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Accompanying document to the

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

On a European Community Plan of Action for the Conservation and Management of Sharks

IMPACT ASSESSMENT

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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

On a European Community Plan of Action for the Conservation and Management of Sharks

EXECUTIVE SUMMARY

This Impact Assessment (IA) concerns a proposal for a Communication from the Commission to the European Parliament and the Council on a European Community Plan of Action for the Conservation and Management of Sharks. The report has been drafted taking into consideration the results of public and institutional consultations and a study commissioned from a private consultant on this subject.

Three policy objectives and nine fields of action were initially envisaged by the draft submitted for consultation. Following the consultation process, the fields of action have been reduced to five, by merging some of them while retaining all the particular measures initially proposed.

The main policy objectives remain the same:

(1) Broaden the knowledge both on shark fisheries and on shark species and their role in the ecosystem.
(2) Ensure that directed fisheries for shark are sustainable and that by-catches of shark resulting from other fisheries are properly regulated.
(3) Encourage a coherent approach between the internal and external EC fishery policy for sharks.

The policy options analysed by this IA are as follow:

Option A: Status Quo with no Action Plan.

Option B: Several fields of Action to be addressed (with the possibility for "hard" and "soft" sub-options).

Option C: Application of a strict precautionary approach.

Following a detailed study of the environmental, economic and social impacts of each option and each field of action, the range of measures initially proposed under the re-arranged five fields of action has been slightly reduced, mainly because other bodies are

already dealing with them and in order to ensure a balance between available resources and effectiveness. However, a new measure has been added (co-operation through the Convention on Migratory Species –CMS- and the Convention on International Trade in Endangered Species of Wild Fauna and Flora -CITES).

The IA therefore concludes that the preferred option is an amended version of Option B. The main elements of the selected option comprise measures for data collection and scientific advice, management and technical measures and further limitations on shark fining practices. The fields of action and corresponding measures included in the revised draft Community Plan of Action (CPOA) are set out in Section 7.4 of the present Impact Assessment and in the table annexed to the Communication to the Commission.

Finally, a series of impact indicators (of the broad CPOA policy objectives) and result indicators (for the specific aims of the individual fields of action) have been proposed.

In summary, there are long-term negative impacts associated with the present *status quo*. The actions under option B should go along way to reversing those impacts, particularly within Community waters, without unacceptable social and economic short-or medium term impacts.

Lead DG: DG MARE

Other involved services: DG ENV, DG RTD, DG DEV and the SG.

Agenda planning reference: 2009/MARE/001

1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Organisation and timing

This impact assessment concerns a proposal for a Communication from the Commission to the European Parliament and the Council on a European Community Plan of Action for the Conservation and Management of Sharks. Its development is foreseen in Agenda Planning 2009/MARE/001 (Commission Communication on an EU Action Plan for sharks) and in the 2008 Annual Management Plan of the Directorate General for Maritime Affairs and Fisheries under the specific objective "Improve the governance of shark fisheries and ensure the sustainability of shark stocks".

On 16 October 2007, an inter-service steering group on an EU Plan of Action for the Conservation and Management of Sharks was convened by note of the DG FISH General Director to DGs ENV, RTD, DEV, AIDCO, TRADE, RELEX, SANCO, the LS and the SG. Four meetings of the steering group have taken place so far, with the participation of DGs MARE, RTD, ENV, DEV and the SG.

On 13 March 2008, a contract has been signed between an external consultant and the Commission to carry out a study concerning the Impact Assessment of the Commission's projected Plan of Action. The final report of this study has been delivered by the consultant on 18 July 2008.

The adoption of the Communication by the Commission is foreseen in January 2009.

1.2. Consultation and expertise

As a first step of this assessment, the Commission identified nine fields of action that it believed should be addressed in an EU Action Plan for Sharks.

On 11 December 2007, DG MARE launched a public consultation process through "*Your Voice in Europe*" on the measures to take, which was completed in March 2008. Furthermore, during the first part of 2008, the Commission services had contacts and exchange of views with NGOs and stakeholders and formal institutional consultations with all the RACs (Regional Advisory Councils), the ACFA (Advisory Committee on Fisheries and Aquaculture) and the STECF (Scientific, Technical and Economic Committee on Fisheries).

The input received in the consultation process has been used to inform this report and the impact assessment of the envisaged Action Plan. Appendix I to this report presents a brief summary of the contributions made by stakeholders to the EC.

On 29 September 2008 the Impact Assessment Board issued its opinion on the 1 September 2008 version of the draft impact assessment report. The Board's

recommendations have led to changes which are included in the present draft. They can be summarised as follows:

- The report has been re-structured to provide more information on the general policy context and to improve the presentation and analysis of the options.

- The analysis of option A better demonstrates the problems to be solved and the rejection of option C has been further justified.

- Economic, social, trade and international cooperation considerations have been incorporated to section 2.2.

- Basic information on fisheries and areas most concerned has been included in section 2.3.

- Further references to the EU and international policy context in which the CPOA will be developed have been included in section 3.2 (Johannesburg World Summit, CFP reform, Communication on discards and IUU Regulation).

- The policy objectives, scope and aimed vessels of option B have been clarified and further developed in sections 4 and 5.

- The operational objectives have been redefined in order to make them "SMART".

- Administrative and management costs have been extended in section 6 and a comprehensive presentation about the estimation which was used is given in Appendix III.

- Option B is now analysed at the same level of detail than options A and C in the main text.

2. PROBLEM DEFINITION

2.1. Issues requiring action

Despite their known vulnerability to overfishing, chondrichthyans (sharks, rays and chimaeras) have been increasingly exploited in recent decades. A number of factors are responsible for this trend, including improvements in fishing technology, processing and consumer marketing, expanding human populations and declines in other fish stocks, all of which have made sharks a more valuable fisheries resource. Thus, shark fisheries have experienced rapid growth since the mid-1980s due to an increased demand for shark products (fins in particular, but also meat, skin, cartilage, etc), especially in Asian markets. Between 1984 and 2004, world catches of sharks grew from 600,000 to over 810,000 metric tons. In addition, many thousands of sharks have been taken accidentally in tuna longline fisheries every year since their introduction in the 1960s.

Shark populations are generally fragile when targeted by unregulated fisheries, resulting in a pattern of “boom and bust”. Rising catches are followed by rapid declines and very slow recoveries when stocks are protected.

Roughly one-third of European shark species occurring in the EU waters are considered by IUCN to be threatened with extinction. Of the pelagic species, porbeagle *Lamna nasus* has been assessed as Critically Endangered in the Northeast Atlantic and Mediterranean Sea, the shortfin mako *Isurus oxyrinchus* is Critically Endangered in the Mediterranean, the white shark *Carcharodon carcharias* is Endangered in the Mediterranean, and the basking shark *Cetorhinus maximus* is Endangered in the Northeast Atlantic. The blue shark *Prionace glauca* is assessed as Vulnerable in the Mediterranean. Deepwater sharks are of particular concern: in the Northeast Atlantic, the gulper shark *Centrophorus* is Critically Endangered whilst the leafscale gulper shark *Centrophorus squamosus* and Portugese dogfish *Centroscymnus coelolepis* are both Endangered here. Two species of smoothhound *Mustelus asterias* and *Mustelus mustelus* are assessed as Vulnerable in the Mediterranean. Also of particular concern in European waters is the spiny dogfish *Squalus acanthias*, which is assessed as Critically Endangered in the Northeast Atlantic and Endangered in the Mediterranean.

The high value and demand for fins has led to the highly wasteful practise of cutting off the fins and discarding the carcasses. This practice is banned by all RFMOs and under Council Regulation (EC) No. 1185/2003, but cutting the fins on board and keeping the carcasses is allowed under certain conditions. Thus, member States are permitted to issue Special Fishing Permits (SFP) that allow derogation from the prohibition to remove shark fins at sea provided they do not have onboard more than 5% live weight of fins. However, this measure does not guaranty that finning practices are 100% prevented. In 2006 approximately 216 vessels (mostly Spanish) obtained this derogation, down from 232 in 2004. For other parties of RFMO's, the current state of implementation of the shark finning ban is unknown.

Within the framework of the Code of Conduct for Responsible Fisheries, the FAO adopted in 1999 the International Plan of action for the conservation and management of sharks (IPOA SHARKS). This international plan is voluntary but all concerned States are encouraged to implement it. It therefore foresees the implementation by States of national plans to ensure the conservation, management and long-term sustainable exploitation of shark following the guidelines of the IPOA.

The ability to manage elasmobranch stocks in both European waters and elsewhere is severely limited by the lack of detailed information on catches, discards and landings. Traditionally, however, not only have catches, discards and landings been under-recorded, but trade in shark products has been poorly understood and trade statistics are poor.

For both EU and non-EU fleets, species caught are often aggregated under generic headings such as *inter alia* rajiformes, sharks nei, elasmobranchii, preventing a clear distinction of catches by species, and therefore robust basis for stock assessment. This may be caused by the inability of fishing masters to formally identify the various shark species and/or reluctance to declare catches of individual species since some of them may be under special status (IUCN red list, CITES listing).

The European Community has the exclusive competence for the management of fisheries resources; however, it has not yet developed an EC Plan of Action for sharks, although it has adopted a number of measures aiming directly or indirectly at the conservation and management of sharks. However, the range of existing measures is clearly insufficient to

ensure the rebuilding of many depleted stocks fished by the Community fleet in Community and outside Community waters. Furthermore, given its weight at international level, the Community should assume a leading role in the development of policies aiming at the rational exploitation of fishing resources. Therefore, the Commission has foreseen the adoption at the end of 2008 of a Communication on an EC Plan of Action for the Conservation and Management of Sharks.

2.2. Underlying drivers of the problem

Biological considerations

In general, chondrichthyans have life histories characterised by low fecundity, large young, slow growth, late maturity, long life and high survival of all age classes.

This suite of life history characteristics results in low reproductive potential and low capacity for population increase, which has serious implications for chondrichthyan populations, as they limit their capacity to recover from over-fishing or other negative impacts. In contrast to teleosts, the recruitment of sharks to the adult population is very closely linked to the number of mature, breeding females (Holden 1974). The result is that, as mature animals are caught, the production of offspring that will support future generations also declines, which in turn limits future productivity of the fishery and the ability of chondrichthyan populations to recover from overfishing. In this respect, the reproductive potential and strategies of the chondrichthyans are more closely related to those of the cetaceans, large land mammals and birds than to the teleost fishes. Hence, long recovery periods are needed in response to over-fishing.

Data availability considerations

The European Commission is aiming to base the management of shark fisheries following the management advice of independent International Scientific Fora, as well as the recommendations of the Regional Fisheries Management Organisations (RFMOs). A crucial element of the present European Community's action plan will be the improvement of the knowledge on directed fisheries as well as on incidental catches of sharks.

Catch data for elasmobranchs in the ICES area are poor, and there are several reasons for this. Landings data are not indicative of catch levels because of the high discarding of some species. Even the available landings data for elasmobranchs are unreliable. Elasmobranchs are often not considered of high commercial importance, and consequently not always recorded in official records, many fisheries are unregulated, some commercial teleost species may be misreported as elasmobranchs, and the use of the more inappropriate, generic reporting categories hampers analyses. Methods to estimate elasmobranch catch data included sampling of mixed landings; establishing ratios of elasmobranch to target species, based on observers data, interviews with fishermen, processors and/or gear manufacturers; and correlating generic landings data with indicator species in official data (ICES, 2007).

Concerning the European fleets, there are no data available on discard rates of sharks species. The 2006 STECF Working Paper on discards from Community vessels did not include any shark species in the 27 'priority species' listed (STECF, 2006).

The main data gaps are quite similar across the external fisheries exploited by European vessels. The quantity of sharks declared by the European vessels reflect basically the quantities retained onboard as per the reporting obligations imposed by the competent RFMO's. However, raw data on total catches and portion thereof discarded have been collected through independent scientific observations, notably under the requirements of the Data Collection regulation. No analysis of these discard data have been placed in the public domain so far.

Considerations on the nature of the fishery

One of the most essential problems for the management of sharks in EC waters is the mixed nature of demersal fisheries, which makes it very difficult to target protective action on sharks without severe consequences on the other species caught. Furthermore, the large overcapacity of the fleets that catch small sharks, skates and rays as by-catch in demersal fisheries is also an important driver of the management problems in this area.

Economic and social considerations

An estimated 41% percent of the total value of all shark catches made by EU vessels is made from catches in the Northeast Atlantic, where most EU landings are skates, rays and dogfish. French vessels account for 37% of the value of shark catches made in the North Atlantic and Spain 25%. Catches in the Central and Southern Atlantic (mainly by Spain and Portugal) are even more important representing 47% of the total value of EU catches of sharks[1]. The Indian Ocean (again mainly Spain and Portugal) accounts for 6%, and the Pacific (mainly Spain) for 2%. Almost all landings in the Central and Southern Atlantic, Indian and Pacific Oceans are blue and mako shark. The Mediterranean accounts for just 3% of the total value of EU shark catches. In the Southern Oceans the very small catches of less than 100 tonnes per year are mostly rays. The total catches of elasmobranchs must also be seen in the context of total EU catches for all species - in 2005, the volume of landings was recorded at 5.6 million tonnes, meaning that catches of elasmobranch represent just 1.8% of the total volume of landings. While in 2006 landed values for the EU-15 are recorded as Euro 6.68 billion, meaning that elasmobranch catches represent 2.9% of the value of landings.

The main socio-economic indicators of the number of vessels and employees that could to some extent be dependent upon elasmobranch catches and which might therefore be affected by measures proposed under the CPOA are summarised in Table 1. Given the lack of data available on specific species being caught by specific fleets and the mixed nature of fisheries in Northern waters and the Mediterranean, it is impossible to state with any accuracy the number of vessels actually relying on shark catches in these areas. This necessitates an approach in estimating the socio-economic benefits which includes all vessels in each fishing area using gears that could be catching sharks.

In Northern waters and the Mediterranean this results in average catches per vessel that are low, with average individual vessel dependencies typically between 2-5% of total values. The average catch volumes and values per vessel are however sure to hide significant differences between different vessels/metiers in each country, and in addition

[1] Note that C&S Atlantic catches are based on ICCAT data and include some pelagic shark catches made in Northern waters

are almost certainly an underestimate because an unknown proportion of the vessel numbers in the table below may not catch any shark species at all. The lack of information on specific metiers in Northern waters catching sharks also means that it is not possible to make any meaningful estimates about the percentage of total income for those particular metiers that might be made up of shark catches.

For surface longline vessels operating in the Indian Ocean and Pacific, shark catches are estimated to contribute around 40% of catch volumes and 20-25% of total incomes. While in the Central and Southern Atlantic, shark catches are around 65-70% of total catch volumes (the remainder being swordfish and tuna), and may contribute between 35-45% of total catch values.

The almost certain over-estimate of vessels in Northern and Mediterranean waters potentially catching sharks also means that caution should be expressed in the estimates of the numbers of catching and processing labour potentially involved with shark catches – these estimates are also certain to be an over-estimate, but there is no way to refine the assessment given current data deficiencies, a deficiency which is part of the very reason for the proposed CPOA.

Table 1: Summary of the value and contribution of elasmobranch landings & downstream employment (MRAG Study on the impact of measures under the CPOA on Sharks –July 2008-).

Region	Value of elasmobranch landings (€ million)	Contribution to total EC-15 value of landings	Maximum EU vessels involved	Average value of catch per vessel	Maximum catching sector employment	Maximum processing/ ancillary sector employment	Average value of landings per employee
NE & NW Atlantic	81.2	1.22%	20 458	€ 3 968	42 274	28 141	€ 1 153
Mediterranean	5.7	0.09%	32 727	€ 175	63 140	20 160	€ 69
C&S Atlantic	93.0	1.39%	200	€ 464 946	3 296	2 039	€ 17 430
Indian Ocean	11.8	0.18%	103	€ 114 501	1 960	1 340	€ 3 573
Pacific	4.1	0.06%	12	€ 340 853	224	140	€ 11 248
Total / Average	195.8	2.93%	53,500	€ 184 889	110,894	51,820	€ 6 695

Trade considerations

The demand for and the value and volume of shark products in trade have increased considerably over the past 15 years and continue to rise.

The shark biomass represented by the global fin trade is estimated to lie between 1.21 and 2.29 million t/year with a median of 1.70 million t/year. This is some three to four times higher than indicated by FAO's landings data. It should be stressed that only those sharks whose fins are taken for use in the international shark fin trade are represented in these estimates. Sharks which are a) discarded dead; b) released but subsequently die due to injury or stress; or c) are retained but whose fins are either not used at all or used within the country of landing are not accounted for, therefore these estimates are considered to be minimum values. (Clarke S.C. 2008).

Given what now appears to be a strong linkage between shark catches and the volume of the fin trade, several leading shark scientists have called for urgent consideration of effective fisheries management measures for sharks (Dulvy et al. 2008).

International cooperation considerations

In the North Atlantic, nearly two thirds of the total catch of shark species is made by the EC fleet. It is not possible to clearly establish the share of the EC fleet in other areas of the world due to the lack of data, but for the most commercially important species EC catches in all waters are also almost two thirds of the total world catches.

One of the stated specific objectives of the Plan of Action is "to ensure a coherent approach between the internal and external EC fishery policy for sharks". For some species, such as small-spotted catshark, and spurdog, most of the world catches are made by the EC fleet and in these cases international cooperation is not so important to achieve their long term sustainable use. However, for other species, such as blueshark or shortfin mako the part of foreign fleet catches is much more important and international cooperation is an essential element to achieve the general objective of sustainable use of these species.

2.3. Who is affected?

The CPOA has the potential to impact on a wide number of stakeholders. It is recognised that a successful CPOA will have long-term benefits to all, but its implementation may have implications for some resources users. This impact assessment will aim to capture the economic, environmental and social consequences for the affected stakeholders.

As a framework for this assessment, the main stakeholders have been identified as follows:

Table 2: Key stakeholders in EU shark fishing effort

Stakeholder	Description	Key interests
Catching sector	EC vessel owners, operators and crew.	Maintaining profitability and livelihoods.
Dependent businesses & communities	Business and communities dependent upon shark fisheries for their livelihoods.	Maintaining profitability and livelihoods.
Processing sector	Those processing raw material from the EC shark catch (target and retained bycatch)	Maintaining profitability and livelihoods.
Sector regulators	Regional, national and provincial bodies regulating EC shark fishing effort	Ensuring an efficient, effective and practical management framework that balances a wide range of stakeholder needs.
Sector research	Scientific research bodies contributing to the conservation and management of shark stocks.	Contribution to an effective fisheries management regime through the timely access to high quality, robust data from fishery dependent and independent sources.
Retailers	Organisation selling shark and shark products to consumers	Continuity of supply and, increasingly, sustainable credentials of the resource.
Consumers	Those persons consuming shark	Availability, cost and quality of shark-

	products	derived products with varying degrees of environmental scrutiny.
NGOs	Non-governmental organisations advocating responsible management of shark populations.	To secure responsible, science-based shark fishing limits for long-term sustainability and ecosystem health.
Civil society	The wider public with an interest in and concern for, the sharks in particular and the marine environment in general	To maintain shark populations and diversity.

The main fisheries involved and the priority for action have been identified as follows:

Table 3: Summary risk table showing priorities for action

Region (RFO)	Nationality (EU only)	Main Gear type	Species	Vulnerability (IUCN cat)	Exposure and vulnerability	Priority for action
NE Atlantic skates and rays (ICES)	France, UK, Spain, Portugal, Ireland & Belgium	Trawl, nets	Various skates, rays and small shark species	Range from CR (common skate), EN (sandy white skate) to LC	High volume mixed fishery including some with high vulnerability	High
NE Atlantic deepsea sharks (ICES)	UK and Germany	Gillnet & longline	Portuguese dogfish Gulper shark	EN VU/EN	Low volume catch but probable high discards	High
Mediterranean (GFCM)	Italy, Greece, Spain, France	Gillnets	Smoothhound, tope, spurdog	VU	Large number of vessels in a mixed fishery with increasing catches of vulnerable species (e.g. smoothhound)	Medium
	Italy, Greece, Spain, France	Trawl	Various skates, rays, guitarfish and small shark species	Ranges from EN(guitarfish), most VU, some LC	Extensive mixed fishery including some with high vulnerability	Medium
Atlantic pelagic sharks (ICCAT)	Spain & Portugal	Purse seine, Long lines	Blue shark	NT	High volume and medium sensitivity	Medium
	Spain & Portugal	Purse seine, Long lines	Mako, porbeagle	VU	Misreporting and high sensitivity	High
Indian Ocean pelagic sharks (IOTC)	Spain & Portugal	Long line	Blue	NT	High volume	Medium
		Long line	Mako, porbeagle	VU	Misreporting and high sensitivity	High
		Purse seine	Unknown	??	Little known exposure and vulnerability	??
Pacific Ocean pelagic sharks (WCPFC)	Spain and Portugal	Purse seine	Silky shark, mako, porbeagle, & oceanic whitetip	VU	Little known exposure and high vulnerability	Medium
	Spain	Longline	Blue shark, mako	LC, VU	Low volume catch with some high sensitivity (mako)	Medium
Southern Oceans (CCAMLR)	Spain & France	Longline	*Rajiformes* & *Bathyraja* spp.	Not determined, but probably LC	Low volume and low sensitivity	Low

Vulnerability key: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), NT Near threatened (NT) and LC Least concern (LC)

2.4. How would the problem evolve?

A number of legal measures have been taken to date concerning aspects of the conservation and management of sharks at both at the international level and by the European Community.

At international level, the most high profile development to date has been the adoption by FAO in 1999 of the International Plan of Action (IPOA) for the conservation and management of sharks ('IPOA SHARKS'[2]). IPOA SHARKS, which was developed and adopted within the framework of the 'Code of Conduct for Responsible Fisheries' (CCRF), is like the CCRF itself voluntary but all concerned States are encouraged to implement it. It therefore foresees the implementation by States of national plans to ensure the conservation, management and long-term sustainable exploitation of sharks.

Otherwise the main actions taken to date have been undertaken by regional international fisheries management organisations (RFMOs) including:

- the Inter American Tropical Tuna Commission (IATTC);
- the International Commission for the Conservation of Atlantic Tuna (ICCAT);
- the Indian Ocean Tuna Commission (IOTC);
- the North Atlantic Fisheries Organisation (NAFO);
- the General Fisheries Commission for the Mediterranean (GFCM);
- the South East Atlantic Fisheries Organisation (SEAFO);
- the North East Atlantic Fisheries Commission (NEAFC);
- the Commission for the Conservation of Southern Bluefin Tuna (CCSBT); and
- the Western and Central Pacific Fisheries Commission (WCPFC).

The EU is party to most of these of RFMOs[3] and a cooperating non-party in respect of the remainder.[4] The measures taken are of somewhat limited effect and do not generally including binding management measures.

It is also important to note that a number of steps have been undertaken at international level and by the European Community concerning the regulation of the international trade in sharks and shark products. Such activity has taken place within the auspices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora

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2 The FAO International Plan of Action for the Conservation and Management of Sharks considers the term "shark" to include all species of sharks, skates, rays, and chimaeras (Class Chondrichthyes). The EU Action Plan will follow the same approach.

3 The EU is party to ICCAT, the IOTC, NAFO, GFCM, SEAFO, NEAFC and the WCPFC.

4 The EU is a cooperating non-party to the IATTC although France and Spain are parties. The EU is also a cooperating non-party to the CCSBT.

(CITES) which was signed in Washington DC in 3 March 1973. All 27 Members of the EU are Parties to CITES although the Community itself is not. Nevertheless the provisions of CITES have been implemented in European Community law since 1982.

Within the European Community the basic legal framework for the implementation of CITES is contained in Regulation Council Regulation (EC) No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein[5], as amended (the CITES Regulation). A number of shark species namely basking shark (*Cetorhinus maximus),* great white shark (*Carcharodon carcharias)* and whale shark (*Rhincodon typus),* are included in CITES Appendix II meaning that trade in them is strictly regulated.

Furthermore, the basking shark and the great white shark are listed on the Appendices I and II of the Convention on Migratory Species (CMS). The whale shark is listed on Appendix II of this Convention.

Turning to measures undertaken by the European Community, a number of measures have been taken that aim directly or indirectly at the conservation and management of sharks. These measures have been adopted within the context of the basic legal framework established by Council Regulation (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy[6] ('the Framework Regulation ').

In general terms, as regards fishing opportunities for sharks, two types of Regulations lay down the rules for shark directed fisheries and by-catches of sharks:

a) Bi-annual Council Regulations fixing the fishing opportunities for Community fishing vessels for certain deep-sea fish stocks every two years, for EU and NEAFC waters;

b) Annual Council Regulations fixing fishing opportunities and associated conditions for certain fish stocks, applicable in Community waters and, for Community vessels, in waters where catch limitations are required (including NEAFC, NAFO and CCAMLR).

Moreover, Regulation (EC) N° 2347/2002 of 16 December 2002[7] establishes specific access requirements and associated conditions applicable to fishing for deep-seas stocks, among others a wide rage of deep-water sharks.

In addition, mention must be made of Commission Regulation (EC) No 1639/2001 of 25 July 2001 establishing the minimum and extended Community programmes for the collection of data in the fisheries sector and laying down detailed rules for the application of Council Regulation (EC) No 1543/2000[8], as amended, which includes sharks within the mandatory sampling schemes for data collection. A new regulation under new framework for data collection (Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice

5 OJ L 61, 3.3.1997, p. 1
6 OJ L 358, 31.12.2002, p 59.
7 OJ L351, 28.12.2002.
8 OJ L 222, 17.8.2001, p. 53.

regarding the Common Fisheries Policy does not add anything new related to shark catch sampling.

Other measures, although not shark specific, may have an important bearing on them, especially for those taken as a by-catch. Among them, we should mention measures taken in the context of multi-annual plans in the framework of Regulation (EC) N° 1967/2006.

Nevertheless, the range of existing measures is clearly insufficient to ensure the rebuilding of many depleted stocks. Furthermore, the Community should assume a leading role at international level in the development of policies aimed at the rational exploitation of fishing resources.

The only regulation adopted to date that is exclusively concerned with sharks is Council Regulation (EC) No 1185/2003 of 26 June 2003 on the removal of fins of sharks on board vessels. This regulation was intended to prevent the practice of shark finning within the European fleet. Pursuant to Article 3 (1) it is prohibited to remove shark fins on board vessels, and to retain on board, tranship or land shark fins. Furthermore the purchase, offer for sale and sale of shark fins which have been removed on board, retained on board, transhipped or landed in contravention of the Regulation is also prohibited.

However by way of derogation Article 4 provides that, subject to certain specified conditions, the removal and retention of shark fins from dead sharks on board and the transhipment or landing of such fins may be permitted with regard to vessels which hold a special fishing permit. Such permits may only be issued to fishing vessels where a capacity to use all parts of sharks has been demonstrated and where the need for the 'separate processing on board of shark fins and the remaining parts of sharks has been justified' (Article 4(2)). The discard of the remaining parts of sharks after removal of the fins is prohibited (except for those parts resulting from basic processing operations, such as beheading, gutting and skinning).

Article 4 goes on to specify that the weight of the fins kept from the catch may not exceed the theoretical weight of the fins that would correspond to the remaining parts of sharks retained on board, transhipped or landed and that in no circumstances the theoretical weight may exceed 5% of the live weight of the shark catch. This approach is often complementary to the one most commonly taken by third countries and RFMOs which seeks to apply a ratio of 5% of total weight of sharks retained on board, although there is some lack of clarity as to whether they refer to total live or dressed weight. Regulation 1185/2003 does not provide detailed indications as to the justification necessary to permit the separate processing onboard of shark fins.

According to this Regulation, Member States shall send to the Commission comprehensive annual reports on its implementation. On the basis of these reports, the Commission has issued on 23.12.2005 a report to the European Parliament and the Council on the operation of this Regulation[9]. According to this report, the information made available by the Member States to the Commission on the operation of this Regulation, although not always complete, amounts to a confirmation that the Regulation

[9] Report on the operation of Council Regulation (EC) N° 1185/2003 on the renoval of fins of sharks on borrad vessels. COM(2005)700.

appears to be achieving its general objectives. Therefore, the Commission concluded that the Regulation did not appear to need an amendment at that stage. However, improved implementation of some aspects by some Member States was desirable, "in particular in terms of the criteria for allocation of special fishing permits or reporting".

Finning regulations in other parts of the world are stricter than in the EU as they use the ratio between wet fins and the processed carcass (Fin/Dressed weight), instead of the ratio provided by the EC Regulation (Fin/live weight). The ratio most widely applied by third countries is 5% of wet fin weight to 'dressed' (gutted and beheaded) carcass weight, or 2% of wet fin weight to whole shark ('round' or 'live') weigh (5% in the EU). The finning recommendations or resolutions adopted by RFMOS all include a fin/body weight ratio. The common wording is that Contracting Parties, Cooperating non-Contracting Parties and other bodies (CPCs): "*Shall require their vessels to have on board fins that total no more than 5% of the weight of sharks on board, up to the first point of landing*".

However, there may well be some species differences and also the way finning is carried out makes a difference. For example, Asian crews tend to remove just the fins whilst Spanish crew are reported to take a piece of meat off with the fin. There is also the issue of whether the rule might be applied to live weight or dressed weight and which measure is the most practical. Fin weights as a proportion of round weight (FW:RW) and dressed weight (FW:DW) differ significantly for different species and fleets.

Some stakeholders advocate a move to five percent of dressed weight ratio from five percent of whole weight or a complete, unequivocal ban on finning. The latter approach is often advocated as it removes difficulty over species identification, enforcement and leaves little room for abuse.

More systematic work on this standard needs to be carried out in the context of this measure. Meanwhile, a precautionary approach would recommend the more conservative general rule (5% FW:DW) while providing for the status quo (5% FW:RW) for those been able to fully justify this need.

There are clear indications of reductions of shark populations. The true status of most elasmobranch populations, however, remains uncertain due to lack of stock specific information particularly over significant time series. For example, the common skate and angel sharks have virtually disappeared from North Sea fisheries and ICCAT (2007) reported up to a 50% reduction for the population of *Isurus oxyrinchus*. How widespread such reductions are remains to be determined. It is also clear that the international trade in shark and shark products is increasing, thus providing a future driver for continued fishing pressure. The situation is likely to persist as a result of this driver.

Under Section 5, we will further develop these aspects and examine the risks and trade-offs of the status quo option.

2.5. Right to act

The right of the European Community to legislate in the sphere of fisheries is long established and has led to the adoption of a large body of secondary legislation exclusively in the form of regulations. The right to legislate derives from the provisions

in Article 32 of the Treaty Establishing the European Community (as amended) (the 'Treaty') concerning the establishment of a common market for agricultural products, which term includes fisheries products. Such a common market is to be accompanied by a common policy which in terms of fisheries is the Common Fisheries Policy (CFP).

The scope of the CFP is currently defined in Article 1 of the Framework Regulation so as to cover the '*conservation, management and exploitation of living aquatic resources…where such activities are practised …in Community waters or by Community fishing vessels*'.

3. OBJECTIVES

3.1. Policy objectives and scope

The general objective, in line with the FAO IPOA SHARKS, is to ensure the conservation and management of sharks and their long-term sustainable use worldwide.

The scope of the initiative includes directed commercial, by-catch commercial, directed recreational, and by-catch recreational fisheries catching any chondrichthyans within Community waters by both EU flagged vessels and foreign vessels. It also includes any fishery covered by current and potential agreements and partnerships between European Community and third countries, as well as fisheries in the high seas and fisheries covered by RFMOs managing or providing non-binding recommendations outside Community waters.

The Plan of Action is based on the following three main specific objectives, aiming to:

(1) Broaden the knowledge both on shark fisheries and on shark species and their role in the ecosystem.

(2) Ensure that directed fisheries for shark are sustainable and that by-catches of shark resulting from other fisheries are properly regulated.

(3) Encourage a coherent approach between the internal and external EC fishery policy for sharks.

In order to achieve the three main objectives, the Commission initially proposed in its EC consultation document nine 'fields of action' or operational objectives which it felt could help to fulfil these objectives (see table 4).

Table 4: Initial operational objectives

Specific objectives		**Operational objectives (field o action)**
Ensure a coherent approach between the internal and external EC	**Deepening the knowledge both on shark fisheries and on shark species and their role**	– 1 Facilitate improved species-specific catch and landings data and monitoring of shark catches
		– 2 Facilitate the identification and reporting of species-specific biological and trade data

fishery policy for sharks	**in the ecosystem**	– 3 Compile the necessary information to 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
		– 4 Develop research projects to assess threats to shark populations and implement harvesting strategies consistent with the principles of biological sustainability and rational long term economic use
		– 5 Improve and develop frameworks for establishing and coordinating effective consultation involving stakeholders in research, management and educational initiatives within and between States
	Ensure that directed fisheries for shark are sustainable and that by-catches of shark resulting from other fisheries are properly regulated	– 6 Adjust fishing effort to the available resources
		– 7 Adjust catches to the available resources
		– 8 Minimize waste and discards from shark catches in accordance with article 7.2.2(g) of the Code of Conduct for Responsible Fisheries requiring the retention of sharks from which fins are removed and encourage the use of dead sharks
		– 9 Identify and provide special attention in particular to vulnerable or threatened shark stocks

Operational objectives 1-5 responded to the objective of greater knowledge of shark fishers and their ecosystem linkages. Operational objectives 6-9 aimed at ensuring that directed shark fisheries are sustainable and that by-catches were regulated. All of them were required to ensure a coherent approach between the internal and external EC fishery policy for sharks.

These fields of action include all the measures originally proposed in the consultation document presented by the Commission, but, following the consultation process, they have been simplified/consolidated where possible and appropriate. This has involved merging fields of action 1 and 2, 3 and 4, 6 and 7, and distributing measures under field of action no. 9 throughout other fields of action. It is important to note that no measures have been dropped at this stage, only consolidated under a lesser number of 'fields of action'. It should also be noted that merging fields of action was suggested by a number of stakeholders (see Appendix I).

Table 5: Justification for merging Fields of Action during option screening

Merger	Justification
Fields 1 & 2	Both have the same objective. Both look at facilitating improved data collection but at different points in the harvest chain. RFMO measures similar in both cases.
Fields 3 & 4	Both have the same objective. Both have the same intent, with FoA 3 looking at data collection and FoA 4 implements subsequent research and can thus be compiled together. Merger also suggested by some stakeholders (see Appendix I).
Fields 6 & 7	Both have the same objective. FoA 6 looks at controlling effort and FoA 7 looks at controlling catches. Both act at similar levels and effort / catch reduction mechanisms need to be complementary. Merger also suggested by some stakeholders (see Appendix I).
Field 9	FoA 9 focuses on vulnerable or threatened species. Whilst a legitimate goal, it is considered that all the measures in this field are already included in the earlier Fields of Actions, especially 6 & 7. It does highlight the need to conduct risk assessments for the majority of the different measures in order to target vulnerable and threatened species across ALL the Fields of Action, rather than having a specific programme that addresses this separately. This merger is considered to have a number of effectiveness and efficiency advantages.

Furthermore, the operational objectives have been redefined in order to make them "SMART". Table 6 offers a general vision of how the 5 selected operational objectives respond to each of the specific objectives.

Table 6: Final operational objectives.

Specific objectives		**Operational objectives**
Ensure a coherent approach between the internal and external EC fishery policy for sharks	**Deepening the knowledge both on shark fisheries and on shark species and their role in the ecosystem**	– Having reliable and detailed species-specific quantitative and biological data on catches and landings as well as trade data for high and medium priority fisheries, after three years of implementation.
		– Being able to efficiently monitor and assess shark stocks on a species specific level and develop harvesting strategies with the principles of biological sustainability and rational long term economic use, after three years of

		implementation.
		– Improve and develop frameworks for establishing and coordinating effective consultation involving stakeholders in research, management and educational initiatives
	Ensure that directed fisheries for shark are sustainable and that by-catches of shark resulting from other fisheries are properly regulated	– Adjust catches and fishing effort to the available resources with particular attention to high priority fisheries and vulnerable or threatened shark stocks, after three years of implementation.
		– Minimize waste and discards from shark catches requiring the retention of sharks from which fins are removed and strengthening control measures.

3.2. Consistency with other EU policies

At the 2002 Johannesburg World Summit on Sustainable Development the EU Member States signed up to limiting fishing to sustainable levels by maintaining or restoring stocks to levels that can produce the maximum sustainable yield. For depleted stocks, it was agreed that this should be achieved urgently, and where possible not later than 2015.

The new CFP which resulted from the 2002 reform intended to adopt measures aiming at ensuring the sustainable development of fishing activities from an environmental, economic and social point of view. Coherence with other EU policies such as environmental policy was also a major element of the new CFP.

The initiative is consistent with the communications from the European Commission to the Council and the European Parliament that pointed out the importance of a European Community biodiversity strategy[10] and that highlighted the relationships between

[10] Communication from the Commission to the Council and the European Parliament on a European Community Biodiversity Strategy : COM(98)42 final.

fisheries management and nature conservation[11] as well as with the Communications from the Commission to the Council and the European Parliament on the review of the management of deep-sea fish stocks[12] and on a policy to reduce unwanted by-catches and eliminate discards in European fisheries[13]. However, the EC communication on discards is general, and does not fully address the specificities of shark. For example shark fining results in the discard of the body of the shark, a practice which is not covered by the EC communication on discards.

The elimination of discards, including a discard ban is an element of the Plan of Action itself. The new Fisheries Control Regulation will enhance the efficacy of the measures contained in the Plan but does not form part of it.

The IUU Regulation adopted by the Council on 29 September is a broad instrument that will apply to all stocks. It will encompass shark catches and should contribute to a reduction of illegal fishing for such species. However, the management of sharks requires that specific rules are adopted in order to better address the specific problems posed by this fishery. Such rules are not laid down in the IUU Regulation, which is a dedicated to control measures and not conservation measures.

4. POLICY OPTIONS

The analysis of impacts presented in Section 5 considers three main options as follows:

Option A: Status Quo with no Action Plan.

This Option represents a continuation of the current *status quo* with no CPOA and keeping the current EC legislation on sharks, while adapting it to new circumstances when necessary taking into consideration new scientific advice.

This is a 'do nothing more' option and will be used as the baseline for the impact assessment in the next section of the report. This 'no action plan' scenario presumes that the existing measures continue to exist without the assistance of a specific Plan of Action.

Option B: Action Plan:

This option is based on the adoption of an Action Plan, which provides for the continuation of the current status quo regarding EC legislation on sharks **and** for the introduction of new legislation or the adaptation of existing one aiming at ensuring the achievement of the objectives envisaged. This Action Plan will allow having a clear and comprehensive picture of what is already in force and what remains to be done in order to achieve a coherent and effective approach. Under some of the operational objectives foreseen by this option, different alternatives (i.e. softer or stricter measures) have been considered for implementation. These alternatives include, for example, a) voluntary vs.

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[11] Communication from the Commission to the Council and the European Parliament on Fisheries Management and Nature Conservation in the Marine Environment. COM(1999)363 final.

[12] COM(2007) 30 final of 29.01.2007

[13] COM(2007) 136 final of 28.03.2007

optional activities/funding, b) full vs. partial coverage, c) immediate or phased implementation. The table in Appendix II shows the implementation alternatives which are subject to the IA in Section 5. As a result of this analysis, section 7.4 will describe the preferred option as an amended version of option B.

The policy objectives and scope have been described in section 3.1. The measures envisaged under this option will be applicable to all vessels operating in Community waters and to all EU flagged vessels in all waters. Furthermore, in order to ensure a coherent approach between the internal and external EC fishery policy for sharks, the Community will seek that the relevant international bodies adopt similar measures to third country vessels outside Community waters.

Option C: Application of a strict precautionary approach:

Option C looks at taking a strict precautionary approach. Essentially it seeks the adoption of a Plan of Action modifying the current EC legislative framework on sharks and introducing a strict interpretation of the precautionary approach by prohibiting all directed fisheries or indirect catches on sharks by Community vessels, unless TACs and other regulatory measures have been put in force, following scientific advice. This Option includes all the measures and implementation mechanisms specified in Option B, except that in this case, non regulated shark fisheries would not be allowed. Furthermore, only sharks complete with fins could be landed.

5. ANALYSIS OF IMPACTS

The following analysis has been developed on the basis of the information and data provided by the MRAG Study on the impact of measures under the CPOA on Sharks finalised in July 2008.

5.1. Option A

5.1.1. Environmental impacts

This option represents a continuation of the *status quo*. As such, no changes to the current impacts of the current *status quo* are envisaged. The impacts of the *status quo* are examined below.

5.1.1.1. Direct Impacts

A major feature of the interaction of shark population and fisheries across the oceans is that it is not entirely clear what the *status quo* is. The data gaps, particularly at the species level, produce a very incomplete picture. Catch, landing and trade data are poor or patchy and many of the demersal shark catches are not from targeted fisheries but exist as bycatch. Shark fisheries, *per se*, are consequently often not subject to direct regulation and reported catches refer only to that portion retained onboard yet no systematic data on discard rates are in the published domain. Some high discard rates (e.g. 60%) worldwide are reported and this is compounded by the practice of finning and discarding the carcass. The study shows that there is a rather underestimated view of impacts. There are indications that the actual catches for finning alone might be four times higher than FAO landing data.

The first direct impact observable is some reduction of shark populations. The true status of most elasmobranch populations, however, remains uncertain due to lack of stock specific information particularly over significant time series. This has lead to dispute in some areas over the extent of any decline, for example in the NW Atlantic (e.g. Baum *et al* 2003, Baum *et al* 2005, Burgess *et al* 2005a & Burgess 2005b). Even where limits have been imposed by ICES and some RMFOs this has mainly been based on catch trends since there has been inadequate information to construct stock models. Nevertheless, some fisheries have shown reductions, for example, the common skate and angel sharks have virtually disappeared from North Sea fisheries and ICCAT (2007) reported up to a 50% reduction for *Isurus oxyrinchus*. How widespread such reductions are remains to be determined and a precautionary approach would be of advantage here which is reflected in the perception by NGOs that some species now are under threat. It is also clear that the international trade in shark and shark products is increasing (see Appendix V), thus providing a future driver for continued fishing pressure. The situation is likely to persist as a result of this driver.

The impacts of sustained fishing will reduce shark populations further. Moreover, it is not just a question of the volume of a shark species taken which defines the risk, it is a function of the status of a stock and its increased vulnerability which, in turn, is a function of its rate of replication, the degree of specialisation of the species and the time and place of catches. It is clear that particular species have become threatened and in consequence, even small catches of such species would drive it to a higher category of threat. Therefore, if current trends continue it could be expected that there will be an increase in the number of species threatened and a general upward trend of threatened species towards extinction. However, there is no sufficient technical evidence to prove it.

Such impacts are likely to be greatest on those species with particularly low rates of replacement, low growth rates and greater longevity which almost certainly includes the deep sea sharks. Conversely, the blue shark provides the greatest catches amongst pelagic sharks but has one of the highest rates of replication. It is, therefore, important to understand the biology to produce a management plan for particular shark species.

The above comments refer to the general importance of continued fishing under the *status quo* on sharks. Of course, the EU fleet is not alone in contributing to this situation. The pressures, and therefore, the impacts vary greatly across the oceans. Thus, the EU fleet accounts for 70% of all sharks landed in the NE Atlantic, 89% for the Mediterranean, 39% for Central and Southern Atlantic, 8% for the Indian Ocean, 16% for the Pacific Ocean and a very small amount for the Southern Ocean. Clearly then the greatest regional impacts from the EU fleet are most likely to be felt in home waters which helps prioritise and regulate actions. Taking into account the range of measures that are already being taken by the EC, a likely scenario under option A could also be that the very depleted state of several stocks will not improve or will improve too slowly, but will not necessarily deteriorate further.

5.1.1.2. Indirect and Ecosystem Impacts

Most sharks are predators. Some, like skates and rays, are bottom feeding predators on crustacean and molluscs, whilst others conform to the stereotype of open water piscivores, and top predators. In ecosystems, particularly aquatic ecosystems, top predators appear to have a significant regulatory effect on populations in the lower

trophic levels. Consequently the introduction or elimination of top predators has considerable impacts on other communities and the ecosystem as a whole.

The elimination of top predators generally tends to have a simplifying effect on the ecosystem. Examples are rarely straightforward but it seems that the elimination of the larger predatory species for the Black Sea fisheries, such as tuna-like species and mackerels, contributed to the shift from a fishery typified by 24 species to one relying only on 6 species with the bulk being taken from a single plankton feeding anchovy. It is equally thought that the elimination of cod from the Grand Banks fishery and its failure to recover may well be due to crabs taking over the vacant feeding niche. This phenomenon of removal of top predators leading to a redistribution of species lower down the trophic system has been termed 'fishing down the food chain' (Pauly *et al* 1998).

Essentially, such impacts change the nature of the target fisheries whilst also reducing biodiversity. Whilst this effect is yet to be recorded in sharks it would be most surprising if it didn't follow the general pattern described by Pauly *et al* (1998). The impacts on biodiversity in terms of both numbers and relative abundance of other species in the system is likely to produce a disproportionate impact on biodiversity beyond the reduction in specific shark species. In this respect sharks and rays may be different depending upon their mode of feeding and trophic level.

Whilst the EU may not be the main source of fishing mortality in external waters, doing nothing to rectify the above situation diminishes the influence of the EU in the international community to control such environmental damage.

5.1.2. Economic impacts

As noted in this Section, catches of elasmobranchs by the EU fleet are made in a number of different oceans. The lack of species-specific reporting by metier restricts a detailed analysis of the economic benefits of elasmobranch catches; indeed this lack of detailed information is itself one of the primary drivers of the problem. Nevertheless, some indicative figures on the value of catches by region, and the potential importance of these catches on an average vessel basis are presented. These figures on the *current/short-term* economic benefits to the *catching sector*, are summarised in the table below.

Table 7: Summary of current annual economic benefits from elasmobranch landings (MRAG Study on the impact of measures under the CPOA on Sharks –July 2008-)

Region	**Value of elasmobranch landings (€ million)**	**Contribution to total EC-15 value of landings**	**Maximum EU vessels involved**	**Average value of catch per vessel**
NE & NW Atlantic	81.19	1.22%	20 458	€ 3 968
Mediterranean	5.73	0.09%	32 727	€ 175
C & S Atlantic	92.99	1.39%	200	€ 464 946
Indian Ocean	11.79	0.18%	103	€ 114 501
Pacific	4.09	0.06%	12	€ 340 853

The table indicates that income dependency on elasmobranch catches for individual vessels are most significant for the distant water fleets of Spain, Portugal and France. For some vessels in these distant water fleets, shark catches may represent between 20-45% of the total value of catches. For individual vessels in Northern waters and the Mediterranean, vessel dependencies on shark catches are on average very much lower; while detailed quantification is not possible, taking the total value of national catches as a proxy, average individual vessel dependency may be in the order of 1.2 – 4.7%. Within the North Atlantic, while the total value of landings is significantly greater for France and Spain than for other EU MS, due to numbers of vessels potentially involved in catching elasmobranchs, the average income dependency on vessels is highest in Belgium, followed by France, Ireland, the UK and then Spain. These average figures, as already noted, do not of course capture the fact that some individual vessels may be much more dependent on the income from elasmobranch catches on an annual basis, or during particular seasons. The *status quo* would have no impacts on the costs to the catching sector of in terms of current reporting requirements, any consultation, nor on the short-term economics of fishing operations in terms of the ability of vessels to obtain exemptions from the ban on finning and their ability to land fins and shark carcasses in different ports.

When considering the dependency of the EU fleet on different regions, the table shows that catches made in Northern Atlantic waters (predominantly by gillnet and trawl vessels) represent 41% of the value of total catches by the EU fleet, with Central/Southern Atlantic and distant water longliners accounting for around 47%, the Indian Ocean 6%, the Pacific 2% and the Mediterranean the remaining 3% by value.

To these *direct* economic benefits should be added *indirect* income multiplier benefits to the *processing and ancillary sectors*, and second-round multipliers in other sectors of the economy. A recent European Parliament study[14] suggests that income multipliers in the processing / ancillary sectors across the EU as a whole are in the order of 1.9 times the income made in the catching sector (France 1.87, Spain 1.77, the UK 2.9, Portugal 1.1, and Ireland 1.64).

However these economic benefits to both catching and processing/ancillary can be assumed to be of a *short-term* nature only, if indeed stocks are being overexploited as suggested in the preceding section on the environmental impacts of the *status quo*. Thus, while the *status quo* includes some regulations and actions to limit catches, reducing finning, etc in the *long-term*, without any *improved* conservation measures and better knowledge of shark catches, it is *highly likely* that the value of current economic benefits from landings would decline through over-fishing, potentially to a *significant* extent for some vessels. These declines will be particularly marked for those vessels which depend to a great extent on shark catches to contribute to their total earnings e.g. the distant water fleets, and some selected fleets/metiers in EU waters. Shark catches are thought to contribute around 25% of total vessel turnover for distant water longliners. The current *status quo* with limited specific reporting and control of shark catches, and with shark being a bycatch in many fisheries, also does little or nothing to encourage innovation and research on species selectivity in fishing operations.

[14] Regional dependency on fisheries. 2007. Directorate General Internal Policies of the Union

EU vessels catching elasmobranchs do so in many of the world's oceans, in competition with other fishing nations. It is thus equally true that for *third countries*, continuation of the current *status quo* would be *likely* to result in the *significant long-term* declines in the economic benefits to both catching and processing/ancillary sectors through overfishing.

For the EU *retail/food service sectors*, and *consumers* as the end point of the supply chain, current *short-term* trade in shark products primarily involves shark meat. For catches made in the North East Atlantic, the primary products are skates, rays, and dogfish, which are generally sold in the country of landing, although France and Spain also import product from other EU countries. For catches made by the EU distant water fleet, primarily of blue shark, shark meat is sold in the EU, with fins generally being exported to the Asian markets. Current short-term availability of shark products to all consumers is *highly likely* to decline *significantly* in the *longer-term* under the *status quo* option. This will particularly affect consumers in France and Spain, where demand is high. This in turn is also highly likely to result in an increase in market prices for shark products as availability becomes more limited.

For *EU MS authorities*, and for *RMFOs*, the current *status quo* would have no *direct short* or *long-term* economic impacts over and above current reporting and control obligations. However, *longer-term indirect* costs be incurred if vessel profitability declines as a result of over-fishing, in turn resulting in increases in social support to those leaving the fishing sector. And declining economic benefits in third countries in the *long-term* could also be contrary to MS and EU development policy. The *status quo* would also mean a continuation in the *short- and longer-term* of a situation in which there is poor knowledge both on shark fisheries and shark species and their role in the ecosystem, and a lack of coherence between internal EC fisheries policy and international best practice e.g. via requirements for a plan of action as required by FAO in 1999.

For *NGOs and civil society*, there are now a number of groups/organisations actively involved in trying to protect shark species. Their activities require financial and human resources. A continuation of the *status quo* would result in them continuing in both the *short and long-term* to spend money and time researching shark issues and lobbying for protection of sharks.

5.1.3. Social impacts

The *short-term direct* social benefits to the *catching and processing/ancillary sectors* of shark catches in different regions are shown in the table below.

Table 8: Summary of current social benefits from elasmobranch landings (MRAG Study on the impact of measures under the CPOA on Sharks –July 2008-)

Region	**Maximum catching sector employment**	**Maximum processing/ ancillary sector employment**	**Average value of landings per catching sector employee**	**Average value of landings per processing sector employee**
NE & NW Atlantic	42 274	28 141	€ 1 920	€ 2 885

Mediterranean	63 140	20 160	€ 91	€ 284
C&S Atlantic	3 296	2 039	€ 28 213	€ 45 606
Indian Ocean	1 960	1 340	€ 6 017	€ 8 799
Pacific	224	140	€ 18 260	€ 29 292

It should be noted that these figures are a *maximum* number of those potentially involved in catching sharks and in related processing/ancillary employment and are not full time equivalents but just the total number of people who could potentially be dependent on shark catches. Likewise, the table provides only an *average* value of landings per employee. Again, the figures suggest that while the North East Atlantic may provide the greatest total dependency in terms of employment *to some degree* dependent on shark catches, social dependency in terms of the value of landings per employee is very much higher from catches made in distant waters. As with the economic impacts discussed above, labour in different countries will be dependent on shark landings to a lesser or greater degree. To these *direct* employment benefits must be added the *indirect* second-round multiplier effects from economic activity related to shark catches and employment.

In terms of regions which make significant catches of sharks, the importance of Galicia, Bretagne, NE Scotland, Highlands and Islands, and the Algarve regions, should be highlighted as being especially dependent on fisheries.

The *longer-term* negative social impacts of this option on the catching and processing/ancillary sectors would be *significant* and *very likely* in regions particularly dependent on fisheries. In many countries, while catching sector employment is strongly dominated by men, the processing sector typically employs many women. Employment on the distant water fleet could be particularly susceptible to negative impacts in the longer-term because of the higher dependence of individual vessels on blue shark catches, compared to those vessels catching skates, rays and dogfish in the Atlantic.

The *status quo* option, with limited stakeholder consultation (to be addressed specifically by one Field of Action in Option B), would also directly impact in both the *short and long term* on the ability of catching and processing sector stakeholders, along with *NGOs and civil society,* to be involved in issues of sector governance as provided for in the Treaty and the new governance approach. These impacts would be both *high likely* and *significant*.

It should also be noted that many of the crew on these distant water vessels are from outside the EU, so the negative impacts on labour from *third countries* would also be *likely* and *significant* in the longer term. Other *longer-term* negative social impacts in third countries would also come from declining catches in these countries from overfishing, and would be both *significant* and *likely*.

The social impacts on *consumers* would be *very likely* in the *longer-term*, and potentially *significant*, and would involve a declining availability of shark products, which in some regions, are in high demand.

For *EU MS authorities*, and for *RMFOs*, the current *status quo* would have no *direct short* or *long-term* social impacts. However, *longer-term indirect* social costs are *likely*, and in some regions could be *significant*, if vessel profitability declines as a result of

over-fishing, in turn resulting in necessary increases in social support to those unemployed on leaving the fishing sector. And declining social benefits in third countries from declining catches in the *long-term* would also be *significant* and *highly likely* in terms of a lack of coherence with MS and EU development policy.

5.1.4. Risks, trade-offs / synergies, public opinion, enhancing measures

The trade offs inherent in the status quo option are by definition all those environmental, economic and social impacts of the proposed policy options presented in Option B (and the five Fields of Action), and Option C. The negative public opinion which would result from Option A would be very significant and very likely (despite the current initiatives already being taken as outlined in Section 2) given the significant decline in many shark populations in recent years and given increasing consumer concerns over the sustainability of seafood catches.

The European Community has the exclusive competence for the management of fisheries resources. Although it has adopted a number of measures aiming directly or indirectly at the conservation and management of sharks, it has not yet developed an EC Plan of Action for sharks. However, the range of existing measures is clearly insufficient to ensure the rebuilding of many depleted stocks fished by the Community fleet in Community and outside Community waters. Furthermore, given its weight at international level, the Community should assume a leading role in the development of policies aiming at the rational exploitation of fishing resources.

5.2. Option B

Within Option B, the IA assesses individually a number of fields of action. It is appropriate to consider the likely impact of each of the fields in turn, bearing in mind the original nine have been condensed to five (see Appendix II). The detailed analysis of the environmental, economic and social impact of every field of action is provided below.

5.2.1. Environmental Impacts

Field of Action 1

This provides for improved collection and verification of catches and related data by species and product backed up by pilot observer schemes to scrutinise catches and discards. Clearly catches and presumably the equivalent effort data will go some way to defining the precise magnitude of the problem which currently contains many uncertainties. This is particularly the case if pilot observer schemes are used to obtain a proper estimate of discard rates. Once the scale of the problem, in terms of accurate estimates of losses by species, is fully understood then the management and mitigation measures can be more clearly defined.

Additional benefits can come from catch and effort data since these will allow a start to be made on population assessments for key species as with other fisheries regulated under the CFP. The presence of observers often has effects beyond the collection of data. Their presence also tends to help towards compliance with recommended practices and responsible fishing.

Improved processing and landing data will also help estimate the present and future pressure from the market driver and better monitoring of vulnerable species traded.

Promoting similar data collection with across RMFOs will enlarge the scope of data collected but also be a way of promoting equivalent measures outside the EU. Linking up with FAO, CITES and other international bodies with related agendas on sharks will further internationalise actions.

Field of Action 2

Given the general lack of information on sharks and the key role that differences in biology are likely to make both to management and stock recovery plans, this Field of Action should have a considerable impact towards positive recovery of the stocks. This element will provide the parameters in growth, mortality and behaviour which together with the information gathered under Fields of Action 1 and from previous studies will enable population and fishery models to be constructed as for other regulated species. A more generalised risk assessment is also included as a rapid appraisal of relevant stocks which will enable those stocks for which a full model would be essential, to be prioritised. Again working with RMFOs would help disseminate the approach. Work on the identification of more selective technologies, similar to that carried out on turtles and dolphins, would be very helpful.

Field of Action 3

This has a two-fold impact, to educate the industry as to those best practices which impinge least on their livelihoods and to inform the civil society of the commitment of the EU to addressing the problem. This may add further pressure on the industry through market-based customer responses to further increase compliance.

This will be a facilitating measure which will underpin the positive impacts of the other activities.

Field of Action 4

These are the regulatory measures stemming from the earlier actions data collection and research dealt with under the Fields of Action above. Given that the greatest proportionate impact of the EU fleet is with the NE Atlantic, it is appropriate that sharks are brought more generally under the ICES- based TAC and quota systems and the full regulations of the CFP. In fact, ICES and some of the RMFOs have started to recommend TACs although these are often based on catch trends rather than population analysis and have a precautionary element in them. Some examples are shown in Table 9.

Table 9: Summary table of current scientific advice and current TACs actually set

Species /areas	Recommended scientific advice on catch limits	TACs actually set
Deepwater sharks: [15]ICES V, VI, VII, VIII, IX	0 (2006)[16]	6 763 (2006)

[15] Includes Portuguese dogfish, leafscale gulper shark, birdbeak dogfish, kitefin shark, greater lantern shark, velvet belly, black dogfish, gulper shark, black mouth dogfish, mouse catshark and Iceland catshark.

Deepwater sharks: ICES XII	0 (2006)[16]	243 (2006)
Basking shark: ICES I-XIV/EU	0 (2006-07)[17]	0 (2006-2008)
Porbeagle shark: EC and international waters of I, II, III, IV, V, VI, VII, VIII, IX, X, XII & XIV	0 (2006) [3] IIIa (Minimum bycatch) x IV (Minimum bycatch) x VIId (Minimum bycatch) x	0 (2007) 581 (2008)
Thorny skate (*A. radiata:*) NAFO 3L, 3N, 3O	11 000 (2006)[18]	13 500 (2005-2007)
White shark: EU	0	0
Squalus acanthius: EU (bycatch)	0 (2006-07)[17]	<5% retained weight

Source: see footnotes

Of course, many are tuna RMFOs and have no remit to set TACs on shark but do have recommendations on the treatment of bycatch, most commonly the 5% rule. Several of the other points of action such as limitations in sensitive areas (or time periods) will also be feasible within Community waters to protect spawning or feeding areas or migration routes. It will be also important, following stock assessments, to draw up recovery plans for the worst affected species. The commitment to adjust fishing levels under international circumstances to appropriate resource levels maybe more difficult, particularly where sharks are not the target species.

The prohibition of all discards could be a very powerful measure given the probable extent to which this distorts the problem. Much depends on upon the robustness of the animals themselves with regard to their survival on liberation. This may need some research. The problem, for example, for a tuna long-liner is that if the shark comes in dead, will the crew want to fill up the hold with shark rather than the target tuna? Thus, whilst it is potentially a powerful measure some problems of implementation still remain, especially in international waters where control is difficult. Compliance with a discard regulation is a point where observers can have a positive role. Where there is sufficient civil awareness, consumer driven market instruments can also positively re-enforce compliance.

If fully implemented this action will have direct, very positive impacts to shark stocks and biodiversity.

Field of Action 5

It refers largely to a ban on finning and to the current reflexion on discards. Clearly this is a positive move which will underline the EU commitment but probably the most

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16 ICES (2005). ICES Advice 2005, Book 10. 35 pp. http://www.ices.dk/products/icesadvice2005.asp

17 ICES (2006). ICES Advice 2006, Book 9. 255 pp. http://www.ices.dk/products/icesadvice2006.asp

18 NAFO (2005). Thorny skate (Amblyraja radiata) in Divisions 3L, 3N and 3O and Subdivison 3Ps. http://www.nafo.int/science/frames/science.html

important downstream effect will be as an example for wider RFMO adoption although most have already gone down this route

The impacts of finning really depend upon any additional mortality caused since this is a parameter in the context of managing the stocks. In this respect it is really a specialised element of fishing mortality and therefore a component of FoA 4. In a targeted fishery, where the whole shark is taken but the fins sold separately, the practice of finning may have no specific impacts on shark populations. It is the practice of finning the sharks and then discarding the carcase which may encourage incremental mortality since the fins take up very little storage space and therefore makes little demand on the hold space for target species. In this way, many more individual sharks may be taken than if the whole carcass was being taken. It is also for this reason that this practice is being discouraged, to reduce or eliminate this incremental mortality as a negative impact.

An element of trying to ensure that only whole sharks are being landed is to specify the ratio of permissible fins to carcass weight, typically the '5% rule'. Where regulations on finning have been brought to bear, as in some RMFOs for example, there appears to be a standardised concept that a fin should constitute no more than 5% by weight of the shark catch. However, there is little systematic work to show this is actually the case. There may well, therefore, be some species differences and also the way finning is carried out makes a difference. For example, Asian crews tend to remove just the fins whilst Spanish crew are reported to take a piece of meat off with the fin. There is also the issue of whether the rule might be applied to live (or round) weight (RW) or dressed weight (DW) and which measure is the most practical. Clearly more systematic work on this standard needs to be carried out in the context of this measure. Meanwhile, a precautionary approach would recommend the more conservative general rule (5% FW:DW) while providing for the status quo (5% FW:RW) for those been able to fully justify this need. The final definition may not, in itself, have any direct impact on shark fishing mortality but the most rational ratio would be fairer and therefore more likely to achieve compliance.

5.2.2. Economic Impacts

Field of Action 1

Measures 1.1, 1.2 and 1.5, and 1.11, will all have *direct* cost implications on the *catching sector in the EU (recreational and commercial), the processing sector in the EU, MS authorities and the Commission.* For the catching and processing sectors direct costs in terms of the time spent providing additional data over current requirements are not expected to result in any reduced fishing time and therefore profitability. Rather costs will relate to some amounts of reduced leisure time that might be involved[19]. Measures 1.6 through 1.9 will also have *direct* cost implications for *RFMO administrations* and all *third country* contracting parties, in terms of the collection, analysis and reporting of landings and trade data. Measure 1.8 would also have some, as yet unspecified, direct costs of workshops. All these *direct* costs can be expected to run indefinitely once improved data collection systems are put in place. All are *certainly* going to occur, but all costs are deemed to be *not significant* in terms of their magnitude, given that existing

[19] In investment appraisal (e.g. of fishing harbour investments) it is standard practice to value leisure time at around 30% of the hourly earnings made from fishing

data collection systems can be amended to include provision of additional species-specific data on sharks.

Measures 1.3 and 1.4 will also have *direct* cost implications. If this measure is put into practice then costs will *definitely* occur. Likewise, measure 1.10 would be certain to have direct cost implications on RFMOs.

Section 3 of Appendix III provides a detailed explanation of the magnitude of the management costs involved by the observers schemes.

There are also expected to be many positive *indirect* economic impacts of FoA 1 in the *longer term*. Taken as a whole, if implemented FoA 1 can be expected to contribute towards safeguarding the current economic benefits from shark fisheries to *all stakeholders* by ensuring long-term sustainability of catches.

Field of Action 2

All measures proposed in FoA 2 (2.1 to 2.8) will involve *direct* economic impacts in the *short, medium and long term*. Some costs may be necessary only in the short-term e.g. related to identification of space-time boxes, while others will be continuous into the future e.g. regular assessments proposed under measure 2.2. These costs will generate *negative* direct impacts on those paying for them e.g. *EC MS, Commission, RFMOs, and third countries*, and *positive* direct impacts for those being paid to undertake the proposed research and assessments e.g. *researchers/scientists*. If implemented the *likelihood* of these economic impacts is *high*, but their *magnitude* is not quantifiable in the absence of more specific information on exactly how the measures would be implemented, and to what extent. The direct economic costs/benefits of the measures will depend to a large extent on the financial resources that are available to implement the measures.

Field of Action 3

Measures 3.1, 3.3 and 3.4 proposed in FoA 3 will involve *direct* economic impacts in the *short, medium and long term*. Costs will generate *negative* direct impacts on those paying for the measures e.g. *EC MS, Commission, RFMOs, and third countries*, and *positive* direct impacts for all stakeholder being paid to undertake/organise/attend the proposed awareness and consultation envisaged. If implemented the *likelihood* of these economic impacts is *high*, but their *magnitude* is not quantifiable in the absence of more specific information on exactly how the measures would be implemented. The direct economic costs/benefits of the measures will depend to a large extent on the financial resources that are available to implement the measures. Measure 3.2 is not expected to involve any direct economic impacts over and above the administrative costs discussed later in this report.

Field of Action 4

Measures 4.1 – 4.4 and 4.8 would all involve *direct* costs in the *short-term* on the *catching sector* (both in the EU and from third countries), in the form of reduced shark catches and therefore revenues (subject to price elasticities of supply which are not known). The *processing sector* and *retailers/consumers* would also be negatively impacted in the short term through reduced availability of shark species for processing and consumption, with associated higher prices. The *magnitude* of these impacts will be

directly related to a) the economic dependency on different shark fisheries in particular areas and by particular fleet segments, as already discussed, b) the extent of the limitations put in place, and c) the extent to which fishing strategy could be altered so as to minimise the economic impacts through focusing catches on other species/areas. At the present time, sufficient detail is unavailable on the implementation of the measures, or the specific fleets involved, to be able to quantify the sum of these negative short-term impacts. However, the cessation of the deepwater shark fishery would impact most strongly on the German and UK registered vessels (10), which are Spanish owned, which prosecute this fishery.

Measure 4.4 could potentially be implemented through a hard or soft approach. The costs involved with these sub-options would be the same, but the hard approach would result in costs being incurred immediately, while for the soft approach the associated costs would not commence until 2013.

Measure 4.5 could have *significant* negative economic impacts on the *catching sector* in the *short- and long-term*, with the prohibition on any discards resulting in increased fishing hold space being used to store low value sharks (some potentially unmarketable if too small, or conversely very large specimens filling alone a lot of space) instead of higher value species. A related impact on the catching sector could be to require vessels to make shorter fishing trips as fishing holds fill up more quickly. This could increase overall fuel costs related to steaming time between ports and fishing grounds, but could also increase unit prices received for all landed fish because of improved quality resulting from shorter trips. Impacts of this measure on the *processing sector*, and on *retailers/consumers*, could be to increase the availability of shark products for processing/consumption, but to reduce the availability of other species, thus increasing prices for other species which may be in stronger demand, while reducing prices for shark products (again, subject to unknown price elasticities of supply).

Measures 4.6, 4.7 and 4.9 will involve *direct* economic impacts in the *short and medium term*. These costs can be expected to be phased out over time as discards and bycatch are successfully reduced, and as the impact of market mechanisms on conservation measures is better understood. These costs will generate *negative* direct impacts on those paying for them e.g. *EC MS*, *Commission*, *RFMOs*, *and third countries*, and *positive* direct impacts for those being paid to undertake the proposed research and assessments e.g. *researchers/scientists*. Direct costs could also be imposed on the *catching sector* in the *short*-term through the need to modify fishing gear and fishing strategy. But these costs would in part be offset by increased size and species selectivity which should result in higher prices and a more efficient and targeted fishing strategy. If implemented the *likelihood* of these economic impacts is *high*, but their *magnitude* is not quantifiable in the absence of more specific information on exactly how the measures would be implemented, and to what extent they would affect different fishing fleets. The direct economic costs/benefits of the measures will depend to a large extent on the financial resources that are available to implement the measures.

EU MS, the *Commission*, and *RFMOs* can also be expected to face *direct* economic costs in both the *short* and *long-term* from measures 4.1 – 4.8, in terms of both administration (discussed later), and increased budgetary allocations for monitoring, control and surveillance (MCS). Again, at the present time, sufficient detail is not available on the implementation of the measures to be able to quantify these costs. The *likelihood* of some costs being incurred is very high, however given existing commitments for MCS

activities and the potential ability of existing operations to include the policing of new conservation measures, the *magnitude* of these increased costs may not necessarily be significant. EU MS, the Commission, and RFMOs are also likely to incur some small *direct* economic costs associated with the development of any new effort regulation.

Also to be expected are many positive *indirect* economic impacts of FoA 4 in the *longer term*. Taken as a whole and if implemented, FoA 4 can be expected to contribute towards safeguarding the current economic benefits from shark fisheries to *all stakeholders*, by ensuring long-term sustainability of catches. These positive indirect long-term benefits could take the form of a continuation of the current level of economic benefits from the fishery, or if stocks can be re-built, of actually increasing them. The *magnitude* of these impacts should therefore be seen in the context of the long-term economic costs/impacts associated with Option A. The reader is thus referred the discussion of economic impacts in Option A. FoA 4 (along with FoA 5 – see following text) is estimated to be of special importance in generating/ensuring these long-term economic benefits

Field of Action 5

Assessment of the impacts of this FoA is underpinned by[20]:

- the current use of derogations under existing regulations;
- the fin: whole weight and the fin: dressed weight for different species being caught by EU vessels; and
- current (and potential) fin cutting practices

The fleets that have obtained derogations are primarily Spanish owned operating in the Atlantic, and total around 200. These are almost all surface longline vessels targeting pelagic species (with catches very strongly dependent on blue shark and shortfin mako), but derogations have also been provided for Spanish owned (German/UK-registered) deepwater shark vessels in Northern waters. Some Portuguese vessels operating in the North Atlantic have also previously obtained permits to remove fins onboard. French vessels in C&S Atlantic are not thought to have requested any exemptions from the anti-finning regulation.

Fin weights as a proportion of a) round weight (FW:RW) and dressed weight (FW:DW) differ significantly for different species and fleets, as shown in the table hereunder for key species being caught by EU vessels.

Table 11: Fin weight ratios for different species and fleets

Species	**FW:RW (EU)**	**FW:DW (EU)**	**FW:RW (US)**	**FW:DW (US)**
Porbeagle	?	?	2.2%	3.6%
Blue shark	6.6%	14.6%	2.1%	3.7 – 4.5%
Shortfin mako	3.9	5.8%	1.6 – 1.7%	2.9 – 4.2%

[20] Information on these three issues obtained from a recent report by the European Elasmobranch Association – see http://www.lenfestocean.org/publications/SharkFinning_underlying_report.pdf

Deepwater sharks	1.6	6.5%

However these % are based not just on the species, but also on a) whether just primary or all fins are retained, b) the cutting practices and the amount of meat attached to fins when cut from the carcasses, and c) the dressed weight products. Current practices by the EU fleet increase FW:RW ratios compared to north American estimates, because generally all fins are retained (except from deepwater sharks where only the caudal fins are retained), and because fins are cut with more meat attached than in fisheries in North America. It is estimated for example that if Portuguese vessels retained primary fins only from blue shark with improved cutting practices FW:RW would be 3.8%, and that "clean cutting" could result in a FW:RW of 6.56% for all fins. It is probable therefore that changed cutting practices could be sufficient to bring all FW:RW figures below 5% for EU vessels. With regards to FW:DW figures, it is likely that "clean cutting" practices would result in figures of less than 5% for all species, except blue shark (see discussion below on measure 5.2)

However, as noted and acknowledged in the study referenced on the previous page, the real/specific impacts on ratios of a) the fins retained b) the cutting practices and c) the forms of dressed products, are not well understood. Ratios within a particular fleet segment can vary greatly. This makes quantification of the impacts of the proposed measures problematic, although some general conclusions can certainly be drawn and are presented below.

Measure 5.1 would involve *direct* economic costs for the *catching sector* currently obtaining exemptions (primarily Spanish as noted above) in both the short- and long-term, and for their *national administrations*, in terms of the extra work required to provide additional/improved justification. These costs are not quantifiable but could include the time and costs involved with both additional research and paperwork required to provide the improved justifications envisaged by the measure. Such direct costs are expected to be *insignificant*. However, this measure could result in *indirect* operational costs if vessels avoid the need for exemptions, either by amending their cutting practices to reduce fin weights (and therefore potentially values, although the exact financial benefits of more/less meat on fins is not known) so as to reduce the need to obtain exemptions, or by reducing discard practices, which could result in vessels having to use increased fishing hold space to store low value shark meat instead of higher value species[21]. Quantification of the significance of these impacts is not possible due to the fact that it is impossible to know the extent to which a) vessels would change their cutting practices to being fin weights under the existing 5% rule as opposed to incurring additional costs involved with obtaining derogations/exemptions, and b) discarding is currently taking place and therefore the extent to which the measure would reduce discards and impact on operational costs.

Measure 5.2 would potentially involve all distant water surface longline vessels (247) i.e. *catching sector*, on the basis that all are expected to catch at least some blue shark, and a move to 5% dressed weight would mean that all catches of blue shark *could* fall foul of the new regulation, even if cutting practices are improved. This would affect Spanish, Portugese and French vessels. For other species it is expected that improved cutting

[21] One can presume that vessels discard because it is financially advantageous to do so

practices would bring FW:DW to below 5%. But important in assessing the economic impacts of this measure is that the measure provides for 5% of live weight to be retained if proven. In essence this means that research can be used to ensure that adverse economic impacts are not incurred. It is thus expected that the *catching sector* and *administrations* in Spain, France, and Portugal, as well as in *RFMOs* would all incur *direct* costs in the short-term involved with investigating whether the revised 5% rule should include blue shark or not. It is expected that these costs would not be *significant*. On the basis that research on blue shark either proves that 5% of live weight should be retained, or that improved cutting practices could bring the FW:DW below 5% for blue shark as well as for other species, this measure would then only involve the *indirect* costs to the catching sector of changed values of fins with lower meat content, and costs are therefore expected to be *insignificant*. This measure could also result in *indirect* costs to the catching sector associated with reduced discards i.e. vessels having to use increased fishing hold space to store low value shark meat instead of higher value species. Quantification of the significance of these indirect impacts is not possible due to the fact that it is impossible to know the extent to which a) changed cutting practices would alter values, and b) discarding is currently taking place and therefore the extent to which the measure would reduce discards and impact on operational costs.

A *direct* impact of Measure 5.3 on the longline *catching sector* exempted could be to increase fuel costs from landing fins and carcasses in the same port, but for these savings to be outweighed by the inability to sell different products into ports commanding the best prices (on the basis that current practices maximise revenues/profits). In the US, similar regulations have resulted in vessels part-cutting fins and folding them next to the carcass for freezing. Quantification of these impacts is not possible, but stakeholder objections to this measure suggest that the industry feel they could be quite *significant*.

The impacts of measures 5.1 to 5.3 on the *processing sector, and on retailers/consumers*, in both the *short* and *long-term* could be to increase the availability of pelagic shark meat for processing/consumption (in high demand in Spain in particular), but to reduce the availability of other species (e.g. swordfish), thus increasing prices for other species which may be in stronger demand, while reducing prices for shark products (subject to unknown price elasticity of supply). However, these negative economic impacts could be partially offset by the measures resulting in greater efforts of fishing fleets to improve selectivity.

EU MS, the *Commission*, and *RFMOs* can also be expected to face *direct* economic costs in both the *short* and *long-term* from all measures, in terms of both administration (discussed later in this IA), increased budgetary allocations for monitoring, control and surveillance (MCS) (in distant water longline ports in Spain and Portugal especially), and for the specific data collection programmes mentioned in measure 5.2. Again, at the present time, sufficient detail is not available on the implementation of the measures to be able to quantify these costs. The *likelihood* of some costs being incurred is very high, however given existing commitments for MCS activities and the potential ability of existing operations to include the policing of new conservation measures, the *magnitude* of these increased costs may not necessarily be significant.

5.2.3. Social Impacts

Field of Action 1

Measures proposed in FoA 1 will involve *positive direct* social impacts in the *short, medium and long term*, through the enhancement of individual and organisational human capacity of *all stakeholders* involved with the proposed data collection. These impacts are certain to occur and likely to be significant. In addition, as with the economic impacts, there are also expected to be many positive *indirect* social impacts of FoA 1 in the *longer term*. Taken as a whole, if implemented FoA 1 can be expected to contribute towards safeguarding the current social benefits from shark fisheries to *all stakeholders*.

Field of Action 2

All measures proposed in FoA 2 (2.1 to 2.8) will involve *positive direct* social impacts in the *short, medium and long term*, through the enhancement of individual and organisational human capacity of ***researchers/scientists*** involved with the proposed research. These impacts are *certain* to occur if the measures are implemented, and likely to be *significant*.

Field of Action 3

All measures proposed in FoA 3 will involve *positive direct* social impacts in the *short, medium and long term*, through the enhancement of knowledge to *all stakeholders* involved. This FoA will also directly generate positive social benefits in terms of sector governance as provided for in the Treaty and the new governance approach. These impacts would be both *high likely* and *significant*.

Field of Action 4

In the short-term, all measures under FoA 4 are expected to result in negative *indirect* social impacts, through a reduction in shark catches that are currently generating the social benefits as previously discussed in Section B and Option A. These impacts are likely to be most strongly felt by the catching and processing sectors, and are certain to occur. However, the effects should be medium to low in most areas of the EU, but perhaps high in some especially dependent areas e.g. Galicia, Brittany.

Measures 4.6, 4.7 and 4.9 will involve *positive direct* social impacts in the *short and medium term*, through the enhancement of individual and organisational human capacity of *researchers / scientists* and the *catching sector* involved with the proposed research and programmes. These impacts are *certain* to occur if the measures are implemented, and likely to be *significant*.

In the *longer term*, FoA 4 can be expected to contribute towards safeguarding the current social benefits from shark fisheries to *all stakeholders*, by ensuring long-term sustainability of catches. These positive indirect long-term benefits could take the form of a continuation of the current level of social benefits from the fishery, or if stocks can be re-built, of actually increasing them. The *magnitude* of these impacts should therefore be seen in the context of the long-term social costs/impacts associated with Option A. The reader is thus referred to the discussion of social impacts in Option A.

Field of Action 5

In the short-term, all measures under FoA 5 are expected to result in negative *indirect* social impacts, through a reduction in revenues from pelagic shark catches that are currently generating the social benefits as previously discussed in Option A. These impacts are likely to be most strongly felt by the catching and processing sectors

associated with the longline fleet in the Central and Southern Atlantic, Indian Ocean and the Pacific, and are certain to occur. The impacts should be medium to low in most areas of the EU, but perhaps high in some especially dependent areas e.g. Galicia where most of the EU longline fleet is based.

Measure 5.2 will involve *positive direct* social impacts in the *short and medium term*, through the enhancement of knowledge about the applicability/suitability of the 5% rule to particular species. These impacts are *certain* to occur if the measures are implemented, and likely to be *significant*.

5.2.4. Risks, trade-offs/synergies, public opinion, enhancing measures

Field of Action 1

It is clear from stakeholder feedback on the consultation document, that public opinion would in general be very favourable to this FoA. Certainly public opinion is of the view that it is entirely appropriate for the EC to act on the measures proposed. Public opinion is unlikely to be consistent however with regards to the detailed implementation of the measures related to observer coverage (1.3 and 1.4). Certain NGOs have advocated for vessels of less than 24m to be included in measures 1.3, and for the hard versions of 1.3 and 1.4 to be introduced i.e. immediately. The catching sector to be affected by measures 1.3 and 1.4 would probably argue that the soft versions are entirely sufficient i.e. sufficient/representative (not total) observer coverage to be phased in. As a result, it is likely there will be risks and trade-offs between the hard and soft sub-options of measures 1.3 and 1.4. Proposing the hard options could end up reducing enforceability and resulting in a deterioration of relations between the catching sector and the Commission. The hard and soft versions of measures 1.3 and 1.4 clearly represent a trade-off in terms of different costs related to different levels of observer coverage. Synergy with other proposed bycatch reduction measures under Option B is envisaged, as these other measures would reduce the number of vessels affected by Measure 1.3, and would therefore reduce the required observer costs.

The FoA brings with it certain risks in terms of implementation by third countries and RFMOs, given the lack of jurisdiction of the EC over these parties. The result in external waters could be increased costs being borne by EC stakeholders, no action being taken by third countries/RFMOs, and therefore a reduced impact on safeguarding/improving long term economic and social benefits. Given differing stakeholder views, no specific ways of enhancing the measures are recommended.

Field of Action 2

It is clear from stakeholder feedback on the consultation document, that public opinion would in general be very favourable to this FoA. All are likely to be of the view that management measures must be taken based on appropriate research. Certainly public opinion is of the view that it is entirely appropriate for the EC to act on the measures proposed. Public opinion is also likely to be fairly consistent with regards to the detailed implementation of the measures. The FoA brings with it certain risks in terms of implementation by third countries and RFMOs, given the lack of jurisdiction of the EC over these parties. The result in external waters could be increased costs being borne by EC stakeholders, no action being taken by third countries/RFMOs, and therefore a reduced impact on safeguarding/improving long term economic and social benefits.

Field of Action 3

It is clear from stakeholder feedback on the consultation document, that public opinion would in general be very favourable to this FoA. All stakeholders are likely to be of the view that increased awareness and consultation is to be supported.

Field of Action 4

Public opinion would in general be favourable to this FoA. NGOs and advisory bodies are particular supportive and view this FoA as perhaps the most important, while the industry is supportive to the extent that the detailed implementation mechanisms for all measures is based on suitably rigorous evidence and justification. Public opinion is of the view that it is entirely appropriate for the EC to act on the measures proposed.

The FoA brings with it certain risks in terms of implementation by third countries and RFMOs, given the lack of jurisdiction of the EC over these parties. There is also the added risk on non-acceptability by EC Member States as well. The result in external waters could be increased costs being borne by EC stakeholders, no action being taken by third countries/RFMOs, and therefore a reduced impact on safeguarding/improving long term economic and social benefits. Additional risks to this FoA relate to control of catches and fishing effort on shark resulting in displacement to other fisheries that may also be under pressure and susceptible to overfishing.

Field of Action 5

It is clear from stakeholder feedback on the consultation document, that public opinion would in general be favourable to this FoA. NGOs and advisory bodies are particular supportive and view this FoA as important, while the industry is supportive to the extent that the detailed implementation mechanisms for all measures is based on suitably rigorous evidence and justification related to different species and the potential impacts. Public opinion is of the view that it is entirely appropriate for the EC to act on the measures proposed.

The FoA brings with it certain risks in terms of implementation by third countries and RFMOs, given the lack of jurisdiction of the EC over these parties. There is also the added risk on non-acceptability by EC Member States as well. The result in external waters could be increased costs being borne by EC stakeholders, no action being taken by third countries/RFMOs, and therefore a reduced impact on safeguarding/improving long term economic and social benefits. Additional risks to this FoA relate to control of catches and fishing effort on shark resulting in displacement to other fisheries that may also be under pressure and susceptible to overfishing.

Summarising the analysis of option B, there are long-term negative impacts associated with the present *status quo* (option A). The above actions should go along way to reversing those impacts particularly within Community waters, in relation to both stock and ecosystem responses. The key effective actions are 1, and 4 with the other three providing a supporting function. The positive environmental impacts, however, could only be achieved with full implementation of at least the two key actions which must be underpinned by a binding regulation.

5.3. Option C

5.3.1. Environmental Impacts

Essentially the actions are similar to those outlined in Option B but would attempt to reverse the negative impacts much more immediately to ensure no further damage is done. It would be more interventionist with highly restrictive harvesting practices which would further impact on other fish and fisheries within the immediate target fishery. Based upon an initial rapid risk assessment on existing data, all high and medium priority fisheries would be closed down immediately and only sharks complete with fins could be landed.

In terms of environmental impacts the effects would be positive, like Option B, but occurring more immediately. This may mean less damage might be incurred during the implementation period so stocks are in a better condition to recover since the regulation is more immediate. Positive environmental impacts may therefore be achieved more completely and more quickly.

The effects would be felt particularly in the NE Atlantic where the mixed nature of fishery with an inevitable shark/ray catch might seriously interfere with the fishery if Option C is fully implemented.

5.3.2. Economic Impacts

This option would result in a complete ban on the catches of many shark species in the *short- to medium term*, and until such time as TACs are established for individual species. In the case of the N. Atlantic and the Mediterranean, given that most sharks are caught in mixed fisheries, the potential economic impact of this option would be a complete cessation to *all stakeholders* of all current benefits being generated from non-TAC shark fisheries as outlined in Option A. As a recommended TAC is only available for a few species including thorny skate (11,000 tonnes), this could reduce catches in the North Atlantic and Mediterranean from around 54,000 tonnes of shark to around 10,000 tonnes. This would result in a *direct* and *significant* cost of reduced sales values of shark species by the catching sector of around Euro 69 million per year[22]. Given the low average dependency on shark catches in Northern and Mediterranean waters, these impacts would probably be *insignificant* in terms of individual vessel viability for most vessels, but could be *significant* for some specific metiers/fleets relying heavily on shark catches (e.g. specific French fleets in Bay of Biscay targeting sharks). Further quantification is not possible given the lack of current species reporting which precludes an analysis of economic benefits being generated by specific species or fleets.

Impacts in the *short- to medium-term* on the *processing sector* as a whole would be *significant* in terms of reduced product for processing and subsequent sale. This would mean that current margins/profits on around 43,000 tonnes of product would be forgone. Sufficient data/information is not available on margins/profits made specifically from processing shark species in Northern waters to estimate the economic costs that would result. However, it can be assumed that given other species available for processing and

[22] It should be noted that this lost value to the catching sector, could to some extent be recovered by increases of catches of other non-TAC species.

the relatively small percentage that sharks make up of total catches in Northern waters, that these impacts would probably not be significant enough to result in the difference between processors being economically viable or not, except in cases where any individual processors rely strongly on shark catches. The impacts can therefore be viewed as *not significant*.

For the distant water pelagic fisheries, as already noted shark catches represent a significant proportion of total turnover of longline vessels (around 25-45% depending on the fishery). In the absence of TACs for specific shark species, a ban on catches of all sharks would result in the *short- to medium term* in a loss of revenue of Euro 93 million from the C&S Atlantic, Euro 12 million in the Indian Ocean and Euro 4 million in the Pacific. These impacts are obviously *very significant.* In the current climate of increased operational costs (e.g. from fuel price rises), the impacts on individual vessels could very well make such fisheries unviable for the *catching sector*. This is especially likely given operational fishing strategies which rely on different species at different times of the year depending on both market prices and species availability in different locations. Impacts in the *short- to medium-term* on the *processing sector* as a whole would be *significant* in terms of reduced product for processing and subsequent sale. This would mean that current margins/profits being made on around 48,000 tonnes of pelagic shark product would be forgone. Sufficient data/information is not available on margins/profits made specifically from processing pelagic shark species from distant waters to quantify the costs that would result. Some very specialist shark processing operations could also be expected to be so negatively affected as to render them unviable due to reduced landings of shark, but the impacts on the processing sector would be less severe than on the catching sector, as it can be expected that processors are engaged with processing other species as well as sharks.

In the longer term, and as TACs are phased in for all species, Option C can be expected to contribute towards re-establishing or increasing the current economic benefits from shark fisheries to all stakeholders by ensuring long-term sustainability of catches. However, it must be remembered that the short-term impacts as discussed above could be very significant for some specific fleet segments, potentially meaning that operations could have ceased to exist by the time stocks recovered and/or TACs introduced. The *magnitude* of the balance of these short- and long term impacts should therefore be seen in the context of the discussion of the current economic benefits of shark fisheries.

For the new measure proposed for FoA 5 in Option C (landing of all sharks with fins with no exceptions), there would be no merit in stakeholders spending any monies on research to demonstrate/justify exemptions, so these *short-term* costs associated with Option B would be saved. *Short- and long term* economic costs would therefore involve the *direct* impact on the *catching sector* for those pelagic shark vessels currently gaining exemptions (mostly Spanish) of increased fuel costs from landing fins and carcasses in the same port, but for these savings to be outweighed by the inability to sell different products into ports commanding the best prices (on the basis that current practices maximise revenues/profits). Quantification of these impacts is not possible, but stakeholder objections to this measure suggest that the industry feel they could be quite *significant*. Likewise a requirement to land all fins without any exceptions, would also result in *indirect* operational costs if vessels are forced to amend their cutting practices to reduce fin weights (and therefore potentially values) so as to fall under the 5% rule. The measure would also result in costs to the catching sector of reduced discard practices,

which could result in vessels having to use increased fishing hold space to store low value shark meat instead of higher value species. Quantification of the significance of these impacts is not possible due to the fact that it is impossible to know the extent to which a) changes to cutting practices would reduce sales values and b) discarding is currently taking place and therefore the extent to which the measure would reduce discards and impact on operational costs.

5.3.3. Social Impacts

In the case of the North Atlantic and the Mediterranean, given that most sharks are caught in mixed fisheries, this option would mean that around 50,000 vessels, 100,000 catching sector jobs, and 50,000 processing sector jobs could be impacted. Given the relatively low importance of shark species as a proportion of total catches in northern waters, these impacts would probably not be significant overall, but could be significant for some specific metiers/fleets and areas, such as the longline fishery for porbeagle from Isle d'Yeu. However a detailed quantification is not possible given the lack of current species reporting which precludes an analysis of economic benefits being generated by specific species or fleets.

For the distant water pelagic fisheries, as already noted shark catches represent a significant proportion of total turnover of longline vessels (around 25-45%) and some regions e.g. Galicia are very dependent on fisheries. A complete ban on shark fisheries in distant waters given the lack of TACs would affect more than 300 longline vessels and around 5,000 crew, an additional 56 purse seine vessels and their crew, and around 3-4000 processor sector jobs. In the absence of TACs for specific shark species, a ban on catches of sharks, especially in the current climate of increased operational costs (e.g. from fuel price rises), could very well make such distant water fisheries unviable for the *catching sector*, with resulting social implications in terms of job losses. This is especially likely given operational fishing strategies which rely on different species at different times of the year depending on both market prices and species availability in different locations. Some very specialist shark *processing operations* could also be expected to be so negatively affected as to render them unviable due to reduced landings of shark, with resulting negative social impacts in terms of employment, but given the ability/likelihood of processing companies obtaining species from other sources and not be entirely dependent on longline catches, the impacts may not be as severe as for the catching sector.

In the longer term, and as TACs are phased in for all species, Option C can be expected to contribute towards re-establishing or increasing the current social benefits from shark fisheries to *all stakeholders* as discussed earlier in Option A, by ensuring long-term sustainability of catches.

For the new measure proposed for FoA 5 in Option C (landing of all sharks with fins with no exceptions), the short and long-term direct and indirect social impacts would be the same as those described under FoA 5 for Option B, except even greater because no vessels would be afforded the derogations. Impacts would be both *certain* and *significant*.

5.3.4. Risks, trade-offs/synergies, public opinion, enhancing measures

It is clear from stakeholder feedback on the consultation document, that while some NGOs might be supportive of this Option, the industry would certainly not be. Compliance and enforceability issues would certainly therefore be a significant concern. In addition, it must be remembered that the short-term impacts as discussed above would be very significant. The *magnitude* of the balance of these short- and long term impacts should therefore be seen in the context of the discussion of the current social benefits of shark fisheries, and the probable trade-off between short-term costs and long-term gains could be unacceptable and hardly supported by politicians.

The Option also brings with it certain risks in terms of implementation by third countries and RFMOs, given the lack of jurisdiction of the EC over these parties. There is also the added risk on non-acceptability by EC Member States as well. The result in external waters could be increased costs being borne by EC stakeholders, no action being taken by third countries/RFMOs, and therefore a reduced impact on long term economic and social benefits. Additional risks to this FoA relate to control of catches and fishing effort on shark resulting in displacement to other fisheries that may also be under pressure and susceptible to overfishing.

In summary, implementation of Option C would have similar environmental impacts to Option B in that it would slow down or reverse the decline in shark populations, particularly the more vulnerable species, and reverse negative trends in ecosystem structure. It would, however, achieve these positive impacts more immediately and more extensively than Option B. Never the less the social and economic impacts would also be more immediate for an unprepared industry and consequently cause some hardship in some fishing regions.

6. ADMINISTRATIVE AND MANAGEMENT COSTS

Administrative costs are those that are defined as "the costs incurred by enterprises, the voluntary sector, public authorities and citizens in meeting legal obligations to provide information on their action or production, either to public authorities or to private parties" (EC Impact Assessment Guidelines, Sept 2006 update). The administrative costs were estimated using the EU Standard Cost Model. Please find here the estimation's main results (see the detailed calculation in Appendix IV.):

Option A (the *status quo*) results in **no net change** to administration costs.

Option B (the proposed CPOA) is estimated to result in administration costs of **around €19 million.** Around 99% of these costs relate to Field of Action 1. The proposed measure to change catch reporting for elasmobranchs to species level results in 55% of the costs incurred by the catching sector through additional labour allocated to more detailed catch reporting and 20% is incurred by the post-harvest sector for resulting alterations to reporting. A further 24% is incurred by Member States resulting from additions to the DCR, but mainly through the administration costs associated with the proposed observer scheme.

With the large numbers of vessels and seafood enterprises affected by the proposed change to reporting requirements, the additional administration costs estimated for RFMO and RAC secretariats to increase research and information on elasmobranch are comparatively minimal. These will however have budgetary implications and require future funding.

The total administration costs for **Option C** (application of a strict precautionary approach) are estimated to be just over **€17 million**. Option C incurs similar levels and target group apportionment of costs as Option B. Some costs savings result from the outright ban on high and medium priority fisheries resulting in no observer scheme in these fisheries and no costs associated with the application for and processing of finning and landing exemptions.

Management costs essentially cover the cost of implementation – be this management or research – and are considered separately. The total management costs for options B and C are estimated to be from the first year between just over €4 million (soft option) and almost **€**14 million (hard option). This amount can be from the fifth year about **€**5 million.

The ***total anticipated costs*** (both management and administrative) are included in Appendix IV. Option B results in marginally higher overall costs compared to Option C, with the hard options both totalling just over €30m in the first year, decreasing to annual costs of approximately €23m in Year 5.

7. COMPARING THE OPTIONS

The options for applying the Shark Action Plan have been examined above along with their relative impacts. It remains to assess the effectiveness of these options for achieving the stated objectives of the Plan. These objectives were:

- Ensuring a coherent approach between internal and external EC fishery policy for sharks.

- Deepening the knowledge both on shark fisheries and on shark species and their role in the ecosystem.

- Ensure that directed fisheries for shark are sustainable and that by-catches of shark resulting from other fisheries are properly regulated.

The probable effectiveness of the three options of achieving these objectives can be compared and an indication of their relative efficiencies can be gained by comparing their advantages and drawbacks.

Advantages, drawbacks and relative efficiency of options

7.1. Option A: Status quo

7.1.1. Advantages

In the short-term, there are currently significant economic and social advantages to no change in the present situation. Current catches are worth around EUR 196 million annually with significant income dependency particularly for the external fleets and amongst the major fishing regions of the Community. This benefit extends to secondary and tertiary tiers of the industry. In addition, much of the shark is retailed and consumed within the EU therefore it makes a significant contribution to EU fish supplies.

7.1.2. Drawbacks

Most of the advantages listed above are short-term. All the indicators suggest that current stocks are declining rapidly and that some may be already badly damaged. This is, in itself, a drawback in environmental terms, of doing nothing, but it would have the additional disadvantages of undermining the economic and social benefits from shark fishing described above. These progressively negative effects would affect some of the most sensitive fishing regions of the Community, such as Galicia, Brittany and NE Scotland. Clearly, market supplies would also suffer. Such effects might also be felt in third party countries who often supply crew for the distant water fleet. With such long-term costs this cannot be regarded as an efficient option.

With increasing damage to shark stocks, the role of many sharks as top predators with a regulatory role in ecosystem function, may have wider effects within the ecosystem and its biodiversity as they are progressively removed.

There will also be drawbacks for the Commission itself since doing nothing on an issue widely perceived to be a serious problem will lead to increasing friction with NGOs, civil society and concerned Member States. This would also compromise the standing of the EU in international management and conservation bodies.

This option is neither effective nor efficient in the long-term.

7.2. Option B: Proposed Fields of Action

7.2.1. Advantages

The main advantages of Option B are initially environmental along with improved governance and best practice. If all the actions included in this option were fully implemented and complied with, the objectives of the Plan would be achieved and the negative impacts on shark populations and biodiversity minimised or reversed through the positive impact of the actions.

Governance should be linked with improved coherence between home and external fleets since the outputs of the CPOA should take into account and address the interests of both fleets. It will also require much closer collaboration with RMFOs and international bodies. Moreover the EU can be seen to be taking the initiative in a plan of some significance in the marine environment, thereby increasing its political capital.

Ultimately, in the longer term although there may have been initial costs within the industry the management of the shark stocks will guarantee a more stable and sustainable activity within the industry thereby conferring more long term benefit and more supply. The consultation action (Activity 3) will also help a more informed civil society and industry.

7.2.2. Drawbacks

There are significant direct and indirect costs associated with both the data collection elements (Actions 1 and 2) and the management elements (Actions 4 and 5). Data collection always has a cost attached to it. Catch and effort monitoring will have some administrative associated with it both within the industry and the Commission. The use of observer pilot schemes could be particularly costly (Section 6). In addition to monitoring and observer costs there would also be research costs particularly for measures of Action 2. The consultation process envisaged in Option 3 would also have a cost.

The implementation of Option 4 and 5 would have their costs on the industry. As management measures are implemented there will be a curtailment in fishing for sharks which will have economic and social costs within the industry and fishing communities. The extent of these costs would depend upon the degree of limitations put in place and the extent to which fishing strategies could be altered so as to minimise economic costs. The prohibition of discards could prevent the full benefit of fishing from the target species to be realised. This would also be the case in Option 5 where fishing costs may also be increased due to increased frequency of landings needed.

In the longer term many of these costs would be offset by the more sustainable sub-sector as described under ‘advantages’.

To be fully effective new regulations would had to be of a binding nature which brings additional costs of ensuring compliance through inspection and monitoring.

This option is likely to be effective but will have its costs, particularly in the short term. If properly adjusted, however, it should be reasonably cost effective and efficient. It seems to offer the most efficient way of achieving effectiveness of the objectives.

7.3. Option C: Strict Precautionary Approach

7.3.1. Advantages

It should achieve the objectives of data collection and management as per Option B but achieve them more quickly and with less damage being done to shark stocks during the implementation period.

7.3.2. Drawbacks

The range of costs is likely to be similar to Option B but the immediate curtailment of all medium and high risk fisheries will have rapid and more profound consequences for the industry. The more rigorous regulations, which will be binding, will present much greater issues of compliance. This could further increase the risks of compliance not being achieved.

The ultimate effectiveness will be achieved in advance of Option B but the increased costs, largely economic and social, will largely be felt by the industry and also the consumer as market supplies are more reduced. The efficiency of this option may be less than that for Option B.

7.4. Preferred option

Given the evidence for a deteriorating situation for a number of shark populations, it cannot be said that Option A will enable an effective systematic response to be arrived at by the EU in a timely fashion and the present situation could become unacceptable. The overall negative impacts of continuing with the *status quo* were outlined in the previous Section. It is this that the Commission intends to mitigate through fields of action within the CPOA.

If fully implemented and complied with Option C would be highly effective in achieving both data and management objectives. However, the strong drawbacks pointed out above do not allow the choice of this option as the preferred one. It is important to recall that this option also brings with it certain risks in terms of implementation by third countries and RFMOs, given the lack of jurisdiction of the EC over these parties. The result in external waters could be increased costs being borne by EC stakeholders, no action being taken by third countries/RFMOs.

Our preferred option is an **amended version of Option B** (including the "soft" sub-option for measures 1.3, 1.4 and 1.10 and the "hard" sub-option for measure 4.4 –see Appendix II).

Following the analysis made in the previous sections, it could be inferred that not all the proposed actions seem compulsory. A number of them could be dismissed without major detriment for the whole Plan of Action in consideration of the workload involved in relation to the available human resources.

In the preferred option, measures 2.2, 2.3, 2.4, 2.5, 2.7 and 3.3 are dropped and a new measure (4.10) is added.

The measures to be dropped are the following ones:

Under Field of Action 2:

2.2 To conduct regular assessment in order to identify threats to shark populations and to determine the fishing mortality by stocks and, if possible, partitioned by fishery.

Reason: This task should be accomplished by relevant scientific advisory bodies without specific resort to Community action. Although the existing mechanisms could be considered insufficient, the lack of human resources in DG MARE does not allow making further progress. Furthermore, the relative weight of this action in the whole CPOA has been considered low to medium and its implementation optional.

2.3 Identification of space-time boxes in areas where juveniles or spawners are abundant.

Reason: Already covered by measure 4.8

2.4 Study biology and ecology of sharks.

Reason: This task should be accomplished by relevant national and international research bodies without specific resort to Community action. Although the existing mechanisms could be considered insufficient, the lack of human resources in DG MARE does not allow making further progress. Furthermore, the relative weight of this action in the whole CPOA has been considered low to medium and its implementation optional.

2.5 Develop prototypes, monitor experiments and propose measures for improving size selectivity and for reducing unwanted by-catch and discarding of no commercial species.

Reason: DG Research is financing a collaborative project, MADE, selected through FP7, which perfectly fits into this particular action. MADE addresses the objective of "mitigating adverse ecological impacts of open ocean fisheries", i.e. of pelagic long lines and FAD fisheries. Sharks are concerned as by-catch for these two fisheries. The field of the programme corresponds to the main fishing grounds of European fleets in the Indian and Atlantic oceans, and in the Mediterranean Sea.

The programme begun in May 2008 and will end in 2012 but deliverables will be available from December 2009 on. Therefore, it seems appropriate to see this action in the context of the EC Plan of Action.

Although this could be considered insufficient, the lack of human resources in DG MARE does not allow making further progress. Furthermore, the relative weight of this action in the whole CPOA has been considered low to medium and its implementation optional.

2.7 Foster implementation of internationally coordinated studies on straddling and/or shared stocks.

Reason: This task should be accomplished by relevant international research bodies without specific resort to Community action. Although the existing mechanisms could be considered insufficient, the lack of human resources in DG MARE does not allow making further progress. Furthermore, the implementation of this measure has been considered optional.

Under Field of Action 3:

3.3 Foster stakeholder awareness and consultation regarding shark management and best practices to reduce unwanted by-catch through programs promoted by RFMO and international fishermen associations.

Reason: This task should be accomplished by relevant international bodies without specific resort to Community action. Although the existing mechanisms could be considered insufficient, the lack of human resources in DG MARE does not allow making further progress. Furthermore, the implementation of this measure has been considered optional.

The measure to be added is the following one:

4.10 Co-operate through CMS and CITES to controlling shark fishing and trade.

Reason: The Community is already cooperating with these two international Conventions. However, strengthened participation on shark conservation related activities is advisable. Additionally, this measure has been suggested by a number of stakeholders and is clearly relevant and appropriated.

The Fields of Action and the corresponding measures actually included in the draft CPOA can be found in the following table:

Operational objectives, measures and implementation mechanisms resulting from the IA

Operational objective	Basic Measures		Implementation mechanisms and options
1. Having reliable and detailed species-specific quantitative and biological data on catches and landings as well as trade data for high and medium priority fisheries, after three years of implementation.[23]	EC level	Increase investment in shark data collection at landing sites and by processing and marketing industries.	Increase the requirements of the DCR to specify shark landings by species. Use of Control regulation
		Establish systems to provide verification of catch information by species and by fishery.	As above. Focus should be on strengthening implementation of existing control regulations
		Mandate representative coverage on EC fishing vessels by on-board observers for vessels over 24 m and with recent by-catches figures of more than 10% to 15% (depending on the particular fishery) of sharks over the total catch.	Soft option: 40% observer coverage for high priority pelagic fisheries that catch more than 10% shark bycatch by 2013.
		For all the distant water fleets not covered by the measure above and taking sharks as a by-catch, mandate at least 10% observer coverage by 2013. For high priority shallow-water fisheries in the NE Atlantic, mandate pilot-based observer scheme (e.g. *c.* 25 observers) by 2013.	Soft option: 10% observer coverage of all distant water fleets not covered by Measure 1.3 by 2013 and pilot-based observer scheme (e.g. *c.* 25 observers) by 2013 on high priority shallow-water fisheries in the NE Atlantic. Refine over time with better landings data from Measure 1.1 and 1.2.

[23] Fields of Action 1 & 2 merged

Operational objective	Basic Measures		Implementation mechanisms and options
		Ensure that all landings and trade of shark fins, meat and oil are recorded separately by commodity and to the species level.	Adapt Reg. 1921/2006 on landings to presentation of shark commodities by species.
	RFMO level	Promote improved species-specific catch and landings data and monitoring of shark catches by fishery.	Promote adoption of regulatory measures for shark catches reporting (see Measure 2.6) through binding measures.
		Improve, in cooperation with FAO and relevant fisheries management bodies, the monitoring and reporting of catch, bycatch, discards, market and international trade data, at the species level where possible.	Financial support to FAO, and contribution to Working Groups and RFMO meetings.
		Request through the FAO and Regional Fisheries Management Organisations where appropriate that these organisations develop and implement Regional Shark Plans and associated measures to assist in species identification and monitoring, as called for in the IPOA–Sharks, by mid-2009 in order to report to the 15th Meeting of the CITES Conference of Parties.	Contribution to Working Groups and RFMO meetings to assist NPOA development. Consider technical and financial assistance through FPAs. NPOA outputs
		Promote the identification and reporting of species-specific biological and trade data.	RFMO alter reporting requirements accordingly through recommendations.

Operational objective	Basic Measures		Implementation mechanisms and options
		Encourage representative coverage on fishing vessels by on-board observers for vessels over 24 m fishing in the high seas and with recent by-catches figures of more than 10% to 15% (depending on the particular fishery) of sharks of the total catch. For other fleets not covered by the measure above and taking sharks as a by-catch, mandate at least 10% observer coverage by 2013.	Soft option: 40% observer coverage for high priority pelagic fisheries that catch more than 10% shark bycatch by 2013.
	Member State level	Monitor recreational catches and distinguish between the fishing mortality exerted by recreational and commercial fishing.	Mandatory reporting of recreational seafishing landings of elasmobranchs. Studies into mortality following release in both recreational and commercial fisheries
2. Being able to efficiently monitor and assess shark stocks on a species specific level and develop harvesting strategies with the principles of	EC and RFMOs level	Enhance EC and RFMOs research programmes to facilitate data collection, monitoring and stock assessment on a species-specific level.	Following ICES and RFMOs advice, seek specific scientific advice based on MoU with JRC and STEFC through specific requests. Promote specific research programmes through the 7th Framework Programme (2007-2013). Contribution to Working Groups and RFMO meetings. Finance provided to studies.

Operational objective	Basic Measures		Implementation mechanisms and options
biological sustainability and rational long term economic use, after three years of implementation.[24]	Member State level	Develop national expertise	Promote uptake of courses, facilitate exchange and mobility of researchers through funding available under FP7.
3. Improve and develop frameworks for establishing and coordinating effective consultation involving stakeholders in research, management and educational initiatives	EC level	Facilitate stakeholder awareness and consultation regarding shark management and best practices to reduce unwanted by-catch through RAC programs.	Solicit inclusion of shark management issues on agenda of RACs
		Encourage Member States to allow public access to relevant aggregated data for fleets and information on shark fisheries, while protecting the right of confidentiality.	Establish internet-based resources either on Europa website or via independent provider, but respecting issues of individual vessel / owner confidentiality.
	Member State level	Launch educational programs aimed specifically at educating fishermen and the public about shark and ray conservation programs and restrictions.	Promote specific programmes with financial support of EFF or through NGOs.
4. Adjust catches and fishing effort to the available resources with	EC level	Limitation or prohibition of fishing activities in areas that are considered sensitive to endangered stocks.	Specific legislation.
		Stronger limitation of fishing effort by relevant fisheries.	Specific legislation.

[24] Fields of Action 3 & 4 merged

Operational objective	Basic Measures		Implementation mechanisms and options
particular attention to high priority fisheries and vulnerable or threatened shark stocks, after three years of implementation. [25]	Both EC and RFMO levels	Foster programmes and analysis to adjust fishing effort at international level.	Active contribution to Working Groups and RFMO meetings to develop resolutions to limit shark-related effort.
		Establish catch limits by stocks in conformity with the advice provided by ICES and by the relevant RFMOs.	Hard option: Immediate imposition of TACs and other management measures as recommended by ICES and by the relevant RFMOs.
		Prohibit all shark discards and require that all catches (including by-catches) are landed. Unwanted by-catches of sharks that have a chance to survive must be released back into the water.	Provide derogations for species with high post-discard survivability e.g. some ray species. Propose discard ban at RFMO level. Provide derogations for species with high post-discard survivability e.g. blue shark.
		Increase size and species selectivity in order to reduce undersized catches and unwanted by-catch.	Develop joint research programmes that would test different gear options. Possible maximum size limits to conserve large breeding females.
		Establish bycatch reduction programs for shark species considered Critically Endangered or Endangered by relevant international organisations.	Dedicated RFMOs working groups on shark fisheries that would analyse data available and make management recommendations to the Plenary.
		Establishment of space-time boxes in areas where juveniles or spawners are abundant, esp. for vulnerable or threatened species.	Specific legislation.
		Provide international cooperation in CMS and CITES with a view to controlling shark fishing and trade.	Proactive participation in CMS and CITES in support of shark conservation measures.

[25] Fields of Action 6 and 7 merged

Operational objective	Basic Measures		Implementation mechanisms and options
		Examine the possible impact of market mechanisms on conservation measures, including for shark species within the framework of the ongoing evaluation of the Common Market Organisation in fishery and aquaculture products.	Review the applicability of market intervention measures to endangered shark species.
5. Minimize waste and discards from shark catches requiring the retention of sharks from which fins are removed and strengthening control measures.	Both EC and RFMO levels	Confirm the ban of finning practices[26]. As a general rule, it will be prohibited to remove shark fins on board, tranship or land shark fins. Any exception to this rule will have to be fully justified on solid and objective grounds and documented prior to the issuing by the Member State of the special permit. Member States should not issue special permits to vessels not having fulfilled this condition.	Amendment of Reg. 1185/2003.
		To review the 5% rule by requiring that in no case shall the weight of the fins exceed 5% of the dressed (gutted and beheaded) carcass weight of the shark catch. However, Member States having set up and implemented data collection programmes proving that this percentage could be increased in certain cases, could do so up to a percentage corresponding to 5% of the live weight of the shark catch.	
		For vessels of Member States having been exempted from the obligation of landing of sharks with fins attached, introduce the requirement to land shark fins and carcases at the same time in the same port.	

[26] Practice whereby the fins are removed from sharks, with the reminder of the shark being discarded at sea.

8. MONITORING AND EVALUATION

Identification of core indicators

A series of indicators have been drafted in the table overleaf. These have been divided into:

- Impact indicators: CPOA broad policy objectives
- Result indicators: CPOA Fields of Action (specific objectives)

Table 8: Core indicators for monitoring and evaluation

OBJECTIVE LEVEL	TARGET	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT RISKS AND ASSUMPTIONS
Broad policy objectives				
1. Deepening the knowledge both on shark fisheries and on shark species and their role in the ecosystem.		Activity and outputs of elasmobranch-specific Working Groups Number and focus of species and fisheries-specific management mechanisms elucidated	ICES, STECF and RFMO reports	Research is focused on vulnerable and threatened species. Dependent upon regular risk assessment and prioritisation.
2. Ensure that directed fisheries for shark are sustainable and that by-catches of shark resulting from other fisheries are properly regulated.		Shark populations recover to sustainable levels.	ICES, STECF and RFMO reports	Some species are already critical and their potential for recovery uncertain.
		Number of species in the IUCN Red List CR, EN & VU categories	IUCN Red List updates	
3. Encourage a coherent approach between the internal and external EC fishery policy for sharks		Uptake and consistency of internal EC regulations related to sharks into RFMO resolutions.	EC Regulations and relevant RFMO resolutions	The adoption of a precautionary approach may not be acceptable to all RFMO CPs.
Fields of Action - specific objectives				
1. Facilitate improved identification and reporting of species-specific catch, landings and market data	MS / EC / RFMO	Increased proportion of catches and landings reported to species level. Level of observer coverage on high priority and other fisheries. DCR regulations update and strengthened to reflect the Action Plan.	Eurostat, ICES and FAO databases	Nomenclature can be clarified and agreed
2. Conduct research and compile the necessary information to assess threats to shark populations and protect critical habitats, and implement sustainable and rational harvesting strategies	MS / EC / RFMO	New stocks assessed. New national expertise developed	ICES, STECF and RFMO reports	FP7 funding priorities coherent with Action Plan-related research needs

3. Improve stakeholder awareness and consultation processes	EC	RACs incorporate shark management issues MS public access portal providing access to relevant information on sharks	RAC reporting Website or other portal	Regional issues recognised Technical and financial resources made available. Public information needs identified.
	MS	EFF fund uptake includes education & awareness building for shark conservation	MS mid-term review of EFF uptake	National fisheries administrations encouraged to include shark issues in EFF programmes
4. Adjust fishing effort and catches to the available resources	EC / RFMO	Number of fisheries where effort and / or catch is limited (all fishery / spatial / seasonal) due to shark-related concerns Imposition of a discard ban (except for certain species / fisheries where post-discard mortality is acceptable) Imposition of maximum size limited for certain species.	Relevant regulations and resolutions.	Key risk is the acceptability of EC measures to RFMOs and their Contracting Parties.
5. Minimize waste and discards from sharks	EC / RFMO	Amendments to Reg. 1185/2003, with sufficiently justified applications for derogations	Revised regulation(s) and MCS records	Consensus agreed within Member States.

Monitoring and evaluation

The following is proposed:

- An interim evaluation report on the qualitative and quantitative implementation of the programme and on the results so far achieved after three years of implementation.
- A communication on the continuation of the programme.
- A full evaluation report after six years of implementation.

APPENDIX I

Summary of stakeholder feedback presented to the European Commission

Prior to the commencement of this study, the Commission identified nine fields of action that it believed should be addressed in an EU Action Plan for Sharks. Stakeholders were invited to express their views on these fields of action, and present their opinions as to what further measures would be appropriate to reinforce the policy of the European Community on the conservation and management of sharks. The input received in the consultation process has been used to inform this report and the impact assessment conducted of the envisaged Action Plan. This Appendix presents a brief summary of the contributions made by stakeholders to the EC. It is not intended to be an all encompassing presentation of all the views contained in the contributions, and more detail on the specific views of stakeholders is contained in the contributions themselves, which can be found at the relevant EC website.

http://ec.europa.eu/fisheries/cfp/governance/consultations/consultation_111207_contributions_en.htm

Field of Action No. 1: Facilitate improved species-specific catch and landings data and monitoring of shark catches.

Sector	**Some specific comments and concerns**
Industry	• Appropriate for Community to act, question whether data will improve knowledge about status of sharks in eco-system • Important for processing/marketing sectors of contracting parties to RMFOs to be included • Should be easy in recreational fisheries • Could have large negative economic/social impact in developing countries • Strong environmental benefits through better knowledge
Recreational	• Important to distinguish between landings and mortality, and also be sub-sectors of the recreational sector in terms of data collection and regulation
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability • Declaration systems need to be more precise
NGO and others	• Very important and entirely appropriate for EC to act • Should include data collection at sea and should include FPAs

	• Could be facilitated by dedicated landing ports for shark • Commission could play an important role in standardizing names across countries/regions • Could be facilitated through incentives not just penalties • EU action should not be held up by lack of international or regional action • Not properly distributed – need more emphasis on MS and international level, not just RMFOs • Only minor economic/social costs of better data collection and reporting, but impacts of not doing so could be very serious • Very important environmental benefits • Use CCAMLR and DCR as model
STECF	• An appropriate area where progress has been made in recent years • There is a need to collate and verify existing information. • The recording of the catch of sharks as bycatch is required, as is biological information for stock assessment purposes

Field of Action No. 2: Facilitate the identification and reporting of species-specific biological and trade data.

Sector	**Some specific comments and concerns**
Industry	• Appropriate for Community to act but terms need to be gradual • Concern about lack of reporting of Asian vessels and ability to enforce, and proposed measures not complete at regional level • Impacts on EU fleet would be serious, and the proposed extent of coverage is not needed in order to obtain reliable information • Port sampling would be better in developing countries • Limited environmental impact on Community directed fisheries given existing reporting, but significant on non-EU fleets
Recreational	• Supportive
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability • Declaration systems need to be more precise

NGO and others	• Separate catch reporting in field of action 1, and trade issues in FoA 2 i.e. move observer coverage measures to FoA 1 • >24m cut off for observer coverage too large • Suggest 10% observer coverage, and move from full to partial coverage must be phased • Observers when bycatch more than 10% • Trade data to be covered could be broadened to include all/additional products • Use CCAMLR and DCR as model • Potential problems with trade species-specific data should not delay FoA 1.
STECF	• The proposals for full observer coverage for >24 m vessels and those with >10-15% bycatch may encourage misreporting by those not carrying observers. • It should be mandatory for all vessels wishing to land shark fins without the accompanying carcass, to carry observers on board. • Increasing observer coverage is expensive.

Field of Action No. 3: Compile the necessary information to 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.

Sector	**Some specific comments and concerns**
Industry	• Appropriate to act, but need better mapping for space-time boxes • Proposed measures not complete at regional level, and will be difficult to enforce • Limited impact on Community directed fisheries but could be impacts on incidental catches • Significant costs implications on developing countries • Needs amending to be effective on Asian fleets • Positive environmental impact
Recreational	• Supportive but need to be aware of value of recreational fisheries
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability
NGO and others	• Appropriate to act. Proposals will be particularly relevant for establishing Natura 2000 sites for any sharks listed under the Habitat Directive.

	• Recommend the models & approaches used by the international expert WG convened last year by the Lenfest Ocean Program to set annual catch limits for a variety of fisheries • No new shark fisheries to be allowed without EIA to include threats • Properly distributed • Social/networking and raised profile benefits of better research, and identification of economically sustainable fisheries. Economic and social impacts of no action would be serious • Need to foster technical expertise at national level
STECF	• No comments

Field of Action No. 4: Develop research projects to assess threats to shark populations and implement harvesting strategies consistent with the principles of biological sustainability and rational long term economic use.

Sector	**Some specific comments and concerns**
Industry	• Appropriate to Act, especially to ensure that management decisions are taken based on proven data and not just on speculation • Proposed measures not complete at regional level • Impacts on EU and developing countries dependent on harvesting strategies chosen and balance of imports • Environmental impacts positive, but less implementable if social/economic impacts very large and negative on fleets
Recreational	• Supportive but need to be aware of value of recreational fisheries
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability
NGO and others	• Suggest merging FoA 3 and 4, because the title of FoA 4 is broader than its measures • Conservation targets could be broadened and should seek to minimize not reduce bycatch • Need to foster technical expertise at national level • Appropriate to act because the proposals in this field of action are consistent with an ecosystem-based approach to fisheries management, a stated goal of the Community. • Not distributed properly because the document proposes no role for Member States and neglects to include bycatch reduction research in programmes fostered regionally.

	• Social/networking and raised profile benefits of better research, and identification of economically sustainable fisheries. Economic and social impacts of no action would be serious • Determining important parameters and learning how to minimise shark bycatch and discard mortality are key steps toward safeguarding shark populations & the ecosystems they support.
STECF	• Suggests that the Community level proposal "Study biology and ecology of sharks" should be reworded to reflect the true focus which is to target gaps in knowledge which are important for assessing threats in the shark populations.

Field of Action No. 5: Improve and develop frameworks for establishing and coordinating effective consultation involving stakeholders in research, management and educational initiatives within and between States.

Sector	Some specific comments and concerns
Industry	• Appropriate to act, but measures need modification • Measures not properly distributed. Too much emphasis on RACs and not enough on industry representation • Public access should only be considered from a standpoint of aggregate data for fleets, protecting the right of confidentiality • Community and regional measures should be the same • Strongly positive social impacts, economic impacts uncertain • Environmental impacts positive, but less implementable if social/economic impacts very large and negative on fleets
Recreational	• Supportive. Anglers must not be overlooked and can play important part in tagging programmes
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability
NGO and others	• Need a broad definition of stakeholders • Need to include advice with regards to minimizing bycatch, not just unwanted animals • Education also needs to focus on threats to sharks, not just about conservation programmes and regulations • Appropriate to act and well distributed • Strong positive economic, social and environmental benefits
STECF	• No comments

Field of Action No. 6: Adjust fishing effort to the available resources.

Sector	Some specific comments and concerns
Industry	• Must be carefully studies to assess social/economic impacts • Measures equally distributed, , but must be based on scientific data and evidence, not speculation • Economic/social impacts could be great but handled, but concern over Community fleet being affected with less effort/concern on non-EU vessels • Suggest merging fields of action 6 and 7 • Positive environmental impact but must be equally imposed on all fleets, not just EU
Recreational	• Supportive and suggest that some species could be for recreational catches only
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability
NGO and others	• One of the most crucial FoA • Should specify emergency measures to protect from excess effort • Potential for eco-tourism 'effort' • Need closed areas in-shore, and no expansion of effort with EIA • Appropriate to act in line with FAO, and Commission's stated goals of substantially reducing EC fishing capacity and adopting an ecosystem approach. • In terms of distribution, should propose options for encouraging meaningful and enforceable reductions in fishing effort, as well as closed areas, at the national level and guard against effort displacement to other sensitive areas or the waters of other countries. • Essential for economic, social and environmental benefits
STECF	• No comments

Field of Action No. 7: Adjust catches to the available resources.

Sector	Some specific comments and concerns
Industry	• Suggest merging fields of action 6 and 7 • Need for good mapping • Need to carefully consider different characteristics of fisheries and species in the detail

	of the measures • Balance in distribution between Community and RMFO, but must be based on scientific data and evidence, not speculation • Economic/social impacts would depend on application of measures in EU and developing country fleets • Positive environmental impact but must be equally imposed on all fleets, not just EU
Recreational	• Need to distinguish between discards in commercial fisheries and releases in angling
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability • In favour of the adoption of catch limits for sharks, fixed on the basis of the best possible evaluations produced by ICES or the scientific committees of concerned RFMOs or, when these evaluations are not available, in favour of the adoption of precautionary TACs to be established on the basis of fishing statistics and recommendations of independent and institutionally recognized scientific authorities
NGO and others	• One of the most crucial FoA • Need realistic timelines • In favour exceptions to the EU discard ban for shark species with a high discard survival rates and a chance to survive capture. Should also grant exceptions for shark species that are considered by IUCN as Threatened (Critically Endangered, Endangered or Vulnerable), and Commission should promote release of shark species that are legally protected. • Trawl fisheries with high bycatch of skates and rays should be among the first fisheries subjected to the new discard ban rules. • Should not be reserved for undersized sharks • Fisheries management measures under this field of action should include not only Total Allowable Catches (TACs) and quotas, but size limits (minimum, maximum, and slot) and restrictions on fishing gear, and sharks should be regularly considered as part of the review of technical measures. • Urge precautionary approach, EIAs, and emergency measures • Appropriate to act, but need more measures at MS level • Short term costs will be outweighed by long-term benefits
STECF	• Concern is raised over “unpredictable behaviour” that may result from a discard ban, its enforceability without observers and the impact on post discard mortality.

Field of Action No. 8: Minimize waste and discards from shark catches in accordance with article 7.2.2(g) of the Code of Conduct for Responsible Fisheries requiring the retention of sharks from which fins are removed and encourage the use of dead sharks.

Sector	Some specific comments and concerns
Industry	• Valid for non-EU fleets. But for EU sector there must be careful analysis of the implications of introducing an obligation to land shark fins and carcasses at the same time, as it could have a negative impact on the marketing of sharks, whilst failing to make a positive impact on the goal of conservation • Balance in distribution between Community and RMFO, but measures flawed because 1) different marketing channels and ports of landing for fins and meat, 2) for some species fin ratio needs to be increased • Economic/social impacts would be devastating for EU and developing country fleets, but Asia fleets would avoid enforcement • Environmental impacts limited because would result in discards of fins
Recreational	• Supportive but see no need for 5%
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability • Need research on minimizing bycatch
NGO and others	• 5% proposed is better than current 5% of total body weight but problematic for some species and governments moving away from ratios, and still not warranted/justified • Support same port of landing for fins and carcasses until finning completely prohibited • Urge the Commission to eliminate the derogation that allows shark fins to be removed on board vessels and thereby ensure that all sharks are landed with their fins attached. Commission should facilitate the rapid development of pilot programmes to study and document the practical execution of a fins-attached rule in EU waters. • Appropriate to act, but need more measures at MS level • Negative impacts minimal, positive impacts will be significant
STECF	• Recommends that finning should be eradicated without exception. • Agrees that the current 5% ratio be reviewed and supports the proposal to oblige vessels to land carcases and fins in the same port in order to improve the quality of landing statistics.

Field of Action No. 9: Identify and provide special attention in particular to vulnerable or threatened shark stocks.

Sector	Some specific comments and concerns
Industry	• Appropriateness of Community action would depend on approach • Could be conflict of jurisdiction and hence not properly distributed • Major economic/social impacts because there would be a lack of action and enforcement from RMFOs on Asian fleets
Recreational	• Supportive but could exempt recreational fishers
Advisory	• Need to measures to be carefully tailored to reflect difference in species, and different dependencies on shark by commercial and recreational interests • Need for measures to be adequately researched and agreed, and subject to impact assessment and objective specification, so as to ensure applicability
NGO and others	• Roughly one-third of European shark populations are considered by IUCN (World Conservation Union) to be threatened with extinction. • Commission should clarify that TACs of zero and/or prohibited status are possible options under this field and that measures to protect these species are not limited to bycatch reduction programmes. • Need to clarify that 'season' refers to seasonal closures, not open seasons on threatened species • Recovery plans and implementation of scientific advice for threatened spurdog and porbeagle sharks to be identified in the CPOA as priority actions. • May need emergency measures and some year-round closures • Appropriate to act, but need distribution of measures at MS level, & also suggest international measures should include promotion of complementary protective measures for threatened sharks by not only RFMOs but also various wildlife treaties, including CMS & CITES. • Short term costs will be outweighed by long-term benefits
STECF	• STECF agrees that the proposed bycatch reduction programmes are desirable but should be applied regardless of whether a TAC has been set. • Would consider convening a meeting to expedite providing definitions for each of the IUCN Red List threatened categories and their criteria.

APPENDIX II

Option B: Fields of Action, measures and implementation mechanisms subject to the IA

Field of Action	**Basic Measures**		**Implementation mechanisms and options**
1. Facilitate improved identification and reporting of species-specific catch, landings and market data[27]	EC level	1.1 Increase investment in shark data collection at landing sites and by processing and marketing industries.	Increase the requirements of the DCR to specify shark landings by species. Use of Control regulation *Mandatory*
		1.2 Establish systems to provide verification of catch information by species and by fishery.	As above. Focus should be on strengthening implementation of existing control regulations *Mandatory*
		1.3 At an *initial phase*, mandate full coverage on fishing vessels by independent on-board observers for vessels >24 m and with recent by-catches figures of more than 10- 15% (depending on the particular fishery) of sharks over the total catch. At a *later stage*, once the basic information on the fisheries has been obtained, full coverage could be replaced by a partial coverage, at a level ensuring representative coverage.	Hard: 100% observer coverage for high priority pelagic fisheries[28] that catch more than 10% shark bycatch immediately. *Mandatory*
			Soft: 40% observer coverage for high priority pelagic fisheries that catch more than 10% shark bycatch by 2013. *Mandatory*
		1.4 For other fishing vessels taking sharks as a by-catch, mandate sampling scheme for representative coverage of fishing operations by independent, on-board observers.	Hard: 10% observer coverage of all distant water fleets not covered by Measure 1.3 immediately and pilot-based observer scheme (e.g. *c.* 100 observers) by 2013 on high priority shallow-water fisheries in the NE Atlantic. Refine over time with better landings data from Measure 1.1 and 1.2. *Mandatory*

[27] Fields of Action 1 & 2 merged

[28] See

Field of Action	Basic Measures		Implementation mechanisms and options
			Soft: 10% observer coverage of all distant water fleets not covered by Measure 1.3 by 2013 and pilot-based observer scheme (e.g. *c.* 25 observers) by 2013 on high priority shallow-water fisheries in the NE Atlantic. Refine over time with better landings data from Measure 1.1 and 1.2. *Mandatory*
		1.5 Ensure that all landings and trade of shark fins, meat and oil are recorded separately by commodity and to the species level.	Adapt Reg. 1921/2006 on landings to presentation of shark commodities by species. *Mandatory*
	RFMO level	1.6 Promote the facilitation of improved species-specific catch data and monitoring of shark catches by fishery.	Promote adoption of regulatory measures for shark catches reporting (see Measure 2.6) through binding measures[29] *Mandatory*
		1.7 Improve, in cooperation with FAO and relevant fisheries management bodies, the monitoring and reporting of catch, bycatch, discards, market and international trade data, at the species level where possible.	Financial support to FAO, and contribution to Working Groups and RFMO meetings. *Optional*
		1.8 To organise through FAO and regional fishing management organizations where appropriate, workshops on RPOA as called for in the IPOA–Sharks, by mid-2009 in order to report to the 15th Meeting of the CITES Conference of Parties.	Contribution to Working Groups and RFMO meetings to assist NPOA development. Consider technical and financial assistance through FPAs. NPOA outputs *Optional*
		1.9 Promote the identification and reporting of species-specific biological and trade data.	RFMO alter reporting requirements accordingly through recommendations *Optional*

[29] Note resolutions binding, recommendations do not require obligatory action on the part of contracting parties.

Field of Action	Basic Measures		Implementation mechanisms and options
		1.10 Full coverage on fishing vessels by independent on-board observers for vessels over 24 m fishing in the high seas and with recent by-catches figures of more than 10% to 15% (depending on the particular fishery) of sharks of the total catch and the introduction of sampling schemes for representative coverage of other fishing vessels taking sharks as a by-catch by independent, on-board scientific observers.	Hard: 100% observer coverage for high priority pelagic fisheries[30] that catch more than 10% shark bycatch immediately. *Mandatory*
			Soft: 40% observer coverage for high priority pelagic fisheries that catch more than 10% shark bycatch by 2013. *Mandatory*
	Member State level	1.11 Monitor recreational catches and distinguish between the fishing mortality exerted by recreational and commercial fishing.	Mandatory reporting of recreational seafishing catches of elasmobranchs Studies into mortality following release in both recreational and commercial fisheries *Optional*

Field of Action	Basic Measures		Implementation mechanisms and options
2. Conduct research and compile the necessary information to assess threats to shark populations and protect critical habitats, and implement	EC level	2.1 Enhance programs to facilitate data collection, monitoring and stock assessment on a species-specific level.	Seek specific scientific advice based on MoU with JRC and STEFC through specific requests *Optional*
		2.2 To conduct regular assessment in order to identify threats to shark populations and to determine the fishing mortality by stocks and, if possible, partitioned by fishery[32].	Seek specific scientific advice based on MoU with JRC and STEFC through specific requests *Optional*
		2.3 Identification of space-time boxes in areas where juveniles or spawners are abundant.	Promote specific research programmes through the 7th Framework Programme (2007-2013).
		2.4 Study biology and ecology of sharks.	Seek scientific advice based on MoU with JRC and STEFC through

[30] See

Field of Action	Basic Measures		Implementation mechanisms and options
sustainable and rational harvesting strategies [31]		2.5 Develop prototypes, monitor experiments and propose measures for improving size selectivity and for reducing unwanted by-catch and discarding of no commercial species	specific requests. Link to Measure 4.8 *Optional*
	RFMO level	2.6 Foster enhanced programs to facilitate data collection, monitoring and stock assessment on a species-specific level.	Promote adoption of regulatory measures for shark catches reporting (see Measure 1.6) plus additional stock assessment work commissioned *Optional*
		2.7 Foster implementation of internationally coordinated studies on straddling and/or shared stocks.	Contribution to Working Groups and RFMO meetings. Finance provided to studies. *Optional*
	Member State level	2.8 Develop national expertise	Promote uptake of courses, facilitate exchange and mobility of researchers through funding available under FP7 *Optional*
3. Improve stakeholder awareness and consultation processes	EC level	3.1 Facilitate stakeholder awareness and consultation regarding shark management and best practices to reduce unwanted by-catch through RAC programs.	Solicit inclusion of shark management issues on agenda of RACs *Optional*
		3.2 Direct Member States to allow public access to relevant fishing permit information on sharks.	Establish internet-based resources either on Europa website or via independent provider, but respecting issues of individual vessel / owner confidentiality *Optional*

[31] Fields of Action 3 & 4 merged

[32] Includes measure for vulnerable or threatened species from original Field of Action 7

Field of Action	Basic Measures		Implementation mechanisms and options
	RFMO level	3.3 Foster stakeholder awareness and consultation regarding shark management and best practices to reduce unwanted by-catch through programs promoted by RFMO and international fishermen associations.	Develop and disseminate a code of conduct (or equivalent) for tuna and swordfish-directed fisheries to reduce bycatch and improve post-discard survival. *Optional*
	Member State level	3.4 Launch educational programs aimed specifically at educating fishermen and the public about shark and ray conservation programs and restrictions.	Promote specific programmes with financial support of EFF or through NGOs *Optional*

Field of Action	Basic Measures		Implementation mechanisms and options
4. Adjust fishing effort and catches to the available resources[33]	EC level	4.1 Limitation or prohibition of fishing activities in areas that are considered sensitive to endangered stocks.	New regulation. Link to Measure 2.3 *Mandatory*
		4.2 Stronger limitation of fishing effort by relevant fisheries.	As for Measure 4.1 (new effort regulation) *Mandatory*
	RFMO level	4.3 Foster programmes and analysis to adjust fishing effort at international level.	Active contribution to Working Groups and RFMO meetings to develop resolutions to limit shark-related effort. Similar to Measure 3.3 *Mandatory*
	Both EC and RFMO	4.4 Establish catch limits by stocks in conformity with the advice provided by ICES and by the relevant RFMOs.	Hard: Immediate imposition of TACs and other management measures as recommended by ICES and by the relevant RFMOs *Mandatory*

[33] Fields of Action 6 and 7 merged

Field of Action	Basic Measures		Implementation mechanisms and options
	levels		Soft: Imposition of TACs and other management measures as recommended by ICES and by the relevant RFMOs, to be phased in by 2013 *Mandatory*
		4.5 Prohibit all shark discards and require that all catches (including by-catches) are landed. Unwanted by-catches of sharks that have a chance to survive must be released back into the water.	Provide derogations for species with high post-discard survivability e.g. some ray species (i.e. link to Measure 1.10) Propose discard ban at RFMO level. Provide derogations for species with high post-discard survivability e.g. blue shark *Mandatory*
		4.6 Increase size and species selectivity in order to reduce discards of undersize and unwanted by-catch.	Develop joint research programmes that would test different gear options.Possible maximum size limits to conserve large breeding females. *Mandatory (after 2010)*
		4.7 Establish bycatch reduction programs for shark species considered Critically Endangered or Endangered by IUCN, where a zero TAC or prohibited status is not in force for these species.	Dedicated working groups on shark fisheries that would analyse data available and make management recommendations to the Plenary. *Voluntary.*
		4.8 Establishment of space-time boxes in areas where juveniles or spawners are abundant, esp. For vulnerable or threatened species.	Link to Measure 2.3. *Voluntary*
		4.9 Within the framework of the ongoing evaluation of the Common Market Organisation in fishery and aquaculture products, the Commission will examine the possible impact of market mechanisms on conservation measures, including for shark species.	Funds for studies (FP7), and EFF funding towards the certification e.g. MSC or other responsible fishing scheme, of 'well managed' and sustainable fisheries where shark bycatch is an issue. *Voluntary*

Field of Action	Basic Measures		Implementation mechanisms and options
5. Minimize wastes and discards from sharks	Both EC and RFMO levels	5.1 To ban finning practices as the general rule. Any exception to this general rule will have to be fully justified on solid and objective grounds and documented prior to the issuing by the Member State of the special permit. Member States should not issue special permits to vessels not having fulfilled this condition.	Provide sufficient level of justification for derogations. *Mandatory*
		5.2 To review the 5% rule by requiring that in no case shall the weight of the fins exceed 5% of the dressed (gutted and beheaded) carcass weight of the shark catch. However, Member States having set up and implemented data collection programmes proving that this percentage could be increased in certain cases, could do so up to a percentage corresponding to 5% of the live weight of the shark catch.	Have this issue included in the Terms of Reference of the scientific working groups, and then revise Regulation No. 1185/2003. *Mandatory*
		5.3 For vessels of Member States having been exempted from the obligation of landing of sharks with fins attached, introduce the obligation to land shark fins and carcases at the same time in the same port.	Amendment of Reg. 1185/2003. To date 5 German, 198 Spanish and 20 UK vessels have obtained this derogation. *Mandatory*

APPENDIX III

ADMINISTRATIVE AND MANAGEMENT COSTS

As **Option A** relates to the *status quo*, no net change to administrative costs is anticipated.

For **Option B** a three-phase process was undertaken in line with the guidance.

Option C was then assessed to determine any differences in administration costs compared with those estimated for option B.

1. ADMINISTRATION COSTS OF OPTION B

Phase 1 Preparatory Analysis

Those incurring administration costs as a result of the measures (the target groups) are identified as DG MARE, Regional Fisheries Management Organization (RFMO) secretariats, Regional Advisory Council (RAC) secretariats and Member State fishery departments. In the private sector target groups identified are owners of over 10m vessels and fish merchants/wholesalers.

The following assessment has been made in relation to identification of information obligations, required actions and target groups for the proposed fields of action:

Field of Action 1: Facilitate improved identification and reporting of species-specific catch, landings and market data

The proposed measure requiring catch and commodity reporting to species level has a recurrent administrative cost for vessel owners, merchants and Member State fishery departments due to the required adjustment of existing regular reporting practices. Monthly reporting by vessel owners and merchants is assumed, with amendments to the annual submission of the DCR for member state fishery departments.

The main costs for observer programmes such as observer wages, deployment, support structure, training etc. are included in the main Impact Assessment and not within this assessment of administration costs.

Observer programmes result in additional administrative costs to fishery departments due to additional data collection and reporting from on board inspection, but not to fishing vessels as it is the observer rather than vessel owners required to report this data.

Co-ordination with FAO and RFMOs primarily results in administrative costs for RFMO secretariats through incorporating additional meetings, workshops and agenda items, along with additional financial management with EC support for these activities.

The reporting of recreational elasmobranch catches will result in additional regulatory costs from the collation and reporting of that data. The significant costs associated with producing such data are included in the main Impact Assessment.

Field of Action 2: Conduct research and compile the necessary information

The main administrative costs relate to those incurred by DG MARE in establishing and managing additional information requests on elasmobranchs including the development of research programmes.

RFMOs will incur additional administrative costs through commissioning new research and stock assessments for elasmobranch fisheries.

Member state fishery departments will incur administration costs through efforts to develop national expertise.

Field of Action 3: Improve stakeholder awareness and consultation processes

Regional Advisory Councils (RACs) will incur additional administrative costs through expanding their current scope of works to more explicitly include elasmobranch issues, specifically in their reporting to the EC.

DG MARE will incur additional costs through the design of information material and RFMOs will incur some cost associated with dissemination of material to and subsequent consultation with stakeholders.

Member states should incur no additional administrative costs associated with proposed measures under this field of action as required actions would be supported through EFF project funding.

Field of Action 4 - Adjust fishing effort and catches to the available resources

Administration costs are primarily associated with one off costs to ensure familiarization with the proposed new regulation. These would be incurred by DG MARE and RFMO secretariats.

The development of research programmes and dedicated working groups would result in recurring additional meeting and reporting requirements for RFMO secretariats.

Field of Action 5 - Minimize wastes and discards from sharks

In relation to banning finning practices and the landing of shark carcases at the same time as shark parts, fishing vessel owners and member state fishery departments will incur additional administration costs in the application for derogation or exemption. The precise details of such as measure would determine the extent of likely applications for exemptions and their frequency (i.e. one-off or annual licences).

One-off costs would be incurred by all member state fishery departments associated with informing vessels of the new regulations and by vessel operators familiarizing themselves with the new regulations.

In relation to step 3 of the administration cost assessment process, the regulatory origin is identified as being 100% from the EU.

1.1. Phase 2: Data capture and standardization

This section examines the incremental administrative costs that would be incurred as a result from new legislation being promulgated directly as a result of the CPOA. These administrative costs are defined as "the costs incurred by enterprises, the voluntary sector, public authorities and citizens in meeting legal obligations to provide information on their action or production, either to public authorities or to private parties" (EC Impact Assessment Guidelines, Sept 2006 update). Implementation costs – be they management or research costs – are considered separately.

The following data was used as the basis for calculations:

Hourly tariff

Eurostat data on EU 27 labour costs (excluding apprentices) per employee per hour were collated using the following categories to distinguish costs for target groups:

Labour costs for the private sector (fishing vessel owners and merchants) were based on category G51 (wholesale trade and commission trade). It was assumed that fishing vessel reporting associated with larger vessels would be undertaken by vessel agents or owner/operators and therefore the service category was more appropriate than the lower wage levels recorded for those engaged in fishing, which includes the inshore/artisanal sectors.

Labour costs for the public sector (member state fishery departments, RFMO secretariats and RAC secretariats) were based on category L (public administration)

Labour costs for DG MARE were based on category L (public administration) for Belgium.

Labour costs data were from 2004. To bring these up to date an annual inflation rate of 2.3% was applied based on the Harmonised Indices of Consumer Prices (HICPs) for EU27.

A 25% overhead figure was applied across all groups to derive the following hourly tariffs: private sector: €29.23/hour; public sector €26.51/hour; DG MARE €45.17/hour.

Time

The number of hours spent on a specific action is estimated based on expert assessment. For initial recording catches to species level an additional 0.5 hours is assumed for the catching sector and 0.25 hours for merchants for more extensive recording of shark and ray species. This reporting is assumed to simply be an extension to catch reporting on a per landing basis for the catching sector and a monthly basis for the merchanting sector.

More significant time costs are assumed for member state fishery departments however this would amount to additional collation and reporting for the annual submission of the DCR.

Significant one-off administration costs are assumed for RFMO secretariats in setting up meetings and adopting resulting changes in reporting procedures. Recurrent annual costs for member states are identified for the reporting of recreational elasmobranchs, which is not a current requirement.

The administration costs associated with the establishment and reporting of new working groups are assumed to be 2 weeks initial set-up plus 3 days preparation and 3 days reporting for 2 working groups per year.

Equipment costs

No additional equipment costs are expected as a result of the proposed measures.

Frequency of Actions

As proposed in the guidelines, one-off costs are distinguished from annual costs by '*1'* being in italics in the reporting sheet, Table below.

Private sector reporting for the merchanting sector was assumed to be on a monthly basis, while for the catching sector this was assumed to be on a per landing basis. Frequency of landings (44) was estimated based on an average 5 day trip length over 220 working days.

The additional administration costs for Member State fishery departments associated with inspections relate to daily reporting for the number of vessels requiring observer coverage (247) and the average number of working days (220). For the observer programme associated with a sample of vessels operating in other distant water fleets, an estimate of 500 observers has been made.

Number of entities

The number of >10m vessels was derived from data within the EC Fleet Register (http://ec.europa.eu/fisheries/fleet/index.cfm) for all gear types (21,196) excluding those with no potential for elasmobranch catch such as pots, traps, dredges, purse seines, etc. (5,227) to give a total of 15,969.

The number of fish merchant enterprises in EU27 (43,000) was derived from Eurostat data (NACE) for the number of enterprises under the category 'Wholesale of other food including fish, crustaceans and molluscs' for 2005.

The number of RFMO secretariats (13) relates to the marine RFMOs where EU vessels may operate, namely: APFC, CCAMLR, CCSBT, CECAF, GFCM, IATTC, ICCAT, NEAFC, NAFO, SEAFO, SWIOFC, WECAFC, and WCPFC.

There are currently seven RACs, each of relevance to the proposed measures: Baltic, Mediterranean, North Sea, NW Waters, SW Waters, Pelagic Stocks and Distant Waters.

The number of fishing vessels seeking derogation from proposed regulations is based on the number of vessels currently receiving derogation (223) and the different member state departments associated with those vessels (3).

1.2. Phase 3: Calculation and reporting

Table 15: Summary administration costs per field of action and target group (Option B)

Field of Action	Target group	Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	% of total cost
FOA 1	>10m fishing vessel owners	€ 15	44	15 969	702 636	€10 269 025	55%
	fish merchants and traders	7 €	12	43 000	516 000	€3 770 670	20%
	M.S. fishery departments	€2 558	458	936	164 826	€4 463 661	24%
	RFMO secretariats	€822	3	39	39	€10 684	0%
	Sub-total	***€3 402***	***517***	***59 944***	***1 383 501***	***€18 514 040***	***99%***
FOA 2	DG MARE	€2 936	4	4	4	€2 936	0.0%
	RFMO secretariats	€265	1	13	13	€3 446	0.0%
	M.S. fishery departments	€ 530	1	27	27	€14 315	0.1%
	Sub-total	***€ 3 731***	***6***	***44***	***44***	***€20 698***	***0.1%***
FOA 3	RAC secretariats	€ 265	1	7	7	€1 856	0.0%
	DG MARE	€ 6 776	1	1	1	€6 776	0.0%
	RFMO secretariats	€ 1 988	1	13	13	€25 847	0.1%
	Sub-total	***€ 9 029***	***3***	***21***	***21***	***€34 478***	***0.2%***
FOA 4	DG MARE	€ 28 796	4	4	4	€28 796	0.2%
	RFMO secretariats	€ 7 595	5	65	65	€98 736	0.5%
	Sub-total	***€ 36 391***	***9***	***69***	***69***	***€127 532***	***0.7%***
FOA 5	M.S. fishery departments	€ 1 683	3	57	57	€39 089	0.2%
	fishing vessel owners	€ 205	2	446	446	€45 628	0.2%
	Sub-total	***€ 1 888***	***5***	***503***	***503***	***€84 717***	***0.5%***
Total for all fields of action		**€54,441**	**540**	**60 581**	**1 384 138**	**€18 781 465**	**100%**

Table 16: Report sheet for administrative costs associated with Shark management measures - Option B

Community Plan of Action for the Conservation and Management of Sharks						**Tariff (€ per hour)**		**Time (hour)**		**Price (per action)**	**Freq (per year)**	**No. of entities**	**Total no. of actions**	**Total cost**	**Regulatory origin (%)**			
No.	FOA	Orig. Art.	Type of obligation	Description of required action(s)	Target group	i	e	i	e						Int	EU	Nat	Reg
1	1.1		Submission of (recurring) reports	Adjusting existing data	>10m fishing vessel owners	29		0.50		14.6	44.00	15 969	702 636	10 269 025		100%		
2	1.1		Submission of (recurring) reports	Adjusting existing data	fish merchants and traders	29		0.25		7.3	12.00	43 000	516 000	3 770 670		100%		
3	1,1		Submission of (recurring) reports	Adjusting existing data	MS fishery departments	27		5.00		132.6	1.00	27	27	3 579		100%		
4	1.3		Inspection	Filling forms and tables	MS fishery departments	27		1.00		26.5	220.00	247	54 340	1 440 553		100%		
5	1.3		Inspection	Producing new data	MS fishery departments	27		10.0		265.1	1.00	27	27	7 158		100%		
6	1.3		Inspection	Submitting the information	MS fishery departments	27		0.50		13.3	1.00	27	27	358		100%		
7	1.4		Inspection	Filling forms and tables	MS fishery departments	27		1.00		26.5	220.00	500	110 000	2 916 100		100%		
8	1.4		Inspection	Producing new data	MS fishery departments	27		10.0		265.1	1.00	27	27	7 158		100%		

Community Plan of Action for the Conservation and Management of Sharks						Tariff (€ per hour)		Time (hour)		Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	Regulatory origin (%)			
9	1.5		Submission of (recurring) reports	Adjusting existing data	MS fishery departments	27		5.00		132.6	12.00	27	324	42 946		100%		
10	1.6		Notification of (specific) activities	Familiarising with the information obligation	RFMO secretariats	27		3.00		79.5	*1.00*	13	13	1 034		100%		
11	1.7		Application for subsidy or grant	Filling forms and tables	RFMO secretariats	27		4.00		106.0	*1.00*	13	13	1 379		100%		
12	1.8		Other	Holding meetings	RFMO secretariats	27		24.0		636.2	*1.00*	13	13	8 271		100%		
13	1.9		Submission of (recurring) reports	Adjusting existing data	MS fishery departments	27		24.0		636.2	*1.00*	27	27	17 178		100%		
14	1.10		Submission of (recurring) reports	Producing new data	MS fishery departments	27		40.0		1 060.4	1.00	27	27	28 631		100%		
15	2.1		Notification of (specific) activities	Familiarising with the information obligation	DG MARE	45		10.0		451.7	*1.00*	1	1	452		100%		
16	2.2		Notification of (specific) activities	Familiarising with the information obligation	DG MARE	45		10.0		451.7	*1.00*	1	1	452		100%		
17	2.3		Non-labelling information for	Designing information material	DG MARE	45		40.0		1 806.8	*1.00*	1	1	1 807		100%		

Community Plan of Action for the Conservation and Management of Sharks						Tariff (€ per hour)		Time (hour)		Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	Regulatory origin (%)			
			third parties															
18	2.6		Notification of (specific) activities	Familiarising with the information obligation	RFMO secretariats	27		10.0		265.1	*1.00*	13	13	3 446		100%		
19	2.7		Application for subsidy or grant	Filling forms and tables	DG MARE	45		5.0		225.9	1.00	1	1	226		100%		
20	2.8		Other	Designing information material	MS fishery departments	27		20.0		530.2	1.00	27	27	14 315		100%		
21	3.1		Submission of (recurring) reports	Adjusting existing data	RAC secretariats	27		10.0		265.1	1.00	7	7	1 856		100%		
22	3.2		Non-labelling information for third parties	Designing information material	DG MARE	45		150.0		6 775.5	*1.00*	1	1	6 776		100%		
23	3.3		Non-labelling information for third parties	Copying (reproducing reports, labels or leaflets)	RFMO secretariats	27		75.0		1 988.3	*1.00*	13	13	25 847		100%		
24	4.1		Notification of (specific) activities	Designing information material (leaflet conception)	DG MARE	45		225.0		10 163.3	*1.00*	1	1	10 163		100%		
25	4.2		Notification of (specific)	Designing information material	DG MARE	45		225.0		10 163.3	*1.00*	1	1	10 163		100%		

Community Plan of Action for the Conservation and Management of Sharks						Tariff (€ per hour)		Time (hour)		Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	Regulatory origin (%)			
			activities	(leaflet conception)														
26	4.3		Non-labelling information for third parties	Designing information material	RFMO secretariats	27		75.0		1 988.3	*1.00*	13	13	25 847		100%		
27	4.4		Notification of (specific) activities	Designing information material	DG MARE	45		75.0		3 387.8	1.00	1	1	3 388		100%		
28	4.6		Notification of (specific) activities	Designing information material	DG MARE	45		112.5		5 081.6	*1.00*	1	1	5 082				
29	4.6		Notification of (specific) activities	Familiarising with the information obligation	RFMO secretariats	27		37.5		994.1	*1.00*	13	13	12 924		100%		
30	4.7		Submission of (recurring) reports	Holding meetings	RFMO secretariats	27		120.0		3 181.2	1.00	13	13	41 356		100%		
31	4.7		Submission of (recurring) reports	Producing new data	RFMO secretariats	27		48.0		1 272.5	1.00	13	13	16 542		100%		
32	4.7		Submission of (recurring) reports	Submitting the information	RFMO secretariats	27		6.0		159.1	1.00	13	13	2 068		100%		
33	5.1		Application for general	Filling forms and	MS fishery departments	27		37.5		994.1	*1.00*	27	27	26 841		100%		

Community Plan of Action for the Conservation and Management of Sharks						Tariff (€ per hour)		Time (hour)		Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	Regulatory origin (%)			
			authorisation or exemption	tables														
34	5.1		Application for general authorisation or exemption	Filling forms and tables	fishing vessel owners	29		5.0		146.2	*1.00*	223	223	32 591		100%		
35	5.2		Application for general authorisation or exemption	Filling forms and tables	MS fishery departments	27		10.0		265.1	1.00	3	3	795		100%		
36	5.3		Notification of (specific) activities	Designing information material	MS fishery departments	27		16.0		424.2	*1.00*	27	27	11 452		100%		
37	5.3		Notification of (specific) activities	Familiarising with the information obligation	fishing vessel owners	29		2.0		58.5	*1.00*	223	223	13 037		100%		

Total administrative costs (€) 18 781 465

2. ADMINISTRATION COSTS OF OPTION C

Option C was assessed in relation to the individual elements of the Option B assessment with the same assumptions adopted (see 1). In administrative terms the ban on high and medium priority fisheries should result in similar costs for familiarisation with the new regulation, but would save administration costs associated with:

Observer schemes for high and medium priority fisheries

(estimated to amount to €1 448 069)

Applications for exemptions from finning and landing requirements

(estimated to amount to €84 717)

It is assumed that all other measures discussed under option B, including the observer schemes associated with fisheries where shark is taken as by-catch, are retained.

The above saving results in administration costs estimated to total €17 248 679 for Option C, as illustrated in Table 17 overleaf.

Table 17: Report sheet for administrative costs associated with Shark management measures - Option C

Community Plan of Action for the Conservation and Management of Sharks						**Tariff (€ per hour)**		**Time (hour)**		**Price (per action)**	**Freq (per year)**	**No. of entities**	**Total no. of actions**	**Total cost**	**Regulatory origin (%)**			
No.	FOA	Orig. Art.	Type of obligation	Description of required action(s)	Target group	i	e	i	e						Int	EU	Nat	Reg
1	1.1		Submission of (recurring) reports	Adjusting existing data	>10m fishing vessel owners	29		0.50		14.6	44.00	15 969	702 636	10 269 025		100%		
2	1.1		Submission of (recurring) reports	Adjusting existing data	fish merchants and traders	29		0.25		7.3	12.00	43 000	516 000	3 770 670		100%		
3	1,1		Submission of (recurring) reports	Adjusting existing data	member state fishery departments	27		5.00		132.6	1.00	27	27	3 579		100%		
4	1.4		Inspection	Filling forms and tables	member state fishery departments	27		1.00		26.5	220.00	500	110 000	2 916 100		100%		
5	1.4		Inspection	Producing new data	member state fishery departments	27		10.0		265.1	1.00	27	27	7 158		100%		
6	1.5		Submission of (recurring) reports	Adjusting existing data	member state fishery departments	27		5.00		132.6	12.00	27	324	42 946		100%		
7	1.6		Notification of (specific) activities	Familiarising with the information obligation	RFMO secretariats	27		3.00		79.5	*1.00*	13	13	1 034		100%		
8	1.7		Application for subsidy or grant	Filling forms and tables	RFMO secretariats	27		4.00		106.0	*1.00*	13	13	1 379		100%		
9	1.8		Other	Holding meetings	RFMO secretariats	27		24.0		636.2	*1.00*	13	13	8 271		100%		
10	1.9		Submission of	Adjusting existing	member state fishery	27		24.0		636.2	*1.00*	27	27	17 178		100%		

Community Plan of Action for the Conservation and Management of Sharks						Tariff (€ per hour)		Time (hour)		Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	Regulatory origin (%)			
			(recurring) reports	data	departments													
11	1.10		Submission of (recurring) reports	Producing new data	member state fishery departments	27		40.0		1 060.4	1.00	27	27	28 631		100%		
12	2.1		Notification of (specific) activities	Familiarising with the information obligation	DG MARE	45		10.0		451.7	*1.00*	1	1	452		100%		
13	2.2		Notification of (specific) activities	Familiarising with the information obligation	DG MARE	45		10.0		451.7	*1.00*	1	1	452		100%		
14	2.3		Non-labelling information for third parties	Designing information material	DG MARE	45		40.0		1 806.8	*1.00*	1	1	1 807		100%		
15	2.6		Notification of (specific) activities	Familiarising with the information obligation	RFMO secretariats	27		10.0		265.1	*1.00*	13	13	3 446		100%		
16	2.7		Application for subsidy or grant	Filling forms and tables	DG MARE	45		5.00		225.9	1.00	1	1	226		100%		
17	2.8		Other	Designing information material	member state fishery departments	27		20.0		530.2	1.00	27	27	14 315		100%		
18	3.1		Submission of (recurring) reports	Adjusting existing data	RAC secretariats	27		10.0		265.1	1.00	7	7	1 856		100%		
19	3.2		Non-labelling information for third parties	Designing information material	DG MARE	45		150.		6 775.5	*1.00*	1	1	6 776		100%		

Community Plan of Action for the Conservation and Management of Sharks						Tariff (€ per hour)		Time (hour)		Price (per action)	Freq (per year)	No. of entities	Total no. of actions	Total cost	Regulatory origin (%)			
20	3.3		Non-labelling information for third parties	Copying	RFMO secretariats	27		75.0		1 988.3	*1.00*	13	13	25 847		100%		
21	4.1		Notification of (specific) activities	Designing information material	DG MARE	45		225		10 163.3	*1.00*	1	1	10 163		100%		
22	4.2		Notification of (specific) activities	Designing information material	DG MARE	45		225		10 163.3	*1.00*	1	1	10 163		100%		
23	4.3		Non-labelling information for third parties	Designing information material	RFMO secretariats	27		75.0		1 988.3	*1.00*	13	13	25 847		100%		
24	4.4		Notification of (specific) activities	Designing information material	DG MARE	45		75.0		3 387.8	1.00	1	1	3 388		100%		
25	4.6		Notification of (specific) activities	Designing information material	DG MARE	45		112.5		5 081.6	*1.00*	1	1	5 082				
26	4.6		Notification of (specific) activities	Familiarising with the information obligation	RFMO secretariats	27		37.50		994.1	*1.00*	13	13	12 924		100%		
27	4.7		Submission of (recurring) reports	Holding meetings	RFMO secretariats	27		120		3 181.2	1.00	13	13	41 356		100%		
28	4.7		Submission of (recurring) reports	Producing new data	RFMO secretariats	27		48.0		1 272.5	1.00	13	13	16 542		100%		
29	4.7		Submission of (recurring) reports	Submitting the information	RFMO secretariats	27		6.0		159.1	1.00	13	13	2 068		100%		

Total administrative costs (€) 17 248 679

3. MANAGEMENT COSTS (OPTION B and C)

Only under measures 1.3 and 1.4 will have direct and significant cost implications. According to Article 11 of Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy[34] and Article 16 of Council Regulation (EC) No 861/2006 of 22 May 2006 establishing Community financial measures for the implementation of the common fisheries policy and in the area of the Law of the Sea[35], 50% of these costs will be covered by the EC and 50% by the Member States.

In assessing the magnitude of observer costs on EU vessels (measures 1.3 and 1.4), for the purpose of this assessment an average of Euro 125/day is estimated per observer[36]. For measure 1.3, there is a 'hard' and a 'soft' option. For the hard option, measure 1.3 would involve 100% observer coverage on all longline vessels in the Central and Southern Atlantic, Indian Ocean and Pacific (except the 33 small French longliners in the Indian Ocean)[37]. This coverage would start immediately and continue thereafter for a period until full coverage could be replaced by partial coverage. 247 vessels would thus be involved in the short- to medium term. Taking an average of 300 days of fishing a year, total observer costs are estimated at Euro 9.26 million per year. In the longer term a partial 40% observer coverage (typically considered sufficient in many fisheries) would reduce annual costs to Euro 3.7 million. For the soft option of measure 1.3, annual costs would be Euro 3.7 million from 2013 onwards. These two levels of observer coverage is also expected to be extended to the non-EU vessels through RFMO actions in Measure 1.10, although this does not have any direct costs to the EU.

For measure 1.4 hard and soft options are also envisaged. Both would involve the pelagic and pole and line vessels not covered under measure 1.3 along with the 33 smaller French longliners in the Indian Ocean and all distant water purse seiners. Total vessel numbers involved would thus be 102. The hard option would involve immediate costs of Euro 382 500 per year for the EU fleets in the central and Southern Atlantic, Indian Ocean and the Pacific. The hard option for measure 1.4 also envisages a pilot observer scheme of 100 observers in the NE Atlantic to collect data on shallow water high risk fisheries. These observers would be deployed on a rotating basis between high risk fisheries. This would involve immediate costs of Euro 4.56 million per year. The soft often would result in similar costs of Euro 382 500 per year for the pelagic shark fleet, but only beginning in 2013. While costs for a reduced observer scheme of 25 observers for the NE Atlantic from 2013 would result in annual costs thereafter of Euro 1.14 million.

It is also important to remember that, while not costed as part of this CPOA, observer coverage on EU longline vessels should be completed by similar levels of observer coverage on vessels from *third countries* e.g. Asian vessels. Given that the EC might decide to act with regards to its distant water fleet (to demonstrate best practice) with no guarantee that other

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34 O.J. L 060, 05/03/2008

35 O.J. L 160, 14/06/2006

36 Based on a range of observer costs in other fisheries

37 Shark bycatches in purse seine fisheries are generally thought to be well below 10%, except for some specific temporal/spatial fishing on FADs

countries will do the same given that vessels from third countries are not directly responsible to the EC, the *likelihood* and *magnitude* of observer costs being incurred by third countries and RFMOs (Measure 1.10) are less certain and not quantifiable.

Table 18: Management costs for measures 1.3 and 1.4

Options	***1.3* Measure**		***1.4 M*easure**		***TOTAL***	
	Year 1	***Year 5***	***Year 1***	***Year 5***	***Year 1***	***Year 5***
HARD	**9.26 M€** 247 > 24 m vessels; 300 days; 125€/day.	**3.7 M€** 40%	**4.56 M€** 102 LD vessels; 100 SW observers	**1.52 M€** Only SW vessels	**13.82 M€**	**5.22 M€**
SOFT	**2.94 M€** 30%	**3.7 M€** 40%	**1.14 M€** 25 observers	**1.52 M€** **(**0.382 M€ LD vessels + 1.14 M€ 25 observers)	**4.08 M€**	**5.22 M€**

LD: Long distance fleet.

SW: Shallow water fleet.

Table 19: Summary of management (implementation) and administrative costs

Field of Action		OPTION B ANNUAL COSTS				OPTION C ANNUAL COSTS			
		Hard option		Soft option		Hard option		Soft option	
		Year 1	Year 5	Year 1	Year 5	Year 1	Year 5	Year 1	Year 5
FoA 1	Management	13 820 000	5 220 000	4 082 500	5 222 500	13 820 000	5 220 000	4 082 500	5 222 500
	Administration	18 514 040	18 486 178	18 514 040	18 486 178	17 065 971	17 038 109	17 065 971	17 038 109
	Sub-total	***32 334 040***	***23 706 178***	***22 596 540***	***23 708 678***	***30 885 971***	***22 258 109***	***21 148 471***	***22 260 609***
FoA 2	Management	na	na	na	na	na	na	na	na
	Administration	20 698	14 541	20 698	14 541	20 698	14 541	20 698	14 541
	Sub-total	***20 698***	***14 541***	***20 698***	***14 541***	***20 698***	***14 541***	***20 698***	***14 541***
FoA 3	Management	na	na	na	na	na	na	na	na
	Administration	34 478	1 856	34 478	1 856	34 478	1 856	34 478	1 856
	Sub-total	***34 478***	***1 856***	***34 478***	***1 856***	***34 478***	***1 856***	***34 478***	***1 856***
FoA 4	Management	na	na	na	na	na	na	na	na
	Administration	127 532	63 353	127 532	63 353	127 532	63 353	127 532	63 353
	Sub-total	***127 532***	***63 353***	***127 532***	***63 353***	***127 532***	***63 353***	***127 532***	***63 353***
FoA 5	Management	na	na	na	na	na	na	na	na
	Administration	84 717	795	84 717	795	-	-	-	-
	Sub-total	***84 717***	***795***	***84 717***	***795***	**-**	**-**	**-**	**-**
Management		**13,820,000**	**5 220 000**	**13 820 000**	**5 220 000**	**13 820 000**	**5 220 000**	**13 820 000**	**5 220 000**
Administration		**18,514,040**	**18 486 178**	**18 514 040**	**18 486 178**	**17 065 971**	**17 038 109**	**17 065 971**	**17 038 109**
Total		**32,601,465**	**23 786 723**	**22 863 965**	**23 789 223**	**31 068 679**	**22 337 859**	**21 331 179**	**22 340 359**

4. MANAGEMENT AND ADMINISTRATION COST ESTIMATES

Table 19 overleaf summarises the various costs that can be been quantified for each option under each Field of Action. The table collates the management and monitoring costs, and the administrative costs above. Option B results in marginally higher overall costs compared to Option C with the hard options both totalling just over €30m in the first year, decreasing to annual costs of approximately €23m in Year 5.

For the hard option, the reduction in costs over time is evident due to two factors:

Monitoring and management is proposed to change by 2013 including reduced levels of observer coverage which results in cost savings.

Some administration costs are one-off costs only incurred in year 1

The soft option with a lower proportional observer coverage from Year 1 amounts to approximately €22m. This increases by Year 5 as the existing lower level of observer coverage continues (in line with the hard option) plus additional observer programmes come on stream for other fisheries by 2013.

Management and monitoring costs and administrative costs are predominantly associated with Field of Action 1 as this relates to increased reporting and observer schemes, while other fields of action relate to research, awareness raising and co-ordination. It is not possible to quantify the direct economic costs of these as they are dependent upon allocated budgets, but some increase in administrative costs resulting from meetings and reporting requirements are assumed.

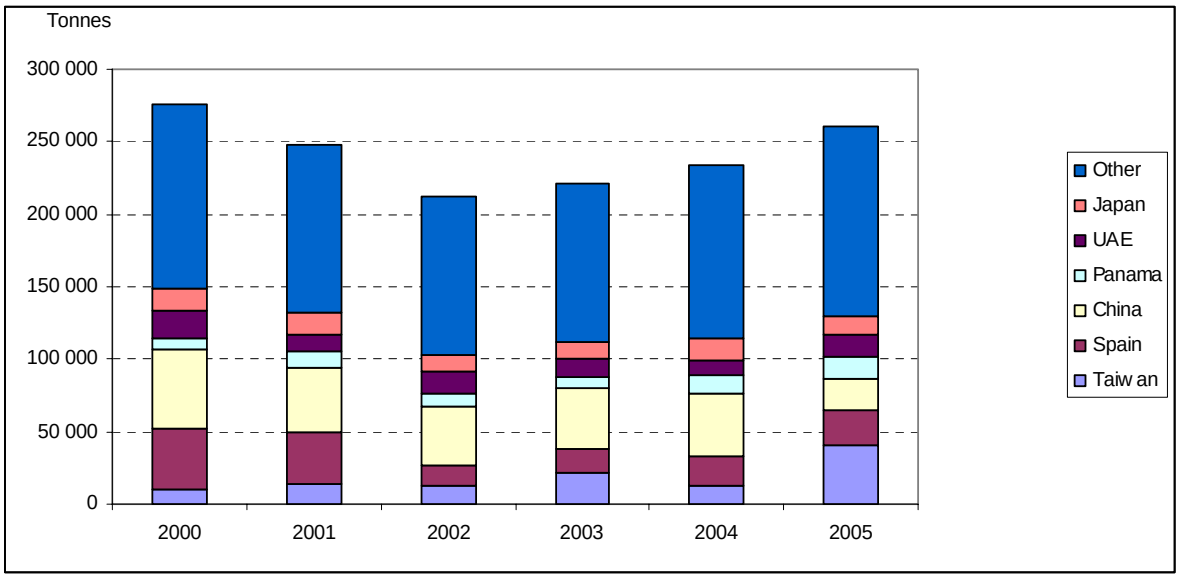
Management and monitoring costs are the same for both Option B and Option C, while the stricter but simpler Option C does create some small savings in administrative costs.

APPENDIX IV

Markets and trade in sharks and shark products

According to Globefish (2008), the largest exporters of sharks are Taiwan, China, Japan, Spain, Panama and the United Arab Emirates (see figure below). Products include fins, meat, and other shark products such as liver oil, skins and cartilage. Spain represents approximately 11% of total world trade of sharks products in value over the last 6 years (2000-2005). At the same time, Spain and Italy are significant importers of shark species (15 000 t and 10 000 t respectively) suggesting that there is a domestic market that is insufficiently supplied by national fleets. The development of markets for shark products is demonstrated by catches from the deepwater Atlantic fishery; initially only the sharks' livers were landed, but a limited market for fresh shark developed for fish caught in the last days of a trip. Gradually the meat of the fish has become the main product and since 1999 deepwater sharks have been landed for human consumption of the meat, initially into the French market and more recently as frozen siki 'backs' into the Spanish market.

Exports (in Million USD) of sharks by countries.



The demand for and the value and volume of shark products in trade have increased considerably over the past 15 years and continue to rise. However, membership of China to WTO appears to have decreased the volume traded. Estimates of the total number of sharks traded annually worldwide range from 26–73 million/year with an overall median of 38 million/year. The shark biomass represented by the global fin trade is estimated to lie between 1.21 and 2.29 million t/year with a median of 1.70 million t/year. This is some three to four times higher than indicated by FAO's landings data, and does not include sharks that are discarded at sea or that are wholly processed and utilised domestically (for example those taken by the Japanese and Taiwanese fleets). (Clarke, S.C. 2008).

According to the Marine Resource Economics (Clark 2007), although Hong Kong has long been the world's largest shark fin trading center, handling shark fin trading activity has shifted from centralized channels in Hong Kong to a diversified Mainland China network. Today, shark fin is available in most, if not all, major cities in China, and with population growth between 2000 and 2005 of 9.5 million persons per year, a large number of consumers are

sampling shark fin for the first time. While traders insist that the shark fin market is driven by demand in Mainland China, due to statistical problems involving combining frozen shark fins (a significant portion of the market) with frozen shark meat in the Mainland customs data, it is not possible to accurately track trade levels in recent years. However, it appears that the trend in the Mainland fin trade is downward since 2000 (Clarke 2008). After increasing at a rate of 6% per annum, shark fin imports to Hong Kong have also declined since 2000. This trend is matched by an observed decline in global shark catches since 2000 based on FAO capture production data. It is not known whether these trends may be caused by over-exploitation of sharks, a reduction in fishing effort due to higher fuel prices, or a combination of these or other factors. Nevertheless, the downturn in catches in combination with similar trends in the fin trade, despite indications that demand for fins is growing, is worrying. Given what now appears to be a strong linkage between shark catches and the volume of the fin trade, several leading shark scientists have called for urgent consideration of effective fisheries management measures for sharks (Dulvy et al. 2008).

APPENDIX V

Acronyms Used

ACP	African, Caribbean, and Pacific
CAP	Community Action Plan
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCR	Joint Research Centre (JRC)
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CECAF	Fishery Committee for the Eastern Central Atlantic
CFCA	Community Fisheries Control Agency
CFP	Common Fisheries Policy
CNRO	Centre National de Recherches Océanographiques
COFREMAR	Joint Technical Commission for the Argentina / Uruguay Maritime Front
COREP	Regional Fisheries Committee for the Gulf of Guinea
CP	Contracting Party
CPOA	Community Plan of Action
CPPS	Comisión Permanente del Pacífico Sur
CpUE	Catch per Unit Effort
CRO	Centre de Recherches Océanologiques
CSRP	Sub Regional Fisheries Commission (West Africa)
DCR	Data Collection Regulations
DELASS	Development of Elasmobranch Assessments
DNAP	Direcção Nacional de Administração Pesqueira
DPS	Demersal and pelagic species
DWF	Distant Water Fleet
EC	European Commission
EEZ	Exclusive Economic Zone
EP	European Parliament
EU	European Union

FA	Fisheries Agreement
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organisation
FFA	Forum Fisheries Agency
FIAS	Fisheries Information and Analysis System
FOC	Flag of Convenience
FP7	Framework Program (7^{th} of)
FPA	Fisheries Partnership Agreement
GDP	Gross Domestic Product
GFCM	General Fisheries Commission for the Mediterranean
GRT	Gross Registered Tons
GVA	Gross Value Added
HACCP	Hazard Analysis and Critical Control Point
HMS	Highly Migratory Species
IATTC	Inter-American Tropical Tuna Commission
IBSFC	International Baltic Sea Fishery Commission
IBTS	International Bottom Trawl Survey
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Seas
ICRAM	Italian Centre for Applied Marine Research
IEO	Instituto Español de Oceanografía
IFC	International Fisheries Commission
IIP	Instituto de Investigação Pesqueira
IOC	International Oceanographic Commission
IOTC	Indian Ocean Tuna Commission
IPIMAR	Instituto de Investigação das Pescas e do Mar
IPOA	International Plan of Action
IRD	Institut de Recherche pour le Développement

ISTAM	Improve Scientific and Technical Advices for fisheries Management
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unregulated and Unreported
JRC	Joint Research Centre
LME	Large Marine Ecosystem
LOSC	Law of the Sea Convention
MCS	Monitoring, Control and Surveillance
MEU	Marine Environment Unit
MPA	Marine Protected Area
MS	Member State (of the EU)
MSY	Maximum Sustainable Yield
NAFO	Northwest Atlantic Fisheries Organisation
NEAFC	Northeast Atlantic Fisheries Commission
NOAA	National Oceanographic and Atmospheric Administration
NTZ	No Take Zone
RAC	Regional Activity Centre
RFB	Regional Fisheries Body
RFMO	Regional Fisheries Management Organisation
RIP	Regional Indicative Programme
RPOA	Regional Plan of Action
RTD	Research and Technological Development
RTTP	Regional Tagging Programme
SBT	Southern Bluefin Tuna
SEAFDEC	Southeast Asian Fisheries Development Center
SEAFO	South-East Atlantic Fisheries Organisation
SPC	Secretariat of the Pacific Community
SPRFMO	South Pacific Regional Fisheries Management Organisation
SRFC	Sub-regional Fisheries Commission

STA	Scientific and Technical Advice
STECF	Scientific, Technical and Economic Committee for Fisheries
SWIOFC	South-West Indian Ocean Fisheries Commission
TAC	Total Allowable Catch
ToR	Terms of Reference
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WECAFC	Western Central Atlantic Fishery Commission
WGEF	Working Group on Elasmobranch Fisheries (ICES)
WIO	Western Indian Ocean
WSSD	World Summit on Sustainable Development

APPENDIX VI

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