le Boeuf, *supra* note 47, at 90.

⁹⁷ ENVTL. JUST. FOUND., *supra* note 74, at 9.

⁹⁸ STOP ILLEGAL FISHING, STOP ILLEGAL FISHING IN SOUTHERN AFRICA 66 (2008), available at <http://www.illegal-fishing.info/uploads/sifbrochureeng.pdf>.

⁹⁹ Doulman, *supra* note 79.

¹⁰⁰ See INT’L SHIP & AIRCRAFT REGISTRIES, www.flagsofconvenience.com (last visited Oct. 17, 2010).

¹⁰¹ ENVTL. JUST. FOUND., *supra* note 74, at 10.

¹⁰² *Id.*

¹⁰³ *Id.* at 11.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

public opinion more easily than the pernicious damage done to the marine environment by fishing vessels.”¹⁰⁶ The harm caused by FOCs may not be immediately apparent, though their usage contributes to the exploitation of marine resources. International law requires a country to be responsible for controlling the activities of a vessel that flies its flag.¹⁰⁷ Generally, flag states do not fulfill their responsibility and instead ignore offenses that are committed.¹⁰⁸ This is in part because many of the flag states are developing countries lacking the ability to properly monitor vessels.¹⁰⁹ The top four FOC nations, Belize, Panama, Honduras, and St. Vincent, each have well over one hundred vessels operating under their flag.¹¹⁰

D. MOZAMBIQUE’S SALE OF FISHING ACCESS RIGHTS TO THE E.U.

Mozambique’s sale of their fishing access rights to the European Union (EU) is yet another disservice to its marine conservation efforts. On January 1, 2007, a five-year renewable Fisheries Partnership Agreement commenced, granting European fishing vessels an annual quota of 10,000 tons of tuna and related species in exchange for €900,000 (approximately US\$1.25 million) annually and revenue from license fees.¹¹¹ The arrangement appeared to be mutually beneficial; a poor nation acquired a new source of income and economically stable nations acquired a new source of fish. Yet the long-term implications of this agreement threaten the sustainability of Mozambique’s marine resources. Mozambique lacks sufficient resources to ensure that EU vessels are complying with catch quotas and complying with the agreements provisions. Additionally, Mozambique has no real incentive to ensure that the EU fleets stay within their allotted quotas because additional catches are subject only to additional

¹⁰⁶ *Id.* at 10.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ MARINE RES. ASSESSMENT GRP., REVIEW OF IMPACTS OF ILLEGAL, UNREPORTED AND UNREGULATED FISHING ON DEVELOPING COUNTRIES 64 (2005), available at <http://www.dfid.gov.uk/pubs/files/illegal-fishing-mrag-report.pdf>.

¹¹⁰ *Id.* at 67.

¹¹¹ Press Release, Europa, EU and Mozambique Initial new Fisheries Partnership Agreement (Dec. 22, 2006), <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/1898&format=HTML>.

payment.¹¹² Thus with more income pouring into the impoverished nation, there is no reason to strictly enforce compliance with the quotas. This agreement essentially creates an invitation for EU vessels to fish beyond the quotas at the further expense of Mozambique's marine resources.

E. CORRUPTION AND THE "CHINA FACTOR"

There is extensive evidence that shark finning is occurring throughout Mozambique and is becoming quite organized.¹¹³ With many fish stocks depleted and livelihoods threatened, local fishermen have turned to fishing for sharks as a source of income. Shark carcasses are common sights along the Pomene reserve's coastline.¹¹⁴ Local fishermen in this area catch approximately twenty sharks each day, which are exported to the Asian shark fin market.¹¹⁵ One shark can fetch around US\$30, which is the average monthly income for much of the poverty stricken population.¹¹⁶ The main purchasers of these sharks and fins are Chinese fishermen.¹¹⁷

Mozambique has not consistently enforced fishing regulations in the last decade. For example, in 2005 a Chinese vessel carrying four tons of illegal shark fins left Maputo harbor for Hong Kong without seizures or fines.¹¹⁸ Some commentators speculate Mozambique's increasing financial reliance on China has virtually indemnified the Asian nation against successful prosecution.¹¹⁹ In a country where foreign investment is likely the only way to obtain needed infrastructure, one may wonder if turning a blind eye to resource exploitation is just the price of doing business.

¹¹² *Id.*

¹¹³ *Shark Fishing, Mozambique*, BBC
<http://www.bbc.co.uk/oceans/locations/indian/mozambique.shtml>
 (last visited Oct. 17, 2010).

¹¹⁴ *Mozambique: Illegal Shark Fishing in Inhambane*, ALLAFRICA.COM
 (Oct. 10, 2007), <http://allafrica.com/stories/200710100995.html>.

¹¹⁵ LACK & SANT, *supra* note 86, at 42.

¹¹⁶ *Id.*

¹¹⁷ STOP ILLEGAL FISHING, *supra* note 98, at 17.

¹¹⁸ Loro Horta, , *China's Relations with Mozambique: A Mixed Blessing*, CTR. FOR STRATEGIC & INT'L STUDIES,
<http://csis.org/blog/china%E2%80%99s-relations-mozambique-mixed-blessing>
 (last visited Oct. 17, 2010).

¹¹⁹ ANDRÉ STANDING, U4 ISSUE 2008:7, CORRUPTION AND INDUSTRIAL FISHING IN AFRICA 15 (2008), available at <http://www.illegal-fishing.info/uploads/CorruptionIndustrialfishingAfrica.pdf>.

China's role in Mozambique's infrastructure and economy has been instrumental since the conclusion of the African nation's civil war.¹²⁰ In 2008, China invested US\$76.8 million in various initiatives and has quickly become Mozambique's second largest investor behind South Africa.¹²¹ Some of China's high-profile investment projects include: the US\$2 billion Mpanda Nkuwa hydro-electric dam financed by China Exim Bank, a US\$57 million sports stadium in Maputo financed by the Chinese government, and a US\$75 million expansion of the Maputo airport.¹²² Additionally, in 2007 the Chinese President Hu Jintao forgave approximately US\$20 million of public debt incurred by Mozambique between 1980 and 2005.¹²³

The level of trade between China and African nations has increased tenfold between 1999 and 2006.¹²⁴ In the last few years, Mozambique has emerged as China's leading source for timber within Eastern Africa. Some commentators believe this arrangement is exploitative and refer to the arrangement as "the Chinese takeaway."¹²⁵ Many Mozambican government officials have been very receptive to partnerships with China despite the potential destructive consequences.¹²⁶ As a former unnamed Mozambican Ambassador once explained:

Let's stop blaming the Chinese, they have money and they want to buy. Nobody is forcing us to rape our resources; we are being paid generously for it. In the end, my friend, it's up to us to decide how we want to do business. This is our country, so it's our fault.¹²⁷

¹²⁰ SÉRGIO CHICHAVA, INST. OF SOC. & ECON. STUDIES, MOZAMBIQUE AND CHINA: FROM POLITICS TO BUSINESS? 8 (2008), available at http://www.iese.ac.mz/lib/publication/dp_2008/DP_05_MozambiqueChinaDPaper.pdf.

¹²¹ *China is Mozambique's Second Largest Investor*, CHINAFRICA.ASIA, <http://www.chinafrica.asia/china-mozambique-second-largest-investor> (last visited Oct. 17, 2010).

¹²² CHICHAVA, *supra* note 120, at 8.

¹²³ Mozam. News Agency, *Mozambique: China to cancel debts*, AFRICA NEWS UPDATE, THE NORWEGIAN COUNCIL FOR AFRICA Feb. 9, 2007, <http://www.afrika.no/Detailed/13511.html>.

¹²⁴ CHICHAVA, *supra* note 120, at 1.

¹²⁵ Horta, *supra* note 118.

¹²⁶ CHICHAVA, *supra* note 120, at 2.

¹²⁷ Horta, *supra* note 118.

III. APPLICABLE INTERNATIONAL AND REGIONAL AGREEMENTS

There are three separate international agreements which could possibly be utilized more effectively to regulate Mozambique's fisheries, outlined in sections A through C, below. First is the Convention on International Trade in Endangered Species, Second is the United Nations Convention on the Law of the Sea, and third is the South African Development Community commitment. However, each of these three options is currently either merely used as guidance, under-enforced, or outright ignored as of right now.

A. CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA

The main international regulating body for endangered species is the Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES").¹²⁸ It is a voluntary international agreement that controls the international trade of vulnerable plants and animals in a way that will ensure their sustainability.¹²⁹ Once a nation becomes a party to the Convention, it is responsible for adopting domestic regulations in compliance with the Convention and appointing domestic management authorities that will be responsible for authorizing and licensing the trade of CITES species.¹³⁰ Mozambique has been a party to the Convention since 1981.¹³¹

Animal species regulated by CITES are analyzed under a set of criteria based on biology and trade in order to determine which of three levels of protection is needed.¹³² Species placed in Appendix I are given the highest level of protection as they are considered to be species threatened with extinction. Appendix II applies to species not imminently threatened with extinction, but the trade in such species must be controlled

¹²⁸ *What is CITES?*, CONVENTION ON INT'L TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA, <http://www.cites.org/eng/disc/what.shtml> (last visited Oct. 17, 2010).

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *List of Contracting Parties*, CONVENTION ON INT'L TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA, <http://www.cites.org/eng/disc/parties/alphabet.shtml> (last visited Oct. 17, 2010).

¹³² *How CITES Works*, CONVENTION ON INT'L TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA, <http://www.cites.org/eng/disc/how.shtml> (last visited Oct. 17, 2010).

to maintain sustainable levels for the species' survival. Finally, species listed under Appendix III receive the lowest level of protection and compliance with guidelines are not mandatory.¹³³ Both the whale shark and white shark currently receive protection under Appendix II.¹³⁴

The Convention also has a mechanism for nations to object to the protection of particular species.¹³⁵ If a nation has a sufficient justification for receiving an exception, it will be required to abide by the provisions set out in the appendix below that which the species is currently listed. For example, if a nation takes exception to a species listed in Appendix I, the nation will be required to abide by the trade standards set forth in Appendix II, rather than Appendix I. Nations taking exception to species listed under Appendix II do not have a minimum standard to abide by because compliance with Appendix III is not mandatory. Currently Iceland, Japan, Norway and Palau have taken exception to the Appendix II listing of the white shark¹³⁶ and Iceland, Indonesia, Japan, Norway, Palau, and the Republic of Korea have taken exception to the Appendix II listing of the whale shark.¹³⁷ This is troubling because the Asian nations currently pose the greatest threat to these shark species, as they are known to be among the major culprits of IUU fishing.¹³⁸

CITES is an important tool for regulating the trade in vulnerable and endangered species; however, it has little effect on the systematic decimation of shark populations

¹³³ *Id.*

¹³⁴ The CITES Species Gallery, CONVENTION ON INT'L TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA, <http://www.cites.org/gallery/species/fish/fishes.html> (follow "Whale shark" hyperlink) (last visited Oct. 17, 2010); The CITES Species Gallery, CONVENTION ON INT'L TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA, <http://www.cites.org/gallery/species/fish/fishes.html> (follow "Great White shark" hyperlink) (last visited Oct. 17, 2010).

¹³⁵ *How CITES Works*, *supra* note 132.

¹³⁶ *Reservations Entered by Parties*, CONVENTION ON INT'L TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA, http://www.cites.org/eng/app/reserve_index.shtml (effective June 23, 2010).

¹³⁷ *Id.*

¹³⁸ See LACK & SANT, *supra* note 86, at 42; STOP ILLEGAL FISHING, *supra* note 78, at 47.

within the Southern African region. CITES only monitors and restricts the international trade in species such as the whale shark and white shark and has no influence on domestic trade, much less the illegal trade in these species.¹³⁹ This calls into question whether CITES placement is even an effective conservation mechanism.

Alarming, roughly one fourth of the 164 CITES member countries have the bare minimum legislation to implement the treaty.¹⁴⁰ In South Africa and other nation's where the white shark is legally protected beyond CITES requirements, data shows the population's annual rate of growth subsequent to protection is only 4 to 11.9 %; this is much lower than what is required for a white shark population to be sustained.¹⁴¹ If the preceding statistics are true, human contribution to the species' mortality could be graver than initially estimated.¹⁴² Therefore, if research indicates that shark populations are not sustainable even after specific domestic regulatory measures are implemented, it is unlikely that Mozambique, a nation that does not provide specialized protection for white sharks and whale sharks, could effectively protect their marine resources through CITES.¹⁴³

B. UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

Theoretically, African waters are protected under the United Nations Convention on the Law of the Sea (UNCLOS). Adopted in 1982, a key provision requires the coastal state to "ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation."¹⁴⁴ To promote proper management of the living

¹³⁹ NORMAN & CATLIN, *supra* note 53, at 5.

¹⁴⁰ Charles Schmidt, *Environmental Crimes: Profiting at the Earth's Expense*, 112 ENVTL. HEALTH PERSP. 96, 98 (2004).

¹⁴¹ Allison Kock & Ryan Johnson, *White Shark Abundance: Not a Causative Factor in Numbers of Shark Bite Incidents*, in FINDING A BALANCE: WHITE SHARK CONSERVATION AND RECREATIONAL SAFETY IN THE INSHORE WATERS OF CAPE TOWN, SOUTH AFRICA 22, 23 (Deon C. Nel & Thomas P. Peschak, eds., 2006).

¹⁴² *Id.* at 2.

¹⁴³ Pierce, *supra* note 36.

¹⁴⁴ United Nations Convention on the Law of the Sea, art. LXI, ¶ 2, Dec. 10, 1982, 1833 U.N.T.S. 397.

resources, the coastal state can require licenses for fishing, determine the catch quotas for species and require fishermen to provide adequate records of catches.¹⁴⁵

The provision is strong in its premise yet unpractical in its application within most African nations. Deceptive fishing practices are generally utilized by ships flying flags of convenience, and completely disregarding licensing requirements and measures to prevent over-exploitation. Vessels often re-flag to nations not members of RFMOs to avoid being held to a region's agreed conservation and management measures.¹⁴⁶ The Mozambican Fisheries Ministry has only four surveillance vessels to patrol the 2,800-kilometer coastline at a cost of US\$3,000 per day and is severely ill-equipped to monitor their marine resources.

The impoverished African nation also has limited patrol capabilities, lacks a seagoing navy, and has limited to no aerial surveillance to monitor its marine resources.¹⁴⁷ In 2007, the United States donated three vessels to help increase surveillance; however, many more resources are still needed.¹⁴⁸ Reports of dead sharks along the coast of Mozambique are so frequent that authorities simply record it in their books because they do not have the resources to verify the report.¹⁴⁹ Whale sharks are often brought to the beach and slaughtered by artisanal fishermen, yet authorities have no way to respond other than to simply denounce the behavior.¹⁵⁰

C. SOUTH AFRICAN DEVELOPMENT COMMUNITY COMMITMENT

In July 2008, Mozambique, along with nations belonging to the South African Development Community (SADC), dedicated their efforts to combating IUU fishing in a Statement of Commitment. The nations avowed to improve the license application process for foreign fishing vessels, strengthen port control measures, develop regional

¹⁴⁵ *Id.* at art. LXII, ¶ 4.

¹⁴⁶ ENVTL. JUST. FOUND., *supra* note 74, at 11.

¹⁴⁷ STOP ILLEGAL FISHING, *supra* note 78, at 48.

¹⁴⁸ *Mozambique*, CHATHAM HOUSE, http://www.illegal-fishing.info/sub_approach.php?subApproach_id=71 (last visited Oct. 17, 2010).

¹⁴⁹ *Mozambique: Country Loses Millions to Illegal Shark Fishing*, ALLAFRICA.COM, May 13, 2009, <http://allafrica.com/stories/200905130793.html>.

¹⁵⁰ See The Marine Conservation Society, *Mozambique Whale Sharks Under Attack*, 2 SEYCHELLES WHALE SHARK MONITORING NEWSLETTER (June 2004), [http://www.mcass.sc/SAGREN/Sagren v2 2 art1.htm](http://www.mcass.sc/SAGREN/Sagren_v2_2_art1.htm).

monitoring protocol, and improve communication between partnering nations. In an effort to hold to this commitment, the Mozambican government is working with the international community to secure US\$80 million to purchase surveillance aircraft and vessels to effectively patrol their coastline.¹⁵¹

While this agreement appears to be promising, one must question the participating parties' true level of commitment to this agreement. Just weeks after the SADC nations convened in Namibia to commit their efforts to curb illegal fishing, an unlicensed Namibian fishing vessel was seized within Mozambican waters.¹⁵² The ship contained a substantial quantity of shark fins, shark liver, and illegal equipment for catching deep-sea sharks.¹⁵³ This serious infraction shows total disregard for fellow SADC nations and threatens participating nations' future confidence and commitment to the agreement.

IV. PROPOSED THEORIES TO EFFECTIVELY PROTECT SHARKS

A. INCREASE SUSTAINABLE AND RESPONSIBLE ECO-TOURISM

It is apparent that international, regional, and domestic regulations are insufficient in maintaining sustainable shark populations in Mozambican waters. As a third-world nation, the driving force behind much of this nation's marine resource exploitation is money. This is evidenced by the nation's willingness to allow destructive and illegal fishing practices by Chinese fishermen go unpunished in exchange for investment in infrastructure and the sale of fishing access rights to the EU for a meager sum. However, if Mozambique were to shift its focus into long-term sustainable models of profiting off marine resources rather than permitting exploitation for instant financial gratification, the nation could improve its economy, create jobs, and incentivize the nation to protect vulnerable marine resources.

¹⁵¹ *Mozambique Seeks International help to Fight Illegal Fishing*, REUTERS AFRICA, Jan. 22, 2009, <http://af.reuters.com/article/mozambiqueNews/idAFLM16617020090122>.

¹⁵² *Namibian Vessel Seized*, CHATHAM HOUSE, July 21, 2008, http://www.illegal-fishing.info/item_single.php?item=news&item_id=3253&approach_id=

¹⁵³ *Id.*

Marine eco-tourism is an important industry for Mozambique, though it has not been developed to its full potential. Currently, foreign investors dominate a substantial portion of Mozambique's whale shark tourism industry. Thus, many poor fishermen continue to target sharks because there are few other ways to make a living.

Yet, despite the grim outlook, there still may be hope. In the early 2000s, Donsol, a municipality in the Philippines managed to elevate their status from being one of the poorest municipalities in the region to being among the most economically successful. The economy's drastic improvement is attributed to their successful whale shark tourism industry.¹⁵⁴ Former local whale shark fishermen were retrained to be whale shark spotters and as a result of the reliability of sightings, the industry grew by nearly 800%, creating hundreds of new jobs in just three years.¹⁵⁵

Mozambique could learn from the success of Donsol's industry and employ local fishermen who are arguably the most knowledgeable about locating tourism-friendly species. Incorporating locals into the eco-tourism industry gives them a direct interest in the welfare of the marine ecosystem and provides an incentive to conserve and protect it. At the current rate of Mozambique's marine resource exploitation no one will be willing to do business with the nation; in a few decades the environmental damage may be so severe that the area will be functionally depleted.

B. STRENGTHEN FLAG STATE CONTROL FOR FOC COUNTRIES

There is a very strong relationship between fishing vessels flying flags of convenience and those engaged in IUU fishing. Therefore, a substantial portion of IUU fishing could be eliminated if the loophole in international law allowing States to issue flags of convenience was addressed.¹⁵⁶ The estimated profit margin from the top four FOC countries may only be a few million US dollars; this is an extremely small profit in comparison to the billions of dollars in global losses caused by IUU.¹⁵⁷ Flag states must do their part to monitor the activities of the vessels that fly their flag. If the flag state is unwilling or incapable of conducting the requisite monitoring, then they should be

¹⁵⁴ NORMAN & CATLIN, *supra* note 53, at 12.

¹⁵⁵ WILDAID, *supra* note 9, at 9.

¹⁵⁶ ENVTL JUST. FOUND., *supra* note 74, at 9.

¹⁵⁷ *Id.* at 10.

prevented from issuing their flag and benefitting financially. Unfortunately though, attempts to abolish or change the flagging system have thus far been unsuccessful.¹⁵⁸

C. IMPLEMENTATION OF REALISTIC SHARK CONSERVATION AGREEMENTS

As the perils facing sharks become more apparent, many well-intentioned shark conservation organizations, such as WildAid, have advocated for global shark-finning moratoriums in order to eliminate the Asian shark fin trade. However, there are several major issues that make an all-encompassing moratorium fundamentally impracticable. First, developing nations like Mozambique lack the capacity and necessary resources to fully enforce a moratorium of this magnitude. Second, the moratorium ignores the fact that many impoverished African nations and Pacific Island nations regularly hunt for sharks as a source of daily sustenance. Finally, a global moratorium completely disregards the cultural tradition of consuming shark fin soup, which has been going on for many centuries in Asian nations.

Despite this on-going debate, it is extremely unlikely that a blanket shark finning moratorium would ever materialize. A shark conservation framework similar to that of the International Whaling Commission's (IWC) moratorium on whaling may be more practicable. In 1986, the IWC initiated a global whaling moratorium for the "great whales" (includes all baleen whales and the sperm whale) so that global stocks could recover. Under the Convention, participating nations may hunt whales only under three circumstances: with a "scientific permit,"¹⁵⁹ by formally objecting on the basis that a provision seriously affects national interests,¹⁶⁰ and where necessary for aboriginal subsistence.

A shark conservation structure similar to the above-mentioned structure for whales has the potential to provide global shark populations with a much-needed chance to recover. The voluntary nature of a similar moratorium allows nations incapable of or unwilling to participate to make the choice based on their nation's best interests. A framework tailored to sharks may appropriately apply only to the "great shark" species, those over two meters total length. Participating nations could also be

¹⁵⁸ *Id.*

¹⁵⁹ International Convention for the Regulation of Whaling, art. VIII, ¶1-3, Nov. 19, 1956, 161 U.N.T.S. 72.

¹⁶⁰ *Id.* at art. V, ¶3.

granted similar exceptions to hunt sharks: with a scientific permit for research purposes, when a nation's interests sufficiently required a certain species to be hunted, and for aboriginal sustenance. The reality of any effort to protect sharks, whales or any other species is not going to be without flaws, the key is to create a framework that will willingly be followed by participating nations and accomplish the goal of protecting vulnerable shark species.

V. CONCLUSION

The fact that Mozambique is losing the battle to protect their marine resources can no longer be ignored. The welfare of the nation and its people are strongly linked to the health of the marine ecosystem. The current rate of exploitation both permitted by Mozambique and through illegal, unregulated, and unreported activities is cause for concern for the future viability of this area's marine ecosystem. The ability to protect these valuable resources and ensure their sustainability now, forecasts the nation's economic and social stability in the decades to come.

Unfortunately, the impoverished African nation cannot sufficiently protect their marine resources alone, as they are at a severe disadvantage because of their insufficient resources and funding. Mozambique desperately needs the aid and support of other nations in order to adequately address the exploitation occurring in their waters. Perhaps most importantly, Mozambique must shift their focus from short-term financial gain, which risks the complete destruction of their resources, to a long-term sustainable view where the nation can continue to financially benefit from their marine resources for years to come.

