Antigua and Barbuda

NATIONAL PLAN OF ACTION FOR THE CONSERVATION AND MANAGEMENT OF SHARKS

(NPOA-SHARKS)

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List of Acronyms

A&B	Antigua and Barbuda
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNFO	Caribbean Network of Fisherfolk Organizations
EAF	Ecosystem Approach to Fisheries
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
IUU	Illegal, unreported and unregulated
IPOA	International Plan of Action
MoU	Memorandum of Understanding
NPOA	National Plan of Action
NPOA IUU	National plan of action to combat illegal, unreported and unregulated fishing
NPOA Sharks	National Plan of Action for the Conservation and Management of Sharks
PSMA	FAO Port State Measures Agreement
RFMO	Regional Fisheries Management Organization
RPOA	Regional Plan of Action
WECAFC	FAO Western Central Atlantic Fisheries Commission

EXECUTIVE SUMMARY

There is a global concern over the uncontrolled increase of shark catches and by-catches and the consequences which this has for the populations of the shark species in several areas of the world's oceans due to the biological characteristics of sharks which make them highly vulnerable to overfishing. The term "shark", as used generally in this document, refers to all sharks, rays, skates, chimaeras and other members of the Class Chondrichthyes. Sharks can also play important roles in maintaining healthy ocean ecosystems.

Recognition of these characteristics led to global initiatives to improve the conservation and management of sharks, culminating in the United Nations Food and Agriculture Organization (FAO)'s International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). The overarching objective of the IPOA-Sharks is "to ensure the conservation and management of sharks and their long-term sustainable use." The IPOA-Sharks suggests that member states of the FAO that conduct fisheries either targeting sharks, or regularly taking sharks as incidental bycatch, should each develop a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks). In this regard, the Government of Antigua and Barbuda has collaborated with the FAO's Sub-Regional Office for the Caribbean, the Caribbean Network of Fishers Organizations (CNFO) to take the necessary steps in the development of the A&B´s NPOA-Sharks and contribute to the sustainable use of elasmobranchs becoming one of the leading nations in the Caribbean.

This NPOA has been developed by the Fisheries Division of the Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs, in consultation with stakeholders, to fulfill the national responsibility of the Antigua and Barbuda. By participating and by supporting the adoption of the NPOA, the country has committed to ensuring that shark fisheries or shark related activities (tourism and recreational fishing) are sustainable.

The general objective of the NPOA-shark strives to secure sharks national biodiversity conservation and manage fisheries and/or other economic activities where sharks, rays and chimeras inhabiting marine waters of the country interact, are target or by catch species. The principles of the NPOA – sharks are Participation, Sustaining stocks, Nutritional and Socio-Economic considerations, Adoption of the Precautionary Approach and the adoption of the Ecosystem Approach to Fisheries (EAF).

The following lines of actions were identified for the NPOA-sharks:

1. Fisheries Research
2. Monitoring
3. Responsible fishing practices, governance and legislation
4. Participation
5. Education and communication

These lines of actions link the objectives which are made operational through proposed goals and activities identified for their achievement. It is used as a control system indicator the means of verification and assumptions. The presentation of the Plan is done through a logical framework matrix.

Line of Action 1 Fisheries Research

Objective	Goals	Activities
Develop shark research programs under the ecosystem approach to fisheries to be the foundation upon which the Fisheries Division will obtain good data and information for decision making on shark management	Shark research program on shark taxonomy and identification, shark biology, their ecosystems and the environment Development of socio economic research programs Incorporation of fishers and other stakeholders´ knowledge	Creation of a national shark scientific working group/ appointment of a shark national focal point as appropriate Training on shark identification Selectivity studies on fishing gears if needed At sea/ dockside regular sampling programs of shark catch/ landings Implementation of a socio economic research program Identification of potential nursery and breeding areas Development of collaborative partnerships Establishment of mechanisms for incorporating fishers and other stakeholders´ knowledge
Provide easy access to information on shark fisheries by fishery scientists	A shark national database in place to be easily accessed by fishery scientists and other stakeholders	Creation of a national shark database and users´ rules Establishment of mechanisms for incorporating fishers and others stakeholders´ knowledge

Line of Action 2 Monitoring

Objectives	Goals	Activities
Development of a shark monitoring system	A control system through an export certification scheme with identification of the species	Develop legal framework and procedural mechanisms as appropriate Develop species identification procedures Training of staff on shark identification of shark and by-products exported, including staff from other institutions Preparation and signing of an MoU between the Fisheries Division and Customs Department

Objectives	Goals	Activities
	Shark export database	Build historical data series Set up an export register system
	Catch/landings data series of shark target species and by catch/discards as appropriate	Develop a shark catch/ landings and by catch database as appropriate Training of fishery inspectors on shark identification (whole shark, fins, carcasses or other derivatives) Develop sampling procedures for shark by-catch estimates if needed Implementation of fishery logbooks on board At sea- observers and/or dockside monitoring program
	Fishing effort data collection	Development of a shark fishing effort database if appropriate

Line of Action 3 Responsible Fishing Practices, Governance and Legislation

Objective	Goals	Activities
Regulate shark fisheries based on conservation standards appropriate to their biology, population dynamics and the socioeconomic and local conditions	Implement conservation measures to regulate shark catches based on appropriate reference points	Set reference points for target shark species management if needed Set catch quotas for target shark species if needed
Manage areas that are critical to the life cycle and survival of shark species, if any	Management of sharks nursery and/or breeding grounds	Establishment of the selected management areas and implementation follow up and monitoring
Recover shark populations in danger of extinction or near critical sustainability thresholds, if any	Implementation of specific programs and measures to ensure the recovery of the populations in danger of extinction or near critical thresholds	Develop and implement programs to recover shark species considered to be in danger or near critical thresholds
Join and adopt international agreements for the conservation of sharks, in particular oceanic and deep water species	Become State Party of international agreements for the conservation of sharks, in particular oceanic and deep water species in the Caribbean Sea	Develop multi o binational Agreements for the conservation of shark species, in particular highly migratory or from shared stocks among different countries in the Caribbean Development of a Regional Plan of Action for Sharks (RPOA) at the WECAFC/CARICOM/ OECS level if

Objective	Goals	Activities
		appropriate
Promote full utilization of dead sharks captured and retained	Shark finning prohibited	Make regulations on shark landings, e.g. provisions for sharks landed with fins naturally attached
	Minimize shark discards in compliance with the Code of Conduct for Responsible Fisheries	Establish commercial strategic alliances to develop new markets and technology transfer to enhance the degree of utilization of sharks Training/Assistance on shark utilization and marketing/branding
Address shark by-catch and/or neonates/ juvenile shark catches	Reduction of shark by-catch and juvenile/ neonate sharks in fishing operations	Selectivity studies on fishing gears and methods Identification of nursery/ breeding areas Regulate fishing gears and methods, closed season/ area, if applicable
Promote the development of the shark ecotourism industry	Responsible shark ecotourism industry	Development of a shark ecotourism policy, if appropriate Development and adoption of a code of conduct and best practices in shark ecotourism Consultation with appropriate stakeholders Potential creation of an ad hoc advisory board, as appropriate Adoption of the regulation
Compliance of CITES regulations	Issuance of shark regulations for CITES listed species	Development of procedures and regulatory framework for CITES shark species Preparation of Non Detrimental Findings (NDF) Reports Training on shark identification for Customs staff Coordination between the CITES national scientific authority and the CITES national administrative authority

Line of Action 4 Participation

Objective	Goals	Activities
Increase the participation of interest groups / stakeholders in the decision making process for shark management	Increased knowledge and understanding of shark fisheries management policies and programs by resource users	Carry out workshops and other meetings to discuss and disseminate fisheries management policies and programs Establishment of feedback mechanisms with stakeholders

Objective	Goals	Activities
	NPOA implementation and shark management follow up	Creation of an ad hoc NPOA-shark advisory committee if necessary Formation of the fisheries advisory committee considered in the A&B Fishery Act

Line of Action 5 Communication and Education

Objectives	Goals	Activities
Enhance awareness of the importance of fisheries management and sustainable use of shark resources	Enhance awareness of the NPOA-sharks, and on the importance of sustainable utilization of sharks, among fishers, resource users and the general public Feedback mechanisms	Identification of target groups Preparation and distribution of publications and dissemination materials (e.g. shark identification sheets) Symposium/ Seminars or other meetings on fisheries management and shark conservation Provision of relevant and updated information to fishers and fishers' organizations Dissemination and educational activities in schools or any other sectors identified Use of social networks and media Establishment of feedback mechanisms

I. Background

The increase of shark[1] fishing and the impact this may have on populations of some species in several areas of the oceans around the world has been a growing concern. The prevailing view is that it is necessary to control shark fisheries and the activities in which sharks may constitute a significant by-catch. Sharks share a number of biological characteristics that make them susceptible to over-utilization. Sharks are predators and many are top-level carnivores. As a result, their abundance is low compared with species at lower trophic levels. Additional aspects of shark biology that make them susceptible to overfishing include late onset of maturity, slow growth rates, low fecundity and reproductive strategies such as giving birth to live young or laying a small number of eggs.

Reflecting this concern, FAO organized an expert meeting in April 1998 in Tokyo, Japan, where an International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) was developed. In 1999, FAO, through the Committee on Fisheries, adopted the IPOA-Sharks in response to these growing international concerns about the inherent vulnerability of elasmobranch stocks to overfishing, the demonstrated historical collapse of some shark fisheries and the rapidly increasing shark landings. The IPOA-Sharks requested that all United Nations member countries that captured sharks and their relatives voluntarily prepare national "shark-plans" (NPOAs), which should include monitoring, assessments and management protocols to insure that shark stocks are fished sustainably and that threatened species be conserved (FAO, 1999).

According to FAO (2015) a comprehensive review of the implementation of the IPOA-Sharks by FAO was concluded in 2012 (Fischer *et al*., 2012). It focused on the 26 top shark-fishing countries, areas and territories as well as 10 RFMOs determined as those reporting at least 1 percent of the global shark catch during the decade from 2000 to 2009. These 26 countries, areas and territories were responsible for 84% of the global shark catches reported to FAO from 2000 to 2009 and the top seven alone were responsible for over half of the global reported shark catches.

Only five (20 percent) of the top 26 shark-fishing countries, areas and territories have not adopted an NPOA Sharks, signed the PSMA or implemented an NPOA IUU. Nonetheless, in quite a few countries the effective implementation of monitoring, control and surveillance schemes is problematic, often because of a lack of human and financial resources (Fischer *et al*., 2012).

[1] In the NPOA-Shark context the term "sharks" defines all species of the class Chondrichthyes and includes sharks, skates, rays and chimeras occurring in A&B, unless otherwise noted. The term "shark catch" includes directed, by-catch, commercial, recreational and other forms of taking sharks (FAO, 2000). The term "elasmobranch" is also used as equivalent for "sharks".

A survey to assess the degree of implementation of the IPOA-Sharks by WECAFC[2] member states was conducted in late 2011. As of November 2011, 28% of WECAFC members had developed NPOAs, and a further 7% had any form of fisheries legislation pertaining to elasmobranchs. As it stands, there is no management of elasmobranch fisheries in the vast majority (74%) of the western central Atlantic fisheries area (Brooks, 2013).

As of June 2013, eight species of sharks and all manta rays are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The list includes the Basking shark (*Cetorhinus maximus*), Whale shark (*Rhincodon typus*), Great white shark (*Carcharodon carcharias*) the Oceanic whitetip shark (*Carcharhinus longimanus*), Porbeagle shark (*Lamna nasus*), Scalloped hammerhead shark (*Sphyrna lewini*), Smooth hammerhead shark (*Sphyrna zygaena*), Great hammerhead shark (*Sphyrna mokarran*) and the Manta rays (Manta spp.). The inclusion of hammerhead sharks took place at the 16th Conference of the Parties in 2013. Their inclusion in Appendix II may be of importance where these species interact with small scale fisheries and some of their products can be traded across many countries. Hammerhead sharks are also important because a great deal of the shark by-catch in tropical coastal gillnet fisheries consists of neonates (newborn) and juveniles.

In the Caribbean, regional policy initiatives recommend that governments in the region develop management regimes for the use and conservation of shark resources, in the context of the International Plan of Action for the Conservation and Management of sharks (IPOA-Sharks). This is in recognition of the fact that sharks are caught, sold and consumed by small scale fishers, who operate in multi-gear, multi-species fisheries. It is also recommended that fishers' organizations at all levels, be strengthened to become true partners in responsible fisheries management (CNFO, 2014).

In this regard, the Government of Antigua and Barbuda has collaborated with the FAO's Sub-Regional Office for the Caribbean, the Caribbean Network of Fishers Organizations (CNFO) to take the necessary steps in the development of the A&B´s NPOA-Sharks and contribute to the sustainable use of elasmobranchs becoming one of the leading nations in the Caribbean.

II. Introduction

Sharks, rays and chimeras are important resources from ecological (food chain) and economic (fishing, food, tourism) point of view. These cartilaginous fish belonging to Class Chondrichthyes are divided into two subclasses: Elasmobranchii

[2] Current membership incude Antigua and Barbuda, Bahamas, Barbados, Belize, Brazil, Colombia, Cuba, Dominica, Dominican Republic, European Union, France, Grenada, Guatemala, Guinea, Guyana, Haiti, Honduras, Jamaica, Japan, Mexico, Netherlands, Nicaragua, Panama, Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Spain, Suriname, Trinidad and Tobago, United Kingdom, United States of America, and the Bolivarian Republic of Venezuela.

(Sharks and rays) and Holocephalii (chimeras). Chondrichthyans have unique biological characteristics and are found as top predators of the food chain of the marine ecosystem. They are of slow growth, long life span, mature at older ages and most of the species have low fecundity, therefore their abundance is relatively small compared with other groups. These characteristics, in addition to the level of fishing effort worldwide, gives us reasons to believe these species may be more vulnerable to fishing pressure than other fish resources.

Catch levels in shark fisheries at a global level are still of great concern which led FAO to develop the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), within the framework of the Code of Conduct for Responsible Fisheries, encouraging countries to develop their own National Plans of Action (NPOA). The guiding principle requires that the States contributing to shark fishing mortality should participate in shark conservation and management since they are a traditional and important source of food, employment and income, and as such they should be utilized sustainably.

Sharks and rays generally have a relatively low economic value, making them of low priority in terms of research and conservation needs, while demand for some of their products, such as fins, is very high and encourages increased exploitation. Despite the great ecological, social and economic importance of sharks, in general terms there is limited knowledge about their current state; studies and research are scarce, isolated and discontinuous in time. Lack of information is a major barrier to proper assessment of shark resources for management purposes.

Another important aspect to be considered is the involvement of resource users / stakeholders in the fishery management process. Any initiative for shark management and conservation is more likely to be successful if fishers, entrepreneurs, tourism stakeholders, environmental NGOs and others are involved and participate in joint efforts with government institutions. Since many shark species are also migratory and shared among countries, international cooperation and coordination is also needed.

1. Description of the prevailing state of sharks stocks in Antigua and Barbuda

Antigua and Barbuda established itself as an archipelagic state in 1982 with a 12 nautical mile territorial sea, an Exclusive Economic Zone (EEZ) and a Fishery Zone of 200 nautical miles. The full extent of the EEZ is unknown since negotiations with neighboring states have not been completed.

It is estimated that Antigua and Barbuda has a total shelf area of 3,568 km^2. This includes the Antigua and Barbuda shelf (3,400 km^2), South Bank (40 km^2), a section of Anguilla shelf (7 km^2), Redonda shelf (98 km^2), Havers Shoal (5 km^2) and a section of St. Christopher and Nevis shelf (18 km^2). The Antigua and Barbuda shelf

that both islands emerge from is one of the largest in the Eastern Caribbean. These relatively extensive fishing grounds support a substantial demersal resource of reef fish, Gastropoda (e.g., Queen conch) and Crustacea (e.g., Caribbean spiny lobster). Based on the most conservative of estimates from various sources, including the Fisheries Division, these resources could provide an annual sustainable yield of between 3,409 and 6,585 metric tons. Current production is line with the fore mentioned maximum sustainable yield estimates; in 2012, the demersal resource yielded 5,426 metric tons (live weight) and accounted for 91% of the total ex-vessel value of production (EC$54.79 million). For the same period, the fisheries sector contributed to 2% of the national GDP (in current prices).

In addition to these demersal resources, seasonal large pelagic species, (e.g., tunas, dolphinfishes, wahoos and billfishes) pass through the waters of Antigua and Barbuda. Even though the extent of these resources is not fully known, the consensus of opinion is that most are not fully utilized. In 2012, production of large pelagics was estimated at 100 metric tons. The large pelagics not only offer great potential for the expansion of the capture fishery but also the sport fishing or recreational fishery.

There are about 40 private sport fishing vessels operating in Antigua and Barbuda, including 10 commercial charters. The Antigua and Barbuda Sport Fishing Association sponsors an international billfish tournament annually, which attracts about 30 to 40 entrants from neighboring islands. To-date no valuation of the contribution of the sport fishery has been conducted.

At the end of 2012, there were 1,635 registered fishers engaged in the sector, with 754 (approximately 46%) classified as full-time. Of the registered fishers, 849 were actively fishing, which is about 2% of the national labor force. An addition 50 individuals were employed in an underdeveloped processing sector. The high energy cost associated with processing and storage, and inadequate access to capital has curtailed the development of this area. In terms of employment, values should be taken as conservative estimates since the fisheries sector acts as a "safety-net" for other economic activities (i.e., a large proportion of fishers are also employed in the construction and tourism sectors), hence downturns in these areas of employment can impact on fishing effort. In terms of level of dependency on fishing, the community of Codrington, Barbuda, has the highest, with 1 in every 4 persons economically supported by the export-oriented spiny lobster fishery.

The fishing fleet of Antigua and Barbuda has undergone significant modernization. Old sloops and dories have been gradually replaced by modern fiberglass launches and pirogues with the latest fishing equipment (global positioning system, depth sounder, etc.). While there have been significant improvements in terms of vessel construction and fishing technology, traps or "fish pot" used to target the demersals remain the dominant gear due to the extensive nature of the island shelf. In 2012, trap fishing vessels comprised 30% of the active fishing fleet of 339 vessels.

In terms of exports, the contribution of the fisheries sector to foreign exchange earnings has decreased significantly since the formation of the single European Market on1993, when legislation governing the production of food was harmonized throughout the European Community. For example, in 1990, the domestic export of seafood from Antigua and Barbuda was 183 metric tons; export has decreased to 83 metric tons in 2010. Despite the decline in exports, the European Union remains the main market, with as much as 84% of the lobsters landed in Barbuda being shipped to the French territories in the region.

Regarding regional shark fisheries, the Western Central Atlantic Fisheries area encompasses the tropical and sub-tropical western Atlantic, the Gulf of Mexico and the Caribbean, including the territorial waters of Antigua and Barbuda. The majority of coastal, pelagic and deep-water elasmobranch stocks likely to be encountered in the waters of Antiqua and Barbuda are found within this fisheries area. Many species endemic to the region are trans-boundary in nature, meaning their natural life history straddles the EEZs of many nations, and in many cases, the high seas. As such, regional management of elasmobranch resources is as important as national management, for the sustainable exploitation of elasmobranch resources in Antigua and Barbuda.

The total catch of elasmobranchs in the Western Central Atlantic Fisheries Area has mirrored trends in the global catch, with the exception of a more defined increase in catch from 1980 to 1985 (Figure 1). Over the last ten years (1991-2011), total elasmobranch catch in the Western Atlantic Fisheries Area represents 3.43% of the total global catch reported to the FAO (Brooks, 2013). Antigua and Barbuda first started reporting elasmobranch landings in 2001 (Figure 2), landing a mean of 34 metric tons annually since records began. This low reported catch ranks Antigua and Barbuda at number 17 of 22 WECAFC nations that contribute to shark mortality within the fishing area (Brooks, 2013). In 2012, 50 metric tons (live weight) of sharks were landed at an ex-vessel value of EC$0.6 million.

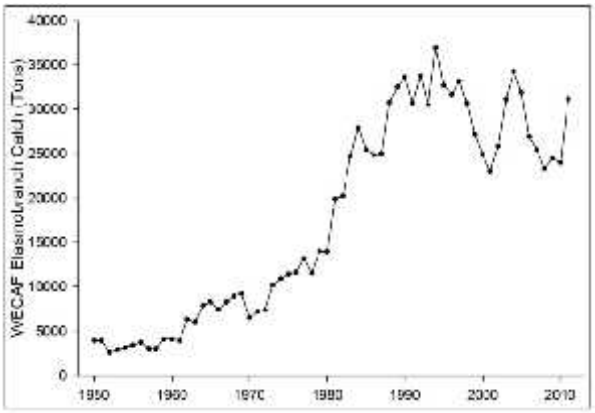

Figure 1. - Elasmobranch landings in the Western Central Atlantic Fisheries Area (from Brooks, 2013)

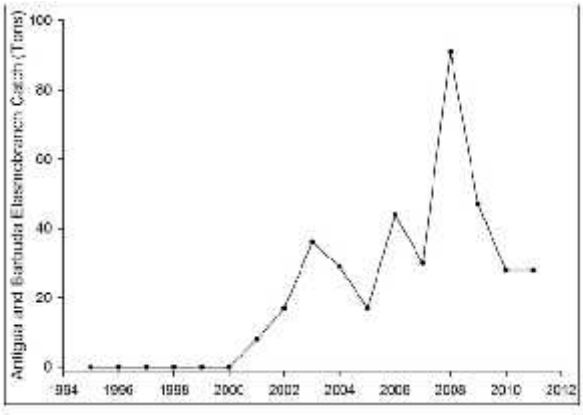

Figure 2. Reported Elasmobranch catch from Antigua and Barbuda 1995 – 2011 (from Brooks, 2013)

As part of collaborative research between Antigua and Barbuda Fisheries Division and the Caribbean Network of Fisherfolk Organization (CNFO, 2014), results of60 interviews carried out at the end of 2012 (4 from recreational fishers, 35 from commercial fishers, 11 from conch and lobster fishers, and 10 from dive operators) indicated that

- 38.3% perceived a decline in shark abundance, while 56.67% indicated that shark abundance was stable or had increased.
- The most commonly sighted species, starting with most often sighted, were Nurse Shark (*Gynglimostoma cirratum*), Blacktip Shark (*Carcharhinus limbatus*), Tiger Shark (*Galeocerdo cuvieri*), Lemon Shark (*Negaprion brevirostris*), Caribbean Reef Shark (*Carcharhinus perezi*), Hammerhead Shark (probably *Sphyrna gilberti*, *S. lewini, S. mokarran*, *S.tiburo* and *S. zygaena*), Bull Shark (*Carcharhinus leucas*) and the Sixgill Shark (Hexanchus *spp*.).
- Fishers using gillnets, hook and line, vertical longlines and traps caught sharks, while no spear fisher caught sharks.
- 80% of commercial fishers caught sharks and the most commonly captured were Tiger Shark, Nurse Shark, Blacktip Shark, Lemon Shark, Caribbean Reef Shark, Hammerhead Shark, Sixgill Shark. Least commonly captured was the Bull Shark.
- Commercial fishers sold dressed shark carcasses for prices ranging from EC$2.00 to EC$12.00, but the fins were discarded.

There is an established shark fishery in Antigua and Barbuda, however, its scale and diversity is challenging to quantify given the limited data. The fishery is subsistence to artisanal in nature with sharks being landed for their meat rather than the potentially higher economic returns associated with the fins; the liver is occasionally used in traditional medicine such as shark oil Landed sharks (mainly juvenile *G. cirratum* and *C. perezi*) are incidental catch of the trap and inshore gillnet fishery respectively. Fishers generally try to exclude sharks from their gear given their impact on their catch (e.g., bitten fish in traps and nets) and damage caused to gear (e.g., ripped nets and holes in traps). To minimize losses, the

entrance of traps is typically reinforced with additional wattle or steel to exclude large sharks and soak-time for nets are minimized to limit damage. According to the Fisheries Regulations 2013, a net cannot remain in place in the sea for longer than four consecutive hours; this done to minimize the gear impact on nontarget species (marine turtles, sharks, etc.) Note incidental catch of neonate and juvenile segments of a population can have an impact on the abundance of a species that may not be immediately apparent until the breeding stock has depleted. Given the longevity of elasmobranchs, this can be many years (Brooks, 2013).

An item of particular concern is the lack of specific management regulations regarding elasmobranch, if any entrepreneurial fisherfolk identify the Asian fin trade as a new market. The current legislation, the Fisheries Act 2006, allows the Minister to: make new regulations for the conservation and management of any particular fishery; prescribe prohibited methods; regulate the catching and utilization of fish taken incidentally; and provide for the control or prohibition of the import and export of fish. Administratively, export of fish and fishery products require the approval of the Chief Fisheries Officer with respect to customs procedures. While harvesting of sharks solely for their fins is not currently a practice in Antigua and Barbuda fishery, the threat exists given the high retail value of fins in the Asian market; prices has reached as high as US$700 per kg or US$320 per lb. (Clarke 2004).

Another distinctive feature in A&B is shark ecotourism where one tour operator, Stingray City, has been in operation since 2002. This operator offers interactions with up to fifty southern stingrays (*Dasyatis americana*) predominantly for tourists arriving by cruise ship, but also catering to hotel guests and local Antiguans. The owner estimates that over 20,000 people visit stingray city annually and it is rated as one of the main attractions of Antigua and Barbuda. Other similar interactions are common in other countries in the Caribbean (The Bahamas and Cayman Islands). The potential for expanding this industry is perceived as positive because of the generated revenues, although protocols and guidelines must be developed.

2. Principles of the Plan

The IPOA-Sharks defines the guiding principles for the development of an NPOA-Sharks. These are:

Participation. Stakeholders that contribute to fishing mortality on a species or stock or those in shark-related activities should participate in its management.

Sustaining stocks. Management and conservation strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying the precautionary approach.

Nutritional and socio-economic considerations. Management and conservation objectives and strategies should recognize that shark fisheries or shark-related activities may be a traditional and important source of food, employment and/or income. Such activities should be managed on a sustainable basis to provide a continued source of food, employment and income to local communities.

In addition, the following principles are also included:

Adoption of the Precautionary Approach. Because fishing sharks down to unsustainable levels may occur rapidly and recovery can take decades for many species, successful management of shark fisheries should be based on the precautionary approach in which measures are implemented proactively before overfishing occurs. FAO (2000) pointed out that the low productivity of shark stocks in general, the particularly low productivity of some species of shark, and naturally small population size or rarity of some species of shark implies that the precautionary approach is most applicable to this group of fishes. Their stocks can often be rapidly depleted to very levels and be slow to recover from the effects of overfishing. Controls should be implemented early during the developmental phases of fisheries taking sharks and other chondrichthyan species.

Adoption of the Ecosystem Approach to Fisheries (EAF). Commercial and recreational fisheries exhibit numerous regional distinctions and differences such as: target species, incidental species, by-catch and by-catch mortality, geographic location, gear, season, weather, vessel characteristics, and shark species present. Consequently, each fishery poses different levels of risk to elasmobranch populations with regard to directed or incidental catches or by-catch, and commercial or recreational fisheries. Other economic activities as tourism, maritime transport may also have an effect. Therefore, as it is defined by FAO, the EAF strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.

3. Objectives of the Shark Plan

The Antigua and Barbuda Sharks NPOA strives to secure sharks national biodiversity conservation and manage fisheries and/or other economic activities where sharks, rays and chimeras inhabiting marine waters of the country interact, are target or by catch species.

The plan will also implement the aims identified in the International Plan of action for Sharks as provided by FAO:

- Ensure that shark catches from directed and non-directed fisheries are sustainable;

- Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use;
- Identify and provide special attention, in particular to vulnerable or threatened shark stocks;
- Improve and develop frameworks for establishing and coordinating effective consultation involving all stakeholders;
- Minimize unutilized incidental catches of sharks;
- Contribute to the protection of biodiversity and ecosystem structure and function;
- Minimize waste and discards from shark catches in accordance with article 7.2.2. (g) of the Code of Conduct for Responsible Fisheries (for example, requiring the retention of sharks from which fins are removed);
- Encourage full use of dead sharks;
- Facilitate improved species-specific catch and landings data and monitoring of shark catches;
- Facilitate the identification and reporting of species-specific biological and trade data.

The Government of Antigua and Barbuda should ensure that the implementation of the NPOA for shark conservation is consistent with the obligations and commitments adopted in international agreements and treaties relevant to the topic e.g., the Convention on the Biological Diversity(CBD), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals (CMS) as well as with the Caribbean Community Common Fisheries Policy (CCCFP).

This NPOA has been developed by the Fisheries Division of the Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs, in consultation with stakeholders, to fulfill the national responsibility of the Antigua and Barbuda. Although shark landings do not constitute a large portion of the A&B landings the sustainability of shark stocks is of international concern. In addition, overfishing of sharks can occur rapidly with extended periods required to rebuild. Furthermore, the depletion of traditionally higher-value species can lead to increased directed fishing on sharks. By participating and by supporting the adoption of the NPOA, Antigua and Barbuda has committed to ensuring that shark fisheries or shark related activities (tourism and recreational fishing) are sustainable.

4. Scope of the Plan

The National Action Plan is a planning and management tool that specifies the goals, targets and activities considered relevant to cover shark conservation at the national level bearing in mind the indicators and means of verification. It represents an effort to generate inter-sectorial synergies aimed at enabling the

viability and sustainability of the current and/or new shark management initiatives in the nation.

The National Action Plan will apply on a voluntary basis to all fishing activities, storage, transport, marketing and research carried out on shark species and their derivatives, as appropriate, in Antigua and Barbuda EEZ and territorial sea where there is national jurisdiction in accordance with international laws and treaties, as well as species taken by A&B-flagged vessels fishing in extra-territorial waters, if any, subject to the rules that may apply other States, organizations or competent regional or sub-regional arrangements.

The NPOA-Sharks is an operational plan. It is a record of both actions already underway and recommendations for actions that could enhance the conservation and management of sharks in Antigua and Barbuda.

The NPOA-Sharks will be reviewed and revised periodically to ensure on-going effectiveness of Antigua and Barbuda's efforts to address the conservation and management of shark species.

5. Procedures for NPOA implementation, follow up and review

The National Plan is designed as a planning and management tool, consisting of short, medium and long term goals whose achievement and development involves multiple sequential or simultaneous steps.

Considering the number and diversity of the proposed targets, it is necessary to prioritize the goals and activities establishing the corresponding implementation schedule. For this purpose a public-private NPOA coordinating committee will be set up, if needed. This committee will define the necessary working programs to be implemented and may adjust or modify the contents of the shark-NPOA (objectives, goals, activities, etc.) depending on its progress or new available information. This committee will also seek the necessary funds for implementation

The public-private NPOA advisory committee will be also set up as a discussion forum for the NPOA review. These cooperative efforts will be guided by the plan of action whose progress and implementation will be subject to regular review and evaluation on a yearly basis. Prioritization of activities and budget of the Plan will be determined by the shark advisory group that it will be created

6. Strategies for achieving objectives.

The following lines of actions were identified for the NPOA-sharks:

6. Fisheries Research
7. Monitoring
8. Responsible fishing practices, governance and legislation
9. Participation
10. Education and communication

These lines of actions link the objectives which are made operational through proposed goals and activities identified for their achievement. It is used as a control system indicator the means of verification and assumptions. The presentation of the Plan is done through a logical framework matrix.

For the above mentioned the following terms are then defined:

Objective: strategic purpose
Goal: operational purpose, time bounded and measurable

The plan has two types of goals:

1. Result-oriented goals
2. Action-oriented goals that target the following three areas:
   i) enhance knowledge and understanding of specific areas;
   ii) develop and strengthen initiatives and specific sectorial projects;
   iii) support the development and implementation of national initiatives through inter-sectorial coordination and collaboration.

Activities: Actions or tasks that must be implemented to meet the goal within the set deadline.
Indicators: The unit that allows to assess whether a goal has been achieved. The indicators provide the basis for monitoring and evaluation.
Means of verification: are the sources of information that allow to assess the indicators.
Assumptions: external situations and conditions that are outside the control of the plan. The achievement of goals depends on whether or not assumptions hold true.

Line of Action 1 Fisheries Research

Adaptive and participatory shark research is needed to generate information for decision-making and adjustments made as more information is available on sharks biology, their population dynamics, the ecosystem and socioeconomics. Conservation and management of sharks require to make use of the best information available, including scientific information, for proper decision making. Therefore, the priority is to ensure that key fishery aspects, e.g. biological and environmental, capture technology and socioeconomics, are properly focused. The incorporation of fishers and other stakeholders´ knowledge will also be properly addressed.

Management of shark resources for sustainable use involves the control of the fishing mortality by limiting fishing effort and the use of management tools such as minimum sizes, the provisions on mesh/hooks size and closed areas and seasons.

Objective	**Goals**	**Activities**	**Indicators**	**Means of Verification**	**Assumptions**
Develop shark research programs under the ecosystem approach to fisheries to be the foundation upon which the Fisheries Division will obtain good data and information for decision making on shark management	Shark research program on shark taxonomy and identification, shark biology, their ecosystems and the environment Development of socio economic research programs Incorporation of fishers and other stakeholders´ knowledge	Creation of a national shark scientific working group/ appointment of a shark national focal point as appropriate Training on shark identification Selectivity studies on fishing gears if needed At sea/ dockside regular sampling programs of shark catch/ landings Implementation of a socio economic research program Identification of potential nursery and breeding areas Development of collaborative partnerships Establishment of mechanisms for incorporating fishers and other stakeholders´ knowledge	Research programs developed and implemented A shark working group/ national focal point in place and implemented as appropriate Number of workshops on shark identification and sampling Number of Nursery/breeding areas identified Number of research papers/ reports Meetings with fishers	Research database in place Research reports Management measures recommended for implementation Research programs implemented Trained staff on shark research available Institutions/ Organizations supporting the Fisheries Division in training and research programs Feedback mechanisms in place Fishers and other stakeholders knowledge documented	Financial support available Political willingness for implementation Research protocols in place and staff available Other institutions and organizations available and willing to contribute Fishers willingness to share knowledge
Provide easy access to information on shark fisheries by fishery scientists	A shark national database in place to be easily accessed by fishery scientists and other stakeholders	Creation of a national shark database and users´ rules Establishment of mechanisms for incorporating fishers and others stakeholders´ knowledge	Database implemented Rules of access	Access to the shark database in place and implemented Feedback mechanisms in place	Institutions and scientists willing to share data and information on shark fisheries Fishers and other stakeholders willingness to

Objective	Goals	Activities	Indicators	Means of Verification	Assumptions
					participate

Line of Action 2 Monitoring

Ensuring sustainable fisheries requires precision in stock assessment and models, both of which require the collection or access to up-to-date statistics, e.g. catches broken down by species, area and gear, as well as some measure of fishing effort. Well informed formulation of policy, the elaboration of plans and the management of fisheries and aquaculture, relies on the collection of basic data on fishers, catches, fishing effort, prices, values and other related information, such as size at capture and length frequencies of target species (FAO, 2001)

Objectives	Goals	Activities	Indicators	Means of Verification	Assumptions
Development of a shark monitoring system	A control system through an export certification scheme with identification of the species	Develop legal framework and procedural mechanisms as appropriate Develop species identification procedures Training of staff on shark identification of shark and by-products exported, including staff from other institutions Preparation and signing of an MoU between the Fisheries Division and Customs Department	Control system implemented Number of species registered Number of training workshops and staff	Exports register and database Export records Species identification procedures and trained staff in place Legal framework and procedural mechanisms in place MoU signed and implemented	Legal framework in place The control system is useful for the regulatory entities Customs department willingness to sign an MoU
	Shark export database	Build historical data series Set up an export register system	Export register implemented	Export records Historical exports database	

Objectives	Goals	Activities	Indicators	Means of Verification	Assumptions
	Catch/landings data series of shark target species and by catch/discards as appropriate	Develop a shark catch/ landings and by catch database as appropriate Training of fishery inspectors on shark identification (whole shark, fins, carcasses or other derivatives) Develop sampling procedures for shark by-catch estimates if needed Implementation of fishery logbooks on board At sea-observers and/or dockside monitoring program	Shark catch and by catch statistics Number of shark species registered for statistical purposes (Statistics broken down by species) Number of training workshops and staff Estimation of shark by-catch Statistics in place and updated Number of logbooks implemented	Yearbook of fishery statistics Logbooks provided to the authorities Workshop reports Papers and reports Potential at sea observers program in place	Fishers willingness to provide logbooks Financial support I in place Staff available
	Fishing effort data collection	Development of a shark fishing effort database if appropriate	Fishing effort statistics Fishing permits/ licenses	Yearbook of fishery statistics Vessels register Permits register	Vessel register in place

Line of Action 3 Responsible Fishing Practices, Governance and Legislation

Sustainability of the fisheries and the shark species should be the priority of fisheries management since it is a basic condition for obtaining benefits from the activity. Fisheries management would not be complete if there is no legal framework in place and legal support to underpin the various fisheries management measures. In the case of sharks, the scope of the fisheries regulations is not clear as long as many shark species are migratory, expressing the additional need for international regulation measures and coordination. In the particular case of Antigua and

Barbuda the development of the shark ecotourism industry shall be properly addressed.

Objective	Goals	Activities	Indicators	Means of Verification	Assumptions
Regulate shark fisheries based on conservation standards appropriate to their biology, population dynamics and the socioeconomic and local conditions	Implement conservation measures to regulate shark catches based on appropriate reference points	Set reference points for target shark species management if needed Set catch quotas for target shark species if needed	Number of regulations agreed and adopted Reference points identified Catch quotas	Official publications (Gazette)	Knowledge and data on the biology of the shark species available Socio economic data and fishers 'knowledge incorporated Appropriate shark stock assessment models available
Manage areas that are critical to the life cycle and survival of shark species, if any	Management of sharks nursery and/or breeding grounds	Establishment of the selected management areas and implementation follow up and monitoring	Number of areas under management and/or selected, implemented and monitored	Publication in the Official Gazette Research reports Monitoring reports	Studies of the shark species that require special protection in place and available Studies of the areas identified as critical for shark protection in place and available Technical feasibility and capacity to manage the areas in place
Recover shark populations in danger of extinction or near critical sustainability thresholds, if any	Implementation of specific programs and measures to ensure the recovery of the populations in danger of extinction or near critical thresholds	Develop and implement programs to recover shark species considered to be in danger or near critical thresholds	Number of regulations adopted and implemented to protect shark species in danger or near critical sustainability thresholds	Publications of regulations and species in the Official Gazette	Knowledge and data on the biology and fisheries of the shark species involved available Appropriate biological

Objective	Goals	Activities	Indicators	Means of Verification	Assumptions
					reference points for the shark species under management available Shark stock assessments available Classification of the species in danger based on reliable data and information
Join and adopt international agreements for the conservation of sharks, in particular oceanic and deep water species	Become State Party of international agreements for the conservation of sharks, in particular oceanic and deep water species in the Caribbean Sea	Develop multi o binational Agreements for the conservation of shark species, in particular highly migratory or from shared stocks among different countries in the Caribbean Development of a Regional Plan of Action for Sharks (RPOA) at the WECAFC/CARICOM/ OECS level if appropriate	Agreements, Conventions and any international arrangement agreed upon and adopted by Antigua and Barbuda	Ratification of the Agreements/ Conventions by Antigua and Barbuda	Shark protection agreements do not infringe A&B´s foreign policy principles
Promote full utilization of dead sharks captured and retained	Shark finning prohibited	Make regulations on shark landings, e.g. provisions for sharks landed with fins naturally attached	Regulation on shark finning	Implementing rule published	Resource users and stakeholder support
	Minimize shark discards in compliance with the Code of Conduct for Responsible Fisheries	Establish commercial strategic alliances to develop new markets and technology transfer to enhance the degree of utilization of sharks Training/Assistance on shark utilization and marketing/branding	National products in new markets	Export registry of shark products/ by-products	Market opening for shark products/ by-products
Address shark by-catch and/or neonates/	Reduction of shark by-catch and juvenile/ neonate sharks	Selectivity studies on fishing gears and methods	Number of research reports	Research reports Statistics	Technical and financial viability

Objective	Goals	Activities	Indicators	Means of Verification	Assumptions
juvenile shark catches	in fishing operations	Identification of nursery/ breeding areas Regulate fishing gears and methods, closed season/ area, if applicable	Number of areas identified, implemented and monitored Catch/ Landing statistics Species identified as affected	database available Management measures recommended and/or implemented and monitored Implementing rule published	
Promote the development of the shark ecotourism industry	Responsible shark ecotourism industry	Development of a shark ecotourism policy, if appropriate Development and adoption of a code of conduct and best practices in shark ecotourism Consultation with appropriate stakeholders Potential creation of an ad hoc advisory board, as appropriate Adoption of the regulation	Shark ecotourism policy Code of conduct and best practices Number of new initiatives for shark ecotourism Number of consultations and meetings	Policy adopted and in place Code of conduct and best practices adopted and implemented New shark ecotourism initiatives in place Ad hoc advisory board in place	Stakeholders involvement and cooperation Inter-institutional coordination In place
Compliance of CITES regulations	Issuance of shark regulations for CITES listed species	Development of procedures and regulatory framework for CITES shark species Preparation of Non Detrimental Findings (NDF) Reports Training on shark identification for Customs staff Coordination between the CITES national scientific authority and the CITES national administrative authority	Export statistics Number of training workshops and staff Number of CITES permits	Regulatory framework in place and implemented Shark exports NDF Reports CITES permits issued	Institutional coordination and capacity Staff available

Line of Action 4 Participation

Fisheries management seeks to establish clear criteria and processes to make the system stable in the long term in which different interest groups/stakeholders associated with the fisheries sector are involved. This aims to make decisions that favor sustainability, duly considering the social and economic dimensions for the sustainable use of commercial fishery resources. There is the need to recognize and design formal mechanisms for participation in the decision-making process, with broad representation of relevant stakeholders and unimpeded, and timely access to information, particularly the one regarding the scientific advice used as a basis for decision making.

Objective	**Goals**	**Activities**	**Indicators**	**Means of Verification**	**Assumptions**
Increase the participation of interest groups / stakeholders in the decision making process for shark management	Increased knowledge and understanding of shark fisheries management policies and programs by resource users	Carry out workshops and other meetings to discuss and disseminate fisheries management policies and programs Establishment of feedback mechanisms with stakeholders	Number of discussion forums on management policies and programs	Workshops reports Feedback mechanisms established	Fisheries management policies and programs in place
	NPOA implementation and shark management follow up	Creation of an ad hoc NPOA-shark advisory committee if necessary Formation of the fisheries advisory committee considered in the A&B Fishery Act	Ad hoc NPOA-shark advisory committees National fisheries advisory committee	Documents issued and minutes of meetings Committee(s) in place and operating as appropriate	Legal framework and means for work implementation in place Political and stakeholders willingness

Line of Action 5 Communication and Education

To enhance public knowledge about the presence and types of shark species within Antigua and Barbuda waters and demystify the shark; the importance of shark species to sustainable ecosystems, the reasons why our country has developed a national plan of action for the conservation and management of sharks, and the efforts that are being taken to assess, understand and manage these species.

Objectives	**Goals**	**Activities**	**Indicators**	**Means of Verification**	**Assumptions**
Enhance	Enhance	Identification of	Number of	Publications	Financial

Objectives	Goals	Activities	Indicators	Means of Verification	Assumptions
awareness of the importance of fisheries management and sustainable use of shark resources	awareness of the NPOA-sharks, and on the importance of sustainable utilization of sharks, among fishers, resource users and the general public Feedback mechanisms	target groups Preparation and distribution of publications and dissemination materials (e.g. shark identification sheets) Symposium/ Seminars or other meetings on fisheries management and shark conservation Provision of relevant and updated information to fishers and fishers' organizations Dissemination and educational activities in schools or any other sectors identified Use of social networks and media Establishment of feedback mechanisms	seminars/ symposiums carried out Number of fishers/students participating Number of reports and outreach materials	and reports Educational and dissemination materials available Fishers and other target groups are aware of shark management and their sustainable use Feedback mechanisms in place	support and staff available Stakeholders involvement

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