PROPOSAL FOR INCLUSION OF SPECIES ON THE APPENDICES OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

A. PROPOSAL: Inclusion of the Northern Hemisphere populations of the *Squalus acanthias* Linnaeus, 1758 on Appendix II

B. PROPONENT: European Community and its Member States

C. SUPPORTING STATEMENT:

1. Taxon

	Kingdom:	Animalia
	Phylum:	Chordata
1.1	**Classis**:	Chondrichthyes, subclass Elasmobranchii
1.4	**Ordo**:	Squaliformes
1.5	**Familia**:	Squalidae
1.6	**Species**:	*Squalus acanthias* Linnaeus, 1758
1.7	**Common name(s)**:	**E**nglish: spiny dogfish, spurdog, piked dogfish **F**rench: aiguillat commun **S**panish: mielga, galludos, cazón espinozo, tiburón espinozo, espineto, espinillo, tollo, tollo de cachos **D**utch: doornhaai; **Da**nish: pighaj; **G**erman: Dornhai; **I**talian: spinarolo

2. Biological data

The spiny dogfish (*Squalus acanthias, figure 1*) is a small, temperate-water, migratory shark of shelf seas in the northern and southern hemispheres. Although naturally abundant, it is one of the more vulnerable species of shark to over-exploitation by fisheries because of its late maturity, low reproductive capacity, longevity, long generation time (25–40 years) and hence a very low intrinsic rate of population increase (2–7% *per annum*). These life history parameters (Table 1) result in a limited reproductive capacity and one of the lowest population growth rates calculated for any shark species. Smith *et al*. (1998) considered this species to have the lowest intrinsic rebound potential of 26 shark species analysed, at 2.3% annual rate of population increase from maximum sustainable yield (MSY) in the Northeast Pacific, compared with 4–7% in the Northeast Atlantic (Heessen 2003). Annual mortality is estimated as 0.092 in the Northwest Atlantic (NFSC 2003), or around 0.1, increasing to 0.3 for very old or young fish (ICES WGEF 2006).

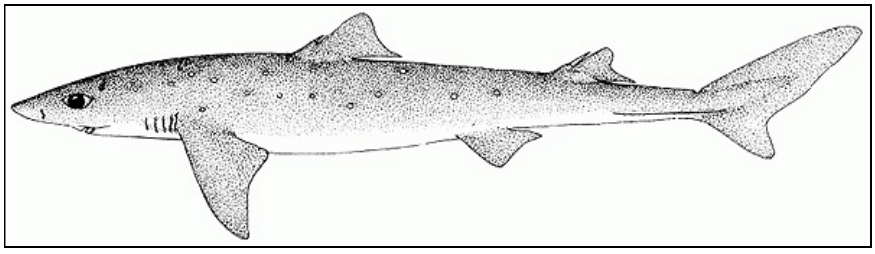

Figure 1: Spiny dogfish *Squalus acanthias*
(Source: FAO FIGIS 2003)

Age at maturity (years)	female:	12 (NW Atlantic); 23 (NE Pacific); 15 (NE Atlantic)
	male:	6 (NW Atlantic)/ 14 (NE Pacific)
Size at maturity (total length cm)	female:	75 (NWA); 93.5 (NEP); 83 (NEA); 70–100 (Mediterranean)
	male:	60 (NW Atlantic); 59 (Australia); 59–72 (Mediterranean)
Longevity (years)	female:	40–50 (NW Atlantic), >60 yrs (NW Pacific), or up to 100 years
	male:	35 (NW Atlantic)
Maximum size (total length cm)	female:	110–124 (N Atlantic); 130–160 (N Pacific); 200 (Med), 111 (NZ)
	male:	83–100 (N Atlantic); 100–107 (N Pacific); 90 (NZ)
Size at birth (cm)		18–33
Average reproductive age *		Unknown, but over 25 years; ~40 years in NE Pacific.
Gestation time		18–22 months
Reproductive periodicity		Biennial (no resting stage, litters are born every two years)
Average litter size		1–20 pups (2–15 NW Atlantic, 2–11 Med), increases with size of female
Annual rate of population Increase		2.3 % (N. Pacific); 4–7% (NE Atlantic)
Natural mortality		0.092 (NW Atlantic), 0.1 (0.3 for very old/young fish) (NE Atlantic)

Table 1 life history parameters of the spiny dogfish (*Squalus acanthias* Linnaeus, 1758)

2.1 Distribution

Squalus acanthias occurs in northern and southern temperate and boreal waters of 7–8°C to 12–15°C (figure 2) and has been recorded in the range States and FAO Areas listed under point 5. It is most common in coastal waters (10–200m) and fished inside 200-nautical mile Exclusive Economic Zones. Although some stocks undertake long distance seasonal migrations (e.g. NFSC 2003, Hanchet 1988), even crossing ocean basins (Templeman 1954, 1984), its distribution is fragmented into distinct populations separated by deep ocean-tropical waters, or polar regions. Genetic exchange across the Atlantic is considered very limited (Hammond and Ellis 2005). The principal populations occur in the Northwest and Northeast Atlantic (including Mediterranean and Black Seas), Northeast and Northwest Pacific (including Sea of Japan), South Atlantic and Southeast Pacific off South America, and New Zealand, with smaller populations off South Africa and southern Australia.

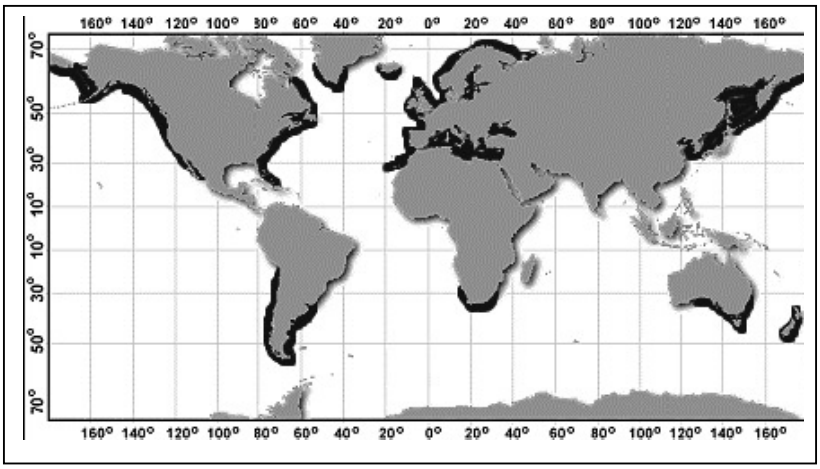

Figure 1. Global *Squalus acanthias* Spiny Dogfish distribution (Source: FAO 2003)

2.2 Population of *S. acanthias* in the Northern Hemisphere

The **Northeast Atlantic** *S. acanthias* population size has been estimated, at between 500,000 and 100,000 mature individuals in 2000, following a roughly 80% decline from 1980 (Annex 1 Figure 2, Heessen 2003 – Annex 1 Figure 3). In 2005, ICES advised: 'The stock is depleted and may be in danger of collapse. Target fisheries should not be permitted to continue, and by-catch in mixed fisheries should be reduced to the lowest possible level. Also in 2005, the ICES Advisory Committee on Fisheries Management (ACFM 2005) reported: "All experimental assessments indicate that the stock is at a record low level. Frequency of occurrence of spurdog in trawl surveys has declined and although large shoals are still caught, the frequency of these has declined. The level of exploitation is unknown, but the continuous decline in landings indicates that fishing mortality has been, and continues to be well above sustainable levels." All analyses presented in reports by the ICES Working Group on Elasmobranch Fisheries (WGEF) have indicated that the NE Atlantic stock has been declining rapidly and is at its lowest ever level. Preliminary assessments making use of the long time-series of commercial landings data suggest that this decline has been going on over a long period of time and that the current stock size may only be a small fraction of its virgin biomass (< 10%). The IUCN Red List assessment for the Northeast Atlantic is **Critically Endangered** (Fordham *et al*. 2006).

Canadian surveys in the Northwest Atlantic (Wallace *et al*. 2006) have produced mature female population size estimates for the Scotian Shelf (Nova Scotia, Atlantic Canada) stable at around 3.5 million (less than 3% of the whole population), but a rapid decline to about 78,000 mature females in 2004 on Georges Bank (a stock shared by the United States of America and Canada), and a reduction in distribution and abundance in the Gulf of Saint Lawrence. In 2006, National Marine Fisheries Service (NMFS) reported some rebuilding in the mature female portion of the Northwest Atlantic population (previously depleted by 75% by targeted fisheries), but continuing poor recruitment, decreased pup survival, declining immature female biomass and mature female size, and a skewed sex ratio (strongly favoring males) leaves cause for concern; complete rebuilding of the population is expected to take decades. The IUCN Red List categorises Northwest Atlantic *S. acanthias* as **Endangered**, on the basis of reductions in population size exceeding 50% (Fordham *et al*. 2006).

Squalus acanthias is very rare in the western **Mediterranean**, but regularly recorded in the eastern basin. The IUCN Red List assessments for Mediterranean and **Black Sea** *S. acanthias* populations are **Endangered, and Vulnerable** respectively (Fordham *et al*. 2006).

In the **Western North Pacific**, Sea of Japan, *S. acanthias* have been fully exploited since before 1897. There appears to have been a rapid decline in stocks after Japanese catches peaked at ~60,000t in 1952 and another decline after the 1970s.Catches had fallen to ~1000t by 1993 and continued to decline to an average of 458t in recent years (Fisheries Agency of Japan 2004). The current stock level is low and the trend decreasing. The IUCN Red List categorises this stock as at least **Endangered**, noting that it may prove to be Critically Endangered once a full regional review can be undertaken (Fordham *et al*. 2006).

Former intensive fisheries for *S. acanthias* in the **Northeast Pacific** apparently collapsed in 1910 and in the late 1940s. This stock has since recovered under low exploitation pressures in most of its range. The current IUCN Red List categorises Northeast Pacific *S. acanthias* as **Vulnerable**, on the basis of an estimated reduction in population size greater than 30% (Fordham *et al*. 2006).

2.3 Habitat

This is a continental shelf species, occurring from the intertidal to the shelf slope. *S. acanthias* are usually found swimming in large schools just above the seabed, but also move throughout the water column on the continental shelf. They have unusually been recorded to depths of 900m (Compagno 1984), but are most common from 10–200m (McEachran and Branstetter 1989). Segregation by size and sex makes schools of large pregnant females particularly vulnerable to fisheries (Compagno 1984).

2.4 Migrations

Squalus acanthias make latitudinal and depth migrations to stay within their optimum water temperature range (7-15°C) (Compagno in prep.). Although some stocks undertake long distance seasonal migrations (e.g. NEFSC 2003, Hanchet 1988), even crossing ocean basins (Templeman 1954, 1984), its distribution is fragmented into distinct populations separated by deep ocean, tropical waters, or polar regions. Extensive horizontal migrations (of up to 7000km) have, however, been recorded during tagging studies in the North Pacific Ocean (McFarlane and King 2003).

Tagging studies have been conducted off the UK since the late 1950s. Fish tagged off Scotland were regularly recaptured off the Norwegian coast (Aasen 1960, Hammond and Ellis 2005), suggesting that these sharks migrate in winter from Scotland to Norway, with a return migration in summer (Aasen 1962, Hammond and Ellis 2005). There were also some recaptures from outside the area: the Barents Sea and west of Ireland, southern North Sea, English Channel and northern Bay of Biscay (Hammond and Ellis 2005). Although the majority of returned fish were from Scottish and Norwegian waters, this may be the result of spatial differences in fishing activity, as Scottish and Norwegian waters were the major fishing grounds (Hammond and Ellis 2005). Fewer studies have been conducted south of the UK, but fish tagged and released in the Irish Sea were recaptured from northern Scotland to the Celtic Sea and fish tagged in the Celtic Sea were recaptured all around the UK (Hammond and Ellis 2005). Changes in the migration pattern of spiny dogfish in the North Sea have also been reported (Hjertenes 1980). Transatlantic migrations have occurred, but these are infrequent, and genetic exchange across the Atlantic is considered very limited (Hammond and Ellis 2005).

Mating and breeding migrations in New Zealand are described by Hanchet (1988) and Ministry of Fisheries (2006). Off New Zealand pregnant females migrate from deeper water to inshore waters, and then return to deepwater to give birth and mate (Compagno in prep).

2.5 Movement between international borders

About 71,000 spiny dogfish were tagged off the west coast of Canada from 1978 to 1988 (McFarlane and King 2003). This study showed that, aside from seasonal movements, male and female spiny dogfish of all sizes migrate considerably farther than suggested by previous studies. Some tagged spiny dogfish released between 1980 and 1987 in open coastal waters off the west coast of Vancouver Island, and northern British Columbia undertook extensive migrations, with recaptures throughout the North Pacific, from Japan, through Alaska, south to Mexico. Substantial movement from Vancouver Island, Canada, south to Washington State, USA, waters

was also recorded. Although the significance of such east to west exchanges is not known, they do provide evidence for trans-Pacific connection of spiny dogfish (McFarlane and King 2003).

Tagging studies off the UK suggest that stocks of spiny dogfish undertake separate winter migrations to the Irish Sea and the Norwegian coast, returning in summer to mix off the northwest of the UK (Compagno in prep, Holden 1962).

In the Northwest Atlantic, *S. acanthias* migrates from deep water off the middle of the US and southern States in spring, travelling northwards along the coasts of Newfoundland and Labrador, Canada, as well as southwards along the US Atlantic coast, sometimes to Cuba (Bigelow and Schroeder 1953, Compagno in prep).

3 Threat data

3.1 Direct threats to the population

The principal direct threat to *S.acanthias* worldwide is **over-exploitation** through targeted fisheries and bycatch. This is a valuable commercial species in many parts of the world, caught by commercial fisheries using bottom trawls, gillnets, line gear, and by sport fishermen using rod and reel. Of particular concern is practice of commercial targeting reproductive females (the largest and most valuable individuals) facilitated by the species' tendency to school by size and sex. Spiny dogfish are also caught as small as 50cm (~4–5 years old) and are therefore exploited before they reach maturity at 74–94cm. This results in a very unnatural population structure in heavily fished stocks, with low mature female biomass and skewed sex ratios The removal of the largest females also causes greatly reduced pup production (small, recently mature females bear small litters of small pups with low survival rates) (NEFSC 2003). In most cases, spiny dogfish catches are not restricted to levels advised by scientists.

Because *S. acanthias* occurs in many areas where gill nets, longlines and trawls are used, **bycatch** in these gears affects its stocks, but is often unreported and not included in national fisheries statistics. Those with small mesh size may kill young individuals, which will not reach the retail market and may not appear in catch records if discarded (NEFSC 2003, Anon. 2003, Bundy 2003). For example, the deepwater bottom trawl fishery for *Nephrops* and shrimps along the south coast of Portugal has large *S. acanthias* discards (European Parliament 1999). NFSC (2003) noted the high levels of by-catch in the Northwest Atlantic, estimating that the mean of discards (16,700t) was more than double that of reported landings in the United States (7200t). The authors stressed, however, that discards have a smaller impact upon stock status because they affect all size classes, while landings primarily impact mature females, which are the most vulnerable and important component of the population.

3.2 Habitat destruction

Coastal development, pollution, dredging and bottom trawling affect the coastal or benthic habitats on which *S. acanthias* and their prey are dependent (ASMFC 2002). Such environmental threats may have potential impacts on *S. acanthias* stocks associated with areas of habitat degradation and loss.

3.3 Indirect threat

Because of their tendency to form large schools, take bait intended for other species, and be of relatively low value, commercial and recreational fishermen may intentional kill *S.acanthias* taken as bycatch. Reports of this practice, usually through spiking the brain or snapping the spine, are particularly common along the U.S. east coast.

3.4 Threat connected especially with migrations

S. acanthias is a migratory species that usually strongly segregates by age and by sex. Their aggregating habit makes it easy for fishermen to continue to obtain good catches from a seriously depleted stock, and to target the most valuable part of the stock (large, usually pregnant females) as they undertake predictable seasonal migrations through fishing grounds. Management is in place in only a few range states, often for only a limited part of the range of highly migratory stocks, and is not always in line with scientific advice. Countries limiting spiny dogfish fisheries do not always coordinate their management programs for shared populations. Evidence from tagging studies shows that this species moves across state borders and uncoordinated regulation is ineffective for conserving a highly migratory species.

3.5 National and international utilization

Compared to most other shark species, catch and trade in *S. acanthias* are relatively well documented. This is due to its long history of domestic and international utilization. This is by far the most important shark species landed commercially in the Northeast Atlantic, where it has been of considerable importance to fisheries for 70 years.

Widely utilized for its flesh, particularly valued for human consumption in Europe, its liver oil and fins are also consumed. Some former fisheries were driven mainly by the demand for oil, until synthetic vitamin A became available and this market collapsed. Despite low quality, *S. acanthias* fins have been routinely traded in East Asia (for shark fin soup) for at least the two last decades of the 20th century (Rose 1996). Cartilage and hides are also utilised, and landings used to produce fishmeal and fertiliser if markets for human consumption are not available (Compagno 1984). They have also been utilized locally as scientific specimens for teaching purposes.

Spiny dogfish **meat**, derived from commercial target fisheries and landed bycatch, is eaten in Europe, Japan, South America and, to a lesser extent, in New Zealand and Australia (where it is considered coarse). It is consumed fresh, frozen or smoked. Markets favour mature females due to their larger size. In the United Kingdom, *S. acanthias* is known as "rock salmon," "huss" or "huss tail") and used mainly in fish and chips. In Germany, meat is sold as "See-Aal" (sea eel) and belly flaps are smoked to make *Schillerlocken* (Rose 1996). In France, fresh meat is sold as *aiguillat commun* or *saumonette d'aiguillat.* In the 1990s, industry groups in the northeast of the United States campaigned to create domestic demand for *S. acanthias* under the more palatable name "cape shark" (Fordham 2005) and this, together with promotional activity by seafood associations, has resulted in an increase in the acceptability of dogfish on the market of the United States.

While *S. acanthias* no longer retain their historical importance as a source of valuable **liver oil** for lighting and vitamin A, the oil is still utilised to some extent, likely mixed with that of other shark species. **Fins** may be utilised nationally in Japan but are of relatively low value because of their small size. The possible use of other parts and derivatives of *S. acanthias*, such as cartilage,

leather or curios (teeth or jaws) is not well documented or officially recorded and, if it occurs, it is of negligible importance compared with the utilisation of meat. Although more common in the past, Spanish fishermen still use sharkskin to polish and sand their boats (Rose 1996). *Squalus* heads are used as bait for other fisheries, in Morocco for instance (Fischer *et al*. 1987). An assessment by the United States of the importance of recreational fishing for *S. acanthias* concluded that this became a significant proportion of total landings from 2001 (NFSC 2003).

There are no global trade data available for *S. acanthias*. FAO trade data includes the species in its various generic shark trade groupings. The bulk of the trade in *S. acanthias* is included in the categories 'Dogfish (Squalidae) fresh or chilled' and 'Dogfish (Squalidae) frozen'. However the data reported in these categories would contain data for species other than *S. acanthias2* and are not meaningful for this analysis.

Since foreign markets are in most cases the driving economic force behind *S. acanthias* fisheries around the world (see 6.2), unregulated international trade into European States is the main threat to inadequately managed populations. The lack of adequate management of *S. acanthias* stocks in the majority of range States, coupled with the long established market demand for its products, has led to a direct impact on this species' populations. Fisheries that formerly caught *S. acanthias* as by-catch and largely discarded it are now moving towards landing and exporting its valuable products, likely driving further stock depletions.

4 Protection status and needs

4.1 National protection status

National biodiversity legislation is not known to be in force for the purposes of conserving *S. acanthias* or its habitats, nor for the purpose of trade regulation.

In recent years, EU spurdog TACs have been limited to bycatch only; spurdog catch thereby cannot exceed 5% of the live weight of fish onboard a vessel. ICES has recommended one TAC of zero for all ICES areas.

EC Regulation 1185/2003 prohibits shark "finning" (the removal of shark fins and subsequent discarding of the body). This regulation is binding on EC vessels in all waters and non-EC vessels in Community waters.

In Atlantic Canada, increasing landings led to the introduction of quotas that capped and allocated catches and bycatch at historic levels, pending investigation of sustainable exploitation levels. There is currently a quota for fixed gear licenses and scientific sampling, and small quotas for each trawl vessel. (Bundy 2003).

U.S. federal and state agencies restrict catches of *S. acanthias*, but attempts to coordinate management have been largely unsuccessful,. The first US Atlantic management plan, developed by the Mid-Atlantic and New England Fishery Management Councils in response to a decade of intense unregulated fishing (Bonfil 1999), took effect in 2000. NMFS has imposed low, science-based trip limits and quotas ever since, but federal management measures are not compulsory in state waters where directed fishing continued, particularly off Massachusetts.

Stocks of the west coast of the United States are minimally managed despite increasing interest in fisheries off Alaska and Washington State. Federal management of *S. acanthias* fisheries in the North Pacific of United States commenced in 2006 with trip limits pending stock assessment (possibly in 2007) and development of quotas. Off Alaska, they are regulated under an "other species" TAC (Alaska NMFS report 2000). Washington State includes *S. acanthias* in bottomfish management plans, but there are few species-specific measures. The directed fishery is subject to mesh restrictions but not quotas and a pupping ground has been closed to fisheries.

The Canadian Pacific quota, 2–3 times higher than recent catches, is based on a stock assessment undertaken in 1987 (Wallace *et al*. in prep.).

New Zealand has included *S. acanthias* in its Quota Management System (QMS) since 2004.

Japan monitors shark stocks and will recommend, when necessary, the introduction of measures for the conservation and management of shark resources (Japanese Fisheries Agency 2003). There are no spiny dogfish restrictions imposed by Asian countries.

Norway restricts its *S. acanthias* fishery with a minimum landing size intended to enable sharks to mature before capture. This is of limited value as it is not coupled with science-based limits throughout its range. There is some coordination between spiny dogfish management efforts f Norway and the European Union (discussed below).

4.2 International protection status

There are no international instruments for the conservation of *S. acanthias*; it is not listed on any international wildlife or fisheries agreement and has no international legal status. No efforts have been made to identify and protect critical *S. acanthias* habitat, although some is incidentally protected from disturbance inside in marine protected areas or static gear reserves.

The International Plan of Action (IPOA) for the Conservation and Management of Sharks urges all States with shark fisheries to implement conservation and management plans. However, this is voluntary and relatively few States have produced Shark Assessment Reports or Shark Plans. Some RFMOs have adopted shark resolutions to support improved recording or management of pelagic sharks taken as bycatch in the fisheries that they manage. *S. acanthias* is not pelagic and will not be covered by these measures.

Annex V of the OSPAR Convention on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area requires OSPAR to develop a list of threatened and/or declining species and habitats in need of protection or conservation in the OSPAR maritime area (Northeast Atlantic). *S. acanthias,* because of its biological sensitivity and population decline in national waters, was added to the list in June 2008.

4.2.1 Northeast Atlantic

The conservation and management of sharks in EU waters falls under the European Common Fishery Policy (CFP). The European Commission is currently developing a Community Plan of Action for Sharks; the document is not expected to be binding but will rather set the stage for future actions. The first EU Total Allowable Catch (TAC) for *S. acanthias* was established in 1988, but only applied to the North Sea (a small part of the European waters used by this stock), and was based on historic landings, not on scientific advice. Despite regular reductions, the TAC greatly exceeded recent North Sea landings until end 2004, when it was reduced by 74% after only 25% uptake in 2004 and may have become restrictive in this area in 2005.

In 2005, ICES advised: 'The stock is depleted and may be in danger of collapse. Target fisheries should not be permitted to continue, and by-catch in mixed fisheries should be reduced to the lowest possible level. A TAC should cover all areas where spurdog are caught in the northeast Atlantic. This TAC should be set at zero for 2006' (ACFM 2005). A 15% TAC reduction was implemented in the North Sea but no other management measures were introduced.

4.2.2 Northeast Pacific

The United States and Canada conduct cooperative surveys for Northeast Pacific *S. acanthias*, but there is no coordinated, international management for the stock (Camhi 1999).

4.3 Additional protection needs

The CMS Scientific Council agreed in March 2007 following consideration of a taxonomic review prepared by the IUCN SSC Shark Specialist Group (2007) that this threatened migratory species meets the criteria for listing on the Appendices and should be considered by the Conference of Parties to CMS in December 2008.

The inclusion of the Northern Hemisphere populations of *Squalus acanthias* in Appendix II of the CMS convention would highlight the urgency for conservation of this particularly vulnerable

species and facilitate coherency among currently uncoordinated and inadequate management measures. Listing would also contribute to immediate engagement and cooperation among the fisheries industry, FAO and RFMOs.

Successful engagement of CMS in migratory shark conservation and management depends on consultation and engagement with FAO, RFMOs and CMS Party Fisheries Departments. If such consultation is undertaken and opportunities are pursued for developing synergies between these two schools of living natural resource management, then there is considerable potential for CMS engagement to prompt higher priority for threatened shark species and facilitate improvement of existing conservation programs that appear at present to be inactive or ineffective in most regions.

The Northern Hemisphere populations of *S. acanthias* would benefit from conservation measures delivered through CMS in cooperation with other partners. As the greatest threats to shark stocks arise from target and bycatch fisheries, it follows that CMS may have greatest impact if it is able to complement, promote and enhance the activities of the fisheries management for example by identifying and addressing the gaps left by the implementation of traditional fisheries measures and the potential for synergistic efforts.

Summary**:**

The spiny dogfish (*Squalus acanthias*) is a small, temperate-water, migratory shark of shelf seas in the northern and southern hemispheres. Although naturally abundant, it is exceptionally vulnerable to over-exploitation by fisheries because of its late maturity, low reproductive capacity, longevity, long generation time (25–40 years) and hence a very low intrinsic rate of population increase (2–7% *per annum*). Its aggregating habit makes it vulnerable to fisheries.

S. acanthias fisheries in the north have been documented over many decades. Stock assessments reveal a decline of more than 95% from baseline in the Northeast Atlantic and a 75% reduction in mature females in the Northwest Atlantic in just ten years. Catch per unit effort and landings data indicate that some other stocks may have experienced a range of similar levels of decline. Elsewhere, increased fishing effort during a period of declining fish stocks and rising international market demand infers that other *S. acanthias* stocks are under similar pressure due to international trade demand for their products.

Management is in place in only a few States in a few regions and, in the majority of these, in only a limited part of the species' range and not well coordinated across jurisdictional boundaries. In most cases, restrictions have been inadequate to reverse declines and ensure future sustainable fisheries. There is no RFMO management of this species, although ICCAT will be undertaking a stock assessment of sharks in 2009, which would probably also include spiny dogfish.

The purpose of an Appendix-II listing for the Northern Hemisphere populations of *S. acanthias* is to facilitate and promote coherent and effective management measures among the broad range of organizations and measures that address the conservation of this species, and would include cooperation and immediate engagement with the fishing industry, FAO and RFMOs. These measures will complement and reinforce traditional fisheries management measures, thus also contribute to implementation of the UN FAO International Plan of Action for the Conservation and Management of Sharks and the conservation of the species.

For the time being, a listing of the Southern Hemisphere populations of *S. acanthias* does not seem to be justified based on the available information. However, existing data, in particular on fishing and landing of the spiny dogfish, has not yet been reviewed in a comprehensive manner, which creates uncertainty about the exact situation of those populations. Therefore it would be appropriate if the CMS Scientific Committee would facilitate the review of the existing data in order to enable parties to revisit this issue at CMS COP10.

5. Range States of the Northern Hemisphere populations of *Squalus acanthias*[1]

ALBANIA, ALGERIA, BELGIUM, Bosnia and Herzegovina, Canada, , China, CROATIA, Cuba, CYPRUS, Democratic People's Republic of Korea, DENMARK, EGYPT, FINLAND, FRANCE, GEORGIA, GERMANY, GREECE, Iceland, IRELAND, ISRAEL, ITALY, Japan, LATVIA, Lebanon, LIBYAN ARAB JAMAHIRIYA, LITHUANIA, MALTA, , Mexico, MONACO, Montenegro, MOROCCO, NETHERLANDS, NORWAY, PHILIPPINES, POLAND, PORTUGAL, Republic of Korea, ROMANIA, Russian Federation, SLOVENIA, SPAIN, SWEDEN, SYRIAN ARAB REPUBLIC, TUNISIA, Turkey, UKRAINE, UNITED KINGDOM, United States.

FAO Fisheries Areas: 21, 27, 31, 34, 37, 61, 67 and 77 (Annex 1, Figure 1).

6. Comments from Range States

7. Additional remarks

8. References

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[1] CMS Parties in capitals.

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ANNEX1

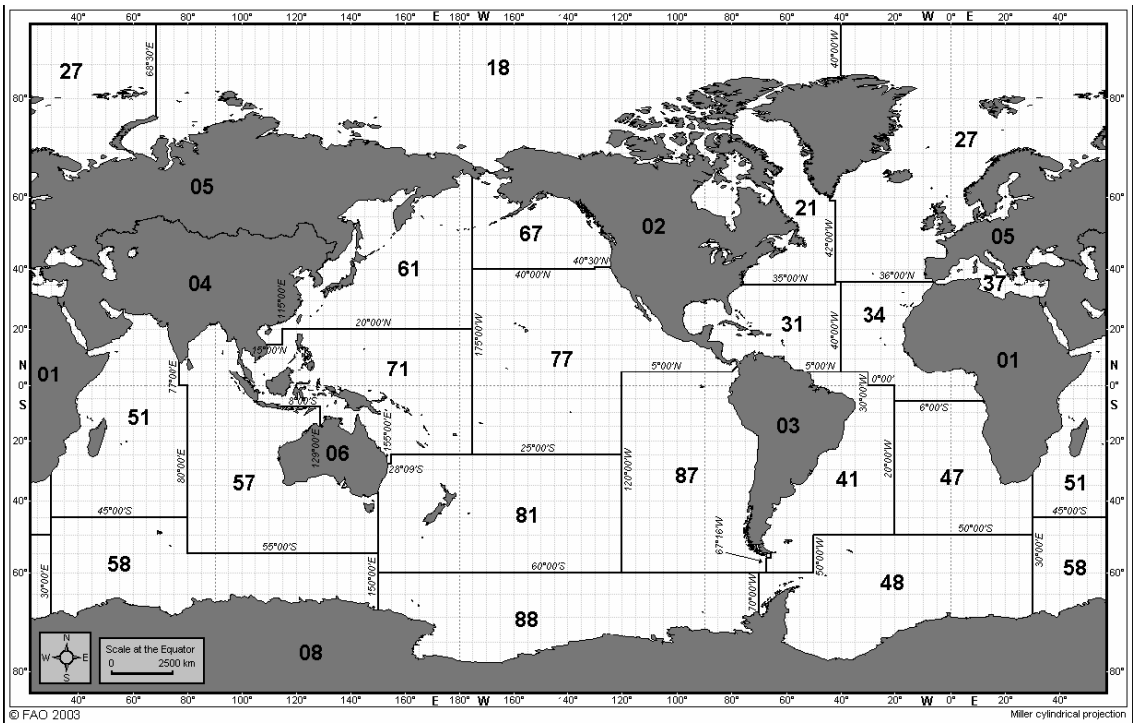

Figure 1. FAO fishing areas.

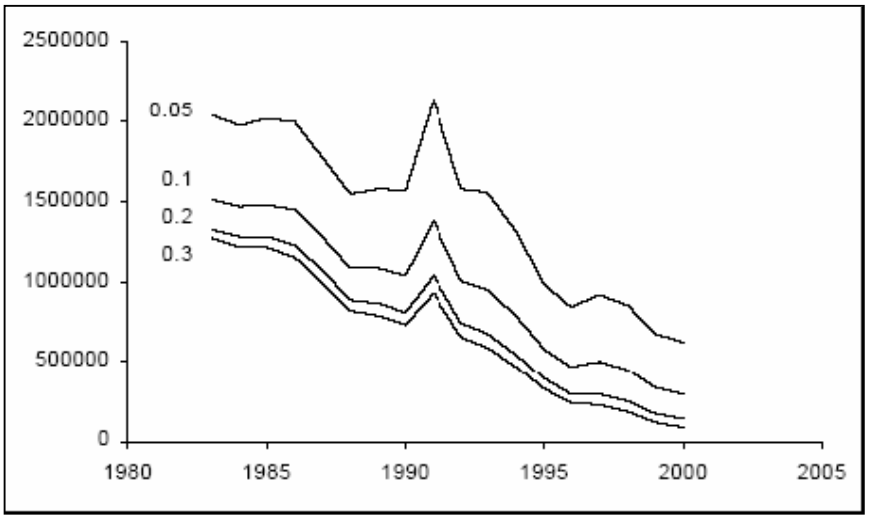

Figure 2. Trends in total population numbers of mature fish in the Northeast Atlantic estimated using a Separable VPA analysis of the catch numbers at age data. Each line represents a different assumption for terminal F (0.05–0.3) on the reference age in the final year.
Source: Figure 6.4.1.14, Heessen 2003.

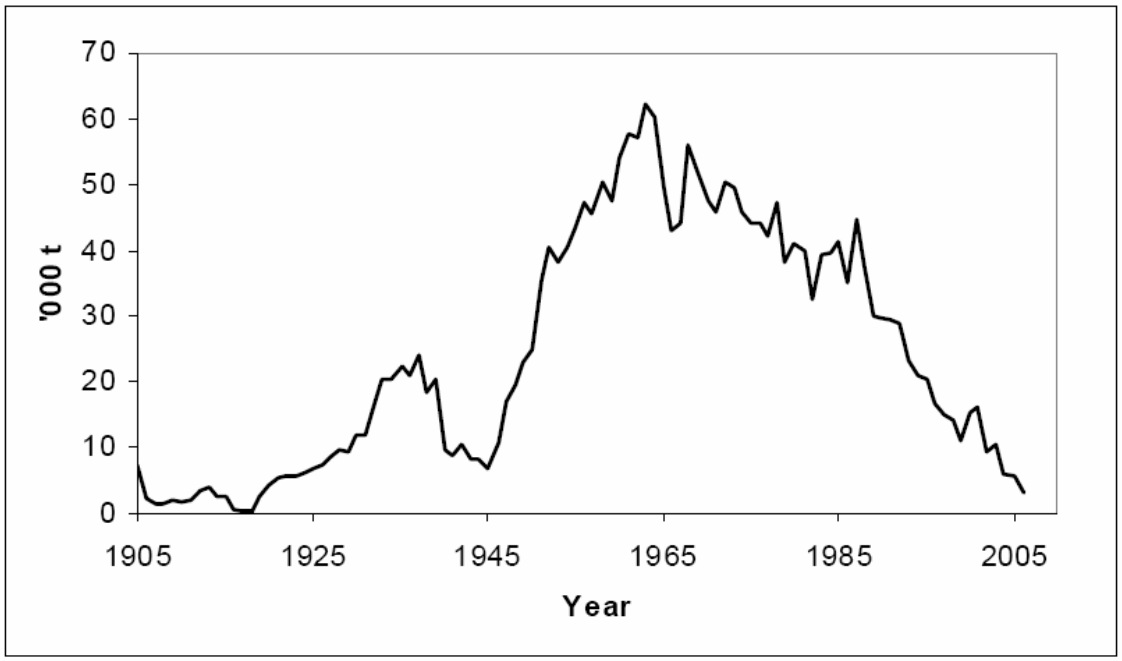

Figure 3. Northeast Atlantic spurdog. WG estimates of total international landings of NE Atlantic spurdog (1905–2006)
Source ICES WGEF 2007