Draft Proposal to list *Lamna nasus* in Appendix II - prepared by Germany in January 2012

A. Proposal

Inclusion of *Lamna nasus* (Bonnaterre, 1788) in Appendix II in accordance with Article II 2(a) and (b).

<u>Qualifying Criteria</u> (Conf. 9.24 (Rev. CoP13))[1]

Annex 2a A: *It is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future.*

North and Southwest Atlantic and Mediterranean stocks of *Lamna nasus* qualify for listing under this criterion, because their marked decline in population size meets CITES' guidelines for the application of decline to commercially exploited aquatic species. The largest global stocks of this low productivity shark have experienced historical extent of declines to <30% of historic baseline as a result of unsustainable target and bycatch fisheries driven largely or partly by international trade demand for its high value meat. These stocks are now under management in some EEZs, but the greatest continuing threat to this species is the unsustainable harvesting elsewhere that supplies international trade in meat and fins.

Annex 2a B: *It is known, or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences.*

Based on past fisheries' development to meet international trade demand, including shifting of effort from Northeast to Northwest Atlantic stocks, and a rapid recent rate of decline in catch per unit effort data for some southern stocks, it can be <u>projected</u> that other southern hemisphere populations for which stock assessments are not available are likely to experience similar or even more serious population decreases, unless international trade regulation provides the incentive to introduce sustainable management and/or improve existing management regimes to provide a basis for non-detriment and legal acquisition findings.

Annex 2b A: *The specimens of the species in the form in which they are traded resemble specimens of a species included in Appendix II under the provisions of Article II, paragraph 2 (a), or in Appendix I, such that enforcement officers who encounter specimens of CITES-listed species, are unlikely to be able to distinguish between them.*

Complex patterns of export, processing and re-export of meat make it difficult to readily distinguish products from different stocks, unless DNA analysis is used to confirm the origin of processed products. A split listing is therefore not recommended as it could facilitate IUU fishing for stocks listed in Appendix II and enable catches to be laundered as taken from non-listed stocks. Such an outcome would clearly be undesirable and has the potential to undermine the effectiveness of global conservation and management efforts (FAO 2007). In the unlikely event that any southern hemisphere stocks do not qualify for listing in Appendix II under Annex 2a A or B, these should be listed under Article II(b).

Annotation

The entry into effect of the inclusion of *Lamna nasus* in Appendix II of CITES will be delayed by 18 months to enable Parties to resolve related technical and administrative issues, such as the possible designation of an additional Management Authority and adoption of Customs codes.

B. Proponent

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Figure 1. Porbeagle *Lamna nasus*

C. Supporting statement

1. Taxonomy

1.1 Class: Chondrichthyes (Subclass: Elasmobranchii)

1.2 Order: Lamniformes

[1] The interpretation and application of Resolution Conf. 9.24 (Rev. CoP14) applied in this listing proposal is described in more detail in Annex 4 to this proposal.

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1.3 Family: Lamnidae

1.4 Species: *Lamna nasus* (Bonnaterre, 1788)

1.5 Scientific synonyms: See Annex 2

1.6 Common names:

English:	Porbeagle
Danish:	Sildehaj
Swedish:	Hábrand; sillhaj
German:	Heringshai (market name: Kalbsfisch, See-Stör)
Italian:	Talpa (market name: smeriglio)
Spanish:	Marrajo sardinero; cailón marrajo, moka, pinocho
French:	Requin-taupe commun (market name: veau de mer)
Japanese:	Mokazame

2. Overview

2.1 The large warm-blooded porbeagle shark (*Lamna nasus*) occurs in temperate waters of the North Atlantic, with smaller stocks in the Southern Oceans. It is highly vulnerable to over-exploitation in fisheries and very slow to recover from depletion. It is taken in target fisheries and is also an important retained and utilised component of the bycatch in pelagic longline fisheries. The meat and fins are of high quality and high value in international trade. Trade records are generally not species-specific; international trade levels, patterns and trends are largely unknown. DNA tests for parts and derivatives in trade are available.

2.2 Unsustainable North Atlantic target *L. nasus* fisheries are well documented. These have depleted stocks severely; landings fell from thousands of tonnes to a few hundred in less than 50 years. Joint assessments of North and Southwest Atlantic stocks by ICCAT and ICES scientists (2009) have identified marked historical extents of decline to significantly less than 30% of baseline. Mediterranean CPUE has declined to less than 5% of baseline. Where data are available for other Southern Hemisphere stocks, which are also a high value target and bycatch of longline fisheries and are biologically less resilient to fisheries than North Atlantic stocks, these show a significant recent rate of decline to less than 30% of baseline (New Zealand) or no trend (Japan southern bluefin area).

2.3 Quota management based on stock assessment and scientific advice has been in place in the Canadian Exclusive Economic Zone (EEZ) since 2002 (the stock has now stabilised under a rebuilding plan), and in the EU since 2008 (with a zero quota since 2010). There has been unrestrictive quota management in the US since 1999 and in New Zealand since 2004, Argentina requires live bycatch of large sharks to be released alive. National management measures cannot control high seas catches, where unregulated and unreported fisheries jeopardize national stock recovery plans. At the time of writing, Regional Fishery Organisations (RFOs) have not set catch limits for high seas stocks.

2.4 *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). Extent and rate of population declines of the majority of global stocks significantly exceed the qualifying levels for listing in Appendix II.

2.5 An Appendix II listing is proposed for *Lamna nasus* in accordance with Article II.2 (a) and (b) of the Convention and Res.Conf. 9.24 (Rev. CoP15). Atlantic stock assessments describe marked historic and recent declines. Exploitation of smaller stocks in other oceans of the Southern Hemisphere is largely unmanaged and unlikely to be sustainable.

2.6 An Appendix II listing for *Lamna nasus* will ensure that international trade is supplied by sustainably managed, accurately recorded fisheries that are not detrimental to the status of the wild populations that they exploit. This can be achieved if non-detriment findings require that an effective sustainable fisheries management programme be in place and implemented before export permits are issued, and by using other CITES measures for the regulation and monitoring of international trade, particularly controls upon Introductions from the Sea. Trade controls will complement and reinforce traditional fisheries management measures, thus also contributing to implementation of the UN FAO IPOA–Sharks.

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3. Species characteristics

3.1 Distribution

In the Southern Hemisphere, in a circumglobal band of ~30–60^{o}S; in the North Atlantic Ocean and Mediterranean, between 30–70^{o}N (Compagno 2001, Figure 2). There are separate stocks in the Northeast and Northwest Atlantic (these were historically the largest global stocks), likely also in the Mediterranean, and in the Southeast and Southwest Atlantic. The latter two stocks extend into the Southwest Indian Ocean and Southeast Pacific, respectively. Other Indo-Pacific stocks have not been identified. Annex 3 lists Range States and FAO Fisheries Areas (Figure 3).

3.2 Habitat

Epipelagic in boreal and temperate seas of 2–18°C, but preferring 5–10^{o}C in the Northwest Atlantic (Campana and Joyce 2004, Svetlov 1978), from the surface to depths of 200m, occasionally to 350–700m. Most commonly reported on continental shelves and slopes from close inshore (especially in summer), to far offshore (where they are often associated with submerged banks and reefs). They also occur in the high seas outside 200 mile EEZs (Campana and Gibson 2008), where they are less abundant. Stocks segregate (at least in some regions) by age, reproductive stage and sex and undertake seasonal migrations within their stock area. (Campana *et al*. 1999, 2001, Campana and Joyce 2004, Compagno 2001, Jensen *et al*. 2002.) Mature females tagged off the Canadian coast appear to migrate 2000km south to give birth in deep water in the Sargasso Sea, Central North Atlantic; pups presumably follow the Gulf Stream to return north (Campana *et al*. 2010a).

3.3 Biological characteristics

Lamna nasus is active, warm-blooded, relatively slow growing and late maturing, long-lived, and bears only small numbers of young. It falls into FAO's lowest productivity category of most vulnerable aquatic species. Life history characteristics vary between stocks and are summarised in Table 2. Northeast Atlantic sharks are slightly slower growing than the Northwestern stock. Both northern stocks are much larger, faster growing and have a shorter life span than the smaller, longer-lived (~65 years old) Southern Oceans porbeagles, which are therefore of even lower productivity and more vulnerable to overfishing than are North Atlantic stocks.

3.4 Morphological characteristics

Heavy cylindrical body, conical head and crescent-shaped tail (Figure 1). First dorsal fin has a distinctive white patch on the lower trailing edge.

3.5 Role of the species in its ecosystem

An apex predator, feeding on fishes, squid and some small sharks, but not on marine mammals (Compagno 2001, Joyce *et al*. 2002). It has few predators other than humans, but Orcas and White Sharks may take it (Compagno 2001). DFO Canada (2006) could not demonstrate an ecosystem role at present low levels. Stevens *et al*. (2000) warn that the removal of top marine predators may have a disproportionate and counter-intuitive impact on fish population dynamics, including by causing decreases in some prey species.

4. Status and trends

4.1 Habitat trends

Critical habitats and threats to these habitats are largely unknown, although some North Atlantic mating grounds have been identified. High levels of ecosystem contaminants (PCBs, organo-chlorines and heavy metals) that bio-accumulate and are bio-magnified at high trophic levels are associated with infertility in sharks (Stevens *et al*. 2005), but their impacts on *L. nasus* is unknown. Effects of climatic changes on world ocean temperatures, pH and related biomass production could potentially impact populations.

4.2 Population size

Effective population size (as defined in Resolution Conf. 9.24 (Rev. CoP14) Annex 5), is best defined by the number of mature females in the population, particularly in heavily fished stocks dominated by immatures or males[2]. The only stock for which population size data are available is in the Northwest Atlantic. Recent stock

[2] The FAO guidance for evaluating commercially aquatic species for listing in CITES (FAO 2001) stresses the importance of this consideration.

assessments (DFO 2005a, Campana and Gibson 2008, Campana *et al*. 2010b, ICCAT/ICES 2009, Figure 13) estimated the total population size for this stock as 188,000–195,000 sharks (22–27% of original numbers prior to the fishery starting; possibly 800,000 to 900,000 individuals) but only 9,000–13,000 female spawners (12–16% of their original abundance and 83–103% of abundance in 2001). Stock size elsewhere is unknown.

4.3 Population structure

Genetic studies identified two isolated populations, in the North Atlantic and the Southern oceans (Pade *et al*. 2006). Tagging studies in the Atlantic support two distinct Northwest and Northeast Atlantic stocks. Long distance movements occur within each stock, with fish tagged off the UK recaptured off Spain, Denmark and Norway, travelling up to 2,370km. ADD RESULTS FROM SOSF FUNDED TAGGING WORK IN PREP. Only one tagged shark crossed the Atlantic (Ireland to eastern Canada, 4,260km) (Campana *et al*. 1999, Kohler & Turner 2001, Kohler *et al*. 2002, Stevens 1976 & 1990). Porbeagles tagged in Canadian waters move onto the high seas for unknown periods of time (Campana and Gibson 2008), including to pupping grounds in the Sargasso Sea (Campana *et al*. 2010a). Stock boundaries in the Southern Hemisphere are unclear. The Southwest and Southeast Atlantic stocks appear to extend into the adjacent Pacific and Indian Oceans. The structure of exploited populations is highly unnatural, with very few large mature females present. This results in an extremely low reproductive capacity in heavily fished, depleted stocks (e.g. Campana *et al*. 2001).

4.4 Population trends

Population trends, summarised in Table 3, are presented in the context of Annex 5 of Conf. 9.24 (Rev. CoP15) and FAO (2001). The estimated generation time for *L. nasus* is at least 18 years in the North Atlantic, and 26 years in the Southern Oceans (Table 2). The three-generation period against which recent declines should be assessed is therefore 54 to 78 years, greater than the historic baseline for most stocks. Trends in mature females (the effective population size[2]) must be considered where possible. Stock assessments for this species usually show a correlation between declines in landings, declining catch per unit effort (CPUE), and reduced biomass because market demand and prices have always been high and there has, until recently, been little or no restrictive management. Where no stock assessments are available, CPUE, mean size and landings are therefore used as metrics of population trends.

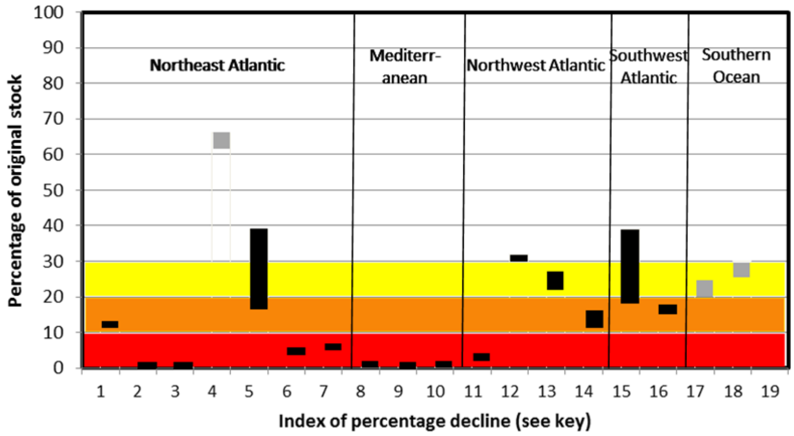

Figure 2. Available decline trends for porbeagle *Lamna nasus* stocks (from FAO 2010 and other sources cited in Section 4, Status and Trends)

Stock declines from historic baseline are indicated in black, more recent declines that have occurred during the past 3 generations (50 years) in grey. A range is indicated where appropriate for some stock assessment model results. The coloured sections identify decline thresholds to within <10% (red), 10–20% (orange) and 20–30% (yellow) of baseline. The Footnote to Annex 5 of Resolution Conf. 9.24 (Rev. CoP15) for Application of decline for commercially exploited aquatic species states that a low productivity species that has declined to 15–20% of baseline can be considered for listing in Appendix I. A low productivity species that is near this level (within 20-30% of baseline) can be considered for listing in Appendix II.

Table 1. Key to index of percentage decline illustrated in Figure 2.

	Index	Trend (to % of baseline
Northeast Atlantic		
1	All landings	13%
2	Norwegian landings	1%
3	Danish landings	1%
4	Recent French catch per unit effort (CPUE)	66%
5	Biomass (surplus production model)	15-39%
6	Biomass (age structured production model)	6%
7	Stock abundance (age structured production model)	7%
Mediterranean		
8	All observations	1%
9	Ligurian Sea catches	1%
10	Ionian Sea CPUE	2%

	Index	Trend (to % of baseline
Northwest Atlantic		
11	All landings	4%
12	Stock biomass (surplus production model)	32%
13	Stock abundance (age structured production model)	22-27%
14	Mature female abundance (age structured production model)	12-16%
Southwest Atlantic		
15	Stock biomass (surplus production model)	18-39%
16	Spawning Stock Biomass (age structured production model)	18%
Southern Oceans		
17	Recent NZ landings	25%
18	Recent NZ longline CPUE	30%
19	Recent Japanese bluefin tuna bycatch CPUE	no trend

The IUCN Red List status assessment for porbeagle is **Vulnerable** globally, **Critically Endangered** in the Northeast Atlantic and the Mediterranean (past, ongoing and estimated future reductions in population size exceeding 90%), **Endangered** in the Northwest Atlantic (estimated reductions exceeding 70% that have now ceased through management, and **Near Threatened** in the Southern Ocean (Stevens *et al.* 2005). Table 1 summarises available information on stock trends from historic baseline and some more recent trend data.

The North Atlantic has historically been the major reported source of world catches, with detailed long-term fisheries trend data available. Landings here have exhibited marked declining trends over the past 60–70 years (see below) during a period of rising fishing effort and market demand for this valuable species and improved fisheries technology. Reported North Atlantic catches (FAO FISHSTAT) during the past decade were less than 10% of those during the past 50 years (only partly due to the recent introduction of restrictive catch quotas). Fewer Southern hemisphere data are available (reporting to FAO only commenced in the 1990s), but some of these also show declining trends. FAO porbeagle catch data (Figure 4) are generally lower than that from other sources (national landings, ICES data *etc*.). Under-reporting is widespread, ‘grossly’ so in the South Atlantic (ICES/ICCAT 2009). Landings from the NAFO Regulatory Area reported to NAFO “seldom resembled those reported to ICCAT... 2005–2006 catches by countries other than Canada are in doubt and probably under reported” (Campana and Gibson 2008).

Stock assessments available for the Atlantic (ICCAT/ICES 2009) illustrate the correlation between steep declines in landings and catch per unit effort (CPUE) and declining biomass. CPUE and landings are therefore used as indicators of population trends for this valuable commercial species in unmanaged fisheries elsewhere, while recognizing that other factors may also affect catchability.

4.4.1 North Atlantic and Mediterranean

Most of the fisheries targeting seriously depleted shelf stocks in the Northeast and Northwest Atlantic are now under stringent management, but not in the Mediterranean. High seas Tuna and Swordfish longline fisheries also exploit these stocks (as target or retained bycatch) in the NAFO, ICCAT and GFCM regulatory areas, where porbeagle shark catches remain largely unregulated, except for shark finning bans.

Northeast Atlantic

The Northeast Atlantic age structured production model stock assessment estimated a decline from baseline of over 90%, to far below the maximum sustainable yield (MSY), at 6% of biomass and 7% of numbers. An alternative surplus production model estimated that biomass had declined to between 15% and 39% of baseline. (ICCAT SCRS/ICES 2009; Figures 10 and 11.) During this period, total landings from the Northeast Atlantic declined to 13% of their 1930s levels.

Lamna nasus has been fished by many European countries, principally Denmark, France, Norway, Faroes and Spain (Figures 5–9). Norway's target *L. nasus* longline fishery began in the 1920s and first peaked at 3,884t in 1933. About 6,000t were landed in 1947, when the fishery reopened after the Second World War, followed by a decline to between 1,200–1,900t from 1953–1960. The collapse of this fishery led to the redirection of fishing effort by Norwegian, Faroese and Danish longline shark fishing vessels into the Northwest Atlantic (see below). Norwegian landings from the Northeast Atlantic subsequently decreased to a mean for the past decade of 20t, <1% of their peak (Figure 7). Average Danish landings (Figure 8) fell by over 99% from over 1500t in the early 1950s to a mean of ~50t. (DFO 2001a, Gauld 1989, ICES and Norwegian data.)

Reported landings from the historically most important fisheries, around the UK and in the North Sea and adjacent inshore waters (ICES areas III & IV) had decreased to very low levels during the past 30–40 years. Catches from offshore ICES sub-regions west of Portugal (IX), west of the Bay of Biscay (VIII) and around the Azores (X) had increased since 1989 (Figure 6). This was attributed to a decline in heavily fished and depleted inshore populations and redirection of effort to previously lightly exploited offshore areas.

French longliners had targeted *L. nasus* since the 1970s in the Celtic Sea and Bay of Biscay. The fleet declined from eleven vessels in 1994 to five in 2008. Mean CPUE fell from 1 to 0.73 kg per hook; from 3t/vessel in 1994, to less than 1t in 2005 (ICES WGEF 2008, Biseau 2006). Reported landings fell from over 1,092t in 1979 to 3–400t in the late 1990s to 2009. Spanish longliners took *L. nasus* opportunistically in the 1970s and since 1998, as bycatch from the longline swordfish fishery in the Mediterranean and Atlantic and from a target Blue Shark fishery that also catches Mako and porbeagle (Biseau 2006, Bonfil 1994, Mejuto 1985, Mejuto and Garcés 1984, Lallemand-Lemoine 1991). ICCAT/ICES (2009) undertook the first assessment of this stock (Figures 10 and 11), concluding that biomass and numbers have declined 94% and 93%, respectively, from baseline, and by more than 50% from the level in 1972, to well below MSY. A zero EU quota has been in place since 2010 – this also applies to EU vessels fishing in international waters.

Mediterranean Sea

Lamna nasus has virtually disappeared from Mediterranean records. Ferretti *et al*. (2008) reviewed historic data from fisher logbooks, reporting declines in tuna traps of >99.99% during a range of time series (135 to 56 years). FAO Fishstat (2009) records very small landings since the 1970s by Malta, in recent years also Spain. In the North Tyrrhenian and Ligurian Sea, Serena and Vacchi (1997) reported only 15 specimens of *L. nasus* during a few decades of observation. Soldo and Jardas (2002) reported only nine records in the Eastern Adriatic from the end of 19th century until 2000. Since then there have been only a few new records (A. Soldo unpublished data). Newborn and juvenile *L. nasus* have been reported in the Western Ligurian and central Adriatic Seas (Orsi Relini and Garibaldi 2002, Marconi and De Maddalena 2001). No *L. nasus* were caught during research into western Mediterranean swordfish longline fishery bycatch (De La Serna *et al*. 2002). Only 15 specimens were caught during research conducted in 1998–1999 on bycatch in large pelagic fisheries (mainly driftnets) in the southern Adriatic and Ionian Sea (Megalofonou *et al*. 2000).

Northwest Atlantic

Detailed stock assessments and recovery projections are available (DFO 2005; Gibson and Campana 2005; Campana and Gibson 2008; ICCAT SCRS/ICES 2009; Campana *et al*. 2010b). Spawning stock biomass (SSB) is currently estimated to be about 22–27% of its size in 1961. The estimated number of mature females in 2009 is in the range of 11,000 to 14,000 individuals, or 12% to 16% of its 1961 level and just 6% of the total population (ICCAT/ICES 2009; Campana *et al*. 2010b).

Targeted *Lamna nasus* fishing started in 1961, when Norwegian and subsequently Faeroese shark longline fleets moved from the depleted Northeast Atlantic to the coast of New England and Newfoundland. Catches increased rapidly from ~1,900t in 1961 to > 9,000t in 1964 (Figure 12). By 1965 many vessels had switched to other species or fishing grounds because of the population decline (DFO 2001a). The fishery collapsed after six years, landing less than 1,000t in 1970. It took 25 years for only very limited recovery to take place. Norwegian and Faroese fleets have been excluded from Canadian waters since 1993. Canadian and US authorities reported all landings after 1995.

Three offshore and several inshore Canadian vessels entered the targeted Northwest Atlantic fishery in the 1990s. Catches of 1,000–2,000 t/year reduced population levels to a new low in under ten years: the average size of sharks and catch rates were the smallest on record in 1999 and 2000, catch rates of mature sharks in 2000 were 10% of those in 1992, and biomass estimated as 11–17% of virgin biomass and fully recruited F as 0.26 (DFO 2001a). The annual catch quota was reduced for 2002–2007 to allow population growth (DFO

2001a, 2001b) and reduced again in 2006. Landings have since ranged from 139t to 229t. Total population numbers have remained relatively stable since 2002, although female spawners may have continued to decline slightly. ICCAT SCRS/ICES (2009) estimated that spawning stock biomass (SSB) is now about 95–103% of its size in 2001 and the number of mature females 83% to 103% of the 2001 value (Figure 13), or 12–16% of baseline.

Stock assessments have determined that recovery is possible, but Campana *et al*. (2010b) warn that the trajectory is extremely low and sensitive to human-induced mortality. Human-induced mortality of ~2 to 4% of the vulnerable biomass of 4,500t to 4,800t (equivalent to catching 185–192t in 2005) should allow recovery to 20% of virgin biomass ($SSN_{20\%}$) in 10–30 years. Recovery to maximum sustainable yield (SSN_{msy}) will take much longer: between 2030 and 2060 with no human-induced mortality, or into the 22nd century (or later) with an incidental harm rate of 4%. At an incidental harm rate of 7% of the vulnerable biomass, corresponding to a catch of 315t, the population will not recover to SSN_{msy} (Figures 14 and 15). Campana and Gibson (2008) also warned that a high seas fishery exploiting this stock jeopardizes Canada's fisheries management and recovery plan – the population would crash at these exploitation rates.

In addition to the Canadian quota of 185t, in 1999 a quota of 92t was set in the US EEZ, which is presumed to share the same stock. The TAC for all US fisheries was reduced to 11t, including a commercial quota of 1.7t, in 2008. Taiwanese, Korean and Japanese tuna longliners take a largely unknown bycatch of *L. nasus* on the high seas in the North Atlantic (ICES 2005). Most of the catch is reportedly discarded or landed at ports near the fishing grounds. Stocks and catches are "under investigation" (Fishery Agency of Japan 2004). Campana and Gibson (2008) note that the unreported porbeagle bycatch observed on Japanese vessels could have amounted to ~200t in 2000 and 2001. These levels of combined Northwest Atlantic landings may prevent stock recovery.

4.4.2 Southern Hemisphere

Observer data from the Uruguayan tuna and swordfish fleet were used to assess the status of the Southwest Atlantic stock. The assessment identified an 82% decline in biomass (SSB) since 1961, and 60% since 1982, to well below maximum sustainable level (B_{MSY}) (Figure 19, ICCAT SCRS/ICES 2009), mirroring the decline in CPUE (Figure 18). This stock probably extends into the Southeast Pacific. Data were not available to support an assessment of the Southeast Atlantic/Southwest Indian Ocean stock.

FAO FISHSTAT data have been greatly improved in recent years; southern hemisphere catch data are now available for several countries since the mid 1990s (Figure 20); these show a declining trend, with New Zealand catches dominating, followed by Spain (which now has a zero quota for porbeagle in EU and international waters) and Uruguay (FAO FISHSTAT). New Zealand commercial catch, discard and processing records are illustrated in Figure 16. Volumes processed are sometimes higher than reported catches. Estimates of tuna longline bycatch are not available for all years and are imprecise because of low observer coverage. Approximately 60% of longline bycatch is alive when retrieved. Survival of unprocessed discarded sharks is unknown. About 80% of the bycatch is processed, 80% of this is finned, 20% processed for the meat and fins (MFSC 2008). There has been a 75% decline in the total weight of *L. nasus* reported since 1998–99, to a low of 55 t in 2005-06. This decline began during a period of rapidly increasing domestic fishing effort in the tuna longline fishery, and has accelerated since tuna longline effort dropped during the last two years. Unstandardised catch per unit effort recorded by observers from 1992–93 to 2004–05 varies considerably, but has been extremely low in recent years (Figure 17). This may not reflect stock abundance because of low observer coverage and other potential sources of variation (e.g., vessel, gear, location and season). [An updated assessment is in preparation and will be incorporated later when available.]

Japanese tuna longline vessels take an unknown quantity of bycatch of *L. nasus* in the Southern Bluefin Tuna fishing grounds. Standardised CPUE has varied from 1992 to 2002 but recent stock trends were deemed to be stable. Current stock levels are under investigation. Most of the catch is reportedly discarded or landed at ports near the fishing grounds (Fishery Agency of Japan 2004), but do not appear in the FAO FISHSTAT database. Matsumoto (2005, cited in FAO 2007) reports an increase from very low levels during 1989–1995 followed by a decline in annual landings to around 40% of original levels between 1997 and 2003. Matsunaga (2009) reported no porbeagle bycatch trend in the same fishery from 1992 to 2007.

4.5 Geographic trends

This species now appears to be scarce, if not absent, in areas of the Mediterranean where it was formerly commonly reported (Ferretti *et al*. 2008, Stevens *et al*. 2006).

5. Threats

The principal threat to *L. nasus* worldwide is over-exploitation, in target and bycatch fisheries, which depleted the world's largest North Atlantic stocks over 50 years ago (Figure 5). More recently, global reported porbeagle landings from bycatch and directed fisheries have decreased from 1 719t in 1999 to 722t in 2009, with the highest catches in 2009 from France (281t), Spain (239t), Canada (63t) and New Zealand (63t) (FAO FishStat 2011), although ICCAT/ICES (2009) notes that reported landings "grossly underestimate actual landings". Canadian catch data indicates that porbeagle landings have progressively decreased, from a peak of 1400 t in 1995, corresponding with decreasing TAC levels (Campana and Gibson 2008, Figure 20), and an EU zero quota was adopted in 2010. However, other fisheries are also declining, even in the absence of restrictive management (for example, in the southern hemisphere (Figure 20). This species is particularly vulnerable to fisheries because, in the absence of management, these target adults and juveniles of all age classes (Ministry of Fisheries 2006, Francis *et al*. 2007). Furthermore, the life history characteristics of Southern Ocean porbeagles make this population significantly more vulnerable to overfishing than the depleted North Atlantic populations.

5.1 Directed fisheries

Intensive directed fishing for the valuable meat of *L. nasus* was the major cause of 20th Century population declines. ICES (2005) noted: "The directed fishery for porbeagle [in the Northeast Atlantic] stopped in the late 1970s due to very low catch rates. Sporadic small fisheries have occurred since that time. The high market value of this species means that a directed fishery would develop again if abundance increased." A target fishery for the meat of *L. nasus* still operates in Canada, and short term opportunistic target fisheries occur in other States, in the absence of management, as and when aggregations are located. There are no high seas catch quotas for porbeagles although the 2009 ICCAT SCRS/ICES stock assessment meeting recommended that high seas fisheries should not target porbeagle. *L. nasus* used to be an important target game fish species for recreational fishing in Ireland and UK. The recreational fisheries in Canada, the US and New Zealand are very small.

5.2 Incidental fisheries

Lamna nasus is a valuable utilised 'bycatch' or secondary target of many fisheries, particularly longline pelagic fisheries for tuna and swordfish (Buencuerpo *et al*. 1998), but also gill nets, driftnets, trawls and handlines. Bycatch is often inadequately recorded in comparison with captures in target fisheries. The high value of porbeagle meat means that the whole carcass is usually retained and utilised, unless the hold space of vessels targeting high seas tuna and billfish is limited, when the fins alone may be retained (e.g. New Zealand and far seas longline fisheries for Southern Bluefin Tuna, and other pelagic fishing fleets operating in the Southern Hemisphere, see Compagno 2001). ICES (2005) noted: "effort has increased in recent years in pelagic longline fisheries for Bluefin Tuna (Japan, Republic of Korea and Taiwan Province of China) in the North East Atlantic. These fisheries may take porbeagle as a bycatch. This fishery is likely to be efficient at catching considerable quantities of this species." This was confirmed by Campana and Gibson (2008). ICCAT/ICES (2009) warned that increased effort on the high seas could compromise stock recovery efforts.

Despite the large amount of oceanic fishing activity that must take a bycatch of *L. nasus* in the Southern Hemisphere, landings reported to FAO only commenced in 1994 and are relatively low, with the exception of New Zealand, Spain and Uruguay. Japan's porbeagle bycatch in southern ocean fisheries is not reported to FAO, but must be significant: porbeagle was the second most abundant species after blue shark and comprised 5.5% of shark catches in the Japanese tuna fishery in Australian waters (Stevens and Wayte 2008)

Spanish vessels used to take a bycatch in their longline swordfish fisheries, and Uruguay and other countries (some of which do not report to FAO) have a significant bycatch in longline swordfish and tuna fisheries in international waters off the Atlantic coast of South America (Domingo 2000, Domingo *et al*. 2001, Hazin *et al*. 2008).

Important but largely unreported bycatch fisheries include demersal longlining and trawling for Patagonian Toothfish and Mackerel Icefish around Heard and Macdonald Islands and in the southern Indian Ocean (van Wijk and Williams 2003, Compagno 2001), and the artisanal and industrial longline swordfish fishery within and outside the Chilean EEZ, between 26–36ºS (E. Acuña unpublished data; Acuña *et al*. 2002), which records porbeagle. Hernandez *et al.* (2008) found that *Lamna nasus* made up 1.7% of all fins tested in the north-central Chilean shark fin trade. Overall catches of *Lamna nasus* by Argentina were 30,1 - 17,7 - 19,8 - 69,7 t between 2003 and 2006 (source: INIDEP 2009) (these data do not appear in FISHSTAT), but porbeagle captures by the Argentinean fleet are probably now limited to incidental captures by three Patagonian

Toothfish fishing vessels, and with strict measures in force to protect sharks in Argentinian waters (live sharks greater than 1.5 m must be released if caught), catches are likely to be minimal. There are observers on all Argentinean fleets, and an observer report for sharks (including *Lamna nasus)* will be released later in 2012 (Ramiro Sanchez, pers. comm.).

6. Utilisation and trade

Until recently, a lack of species-specific landings and trade data made it impossible to assess the proportions of global catches that supply national demand and enter international trade, although the high commercial value of the species has been documented through market surveys (Fleming and Papageorgiou 1997, Rose 1996, unpublished TRAFFIC Europe 2003 market surveys). Survey findings indicated that the demand for fresh, frozen or processed *L. nasus* meat and fins is sufficiently high to justify the existence of an international market, while other products include dried-salted meat for human consumption, oil, and fishmeal for fertilizer (Compagno 2001). The extent of national consumption *versus* export by range States can vary considerably, depending upon local demand. For example, high levels of seafood consumption in Brazil, including by some Asian communities, makes it likely that porbeagle meat is consumed by domestic markets although fins may be exported. Other States with lower domestic seafood consumption, such as Uruguay, are likely to export its landings of porbeagle, mixed with mako, another high value shark meat (Andres Domingo pers. comm.). Following the introduction by the EU of new species-specific codes in 2010, some international trade data for this species is now becoming available (albeit only for trade involving the EU).

6.1 National utilisation

L. nasus has long been one of the most valuable (by weight) of marine fish species landed in Europe, similar in value to swordfish meat and sometimes marketed as such (Gauld 1989; Vas and Thorpe 1998; TRAFFIC Europe market surveys; Vannucinni 1999). Porbeagle may also be utilised nationally in some range States for 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 *L. nasus* parts and derivatives has been reported, partly perhaps because records at species level are not readily available, and partly because quantities landed are now so small, particularly in comparison with other shark species.

The species is utilised for sports fishing in the USA and some EU Member States. Catches are either retained for meat and/or trophies, or tagged and released. Low levels of *L. nasus* are taken by game fishers off New Zealand South Island, but estimates of the recreational harvest is unavailable and probably negligible since *L. nasus* usually occur over the outer continental shelf or beyond (MFSC 2008).

6.2 Legal trade

All international trade in *Lamna nasus* products is unregulated and legal. Prior to 2010, all global trade in porbeagle *Lamna nasus* products was reported under general Customs commodity codes for shark species and could not be identified. In 2010, the EU introduced new species-specific Customs codes for fresh and frozen *Lamna nasus* (porbeagle) products (excluding shark fins) and amended previous codes covering most shark species to now exclude this species. Table 4 shows the old and new relevant Customs codes for porbeagle.

There is a considerable market for porbeagle products within the European Union (EU), with EU Member States having taken 60–75% of FAO's global records of porbeagle catch in 2006 and 2007 (prior to establishment of a TAC, which was reduced to zero for EU waters and EU fleets in 2010). EU market demand must now be met by imports. EU imports and exports of this species in 2010 and 2011, reported in EUROSTAT, are summarized in Tables 5 and 6 (these do not include internal EU trade). Other countries/territories do not have species-specific codes in place for trade in this species, and continue to report its trade under general shark commodity codes, preventing analysis.

The following porbeagle range States were the principal suppliers of fresh and frozen porbeagle meat to the EU (excluding other EU countries) in 2010 and 2011 (EU importer shown in brackets): South Africa (Italy), Japan (Spain), Morocco (Spain), Norway (Germany and Denmark) and the Faroe Islands (Denmark). A total of 45,000kg of porbeagle meat, worth EUR 118,294, was imported during this two year period.

South Africa does not have any directed fisheries for porbeagle, although one or two sharks per trip are apparently caught in the South African pelagic long-line fishery. Therefore, the high quantities imported from South Africa into the EU are likely to be derived from foreign flagged vessels fishing outside South Africa's EEZ and discharging in South African ports. These may include by-catch of Japanese vessels targeting southern bluefin tuna or catches of Korean, Taiwanese or other vessels targeting tuna and tuna-like species

(Source TRAFFIC East and Southern Africa, 2011). None of these fishing entities report porbeagle catches to FAO.

Two non-range States (and previously unknown players in the market for this species) also reported exports to the EU: Senegal and Suriname. However, determining the origin of the meat in trade is fraught with difficulties (as noted above for South Africa), due to countries fishing in international waters and the inconsistencies in reporting between different countries (flag State versus port State exports, exports reported after landing or only after processing *etc*.).

Average prices of imports ranged from only 1.26 EUR/kg for meat imported from Japan to 3.64 EUR/kg for meat imported from the Faroe Islands. This is significantly lower than prices reported in earlier years for porbeagle landed into European ports.

Earlier studies had reported that Canada exports *L. nasus* meat to the US and the EU, Japan exports to the EU, and EU Member States export *L. nasus* to the US, where it is mainly consumed in restaurants (Vannuccini 1999, S. Campana *in litt*. to IUCN Shark Specialist Group 2006). *L. nasus* is also imported by Japan (Sonu 1998). The new EU trade data confirm exports from Japan to the EU. In Australia, data on exports of *L. nasus* to the US are grouped with Mako Sharks (Ian Cresswell, CITES Management Authority of Australia, *in litt*. to BMU, February 2004). Until targeted Customs control and monitoring systems or compulsory reporting mechanisms to FAO are established, data on non-European international trade in *L. nasus* products will not be available.

The EU also reported significant exports of porbeagle, particularly in 2010 (68,200kg). These may have been exports of catches landed and frozen in 2009, before the zero quota, or re-exports. Morocco was by far the largest destination of porbeagle exported from the EU in 2010, followed by Afghanistan in 2011. However, the price of porbeagle exported to Morocco was very low (average 0.69 EUR/kg) compared to 17.81 EUR/kg for porbeagle exported to China and 3-4 EUR/kg for porbeagle exported to Ceuta (Spanish territory in North Africa), Andorra, Afghanistan and Switzerland. All exports from the EU were from Spain, except those to Switzerland which came from Denmark. There were no records of the EU importing porbeagle from Canada, or of the EU exporting (or re-exporting) to the US, as reported in earlier studies.

EUROSTAT also records intra-EU trade – dispatches (equivalent to exports within the EU) and arrivals (equivalent to imports). However, due to movement of commodities between EU Member States, the likelihood of double-counting is high. Also there are often considerable discrepancies between quantities reported as “arrivals” and “dispatches” within the EU (for example if one Member State only reports value, and the other just weight). Total amounts of specific commodities in trade are therefore difficult to estimate, however intra-EU trade data can provide an indication of the most important Member States involved in the trade. In 2010 and 2011 Italy (72%) and Spain (21%) were the principal destinations for trade of porbeagle commodities (fresh and frozen) within the EU, and Portugal (45%) and Spain (39%) were the principal suppliers of products traded within the EU. *Lamna nasus* (Vitello di Mare) was on sale in Venice Fish market, Italy, in November 2010 for 12.80 EUR/kg (pers. comm. Mats Forslund, WWF-SE).

The US Fish & Wildlife Service (USFWS) holds only 20 records of US trade in *Lamna* species between 1998 and 2010 (seven of these being specifically of *Lamna nasus*). Trade involved 13 live specimens for zoos, three bodies for museums and ~20,000 units of jewellery, teeth, bone or skins (source: TRAFFIC North America).

6.3 Parts and derivatives in trade

Meat: This can be a very high value product, one of the most palatable and valuable of shark species, and is traded in fresh and frozen form (see sections 6.1 and 6.2).

Fins: Porbeagle appears in the list of preferred species for fins in Indonesia (along with Guitarfish, Tiger, Mako, Sawfish, Sandbar, Bull, Hammerhead, Blacktip, Thresher and Blue Shark, see Vannuccini 1999), but was reported to be relatively low value by McCoy and Ishihara (1999, quoting Fong and Anderson 1998). The large size of *L. nasus* fins nonetheless means that these are a relatively high value product. They have been identified in the fin trade in Hong Kong and are one of six species (including Makos, Blue, Dusky and Silky Sharks) frequently used in the global fin market (Shivji *et al*. 2002). The raw fins are also readily recognised to species level by fin traders in Chile (Hernandez *et al.* 2008). New Zealand has established conversion factors for *L. nasus* for wet fin (45) and dried fin (108) (equivalent to a weight ratio of 2.2% and 0.9% respectively) in order to monitor quota and establish the size of former catches by scaling up reported landings (Ministry of Fisheries, 2005). The wet fin weight ratio from the Canadian fishery is 1.8–2.8% (S. Campana pers. comm., DFO).

Others: Porbeagle hides can be processed into leather, and liver oil extracted (Vannuccini 1999, Fischer *et al*. 1987), but trade records are not kept. Cartilage is probably also processed and traded. Other shark parts are used in the production of fishmeal, which is probably not a significant product from *L. nasus* fisheries because of the high value of the species' meat (Vannuccini 1999).

6.4 Illegal trade

Although no legislation has been adopted by range States or trading nations to regulate national or international trade in *Lamna nasus*, the increased application of strict quota management (including the EU zero quota) increases the risk of illegal trade transactions and shipments taking place, particularly in the absence of trade monitoring and regulation at species level.

6.5 Actual or potential trade impacts

The unsustainable *L. nasus* 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 the depletion of populations in the North Atlantic and, with the closure of the major northern fisheries, now threatens Southern Hemisphere populations. Southern populations are of particular concern because they are intrinsically even more vulnerable to over-exploitation in fisheries than are the depleted northern stocks.

7. Legal instruments

7.1 National

It has been forbidden to catch and land porbeagle in Sweden since 2004.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated *L. nasus* as Endangered in 2004 (COSEWIC 2004). The Federal Government of Canada declined to list the species under Schedule 1 of Canada's Species at Risk Act (SARA) because recovery measures were already being implemented.

7.2 International

'Family Isurida' (now Lamnidae, including *L. nasus*) is listed in Annex 1 (Highly Migratory Species) of the UN Convention on the Law of the Sea (UNCLOS). The UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks, in force since 2001, establishes rules and conservation measures for high seas fisheries resources. It directs States to pursue co-operation in relation to listed species through appropriate sub-regional fisheries management organisations or arrangements, but there has not yet been any progress with implementation of oceanic shark fisheries management.

Lamna nasus is listed in Annex III, 'Species whose exploitation is regulated' of the Barcelona Convention Protocol concerning specially protected areas and biological diversity in the Mediterranean. This population was also added in 1997 to Appendix III of the Bern Convention (the Convention on the Conservation of European Wildlife and Natural Habitats) as a species whose exploitation must be regulated in order to keep its population out of danger. No management action has yet followed these listings.

L. nasus is included in Appendix II of the Convention on the Conservation of Migratory Species (CMS). CMS is currently developing an instrument for the conservation of migratory sharks, which may in due course stimulate conservation actions for the species.

L. nasus is included in the OSPAR Convention for the Protection of the Marine Environment of the North-east Atlantic list of Threatened and/or Declining Species and Habitats. This list, developed under Annex V on the Protection and Conservation of the Ecosystems and Biological Diversity of the OSPAR Maritime Area, identifies species and habitats in need of protection or conservation. Proposals for actions, measures and monitoring that should be undertaken for this species will be considered in late 2009.

8. Species management

8.1 Management measures

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, but is voluntary. Of the top 20 shark fishing entities, which account for nearly 80% of the world's shark catch, only 13 are known to have a National Shark Plan (Lack and Sant 2011), although FAO (2010) reported that 65% of Members that responded to a survey on the implementation of the Code of Conduct for Responsible Fisheries had Shark Plans in place and 11 RFBs reported that they were assisting in the implementation of the IPOA-Sharks. Porbeagle range and/or fishing States with Shark Plans include Argentina, Australia, Canada, the EU, Japan, New Zealand, Spain, Taiwan, Uruguay and USA.

Many RFMOs have adopted shark finning bans. Some RFOs have recently adopted shark resolutions to support improved recording or management of pelagic sharks taken as bycatch in the fisheries they manage, but no science-based catch limits. ICCAT has required Parties since 2007 to reduce the mortality of porbeagle sharks in directed Atlantic fisheries where a peer-reviewed stock assessment is not available. In 2008 the NAFO Scientific Council was warned that overfishing in the high seas NAFO Regulatory Area was undermining Canada's management for porbeagles and would lead to population crash (Campana and Gibson 2008), but Parties decided that shark management was ICCAT's remit. Although a stock assessment has been available since 2009, neither ICCAT nor NAFO have adopted proposals to introduce catch limits or prohibit the retention of porbeagles caught on the high seas. At the time of writing, ICCAT's Ecological Risk Assessment for pelagic sharks is in preparation for discussion at an ICCAT meeting on 11-15th June 2012 in Portugal. The management of southern porbeagle stocks will require close coordination between RFMOs for the Atlantic, Pacific and Indian Ocean waters and CCAMLR.

In the Northeast Atlantic, the conservation and management of sharks in EU waters falls under the European Common Fishery Policy (CFP), which manages fish stocks through a system of Total Allowable Catch (TAC or annual catch quotas) and reduction of fishing capacity. EC Regulation 40/2008 established a TAC for porbeagle taken in EC and international waters of I, II, III, IV, V, VI, VII, VIII, IX, X, XII and XIV of 581 t (CEC, 2008). The initial restrictive quota was reduced by 25% in 2009 and a maximum landing size (210 cm fork length) introduced to protect large females (CEC 2009). In 2010, EC Regulation 23/2010 prohibited fishing for porbeagle in EU waters and, for EU vessels, to fish for, to retain on board, to tranship and to land porbeagle in international waters. EC Regulation 1185/2003 prohibits 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.

The European Community Action Plan for the Conservation and Management of Sharks (CPOA, EU COM(2009) 40 final), presented by the European Commission in 2009, sets out to rebuild depleted shark stocks fished by the Community fleet within and outside Community Waters, including through the establishment of catch limits for shark stocks in conformity with advice provided by ICES and relevant RFMOs, release of live unwanted bycatch, increased selectivity of fishing gear, establishment of bycatch reduction programmes for Critically Endangered and Endangered shark species, and international cooperation in CMS and CITES with a view to controlling shark fishing and trading. The CPOA's Shark Assessment Report pays particular attention to *Lamna nasus*. These measures will be implemented at Community and Member State level and the Community will seek their endorsement by all relevant RFMOs.

In 2007 Norway adopted ICES advice and banned all direct fisheries for porbeagle. From 2007–2011 specimens taken as bycatch had to be landed and sold. From 2011, live specimens must be released, whereas dead specimens can (not must) be landed and sold. Reporting was extended to include the number of specimens landed in addition to weight. From 2011, the regulations also include recreational fishing.

In the Northwest Atlantic, shark fisheries management is underway in Canadian and US waters. An annual quota of 92t was adopted in US waters in 1999, under the Highly Migratory Species Fisheries Management Plan. This was reduced in 2008 to a TAC of 11t for all US fisheries, including a commercial quota of 1.7t, which often lead to the closure of the fishery before the end of the year. Since 2008, US Atlantic sharks must be landed with their fins naturally attached. The 1995 Canadian fisheries management plan limits number of licenses, types of gear, fishing areas and seasons, prohibits finning, and restricts recreational fishing to catch-and-release only. Fisheries management plans for pelagic sharks in Atlantic Canada established non-restrictive catch guidelines of 1500t for *L. nasus* prior to 1997, followed by a provisional TAC of 1000t for the period 1997–1999, based largely on historic reported landings and the observation that recent catch rates had decreased (DFO 2001). Following analytical stock assessments (Campana *et al.* 1999, 2001), the Shark Management Plan for 2002–2007 reduced the TAC to 250t, followed by a further reduction to 185t (60t bycatch, 125t directed fishery) from 2006 (Figure 20). Population projections indicate that the population will eventually recover if harvest rates are kept under 4% (~185 mt, DFO 2005b), but unregulated and unreported catches on the high seas jeopardize recovery (Campana and Gibson 2008, Figures 14 and 15).

In 2006, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) adopted a moratorium on directed shark fishing until data become available to assess the impacts of fishing on sharks in the Antarctic region. The live release of sharks taken as bycatch is encouraged but not mandated

(Conservation Measure 32-18; CCAMLR 2006). The Western and Central Pacific Fisheries Commission (WCPFC) will be responsible for pelagic shark management, but this is unlikely to be attempted during the early years of this Commission (Ministry of Fisheries 2006). Argentina requires live bycatch of large sharks to be released alive. Australia introduced legislation in 1991 preventing Japanese longliners fishing in the EEZ from landing shark fins unless accompanied by the carcass. They have not fished in the Australian EEZ since 1996. Finning is prohibited in domestic Australian tuna longliners. New Zealand has included *L. nasus* in its Quota Management System (QMS) since 2004 with an unrestrictive TAC set at 249t (Sullivan *et al*. 2005), permitting finning and discard of carcasses.

8.2 Population monitoring

Routine monitoring of catches, collection of reliable data on indicators of stock biomass and good knowledge of biology and ecology are required. Most States do not record shark catch, bycatch, effort and discard data at species level or undertake fishery-independent surveys, preventing stock assessments and population evaluation. High seas catches are particularly poorly monitored (e.g. Campana and Gibson 2008). FAO FISHSTAT data are incomplete. Accurate trade data provide a means of confirming landings and an indication of compliance with catch levels, allow new catching and trading States to be identified, and provide information on trends in trade (Lack 2006). Trade data for porbeagle are, however, unreported except in the EU. FAO (2010) noted that a CITES listing is expected to result in better monitoring of catches entering international trade from all stocks and could therefore have a beneficial effect on the management of the species in all parts of its range. In the absence of a CITES listing there is no reliable mechanism to track trends in catch and trade of this species.

8.3 Control measures

<u>International</u>

Other than sanitary regulations related to seafood products and measures that facilitate the collection of import duties, there are no controls or monitoring systems to regulate or assess the nature, level and characteristics of trade in *L. nasus*.

<u>Domestic</u>

The domestic fisheries management measures adopted by a few States described above cannot deliver sustainable harvest of *L. nasus* when stocks are exploited by several fleets, particularly in unregulated and unmonitored high seas fisheries. Even where catch quotas have been established, no trade measures prevent the sale or export of landings in excess of quotas. Otherwise, only the usual hygiene regulations apply to control of domestic trade and utilisation. STECF (2006) noted that although a CITES Appendix II listing alone would not be sufficient to regulate catching of porbeagle, it could be considered an ancillary measure.

8.4 Captive breeding and artificial propagation

No specimens are known to be bred in captivity.

8.5 Habitat conservation

Research in areas fished by the Canadian and French fleets and the results of tagging studies have identified some important *L. nasus* habitats, both within EEZs and on the high seas. Some habitat may be incidentally protected inside marine protected areas or static gear reserves, but there is no protection for critical high seas habitat.

9. 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*. Salmon Shark *Lamna ditropis* is restricted to the North Pacific. Mako *Isurus oxyrinchus* may be misidentified as *L. nasus* in Mediterranean fisheries, although the identification of whole sharks is straightforward using existing keys.

10. Consultations

Draft Proposal to list *Lamna nasus* in Appendix II - prepared by Germany in January 2012

11. Additional remarks

11.1 CITES Provisions under Article IV, paragraphs 6 and 7: Introduction from the sea

It is unclear whether introduction from the sea will be a significant issue for this species. Most target fisheries, even on the shelf edge, have been recorded inside EEZs. Pelagic Japanese, Korean and Taiwanese vessels, however, take porbeagle bycatch on the high seas, estimates for Japan ranging from 15t to 280t annually during 2000–2002 (DFO 2005b). A CITES Appendix II listing would require introductions from the sea to be accompanied by a non-detriment finding. They would have to be taken from a sustainably exploited high seas fishery, requiring management action by the appropriate Regional Fisheries Management Organisation. FAO (2010) considered that regulation of international trade through listing in CITES Appendix II could strengthen national efforts to keep harvesting for trade commensurate with stock rebuilding plans and improve the control of high seas catches through the use of certificates of introduction from the sea accompanied by non detriment findings.

11.2 Implementation issues

11.2.1 Scientific Authority

It would be most appropriate for the Scientific Authority for this species to be advised by a fisheries expert.

11.2.2 Identification of products in trade

It will be important to develop species-specific commodity codes and identification guides for the meat and fins of this species. *L. nasus* meat, the product most commonly traded, is one of the highest priced shark meats in trade and often identified by name. The dorsal fin (with skin on) has a characteristic white rear free edge and a generic guide to the identification of shark fins is available (Deynat2010). Several research groups have developed species-specific primers and highly efficient multiplex PCR (Polymerase Chain Reaction) screening assay for *L. nasus*, capable of distinguishing between Southern and Northern Hemisphere stocks (e.g. Shivji *et al*. 2002; Pade *et al*. 2006; Testerman *et al*. 2007). Cost per sample processed starts from US$20–60, depending upon condition of sample, less for large numbers. Turn-around time is in the region of 2–7 days from receipt of sample, depending upon urgency. These tests are available and may be used to confirm identification and product origin for enforcement purposes.

11.2.3 Non-detriment findings

CITES AC22 Doc. 17.2 provides first considerations on non-detriment findings for shark species. The Spanish Scientific Authority (García-Núñez 2008) reviewed the management measures and fishing restrictions established by international organisations related to the conservation and sustainable use of sharks, offering some guidelines and a guide of useful resources. It also adapted to elasmobranch species the checklist prepared for making NDF by IUCN (Rosser & Haywood 2002). Similarly, the outcome of the Expert Workshop on Non-Detriment Findings (Anonymous 2008) points to the information considered essential for making NDF for sharks and other fish species, and also proposes logical steps to be taken when facing this task.

Management for *L. nasus* would ideally be based upon stock assessments and scientific advice to allow stock rebuilding (where necessary) and ensure sustainable fisheries (e.g. through quotas or technical measures, including closed areas, size limits and the release of live bycatch). This is standard fisheries management practice – albeit currently not widely applied for this species. Other States wishing to export *L. nasus* products would also need to develop and implement sustainable fisheries management plans if NDFs are to be declared, and would need to ensure that all States fishing the same stocks implement and enforce equally precautionary conservation and management measures.

12. References (see Annex 5)

Annex 1.

Figures and Tables

Table 2. *Lamna nasus* life history parameters

Age at maturity (years)	female:	13 years (North Atlantic); 15–18 years (SW Pacific)	Campana *et al*. 2008; DFO 2005; Francis *et al*. 2007
	male:	8 years (North Atlantic); 8–11 years (SW Pacific)	Campana *et al*. 2008; DFO 2005; Francis *et al*. 2007
Size at maturity (total length cm)	female:	195 cm (SW Pacific), 230–260 cm (North Atlantic)	Campana *et al*. 2008; Dulvy *et al*. 2008; Francis *et al*. 2007; Francis & Duffy 2005
	male:	165 cm (SW Pacific), 180–215 cm (North Atlantic)	Campana *et al*. 2008; Dulvy *et al*. 2008; Francis *et al*. 2007
Maximum size (total length cm)	female:	302, 357 cm (N Atlantic); 240 cm (SW Pacific)	Francis *et al*. 2008; DFO 2005; Dulvy *et al*. 2008
	male:	253, 295 cm (N Atlantic; 240 cm (SW Pacific)	Francis *et al*. 2008; DFO 2005; Dulvy *et al*. 2008
Longevity (years)	>25–46 years (Northwest Atlantic); ~65 years (Southwest Pacific)		Campana *et al*. 2008; DFO 2005; Francis *et al*. 2007
Size at birth (cm)	58–77 (North Atlantic), 72–82 (Southwest Pacific)		Francis *et al*. 2008; Dulvy *et al*. 2008
Average reproductive age/ generation time	18 years (Northwest Atlantic); 26 years (Southwest Pacific)		Campana *et al*. 2008; DFO 2005; Francis *et al*. 2007
Gestation time	8–9 months		
Reproductive periodicity	Annual		
Average litter size	Four pups		
Annual rate of population increase	5–7% (unfished, North Atlantic); 2.6% (from MSY, southwestern Pacific		Campana *et al*. 2008; Smith *et al*. 2008
Natural mortality	0.10 (immatures), 0.15 (mature males), 0.20 (mature F) (Northwest Atlantic)		Campana *et al*. 2001

(Data will be updated at a later stage)

Table 3. Summary of population and catch trend data

Year	Location	Data used	Trend	Source
1933/37–2004/08	NE Atlantic	All Northeast Atlantic landings	87% decline in 5 yr average landings from historic baseline	SCRS (2009); FAO (2010)
1936–2007	NE Atlantic	Norwegian landings	>99 % decline from historic baseline. Trend is the same if 5-year averages are used.	Norwegian and ICES data (Figure 7); SCRS (2009); FAO (2010)
1950/54–2004/08	NE Atlantic	Danish fishery	99% decline from historic baseline	ICES data (Figure 8); SCRS (2009); FAO (2010)
1986–2007	NE Atlantic	Spanish longline bycatch CPUE	No trend in recent catch rates	ICES WGEF (2011).
1972–2007	NE Atlantic	French target longline CPUE	Approximately one third decline in two most recent generations	ICES WGEF (2011); Biais and Vollette (2009)
1926–2008	NE Atlantic	Stock assessment	94% decline in biomass, 93% decline in numbers from historic baseline	Surplus production age-structured model ICCAT/ICES 2009 (Figure 11)
Various, 1800–2006	Mediterranean	Records of *Lamna nasus*	Virtual disappearance from landings and research survey records	Stevens *et al*. 2005 and sources cited in section 4.1.1.
1950–2006	Ligurian Sea, Mediterranean	Abundance &/or biomass of lamnids	>99% decline in tuna traps	Ferretti *et al*. 2008
1978–1999	Ionian Sea, Mediterranean	Standardised CPUE of lamnids	>98% decline in tuna traps	Ferretti *et al*. 2008
1963–1970	NW Atlantic	Norwegian & Faroese landings	~90% decline in catch and collapse of fishery	Landings data (Figure 12)
1961–2008	NW Atlantic	5 year average of all catches	~96% decline	Landings data (Figure 12)
1961–2005	NW Atlantic	Stock assessment (surplus production model)	68% decline in stock biomass from historic baseline	Campana & Gibson 2008, ICCAT SCRS/ICES 2009, Campana *et al*. 2010b
1961–2005	NW Atlantic	Stock assessment (age structured model)	73–78% decline in total numbers from historic baseline	Campana & Gibson 2008, ICCAT SCRS/ICES 2009, Campana *et al*. 2010b
1961–2005	NW Atlantic	Stock assessment (age structured model)	84–88% decline in number of mature females from historic baseline	Campana & Gibson 2008, ICCAT/ICES 2009, Campana *et al*. 2010b
1994–2003	North Atlantic	Catches	Decline, 1000 to near zero/year	Matsunaga and Nakano 2005
1993–2003	North Atlantic	CPUE	Decline with slope -0.6	Matsunaga and Nakano 2002
1961–2008	SW Atlantic	Stock assessment (catch free, age structured production model)	82% decline in spawning stock biomass (SSB) from historic baseline	ICCAT/ICES 2009 (Figure 19)
1982–2008	SW Atlantic	Stock assessment (surplus production model)	61–82% decline in stock biomass from historic baseline	ICCAT/ICES 2009 (Figure 19)
1992–2002	SW Pacific (New Zealand)	Longline CPUE	70% decline in about 10 years	NZ Ministry of Fisheries 2008 (Figure 17)
1998–2005	SW Pacific (New Zealand)	Weight landed	75% decline in about 10 years	NZ Ministry of Fisheries 2008 (Figure 16)

A 'marked historical extent of decline' is a percentage decline to 5%–30% of the baseline, depending upon the productivity of the species [30% for porbeagle]. A 'marked recent rate of decline' is a percentage decline of 50% per cent or more within the last 10 years or three generations, whichever is the longer

Table 4. EU Commodity codes related to trade in *Lamna nasus*

Customs code	Commodity	Validity
FRESH		
0302.6590	Fresh or chilled sharks (excl. dogfish of the species "*Squalus acanthias*" and "*Scyliorhinus* spp.")	Up to and including 2009
0302.6560	Fresh or chilled porbeagle shark	From 2010
0302.6595	Fresh or chilled sharks (excl. dogfish of the species "*Squalus acanthias*", "*Scyliorhinus* spp. and *Lamna nasus*")	From 2010
FROZEN		
0303.7590	Frozen sharks (excl. dogfish)	Up to and including 2009
0303.7560	Frozen porbeagle shark	From 2010
0303.7595	Frozen sharks (excl. dogfish of the species "*Squalus acanthias*", "*Scyliorhinus* spp." or *Lamna nasus*)	From 2010
FROZEN FILLETS		
0304.2069	Frozen fillets of sharks (excl. dogfish)	Up to and including 2006
0304.2969	Frozen fillets of sharks (excl. dogfish)	2006-2009
0304.2965	Frozen fillets of porbeagle shark	From 2010
0304.2968	Frozen fillets of sharks (excl. dogfish of the species *Squalus acanthias*, *Scyliorhinus* spp. or *Lamna nasus*)	From 2010

Table 5. EU imports of porbeagle *Lamna nasus* products, products (fresh and frozen) by source countries/territories, value and weight, 2010 and 2011.

EUR

Source	2010	2011	Total
SOUTH AFRICA	0	35,221	35,221
NORWAY	15,893	9,560	25,453
MOROCCO	21,613	562	22,175
FAROE ISLANDS	15,995	0	15,995
JAPAN	0	10,936	10,936
SENEGAL	4,486	0	4,486
SURINAME	4,028	0	4,028
Total	62,015	56,279	118,294

kg

Source	2010	2011	Total
SOUTH AFRICA	0	12,600	12,600
JAPAN	0	8,700	8,700
MOROCCO	7,300	500	7,800
NORWAY	5,000	2,700	7,700
FAROE ISLANDS	4,400	0	4,400
SURINAME	2,500	0	2,500
SENEGAL	1,300	0	1,300
Total	20,500	24,500	45,000

EUR/kg

Source	2010	2011	Average
FAROE ISLANDS	3.64		3.64
SENEGAL	3.45		3.45
NORWAY	3.18	3.54	3.36
SOUTH AFRICA		2.80	2.80
MOROCCO	2.96	1.12	2.04
SURINAME	1.61		1.61
JAPAN		1.26	1.26
Average	2.97	2.18	

(2011 data are based on monthly data for January to September only and need to be updated later in 2012)

Table 6. EU exports of *Lamna nasus* products (fresh and frozen) by destination, value and weight, 2010-2011.

EUR

Destination	2010	2011	Total
MOROCCO	47,068	0	47,068
AFGHANISTAN	0	8,208	8,208
CHINA	0	3,562	3,562
ANDORRA	0	2,776	2,776
CEUTA	0	2,460	2,460
SWITZERLAND	602	0	602
Total	47,670	17,006	64,676

kg

Destination	2010	2011	Total
MOROCCO	68,000	0	68,000
AFGHANISTAN	0	2,300	2,300
ANDORRA	0	700	700
CEUTA	0	600	600
CHINA	0	200	200
SWITZERLAND	200	0	200
Total	68,200	3,800	72,000

EUR/kg

Destination	2010	2011	Average
CHINA		17.81	17.81
CEUTA		4.10	4.10
ANDORRA		3.97	3.97
AFGHANISTAN		3.57	3.57
SWITZERLAND	3.01		3.01
MOROCCO	0.69		0.69
Average	1.85	7.36	

(2011 data are based on monthly data for January to September only and need to be updated later in 2012)

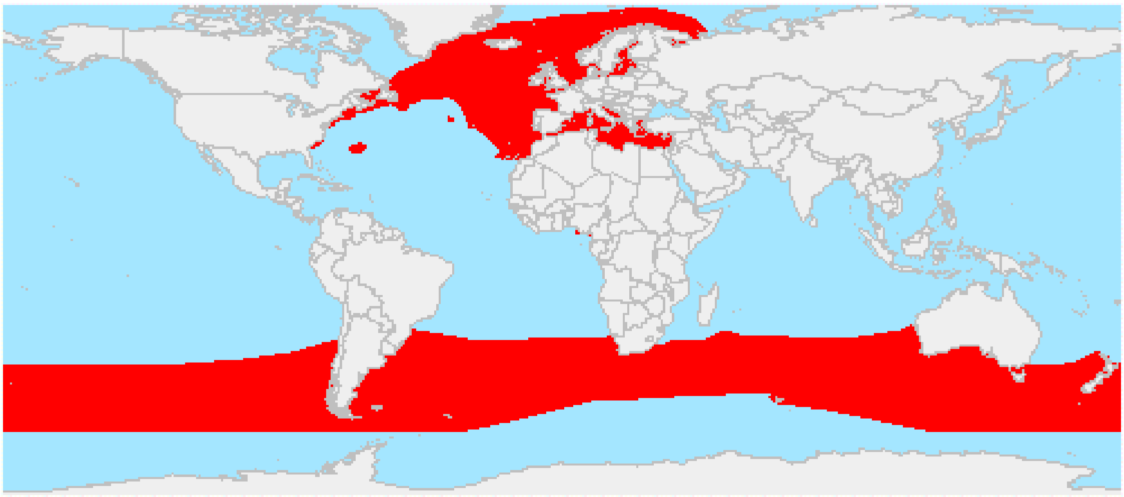

Figure 3. Global *Lamna nasus* distribution (*Source*: FAO FIGIS 2004)

Annexes to Draft Proposal to list *Lamna nasus* in Appendix II - January 2012

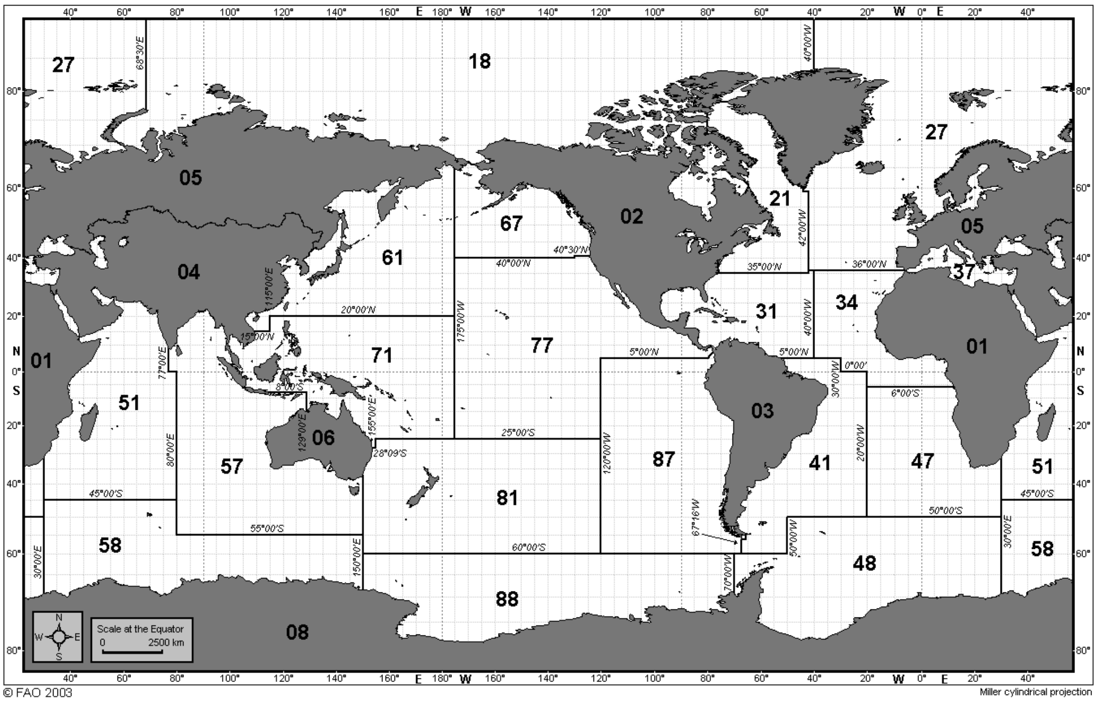

Figure 4. FAO fishing areas.

Key: *Lamna nasus* is reported from the fishing areas underlined below.

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

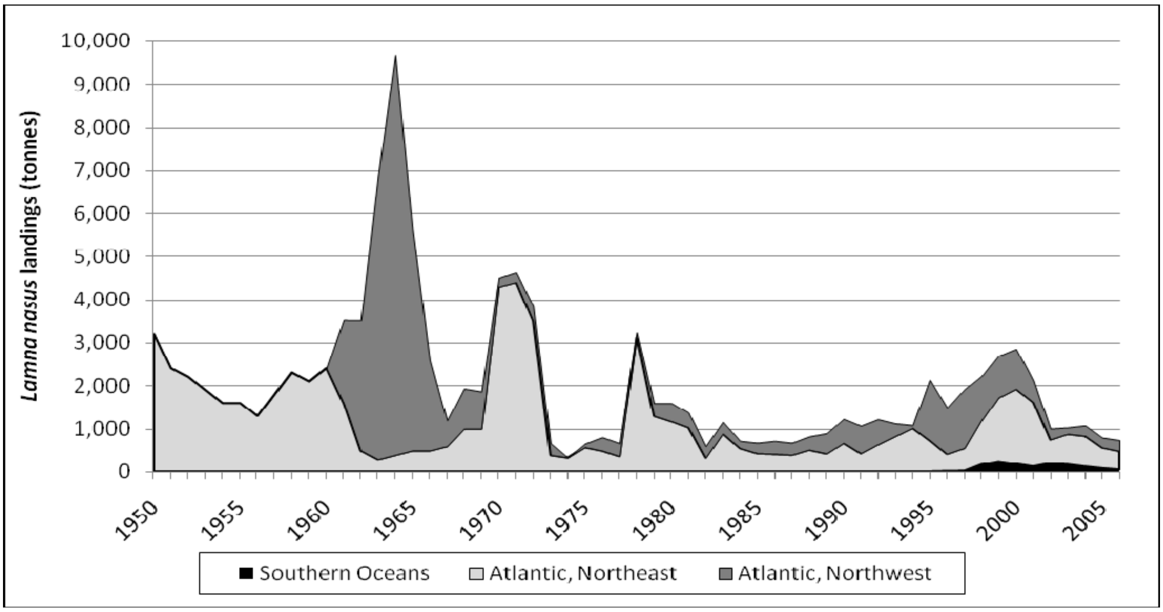

Figure 5. Global reported landings (tonnes) of *Lamna nasus* by major FAO fishing areas, 1950–2009. (*Source*: FAO FishStat) (Data will be updated at a later stage)

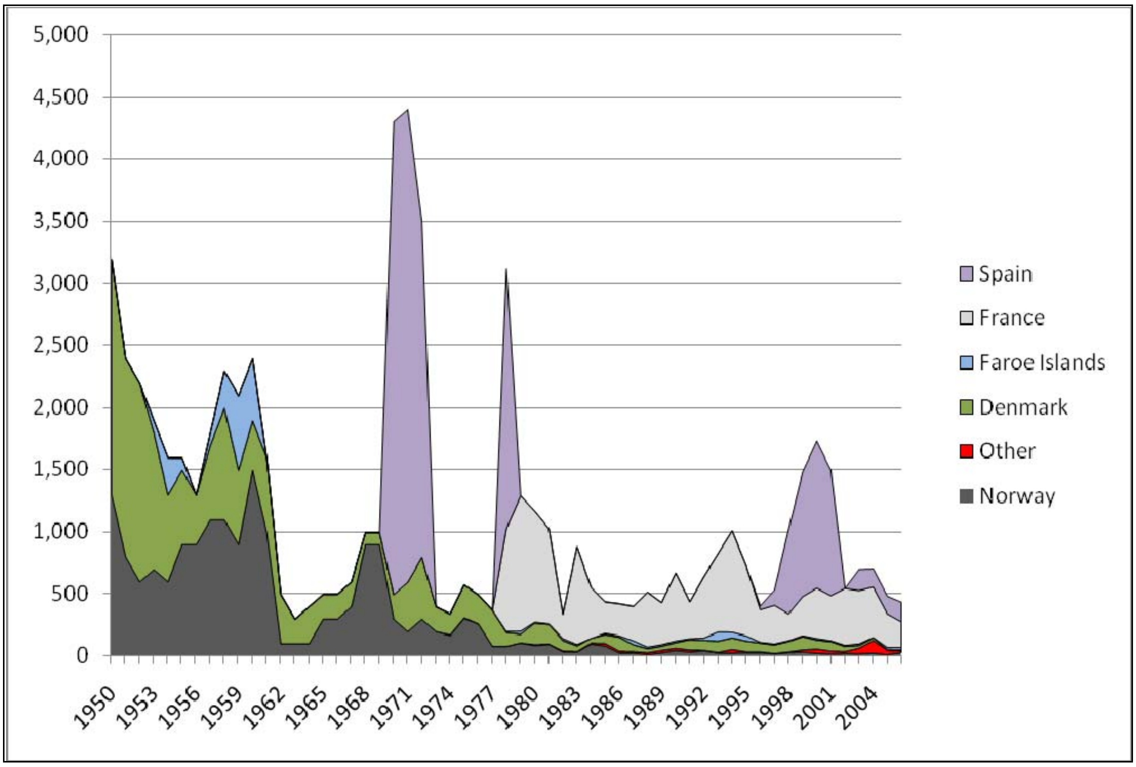

Figure 6. Landings (tonnes) of *Lamna nasus* from the Northeast Atlantic by major fishing States, 1950–2009. **(*Source*: FAO Fishstat)** (Data will be updated at a later stage)

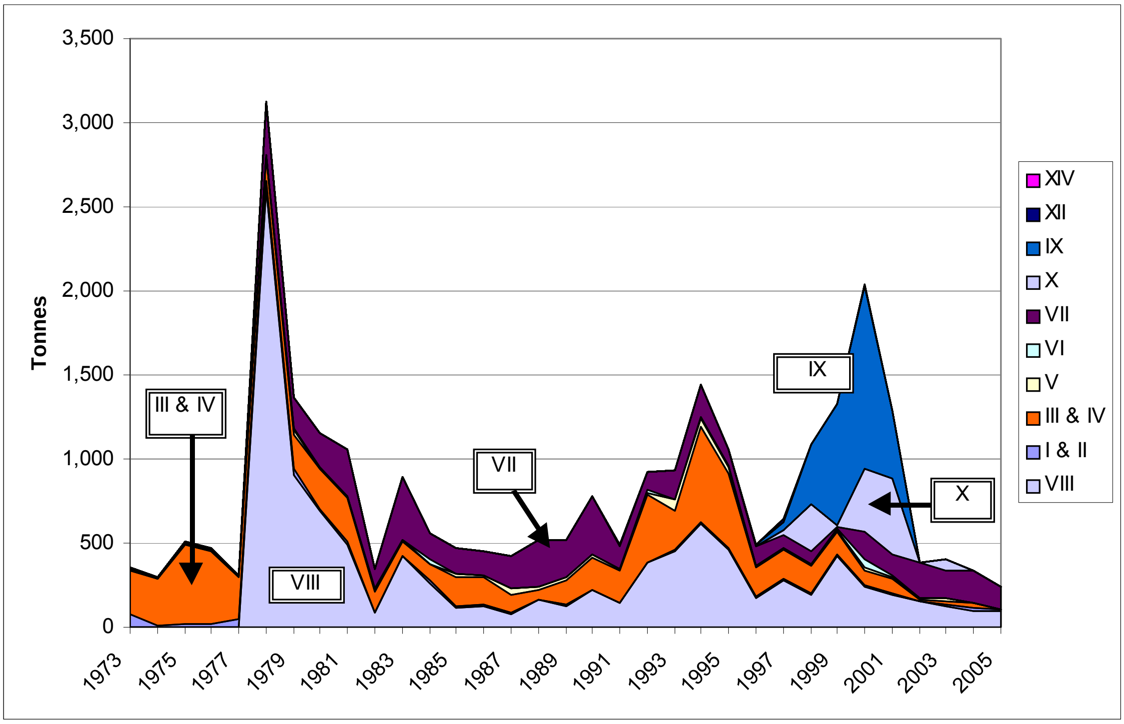

Figure 7. Landings (tonnes) of *Lamna nasus* from ICES Areas (Northeast Atlantic), 1973–2009. **(*Source*: ICES Working Group on Elasmobranch Fishes 2010)** (Data will be updated at a later stage)

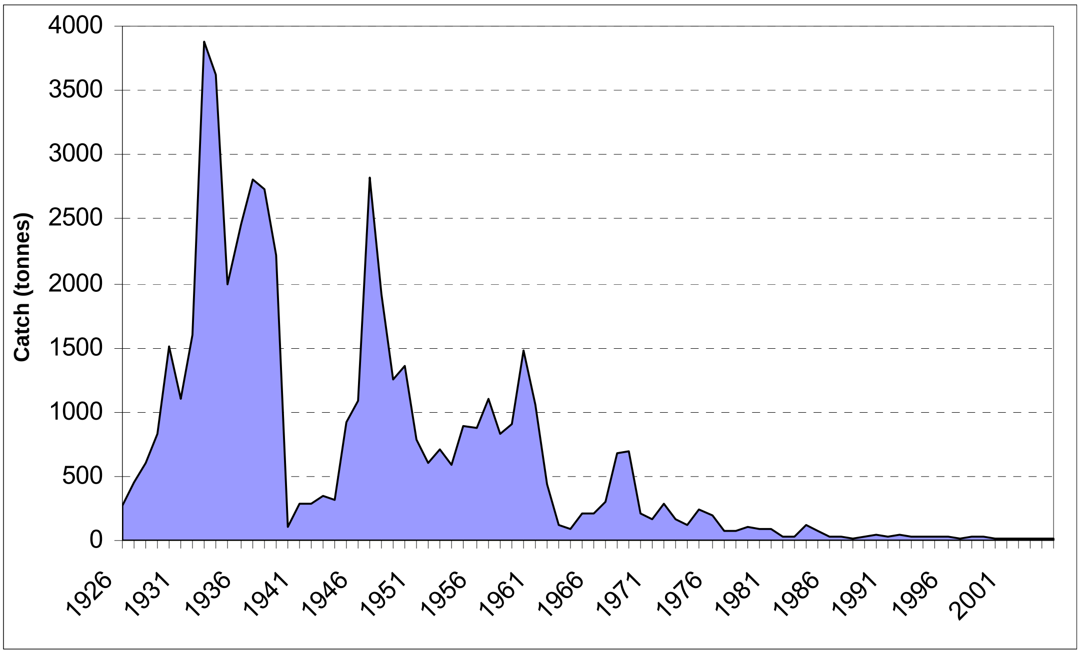

Figure 8. Landings (tonnes) of *Lamna nasus* by Norway in the Northeast Atlantic, 1926–2009. **(*Source*: Norwegian fisheries data & ICES WGEF)** (Data will be updated at a later stage)

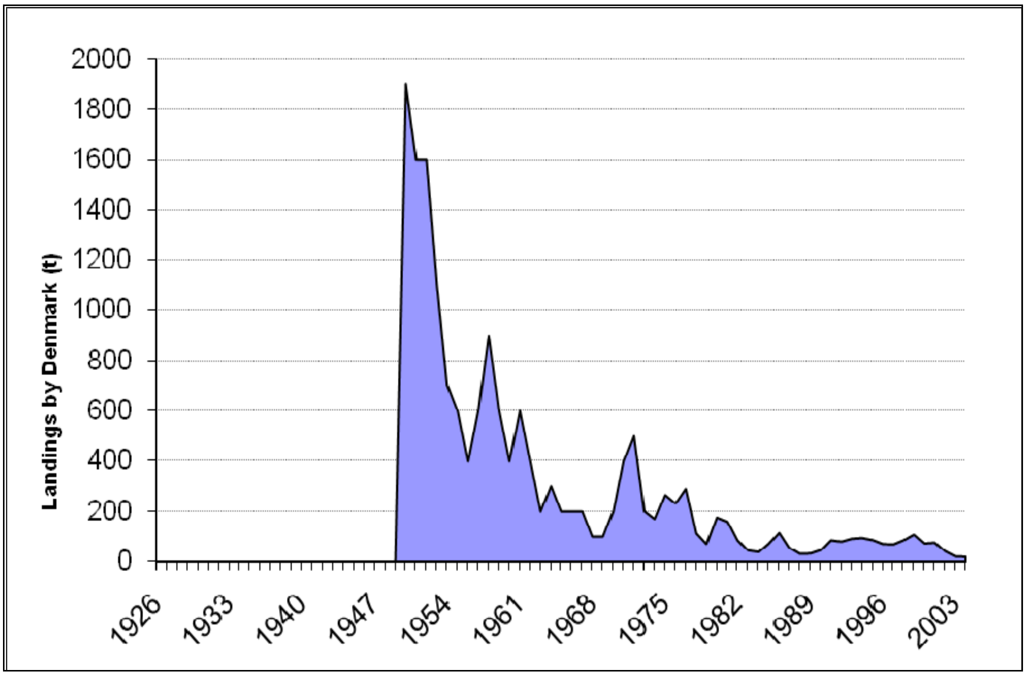

Figure 9. Landings (tonnes) of *Lamna nasus* by Denmark in the Northeast Atlantic, 1954–2009. **(*Source*: ICES Working Group on Elasmobranch Fishes)** (Data will be updated at a later stage

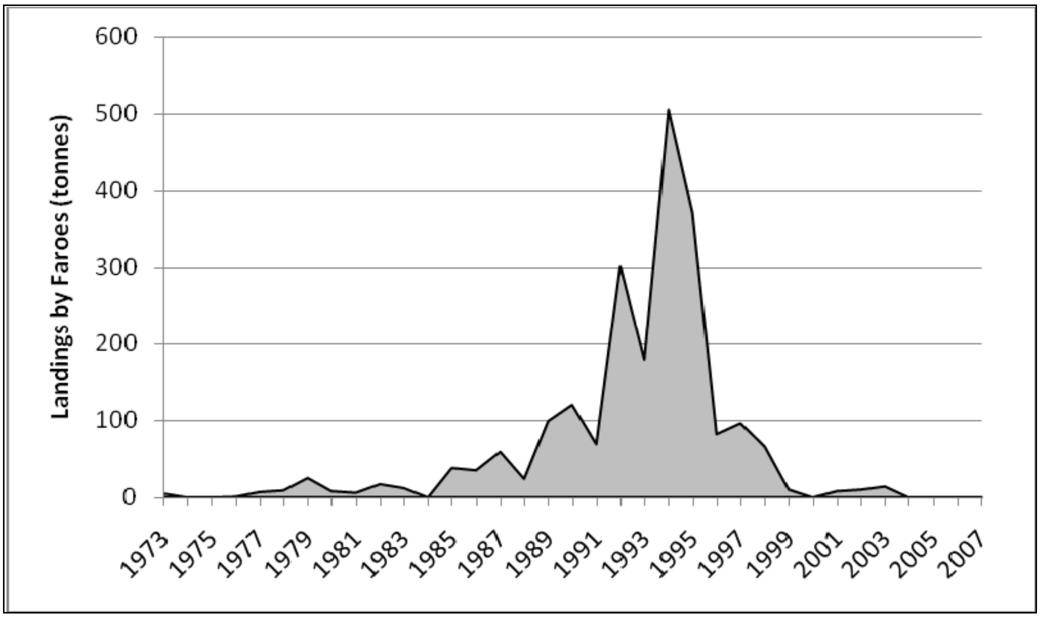

Figure 10. Landings (tonnes) of *Lamna nasus* by Faroe Islands in the Northeast Atlantic, 1973–2009. **(*Source*: ICES WGEF and European Commission.)** (Data will be updated at a later stage)

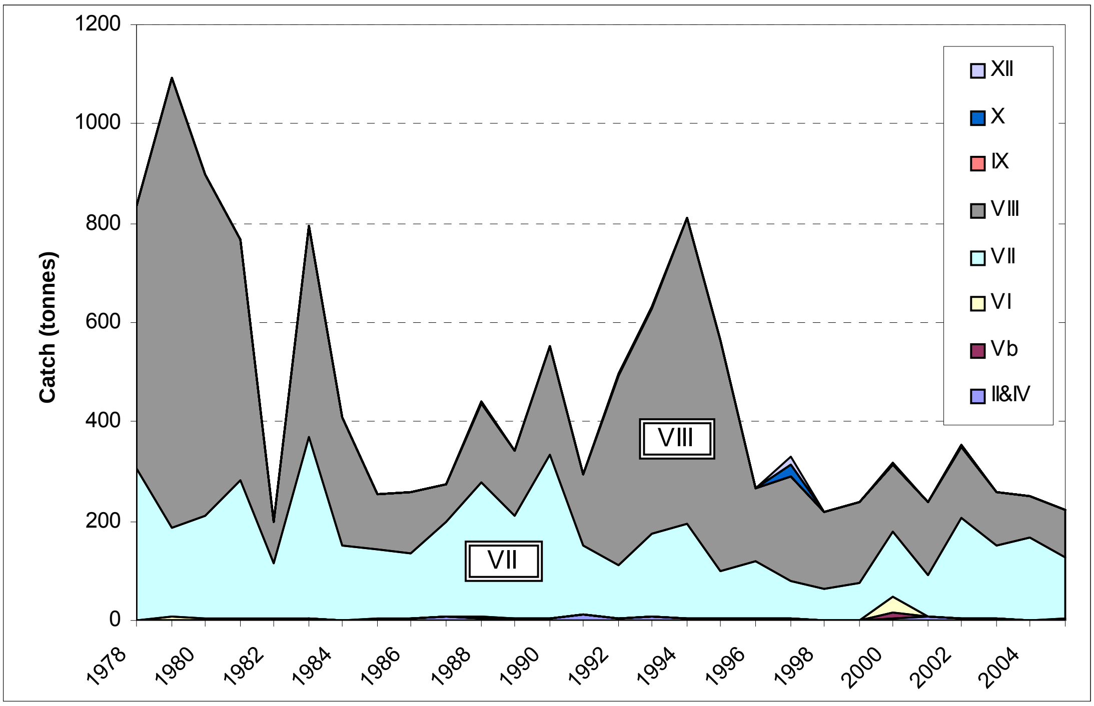

Figure 11. French landings (tonnes) of *Lamna nasus* in the Northeast Atlantic, 1978–2009. **(*Source*: ICES Working Group on Elasmobranch Fishes)** (Data will be updated at a later stage)

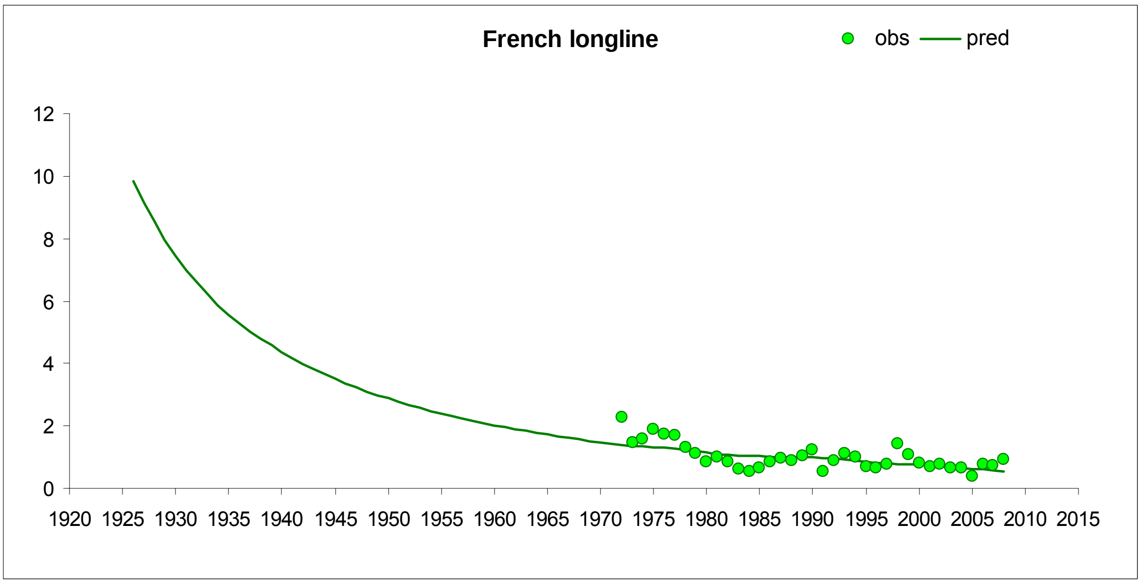

Figure 12. Surplus production age-structured model fits to French longline CPUE indices (assuming virgin conditions in 1926) for northeast Atlantic porbeagle shark. Source ICCAT SCRS/ICES 2009.

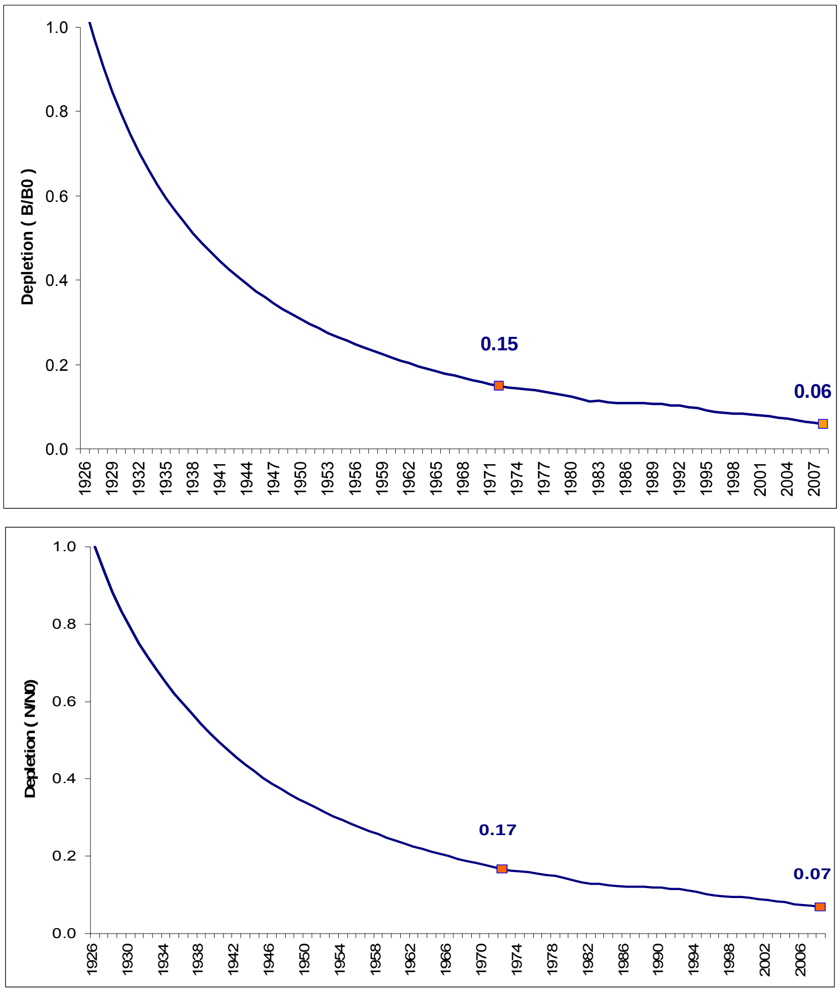

Figure 13. Depletion in total biomass (upper panel) and numbers (lower panel) for a surplus production age-structured model for Northeast Atlantic porbeagle shark. The dots indicated on the line correspond to depletion at the beginning of the modern period (1972) and current depletion (2008).Source ICCAT/ICES 2009.

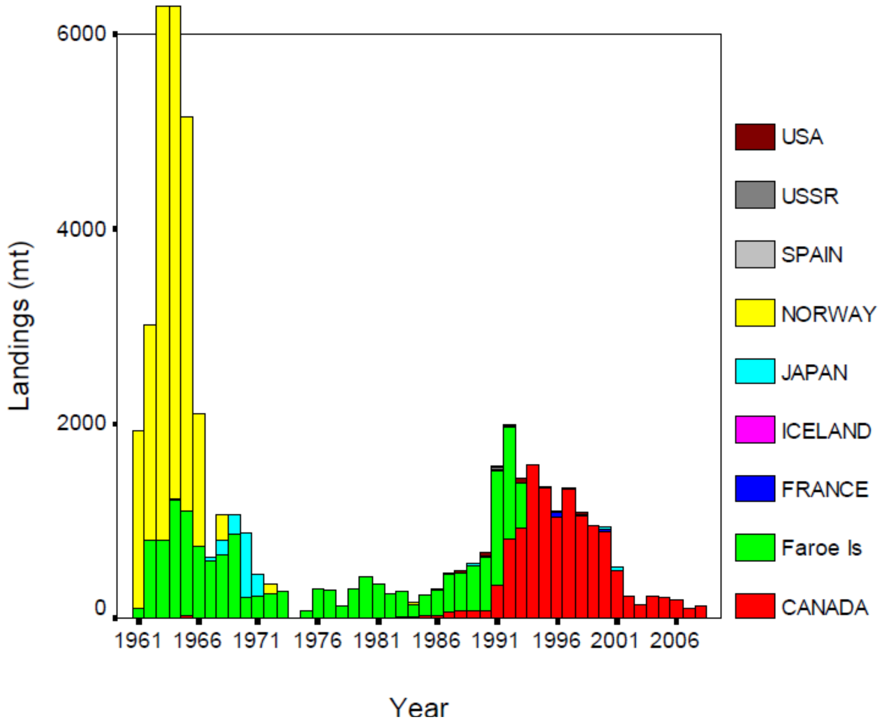

Figure 14. *Lamna nasus* landings in the Northwest Atlantic, 1961–2008 (excluding unreported high seas captures). (Source: Campana *et al*. 2010)

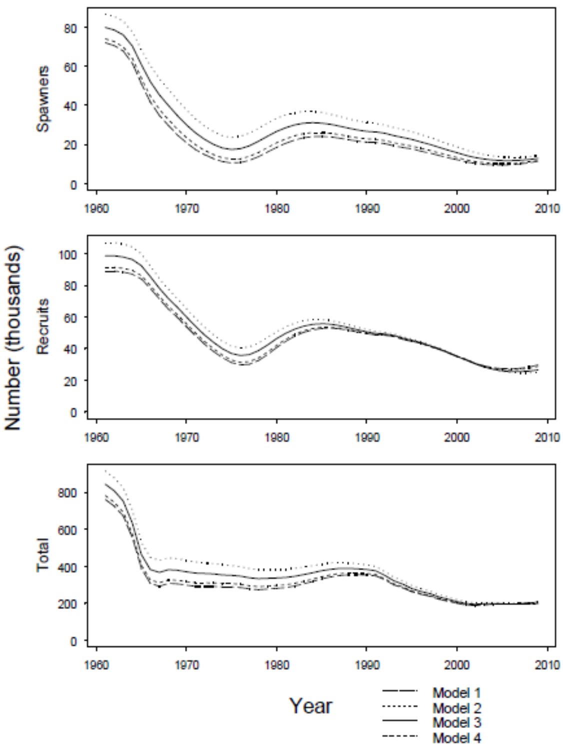

Figure 15. Estimated trends in numbers of mature females (top), age-1 recruits (centre) and total number of *Lamna nasus* in Canadian waters, 1960–2010, from four porbeagle population models (all show similar trajectories). (Source: Campana *et al*. 2010.)

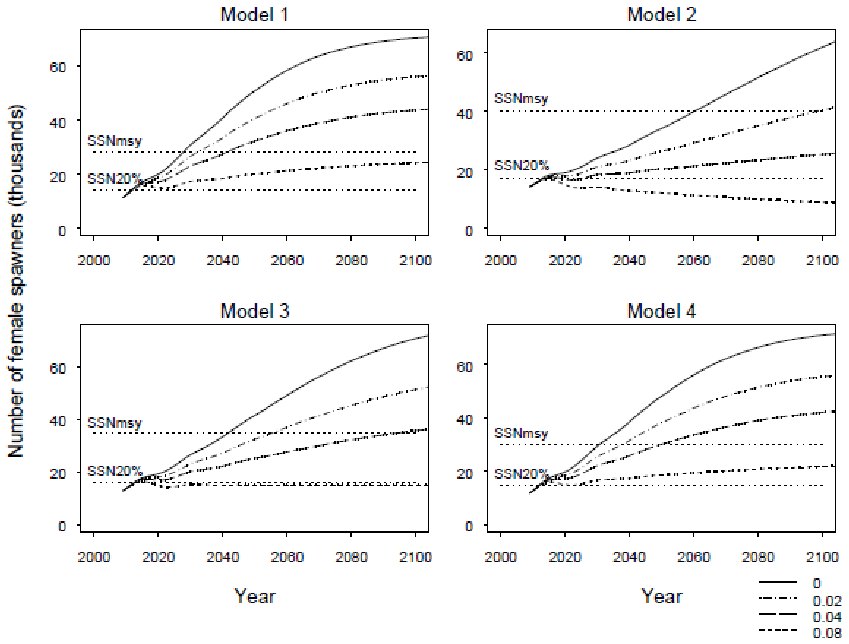

Figure 16. Comparison of recovery targets and trajectories for the Canadian porbeagle stock during 2009–2100, obtained using Population Viability Analysis from four population models projected deterministically under four different exploitation rates (0% to 8% *per annum*). (Source: Campana *et al*. 2010.)

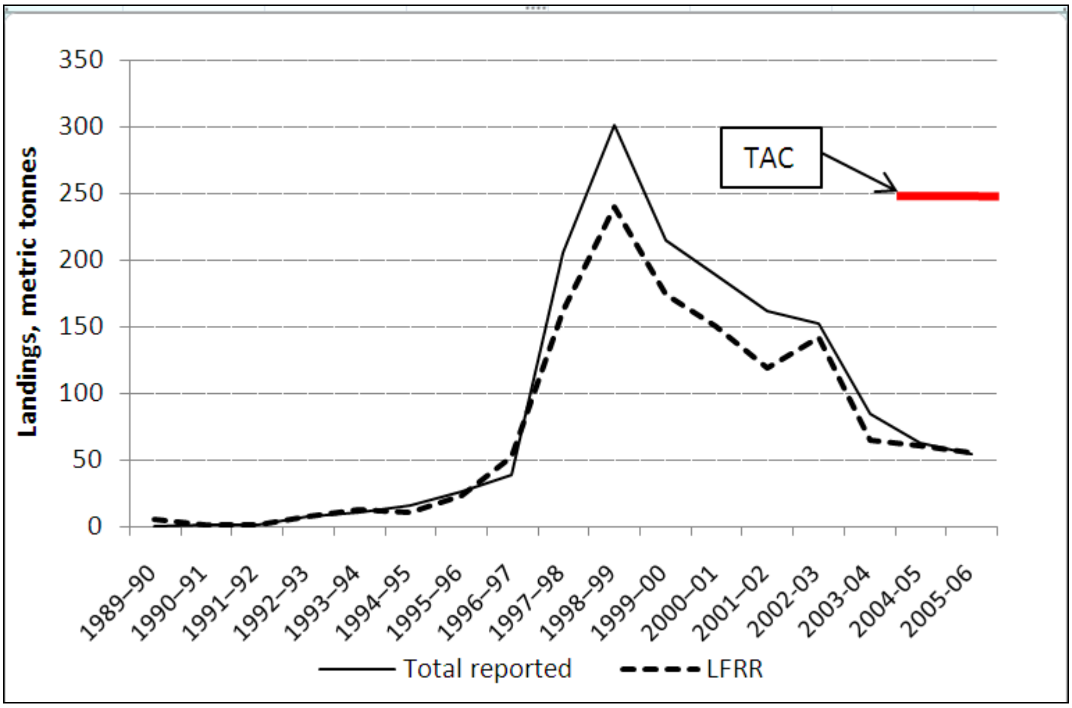

Figure 17. New Zealand commercial landings of porbeagle sharks reported by fishers and processors (LFRR), 1989/90 to 2004/05. (Source Ministry of Fisheries 2008.)

Substantial foreign landings up to about 1992–93 have not been quantified and are not included here. Domestic tuna longline fishing effort rose until 2002/03, but has fallen in recent years.

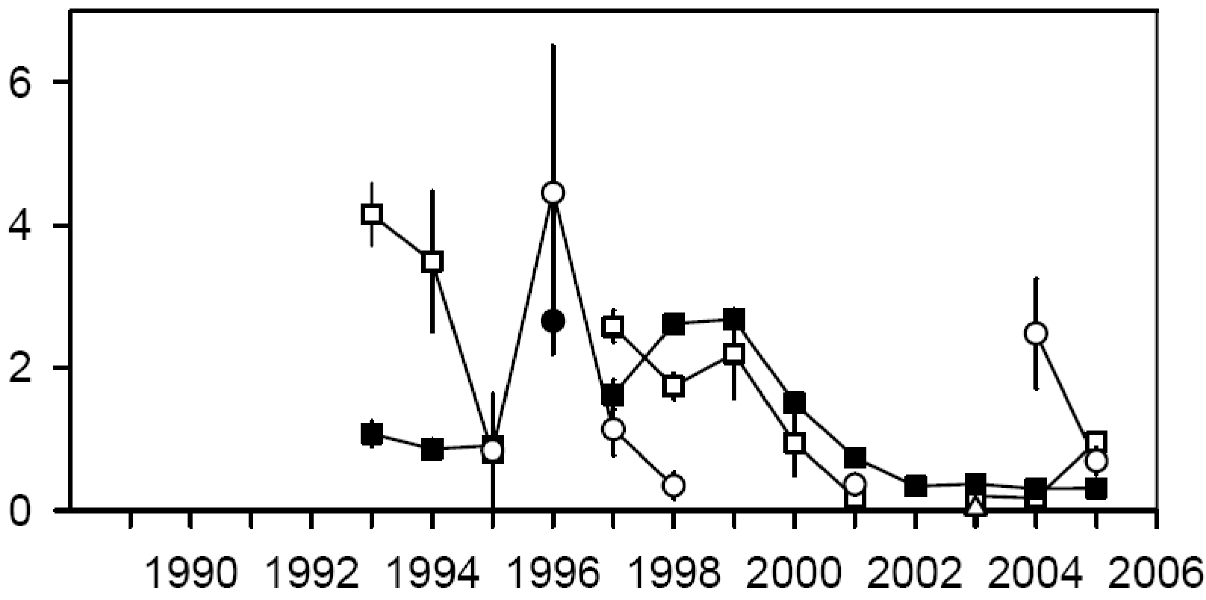

Figure 18. Unstandardised CPUE indices (number of *Lamna nasus* per 1000 hooks) for the New Zealand tuna longline fishery based on observer reports.
Years are fishing years (1993 = October 1992 to September 1993). Confidence intervals are from bootstrapped data. -■- foreign and charter fleet, southern New Zealand; -□- foreign and charter fleet, northern New Zealand; -●- domestic fleet, southern New Zealand; -○- domestic fleet, northern New Zealand. (Taken from Ministry of Fisheries (2008). Source: Griggs *et al*. 2007.)

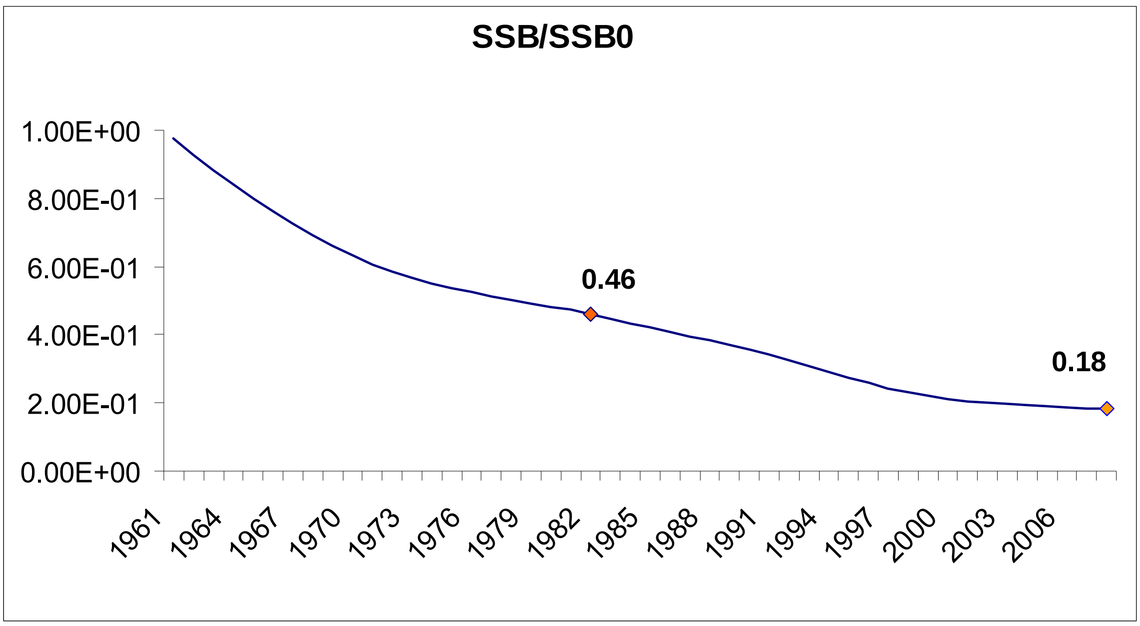

Figure 19. Relative spawning stock biomass (SSB) trend for the catch free age structured production model, assuming virgin conditions in 1961, for southwest Atlantic porbeagle shark. The dots indicated on the line correspond to depletion at the beginning of the modern period (1982) and current depletion (2008). Source ICCAT SCRS/ICES (2009).

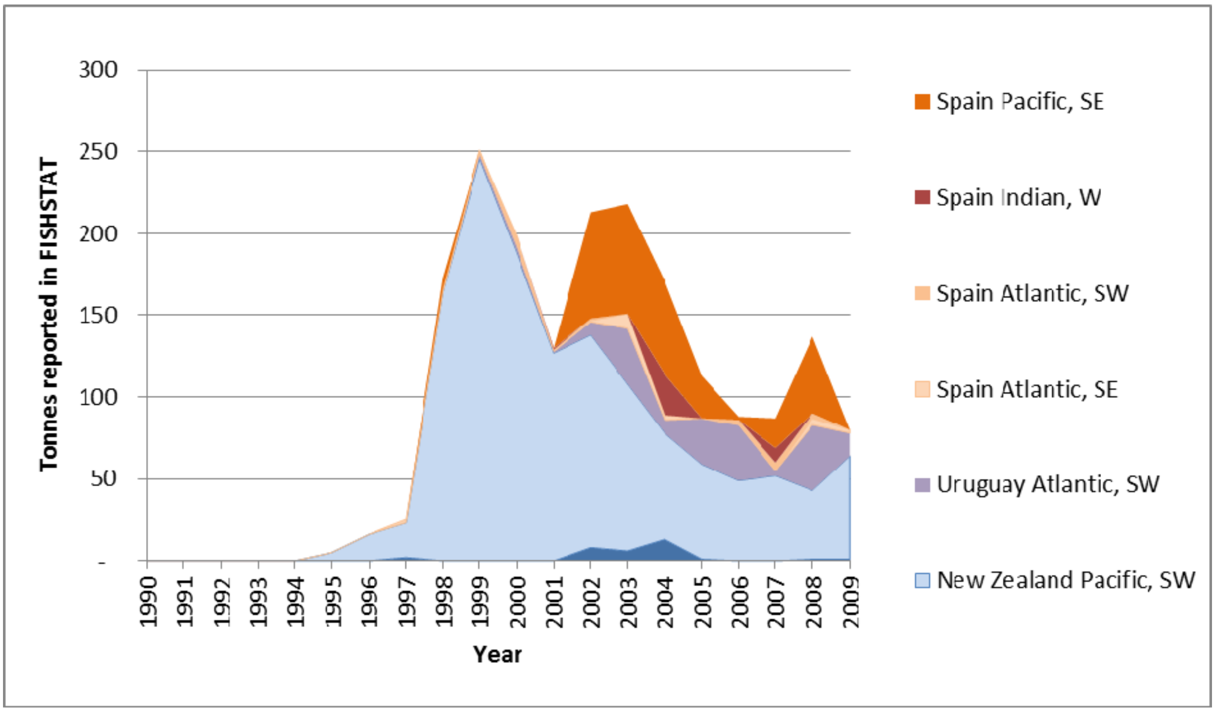

Figure 20. Southern hemisphere landings of porbeagle *Lamna nasus*, 1990–2009 (Source FAO FISHSTAT).

Annex 2.

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.

Annex 3.

Range States and Areas where *Lamna nasus* has been recorded

(Source Compagno 2001)

Albania
Algeria
Antarctica
Argentina
Australia (New South Wales; Queensland; South Australia; Tasmania; Victoria; Western Australia)
Azores Is. (Portugal)
Belgium
Bermuda
Brazil
Canada (New Brunswick; Newfoundland; Nova Scotia; Prince Edward Island)
Canary Islands
Cape Verde
Channel Islands (UK)
Chile
Croatia
Cyprus
Denmark
Egypt
Faeroe Islands
*Falkland/Malvinas Islands
Finland
France
France (Corse)
French Polynesia
Germany
Gibraltar
Greece (East Aegean Is.; Kriti)
Greenland
Iceland
Ireland
Isle of Man
Israel
Italy (Sardinia; Sicilia)
Kerguelen Is.
Lebanon
Libya
Madeira Islands (Portugal)
Malta
*Malvinas/Falkland Islands
Monaco
Morocco
Netherlands
New Zealand
Norway
Portugal
Russian Federation
Slovenia
South Africa
South Georgia and the South Sandwich Islands
Spain
Sweden
Syria
Tunisia
Turkey
United Kingdom (England, Wales, Scotland, Northern Ireland)
United States of America (Maine; Massachusetts; New Jersey; New York; Rhode Island; South Carolinas?)
Uruguay
Yugoslavia

FAO Fisheries Areas:
21, 27, 31, 34, 37, 41, 47, 48, 51, 57, 58, 81 and 87 (see Figure 3).

Oceans:
Northwest Atlantic: Greenland, Canada, United States, and Bermuda.

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; Mediterranean (not Black Sea); Morocco, Madeira, and Azores.

Southern Atlantic: southern Brazil and Uruguay to southern Argentina; Namibia and South Africa.

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. Sub Antarctic waters off South Georgia, Marion, Prince and Kerguelen Islands.

Eastern South Pacific: southern Chile to Cape Horn.

* A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands/Islas Malvinas

Annex 4.

Application of the criteria for amendment of Appendices I and II for commercially exploited aquatic species, with regard to Porbeagle shark *Lamna nasus*

CITES Standing Committee 58 [SC58 Sum. 7 (Rev. 1) (09/07/2009)] asked Parties, as they prepared for CoP15, to clearly define in their listing proposals how they have interpreted and applied Resolution Conf. 9.24 (Rev. CoP14), particularly paragraph B of Annex 2a of the Resolution, which deals with the inclusion of species in Appendix II in accordance with Article II paragraph 2a of the Convention. This paragraph has been interpreted differently by the CITES and FAO Secretariats, and by Parties.

The 15th meeting of the Conference of Parties also discussed this issue, introduced in CoP15 Doc.63, adopting Decision 15.28 (addressed to the Secretariat) and 15.29 (addressed to the Animals Committee), and further amending Res Conf 9.24 (Rev. CoP15). The discussion on the application of the listing criteria within CITES and FAO has continued since then within the framework set out by these Decisions, with the following documents prepared and discussed by AC25 in July 2011: AC25 Doc. 10; AC25 Inf. 10 (Germany); AC25 Inf. 12 (FAO 2011, the report of a workshop on the application of criterion Annex 2a B).

Since these discussions are still underway with no recommendations available yet, this proposal has been developed on the basis of the EU position so far.

<u>Interpreting the Text of Annex 2 a with regard to *Lamna nasus*</u>

The proponents have carefully considered the FAO's views on how CITES Parties should interpret the criteria in Resolution Conf. 9.24 (SC 58 Inf. 6), and the interpretation suggested by the CITES Secretariat (SC 58 Doc. 43). In the view of the proponents, the definition of the term "decline" given in Annex 5 of Resolution Conf. 9.24 and the Footnote "Application of decline for commercially exploited aquatic species" is clearly relevant for Criterion A of Annex 2 a, and we have interpreted it according to the guidelines and the footnote.

Criterion A of Annex 2 a states that a species should be included in Appendix II “to avoid it becoming eligible for inclusion in Appendix I in the near future". According to Article II Paragraph 1 of the Convention, it shall be included in Appendix I if it is "threatened with extinction". According to Annex 1 of Res. Conf. 9.24 (Biological criteria for Appendix I), a species is threatened with extinction if it meets or is likely to meet at least one of the criteria A, B or C, with C specifying "a marked decline in the population size in the wild [...]". This term "decline" used in Criterion C for Appendix I is then further defined in Annex 5 (Definitions, explanations and guidelines) and specified for commercially exploited aquatic species in the abovementioned footnote.

By contrast, Criterion B of Annex 2 a does not refer to Appendix I. Criterion B states that a species should be included in Appendix II "to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences." Whether the Appendix I definition of "decline" is relevant for Criterion B has been subject to different interpretations. The proponents do not wish to enter into this general discussion through the present document. However, the proponents would like to underline that Criterion B represents the outcome of a rewording of the previous version of Paragraph B of Annex 2a in Res. Conf. 9.24, which reads as follows:

> *"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."*

In the criteria working group at Johannesburg (20th Animals Committee, 2004) it was recognized that Criterion B of Annex 2 a in its current version encompasses both meanings of the abovementioned original text, i.e. paragraph i) and ii). With respect to paragraph ii) of the original criterion, decline is relevant with respect to the special case of reducing a population to a level at which depensation might occur. Paragraph i) of the original criterion is a reference to long-term unsustainable harvesting that is known or might be inferred or projected and to the detrimental impact that such harvesting has, or may have, on the species.

This represented the understanding of European Community Parties when the revised criteria were adopted, and the proponents feel that this remains a valid interpretation of this criterion.

Resolution Conf. 9.24 (Rev. CoP 14) also recognizes the importance of the application of the precautionary approach in cases of uncertainty and indicates that the definitions, explanations and guidelines provided in Annex 5 should be interpreted in a flexible manner, taking account of the specific features of each species considered. This was highlighted by the Standing Committee at its 58th meeting, and the proponents have interpreted the Resolution accordingly in their listing proposal for *Lamna nasus*.

On this basis, with regard to the relevant stocks of *Lamna nasus* referred to in the proposal, Criterion B of Res. Conf. 9.24 Annex 2a is regarded to be met because:

- This species is of high biological vulnerability, falling within FAO's lowest productivity, and takes decades to recover from depletion, even under fisheries management;
- Exploitation in target fisheries is driven primarily by international trade demand for this species' meat, while fins and meat enter international trade from target and bycatch fisheries
- Stock assessments identify serious impacts of exploitation in the North Atlantic and Southwest Atlantic (possibly extending into Southeast Pacific), where populations depleted by target and bycatch fisheries qualify for listing in the CITES Appendices;
- Data are lacking on most other southern hemisphere stocks, but these populations are of lower biological productivity, even more vulnerable to depletion than northern stocks, and are also exploited by fisheries;
- *Lamna nasus* is taken in high seas IUU fisheries, which undermine conservation measures adopted by coastal fishing states;
- Improved management of all stocks is a high priority. As also pointed out by the 2009 FAO expert panel (FAO 2010), regulation of international trade through CITES listing can supplement traditional management measures, including by strengthening national efforts to keep harvesting for trade commensurate with stock rebuilding plans and improving the control of high seas catches through the use of certificates of introduction from the sea accompanied by non detriment findings, thus providing a significant contribution to the conservation of this species.

Annex 5.

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