SHARK ALLIANCE

Shark alert

Revealing Europe's impact on shark populations

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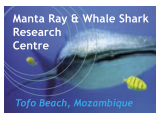

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Executive summary

Europe is playing a lead role in the overfishing, waste, and depletion of the world's sharks. Despite improved management instruments and growing public concern, European Union (EU) restrictions on shark finning remain among the weakest in the world and no overall plan to manage EU shark fisheries and restore depleted populations exists. Because of sharks' importance as predators in ocean ecosystems and Europe's strong influence on global fisheries policy, EU shark fishing regulations have a wide-reaching effect on the world's oceans. Sharks' biological vulnerability to overfishing (due to slow growth and few young) means that mismanagement of shark populations can happen quickly and take many decades to repair.

Sought for centuries for various parts, European sharks are targeted today primarily for meat, fins and oil and taken incidentally as bycatch in most European fisheries. One-third of European shark populations assessed are now considered Threatened under the World Conservation Union (IUCN) Red List criteria. Another 20 per cent are at immediate risk of becoming so. Red List European sharks include spurdog, porbeagle, angel, basking, shortfin mako, blue, smooth hammerhead and several species of deepwater sharks, skates and rays.

Europe's directed shark fisheries have declined along with shark populations, yet the EU remains a significant force in global shark catch, consumption and trade. Spain, Portugal, the UK and France are among the world's top 20 shark fishing nations (which are responsible for 80 per cent of the global catch). Total EU landings have dropped in recent years, with the exception of Spain whose catch increased dramatically. The commercially important Northeast Atlantic spurdog has declined by more than 95 per cent; persistent European demand for this species continues to drive unsustainable fisheries around the world. Europe's basking and porbeagle sharks, still sought for meat and fins, have not recovered from intense fishing in the 1900s. Today, EU vessels targeting tuna and swordfish take substantial numbers of oceanic sharks. European fisheries for the livers and meat of exceptionally slow-growing deepwater sharks have caused extreme population depletion in recent years. Formerly targets of fisheries, skates and rays are taken today mainly as bycatch, yet still make up a large share of Northeast Atlantic 'shark' landings. Some localised populations of large Atlantic skates are thought to be extinct.

The lucrative, global market for shark fin, used for the Asian delicacy 'shark fin soup', is estimated to be increasing by 5 per cent per year. Over the last decade, European

GREAT HAMMERHEAD © NEIL HAMMERSCHLAG

participation in the Hong Kong fin market, led by Spain, has grown from negligible levels to nearly a third of total declared imports. This share is likely to be an underestimate as fins taken by distant water fleets may be credited to other countries. Shark species important for the fin market include hammerhead, blue, mako, basking and dogfish sharks.

Shark finning – the practice of slicing off a shark's fins and discarding the body at sea – is driven by the disparity between high value fins and low value shark meat. Widely considered wasteful and unsustainable, finning has been banned by many countries and regional fisheries management organisations, usually using a fin to carcass weight limit as a means of ensuring the amount of fins corresponds to the amount of carcasses on board. The US and other countries have set a generous ratio of 5 per cent of dressed weight (about 2.5 per cent of whole weight). In contrast, the EU regulation selected a much higher ratio of 5 per cent of whole weight, allowing many more sharks to be finned. The EU finning regulation also allows fins and carcasses to be landed separately. Together, these loopholes render the regulation all but meaningless and undermine finning bans on a global scale.

Despite the strong aims of the EU Common Fisheries Policy, there are very few restrictions on fishing for sharks in European waters, none of which have been effective for recovery. Catch limits are imposed for a few species in the North Sea yet are routinely set in excess of scientific advice. European countries have failed to heed directives for comprehensive, national and regional plans of action under the 1999 United Nations' (UN) Food and Agriculture Organization's (FAO) International Plan of Action for the Conservation and Management of Sharks. There are no ocean-wide, international catch limits on sharks.

We recommend that the European Commission (EC) and ministers of fisheries and environment throughout Europe improve this troubling situation by working to:

- require that shark fins and carcass be landed at the same time and at the same port;
- decrease the EU fin to carcass ratio to (or below) the international standard of 5 per cent dressed weight, or require that sharks be landed whole; and,
- develop and implement a more holistic European plan of action for sharks that includes precautionary limits on catch based on International Council for the Exploration of the Sea (ICES) advice, as well as endangered species protection, bycatch reduction, recovery plans for depleted species and management plans for others.

In working toward such a European plan of action, European countries should:

- immediately adopt and implement scientific advice for sharks offered by ICES;
- elevate the priority of improving species-specific fisheries and trade data collection and facilitating scientific assessment of shark status in European waters and adjacent seas;
- secure national legislation and regional agreements to protect and conserve shark species listed under global and regional wildlife treaties and those considered Endangered or Critically Endangered;
- promote immediate limits on international fisheries taking sharks through regional fisheries management organisations; and,
- support and advance proposals by Germany to include spurdog and porbeagle shark in Convention on International Trade in Endangered Species (CITES) Appendix II, and ensure adherence to existing CITES shark listings, resolutions and decisions.

Shark myths

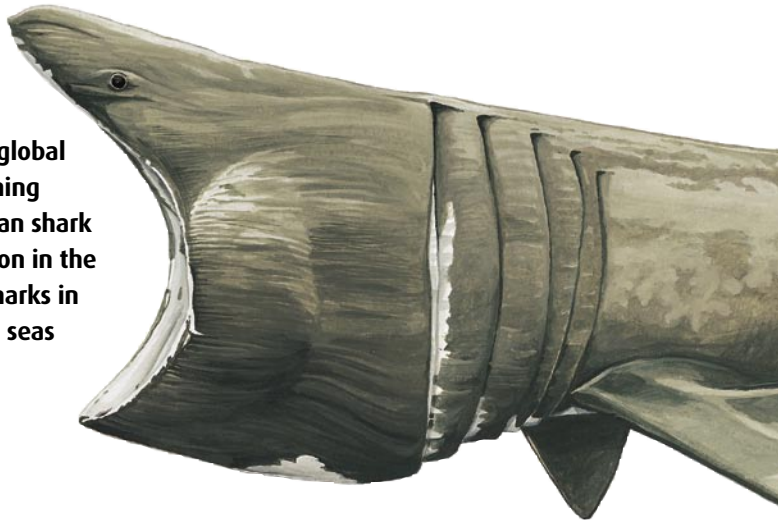
MYTH: Sharks are ferocious beasts that can take care of themselves.
TRUTH: Their slow growth, late maturation, lengthy pregnancies and small litters make sharks among the most biologically vulnerable animals in the oceans.

MYTH: There aren't many sharks in European waters.
TRUTH: There aren't as many sharks as there used to be, but more than 130 species of sharks and closely related rays and chimaeras can be found in European waters. Overall, numbers of sharks are declining with many now seriously depleted and some species already locally extinct.

MYTH: Shark overfishing is only a problem in Asia.
TRUTH: Europe is home to some of the most important shark fishing countries, the most depleted shark populations in the world, and the most persistent demand for shark meat.

MYTH: Even if shark overfishing is a problem, I am powerless to help.
TRUTH: Public concern conveyed to law makers is the key to improving shark conservation policies in Europe and around the world; indeed, it could be their only hope.

Introduction



Contrary to popular belief, Europe plays a major role in the global catch, export and import of sharks. Weak restrictions on fishing (with very few limits specific to sharks) have driven European shark populations to the worst overall status of any assessed region in the world. European fisheries managers have largely ignored sharks in the international arena, or fought for measures on the high seas that are as ineffective as those closer to home.

Shark biology and ecology

Sharks are vulnerable

Sharks are cartilaginous fish, and yet their biological characteristics are more similar to those of sea turtles and large land and marine mammals than of bony fish [6]. In general, sharks grow slowly, mature late and produce few young over long lifetimes [4]. Their populations typically increase at extremely low rates, leaving them exceptionally vulnerable to overexploitation and slow to recover from depletion [6]. Some of the more extreme examples include the female Atlantic dusky shark which doesn't reproduce til at least 20 years of age, the spiny dogfish which carries her pups for nearly two years, the sandtiger shark which gives birth to only two young at a time, and the basking shark which is thought to live for 50 years [6, 26]. Management of shark fisheries must therefore reflect a precautionary approach in order to be effective and allow for sustainable fisheries [32].

Sharks' role in the marine environment

Most sharks serve as top predators, with the larger species likely to significantly affect the size of prey populations as well as the structure and species composition of the marine ecosystem [6]. The effects of removing sharks from ocean ecosystems, although complex and rather unpredictable, are thought to be ecologically and economically significant [4]. For example, the removal of tiger sharks from a tropical ecosystem resulted in a decline in tuna even though tuna were not important prey for the sharks and might therefore have been expected to increase in abundance if sharks were removed. In actuality, the tuna declined because the sharks kept populations of other predators of tuna in check [4].

The sharks of Europe

European waters contain a diverse array of about 70 species of sharks, more than 50 species of skates and rays, and seven species of chimaeras [38]. Sharks and rays are found from the cold North Sea to the warmest waters of the Mediterranean Sea, from estuaries to the deep ocean depths. Sharks range in size from compact dogfish often under a metre long, to the immense basking shark, which can grow up to 12 metres in length.

A wide variety of bottom-dwelling skates, warm-blooded and fast-moving oceanic sharks, and even stingrays and the notorious great white shark can be found in European waters. Few Europeans ever realise that such fancifully-named species as the large-eyed rabbitfish, the velvet-bellied dogfish, the cuckoo ray, the little sleeper shark and the blue pygmy skate exist off their shores. Too many of these fascinating species, however, are increasingly under threat.

TOP: BASKING SHARK; LEFT: COMMON STINGRAY © MARC DANDO

Shark uses

Sharks have been sought for centuries for their meat, hides, liver oil, fins and teeth, and more recently for their cartilage skeletons and for sport. Although their rich liver oil has been and continues to be a reason to fish for sharks in European waters (see spurdog, basking and deepwater shark sections, below) and some recreational shark fishing occurs, most of today's European shark fisheries are driven by commercial demand for meat and fins.

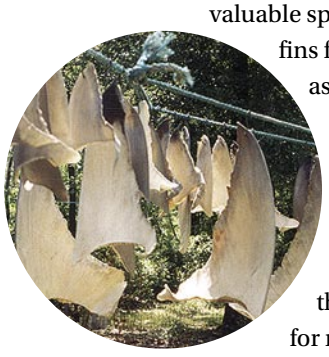
Meat

The EU is a significant consumer and trader of shark meat, particularly dogfishes, smoothhounds, catsharks, skates and rays, as well as shortfin mako and porbeagle sharks [36]. EU countries, particularly Germany and the UK continue to drive a persistent demand for – and serial depletion of – spurdog. Indeed, a recent market study found spurdog meat from the UK which was sold to Italy was found to be the most expensive shark meat at nearly US$10 per kg [40]. The meat from the shortfin mako, the common thresher and the porbeagle shark is also of notable value [36]. In the mid-1990s, France was the largest consumer of shark and skate meat in Europe [40], but has since been surpassed by Spain and Italy (figures from production plus imports minus exports) [11]. Shark meat is sold fresh, frozen, salted and dried.

Fins

The most valuable part of a shark is usually its fins, which are the principal ingredient of 'shark fin soup', a traditional Chinese delicacy which is becoming increasingly popular as more people are able to afford it [10]. Sets of shark fins can sell for more than US$700 per kg [26], and the global shark fin trade is estimated to be increasing by 5 per cent per year [11]. Overall, European participation in the Hong Kong fin market has increased from negligible levels in the early 1990s to nearly a third of total declared imports. Spain has led all other fin exporters in the world by a wide margin [10].

Market surveys over the last three decades have revealed differing results in terms of the preferred shark species for fins, due primarily to regional differences. Most studies, however, include hammerhead sharks among the most valuable species for fins, and count fins from blue and mako sharks as important in trade, if not always top quality [34, 36]. Other Northeast Atlantic shark species prized for their fins include tope and basking shark, with a single fin from the latter species once selling for nearly US$10,000 [2]. The fins of spurdog and other dogfish species are generally low quality, but they have been part of the international fin trade for decades and make up a substantial proportion of the volume of shark fin trade from Europe [36].



"Most scientists agree that the simplest, most effective way to implement a shark finning ban is to require that sharks are landed whole with fins still attached."

Finning

The disparity between the exceptionally valuable shark fins and the less valuable meat creates an economic incentive to take sharks solely for their fins. Shark finning – the practice of slicing off a shark's fins and discarding the body at sea – contributes to an extraordinary waste of public resources, unsustainable shark mortality and dangerous declines in shark populations. Over the last 15 years, widespread public outcry against finning has led to bans on the practice in many countries and most of the world's international waters.

ENFORCING FINNING BANS

Most scientists agree that the simplest, most effective way to implement a shark finning ban is to require that sharks are landed whole with fins still attached. This measure would also improve the collection of species-specific data important for population assessment [30]. In order to grant fishermen flexibility to store fins and carcasses separately, however, most of the world's shark finning bans are enforced through a fin to carcass weight limit.

The US developed its fin to carcass ratio standard in the early 1990s based on samples of sharks processed under commercial fishing conditions, in cooperation with fishermen [30]. This ratio is the means of checking – after at-sea processing – whether the amount of fins corresponds to the number of carcasses on board. Through its 1993 Atlantic shark fishery management plan, the US set a generous ratio associated with the large-finned sandbar shark – 5 per cent of dressed weight (the weight after the shark has been beheaded and gutted) or about 2 per cent of the whole weight. Blue shark fins, however, were found to weigh only 3.74 per cent of dressed body weight while those of scalloped hammerheads weighed just 2.39 per cent [30]. Scientists have since confirmed the 5 per cent dressed-weight value as an appropriate upper limit for mixed-shark fisheries [15].

Taking and trading sharks in Europe

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European fisheries

Europe includes some of the most important shark fishing nations in the world [38]. From 1990 to 2003, global reported catch of sharks increased by 22 per cent, 80 per cent of which was taken by 20 countries (including Spain, Portugal, the UK and France). Over the same period, Spain's share of the global shark catch jumped from 2 per cent to 7.2 per cent [31]. In 1997, Spain reported the world's largest catch of sharks at nearly 100,000 metric tons (t) [11].

According to FAO data, EU countries caught nearly 115,000t of shark (including rays and chimaeras) in 2004. Spain took the largest share at around 45 per cent of the EU total, followed by France (18 per cent), the UK (14 per cent) and Portugal (10.5 per cent).

Table 1: FAO data for total catches of sharks in metric tons by EU countries in 2004

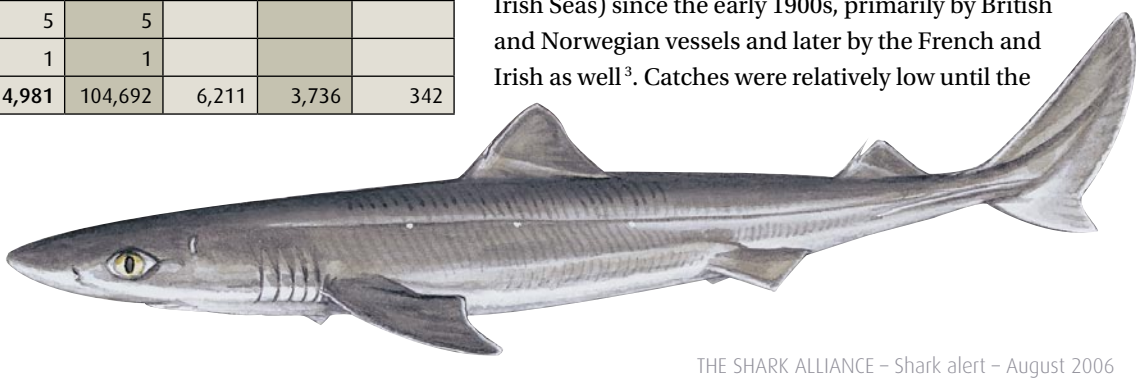
Country	Total in 2004	Atlantic Ocean	Indian Ocean	Pacific Ocean	Southern Ocean
Spain	51,071	42,364	4,969	3,736	2
France	21,613	21,306			307
UK	16,066	16,033			33
Portugal	12,765	11,523	1,242		
Ireland	5,043	5,043			
Belgium	2,505	2,505			
Italy	1,061	1,061			
Greece	925	925			
Estonia	922	922			
Germany	859	859			
Faeroe Islands	687	687			
Netherlands	631	631			
Denmark	402	402			
Sweden	285	285			
Lithuania	101	101			
Malta	26	26			
Cyprus	13	13			
Slovenia	5	5			
Poland	1	1			
Total	**114,981**	104,692	6,211	3,736	342

Ninety-one per cent of the EU shark catch reportedly comes from the Atlantic Ocean. Sharks and rays are taken incidentally as bycatch in longline, purse seine, trawl and other net fisheries pursuing other species, but are also targeted [38]. All of Europe's traditional, directed shark and ray fisheries have declined because of overfishing and population depletion [35]. Overall, shark landings from European waters have dropped in recent years, with the notable exception of Spain whose shark landings have increased eight- or nine-fold. In most cases, it is not known how much of Spain's increase is because of fishermen improving their fishing reports, increasing the number of shark bycatch they keep, or pursuing sharks as a target species more often [38].

Spurdog

Europe's most commercially important shark species is the spurdog, also known as the spiny dogfish [35]. Sought for its liver oil in the first half of the 1900s, the spurdog is now valuable for its meat [22]. In the UK spurdog is sold as rock salmon or huss and used in the traditional British meal of fish and chips. In Germany the meat is sold as *Seeaal* (sea eel) and its belly flaps are smoked to make the delicacy *Schillerlocken* [36]. In France fresh spurdog meat is sold as *aiguillat commun* or *saumonette d'aiguillat* [21].

Northeast Atlantic spurdog are found from the north of the Bay of Biscay to the Norwegian Sea. This population has been fished off Europe (mainly in the North and Irish Seas) since the early 1900s, primarily by British and Norwegian vessels and later by the French and Irish as well [3]. Catches were relatively low until the



SPURDOG © MARC DANDO FROM 'COLLINS FIELD GUIDE: SHARKS OF THE WORLD'

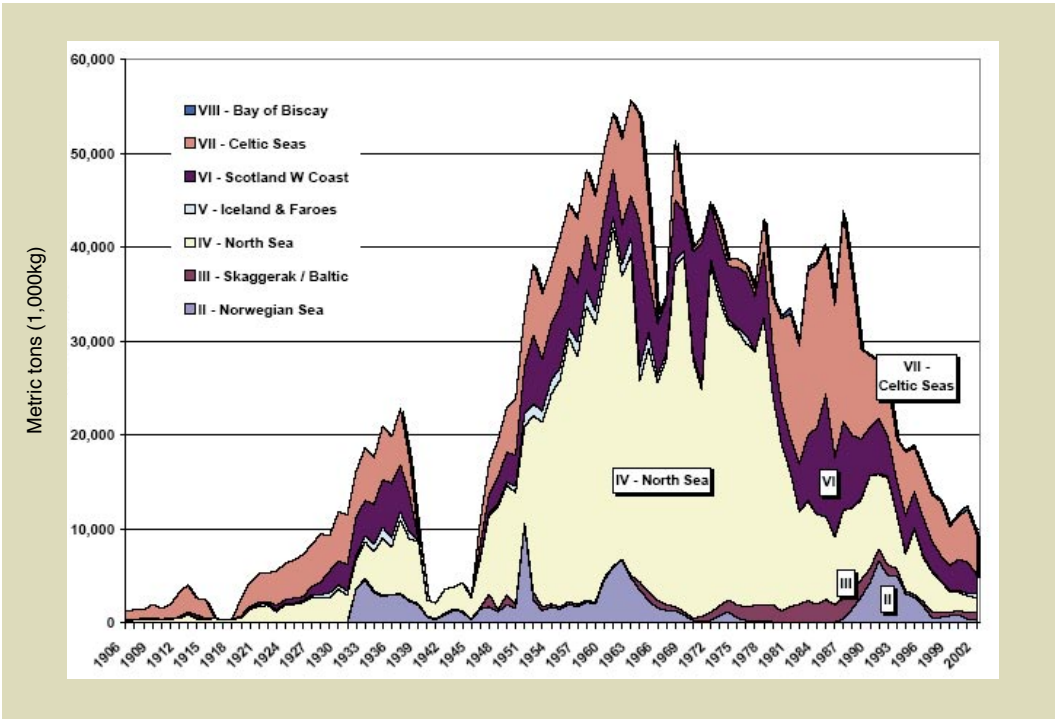


Figure 1: Total reported landings of spurdog in metric tons by ICES fishing area in the Northeast Atlantic, from 1906 to 2002, excluding areas with negligible catches

Source: 1906–1972 from HEESSEN, 2003; 1973–2002 from ICES Statlant Fisheries Statistics Database, November 2003.

Footnote: Heessen, H.J.L. (ed.), (2003). Development of Elasmobranch Assessments DELASS. European Commission DG Fish Study Contract 99/055, Final Report, January 2003.

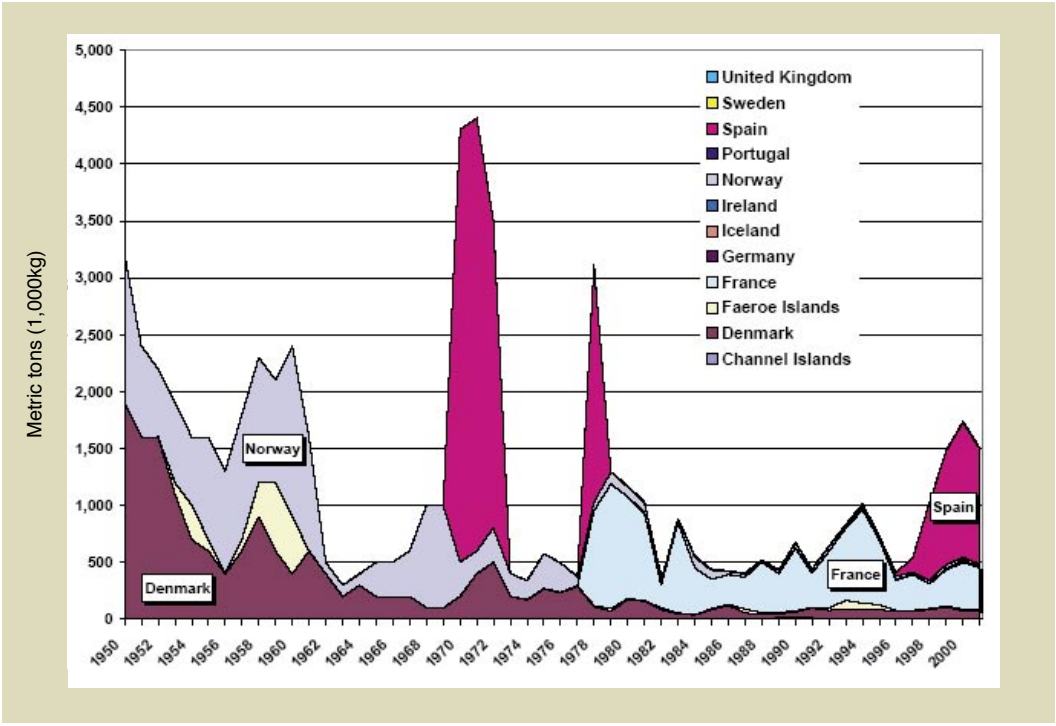


Figure 2: Total reported landings of porbeagle shark in metric tons from the Northeast Atlantic by country, from 1950 to 2001

Source: FAO via FishBase.

1930s after which regional fisheries generally expanded, then dropped sharply as populations declined. Landings fell more than 50 per cent from 1987 to 1994[35]. In recent years, spurdog landings from the Northeast Atlantic have been around 17 per cent of previous peak levels, about 80 per cent of which have been taken in UK fisheries[22]. Although Norway's spurdog landings were decreasing by 2003, reported catches from France, Ireland and the UK increased, creating cause for concern[31].

Spurdog are also present and fished in the Mediterranean and Black Seas, although in much smaller numbers and with less accurate reporting[22].

Porbeagle sharks

The pelagic, wide-ranging porbeagle shark is sought primarily for its high value meat, which is among the most prized in Europe, although its fins are also used (sent to Asia). This species has been the target of intense, unregulated fisheries over the last century, leading to its serious depletion. Vessels fishing porbeagles in the Northeast Atlantic have hailed primarily from Norway, Denmark, France and Spain.

A Norwegian longline fishery targeting porbeagle began in the 1930s and peaked at 3,884t just a few years later. Norwegian and Danish fisheries took off after World War II

MAKO SHARK © JEREMY STAFFORD-DEITSCH, SHARK TRUST

only to collapse by the early 1960s. French and Spanish longliners have targeted porbeagle since the 1970s [25]. Targeted fisheries remain in regions such as the Bay of Biscay and the Celtic Sea [35, 5]. In 2002, France landed about 460t of porbeagle sharks from a directed fishery in the North Atlantic [5]. Overall, landings from historically important fisheries around the UK and in and around the North Sea have decreased to low levels during the last 40 years, while catches off Portugal, west of the Bay of Biscay and around the Azores have increased since 1989. It is thought that fishing vessels have exhausted inshore populations and redirected their effort on to previously less heavily exploited offshore stocks [25].

Other oceanic sharks

Spanish vessels take oceanic (or 'pelagic') sharks such as blues, shortfin makos and threshers both as bycatch and directly from the Northeast Atlantic and the Mediterranean Sea [5]. Blue and mako sharks make up about 33 per cent and 20 per cent of Spain's reported shark catch, respectively [31]. Increased targeting of pelagic sharks by Spanish longline fishermen appears to be the result of the decline in swordfish populations [10]. A Spanish longline fishery targeting blue sharks operates in the Bay of Biscay [38]. The traditional Portuguese longline fishery for swordfish operating in the Azores took increasing numbers of blue sharks in the mid-1990s, and this species accounts for an estimated 86 per cent of total landings [1]. Portugal, France, the UK and Ireland have net and trawl fisheries which also take pelagic sharks as bycatch [14, 38]. Small target fisheries for blue shark have operated off the southwest coasts of England and Ireland [35].

In previous decades, incidental catches of blue, mako and thresher sharks were common in Mediterranean longline fisheries, but have since declined, likely as a result of reduced populations. Today, such bycatch continues at significant levels only in a few places, such as their breeding grounds in the Alboran Sea [33]. Illegal driftnets, primarily targeting swordfish in the Mediterranean, still take substantial numbers of pelagic sharks as well as several species of rays as bycatch [37].

Recreational rod and reel fisheries take pelagic sharks, particularly blues and threshers, from UK waters and the Mediterranean Sea. These operations are increasingly catch and release [38].

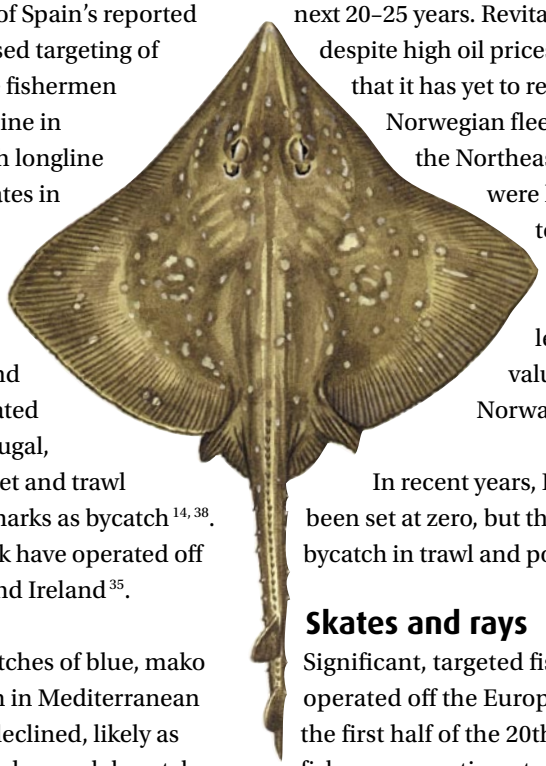
Basking sharks

The immense, filter-feeding basking shark is found in cool waters around the world, including in the Northeast Atlantic from the Arctic to the Mediterranean [24].

The basking shark has been hunted for centuries off Europe. Early whalers sought their livers (which account for up to 25 per cent of their body weight) for lamp oil. Its meat has been used for animal feed and human consumption, and the skin for leather [24]. Fisheries in recent years have used oil (now used for cosmetic and pharmaceutical purposes), meat (for food as well as fishmeal) and fins, which are among the most valuable for international trade to East Asia [21]. Basking shark catches have been recorded from Norway, Ireland, Scotland, Spain and Iceland [24].

Most basking shark fisheries have been characterised by steep, long-lasting declines in catches, after the removal of hundreds to a few thousand individuals [24]. A basking shark fishery began off western Ireland in 1947. Catches peaked in the early 1950s at 1,000–1,800 sharks per year and then declined by more than 90 per cent over the next 20–25 years. Revitalization efforts in the 1970s failed despite high oil prices. The population was so depleted that it has yet to recover some 40 years later [24]. A Norwegian fleet has fished for basking sharks in the Northeast Atlantic for decades. Catches were high from 1959–1980 (from 1,000 to 4,000), rose slightly in the early 1990s based on high fin prices, but then declined to very low levels despite steeply increasing fin values. The majority of fins landed by Norway have been exported to Japan.

In recent years, EU basking shark quotas have been set at zero, but the species is still regularly killed as bycatch in trawl and pot line fisheries [24].



Skates and rays

Significant, targeted fisheries for skates and rays have operated off the European continental coast since the first half of the 20th century and some inshore fishermen continue to specialise in these species, but today most skates and rays are taken as bycatch

SKATE © MARC DANDO

in mixed bottom trawl fisheries targeting groundfish [38, 29]. Skate and ray landings in western France dropped from 1,000t per year (24 per cent of the total catch) to only 3–15t per year (0.3 per cent of the total catch) in recent years, while landings in England and Wales fell from 18,000t to just 3,000t over the last four decades [38]. Skates and rays have accounted for more than 40 per cent of 'shark' landings (by weight) from the northern section of the Northeast Atlantic in recent years. Populations of the largest-sized of these species (such as common, white and longnose skate), which are vulnerable to trawls as soon as they hatch, have declined the most dramatically [16, 38].

ECOTOURISM

Interest in sharks as the focus of ecotourism expeditions is increasing worldwide [11]. In Europe, such activities range from diving with rays in the Mediterranean to sailing with basking sharks off the coast of Cornwall. Although care must be taken to protect the people and the sharks involved, such operations are increasingly demonstrating considerable economic benefits from keeping sharks alive [26].

The pelagic stingray is by far the dominant bycatch species of longline fisheries in the Mediterranean. Annual bycatch of this species by Spanish longliners operating in this region was estimated at 40,000 individuals. This fleet's bycatch of giant devil rays is lower than for stingrays, but still troublesome considering the devil ray's IUCN Red List classification as Endangered [33].

Deepwater sharks

In recent years, as fishermen venture further into deeper and deeper water in search of new species to exploit, European fisheries for exceptionally slow-growing deepsea sharks (found at depths greater than 400 metres) have been cause for great concern. Vessels from Portugal, Spain, Iceland, Norway, the UK, Ireland and France have been taking deepwater sharks in mixed trawl fisheries and targeting them with longlines and gillnets [38]. Increasing numbers of these species, primarily Portuguese dogfish and gulper sharks, were taken for most of the 1990s as new markets for their liver oil and meat developed. Landings peaked in 2003 at about 11,000t, but have since declined despite high fishing pressure, indicating extreme population declines [29]. Scientists have recommended zero catch for Northeast Atlantic deepwater sharks [29].

SPAIN STANDS OUT

Spain's role in shark fishing and trade has increased dramatically since 1990. The country's reported shark catch is made up of about one-third blue sharks and one-fifth shortfin mako [31]. Examples of Spain's dominance in world shark production include:

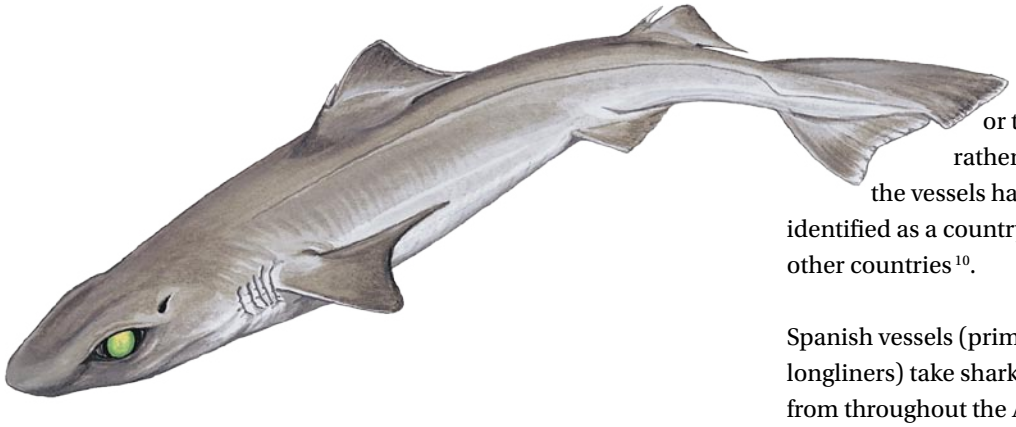
- 1997 – the world's largest annual catch of sharks at nearly 100,000t [31],
- 1999 – the world's greatest supplier of shark fins to Hong Kong by far, at 2,000t and more than one-quarter of the market [10],
- 2003 – world leader in imports of shark products with 15 per cent of the global share, up from 5 per cent in 1990 [31],
- 2004 – responsible for 45 per cent of total EU shark catches, about 50,000t.

A bit more about bycatch

Bycatch is the unintentional or incidental capture of non-target species during fishing operations. Different types of fisheries take different species as bycatch at differing levels, depending on the type of fishing gear and the time, area and depth it is used [28]. Although bycatch is a global issue of significant proportions, bycatch of sharks can be particularly problematic because sharks usually have slower growth rates than the target fish species; sharks populations, therefore, can be seriously depleted through bycatch from a fishery that may be sustainable (or at least a longer term operation) for the target species [32]. Shark bycatch is often discarded dead, or landed but not reported. In such instances, the depletion of shark populations may go unnoticed for long periods of time, as is the case with several species of large-bodied North Atlantic skates [32, 16].

Bycatch is a serious problem for sharks in most European fisheries, as detailed in various sections of this report. Atlantic tuna fisheries alone report 12 species of skates and rays, 11 species of pelagic sharks and 46 species of coastal sharks taken as bycatch [28]. The EC has pledged to promote more-selective fishing gear to address bycatch and discards of sharks [18].

"Bycatch is the unintentional or incidental capture of non-target species during fishing operations."



The European shark trade

From 1990 to 2003, global exports of shark products doubled to 86,500t at a value of nearly US$250 million. In 2003, Panama, Costa Rica and Spain replaced Denmark, Germany and Norway in the top ten countries for shark exports[31]. Norway's share in the global export of shark products fell from the largest at 16 per cent in 1990 to just over 1 per cent in 2003, consistent with the decline in the country's catch of the severely depleted spurdog[31]. Based on the 2003 global shark catch and shark export and import figures, Indonesia, Spain, the US, Japan, the UK and New Zealand are the major players in global production and trade of sharks[31].

Global export of shark fins has fluctuated but is now trending upwards[31]. In 1999, Spain topped a list of 85 countries supplying unprocessed (salted or frozen) shark fins to the Hong Kong market (the world's largest); it was the source of more than one-quarter of the market (by weight)[10]. Other EU countries reporting fin exports to Hong Kong that year included Belgium/Luxembourg, Denmark, France, Germany, Norway, Portugal and the UK. The European contribution to Hong Kong's fin market expanded significantly over the 1990s, from negligible levels up to 27 per cent[10].

Shark fishing by European vessels outside Europe

Fisheries

Trade data revealing the significant role of EU (particularly Spanish) fishing vessels in the global shark fin and meat market come from fisheries both within and outside EU waters. Indeed, EU countries have vessels fishing in distant waters of the globe which fly 'flags of convenience' rather than those reflecting the vessels' true base. The European contribution to the shark fin market from such vessels may be underestimated as shark fins may be credited to the country that governs the fishing grounds or the port where the fins are landed rather than the country from which the vessels hail. Spain in particular has been identified as a country which reroutes shark fins through other countries[10].

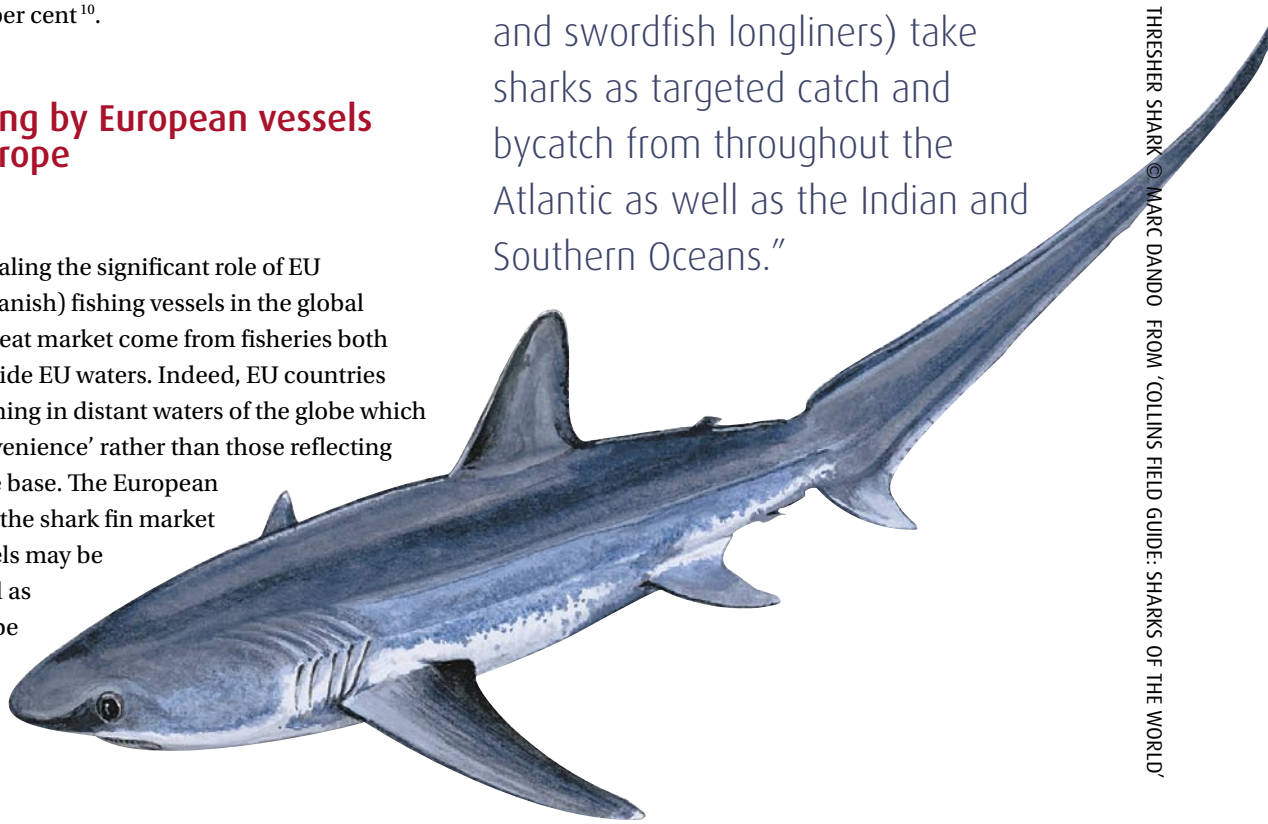
Spanish vessels (primarily tuna and swordfish longliners) take sharks as targeted catch and bycatch from throughout the Atlantic as well as the Indian and Southern Oceans[5, 20]. Shortfin mako, blue and thresher sharks are known to be targeted by these distant water fleets, although information on the species-composition of the catch and amount discarded is lacking[36]. In 2002, 25 per cent of Spain's overall shark landings reportedly came from the Indian Ocean[5].

French vessels also report shark landings from fishing operations outside EU waters – in the Atlantic as well the Indian Ocean[5, 20]. In 2004, France and the UK reported shark landings from the Southern Ocean[20].

Demand

Persistent European taste for spurdog continues to drive unsustainable fisheries targeted at the reproductive females of the species around the world. In 2000, after a decade of intense, unregulated fishing for Northwest Atlantic spurdog to feed European markets, the US population was depleted and the federal water fishery essentially closed[23]. Spurdog fisheries based on European demand for meat have since developed in the Canadian Maritimes, New Zealand, Argentina, and the western US[22].

"Spanish vessels (primarily tuna and swordfish longliners) take sharks as targeted catch and bycatch from throughout the Atlantic as well as the Indian and Southern Oceans."



TOP: GULPER SHARK; LEFT: THRESHER SHARK © MARC DANDO FROM 'COLLINS FIELD GUIDE: SHARKS OF THE WORLD'

The status of European sharks

The abundance and distribution of sharks and rays in European waters, especially those large in size, is generally decreasing[27]. Dramatic declines have been documented for a wide range of species, from sedentary coastal sharks to dogfish of the deep sea, from large, bottom-dwelling skates to swift moving sharks that roam the open ocean.

European sharks and the Red List

Through a series of regional 'expert workshops' and review panels, the IUCN Shark Specialist Group is in the process of assessing the conservation status of all the world's shark and ray species (nearly 1,000 in total). Preliminary results to date indicate that the status of shark and ray populations in the Northeast Atlantic and Mediterranean Sea could be worse than anywhere else on earth. Presently, about one-third of European shark and ray populations assessed are considered Threatened by Red List standards. A further 20 per cent of Northeast Atlantic species and at least 19 per cent of Mediterranean species are considered at risk of becoming so in the near future. For nearly one-quarter of European species assessed, data have so far been insufficient for assessment and classification[7, 27].

Spurdog, porbeagle, gulper and angel sharks, as well as white and common skates of the Northeast Atlantic, have all been classified as Critically Endangered in the Northeast Atlantic under IUCN Red List criteria. Leafscale gulper sharks, Portuguese dogfish and basking sharks are considered Endangered. Even wide-ranging Northeast Atlantic shortfin mako, smooth hammerhead and blue sharks now qualify as Vulnerable and therefore Threatened under Red List criteria. Several more deepwater sharks, three more rays, and one chimaera are also listed as Vulnerable. The Near Threatened category includes another highly migratory species, the thresher shark[27].

In the Mediterranean Sea, species listed as Critically Endangered include the porbeagle shark, three types of angel shark, three species of skates (white, common and Maltese) and the sandtiger shark. The butterfly ray is being proposed as Critically Endangered. The giant devil ray is listed as Endangered in the Mediterranean, while sandbar sharks and two species of smoothhounds have been proposed for this category. Proposals to list thresher, basking, smooth hammerhead and blue sharks as Vulnerable in the Mediterranean are underway, while the gulper shark is already listed as such[7].

Two species of sawfish (shark-like rays with elongated, tooth-studded snouts) are listed as Critically Endangered, but have long since been eradicated from European waters[7, 38].

IN THE RED

The IUCN Red List of Threatened Species is the most comprehensive conservation inventory of the world's plant and animal species. IUCN specialist groups assess species' population health and classify them under categories ranging from Extinct to Least Concern. Species deemed Vulnerable, Endangered or Critically Endangered are considered to be Threatened under Red List criteria (see: www.redlist.org for more information). The IUCN Shark Specialist Group was formed in 1991. Its membership includes leading shark scientists from all parts of the world.

Profiles in depletion: Shark and ray species at risk

PORBEAGLE © MARC DANDO FROM 'COLLINS FIELD GUIDE: SHARKS OF THE WORLD'

Porbeagle shark (*Lamna nasus*)

A powerful, highly-migratory shark related to mako and great white sharks.

FOUND: Cool waters in both hemispheres, including offshore northern Europe.

STATUS: Critically Endangered in the Northeast Atlantic and Mediterranean Sea, Vulnerable globally.

THREATS: Unregulated longline fisheries off Europe and in international Atlantic waters.

COMPLICATING FACTOR: Its meat is among the most valuable of all shark species.

Spurdog or spiny dogfish (*Squalus acanthias*)

A slender, white-spotted shark that grows to about three feet long and travels in schools.

FOUND: Cool, coastal waters worldwide.

STATUS: Critically Endangered in the Northeast Atlantic, Endangered in the Mediterranean Sea, Vulnerable in the Black Sea and globally.

THREATS: Persistent demand for meat used for 'fish and chips' in England and as beer-garden snacks in Germany.

COMPLICATING FACTOR: Reproductive females, known to be pregnant for nearly two years, are targeted by fisheries due to their large size, leading to serious damage to population structure.

Deep-sea gulper shark (*Centrophorus granulosus*)

A small, dark-brown shark with glowing, green eyes.
FOUND: The deep ocean, between 600 and thousands of feet below the surface.
STATUS: Critically Endangered off Europe (particularly Portugal), Vulnerable globally.
THREATS: Increasing interest in deepsea shark meat and liver oil.
COMPLICATING FACTOR: Thought to give birth to just one pup every two to three years.

Common skate (*Dipturus batis*)

Europe's largest skate is far from common today.
FOUND: Once common through European coastal waters, now absent from most of its former range.
STATUS: Critically Endangered
THREATS: High capacity, unselective fisheries throughout its range.
COMPLICATING FACTOR: Its large size makes this species vulnerable to trawl nets as soon as it hatches from the egg case.

Angel shark (*Squatina squatina*)

This flattened, heavenly species may well be doomed.
FOUND: Once common in coastal waters of the Northeast Atlantic, the Mediterranean and the Black Sea, now rare and locally extinct in the North Sea and northern Mediterranean Sea.
STATUS: Critically Endangered throughout European waters, Vulnerable globally.
THREATS: No protection in the face of intense, unselective bottom trawl, set net, and longline fisheries.
COMPLICATING FACTOR: Strict protection in British waters proposed in 2001 is still awaiting action.

"...the status of shark and ray populations in the Northeast Atlantic and Mediterranean Sea could be worse than anywhere else on earth."

Shortfin mako shark (*Isurus oxyrinchus*)

This wide-ranging shark, the world's fastest, cannot out-swim fishing vessels increasingly interested in bringing it aboard.
FOUND: Tropical and temperate open-ocean waters around the world, including the Mediterranean and the Atlantic Ocean from Norway to South Africa.
STATUS: Critically Endangered in the Mediterranean Sea, Vulnerable in the Northeast Atlantic.
THREATS: Global catches doubled from 1990 to 2003 in the face of no European or international Atlantic catch restrictions.
COMPLICATING FACTOR: Scientists for the Atlantic tuna commission have recommended reductions in fishing, but lack the data needed to propose specific catch limits.

Blue shark (*Prionace glauca*)

This sleek, brilliant-blue shark is known to cross entire ocean basins.
FOUND: Similar to shortfin makos – open ocean in temperate and tropical areas around the globe, including the Mediterranean Sea and the Atlantic Ocean from Norway to South Africa.
STATUS: Proposed as Vulnerable in the Northeast Atlantic and Mediterranean Sea.
THREATS: Global catch increased by 50 per cent from 1990 to 2003 in the face of no European or international catch restrictions.
COMPLICATING FACTOR: Blue sharks swim clear across the Atlantic and are increasingly a target of fisheries. Many countries have to agree and act in concert in order to provide consistent, effective limits across this wide range.

COMMON NO MORE

Several species named for their abundance are now exceptionally uncommon, primarily because of overfishing.

- Common skate – listed as Critically Endangered throughout the Northeast Atlantic and the Mediterranean Sea.
- Common guitarfish – proposed as Endangered in the Mediterranean Sea.
- Common stingray – Near Threatened in the Mediterranean Sea.
- Common eagle ray – likely to be proposed as Near Threatened in the Mediterranean Sea.
- Common thresher – considered Near Threatened in the Northeast Atlantic and proposed as Vulnerable in the Mediterranean Sea.
- Common sawfish – listed as Critically Endangered but assumed extinct in European waters.

The two shark species widely considered the world's most abundant in their natural state, blue shark and spurdog, have both been seriously overfished in European waters and are now considered Critically Endangered and Vulnerable, respectively, based on Red List criteria.

BLUE SHARK © BRIAN J SKERRY, NATIONAL GEOGRAPHIC IMAGE COLLECTION

Shark conservation and management

The global situation

Sharks are among the most biologically vulnerable fish to swim across jurisdictional boundaries. This, coupled with increasing fishing pressure worldwide, has led to an urgent need for international shark conservation [23].

UN FAO IPOA-Sharks

In 1999, the UN FAO adopted an International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) with the aim of ensuring the conservation, management, and long-term sustainable use of the species. The IPOA-Sharks calls for fishing nations to develop national plans of action (NPOAs) for sharks that provide for sustainable catch, data collection, stakeholder consultation, waste minimization, biodiversity protection, ecosystem preservation, and special attention to threatened and vulnerable populations. Nations were encouraged to cooperate internationally and bilaterally and regional fisheries management organisations were to develop regional action plans for sharks [19]. The IPOA-Sharks is wholly voluntary and progress toward its implementation has been pitifully slow with only a handful of nations submitting NPOAs even years after the due date [23]. The EU and its Member States have yet to develop NPOAs for sharks.

> "Malta is the only Mediterranean country to protect the Annex II-threatened shark species under national legislation as required by these Conventions."

CITES

CITES provides an international legal framework for preventing trade in endangered species and regulating trade in species at risk. CITES Parties convene every two to two-and-a-half years to amend three Appendices under which species at risk are listed. Proposals to list, down-list or de-list species are proposed by Member governments and require a two-thirds majority for adoption [9].

CITES Appendix I is reserved for species threatened with extinction that are or may be affected by trade. Listing under CITES Appendix I essentially amounts to a ban on international trade. Appendix II includes species that, although not necessarily under current threat of extinction, may become so unless trade is strictly controlled. Appendix II listings serve to monitor and limit trade to sustainable levels through requirements for export permits and non-detriment findings [9]. Specific quantitative biological and trade criteria guide the CITES listing process [23]. Although rarely used, Appendix III listings are imposed by individual countries without the need for approval by other Parties and serve to encourage cooperation from other Parties in controlling trade in species of concern [23].

Through a series of Resolutions and Decisions, CITES has maintained a prominent role in global shark conservation since 1994. In 1997, a US proposal to ban trade in all species of sawfish through a listing on CITES Appendix I failed by a wide margin. In 2002, the first shark species – basking and whale sharks – were added (on the second attempt) to CITES Appendix II based on proposals from the UK and the Philippines (jointly with India), respectively [23]. In 2004, Germany's proposals to include spurdog and porbeagle sharks under CITES Appendix II failed to achieve sufficient support within the EU to move forward, while Australia and Madagascar were successful in their proposal to list great white sharks under CITES Appendix II. Iceland and Norway have joined several Asian countries in taking reservations on all three shark listings under CITES; as such they are treated as non-Parties with respect to trade in these species [9].

The CITES Animals Committee has formed a Shark Working Group and provides regular advice regarding shark fisheries' management priorities, potential listings and shark species at particular risk. In 2004, the group reported favorably on Germany's proposals for spurdog and porbeagle listings and recommended specific actions for management of North Atlantic populations [8]; these recommendations, however, have yet to be heeded.

In 2006, Germany again issued proposals to list spurdog and porbeagle under CITES Appendix II; these will need support from a majority of EU Member States in order to proceed to the next Conference of the CITES Parties in the Netherlands in mid-2007.

Convention on Migratory Species

Basking and white sharks (as well as whale sharks) are listed under both Appendix I and II of the Convention on Migratory Species (CMS). CMS Appendix I includes

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species which are threatened with extinction. Appendix II is used for migratory species with 'unfavorable' conservation status or those that would significantly benefit from international cooperation. CMS listings are meant to prompt either legally binding 'agreements' or less formal 'memoranda of understanding' [13]. Norway opposed both the white and basking shark listings based on lack of scientific evidence showing criteria were met[13]. Denmark supported the basking shark listing but took a reservation on behalf of the Faroe Islands, meaning that the listing will not apply there. The EU supported the basking shark listing, but took a reservation based on an inability to meet associated deadlines [17].

In 2005, CMS adopted a Resolution on Migratory Sharks that urges countries to implement the IPOA-Sharks and otherwise cooperate to enhance the conservation of migratory sharks [13].

The regional situation

The EU plays a significant role in most of the world's regional fisheries management organisations (RFMOs), which are charged with restricting fisheries in international waters outside countries' exclusive economic zones (usually out to two hundred nautical miles) [39]. Not surprisingly, the EU is especially active and influential within North Atlantic RFMOs, namely the Northeast Atlantic Fisheries Commission (NEAFC), the Northwest Atlantic Fisheries Organisation (NAFO), and the International Commission for the Conservation of Atlantic Tunas (ICCAT). It also dominates the General Fisheries Council for the Mediterranean (GFCM). In addition, European officials are active in meetings of the Indian Ocean Tuna Commission (IOTC), while Spain is an active member of the Inter-American Tropical Tuna Commission (IATTC).

There are no concrete limits imposed by RFMOs on the catch of sharks, skates or rays in international waters off Europe. The only quota for these species adopted by any of the world's RFMOs is for thorny skates under NAFO (2004) – this limit was proposed by the US and ultimately raised to well above scientific advice. Beginning in 2003, NEAFC called on their Parties to limit fishing effort on deepsea species (including 11 species of shark) so as not to exceed the highest level in recent years [38].

Eight shark and ray species are listed under the Barcelona Convention for the protection of the Mediterranean Sea. Great white and basking sharks along with the giant devil ray are included in Annex II for endangered or threatened species. The shortfin mako, porbeagle, blue and angel sharks, as well as the white skate are on Annex III for species: "whose exploitation is regulated" [38]. Similar listings under the Bern Convention (Convention on Conservation of European Wildlife and Natural Habitats) followed. However, Malta is the only Mediterranean country to protect the Annex II-threatened shark species under national legislation as required by these Conventions [38]. Although work on conservation action plans for Mediterranean sharks continues, there do not appear to be any plans for shark fishing limits in the near future.

> "Scientists warned that the Northeast Atlantic spurdog stock was overexploited as far back as 1968. There is still no effective management in this region."

Quotas for basking sharks and porbeagle sharks have been imposed on Norwegian and Faeroese vessels fishing in EU waters; the basking shark quota was recently set at zero catch (and Norwegian licences to fish this species are limited), while the porbeagle limits were set many times above historic catch levels [38]. Norway is the only country on the continent to impose a minimum size for spurdog [22].

The situation within Europe

With a few exceptions, shark fisheries are generally unregulated in European waters [38].

Fishing restrictions

Possible marine fishing restrictions in Europe include total allowable catches (TACs) (which are divided among Member States as national quotas), minimum and maximum landing sizes, closed seasons and/or areas, and limits or prohibitions on fishing gear. Through reform of the Common Fisheries Policy (see below) in 2002, measures to control fishing effort and establish multi-year recovery and management plans were added to the EU fisheries management tool box. The EC has pledged to promote more-selective fishing gear to address bycatch and discards of sharks as well as marine mammals and sea birds [18].

TACs have been imposed for only a few shark and ray species in the North Sea, such as spurdog and some skates, but such measures are generally aimed at ensuring allocation to certain states and preventing fishing by others, rather than constraining fishing to sustainable levels [38]. TACs are routinely set well above scientific advice (developed by ICES) and/or current catches and do not account for sharks and rays that are discarded [38]. There are new TACs and gear restrictions for deepwater sharks since 2005, owing to concern over population depletion. England and Wales impose minimum landing limits for a few species of skate and ray within the six mile zone in some regions [38].

A CASE IN POINT: THE MISMANAGEMENT OF SPURDOG

Scientists warned that the Northeast Atlantic spurdog stock was overexploited as far back as 1968. There is still no effective management in this region despite wide-spread recognition that fishing levels are unsustainable and several parts of the population have collapsed (a decline of more than 95 per cent from the baseline). Norway's minimum landing size aimed at protecting mature females is of limited value for this migratory species, which is intensively fished in other parts of its range. TACs in EU waters, first established in 1998, have consistently exceeded recent landings and do not appear, therefore, to constrain fishing. ICES recommended a zero quota in 2006, but this advice was not heeded by EU fishery managers. Mediterranean and Black Sea spurdog populations are unmanaged, despite a decline of more than 60 per cent reported in a Black Sea stock assessment for 1981–1992 [22].

As noted above, Malta has protected great whites, basking sharks and giant devil rays under national legislation. The basking shark received full protection in British waters in 1998 and is also a prohibited species within three miles offshore in the Irish sea, around the Isle of Man and Guernsey [38]. Similar legal protection (under the UK Wildlife and Countryside Act) has been proposed for Norwegian, common, longnose, white and black skates and angel sharks, based on species vulnerability and population declines, but action has been stalled for years [38].

Shark finning

In 2003, the EU adopted a regulation prohibiting shark finning in EU waters and by EU vessels worldwide. The regulation, however, uses extremely lenient enforcement standards and allows fins and carcasses to be landed separately. These loopholes are rendering this critical regulation all but meaningless and setting a poor example for other nations as they develop finning bans.

The EU fisheries management process

The Common Fisheries Policy (CFP) is the principal instrument for managing fisheries in EU Atlantic waters, although it does not apply to the Mediterranean Sea. The primary objective of the CFP is to: "ensure exploitation of living aquatic resources that provide sustainable economic, environmental and social conditions"[18]. The EC claims to apply the precautionary approach in conservation of resources to ensure sustainable use of, and minimize the impact of, fishing on marine ecosystems. Marine fish, including sharks, are considered common property for which common rules are adopted at the EU level and implemented by Member States [18].

The EU Commission's Directorate-General (DG) Fisheries has the sole right to initiate fisheries legislation. If agreed, such proposals are sent to Council Working Groups and the European Parliament for their consideration before being proposed for adoption by the Agriculture and Fisheries Council.

In principle, the EU Fisheries Council (made up of Agriculture and Fisheries ministers), takes decisions related to fisheries by qualified majority vote with Member States' votes weighted, roughly, according to population size. In practice, decisions are often made by

WEIGHTY MATTERS: FIN TO CARCASS RATIOS AND THEIR EFFECT ON SHARKS

In contrast to the science-based 5 per cent dressed-weight fin to carcass ratio in place in the US and Canada, the EU shark finning regulation established a substantially higher fin to carcass ratio limit of 5 per cent of the whole or 'live' weight which corresponds to dressed-weight ratios of 10 per cent or more. According to the IUCN, allowing a fin to carcass ratio of 6 per cent whole weight would allow 66 per cent of captured sharks to be finned. Because of the difference in standards between the EU and other countries, international finning prohibitions use a 5 per cent ratio without specifying whole or dressed weight. This approach, employed to accommodate the EU's weak standards, undermines the effectiveness of shark-finning bans on a global scale.

Although fin to carcass ratios vary among shark species, most species' fins weigh much less than 5 per cent of their whole carcass. While some fleets may take more fin and flesh off a shark than others, the market demands only the first dorsal, pectorals and lower tail fins. Higher fin to carcass ratios mean that more sharks can be legally finned. This loophole, and the ability to land fins and carcasses in separate ports, undermines the effectiveness, intent and purpose of the EU finning prohibition.

consensus. Traditionally, the Fisheries Council's ministers meet in December to decide fishing restrictions for the following year.

This process is informed by Commission Management Committees as well as a number of advisory bodies. ICES is an inter-governmental organisation of more than 1,600 Atlantic marine scientists that coordinates and promotes marine research in the North Atlantic (including adjacent waters such as the Baltic and North Sea) and assesses the status of regional fish populations. These assessments are then reviewed by ICES' Advisory Committee on Fisheries Management (ACFM), which is made up of representatives from the various countries whose recommendations serve as ICES advice. The Commission also consults its Scientific, Technical and Economic Committee on Fisheries (STECF), which is made up of national experts.

In the case of shared North Sea fish populations, the Commission negotiates with Norway.

Enforcement of EU fishing regulations is the responsibility of Member State authorities and the EU Inspectorate (25 inspectors). Establishment of a Fisheries Control Agency, to better coordinate EU fisheries control and monitoring activities, was proposed through the 2002 CFP reform.

The European Parliament has to date only a minor role in fisheries management. The Parliament gives its opinion and proposes amendments to legislative proposals after examination at the Committee level. Proposals related to fishing are reviewed by the Committee on Fisheries while environmental proposals are examined by the Committee on the Environment, Public Health and Consumer Policy. There are provisions for Parliamentary Committees to jointly review proposals, but these are of limited value in practice.

The Fisheries Committee of the European Parliament includes in its responsibilities the operation and development of the CFP and its management, the conservation of fishery resources, the common organisation of the market in fishery products, and structural policy in the fisheries sectors and international fisheries agreements [18].

"The basking shark received full protection in British waters in 1998 and is also a prohibited species within three miles offshore in the Irish sea, around the Isle of Man and Guernsey."

Generally, the Council may take a decision on fisheries matters only after it has sought the opinion of the European Parliament, but it is under no legal obligation to accept any of its amendments.

The EU also engages in bilateral and multilateral fishing agreements (through RFMOs and otherwise) regarding access to and management of fish populations of interest to the EU and other nations.

Conclusions and recommendations

Valuable shark populations are being seriously depleted and in some cases exterminated because of increasing pressure from today's fishing fleets. The EU is playing a leading role in this crisis. Despite improved management instruments and growing concern about the threats to sharks, EU restrictions on shark finning remain among the weakest in the world and no overall plan for EU shark management exists. Because of sharks' importance in ocean ecosystems and Europe's strong influence on global fisheries policy, EU shark regulations have a wide-reaching effect on the world's oceans. Science-based fishing limits for EU member state vessels are urgently needed to ensure sustainable management of sharks in the long-term.

"Science-based fishing limits for EC vessels are urgently needed to ensure sustainable management of sharks in the long-term."

Inadequate EU regulations allow finning and serious overfishing of sharks in Europe and around the world. The EC and ministers of fisheries and environment throughout Europe can improve this troubling situation by working to:

- require that shark fins and carcass be landed at the same time and at the same port;
- decrease the EU fin to carcass ratio to (or below) the international standard of 5 per cent dressed weight, or require that sharks be landed whole; and,
- develop and implement a more holistic European plan of action for sharks that includes precautionary limits on catch based on ICES advice, as well as protection for endangered species, reduction of bycatch, recovery plans for depleted species and management plans for others.

In working toward such a European plan of action, European countries should:

- immediately adopt and implement the TAC recommendations and other ICES scientific advice for shark and skate species that have been evaluated by ICES;
- elevate the priority of improving species-specific fisheries and trade data collection, and facilitating scientific assessment of the status of sharks, skates and rays in European waters and adjacent seas;
- secure national legislation and regional agreements to protect and conserve the shark species listed under CMS, the Barcelona and Bern Conventions, and additional shark species considered Endangered or Critically Endangered by the IUCN Shark Specialist Group;
- promote immediate, precautionary limits on international fisheries taking sharks through RFMOs, particularly for pelagic sharks at ICCAT; and,
- support and advance proposals by Germany to include the spurdog and porbeagle shark in CITES Appendix II and ensure adherence to existing CITES shark listings, resolutions and decisions.

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Note on terminology

In this report, the term 'shark' is often used to refer not only to species of sharks but also to closely related rays and skates, as well as the oft-overlooked chimaeras (rat, rabbit and elephant fish). Collectively these species, characterised by their cartilaginous skeletons, are known as chondrichthyan fishes (forming Class Chondrichthyes). This definition of 'shark' generally holds true in international fisheries policy documents including the United Nations' Food and Agriculture Organization's International Plan of Action for the Conservation and Management of Sharks, and other papers referenced here.

Note on shark data

Assessing the threats to sharks is usually complicated by a lack and/or inaccuracy (under- and overestimates as well as misidentification) of shark fishing information. Fishermen and fishing nations need to do a better job of reporting their shark catches, trade and discards; this information is sorely needed at species level, but rarely recorded as such. Too often, shark life-history information is also lacking, usually due to the low funding priority of shark research.

About the author

Sonja Fordham has directed shark conservation projects at The Ocean Conservancy since 1991. She joined the Shark Alliance as Policy Director in mid 2006. She is Deputy Co-Chair of the IUCN Shark Specialist Group and a member of the Board of Directors of the American Elasmobranch Society. She serves on numerous advisory panels relevant to Atlantic shark and ray conservation and has co-authored several publications on shark fisheries management. Ms Fordham actively promoted adoption of the 1999 United Nations Food and Agriculture Organization International Plan of Action for Sharks and has since worked for its implementation through the world's regional fisheries management organisations and global wildlife treaties. She was named "Environmental Hero" of 2000 by the US Department of Commerce and currently resides in Brussels, Belgium.

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THE SHARK ALLIANCE

The Shark Alliance is a not-for-profit coalition of non-governmental organisations dedicated to restoring and conserving shark populations by improving European fishing policy. Because of the influence of Europe in global fisheries and the importance of sharks in ocean ecosystems, these efforts have the potential to enhance the health of the marine environment in Europe and around the world.

The mission of the Shark Alliance is two-fold:

- to close loopholes in European policy regarding the wasteful and unsustainable practice of shark finning;
- to secure responsible, science-based shark fishing limits for long-term sustainability and ecosystem health.

To discover more about the Alliance visit: www.sharkalliance.org