Proposal to include the Porbeagle (*Lamna nasus*) in Appendix II CITES proposed by the Federal Republic of Germany (on behalf of the member states of the European Community)

Executive summary

- The large warm-blooded porbeagle shark (*Lamna nasus*) occurs in temperate water of the North Atlantic and southern oceans. It is relatively slow growing, late maturing, and long-lived, bears small litters of pups and has an intrinsic rate of population increase of just 5-7% per annum. It is highly vulnerable to over-exploitation driven by global market demand.
- *Lamna nasus* meat is high quality and high value, particularly in the European Union (EU). Its large fins are valuable. It is, therefore, taken in target fisheries and a retained utilised bycatch in other fisheries. Meat and fins enter international trade, but are generally not recorded at species level. Other products (liver oil, cartilage, jaws, teeth and skin) are less utilised. A DNA test is available for parts and derivatives in trade.
- The two North Atlantic target *Lamna nasus* fisheries are well documented; both unsustainable. Reported landings have dropped from thousands of tonnes to a few hundreds in less than 50 years (1950s to late 1990s) (Heessen 2003). The Northwest Atlantic stock assessment documents a decline to about 11% of baseline caused by fisheries overexploitation. There is no stock assessment for the more heavily fished Northeast Atlantic population, which is considered to have experienced a much more serious decline. No information is available for southern hemisphere or high seas stocks, which are a high value utilised bycatch in longline fisheries, particularly for tuna and swordfish.
- Management based on stock assessment and scientific advice is in place in the Canadian EEZ. Quotas in European Community waters apply only to non-EU fleets (i.e. of the Faeroe Islands and Norway). They greatly exceed total landings and have no sustainable management role. There is no management in the southern hemisphere. Regional Fishery Management Organisations (RFMOs) (CCAMLR and ICCAT) are not managing high seas fisheries for *Lamna nasus*.
- An Appendix II listing is proposed for *Lamna nasus* in accordance with Article II, paragraph 2(a). It meets the criteria in Resolution Conf. 9.24 (Rev.) criterion Bi) and ii) of Annex 2a (AC19 Doc. 9) for the two North Atlantic stocks, which have experienced significant and ongoing population declines. Despite lack of trade data, it is clear that all of the fins and some of the meat of this species enter international trade. *Lamna nasus* also clearly meets the existing and proposed new criteria for addition to Appendix I.
- Despite a lack of information on the status of the Southern Ocean population *Lamna nasus*, it is a utilised bycatch whose meat and fins enter international trade. The Southern Ocean population of *Lamna nasus* therefore qualifies for listing under paragraph 2(b) of Article II ("*species which must be subject to regulation in order that trade in specimens of certain species included in Appendix II in accordance with Article II, paragraph 2(a), may be brought under effective control*").
- *Lamna nasus* meets the guidelines suggested by FAO for the listing of commercially exploited aquatic species. It falls into FAO's lowest productivity category of the most vulnerable species; those with an intrinsic rate of population increase of <0.14 and a generation time of >10 years (FAO 2001). The North Atlantic stocks have clearly exceeded the qualifying level of 20% or less of historic baseline for Appendix I listing under the FAO guidelines.
- The 2003 IUCN Red List assessment for *Lamna nasus* is Near Threatened. The North Atlantic and Mediterranean stocks are more seriously threatened. Regional assessments are currently underway for these and other populations. The global status is also under review.
- An Appendix II listing would help ensure that exploitation of this threatened species is regulated and monitored, that international trade is not detrimental to the survival of the species, and would contribute to the implementation of the United Nations Food Agriculture Organisation (FAO) International Plan of Action (IPOA) for the Conservation and Management of Sharks.

13th Meeting of the Conference of Parties, Bangkok, 2-14 October 2004

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Inclusion of the porbeagle shark (*Lamna nasus* (Bonaterre, 1788)) on Appendix II of CITES in accordance with

- Article II, paragraph 2(a) based on Resolution Conf. 9.24 (Rev.) criterion Bi) and ii) of Annex 2a [AC19 Doc. 9 *Review of the criteria for amendment of Appendices I and II (Decision 12.97)*] for Atlantic (including waters north of the Arctic circle) and Mediterranean stocks; and
- Article II, paragraph 2(b), for Indo-Pacific (including Subantartic waters) stocks.

B. Proponent

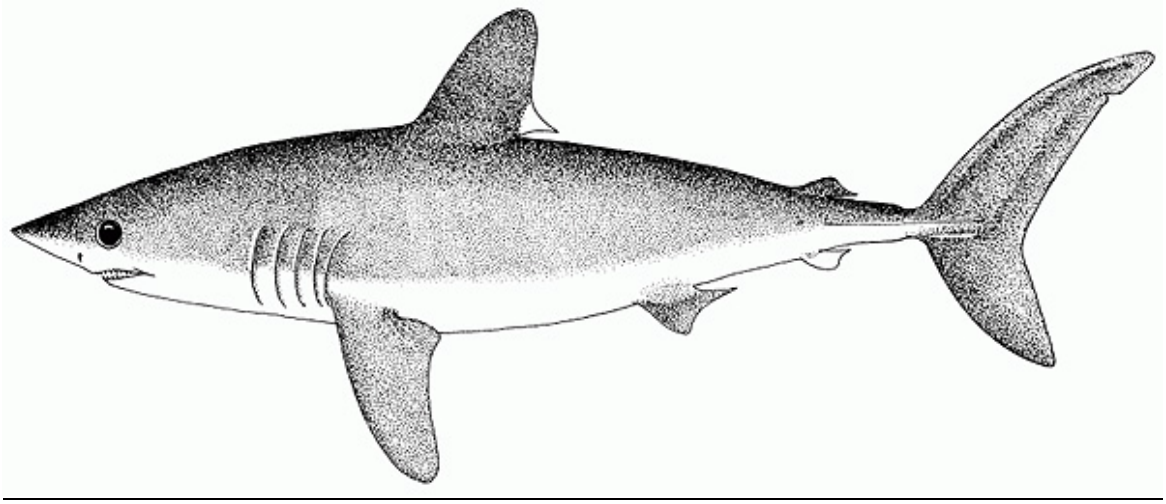
Germany (on behalf of the Member States of the European Community)

C. Supporting statement

1. Taxonomy

1.1 Class:	Chondrichthyes (Subclass: Elasmobranchii)	
1.2 Order:	Lamniformes	
1.3 Family:	Lamnidae (mackerel sharks)	
1.4 Species:	*Lamna nasus* (Bonaterre, 1788)	
1.5 Scientific synonyms:	See Annex 1.	
1.6 Common names:	English:	porbeagle
	French:	requin-taupe commun
	Spanish:	marrajo sardinero; Cailón marrajo
	Italian:	talpa
	German:	Heringshai
	Danish:	sildehaj
	Swedish:	hábrand; sillhaj
	Japanese:	mokazame

2. Biological parameters



350cm

Figure 1. Porbeagle *Lamna nasus* (*Source*: FAO Species Identification Sheet, 2003)

Porbeagle sharks are warm-blooded. They grow and mature faster than many cold-blooded sharks, but are still, however, relatively slow growing and late maturing, long-lived and bear only small numbers of young. This results in a low intrinsic rate of population increase (5-7% per annum) and vulnerability to over-exploitation, made worse by a tendency for fisheries to capture large immature specimens long before they reach maturity. Unmanaged and poorly managed fisheries for this species have been unsustainable.

Life history characteristics vary between stocks. Females mature at an age of 13 years and length of 232-259cm in the Northwest Atlantic, and at 185-202cm in the southern hemisphere. They produce few offspring, with litters of 1-5 pups (usually four), 65-80cm long being born after an 8-9 month pregnancy. They may breed every year. Males mature at 8 years old and a smaller size. Porbeagle sharks reach a maximum length of 365cm, weight of 230kg, and age of 26-45 years (Compagno 2001, Fischer 1987).

2.1 Distribution

The porbeagle shark is an active, warm-blooded epipelagic species inhabiting boreal and temperate waters, sea temperature 1-18°C. It ranges from close inshore (especially in summer) too far offshore, where it is often associated with submerged banks and reefs. These sharks occur mainly near the surface but also occasionally on the bottom to depths of 200m (when shoaling on reefs). They have occasionally been caught at depths of 350-700m. They occur singly, in shoals, and in feeding aggregations (Compagno 2001). The population segregates (at least in some regions) by age, reproductive stage and sex.

The species occurs in:
a) Northwest Atlantic: Greenland, Canada, United States, and Bermuda;
b) Northeast Atlantic: Iceland and western Barents Sea to Baltic, North and Mediterranean Seas, including Russia, Norway, Sweden, Denmark, Germany, Holland, United Kingdom, Ireland, France, Portugal, Spain, and Gibraltar; entire Mediterranean coast (not Black Sea); Morocco, Madeira, and Azores;
c) Southern Atlantic: southern Brazil and Uruguay to southern Argentina; Namibia and South Africa;
d) Indo-West Pacific: South-central Indian Ocean from South Africa east to between Prince Edward and Crozet Islands, between Kerguelen and St. Paul Islands, and southern Australia, New Zealand. Subantarctic waters off South Georgia, Marion, Prince and Kerguelen Islands; and
e) Eastern South Pacific: southern Chile to Cape Horn (Compagno 2001).

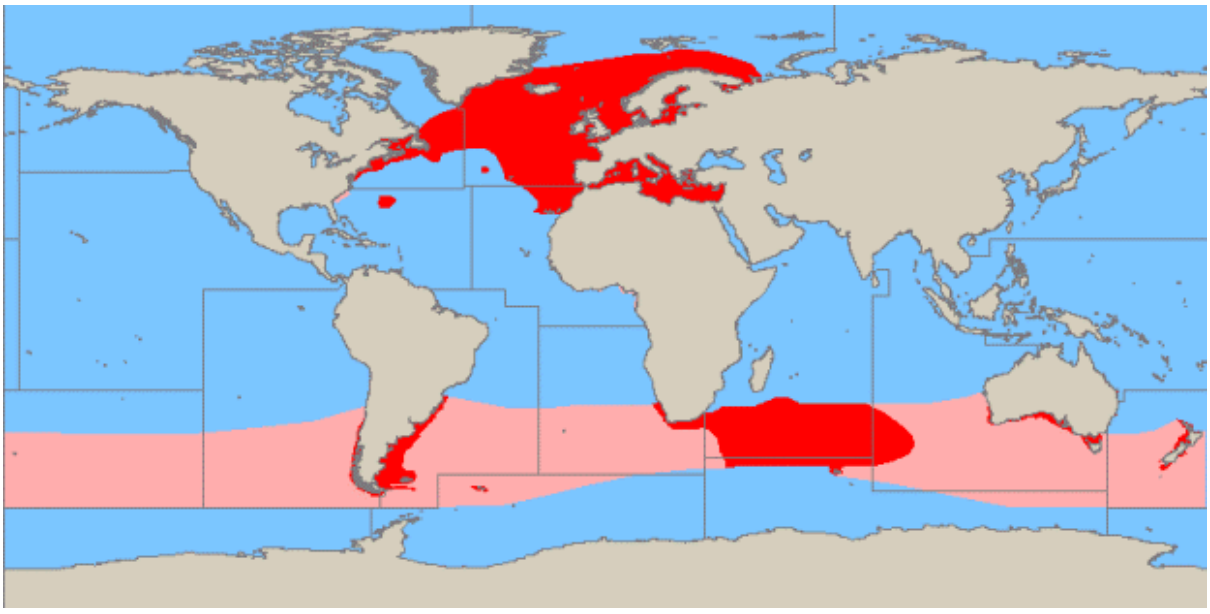


Figure 2. Distribution of porbeagle (Red/Dark: certain, Pink/Light: uncertain)
(*Source*: FAO Species Identification Sheet 2003)

There is apparently no genetic exchange between the northwest and northeast Atlantic populations. The stock structure of the southern hemisphere population(s) is unknown.

2.2 Habitat availability

Critical habitats for this species and threats to these habitats are unknown. High levels of heavy metals (particularly mercury) in such habitats would be of concern because of their bioaccumulation and bio-magnification in top oceanic predators, but their impacts on population fitness is unknown. Potential effects of climatic changes on the world oceans temperature and related biomass production could impact porbeagle food sources.

2.3 Population status

Global: The porbeagle shark has a relatively low reproductive potential, with an intrinsic annual rate of population increase from maximum sustainable yield of 5-7% because of its slow growth, late maturity and small litter size (see above). The 2000 IUCN Red List assessed the porbeagle shark as 'Near Threatened' globally, with North Atlantic stocks more seriously threatened following population depletion caused by unsustainable longline fisheries pressure. This assessment is currently under review.

Southern hemisphere: Longline swordfish and tuna fleets in the southern hemisphere are presumed to take a significant bycatch, but no trend data or stock assessments are available.

Northwest Atlantic: A detailed stock assessment is available for porbeagle within the Canadian 200-nautical mile Exclusive Economic Zone (EEZ). According to the Canadian Department of Fisheries and Oceans (DFO 2001), the biomass in 2000 was depleted to 11-17% of virgin levels in 1961, despite the introduction of management in the 1990s. Management measures have since been improved and a Total Allowable Catch (TAC) was introduced in the US and Canadian fisheries.

Northeast Atlantic: No stock assessment is available, but because this population was depleted well before that in the Northwest Atlantic and has not benefited from sustainable fisheries management measures, it is presumed more seriously depleted than that in Canadian waters. This population was assessed as Vulnerable in the 2000 IUCN Red List of Threatened Species (Stevens 2000), but this assessment is under review and likely to be upgraded to a more severe assessment of risk.

Annex V of the Convention on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area [also called OSPAR (Oslo-Paris) Convention] requires OSPAR to develop a list of threatened and declining species and habitats in need of protection or conservation in the OSPAR maritime area (Northeast Atlantic). OSPAR member states were invited in 2001 to submit proposals for inclusion on this list. In response, Portugal –on behalf of the Azores, proposed to list porbeagle *Lamna nasus* in the wider Atlantic because of its biological sensitivity, keystone importance and the severe decline in its population. This species has not yet been added to the OSPAR list of threatened and/or declining species and habitats.

Some range States have included the species in their Red List, such as Germany and Sweden where porbeagle is listed as vulnerable (VU) (Binot & al. 1998, E. Mehnert, Swedish Board of Agriculture, *in litt*. to the German Ministry of Environment (BfN), 23 September 2003). [Further information on national red listings will be completed later].

2.4 Population trends

North Atlantic populations of porbeagle, which represent the major source of world catches, have declined significantly since fisheries began. Of the reported landings since 1950 (as available from FAO), which are considered broadly to represent population trends for this highly valuable fish, 59% have been taken from Northeast Atlantic waters (Figures 3 and 4), and 40% from the Northwest Atlantic (Figure 6, Table 1). This does not include significant landings reported in the Northeast Atlantic from before 1950, which would increase the former figure very significantly. Fisheries trends in the North Atlantic are described in more detail below.

Porbeagle landings from the Southern Hemisphere are only reported to FAO by New Zealand in the Pacific southwest (21t in 1997), and are minor in comparison with those in the North Atlantic (Figure 6). No trend data are available for the southern stocks.

Northwest Atlantic

Porbeagle fishing in the Northwest Atlantic started in 1961, when a fleet of Norwegian longliners began operating off the coast of New England and Newfoundland after the Northeast Atlantic stocks became depleted (Figure 7). The initial high reported landings peaked in 1961, but then decreased very quickly (Figure 6). By 1965 many of the vessels had switched to other species or moved to other grounds (DFO 2001). Smaller landings were also reported by Faeroese fishing vessels from around the same time and throughout the 1970s and 1980s (Figure 6). Although Norwegian and Faroese reported landings represent 53% and 31% of the total 1950-2001 reported landings in the Northwest Atlantic, no landings have been reported since 1995 due to the introduction of Canadian management controls in Canadian and US EEZs, and the exclusion of the Norwegian and Faroese fleets.

Three Canadian vessels entered the targeted Northwest Atlantic fishery in 1994. Landings of over 1000 tonnes (1 tonne (t) = 1000kg) were reported in the late 1990s (Figure 7), but despite the establishment of quotas, 2001 reported landings were only 5% of their historic peak in 1964 (Table 1) and a recent Canadian assessment (DFO 2001) indicates that biomass in 2000 was 11-17% of virgin levels in 1961.

Northeast Atlantic

Porbeagle has been fished in this region by many European countries, principally Denmark, France, Norway and Spain (Figure 8). The Northeast Atlantic fishery began when Norway started targeting porbeagle in the 1930s. Norwegian landings first reached a peak of 3884t in 1933. About 6000t were taken by the Norwegian fleet in 1947, when the fishery reopened after the Second World War. Since that time, Norwegian landings from the Northeast Atlantic have decreased to only 10 - 40t/year in the late 1980s/early 1990s (DFO 2001; Figure 8). [ICES data from 1930s to 1950s are still awaited to be included].

Northeast Atlantic porbeagle is also caught by a small Danish fleet of specialised shark longline vessels, predominantly working in the North Sea but also extending into the Northwest Atlantic in the 1980s (DFO 2001). Average landings from the Danish porbeagle fishery fell from over 1500t in the early 1950s to less than 100t throughout the 1990s (Figure 8).

French longliners have operated a directed fishery for porbeagle since 1977. Reported landings from the main fishing grounds in the Celtic Sea and Bay of Biscay decreased from over 1092t in 1979 to 3-400t in the late 1990s.

Spanish vessels appear to have taken porbeagle opportunistically both in the early and late 1970s and since 1998. It is unclear, however, whether the very variable early landings data from the Spanish fleet (from nil to nearly 4000 t/year Figure 8) represents huge variations in catches, possibly the result of 'boom and bust' fisheries removing different segments of the stock, or differences in catch reporting. Bonfil (1994) estimated that 50t of porbeagle were taken in the Spanish longline swordfish fishery in the Mediterranean and Atlantic during 1989. Additionally, in the long line fishery in the Bay of Biscay (ICES Area VIII, Figure 3) directed at blue shark, about 30t of mainly porbeagle and shortfin mako (*Isurus oxyrinchus*) were landed in Basque ports (Spain) during the period 1998 - 2000. Based on ICES data (Heessen 2003), annual landings from Area IXa into mainland Portugal are reported to have peaked at almost 3000t in 1987-88, but such records do not appear in the FAO statistics (Figure 8).

Catch data for the different fishing areas (available from ICES only from 1973) show that the 1978 Spanish catch was taken in the Bay of Biscay (Figure 9). The third pulse of Spanish landings reported since 1998 were taken again in the Bay of Biscay and also in the waters off Portugal (ICES Area IX) and further offshore around the Azores (Area X). This movement to offshore fishing is also reflected in the reported landings from ICES sub-regions of the Bay of Biscay, which show a trend from the inshore regions VIIIa and b in the 1970s and 80s, to the offshore sub-regions VIIIc, d and e since 1989. Reported landings from the historically most important fisheries, around the UK and in the North Sea have decreased to low levels in 2002 (Figure 9).

South America
The species has been reported on the Argentinean continental shelf, but the status of the population is yet to be assessed (Victoria Lichtstein, CITES authority of Argentina, *in litt*., 27 October 2003).

2.5 Geographic trends

No information is available on any changes in the geographic range of porbeagle, but this species now appears to be scarce in areas where it was formerly commonly reported, if not absent (e.g. in the Western Mediterranean, Alen Soldo *in litt*. 2003).

2.6 Role of the species in its ecosystem

This shark feeds mainly on small to moderate-sized pelagic schooling fishes, including mackerel, and pilchards and herring, also on demersal fishes including gadoids and other sharks, for instance spiny dogfish (Compagno 2001). In the Northwest Atlantic, pelagic fish and squid are the main diet in deep water, and pelagic and demersal fish are important in their diet in shallow water (Joyce *et al*. 2002). As with many other large shark species, the porbeagle is an apex predator, occupying a position near the top of the marine food web (it does not feed on marine mammals). Stevens *et al*. (2000) warn that the removal of populations of top marine predators may have a disproportionate and counter-intuitive impact on trophic interactions and fish population dynamics, including decreases in some of their prey species. Aside from humans, there is little known about predators of porbeagle sharks, but orcas and white sharks might take this species (Compagno 2001).

2.7 Threats

2.7.1 Directed fisheries

As described above, intensive, directed fishing for porbeagle sharks in the North Atlantic populations has been the major threat to populations during the twentieth century. This species is also a valued target game fish species for recreational fishing in Ireland, USA and UK, as well as catch and release in Canada (FAO 2003, DFO 2001).

2.7.2 Incidental mortality

Porbeagles are caught incidentally in many fisheries, particularly longline fisheries, also by gill nets, driftnets (particularly in the Mediterranean Sea –Fleming and Papageorgiou 1997), pelagic and bottom trawls, and handlines. The high value of porbeagle shark meat means that this is usually an exploited bycatch, at least in the North Atlantic. The exception is in those high seas tuna and billfish fisheries where vessels holding space is too limited to enable even valuable shark carcasses to be retained; in these cases the fins alone may be retained. Examples of the latter may include the considerable but poorly-recorded bycatch fishery for porbeagle by Japanese longliners and probably the pelagic fishing fleets of other countries in the southern Indian Ocean and probably elsewhere in the Southern Hemisphere (Compagno 2001). Porbeagle occurs as a complementary bycatch (fins utilized) of the Japanese longline fishery for southern bluefin tuna off Tasmania and New Zealand. It has recently showed up as bycatch of demersal longlines for Patagonian toothfish (*Dissostichus eleginoides*) in the southern Indian Ocean and by the Argentinean fleet (Victoria Lichtstein, CITES Management Authority of Argentina, *in litt*. to TRAFFIC Europe, 27 October 2003). Porbeagle is also reported to be part of the by-catch of swordfish fisheries operating in international waters off the coast of Argentina and Uruguay. Despite the large amount of fishing activity that might be expected to result in a porbeagle bycatch in the Southern Hemisphere, New Zealand is the only country that reports landings to FAO, indicating that the southern catch is largely unreported.

3. Utilisation and trade

Porbeagle shark products include fresh and dried-salted meat for human consumption, oil and fishmeal for fertilizer, and fins for shark-fin soup (Compagno 2001). The commercial value of the species has been documented through present and past market surveys (Rose 1996, and TRAFFIC Europe 2003 market surveys). Findings indicate that the demand for fresh, frozen or processed meat, as well as fins and other products of porbeagle is sufficiently high to justify the existence of an

international market, in addition to national utilisation. Despite the high value of its meat, and unlike other high-priced fish such as swordfish, bluefin tuna and spiny dogfish, trade in porbeagle is not documented at species level. This makes it difficult to assess the importance and scale of its utilisation worldwide. The species is also utilised for sports fishing in Ireland, USA and UK (FAO 2003), with catches either retained or tagged and released (DFO 2001).

3.1 National utilisation

Meat
According to Gauld (1989), porbeagle was one of the most valuable (by weight) marine species landed in Scotland in the 1980s. In 1997 and 1998 porbeagle meat was auctioned at EUR 5-7/kg, about four times the wholesale price of blue shark (EUR 1.5/kg) (Vas and Thorpe 1998). In Newlyn fishing harbour (South England), the retail price for fresh porbeagle shark loin is about EUR 25/kg (TRAFFIC Europe market survey, November 2003). In Germany it is offered as meat of "Kalbsfisch" or "See-Stör".

Other products
Porbeagles may be utilised nationally in some range states for their liver oil, cartilage and skin (Vannuccini 1999). Low-value parts of the carcass may be processed into fishmeal. There is limited utilisation of jaws and teeth as marine curios. No significant national use of porbeagle parts and derivatives has been reported, partly perhaps because records at species level are not readily available, and partly because landings are now so small, particularly in comparison with other species.

3.2 Legal international trade

Meat
A great deal of trade occurs between European Union (EU) Member States, such as UK exporting to France and Spain and Italy importing from France. Canada declared it exports porbeagle meat to the EU, which in turn is reported to export porbeagle to the USA, where it is consumed in restaurants (Vannuccini 1999). However, these commercial transactions were not quantified nor their economic value estimated. Until targeted customs control and monitoring systems, or compulsory reporting mechanisms to FAO are established, data on international trade in porbeagle products will not be available. Currently, the scale and value of global consumption of the species cannot be assessed.

Fins
Among the 10 nations recorded by FAO as trading in porbeagle products, only Argentina and Norway are reported to export fins of this species (Vannuccini 1999), but this is because these products are not usually declared at species level, not because trade does not occur. The species does not appear on the list of preferred species for its fins (Vannuccini 1999) and was reported to be relatively low value by McCoy and Ishihara (1999), quoting Fong and Anderson (1998).

Others
Porbeagle is included in the list of shark species whose hides are processed into leather and livers are extracted for oil (Vannuccini 1999, Fischer 1987), but trade records are not kept. Cartilage is probably also processed and traded. Waste of shark parts are used in the production of fishmeal, which is probably not a significant product from porbeagle fisheries because of the high value of the species meat (Vannuccini 1999).

3.3 Illegal trade

Because no national legislation has been adopted by range States or trading nations to regulate trade in *Lamna nasus*, there is no evidence for illegal trade taking place. Where strict fishery management controls are in place for porbeagle (i.e. in Canadian waters), the infringement of these controls could lead to illegal trade. No evidence for such trade has been identified.

3.4 Actual or potential impact of the trade

The unsustainable porbeagle fisheries described above have been driven by the high value of the meat in national and international markets. Trade has therefore been the driving force behind

depletion of populations in the North Atlantic and may potentially threaten southern hemisphere populations.

3.5 Captive breeding for commercial purposes

Porbeagle sharks have never been maintained in captivity and are probably unsuitable candidates for aquaria. Their life history constraints also preclude captive breeding for commercial purposes.

4. Conservation and Management

4.1 Legal status

4.1.1 National

Porbeagle sharks are not known to have been awarded any legal status in any range state (their management status is described below).

4.1.2 International

The porbeagle shark is not listed on any international wildlife or fisheries agreement and has no international legal status. A proposal to add the species to the OSPAR Convention list of threatened and declining species has not been adopted (see section 2.3).

4.2 Species management

4.2.1 Population monitoring

Large numbers of porbeagle sharks may be taken as bycatch in high seas fisheries targeting tuna and billfish. Some Regional Fisheries Management Organisations (RFMOs) may, under their terms of reference, monitor if not manage these bycatch shark fisheries. The remit of the International Commission for the Conservation of Atlantic Tunas (ICCAT), for example, covers other species of fishes exploited in tuna fisheries. ICCAT has adopted specific resolutions, including *Resolution 95-2 – Cooperation with FAO to study status of stocks & shark by-catches*, to support improved management of shark stocks, including studies on shark by-catch. It has recommended that the Commission Contracting Parties (CPC) develop and conduct observer programs to collect accurate data on shark catches and discards by species, particularly blue (*Prionace glauca*), porbeagle (*Lamna nasus*), and shortfin mako sharks (*Isurus oxyrinchus*), but Members are not complying with its guidance and the value of these data is limited. Porbeagle was later excluded from the above list of three species for particular attention (ICCAT Resolution 01-11 –*Atlantic sharks*). Data on porbeagle mortality and discards are recorded in the Atlantic shark catch statistics (last updated by ICCAT on 25 June 2001), but these data are outdated and seem largely incomplete, possibly underestimating the impact of by-catch on the species (Excel file at http://www.iccat.es).

Although catches are reported to ICES, there is no monitoring of porbeagle populations in the Northeast Atlantic. In the Northwest Atlantic, monitoring of porbeagle catches is undertaken by scientific observer programs, which trigger management decisions when the quota is reached (Campana 2003). Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) does not monitor porbeagle catches in the southern ocean. [Additional information may become available from the IOTC (Indian Ocean Tuna Commission)]

4.2.2 Habitat conservation

None.

4.2.3 Management measures

The International Plan of Action (IPOA) for the Conservation and Management of Sharks, adopted by the FAO at the 23rd Session of the Conference on Fisheries (COFI) in February 1999, urges states with active shark fisheries to implement conservation and management plans. However, this initiative

is voluntary and, although 116 countries reported shark landings for 2001 to FAO, members of FAO reported to the 25th session of COFI in February 2003 that only six countries had developed a National Plan of Action (NPOA) while a further 11 have partially developed a NPOA for sharks.

At the 12th meeting of the Conference of the Parties of CITES, it was reported (Doc. 41.1 *Conservation and management of sharks*) that, despite significant landings of sharks and their products, progress on the implementation of the IPOA was negligible and that the NPOA-Sharks are not developing rapidly enough. The AC agreed at its 19th meeting (August 2003) to create an inter-sessional working group in order to better implement CITES Resolution Conf. 12.6 and associated Decisions, including a critical appraisal of progress with implementation of the FAO IPOA. A report on progress will be submitted to the 20th meeting of the Animals Committee.

Northeast Atlantic
Since 1982, a resource allocation agreement between the European Community (EC), Norway and the Faeroe Islands, has provided the fishing fleets of the latter two states with a Total Allowable Catch (TAC –annual catch quota) for porbeagle in EC waters. Despite reductions over the years, the combined value of these quotas has still been higher than total landings from the Northeast Atlantic since 2000 (Norway currently receives a quota of 200t and the Faeroe Islands 125t) and there is no TAC for EU fishing fleets catching porbeagle in EC waters. The European Commission's draft NPOA (2001) acknowledges that the management of elasmobranchs goes well beyond the EC Common Fisheries Policy (CFP) and should be related to other environmental legislation; this is a matter that needs to be addressed by the EU for this and other vulnerable species.

Northwest Atlantic.
A Canadian management plan that limits the number of licenses, types of gear, fishing areas and seasons, prohibits finning, and restricts recreational fishing to catch-and-release only, has been in force since 1995. Fisheries management plans for pelagic sharks in Atlantic Canada established non-restrictive catch guidelines of 1500t for porbeagle prior to 1997 (O'Boyle *et al*. 1996). Due to the limited scientific information available at the time, abundance, mortality and yield calculations could not be made. A provisional TAC of 1000t was therefore set in place for the period 1997-1999, based largely on historic reported landings and the observation that recent catch rates had decreased (O' Boyle *et al*. 1998). In 1988, the Canadian government initiated a research program, which included all aspects of porbeagle biology and population dynamics. This, combined with industry support and US collaboration through the National Marine Fisheries Service (NFMS), increased the understanding of porbeagle biology and population dynamics (DFO 2001) and led to two consecutive analytical stock assessments (Campana *et al.* 2001 & 1999, Hurley 1998). Based on these assessments, the Shark Management Plan for 2002-2006 reduced the TAC to 250t. This value is calculated to be close to MSY and should allow stock recovery (Campana *et al*. 2003).

Australasia
In 1991, Australia brought in legislation that prevented Japanese longliners fishing in the EEZ from landing shark fins unless they were accompanied by the carcass. Since 1996, these vessels have not fished in the Australian EEZ. Finning is currently prohibited on domestic Australian tuna longliners. A small regulated fishery is also permitted by New Zealand (Compagno 2001). Currently there are no other management measures applicable to the Antarctic and Southern Ocean.

4.3 Control measures

4.3.1 International trade

Other than the usual sanitary regulations related to seafood products, there are no control measures or monitoring systems to assess the nature, level and characteristics of international trade in porbeagle.

4.3.2 Domestic measures

None, except for the usual sanitary regulations.

5. Information on Similar Species

Lamna nasus is one of five species in the family Lamnidae, or mackerel sharks, which also includes the white shark *Carcharodon carcharias* and two species of mako, genus *Isurus*. The other member of its genus is the salmon shark *Lamna ditropis*, which most resembles the porbeagle shark but is restricted to the North Pacific and the Arctic fringe where porbeagle does not occur. It is imported by Japan (Sonu 1998). The mako shark *Isurus oxyrinchus* could be mistaken for porbeagle in Mediterranean fisheries (Anon. 2003 http://www.zoo.co.uk).

With regard to meat, the product most commonly traded for this species in Europe, porbeagle is one of the highest priced shark meat in trade. Several recent studies on shark DNA show promising perspectives for elasmobranch species identification (Chapman *et al*. 2003, Hoelzel 2001) as well as for the rapid assessment of intra-specific variation, such as sub-species or population differentiation and structure (Keeney and Heist 2003, Stoner *et al*. 2002). There is significant potential for the application of these techniques to other species, such as porbeagle. Detailed methodologies for the development of a species-specific primer and the multiplex PCR (Polymerase Chain Reaction) screening assay are given in Pank *et al*. (2001) and Shivji *et al*. (2002) for several lamnid sharks, including porbeagle, shortfin mako and longfin mako sharks (also silky, blue, sandbar and dusky sharks). A DNA test for the identification of porbeagle meat, fins and other products that are less relevant to international trade, can be developed soon (Dr Arne Ludwig, Institute for Zoo and Wildlife Research, Department of Evolutionary Genetics (Berlin), pers. comm. to TRAFFIC Europe, November 2003).

6. Other comments

In response to a preliminary consultation undertaken by the relevant German government agency (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit) on the initiative to draft a proposal for the inclusion of porbeable in Appendix II of CITES, eight countries provided their opinion and/or input. Two clearly stated their support to this initiative and one indicated that it would not be supportive of such proposal. Among the five remaining responses, while three did not express their opinion on the conservation status of the species, the two other countries recognised the need for improved conservation measures, such as red listing.

7. Additional remarks

7.1 Assessment of porbeagle under the CITES biological criteria

This proposal for the listing of porbeagle shark on Appendix II of CITES is based on the following assessment of the species biological status, using CITES Appendix II criterion B (i) and (ii) (Ref. AC19 Doc. 9: "*B. It is known, or can be inferred or projected, that harvesting of specimens from the wild for international trade has, or may have, a detrimental impact on the species by either i) exceeding, over an extended period, the level that can be continued in perpetuity; or ii) reducing it to a population level at which its survival would be threatened by other influences*.").

a. Due to its low reproduction rate and late age of maturity, porbeagle is especially vulnerable to over-exploitation by unregulated fisheries driven by global market demand.
b. The species has been subjected to unsustainable fisheries in the North Atlantic, where reported landings dropped from thousands of tonnes to a few hundreds in less than 50 years (1950s to late 1990s) (Heessen 2003).
c. The high market value of porbeagle meat makes it a competitive commodity for international trade, particularly to the EU. All or most fins landed will have entered international trade.

7.2 Assessment of the porbeagle shark under FAO's recommended criteria for CITES listing

The UN Food and Agriculture Organization (FAO), has carefully considered the application of the

CITES listing criteria to commercially exploited aquatic species through a series of technical consultations. FAO (2000) notes that large, long-lived, late-maturing species, with both high and low fecundity, but more so the latter, are at a relatively high risk of extinction from exploitation. Productivity, as a surrogate for resilience to exploitation, was considered to be the single most important consideration when assessing population status and vulnerability to fisheries. The most vulnerable species are those with an intrinsic rate of population increase of <0.14 and a generation time of >10 years (FAO 2001). Life history data presented in section 2.4 indicate that the porbeagle shark falls into FAO's lowest productivity category and, as such, could qualify for consideration for Appendix I listing if their population declined to 20% or less of the historic baseline (FAO, 2001). The stock assessment for the Northwest Atlantic clearly demonstrates that this stock has exceeded this level of depletion. Although there is no stock assessment for the northeast Atlantic, this stock is considered highly likely to be depleted even further, because of its longer history of exploitation and the absence of management.

7.3 CITES Provisions under Article IV, paragraphs 6 and 7: *Introduction form the sea*

A Resolution is proposed that provides guidance and recommendations on Parties implementation of CITES provisions for specimens of porbeagle caught in and introduced from waters outside the jurisdiction of the country of export.

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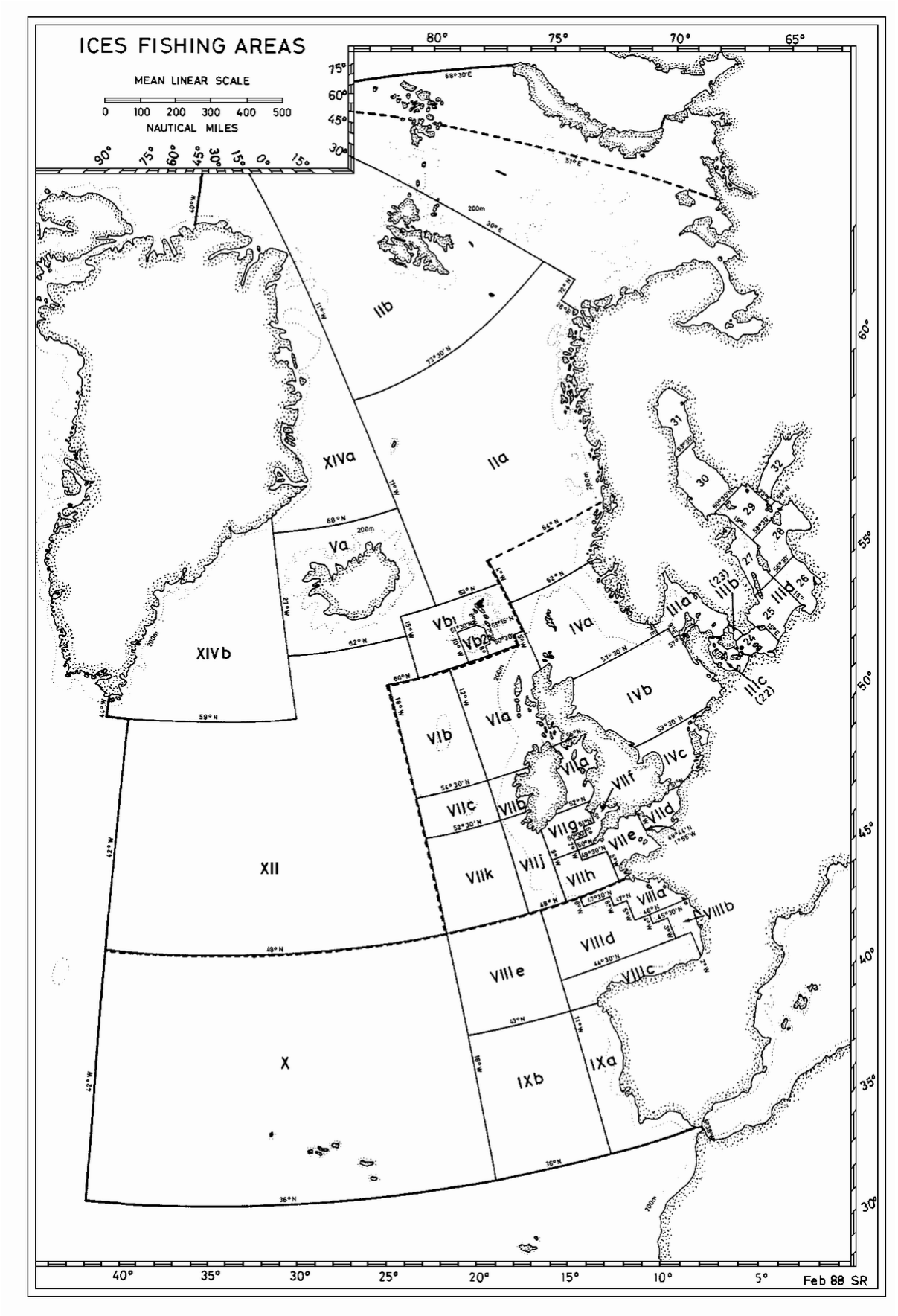

Figure 3. ICES fishing areas in the Northeast Atlantic.

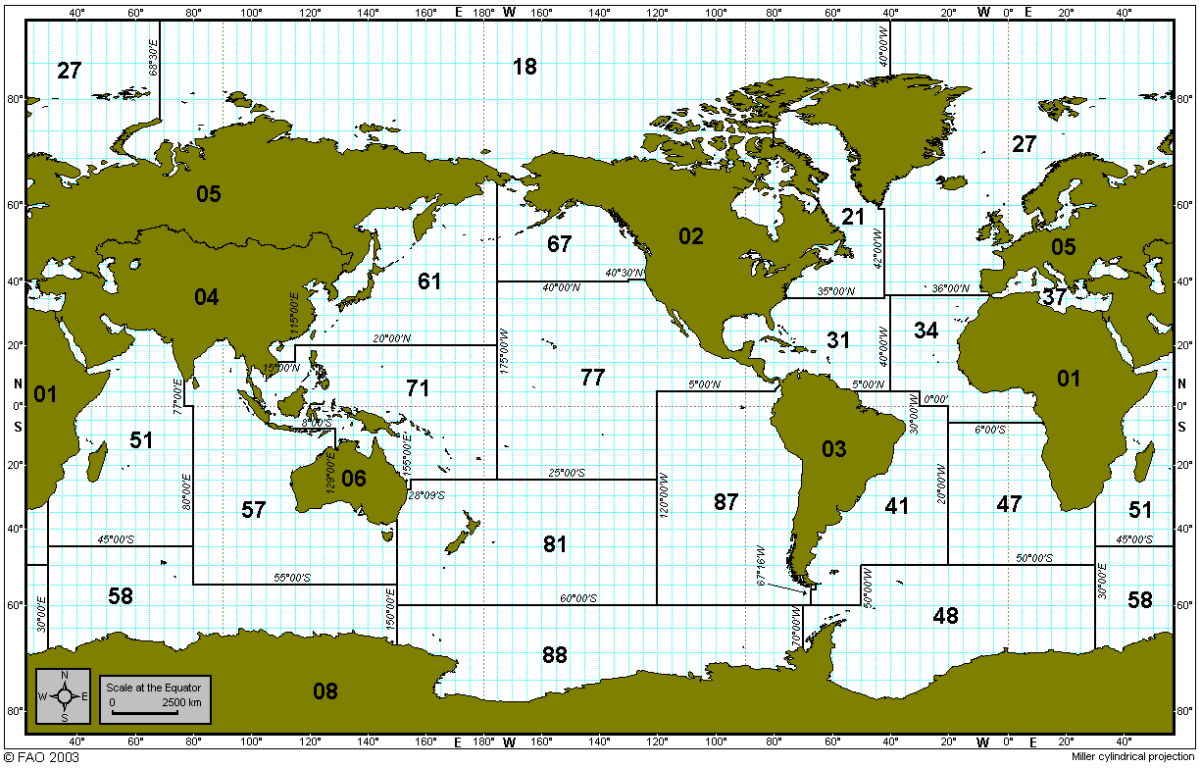

Figure 4. Map of the FAO Fishing Areas.

Porbeagle reported landings are mostly taken in the north Atlantic regions 21 and 27.

01 - Africa-Inland Water
02 - America-Inland Water
03 - America, South-Inland Water
04 - Asia-Inland Water
05 - Europe-Inland Water
06 - Oceania-Inland Water
21 - Atlantic, Northwest
27 - Atlantic, Northeast
31 - Atlantic, Western Central
34 - Atlantic, Eastern Central
37 - Mediterranean and Black seas
41 - Atlantic, Southwest
47 - Atlantic, Southeast
48 - Atlantic, Antarctic
51 - Indian Ocean, Western
57 - Indian Ocean, Eastern
58 - Indian Ocean, Antarctic
61 - Pacific, Northwest
67 - Pacific, Northeast
71 - Pacific, Western Central
77 - Pacific, Eastern Central
81 - Pacific, Southwest
87 - Pacific, Southeast
88 - Pacific, Antarctic

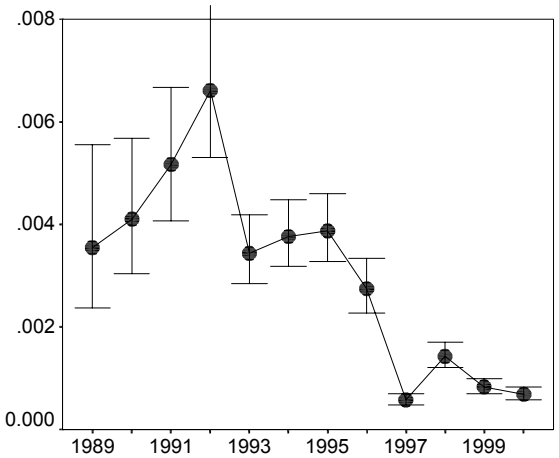

Figure 5a. Catch rates (standardised numbers of mature sharks per hook) in the Canadian porbeagle fishery, 1989 - 2000.

(*Source*: DFO 2001)

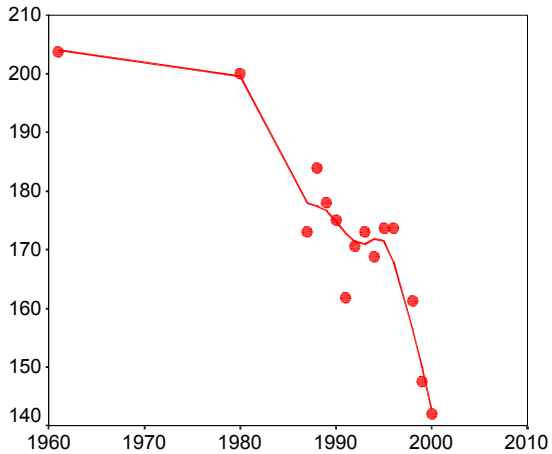

Figure 5b. Median fork lengths (cm) of porbeagles in the Canadian porbeagle fishery from 1961 to 2000.

(*Source*: DFO 2001)

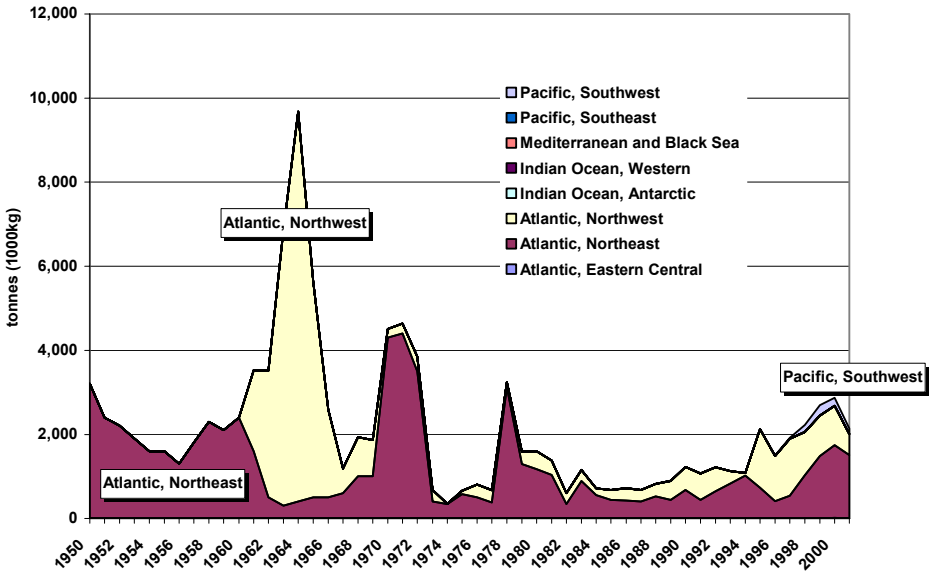

Figure 6. Total world reported landings of porbeagle shark (*Lamna nasus*) (t) by FAO fishing area from 1950 to 2001. See Figure 4 for map of FAO fishing areas.
(*Source*: FAO via FishBase)
NB: This graph excludes pre-1950s Norwegian reported landings from the Northeast Atlantic of 3884t in 1933 and about 6000t in 1947.

Table 1. Total reported landings of porbeagle shark (*Lamna nasus*) (tonnes) as reported by FAO fishing area from 1950 to 2001 (source: FAO via FishBase).

FAO fishing area	Number of countries in fishery	Total catch (t)	% of world total catch	2001 catch as % of max
Atlantic, Eastern Central	1	12	0%	20%
Atlantic, Northeast	12	65,306	59%	34%
Atlantic, Northwest	6	44,896	40%	5%
Indian Ocean, Antarctic	1	2	0%	0%
Indian Ocean, Western	1	1	0%	100%
Mediterranean & Black seas	2	44	0%	67%
Pacific, Southeast	1	7	0%	0%
Pacific, Southwest	1	767	1%	52%
Total		111,035	100%	22%

(*Source*: FAO via FishBase)

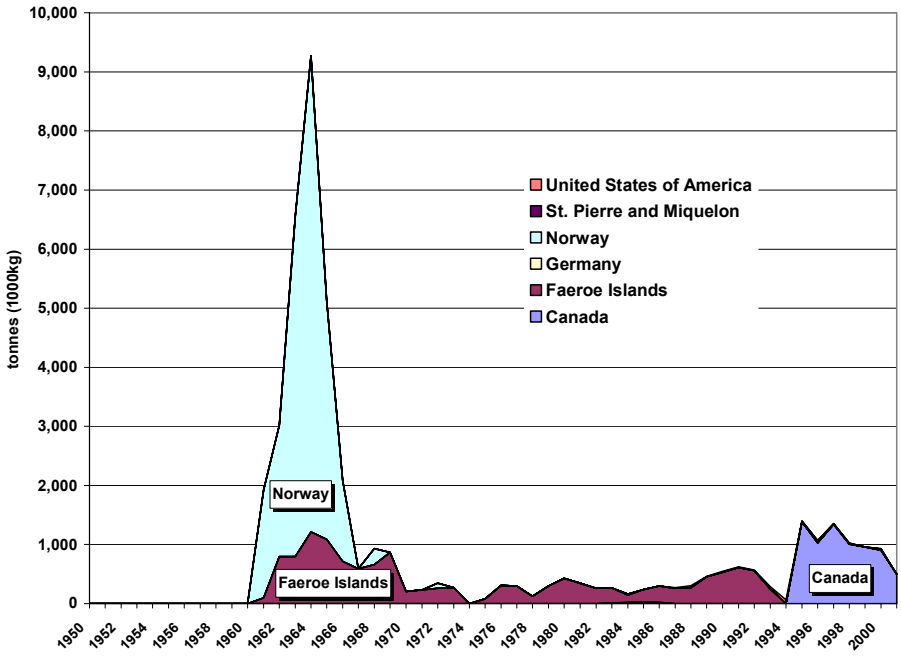

Figure 7. Total reported landings of porbeagle shark (*Lamna nasus*) (in tonnes or 1000kg) by country, in the Northwest Atlantic region, from 1950 to 2001.
(*Source*: FAO via FishBase)

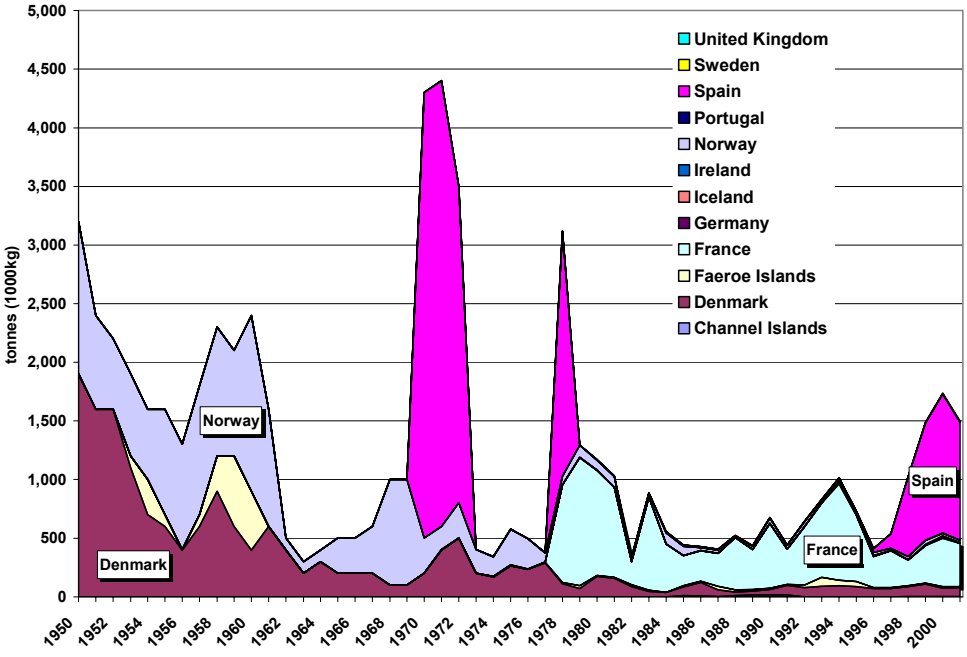

Figure 8. Total reported landings of porbeagle shark (*Lamna nasus*) (tonnes) by country, in the Northeast Atlantic region, from 1950 to 2001.
(*Source*: FAO via FishBase).
NB: This graph excludes pre-1950s Norwegian reported landings from the Northeast Atlantic of 3884t in 1933 and about 6000t in 1947.

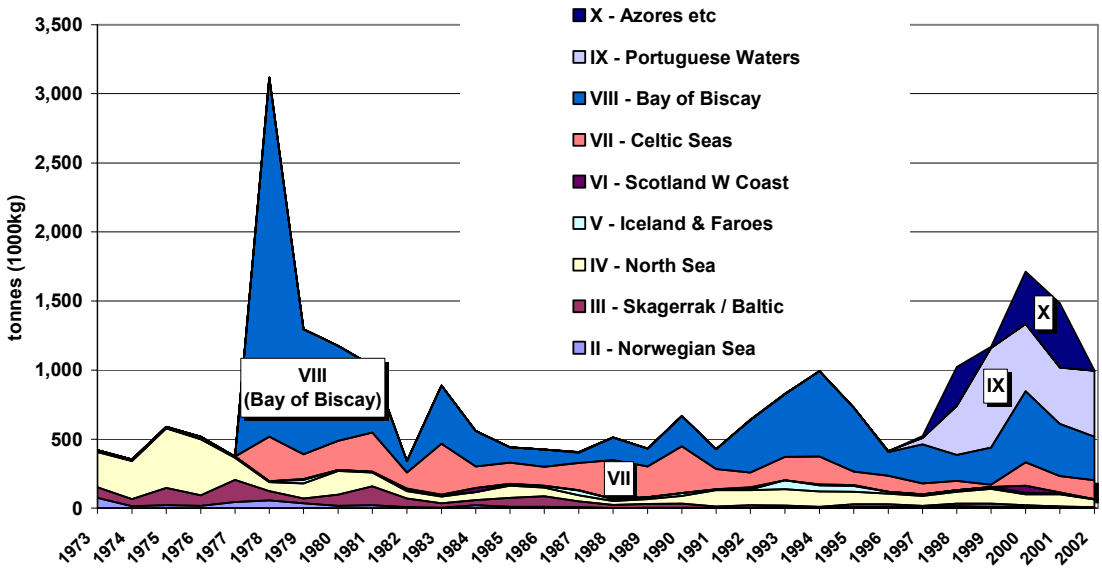

Figure 9. Total reported landings of porbeagle shark (*Lamna nasus*) (t) by ICES Area within the Northeast Atlantic, from 1973 to 2002
(*Source*: ICES Statlant Fisheries Statistics, downloaded in November 2003).
See map of the ICES fishing areas in Figure 3.

Annex 1.

Scientific synonyms of *Lamna nasus*

(*Source*: FAO Species Identification Sheet 2003)

- *Squalus glaucus* Gunnerus, 1768 (not S. glaucus Linnaeus, 1758 = Prionace glauca);
- *Squalus cornubicus* Gmelin, 1789;
- *Squalus pennanti* Walbaum, 1792 (alsoLamna pennanti, Desvaux, 1851);
- *Squalus monensis* Shaw, 1804;
- *Squalus cornubiensis* Pennant, 1812;
- *Squalus selanonus* Walker, in Leach, 1818;
- *Selanonius walkeri* Fleming, 1828;
- *Lamna punctata* Storer, 1839;
- *Oxyrhina daekayi* Gill, 1862;
- *Lamna philippi* Perez Canto, 1886;
- *Lamna whitleyi* Philipps, 1935.