

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Fourteenth meeting of the Conference of the Parties
The Hague (Netherlands), 3-15 June 2007

Comments on the FAO Assessment of the CITES Amendment

PROPOSALS TO LIST THE PORBEAGLE (*LAMNA NASUS*) AND THE SPINY DOGFISH
(*SQUALUS ACANTHIAS*) ON APPENDIX II OF CITES

1. The attached document has been submitted by Germany on behalf of the European Community and its Member States.
2. The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries.

Comments on the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle (*Lamna nasus*) and the Spiny Dogfish (*Squalus acanthias*) on Appendix II of CITES

Executive summary

Germany, on behalf of the European Community and its Member States, has submitted two proposals to list the porbeagle (*Lamna nasus*) and the spiny dogfish (*Squalus acanthias*) on appendix II of CITES because it is convinced that both species meet the criteria of Resolution 9.24 (Rev CoP13) (criteria A and B of Annex 2a).

The outcomes of both the FAO expert assessment and its recommendations as well as those of the CITES-Secretariat have been assessed carefully.

The **FAO panel's assessment** of the shark listing proposals differ in its conclusions from those of the proponents because the panel has used a different interpretation of the CITES criteria and guidelines when evaluating the same data. There appear to be two major reasons for the FAO conclusions:

- i) The FAO Expert Panel did not consider the two Appendix II listing criteria separately, but focused primarily upon qualifying declines under criterion A of Article II, paragraph 2 (a).**

The shark stocks that do not currently qualify for listing under criterion A, however, do qualify for listing under Criterion 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*". Serial or sequential depletion is very common in fisheries. It takes place when, after depleting a population in one area until the fishery has become uneconomic, fishing effort moves to another area, depletes that population, then moves on again. The FAO report notes that this has occurred for porbeagle within the Northeast Atlantic. It also occurred when fisheries opened in the northwest Atlantic following the depletion of northeast Atlantic stocks of both sharks. The unregulated targeted fishing pressure driven by international trade demand that has already depleted many porbeagle and spiny dogfish stocks will, in the near future, cause similar declines in unmanaged stocks that are not yet so heavily fished. The purpose of the proposed CITES listings is to ensure that the management necessary to support non-detriment findings is introduced and hence that these new fisheries remain sustainable.

- ii) The FAO Expert Panel did not take account of the primary importance of the mature female part of the population when considering decline trends and absolute population size.**

This subject was considered by FAO during an earlier Technical Consultation on the CITES criteria (FAO 2001), but may have been overlooked by the Expert Panel. FAO (2001) notes in a discussion of relevant metrics for extent-of-decline, such as number and biomass, that "*The life history stage that is most relevant to measure will in most cases be the mature component*". This is particularly important when mature females are being preferentially targeted and when such targeting has led to recruitment failure. It is, therefore, the proportion of mature females rather than the total population size that must be considered when assessing the qualifying decline under criterion A. Although it has some large populations, mature females make up a very small proportion of these (see below).

*Comments to the FAO Assessment of the CITES Amendment Proposals to list the
Porbeagle and the Spiny Dogfish on Appendix II*

FAO (2001)¹ also recognised that the total number of animals in a population is, under some circumstances, one of the mitigating factors that may decrease concern for a species that qualifies for listing because of a population decline. Thus, if a population is extremely large, it might not automatically be appropriate to consider it for listing. However, FAO (2001) also concluded that "*large numbers by themselves are not a sufficient mitigating factor. It is necessary to demonstrate that, for example, reproductive success is not compromised and vulnerability factors such as schooling are not of overriding importance.*"

Other vulnerability factors identified by FAO that need to be taken into account are *selectivity of removals; age, size or stage structure of a population; social structure, including sex ratio; and vulnerability at different life stages (e.g. during migration or spawning)*. All of the above apply to spiny dogfish, which aggregates in schools of pregnant females that are easily located by fishers and where depletion of mature females leads to reproductive failure.

While the FAO Expert Panel used the stock assessments for the Northeast Atlantic to estimate that there are 50 million spiny dogfish in that region, the same stock assessment concluded that in 2000 there were only some 100,000 to 500,000 mature animals in the same stock (some 0.1 to 0.5 % of the FAO estimate for the total population).

The biomass of mature females in US waters of the Northwest Atlantic is around 15 % of the total. Since mature females are larger than any other individuals in this population, the total number of mature females is significantly less than 15 % of the FAO estimate of 195 million animals of all spiny dogfish in these waters.

A survey of the stock on the Nova Scotia Bank, in Canadian Atlantic waters where DFO Canada reports that females are not preferentially targeted, concluded that only 3 % of the population is comprised by mature females (see section 4.2 of the listing proposal).

The global stock of mature females of spiny dogfish can be calculated from FAO's estimate of total population size by applying an unprecautionary conversion of 6 % of mature females in those stocks where no estimate of mature females has been developed. This produces an estimate of about 60 million mature females globally compared to the FAO estimate of one billion animals of all spiny dogfish.

Conclusion: In view of the above, the proponents still consider that the depleted Northern stocks of porbeagle and spiny dogfish qualify for listing on Appendix II under criterion A. Continued international trade demand for their products is now leading to redirection of fishing effort onto other stocks, which qualify for listing under criterion B because regulation of trade is required to ensure that this harvest is sustainable. An Appendix II listing is therefore needed for both species.

We considered in depth the FAO and CITES Secretariat recommendations and we conclude that the proposal is fully justified and the species meet the criteria for listing on Appendix II of CITES.

¹) FAO 2001. A Background Analysis and Framework for Evaluating the Status of Commercially-Exploited Aquatic Species in a CITES Context. FI:SLC/2001/2.FAO, Rome.

1. Introduction

The Second FAO Ad Hoc Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of CITES Concerning Commercially-exploited Aquatic Species² was held at FAO headquarters from 26 to 30 March 2007. The objective of the Panel was to:

- *assess each proposal from a scientific perspective in accordance with the CITES biological listing criteria (Resolution Conf. 9.24 [Rev. CoP13]);*
- *comment, as appropriate, on technical aspects of the proposal in relation to biology, ecology, trade and management issues, as well as, to the extent possible, the likely effectiveness for conservation.*

An advance copy of the report of this panel has been released as FAO Fisheries Report No. 833. This reports that the FAO Ad Hoc Expert Panel concluded that the available evidence does not support the proposals to include the porbeagle shark, *Lamna nasus* (CoP14 Prop. 15) or spiny dogfish, *Squalus acanthias* (CoP14 Prop. 16) under CITES Appendix II.

This document presents a review of the FAO Ad Hoc Expert Panel report. The aim is to evaluate and explain why the interpretation of the criteria and the conclusions of the Expert Panel differ from the opinion of the proponents (Germany on behalf of the Member States of the European Community) of these listing proposals, based on the same data.

Annex 1 and Annex 2 of this paper presents the text of the FAO report alongside the comments on this text prepared during this review. The following few pages draw upon these Annexes to summarise and evaluate the major arguments that were used by the FAO panel to conclude that the species do not meet the listing criteria.

Most of the information presented here is drawn from the listing proposals, which provide details of the sources cited. Where additional information is presented here, the sources for this are cited.

2. The CITES Listing Criteria

There are two criteria for inclusion of species in Appendix II in accordance with Article II, paragraph 2 (a) of the Convention (see Annex 2 a of Resolution Conf. 9.24 (Rev. CoP13)). This states that:

"A species should be included in Appendix II when, on the basis of available trade data and information on the status and trends of the wild population(s), at least one of the following criteria is met:

- "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; or*
- "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.*"

The first of these criteria covers the situation under which a species has already declined significantly and is close to meeting the Appendix I criteria. Annex 5 of CITES Resolution Conf. 9.24 (Rev. CoP 13) sets out guidelines for applying the decline criterion, including precise quantitative triggers for aquatic species in marine and large freshwater bodies. For low productivity species, the trigger for an Appendix I listing is a decline to 15–20% of historic baseline, and the trigger suggested for an Appendix II listing is 25–30%. FAO (2001, paragraph 44) recognises that "a percentage of baseline greater than 20% may be appropriate

² FAO Fisheries Report No. 833, March 2007, advance copy.

[for consideration for listing on Appendix I] *for some exploited fish species characterised by extremely low productivity, for example certain sharks*". The same FAO document (paragraph 47) also states *"the life history stage that is most relevant to measure will in most cases be the mature component"*. This is particularly important when mature females are being preferentially targeted and when such targeting has led to recruitment failure.

The two shark species, particularly the spiny dogfish, are extremely low productivity. Listings of these species where there has been a decline of less than 70% from baseline (i.e. the remaining population is greater than 30% of baseline) for the mature component of the stock (particularly mature females, which are quantified in some stock assessments for both shark species) could, therefore be justified under criterion A. Some of FAO's conclusions may arise from their differing interpretation of this criterion.

The second criterion, B, covers the situation under which such a decline has not yet taken place but where Parties consider that there is a significant likelihood that harvesting to supply international trade is unsustainable and could damage the viability of wild populations (potentially also leading, in due course, to the species qualifying for Appendix I listing), unless trade is regulated through CITES.

A major reason for the Expert Panel's conclusions appears to arise because *"In the view of FAO, these [Annex 5] decline guidelines encompass the intentions of both Annex 2 a A and 2 a B"* (page 4 of report). They therefore based their conclusions upon the biological decline criterion, largely omitting consideration of Criterion B, which is important for several populations of the two shark species proposed for listing. The importance of Criterion B considerations are, however, recognised in the Panel report (for example: *"...market demand for high-value products had the potential to drive increased exploitation of currently under-exploited stocks"* and *"the potential for exploitation to increase substantially in other areas due to high market demand means that the global status of the species should continue to be monitored"*).

The issue of large population size was also considered by the Expert Panel. FAO (2001) recognised that if a population is extremely large, it might not automatically be appropriate to consider it for listing because of a population decline. However, FAO (2001, section 3.5) also concluded that *"large numbers by themselves are not a sufficient mitigating factor. It is necessary to demonstrate that, for example, reproductive success is not compromised and vulnerability factors such as schooling are not of overriding importance."* Other vulnerability factors that should be taken into account are *selectivity of removals; age, size or stage structure of a population; social structure, including sex ratio; and vulnerability at different life stages (e.g. during migration or spawning)*.

The summarised conclusions of the FAO Expert Panel are presented and evaluated briefly below. Annex I and Annex II provide a far more detailed appraisal of the Panel report and should be consulted if more information is required.

3. Evaluation against the listing criteria

FAO contributed significantly to the development of the quantitative guidelines for commercially exploited aquatic species presented in Resolution Conf. 9.24 (Rev. CoP 13) Annex 5: Definitions, explanations and guidelines. The expert panel focused predominantly upon evaluating the two shark listing proposals against these biological decline criteria. A large number of stocks of porbeagle shark and spiny dogfish that qualify for inclusion in Appendix II under Criterion B, but not under Criterion A, were not evaluated against Criterion B by the FAO Expert Panel. The Panel therefore concluded that the evidence did not support the listing of either of these two shark species on Appendix II.

3.1 Porbeagle shark *Lamna nasus*

FAO Expert Panel conclusion:

"Globally, the species does not meet the biological decline criteria for listing in CITES Appendix II. The decline in population abundance of the northwest Atlantic population meets the Appendix II criterion, but risk to the northwest Atlantic population is mitigated by population rebuilding and the existence of both Canadian and United States management plans designed to rebuild stocks. Porbeagles in the northeast Atlantic Ocean may meet Appendix II criteria, but the limited data that were available were not sufficient to assess the extent of the decline. In the southern hemisphere, porbeagle populations are relatively lightly exploited and Appendix II criteria are likely not met."

Appraisal of FAO conclusions:

a) Risk to the northwest Atlantic population is mitigated by population rebuilding. The biomass of the mature female segment of the seriously depleted Northwest Atlantic population is currently at 12–15% of historic (1961) baseline, thus meeting the biological decline criterion for Appendix I, while the total population (including a large proportion of juveniles) is at 21–24% (meeting the criteria for Appendix II). While the entire biomass of the stock has increased slightly following the latest Canadian management measures, the mature female segment has continued to decline. It is still too early to judge whether effective population rebuilding is occurring; the Canadian rebuilding goal is low and long-term. The Recovery Assessment Report (DFO 2005b) projects recovery to maximum sustainable yield (MSY) at the current exploitation rate taking into the 22nd Century or later, compared with to between 2030 and 2060 if the fishery is closed. It appears that this stock will continue to qualify under the quantitative criteria for listing for many decades into the future.

FAO reports that the United States management plan is *"based on an analytical assessment of population status and an explicit goal of rebuilding population abundance"*. However, the original draft USA Fishery Management Plan (FMP) for Atlantic Highly Migratory Species proposed a species-specific quota for porbeagle shark of 30 mt, based on historic catch levels. The 1999 USA FMP set a quota of, 92 mt dressed weight, which is still in force. This is about 50% of the size of the current Canadian quota. Actual catches have been much lower, in the region of 1–2 t annually. Higher US catches than this would reduce population rebuilding efforts for the Northwest Atlantic stock. It is unclear how Japan's high seas catches of this species are taken into account by the Canadian management plan.

b) The limited data that were available for the northeast Atlantic population were not sufficient to assess the extent of the decline. Long-term data show a decline to <1% of baseline in the Northeast Atlantic for the Norwegian fishery, a decline to 10% of baseline for all landings, and recent declines in catch per unit effort (CPUE) in the French target fishery and Japanese longline bycatch. As noted by FAO: *"landings data do not provide an accurate index of abundance because changes in landings may be influenced by market conditions and management measures rather than abundance"*. This is particularly true for the Northeast Atlantic, where declines in landings have occurred in formerly unmanaged fisheries supplying a growing market demand for a highly valuable product. This means that the landings declines (which already meet the biological decline criterion for Appendix I listing) could therefore significantly under-represent the extent of the northeast Atlantic stock decline. The European Community has not fixed a TAC for porbeagle in 2007. Based on a Council and Commission declaration, proposals will be developed in 2007 to establish an effective management regime for porbeagle to be applied in 2008. Furthermore, as for other shark species since 2003, a Council Regulation bans the removal of fins and establishes the specific conditions under which this practice may be allowed on dead sharks. There are clearly sufficient data to infer that the northeast Atlantic population meets the biological decline criterion A.

c) In the southern hemisphere, porbeagle populations are relatively lightly exploited and Appendix II criteria are likely not met. Southern hemisphere bycatch trend data are variable. Some show no trend (Japanese longline catches and CPUE) and some show qualifying declining trends. New Zealand catch weight declined to 25% of baseline from 1998 to 2005 and CPUE to 30%, reaching the lowest on record in the last two years. NZ MoF (2006) concluded: "declining catches over a period when effort has been increasing rapidly, and low CPUE in recent years, combined with the low productivity of the species and a history of fishery collapses in the North Atlantic, are all cause for concern." Uruguayan longline CPUE has also declined, by 80–90% in 10 years. There may be other explanations for these variable and declining trends (changes to vessels, gear, fishing areas) but it is important to use all data available when assessing stocks against the biological criterion A. No data show stable or increasing trends.

The FAO Expert Panel has used a different interpretation of the second of the two Appendix II criteria, B, which addresses the issue of whether regulation of trade is required to ensure that harvest of specimens do not reduce the wild population to a level where its survival might be threatened. The southern hemisphere porbeagle stock is biologically far more vulnerable than the north Atlantic stocks, growing more slowly, maturing later and reaching a greater age. It therefore requires far more precautionary management than the Atlantic stocks. There is no management of porbeagle fisheries in the southern hemisphere other than the TAC set in New Zealand, which recognises that it is not possible to estimate MSY for just part of a highly migratory stock. NZ MoF (2006) notes: "Management of the porbeagle shark throughout the western and central Pacific Ocean (WCPO) will be the responsibility of the Western and Central Pacific Fisheries Commission (WCPFC)... However, it is not expected that WCPFC will attempt to actively manage porbeagle shark in the first years of the Commission."

Porbeagle is also a valuable bycatch in many southern ocean fisheries and has a high value in international trade (although this trade is not recorded at species level). Its meat is exported (with mako shark) from Uruguay to the United States. Sixty percent of porbeagle sharks landed in New Zealand are utilised only for their fins, which are exported (Oceanic Développement and MegaPesca Lda, 2007). Based on the value of this species in international trade, the existence of fisheries that take it as bycatch (some of which is introduced from the sea and/or subsequently exported), and the history of stock depletion through fisheries in the North Atlantic, it is inferred that regulation of trade in porbeagle products from the southern oceans is required to ensure that these fisheries do not reduce the wild population to a level at which its survival might be threatened by continued harvesting. In conclusion, the southern ocean stock qualifies for listing on Appendix II under criterion B.

3.2 Spiny dogfish *Squalus acanthias*

FAO Expert Panel conclusion:

"Globally, the species does not meet the biological decline criteria for listing under CITES Appendix II. The northeast Atlantic population meets the decline criterion for listing on Appendix II. The northwest Atlantic population does not meet the criterion if the entire population is taken into account, although it may if mature females alone are considered. The northeast Pacific has not shown declines consistent with the Appendix II criteria, while in the northwest Pacific a decline to the threshold level was evident only in a small area believed to be at the margins of the distributional range. In the southern hemisphere, surveys in the southwest Atlantic and southwest Pacific indicate stable or increasing abundance."

Appraisal of FAO conclusions:

a) The northwest Atlantic population does not meet the criterion if the entire population is taken into account, although it may if mature females alone are considered. FAO (2001, paragraph 47) notes in a discussion of relevant metrics for extent-of-decline (such as number and

biomass), that "The life history stage that is most relevant to measure will in most cases be the mature component". In this case of this stock, where targeting of mature females in US waters has affected recruitment, it is the proportion of mature females rather than the total population size that should be considered when assessing the qualifying decline for the *S. acanthias* stock (and indeed any subsequent recovery). Since the number of mature females is currently about 20% of the recent observed maximum (which most likely followed recovery from depletion by foreign fisheries in the 1970s), this stock clearly qualifies under biological decline criterion A for consideration for Appendix II (or even for Appendix I).

b) The northeast Pacific has not shown declines consistent with the Appendix II criteria. Data show a number of trends in this region. In Alaska, where target shark fisheries are prohibited, the stock is broadly stable with a slightly increasing trend. There has been a significant historic decline in British Columbia (to 25%, Anderson 1990), and Palsson *et al.* (1997) report low stock levels in Washington state. The Puget Sound population has decreased significantly. Canadian continental shelf trawl and longline survey CPUE data show a declining trend over ten years to 50% or less by the early to mid 2000s, and biomass decreased in the Vancouver area during the ten years to 2001. In view of the very low productivity of northeast Pacific spiny dogfish stocks, the populations in some or most of the above areas meet the biological decline criterion A, but not all of them. When criterion B is considered, however, against a background of increasing international market demand and largely unregulated fisheries (FAO notes "Restrictive management measures are not in place in the northeast Pacific"), it becomes clear that regulation of trade in spiny dogfish products from the northeast Pacific is required to ensure that these fisheries do not reduce the wild population to a level at which its survival might be threatened by continued harvesting. In conclusion, the different parts of this northeast Pacific stock all qualify for listing on Appendix II either under criterion A or criterion B.

c) In the northwest Pacific a decline to the threshold level was evident only in a small area believed to be at the margins of the distributional range. This refers to the fishery in the Sea of Japan, where there has been a decline to 10–20% of historic baseline. This target fishery was not restricted to a small, marginal part of the species' range. On the contrary, it was one of Japan's largest fisheries during the 1920s, accounting for 17–25% of Japan's overall catch (Fishery Agency of Japan 2003). In the 1950s, when 50,000 t were taken annually, this was the largest single *S. acanthias* fishery ever recorded (only slightly smaller than the total catch by all Northeast Atlantic States during the 1960s, and significantly larger than the Northwest Atlantic fishery). Such a large fishery would be extremely unlikely at the extreme margins of the distribution of spiny dogfish. However, the species' distribution extends at least to northern China and the Yellow Sea and, in deeper, cooler water, possibly as far south as Taiwan. Indeed, the extent of the Sea of Japan, from 35–45° N, is equivalent to the Northwest Atlantic coast from Cape Hatteras to Nova Scotia – the centre of the range for *S. acanthias* in the Northwest Atlantic. While the range of this species also extends north from the Sea of Japan, the size of the northern sector of this stock and its potential importance for fisheries is unknown. The conclusion is that the decline in the Sea of Japan qualifies this important southern sector of the northwest Pacific stock for listing on Appendix I under the biological decline criterion A, while the northern part of this stock, which is also unmanaged, qualifies for listing under criterion B.

d) In the southern hemisphere, surveys in the southwest Atlantic and southwest Pacific indicate stable or increasing abundance. Trend data for *S. acanthias* in most of its southern hemisphere distribution are either lacking, inconclusive or do not exceed a 50% decline in the past ten years, thus do not qualify for listing in Appendix II under Criterion A. There is, however, evidence that some of these stocks are coming under increased fishing pressure because of rising demand for shark meat in Europe and elsewhere, combined with declines in other commercial fish stocks. For example, the collapse of other small coastal sharks on the Atlantic coast of South America has recently resulted in a redirection of target fishing effort to *S. acanthias* (Chiaramonte in litt.). Recognising this, New Zealand introduced quota management for this species in 2004 in order to cap effort and prevent unsustainable fishing to

*Comments to the FAO Assessment of the CITES Amendment Proposals to list the
Porbeagle and the Spiny Dogfish on Appendix II*

supply international trade demand. Southern hemisphere stocks do not qualify for Appendix II listing under criterion A, but they do under criterion B; an Appendix II listing is needed to ensure that the harvest of specimens is not reducing the southern hemisphere population to a level at which its survival might be threatened.

References

- Anderson, E.D. 1990. Fishery models as applied to elasmobranch fisheries. Pp. 479-490 In: Pratt, H.L. Jr, Gruber, S.H. and Taniuchi, T (eds), *Elasmobranchs as living resources: advances in the biology, ecology, systematics and the status of the fisheries*. NOAA Tech. Rep. NMFS 90.DFO 2005b
- FAO 2001. A Background Analysis and Framework for Evaluating the Status of Commercially-Exploited Aquatic Species in a CITES Context. FI:SLC/2001/2. FAO, Rome.
- FAO Fisheries Report No. 833, March 2007, advance copy.
- Fisheries Agency, Government of Japan. February 2003. Report on the Assessment of Implementation of Japan's National Plan of Action for the Conservation and Management of Sharks of FAO (Preliminary version). AC19 Doc. 18.3, Annex 1.
- Ministry of Fisheries, Science Group (Comps.). 2006. Report from the Fishery Assessment Plenary, May 2006: stock assessments and yield estimates. 875pp. (Porbeagle on pp. 592-596.) Unpublished report held in NIWA Library, Wellington, New Zealand.
- Oceanic Développement and MegaPesca Lda, 2007. Analysis of the trade aspects of the German proposals to list two species of shark (porbeagle –*Lamna nasus*– and spiny dogfish –*Squalus acanthias*–) in Appendix II of the CITES Convention. Report ref: FPA 01/CITES/07 to the European Commission.
- Palsson, W.A., J.C. Hoeman, G.G. Bargmann, and D.E. Day. 1997. *1995 Status of Puget Sound bottomfish stocks* (revised). Washington Dept. of Fish and Wildlife. Olympia, WA.

Annex 1. Detailed evaluation of FAO report on the *Lamna nasus* listing proposal

FAO text	Reviewer comments
<p>ASSESSMENT SUMMARY</p>	
<p>1 The FAO Ad Hoc Expert Panel concluded that the available evidence does not support the proposal to include the porbeagle shark, <i>Lamna nasus</i>, in CITES Appendix II. Globally, the species does not meet the biological decline criteria for listing in CITES Appendix II. The decline in population abundance of the northwest Atlantic population meets the Appendix II criterion, but risk to the northwest Atlantic population is mitigated by population rebuilding and the existence of both Canadian and United States management plans designed to rebuild stocks. Porbeagles in the northeast Atlantic Ocean may meet Appendix II criteria, but the limited data that were available were not sufficient to assess the extent of the decline. In the southern hemisphere, porbeagle populations are relatively lightly exploited and Appendix II criteria are likely not met.</p>	<p>Of the Annex 2a criteria for inclusion of species in Appendix II, criterion A is clearly met by both North Atlantic stocks. This is based on qualifying population declines expressed as trends in landings and catch per unit effort and as identified in analytical stock assessments. There is no USA rebuilding plan, it is too early to judge whether population rebuilding is occurring as a result of Canadian management in the Northwest Atlantic, and rebuilding to MSY (if occurring as planned) will take over 100 years.</p> <p>While there are some decline trends from the southern hemisphere, these stocks do not meet criterion A. Rather, southern stocks meet Annex 2a criterion B, which was not considered by the expert panel. This assessment is based on a combination of high international market value and demand combined with the potential for increasing fishing pressure arising from the absence of shark fisheries management in most southern hemisphere waters, and a life history that makes southern stocks even more vulnerable to depletion by fisheries than northern stocks have proven to be.</p> <p>With northern stocks qualifying under criterion A and southern stocks under criterion B, the porbeagle meets the criteria for a global listing on Appendix II.</p>
<p>2 Though adequate management measures are in place in some regions, there are others where some form of management is urgently needed. Sustainable management requires that, where they had not done so, range States develop and implement National Plans of Action for sharks.</p> <p>In the event of a CITES listing, porbeagle caught in European Union (EU) waters would likely be traded within the EU, and thus avoid CITES trade limitations. In the northwest Atlantic, most porbeagles are harvested within the Exclusive Economic Zone and the basis for non-detriment findings should follow the current Canadian Total Allowable Catch (TAC) for porbeagle, which is based on results from a population model. Introduction from the Sea would only be a significant issue for high</p>	<p>It is difficult to understand what is meant by 'adequate' management. The expert panel report only identifies a science-based management regime in Canadian Northwest Atlantic waters, not in the USA, nor on the high seas. Release of large sharks by Argentinean fisheries does not seem adequate for the management of southern hemisphere populations. It is unclear which regions are being referred to here.</p>

	FAO text	Reviewer comments
	seas longline fleets, which catch porbeagle shark only as bycatch.	
	PANEL COMMENTS	
	Biological considerations	
3	<p>Population assessed</p> <p>Porbeagle, <i>Lamna nasus</i> (Bonnaterre, 1788), is distributed throughout the North Atlantic Ocean and in a broad circumglobal band in the southern hemisphere. Porbeagles generally occur in the northwest and northeast Atlantic Ocean. Tagging studies indicate that populations in the northwest and northeast Atlantic are distinct (COSEWIC, 2004), although occasional movements between the two areas have been observed (ICES, 2006b). The northwest Atlantic population migrates seasonally between southern Newfoundland/the southern Gulf of St. Lawrence, and Massachusetts (COSEWIC, 2004). A single stock is considered to exist in the northeast Atlantic (ICES, 2006a). Recent evidence from Japanese catches in high seas longline fishing fleets could indicate the potential for a third stock of porbeagle off Iceland (Matsumoto, 2005; S. Campana, personal communication).</p>	
4	<p>Productivity level</p> <p>Biological information indicates that the species falls into the category of "low" productivity (Campana <i>et al.</i>, 2001; Natanson <i>et al.</i>, 2002; Table 1). Age determination has been validated up to at least 26 years but ages may be underestimated in older fish (Campana <i>et al.</i>, 2002; Francis <i>et al.</i>, 2007). Fecundity in porbeagle is very low at an average of 3.9 pups per female with females giving birth annually (Campana <i>et al.</i>, 2001). There is no relationship between fecundity and age (Jensen <i>et al.</i>, 2002). The intrinsic rate of increase in an unfished population was estimated between 0.05 and 0.07.</p> <p>Porbeagle shark off New Zealand may be less productive than stocks in the North Atlantic Ocean. A recent study estimated age at maturity at 8–11 years for males and 15–18 years for females, while longevity may be around 65 years (Francis <i>et al.</i>, 2007).</p>	<p>FAO's 'low' productivity category is defined by an intrinsic rate of increase (r) < 0.14, age at maturity (t^{max}) > 8 years, longevity (maximum age (t^{max})) > 25 years and mortality (M) < 0.2 (FAO 2001). As noted here and in the proposal, the productivity of <i>L. nasus</i> is very much lower than this threshold (age at maturity in the NW Atlantic is 13 yrs). M for the southern hemisphere population based on data from New Zealand is 0.05 – 0.1, half that in the North Atlantic (Francis pers. comm.). This is significant when considering decline trends, because FAO (2002) notes that the historical-extent-of-decline where listing on Appendix I should be considered may fall outside the recommended range of 15-20% for some species (see 15). This is appropriate for <i>L. nasus</i>.</p>
	Population status and trends	
5	<p>Decline Because this species occurs in several widely separated areas, and in distinct populations, no single abundance index can be applied to the species as a whole. Assessment of decline in abundance of the species can only be done using</p>	

	FAO text	Reviewer comments
	<p>abundance indices from as many parts of the species' distribution as possible.</p> <p>Trend information is summarized in Table 2 and further information on the individual indices is provided in the text below. Percentage declines in indices reported in the proposal (Proposal Table 1) are difficult to assess because the basis for the estimates is not given (for French longline CPUE, it appears that the percent difference between the maximum and minimum value in the series was the basis).</p>	
6	<p>Northeast Atlantic</p> <p><u>Landings and catch data are unlikely to provide an accurate index of abundance as they are strongly influenced by market conditions and management measures. Thus, the Panel felt that the basis for much of the decline in abundance presented for the northeast Atlantic was ambiguous and it was difficult to discern how the declines were estimated.</u></p> <p>Some of the landings reported in the proposal were different than what was reported in the International Council for the Exploration of the Sea (ICES) Working Group on Elasmobranch Fishes document (ICES, 2006b).</p> <p>Landings time series for the northeast Atlantic as a whole was variable, with a generally declining trend. <u>Overall, for total landings between 1973-2004, a decline to 64% of the original was estimated.</u> Norwegian landings have declined to about one percent of values in the 1930s, while recent French landings are about 40% of those around 1980.</p> <p><u>French landings are level over the time series. Spanish landings fluctuate more widely. Longline CPUE and cumulative landings suggest a steady trend in decline. It was also noted that the ICES Working Group on Elasmobranch Fishes was unable to perform an assessment on porbeagle due to the lack of data. However, the ICES Working Group on Elasmobranch Fishes also recommended to the European Union that no fishery should be permitted on this stock.</u></p>	<p>The first two sentences are misleading. They could be interpreted as implying that the observed declines in catch and landings were driven by declining markets and/or management restrictions. In reality, market value and demand are very high and fisheries are unmanaged. It would be more accurate to add a second sentence stating: "Because declines in landings in the northeast Atlantic have occurred in unmanaged fisheries supplying a growing market demand, they could well under-represent the extent of the stock decline." The word "Thus" at the beginning of the second sentence, if not the whole sentence, should be deleted.</p> <p>There is a typographic error in the third line of the proposal. "About 6000 t" should read "About 3,000 t" (see Fig. 7).</p> <p>FAO (2002) recommends using the historic-extent-of-decline as the main criterion for considering listing species on CITES. In the case of the NE Atlantic, the baseline is in the 1930s, when the Norwegian fishery started, not the 1970s (the first ICES data). Annual landings in ICES areas have declined from near 4,000 t in the 1930s to <400 t (disregarding anomalous high catch reports from Spain in 1978 & 2000); a decline to 10% of original, not 64%. Norwegian landings are now 0.6% of baseline.</p> <p>Landings in the French fishery are not level (Figures 1 & 2). ICES (2006) states: "Preliminary data suggest that the number of vessels landing more than 5 t has been stable since 1990, between 8 and 11 vessels (Biseau, 2006 WDb). Landings increased to a peak of over 700 t in 1994, and this was accompanied by a peak in CPUE of about 3 t per vessel. CPUE declined to about 1 t per vessel by 1999 and has fluctuated around this level. In 2005, CPUE was less</p>

FAO text	Reviewer comments
	<p>than 1 t per vessel, the lowest in the series since 1992." Fitting a simple CPUE trend line for vessels catching <5 t produces a 45% decline from 55,000 t in 1990 to 30,000 t in 2005.</p>
<p>7 The panel concluded that much of the data demonstrating a decline, with the exception of the French CPUE series, was based on catch. The Norwegian catch trends are likely to have been influenced by a decline in heavily fished inshore areas and redirection of effort to previously lightly exploited offshore areas based on economics. Sequential depletion of fishing areas was supported by a shift in European landings among different statistical areas between 1973 and 2005. Such a pattern could explain a relatively low decline in total landings coincident with population depletion. Though such a pattern seems difficult to reconcile with the picture of a highly migratory species, relatively distinct sub-populations are possible. A potential problem of species misidentification in the early catch statistics was also noted.</p>	<p>This paragraph omits the reference to the declining CPUE trend observed in Japanese fisheries on the high seas of the North Atlantic (see 10). There are several examples in literature of highly migratory sharks with relatively distinct sub-populations. The first sentence of this section (see 6) noted that landings and catch data are strongly influenced by market conditions and management measures. <i>L. nasus</i> remains one of the highest priced fish species in Europe and NE Atlantic fisheries are unregulated. These catch declines therefore likely broadly follow the stock trend in the NE Atlantic, and probably even under-represent stock declines in this region.</p>
<p>8 Mediterranean Some of the observations suggest that porbeagle may always have been rare in the Mediterranean (proposal). The panel concluded that the information provided made it difficult to determine whether the observations support a real decline or other factors (for example rarity for many years combined with misreporting or a sporadic occurrence to explain the reported catches in the 1970s).</p>	<p>It is unlikely ever to be possible to resolve these uncertainties.</p>
<p>9 Northwest Atlantic Landings in the northwest Atlantic fishery were high in the early 1960s, declined to low levels during the 1970s and 1980s, increased during the early 1990s and declined to low values in the early 2000s (Gibson and Campana, 2005). Recent catches are 8% of the historical maximum levels (Table 2) due to strict quota regulations. The average length of individuals taken in northwest Atlantic fisheries declined from over 200 cm in 1960–1980, to 140–150 cm in 1999–2000 (Campana et al., 2001; Figure 3). A standardized longline catch per unit effort (CPUE) index from three fished areas off eastern Canada (Figure 1, Table 2) indicated declines in the abundance of mature individuals between the late 1980s and recent years. Immature porbeagle CPUE increased substantially in 2002–2004 relative to earlier values, following earlier declines. The reliability of recent index values was affected by a recent decrease in area fished, lack of overlap in vessels between the early and late years in the time series, and seasonal catchability differences (Gibson and Campana, 2005).</p>	<p>FAO (2001) notes in paragraph 47, which discusses relevant metrics for extent-of-decline (such as number and biomass), that "The life history stage that is most relevant to measure will in most cases be the mature component". It is, therefore, the proportion of mature females rather than the total population size that should be considered when assessing the qualifying decline for the porbeagle stock (and indeed any subsequent recovery). As noted in the FAO appraisal, the number of mature females is currently 12–15% of the 1961 level. The last sentence opposite reports that the decline in the porbeagle population has ceased and is beginning to increase, however it omits to point out that this is primarily an increase in juveniles and that DFO (2005b) reported that the mature female segment of the population continued to decline slightly during 2002–2005 and is now ~86–92% of the level in 2002. This stock</p>

	FAO text	Reviewer comments
	<p>Integrating mutually compatible tag-recapture, CPUE, and length-frequency information, an age and sex-structured forward projecting model of the northwest Atlantic population indicated that <u>the total population is currently 21–24% of its size in 1961, while number of mature females is currently 12–15% of the 1961 level (DFO, 2005a). However, population viability analysis indicates that the decline in the porbeagle population has ceased and is beginning to increase (DFO, 2005b).</u></p>	<p>therefore still qualifies under the quantitative criteria for consideration for Appendix I, since mature females have declined to 12-15% of baseline and although this decline has slowed recently, it is still continuing.</p>
10	<p>In the high seas of the North Atlantic, standardized Japanese longline CPUE from bycatch declined at a rate equivalent to a 60% decline over 10 years during 1993–2000 (Matsunaga and Nakano, 2002), although there is considerable variability around this slope estimate. High seas North Atlantic catches during the period 1994 to 2003 were low but catches from 1999–2003 were near zero compared to catches of near 1000 individuals per year 1994–1997 (Matsunaga and Nakano, 2005).</p>	<p>These data should be considered under FAO's guidelines for assessing 'recent-rate-of-decline' (Table 2, FAO 2001). A continued 67% 10 year rate of decline would drive a population down from 60% to the extent of decline threshold for Appendix I in the next 10 years. Extrapolating from these records to the likely extent of decline by 2017 in the absence of fishery regulation: this stock clearly qualifies for CITES Appendix II listing.</p>
11	<p>Southern hemisphere</p> <p>Japanese longline catches in the South Atlantic were below 10 000 individuals per year between 1994 and 2003 and fluctuated without trend (Matsunaga and Nakano, 2005), while CPUEs in the south Atlantic were essentially without trend from 1993 to 2000 (Matsunaga and Nakano, 2002). Standardized Japanese longline CPUE in the Southern Ocean high sea southern bluefin tuna fishery showed large fluctuation without trend from 1992 to 2004 (Matsunaga, 2006).</p> <p>The harvesting of porbeagle off Argentina and Uruguay is exclusively as bycatch and is a minor component of catch in other fisheries: tuna in Uruguay (Domingo, 2000), Patagonian toothfish and other demersal fisheries in Argentina (Waessle, 2007). Longline CPUE in tuna fisheries off New Zealand suggests a declining trend from 1993 to 2002 (proposal; New Zealand Ministry of Fisheries, 2006). CPUE may not reflect stock abundance in this region because of low observer coverage and variations in vessel, gear, location and season (proposal) but recent values are much lower than earlier values in the series (about 30%). Annual landings in these fisheries have declined to around 40% of the original levels between 1997 and 2003, following an increase from very low levels 1989–1995 (Matsunaga, 2006).</p>	<p>This section omits to note that Uruguayan longline porbeagle CPUE has declined 80–90% in 10 years, although this does appear later in the document (see 19).</p> <p>In view of the biological vulnerability of southern hemisphere porbeagles, which "reach a smaller maximum size, mature at a smaller size and greater age, and probably live considerably longer than northern porbeagles" (at least those around New Zealand (Francis <i>et al.</i> 2007), which are presumably representative of other stocks), these recent declining trends to 30% in CPUE and 40% of landings are of considerable concern. This is particularly the case since Pacific management responsibility for this species lies with the newly formed Western and Central Pacific Fisheries Commission, which seems unlikely to implement regional management for some time (Sullivan <i>et al.</i> 2005). Neither are any other RFMOs are taking on management responsibilities for porbeagle.</p>
12	<p>Small population size For the northwest Atlantic population, the most recent estimates from an age- and sex-structured forward projecting model are 9–13 thousand mature females, 33–38 thousand mature individuals, and 188–195 thousand total individuals (DFO, 2005a). No information on population size is available from other areas where the species occurs.</p>	<p>This criterion is not relevant for this listing proposal.</p>

FAO text	Reviewer comments
<p>13</p> <p>Restricted distribution The extent of occurrence in Canada is estimated at 1.2 million km², while the area of occupancy in Canada from recent catch locations is estimated at 830 000 km²; range is not known to have changed since the fishery began in 1961 (COSEWIC, 2004). Area of occupancy and extent of occurrence for the northwest Atlantic would be greater than these values. There is no evidence that local depletion exists in this area for porbeagle because tagging data suggest this species is highly migratory. No information on distribution area is available from other areas where the species occurs, but it is a widely distributed species in the northeast Atlantic and southern hemisphere.</p>	<p>This criterion is not relevant for this listing proposal.</p>
<p>14</p> <p>Assessment relative to quantitative criteria</p>	<p>This section only considers the guidelines for Article II 2(a) criterion A. Unfortunately, the expert panel largely omitted consideration of Article II 2(a) Criterion B (as noted above). This is particularly important for the southern hemisphere stocks that have not yet reached qualifying levels of decline, but appears likely to do so unless trade is regulated, in view of the history of catches in the North Atlantic.</p>
<p>15</p> <p>Decline</p> <p>Under the CITES criteria for commercially-exploited aquatic species (Conf Res 9.24 Rev COP 13), a decline to 15–20% of the historical baseline for a low productivity species might justify consideration for Appendix I. For listing on Appendix II, being "near" this level might justify consideration, which for a low productivity species would be 20–30% of the historical level (15–20% + 5–10%).</p>	<p>As noted above (4), the productivity and resilience of <i>L. nasus</i> is so very low that it likely falls outside the recommended range of 15–20% for an Appendix I listing or 20–30% for Appendix II. FAO (2001, para. 44) states: "a percentage of baseline greater than 20% may be appropriate [for consideration for listing on Appendix I] for some exploited fish species characterised by extremely low productivity, for example certain sharks".</p>
<p>16</p> <p>For the northwest Atlantic population, the current mature female population is 12–15% of the historical baseline prior to major fisheries (1961), while the total population is 21–24% of that historical baseline. This result from the population model is consistent with the catch history and with CPUE information. Number of spawners in 2005 was 86–92% of that in 2002, while the total number of individuals in the population remained relatively stable during this period (DFO, 2005a). This indicates the population meets the criterion for Appendix II. However, population viability projections in the stock assessment indicate that the population decline has ceased and that the population is expected to increase under the new, conservation-oriented management plan.</p>	<p>As noted in 9 above, it is the number of spawners that is important when considering the decline criteria, not the total population size. There is no indication of an increase in number of spawners, indeed the most recent assessment reported a continued slow decrease to 2005. The Recovery Assessment Report (DFO 2005b) projects recovery to maximum sustainable yield (MSY) at current exploitation rate (4% fisheries mortality) taking into the 22nd Century or later, compared with between 2030 and 2060 if the fishery is closed. It appears that this stock will continue to qualify under the quantitative criteria for Appendix I for many decades.</p>

	FAO text	Reviewer comments
17	<p>For the northeast Atlantic, assessment against the decline criterion is difficult. Long-term trends in catch have declined substantially, most notably in the Norwegian fishery, which is now at about one percent of historical values (1920s). Total catches (1926-2004), if summed over periods of 5-10 year periods, would be much lower recently than in the 1930s to 1950s, on the order of 40% of historical catches. However the calculation of decline was sensitive to the choice of periods used for calculation. Nevertheless, as previously stated, landings data do not provide an accurate index of abundance because changes in landings may be influenced by market conditions and management measures rather than abundance of the species. There was some evidence of sequential depletion of fisheries in ICES areas, although this seemed inconsistent with the migratory nature of the species. The only CPUE series available (French longline) has declined to 64% of the level in the early 1990s. Other than a landings decline in one fishery (Norwegian) there appears to be no clear signal in the landings information.</p>	<p>On the contrary, assessment against the decline criterion is easy in the Northeast Atlantic. FAO (2001 and 2002) clearly state that it is the decline from historic baseline that is most important. Longterm data show a decline to <1% of baseline for the Norwegian fishery, a decline to 10% of baseline for all landings, and a recent decline in French and Japanese CPUE. The latter demonstrate a recent 60% decline in CPUE (row 10). As noted by FAO: "landings data do not provide an accurate index of abundance because changes in landings may be influenced by market conditions and management measures rather than abundance". This is particularly true for the NE Atlantic where, because declines in landings have occurred in unmanaged fisheries supplying a growing market demand for a valuable product, they may under-represent the extent of the stock decline (see 6 above).</p>
18	<p>For the southern hemisphere, information was patchy and the time series were short. There was indication of a recent (about 10 years) decline in New Zealand longline landings and CPUE (to ca. 40% and 30% respectively). There has been no recent trend in Japanese longline landings or CPUE in the south Atlantic and in the southern Indian Ocean. The proposal indicates that Uruguayan longline CPUE has declined 80-90% in 10 years, but also notes that this decline may have been due to a change in the distribution and depth of fishing operations.</p>	<p>In view of the biological vulnerability of the southern hemisphere stocks, these declines are of concern, even if there are inevitably uncertainties associated with their interpretation. Most importantly, the expert group omitted to consider these stocks in the context of Article II 2(a) Criterion B, which applies to stocks that may not yet have reached qualifying levels of decline, but may do so unless trade is regulated.</p>
19	<p>In summary, southern hemisphere populations were unlikely to meet Appendix II criteria.</p> <p>The northwest Atlantic population met the criteria, but the population is currently being rebuilt and thus would not benefit from a CITES listing. There were insufficient data to judge the status of the population which is potentially in greatest need of</p>	<p>Because data are limited and time series short, it is unclear whether the southern hemisphere populations meet Appendix II criterion A under Article II 2(a). However, in view of the high value of and demand for this species in international trade, they clearly qualify for listing when applying criterion B. Unfortunately the expert panel omitted to consider this criterion. Had they done so, their conclusion would presumably have been different.</p> <p>Both North Atlantic stocks clearly meet the quantitative criteria for listing on Appendix I, let alone Appendix II. Although one of these stocks is the subject of a rebuilding plan, this plan has not yet reversed declines in mature females. Earlier reductions in Canadian quotas from 1997</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	<p>Reviewer comments</p>
<p>FAO text</p> <p><u>population growth (the northeast Atlantic).</u></p> <p>Overall, the panel concluded that the global status of porbeagle populations did not meet the Appendix II criteria.</p>	<p>were insufficient and allowed the stock decline to continue. Rebuilding to MSY is still projected to take over 100 years under the current TAC. The additional safeguards against illegal trade available under an Appendix II listing, and the need for NDFs for introductions from the sea (which are not regulated by management in State waters) will be a valuable supplementary management tool.</p> <p>Overall, the northern stocks meet Appendix II criterion A, while southern stocks meet Appendix II criterion B (which was not considered by the Panel).</p>
<p>20</p> <p>Small population The estimate of total population size for the northwest Atlantic is 33–38 thousand mature individuals, and 188–195 thousand total individuals. Total population size worldwide would be well above this. This species is therefore not characterized by a small population size.</p> <p>Restricted distribution The panel concluded that this species is not characterized by a “restricted” distribution.</p> <p>Were trends due to natural fluctuations? There is no evidence that observed trends were due to natural fluctuations.</p>	<p>As noted by the expert panel, these considerations are not relevant for this listing proposal.</p>
<p>Risk and mitigating factors</p> <p>Porbeagle sharks have life history characteristics that make them particularly vulnerable to mortality from human activities including fishing. Fecundity is among the lowest of the sharks, and maturation and growth schedules are typical of large sharks, making for high vulnerability (Musick <i>et al.</i>, 2000). Products from the species (meat, fins) are of high value in markets (Fowler <i>et al.</i>, 2004), and the species is taken with longline fishing gear both in directed fisheries and as bycatch for other high-value species such as tuna and swordfish.</p>	<p>As noted above (4, 15), the productivity and resilience of <i>L. nasus</i> is so very low that it likely falls outside the recommended range of 15-20%” for an Appendix I listing or 20–30% for Appendix II. FAO (2001, para. 44) states: “a percentage of baseline greater than 20% may be appropriate [for consideration for listing on Appendix I] for some exploited fish species characterised by extremely low productivity, for example certain sharks”.</p>
<p>21</p> <p><u>Risk to the northwest Atlantic population is mitigated by the existence of management plans in the United States and Canada based on an analytical assessment of population status and an explicit goal of rebuilding population abundance (DFO, 2005b).</u> Catch quotas have already been reduced by Canada and United States to levels which are believed to support population recovery. There are currently a low number of vessels (11 licensed vessels in Canada) fishing directly for porbeagle. Model predictions show stock recovery is currently underway but <u>will take</u> decades to be completed. The Canadian management authority is requiring a fishery independent survey to monitor the population and if results indicate the population is</p>	<p>The USA management plan and porbeagle TAC is not based upon an analytical assessment of population status, nor does it have a rebuilding goal. Fortunately, recent landings are in the region of 1–2 % of the TAC and unlikely to be contributing significant stock mortality. The USA TAC, should it be taken in full, appears not to be taken into account by the Canadian management plan and it is unclear how high seas catches by Japan are taken into consideration. The Canadian rebuilding goal is very low and</p>

FAO text	Reviewer comments
<p>not recovering, the directed fishery will be closed altogether.</p>	<p>extremely long term, envisaging over 100 years for population restoration to MSY at current fisheries mortality rates. Proposals to close the fishery under an Endangered listing on Canada's Species At Risk Act have been rejected on socio-economic grounds.</p>
<p>22</p> <p>In the southern hemisphere, mitigating factors include a regulation that requires all live captures of sharks greater than 1.6 metre to be released by Argentinean longline and trawl fisheries (Consejo Federal Pesquero Argentina, Res. 13/2003). Moreover, Argentina has a 100 percent observer requirement for longline fisheries which provides accurate catch estimates for porbeagle. Off New Zealand, tuna and swordfish fisheries are currently more valuable than porbeagle fisheries and directed porbeagle fisheries are unlikely to develop. New Zealand is developing management plans for highly migratory species, and the opinion of the panel is that if a directed porbeagle fishery were to be developed, New Zealand would enact suitable measures to prevent overexploitation.</p> <p>Moreover, Regional Fishery Management Organizations (RFMOs) around the world are moving toward more specific management measures for sharks.</p>	<p>Without knowing the proportion of southern hemisphere catch taken by Argentinean longline and trawl fisheries, it is impossible to estimate the relative value of this likely minor mitigation measure. Observer data are not presented in the FAO report. Southern hemisphere porbeagle may be less valuable than large pelagic teleosts, but the latter fisheries are strictly regulated on the high seas whereas porbeagle catches are not. In the absence of a CITES listing, it seems that porbeagle fisheries are also unlikely to enter regulation in the near future, with the exception of the precautionary ban on directed (but not bycatch) shark fisheries adopted in 2006 by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) until scientific advice for sustainable catch limits is developed and considered.</p> <p>It is misleading for the FAO Panel to imply that RFMOs are moving towards 'specific' management of sharks. This 'management' consists largely of 'finning bans' which are generic rather than species specific, and carry no guarantee of reducing overall shark mortality.</p>
<p>23</p> <p>Trade considerations</p> <p>Porbeagle shark products, particularly the meat and fins, are highly valued in markets and accordingly are in demand (proposal; Rose, 1996; Fowler <i>et al.</i>, 2004). This is one of the few large shark species for which there have been directed fisheries, driven by the quality of the meat. International trade from Canada to the European Union (EU) has been a factor driving fisheries for this species both in the past and at present. Canadian processors have reported that their main competitor to their trade to European markets is European countries. However, the panel found that it was not possible to quantify international trade in porbeagle products, since the species does not have its own customs code under systems in use (Harmonized System) internationally. Accordingly porbeagle products are lumped with products from other shark species in international trade. Limited information from market surveys and other studies is available to provide indications of the importance of</p>	<p>It is unfortunate that the Panel did not consider the report made available by the European Commission on the trade-related aspects of the CITES listing criteria for this species (Oceanic Développement and MegaPesca Lda, 2007). The consultants also found that it is impossible to quantify international trade in porbeagle because of the lack of customs code. The conclusions of their detailed study, however, was that there may be a need to consider the application of a precautionary approach regarding the CITES listing. They also noted that a listing in Appendix II would potentially ensure a substantial improvement in monitoring the quantities of products in international trade</p>

	<p>FAO text</p> <p>international trade in this species. Most studies available date from the mid to late 1990s and conditions may have changed since that time.</p> <p>Exports of porbeagle meat from Canada to the USA and EU, from Japan to the EU, and from the EU to the USA have been documented in available studies (proposal). Trade in porbeagle meat between France, Spain and Italy has been documented (Vannuccini, 1999) but this is within the EU so not "international". All the countries mentioned are producers as well as consumers of porbeagle, except for Italy that is not a producer (Vannuccini, 1999). Porbeagle fins are found in markets in Hong Kong and internationally (proposal; Shivji <i>et al.</i>, 2002), but are apparently not one of the common species in the Hong Kong dried fin market, possibly because fins in that market primarily come from areas other than those where porbeagle is most abundant (northwest and northeast Atlantic) (Table 2 in Clarke <i>et al.</i>, 2006).</p> <p>Trade in porbeagle parts (primarily meat and fins) was determined by the panel to be a factor affecting porbeagle catch. However, porbeagle caught in EU waters would likely be traded within the EU, and thus avoid CITES trade limitations. In the northwest Atlantic, most porbeagles harvested to supply trade are managed under existing Canadian and United States management plans supporting population growth.</p>	<p>Reviewer comments</p> <p>and high seas catches (as "introductions from the sea"). These additional data would yield the benefits of improved estimates of production and hence improved national and international resource management.</p> <p>Oceanic Développement and MegaPesca Lda (2007) also reported exports of porbeagle meat from Uruguay, and the utilisation of 60% of porbeagle landed in New Zealand for their fins only (these will be exported to Asia).</p> <p>There is no management and inadequate monitoring of porbeagle stocks taken in high seas fisheries in the North Atlantic and South Pacific and no immediate likelihood of these fisheries entering management. A CITES listing would result in the monitoring of introductions from the sea and no detriment findings would require sustainable management to be introduced.</p> <p>There is no evidence yet of spawner population growth under the Canadian management plan (this may take many decades to become apparent), but the plan does appear to have slowed if not totally prevented further depletion. The USA TAC does not support population growth, but is fortunately not being taken. Japan's high seas catches in the North Atlantic are not regulated.</p>
	<p>Implementation issues</p>	
24	<p>Introduction from the sea</p> <p>Most porbeagles are harvested within the Exclusive Economic Zone (EEZ). As such, Introduction from the Sea would only be a significant issue for this species for high seas longline fleets, in particular for porbeagle shark harvested off Iceland by Japan. Japanese longline fleets capture porbeagle as bycatch (Matsunaga and Nakano, 2002, 2005) and may land catches at ports outside Japan (referenced in proposal).</p>	
25	<p>Basis for findings: legally-obtained, not detrimental</p> <p>Non-detriment findings</p> <p>Non-detriment findings (NDFs) are the responsibility of the exporting country and must show that exports are non detrimental to survival of the species, that is, that they are consistent with sustainable harvesting. Development of an NDF requires appropriate scientific capacity, biological information on the species, and an</p>	<p>The development of NDFs under CITES would be a major contribution to the global sustainable management of this species. An NDF for NW Atlantic porbeagle would have to integrate the effects of fisheries not only in Canada, but also</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

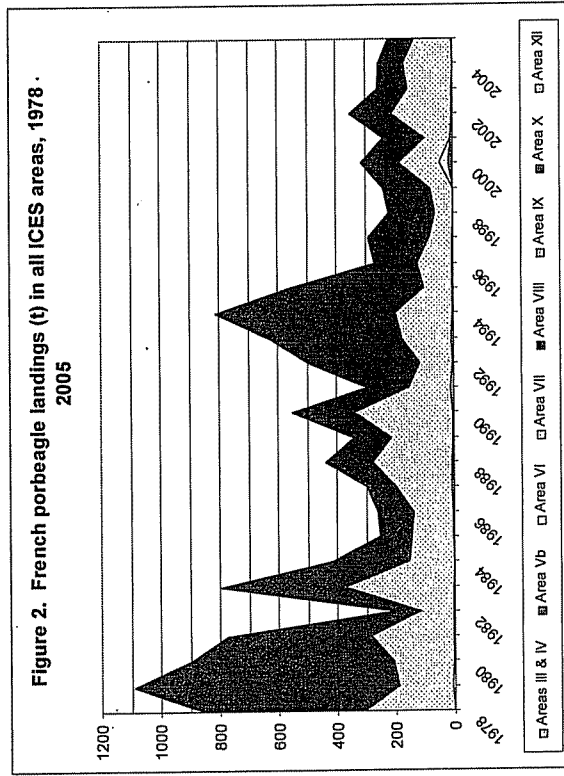
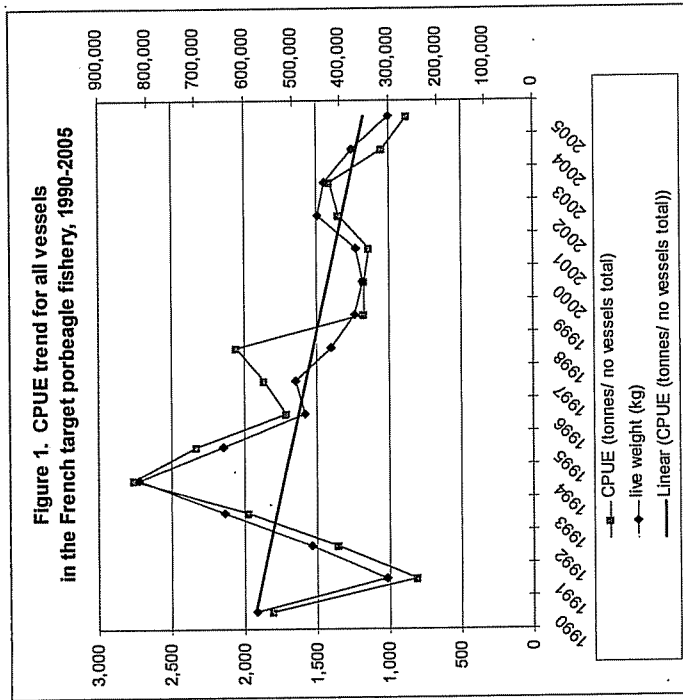
	FAO text	Reviewer comments
	<p>approach to demonstrating that exports are based on sustainable harvests. Quality of NDFs is assured by review in the Scientific Committees of CITES (Animals and Plants Committees) and in individual parties. FAO (2004a, paras 28–29) provides some guidance on NDFs in a fisheries context.</p> <p>For the northwest Atlantic population, the basis for non-detriment findings should follow the current Canadian Total Allowable Catch (TAC) for porbeagle, which is based on results from a population model. For northeast Atlantic, scientific advice is available on which NDF could be based although a closer alignment between management measures and scientific advice would be required. For porbeagle introduced from the sea, existing RFMOs could be used to provide the basis for NDFs.</p>	<p>the USA and on the high seas by Japan.</p> <p>Only part of the NW Atlantic population is regulated under the Canadian management plan. Landings by USA and Japan would also need to be taken into account.</p>
26	<p>Findings that specimens were legally obtained</p> <p>Porbeagle harvests from the northwest Atlantic population are regulated under the Canadian management plan. Exports of products based on legal harvesting under this management plan would qualify as legally obtained for CITES. The United States has been landing porbeagle from this population since 2000 but recent landings have been low (less than 1 mt over the last 4 years).</p> <p>Although the ICES Working Group on Elasmobranch Fishes recommended that no fishery should be permitted on the northeast Atlantic stock, and RFMOs have the authority to regulate porbeagle stocks, porbeagle harvest levels are not currently regulated by states or international organizations in the northeast Atlantic or in the southern hemisphere. Only a 294 t annual TAC in New Zealand (well above recent landings) and high, non-restrictive TACs for Norwegian and Faroese fisheries in the northeast Atlantic (proposal) are available. Accordingly, exports of porbeagle products from fisheries in these areas would qualify as legally-obtained under CITES.</p>	<p>The European Commission is working on proposals for further restrictions on the catch of this species for consideration of European Ministers at the December 2007 Council meeting.</p>
27	<p>Identification of products in trade</p> <p>It would probably be difficult for a non-expert to distinguish meat of porbeagle from that of other similar lamnoid sharks in trade such as shortfin mako. Dorsal fins from large shark species may also be difficult to distinguish, although porbeagle dorsal fins with skin on have a characteristic white rear edge (proposal). Accordingly, a basis for unequivocal identification of porbeagle products in trade appears to exist. DNA techniques are not considered practical as initial screening tools although they may be useful for secondary inspections or enforcement (CITES, 2006).</p>	
28	<p>“Look-alike” issues</p>	

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
29	<p>Potential socio-economic impacts of proposed listing</p> <p>Under an Appendix II listing, socio-economic impacts of the listing would probably be quite limited. Some additional costs would be imposed on exporters to apply for permits, and delays in exports could be experienced while permitting processes were completed, adding to storage costs. Such costs would probably be greatest in the months following a listing, as exporters and CITES Authorities adapted to a new listing.</p>	<p>Proposals to close the Canadian fishery under an Endangered listing on Canada's Species At Risk Act were rejected on socio-economic grounds. According to DFO 2006, only six vessels targeted porbeagle in 2004, one of which was heavily dependent upon this species. The fishery possibly employs some 4-8 full time job equivalents in the region, and the community most heavily reliant on the fishery gains 2% of its revenue from porbeagle (DFO 2006). The socio-economic impact of implementing an Appendix II listing would presumably be considerably less than that of closing the fishery.</p>
30	<p>Likely effectiveness of a CITES Appendix II listing for species conservation</p> <p>The impact of a CITES Appendix II listing on species status depends on several factors including the extent to which trade (as opposed to exploitation for national utilization) is driving exploitation; the relative importance of directed harvest for trade and of other sources of mortality including incidental catch; and the actual effects of the listing (which under Appendix II should relate to regulation and monitoring of trade, but which might include reductions in levels of trade under some circumstances).</p>	
31	<p>Porbeagle products are certainly traded internationally, but the relative proportion of harvests going to international and to national markets is not known. Much of the harvest in the EU is apparently for internal markets, and thus would not be subject to CITES provisions. Landings at distant-water ports by Japanese, Taiwanese and Korean fleets would be subject to CITES provisions related to introduction to the Sea. Restrictions on trade resulting from an Appendix II listing might result in a diversion of product from international to national markets, since the meat and fins are of high quality.</p>	

	FAO text	Reviewer comments
32	<p>Much of the porbeagle shark catch is from incidental harvest in pelagic longline fisheries, in addition to that from directed fisheries. Incidentally caught fish are probably retained because of the high value. There appear to be no sources of anthropogenic mortality other than fisheries. It was noted that if an Appendix II listing was enacted for this species, discards of porbeagles by longline fleets might increase because much of the catch is incidental.</p>	<p>The beneficial impact of the Argentinean legislation requiring discards of large sharks (see 22 and 34) is noted as a mitigating factor, although post-release survival cannot be guaranteed. A further increase in release of incidental catch by longline fleets is presumably, therefore, also beneficial to the stock, although this is not explained here.</p>
33	<p>Fisheries management considerations</p> <p>The management plans in the United States and Canada have an explicit goal of rebuilding population abundance (DFO, 2005b). Catch quotas have already been reduced by Canada to levels which are believed to support population recovery. The Canadian Department of Fisheries is requiring a fishery independent survey to monitor the population and if results indicate the population is not recovering, the directed fishery will be closed altogether.</p>	<p>The Canadian management plan has a recovery goal. This appears not to be the case for the USA Plan, particularly since the TAC is about 50% of the Canadian quota for this shared stock. Fortunately only 1–2% of the TAC is being taken (see 21).</p>
34	<p>In other regions, sustainable harvesting regimes covering the species as a whole would have benefits for conservation of the species. New Zealand is currently developing general management plans for highly migratory species which will include porbeagle shark; thus if a directed porbeagle fishery were to be developed, New Zealand would enact suitable measures to prevent overexploitation. Argentina has regulations that require all live captures of sharks greater than 1.6 metre to be released by Argentinean longline and trawl fisheries (Consejo Federal Pesquero Argentina, Res. 13/2003). Moreover, RFMOs around the world are moving toward more specific management measures for sharks.</p>	<p>RFMOs around the world have been urged to move towards more specific management measures for sharks for several years now. A CITES Appendix II listing would presumably accelerate this process, with benefits for shark stocks and fisheries.</p>
35	<p>Some range states for this species have National Plans of Action for Sharks (NPOA) (FAO, 1998) and there is work towards aiding other countries in developing and implementing NPOAs (FAO, 2006). The Panel noted agreement of states to implement effective management of the International Program of Action for sharks and further noted that sustainable management would require that, where they had not done so, range States develop and implement National Plans of Action for sharks to ensure that catches of porbeagle (and other sharks) from both directed and non-directed fisheries are sustainable.</p>	<p>CITES has repeatedly noted the poor progress with development and implementation of National Shark Plans. It appears that the majority of States do not consider this to be of high priority. The need for a CITES listing is driven in large part by the failure of FAO members to implement NPOAs for sharks. In addition, the mere development of a Plan does not correlate well with better management of shark species.</p>
36	<p>Overall conclusions</p> <p>The FAO Ad Hoc Expert Panel concluded that the available evidence does not support the proposal to include the porbeagle shark, <i>Lamna nasus</i>, in CITES</p>	<p>The above evaluation of the expert panel report, which includes consideration of Criterion B, comes to a different conclusion – that the available evidence does support an Appendix II listing.</p>

	FAO text	Reviewer comments
	Appendix II.	
37	<p>Globally, the species does not meet the biological decline criteria for listing in CITES Appendix II. The decline in population abundance of the northwest Atlantic population meets the Appendix II criterion, but risk to the northwest Atlantic population is mitigated by population rebuilding and the existence of both Canadian and United States management plans designed to rebuild stocks. Porbeagles in the northeast Atlantic Ocean may meet Appendix II criteria, but the limited data that were available were not sufficient to assess the extent of the decline. In the southern hemisphere, porbeagle populations are relatively lightly exploited and Appendix II criteria are likely not met.</p> <p>Though adequate management measures are in place in some regions, there are others where some form of management is urgently needed. Sustainable management requires that, where they had not done so, range States develop and implement National Plans of Action for sharks</p> <p>In the event of a CITES listing, porbeagle caught in EU waters would likely be traded within the EU, and thus avoid CITES trade limitations. In the northwest Atlantic, most porbeagles are harvested within the EEZ and the basis for non-detriment findings should follow the current Canadian TAC for porbeagle, which is based on results from a population model. Introduction from the Sea would only be a significant issue for high seas longline fleets, who catch porbeagle shark only as bycatch.</p>	
	<p>References supporting the Panel evaluation</p>	<p>Additional references</p> <p>Fisheries and Oceans Canada. 2006. Potential Socio-economic Implications of Adding Porbeagle Shark to the List of Wildlife Species at Risk in the Species at Risk Act (SARA). Policy and Economics Branch – Maritimes Region Dartmouth, Nova Scotia.</p> <p>Sullivan, K. J., Mace, P. M., Smith, N. W. M., Griffiths, M. H., Todd, P. R., Livingston, M. E., Harley, S., Key, J. M., and Connell, A. M. (Eds) (2005). Report from the Fishery Assessment Plenary, May 2005: stock assessments and yield estimates. Ministry of Fisheries: Wellington.</p>



Annex 2. Detailed evaluation of FAO report on the *Squalus acanthias* listing proposal

	FAO text	Reviewer comments
	<p>ASSESSMENT SUMMARY</p>	
1	<p>The FAO Ad Hoc Expert Advisory Panel concluded that the available evidence does not support the proposal to include <i>Squalus acanthias</i> under CITES Appendix II. Globally, the species does not meet the biological decline criteria for listing under CITES Appendix II. The northeast Atlantic population meets the decline criterion for listing on Appendix II. The northwest Atlantic population does not meet the criterion if the entire population is taken into account, although it may if mature females alone are considered. The northeast Pacific has not shown declines consistent with the Appendix II criteria, while in the northwest Pacific a decline to the threshold level was evident only in a small area believed to be at the margins of the <u>distributional range</u>. In the southern hemisphere, surveys in the southwest Atlantic and southwest Pacific indicate stable or increasing abundance.</p>	<p>When criteria (2(a) A and B) are both considered, the evidence does support the proposal. According to FAO (2001), it is the mature female stock in the NW Atlantic that should be considered under FAO guidelines. The Sea of Japan stock is not at the southern margins of the distributional range of <i>S. acanthias</i> in the northwest Pacific, neither is the Sea of Japan a small area. It extends from 35-45° N (equivalent to the Northwest Atlantic coast from Cape Hatteras to Nova Scotia) and was the largest single <i>S. acanthias</i> fishery ever recorded, with peak landings of 50,000 t/year.</p>
2	<p>International trade of <i>Squalus acanthias</i> is the key driver of exploitation in all areas, except the northeast Atlantic where most of the catch is traded internally within EU markets. The catch imported into the EU from harvests by non-EU members from the northeast Atlantic stock is, however, appreciable.</p>	
3	<p>There are serious fisheries management failures for some individual populations. Catches from the northeast Atlantic stock, both internally traded in the EU and imported, need to be curtailed. Federal and state U.S. fishery management plans exist for the northwest Atlantic stock and have succeeded in reducing catches, but they are not well coordinated. All other areas in which <i>Squalus acanthias</i> is harvested need to be closely monitored to ensure that catches remain sustainable. Sustainable management requires that, where they had not done so, range States develop and implement National Plans of Action for sharks.</p>	<p>Fishery management plans in the NW Atlantic are conflicting and are preventing stock rebuilding, partly because target fisheries are driven by high international trade demand. A CITES listing will support the introduction of improved collaborative sustainable management measures because range States will need to ensure that fisheries supplying international trade are able to produce non-detriment findings. The FAO's own analysis has shown that implementation of the IPOA Sharks has been poor in terms of both the numbers of Parties implementing NPOAs and the effectiveness of those. Based on this experience it is overly optimistic, and less than precautionary, to continue to rely on NPOAs to address management issues for vulnerable species of shark.</p>
4	<p>If <i>Squalus acanthias</i> is listed on Appendix II key implementation issues will include difficulties in differentiating <i>Squalus acanthias</i> products from other sharks in trade, and the requirement for a closer alignment between management measures and</p>	<p>One of the reasons for the listing is to achieve this closer alignment between management measures and scientific advice.</p>

	FAO text	Reviewer comments
	scientific advice to underpin non detriment findings.	
	PANEL COMMENTS	
	Biological considerations	
5	<p>Population assessed</p> <p>This species is widely distributed in temperate and boreal waters of the northern and southern hemispheres, and is most common at depths of 10–200m. Although long-distance migrations are known to occur (proposal, McFarlane and King, 2003), populations within the distribution of the species have been identified.</p> <p>Individuals in the northeast Atlantic from the Barents Sea to off northwestern Africa are considered to be a single population for fishery management purposes, based on recent tagging studies (ICES, 2006a). Earlier studies had suggested at least two separate populations within this area. The relationship of individuals in the Mediterranean to this population is not known.</p> <p>Individuals in the northwest Atlantic are also considered to be a single population for fisheries management purposes in the USA (NMFS, 2006). The species is most common between Nova Scotia and Cape Hatteras but is found from Labrador to Florida. There are indications of population structuring within this large area and more work on population structure is required (NMFS, 2006).</p> <p>For the north Pacific there does not appear to be an agreed population structure, although the concept of western and eastern populations is consistent with tagging observations available and with the north Atlantic situation. Of 71 000 individuals tagged over a 20–year period in British Columbia, most were recaptured near their release site, but 30 of 2 940 recaptures were recorded near Japan (McFarlane and King, 2003).</p> <p>Spiny dogfish occur off South America, South Africa, Australia and New Zealand (proposal) but there appears to be little information on movements or population structure in these areas. The assumption that there are separate populations in these areas is consistent with information from the north Atlantic and north Pacific.</p>	
6	<p>Productivity level</p> <p>Information available in the proposal and other sources (Table 1) indicates that spiny dogfish fit into the low productivity category, and that there are variations in productivity between populations. Productivity of the northeast Pacific population is lower than Atlantic populations.</p> <p>Fecundity increases with length of females and varies from 1–20 pups per litter; a range of 2–14 is used in northeast Atlantic assessments (ICES, 2006a). Females give birth every two years on average.</p>	<p>FAO's 'low' productivity category is defined by an intrinsic rate of increase (r) < 0.14, age at maturity (t^{mat}) > 8 years, longevity (maximum age (t^{max})) > 25 years and mortality (M) < 0.2 (FAO 2001). The productivity of <i>S. acanthias</i> is very much lower than this threshold. Intrinsic rate of increase (r) ranges 0.0017–0.05, age at maturity (50% female) from 11 to 36 yrs, longevity 50–60 years (and probably underestimated because it is difficult to age old animals), and mortality is 0.065 to 0.1. This is significant when</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
		considering decline trends, because FAO (2002) notes that the historical-extent-of-decline where listing on Appendix I should be considered may fall outside the recommended range of 15-20% for some species. This is appropriate for <i>S. acanthias</i> .
7	Population status and trends	Although not analytical assessments, important trend data (landings, CPUE and 'status of stock') are also presented in Fisheries Agency of Japan 2003 and 2004. See Figure 2 below.
8	Recent peer-reviewed analytical assessments are available for the northeast Atlantic (ICES 2006a) and northwest Atlantic (NMFS, 2006). Relatively little information is available from fishery agencies in the northeast Pacific, northwest Pacific, and for the southern hemisphere.	
9	Decline Information on declines is summarized in Table 2.	
10	Northeast Atlantic : The "base case" of the model runs in the most recent ICES assessment indicates that current total biomass level is 5% of that in 1905 (unexploited) and 7% of that in 1955 (lightly exploited) (proposal, ICES, 2006a). Landings increased during the 1920s and early 1930s, dropped to low levels in 1940-1945, increased to very high levels during the 1950s and 1960s and subsequently declined. Recent landings have been about 15% of the values in the early 1950s.	
11	Black Sea : Results of a virtual population analysis of spiny dogfish abundance in the Black Sea indicate that population biomass increased by about a factor of 3 between 1972 and 1982, and subsequently declined to 1992 by about the same extent (FAO, 1997, proposal). No details of the analysis are given. Landings in the Black Sea followed roughly the same pattern during this period (FAO, 1997).	FAO 1997 reports a decline in biomass of 60% (to 40% of baseline) during the eleven years from 1981 to 1992. Although no details of the collaborative Virtual Population Analysis are provided, this FAO-published stock assessment should receive a reliability index of 4, not 1, in Table 2 of the FAO appraisal.
12	Mediterranean : Two indices cited in the proposal indicate no trend in abundance in parts of the Mediterranean: for the eastern basin 1994-2004 and for the Adriatic Sea 1948-1998. The basis for the statement that the species disappeared from the western Mediterranean in recent years (proposal) is not clear.	The statement in 4.5 of the proposal referring to disappearance in the western Mediterranean is based upon the text presented in 4.4.2: a) Balearic fishers' reports of declines of abundance and directed fisheries closures from the 1970s to the early 1980s, b) a decline in landings from the 1980s (Aldebert 1997), c) a complete absence of records of <i>Squalus</i> in the Balearics during MEDITS ³ surveys during 1994-2004.

³ The Mediterranean International Bottom Trawl Survey Project (MEDITS), initiated in 1993, aims to provide standardised information on the status of demersal fisheries resources within the Mediterranean region by carrying out a universal programme of repetitive trawl surveys.

	FAO text	Reviewer comments
13	<p>Northwest Atlantic : The most recent NMFS assessment (NMFS, 2006) reviews recent information and results of a population assessment. A primary source of information on abundance trends is the NMFS spring trawl survey which is considered to represent trends in the US component of the population (Figure 1). This assessment is somewhat more optimistic than the prior assessment (NMFS, 2003, referred to in proposal), primarily because the most recent trawl survey point (2006) was substantially higher than those for the previous five years, a result considered unlikely in a review of the assessment (Cook, 2006). Analyses of extent of decline (Table 2) do not include this most recent point.</p> <p>Total biomass increased by a factor of three from the late 1960s to the early 1990s and then declined to about 60 percent of maximum values (Figure 1). The biomass of mature females has declined to about 20 percent of the observed maximum between the late 1980s and recent years. An increase in female biomass was observed during the 1980s and recent values are around 30 percent of those in the early 1980s. It is possible that recent female biomass is a larger fraction of that found prior to the 1980s, if the increase in total biomass observed from the 1960s to the 1980s was also true for females.</p> <p>The NMFS assessment does not discuss possible reasons for the increase in biomass from the 1960s to late 1980s. Peak landings occurred in the mid-1970s (Figure 2) so the increase following that period could have been a response to a reduction in fishing mortality.</p> <p>Landings in the northwest Atlantic show two peaks, in the early 1970s and the mid/late 1990s, both with maximum landings of around 20 000 t/year (NMFS, 2006, Figure 2). Recent landings are around 40 percent of these historical values. Fisheries in the USA have targeted mature females which are preferred by markets (NMFS, 2006).</p> <p>The summer trawl survey abundance index from the Scotian Shelf Canadian waters shows a clear increasing trend over the period from about 1980 to the present (Figure 3) for total biomass. In recent years Canadian landings have accounted for almost half of total landings, but Canadian fisheries have not targeted mature females.</p>	<p>The apparent recent increase between 2005 and 2006 has been deemed biologically impossible by the assessment scientists involved. It is appropriate to exclude this single trawl survey point from the overall analysis.</p> <p>FAO (2001, paragraph 47) notes in a discussion of relevant metrics for extent-of-decline (such as number and biomass), that "The life history stage that is most relevant to measure will in most cases be the mature component". In this case of this stock, where targeting of mature females in US waters has led to at least seven years of recruitment failure, it is the proportion of mature females rather than the total population size that should be considered when assessing the qualifying decline for the <i>S. acanthias</i> stock (and indeed any subsequent recovery). As noted in the FAO appraisal, the number of mature females is currently about 20% of the recent observed maximum (which most likely followed recovery from depletion by foreign fisheries in the 1970s). This stock therefore clearly qualifies under the quantitative criteria for consideration for Appendix II (indeed, even Appendix I).</p> <p>Canadian landings are considered unsustainable according to US stock assessments, the only currently available, peer-reviewed assessments for this shared population, and there is no shared management plan.</p>
14	<p>Northeast Pacific :</p> <p>Local abundance is reported to have decreased substantially in Puget Sound (Camhi, 1999 in proposal).</p> <p>In the Gulf of Alaska, trawl survey biomass (Figure 4) and longline survey catches (Wright and Hulbert, 2000) have been increasing in recent years.</p> <p>On Canada's continental shelf, trawl survey CPUE (Figure 5) and longline survey CPUE (Figure 6) have varied without trend since the mid 1980s and early 1990s</p>	<p>The proposal also refers to earlier declines in British Columbia (to 25%, Anderson 1990), and low stock levels in Washington state (Paisson et al. 1997).</p> <p>The recent 150% increase in biomass in two years from the trawl survey in the Gulf of Alaska (FAO Figure 4) is a biological impossibility; this data point should be disregarded. Otherwise, the data are broadly stable with a</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
	<p>respectively, although both surveys show declines in the most recent period. Trawl survey numbers and biomass in waters on both sides of the Canada- USA border have fluctuated without trend since 1980 (Figure 7).</p>	<p>slight increasing trend. Target shark fisheries are prohibited in Alaska, but experimental fisheries are now in the process of being authorised although no stock assessment is planned until 2009.</p> <p>FAO Figures 5 & 6 both show a similar declining trend during the past 10 years to 50% or less at the end of the 1990s.</p> <p>Figure 7 shows an increase to 1989 followed by a decrease, but this data set ends in 2001 so it is not possible to see whether the trend continues, as in Figures 5 & 6. Alaska and Washington state fishermen have shown renewed interest in targeting dogfish.</p>
15	<p>Northwest Pacific : CPUE information from a small area in the Sea of Japan cited in the proposal indicates substantial declines (proposal). CPUE in Danish seines and bull trawls is reported to have declined by 90 percent from the 1970s to the 1990s, while CPUE in unspecified gear is reported to have declined 80–90 percent in the same period.</p> <p>A summary document (Fisheries Agency of Japan, 2004) indicates that landings declined to around two percent of historical levels between the early 1950s and late 1990s. Landings in the early 2000s were around 34 percent of those in the early 1970s, while for the same periods trawl CPUE in the Sea of Japan decreased to 26 percent CPUE in other areas showed varying trends: low with no trend in Iwate Prefecture, a substantial decline (to about 10%) in Shiriya zakii/Aomori Prefectures, and a fluctuation without trend followed by a decline from 1990–2003 in VWest Erimmo/Hokkaido Prefectures (Fisheries Agency of Japan, 2004). However, these trends should be interpreted with caution as it is believed that these fishing areas occur at the extreme margins of the distribution of spiny dogfish. The areas covered by these indices are part of the extended economic zone off northern Japan, on the southern margin of spiny dogfish distribution in the northwest Pacific and a relatively small part of the distribution in this area.</p>	<p>The source of these CPUE data presented in the proposal is Fisheries Agency of Japan 2003, which does not explain the basis for the 80–90% decline identified during 1970s–1990s (Figure 2).</p> <p>This target fishery was one of Japan's largest in the 1920s, accounting for 17–25% of Japan's overall catch. During the 1950s, when 50,000 t were taken annually, this was the largest single <i>S. acanthias</i> fishery ever recorded (only slightly smaller than the total catch by all Northeast Atlantic States during the 1960s, and significantly larger than the Northwest Atlantic fishery). This would be unlikely if this fishing area was at the extreme margins of the distribution of spiny dogfish, and Figure 1 suggests otherwise; the species' distribution extends at least to northern China and the Yellow Sea, although records from Taiwan are queried (Compagno pers. comm.). Indeed, the Sea of Japan extends from 35–45° N (equivalent to the Northwest Atlantic coast from Cape Hatteras to Nova Scotia – the centre of the range for <i>S. acanthias</i> in the Northwest Atlantic) and similarly to the Atlantic likely represents a major sector of its NW Pacific range.</p>
16	<p>Southern hemisphere : In New Zealand reported catches have been increasing since the early 1990s but this increase may be due to better reporting as well as to increased harvest (proposal, New Zealand Ministry of Fisheries, 2006). Trawl surveys indicate no overall trend in abundance between the early 1990s and the present, although an increase in abundance in the mid 1990s was observed (New</p>	<p>Although trend data for <i>S. acanthias</i> in most of its southern hemisphere distribution are either lacking, inconclusive or do not exceed a 50% decline in the past 10 years, there is evidence that these stocks are coming under increased pressure because of rising demand for shark meat in</p>

	FAO text	Reviewer comments
	<p>Zealand Ministry of Fisheries, 2006).</p> <p>Trawl surveys in the EEZ of Argentina indicate that, although there has been some localized decline of spiny dogfish in coastal areas, there have been no overall abundance trends over the last ten years (Massa et al., 2007). In the Bonaerense region (Figure 8a) recent survey biomass has been about 20 percent of a single high value in 1994; this is a relatively small part of the distribution. In the central region (Figure 8b), recent biomass estimates are about 50 percent of those in the late 1990s. In the southern region there has been no trend in survey biomass estimates since the early 1990s (Figure 8c).</p> <p>No information on abundance trends is available (from the proposal or other sources) from other areas where spiny dogfish are found in the southern hemisphere (Australia, South Africa and the Chilean coast of South America).</p>	<p>Europe and elsewhere. Thus, criterion B is most important here (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). Although New Zealand introduced a TAC in 2004 to ensure that the target fishery exporting to Asian and European markets remained sustainable (although not based upon a stock assessment), no other southern hemisphere range states have introduced precautionary management. Stocks of other small sharks (e.g. <i>Galeorhinus galeus</i>) targeted for export have collapsed in Argentina and <i>S. acanthias</i> is now increasingly being targeted to replace these (Gustavo Chiaromonte pers comm.).</p>
17	<p>Small population size An approximate estimate of world population size of 1 000 million individuals was made based on a range of information and assumptions (Table 3).</p>	<p>See comments below in row 28.</p>
	<p>Restricted distribution Quantitative estimates of the distribution area are not available, but the species occurs over very wide areas on continental shelves in many parts of the world's oceans (Figure 2 of the proposal).</p>	<p>This criterion is not relevant for this listing proposal.</p>
	<p>Assessment relative to quantitative criteria</p>	
18	<p>Decline For an Appendix II listing, assessment of whether the species is near Appendix I levels or likely to become so in the foreseeable future is required. For a low productivity species, a decline to less than 15–20 percent of the historical baseline would lead to consideration for Appendix I. To be near the Appendix I threshold, values 5–10 percent above this (i.e. 20–30 percent of the historical baseline) either now or in the near future may justify consideration for Appendix II. Table 4 and Figures 9 and 10 summarize the Panel evaluation of the decline indices in relation to Appendix II criteria.</p>	<p>This section only considers the guidelines for Article II 2(a) criterion A. Unfortunately, the expert panel largely omitted consideration of Article II 2(a) Criterion B (as noted above). This is particularly important for the southern hemisphere stocks that have not yet reached qualifying levels of decline, but appears likely to do so unless trade is regulated, in view of the history of catches in the Northern hemisphere.</p>
19	<p>In the <i>northeast Atlantic</i>, the most recent peer-reviewed stock assessment indicates that recent total biomass is about 5–7 percent of historic values, within the 15–20 percent value that would qualify a species for Appendix I.</p>	
20	<p>The limited information available for the <i>Mediterranean and Black Sea</i> does not indicate any trend in these populations.</p>	<p>A virtual population analysis for the Black Sea (FAO 1997) identified a decline to 40% from 1981 to 1992. Declines in the Western Mediterranean initially led to the closure of targeted fisheries, followed by absence of records in recent</p>

FAO text	Reviewer comments
<p>21 In the US assessment in the <i>northwest Atlantic</i>, decline can be assessed for different population components (total biomass or mature females alone) and relative to different historical baselines (values in the late 1980s, following a population increase, or at earlier periods). Choice of historical baseline depends to some extent on the reason for the observed increase in abundance during the 1980s. If this was an increase toward a "normal" abundance level following exploitation in the 1970s, it would be appropriate to use the higher late 1980s level as best representing the historical population abundance. If this was an increase to "anomalous" levels, the earlier lower baseline population levels would be more appropriate.</p>	<p>surveys.</p> <p>As noted in 13 above, it is the number of spawners (mature females) that is important when considering the decline criteria, not the total population size (FAO 2001, paragraph 47). Figure 2 in the FAO report illustrates landings from a major fishery during the early 1970s, followed by the current fishery that peaked during the 1990s. It is logical to assume that the early fishery caused a decrease in biomass in the same way that the more recent fishery has done, and that the higher population level attained following recovery after the establishment of the USA EEZ should be treated as the baseline.</p>
<p>22 Total biomass is currently about 67 percent of the recent baseline and 200 percent of the historical (early 1960s) baseline. Corresponding percentages for mature females are about 20 percent and 35 percent. The 20 percent estimate for mature females is close to or within the Appendix I threshold, but the other estimates are well above the Appendix I and Appendix II threshold. It is arguable as to whether the population has been declining in recent years or is starting to increase. Projections for the US component indicate that biomass will remain stable at current exploitation rates (Figure 11), but should rebuild if exploitation rates are reduced.</p>	<p>The 20% estimate for mature females is the relevant metric under the detailed guidelines set out in FAO 2001. The single high value in the most recent trawl survey has been queried because it is biologically not possible for the stock to rebound this fast (see 13). Since these projections were made, trip limits have been increased fivefold for Atlantic state waters, leading to at least 156% of the 2006-2007 federal quota being taken. Exploitation rates are increasing on this stock. There are currently no mechanisms in place to ensure exploitation reduction. A CITES listing should, by requiring no detriment findings for exports from this region, increase the likelihood that scientific advice will be carried forward into management and enable stock rebuilding to take place.</p>
<p>23 Canadian surveys suggest that total biomass in Canadian waters has increased in recent years.</p>	<p>No Canadian stock assessment has yet been undertaken. According to US stock assessments, Canadian catches are not sustainable.</p>
<p>24 For the <i>northeast Pacific</i>, there appear to be no indications of severe decline other than for Puget Sound, a small enclosed part of the distribution area. Indices from the Gulf of Alaska are increasing, while for Canadian waters and US waters near the Canadian southern border indices have been fluctuating without trend.</p>	<p>See 14 above. Declines outside Puget Sound may not be 'severe', but declines over the past decade are still appreciable and (with the exception of the Alaska population) may meet the Appendix II decline criterion. These trends indicate the desirability of precautionary management for this stock, which is biologically even more vulnerable to overfishing than Atlantic stocks. CITES listing criterion B applies to those segments of this stock that do</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

FAO text	Reviewer comments
<p>25 Information quoted in the proposal for the <i>northwest Pacific</i> (declines in CPUE of 80–90 percent in one fishery and 90 percent in another) would suggest that this population is near Appendix I territory, as would the observation that recent catches are less than two percent of those in the early 1950s. Declines in the Sea of Japan trawl CPUE to 26 percent of that in the early 1970s would also place this population near Appendix I. However, this decline was observed in only a small portion of the northwest Pacific in an area at the margins of its distributional range. There is other information indicating that abundance may be stable or increasing (proposal, Annex 4).</p>	<p>not meet criterion A, with the possible exception of Alaska (assuming that targeted fisheries will not be permitted prior to the development of stock assessments and the adoption of scientific advice – although experimental fisheries are now being considered prior to any assessment).</p> <p>The Sea of Japan is a major portion of the northwest Pacific range of this species and used to support one of the largest <i>S. acanthias</i> fisheries in the world. Unfortunately there are no available data for fisheries in the Koreas or northern China, which may also have been important. The population within this large area clearly qualifies for Appendix I listing (Figure 2). In contrast, the size of the unfished population inside Russian waters, said to be stable or increasing, is unknown. The latter population qualifies under criterion B, since a CITES listing would ensure that future fisheries providing products for export would have to be sustainably managed.</p>
<p>26 For the <i>southern hemisphere</i>, recent abundance indices appear to be stable or increasing in New Zealand and without trend off Argentina.</p>	<p>See 16. New Zealand's management measures were intended to prevent rising market demand leading to stock depletion. If a stock assessment confirms that this quota is appropriate, it might be the only stock in the world that does not qualify for CITES Appendix II listing. All other southern hemisphere stocks are unmanaged and qualify for listing under criterion B, if not A. For example, stocks of other small coastal shark species whose meat is exported to Europe have collapsed off the South American coast; <i>S. acanthias</i> is now increasingly being targeted for export in their place by unregulated fisheries and urgently requires assessment and management. A CITES listing will support this process.</p>
<p>27 Although some populations or components meet the Appendix II decline criterion (northeast Atlantic, total population; northwest Atlantic, mature females) overall the species does not meet the decline criterion.</p>	<p>The majority of northern hemisphere populations, Atlantic and Pacific, meet the Appendix II decline criterion (A), because according to FAO 2001 it is the reproducing segment of the stock that should be considered under this criterion.</p> <p>The majority of southern hemisphere populations and northern hemisphere populations that do not meet criterion A qualify under criterion B, which was not considered by the FAO expert panel.</p>

	FAO text	Reviewer comments
28	<p>Small population The global population size of <i>Squalus acanthias</i> is possibly as high as one billion fish (Table 3). Thus, although there may be concerns about abundance at the level of local populations or subpopulations, the species is not characterized by a small population size at the global level.</p>	<p>FAO (2001) recognised that the total number of animals in a population is, under some circumstances, one of the mitigating factors that may decrease concern for a species that qualifies for listing because of a population decline. If a population is extremely large, it might not automatically be appropriate to consider it for listing. However, FAO (2001, section 3.5) also concluded that "large numbers by themselves are not a sufficient mitigating factor. It is necessary to demonstrate that, for example, reproductive success is not compromised and vulnerability factors such as schooling are not of overriding importance." For spiny dogfish, other vulnerability factors identified by FAO that should be taken into account are selectivity of removals; age, size or stage structure of a population; social structure, including sex ratio; and vulnerability at different life stages (e.g. during migration or spawning). All of the above factors apply to spiny dogfish.</p> <p>Although it has some large populations, mature females make up only a small proportion of these populations (including 0.5% where mature females are targeted in the NE Atlantic, 3% in the case of a Canadian population where females are not targeted – see section 4.2 of the listing proposal). Table 3 has been amended below to add an estimate for global numbers of mature females, based where possible on stock assessments, and in other cases on an estimated 6% of the stock size produced by FAO.</p>
	<p>Restricted distribution No estimates of area occupied by the species are available, but the species is widely distributed on continental shelves of northern and southern hemispheres (Figure 9).</p>	<p>This is not the basis for the listing proposal.</p>
29	<p>Were trends due to natural fluctuations? In one case, the northwest Atlantic population, observed trends may have been influenced by natural fluctuations as well as by exploitation. Observed increases in spiny dogfish abundance from the 1960s to the 1980s are hypothesized by some to have resulted from replacement of depleted groundfish populations by elasmobranchs (e.g. Sinclair and Murawski, 1997; Hall, 1999), which would suggest that the population levels in the 1980s were anomalously high. This would mean that subsequent declines were greater than from a "typical" level of abundance. However, this increase may also have been in response to a decline in fishery harvests which were at maximum levels in the early</p>	<p>As noted in 21, it is logical to assume that the foreign fishery in the 1970s caused a decrease in biomass in the same way that the more recent fishery has done. In this case, the higher population level attained following recovery after the establishment of the USA EEZ should be treated as the baseline, rather than as an anomalous high following ecosystem changes driven by other fisheries.</p>

	FAO text	Reviewer comments
	<p>1970s and subsequently dropped to about 20 percent of the maximum levels (Fig 2). In other areas there appears to be no evidence for observed trends being due to natural fluctuations.</p>	
30	<p>Risk and mitigating factors Life history parameters of spiny dogfish make them particularly vulnerable to the impacts of mortality from human activities (Table 1). The intrinsic rate of increase is low, even compared to other sharks (Smith <i>et al.</i>, 1998). Rate of reproduction is low and contributes to the low rate of increase; females give birth every two years and number of pups produced is typically 2–14 (ICES, 2006a), although this may range from 1–20. Recent pup production in the northwest Atlantic has averaged 4–9 (NMFS, 2006).</p>	<p>The particularly high vulnerability of spiny dogfish (particularly the northeast Pacific stock) means that they probably fall outside the recommended range of 15–20% for an Appendix I listing or 20–30% for Appendix II. FAO (2001, para. 44) states: "a percentage of baseline greater than 20% may be appropriate [for consideration for listing on Appendix I] for some exploited fish species characterised by extremely low productivity, for example certain sharks".</p>
31	<p>Loss of large reproductive females and changes in sex ratio under exploitation may represent an additional risk factor for some populations of this species, particularly given the potential impact on recruitment. The assessment of the US component in northwest Atlantic indicates that mean lengths and weights of females taken in surveys have declined substantially over the past two decades (Figure 12), and the ratio of mature males to females in survey catches increased 3–fold from 1993–2000 (NMFS, 2006; Figure B13), consistent with targeting of large females in the US fishery. A stock-recruitment relationship for this population indicates that recruitment success is influenced by maternal size, with the odds of poor recruitment 4.5 times greater when maternal size is less than 87cm; average maternal size in 2006 was less than 85 cm (NMFS, 2006 p. 16). Recruitment has been very poor in recent years, with recruit biomass near zero from 1997 to 2003 (compared with values of 1 000–10 000 tonnes in previous years) (NMFS, 2006 Figure B7), and individuals less than 60 cm in length (juveniles) have become rare in US survey catches since 1997 (NMFS, 2006, Figure B11). However, in Canadian surveys there has been a recent increase in abundance in individuals of both sexes less than 60 cm (information provided to the Panel by S. Campana).</p> <p>Similar analysis of size and sex trends is not available in the ICES assessment (ICES, 2006a) but inspection of size and sex frequency histograms from surveys over the past two decades indicates that most females have been less than 80 cm in length in the North Sea (ICES, 2006a, Figure 2.9), while very few females have been greater than 80 cm off the Scottish west coast and in the Celtic Seas (ICES 2006a; Figure 2.10). In surveys in the Irish Sea, a large proportion of individuals are greater than 80 cm (ICES, 2006a, Figure 2.10), although some concern is expressed about whether this information is biased by availability.</p>	<p>In addition to the importance of life history characteristics as modifying factors to be taken into consideration when assessing species for consideration for CITES listing, FAO (CoP12 Inf. 5, p. 14) also adds the following that are of relevance for <i>S. acanthias</i>:</p> <p><u>Selectivity of removals</u> (mature females are often preferentially targeted);</p> <p><u>Aggregating behaviour</u> (dogfish aggregate by sex and maturity, making it easy to target schools of mature females);</p> <p><u>Vulnerability at different life stages</u> (pregnant females are targeted in some fisheries);</p> <p><u>Age, size or stage structure of a population</u> (removal of mature females has led to dominance by males and sub-adults and recent recruitment failure);</p> <p><u>Social structure</u> (e.g. sex ratio – see above).</p>
32	<p>At present, some fishery management measures are in place for several spiny</p>	<p>The New Zealand quotas (if science-based) and the</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
	dogfish populations but these do not appear to be restrictive and thus may not be considered mitigating factors at present.	prohibition on target shark fisheries in Alaska (which may soon cease to apply to <i>S. acanthias</i>) would apply as mitigating factors only for these populations. The inadequate nature of other management measures and widespread absence of management makes CITES criterion B particularly important for this species.
33	In the northeast Atlantic, TACs have been substantially reduced since 2001 (8 870 tonnes) to 2005 (1 136 tonnes) and 2006 (1 051 tonnes), but the TAC only covers part of the distribution of the species, and landings throughout the distribution have been substantially above TACs (16 015 tonnes in 2001 and 5 636 tonnes in 2005) (ICES, 2006a). The species is caught as a bycatch in groundfish fisheries as well as in directed fisheries. ICES advice in 2006, as in 2005 (the first year in which advice was provided on this species) is that directed fisheries should not be permitted to continue, bycatch in mixed fisheries should be reduced to the lowest possible level, and the TAC should be set to zero, in all areas where the species is caught in the northeast Atlantic (ICES, 2006b). Norway has implemented a 70 cm minimum size (ICES, 2006a). Given the inconsistency between the advice and recent fishery practice, it would appear that although the fishery management regime may afford some protection to the species, it is likely to be inadequate for ensuring sustainability of the population.	The European Commission is working on proposals for further restrictions on the catch of this species for consideration of European Ministers at the December 2007 Council meeting.
34	For the northwest Atlantic population, fishery management plans are in place in both Canada and the USA. The USA has two management plans, one led by the National Marine Fisheries Service (NMFS) and one by the Atlantic States Marine Fishery Commission (ASMFC). Both plans have the goal of setting quota levels that should lead to rebuilding, but different quotas are set for U.S. waters in the two plans: 4 million pounds (1 800 tonnes) and 8.8 million pounds (4 000 tonnes) respectively (Goodale, 2003). In Canada, a quota of 2 500 tonnes was instituted in 2001, but this was overruled in one year to 3500 tonnes (Hanson, 2003). Recent landings have been consistent with the TAC (Table 5). Total landings (US commercial, US recreational, and non-US) have been of the order of 5 000–7 000 tonnes from the population in recent years (NMFS, 2006, Figure B4), while recent discard mortality is estimated at about 4 000–5 000 tonnes/yr (NMFS, 2006). Thus, the Canadian and US fishery management plans have succeeded in substantially reducing removals; while it is not yet known whether the reductions are sufficient to enable rebuilding, projections in the US assessment indicate that biomass should remain stable at recent fishing mortality levels and rebuild with a decrease in fishing mortality.	USA catches from the Northwest Atlantic population are again rising with no mechanisms in place to curb state limits to federally adopted levels. Landings increased from 1,637,790 lbs (740 t) in 2005 to 2,469,443 lbs (1,100 t) in 2006 and jumped to 6,230,636 (2,800 t) in 2007. 2007 landings were not incorporated into the projections noted in the FAO report. Fishing mortality rates are increasing. Gaps between state and federal catch limits are widening. In 2007, the state commission raised trip limits to five times the federal limit (600 v 3,000 lbs) in order to allow targeted fisheries to resume. The state annual quota was raised to 6 million lbs or 50% higher than the 4 million lb federal quota; both were exceeded in the last fishing year. Previous scientific advice recommending a two million lb quota was never adopted by either management body. According to US stock assessments, Canadian catches are not sustainable.
35	Restrictive management measures are not in place in the northeast Pacific. In	Since there is no restrictive management in place, most of

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

FAO text	Reviewer comments
<p>Alaska (Gulf of Alaska and Bering Sea/Aleutian fishery management plans), spiny dogfish are lumped with "other species" for which a grouped TAC is in place (NPFMC, 1997, 2001). In Canada's Pacific Region, a TAC of 15 000 tonnes is in place (DFO, 2006, p 16) and catches against the TAC have been around 5 000–6 000 tonnes/year in 2003–2005 (Table 5). For the Washington-Oregon- California region, trip limits are in place but there appear to be no TACs or other management measures for spiny dogfish (PFMC, 2006).</p>	<p>these populations qualify for listing on Appendix II under criterion B, if criterion A does not apply.</p>
<p>36 No fishery management measures are in place in the northwest Pacific (proposal). A TAC is in place in New Zealand but does not appear to be restrictive on catches; for 2004–5 total catches were 7 300 tonnes against a TAC of 12 660 tonnes (New Zealand Ministry of Fisheries, 2006).</p>	
<p>37 Trade considerations Spiny dogfish meat has a high value in markets and substantial amounts have been traded internationally over the past decade (proposal). Available trade and production data show that the European Union is a significant importer of spiny dogfish (proposal Tables 5, 6), and consumed 65 percent of world production in 2001 (Fowler <i>et al.</i>, 2004).</p>	<p>These observations underline the importance of criterion B for this species listing proposal: <i>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.</i></p>
<p>38 Available trade data indicate that a total of 13 exporting countries accounted for 98 percent of imports to the EU between 1995 and 2005 (Lack, 2006). The remaining two percent was supplied by 14 countries/entities (Lack, 2006). Imports and exports have been influenced by changes in landings since 1990; as landings in the EU have declined, landings in the USA increased substantially in the 1990s, then declined (proposal; NMFS, 2006; Table 5). Canadian landings increased six-fold in the period 1997 to 2001 as US regulations on catch went into effect. With the decline in landings in countries which formerly supplied the EU, imports from "new" areas such as Morocco and New Zealand are reported to be increasing (proposal Table 5). The Panel noted that a significant proportion of the EU market (60 percent in 2004) was supplied by catches from EU vessels and that internal trade within the EU was not subject to the provisions of CITES. With respect to the northeast Atlantic population the Panel noted that around 30 percent of the EU supplies originated from non-EU vessels, equivalent to imports.</p>	<p>With the collapse of the <i>Galeorhinus galeus</i> stock in the southwest Atlantic as a result of fisheries driven by international market demand, <i>Squalus acanthias</i> is now likely to become a more important target and increasingly enter European markets from States such as Argentina.</p>
<p>39 Overall, the Panel agreed that international trade was an important factor affecting catches of spiny dogfish globally and that sustained demand for the meat for the EU market was likely to continue.</p>	<p>This highlights the relevance of criterion B for this species globally – see 37 above.</p>
<p>Implementation issues</p>	
<p>40 Introduction from the sea</p>	

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
	<p>Spiny dogfish are associated with continental shelf habitats, most of which are within States' EEZs. Catch of spiny dogfish from waters outside EEZs is possible but it is likely to be a rare event. The greatest potential for catches of spiny dogfish to be taken from waters not under the jurisdiction of any State is in the Mediterranean Sea where few bordering countries have established EEZs. In many cases, waters under national jurisdiction extend only 12 nm offshore, increasing the possibility that spiny dogfish could be taken outside those waters. Should this occur, the State of introduction would be required to make non-detriment findings in respect of the catch. The relevant regional fisheries body in the Mediterranean Sea is the General Fisheries Commission for the Mediterranean (GFCM) and it is possible that that body could facilitate the development of agreed criteria for making non-detriment findings.</p>	
41	<p>Split-listings Given that the Panel agreed that the Northeastern Atlantic population of spiny dogfish met the criteria for listing in Appendix II, the possibility of a split listing was considered, whereby the Northeastern Atlantic population would be listed in Appendix II and other populations would not be listed. The Panel noted the advice of the FAO Expert Panel on Implementation Issues Associated with Listing Commercially-Exploited Aquatic Species on CITES Appendices (FAO, 2004b) that inflexible adherence to the CITES invocation to avoid split-listings could result in stocks that would not otherwise qualify for listing being placed in Appendix II. However, the Panel considered that, in addition to the implementation difficulties under CITES, such a split listing could facilitate IUU fishing for spiny dogfish on the Northeastern Atlantic, with catches laundered as taken from non-listed stocks. Such an outcome would be clearly undesirable and had the potential to undermine the effectiveness of conservation and management efforts for spiny dogfish globally.</p>	<p>In contrast, the above analysis indicates not that just one population meets the CITES listing criteria, but that only two stocks/parts of stocks possibly fail to meet these criteria and might therefore be excluded from a listing: New Zealand (if the TAC is based on a stock assessment) and Alaska (if no target fishery is permitted until a stock assessment has been undertaken and scientific advice used to set a quota – although this is complicated because would cover only part of a shared stock). Rather than a split listing, management measures for healthy stocks should be used as the basis for non-detriment findings under a CITES listing.</p>
42	<p>Basis for findings: legally-obtained, not detrimental Non-detriment findings Non-detriment findings (NDFs) are the responsibility of the exporting state and must show that exports are not detrimental to survival of the species, that is, that they are consistent with sustainable harvesting. Development of an NDF requires appropriate scientific capacity, biological information on the species, and an approach to demonstrating that exports are based on sustainable harvest. Quality of NDFs can be assured by review in the Scientific Committees of CITES (Animals and Plants Committees) and in individual Parties. FAO (2004b, paras 28–29) provides some guidance on NDFs in a fisheries context.</p>	<p>A CITES Appendix II listing would strongly support improved management in line with scientific advice. One benefit of the proposed CITES listing will be to ensure that the necessary stock assessments are developed and implemented, and sustainable fisheries management achieved for this high value and biologically vulnerable species, thus enabling non-detriment findings to be produced.</p>
43	<p>Scientific capacity and management measures are in place with respect to the two populations of spiny dogfish in the northern Atlantic. However, where they are to be relied upon as the basis for non-detriment findings, domestic catch restrictions would</p>	

	FAO text	Reviewer comments
	<p>need to be revised in line with scientific advice and take into account straddling stock and discard issues.</p> <p>For other populations of spiny dogfish there are apparently no biological assessments of population status which could serve as a basis for non-detriment findings. Information may exist which could serve as a basis for such assessments, particularly in some areas where exploitation rates appear to be relatively low (e.g. the northeast Pacific and southern hemisphere).</p>	
44	<p>Findings that specimens were legally obtained</p> <p>The majority of targeted fishing for spiny dogfish currently occurs under the auspices of a national management plan. Exports of spiny dogfish products taken in compliance with such management plans would provide a basis for a finding that it had been legally obtained. Where spiny dogfish is exported from waters with no specific management measures for the species a finding that it is had been legally obtained would be relatively straightforward, though in the longer-term, the absence of such measures may make non-detriment findings increasingly difficult.</p>	
45	<p>Identification of products in trade</p> <p>Spiny dogfish meat is highly valued in markets. Products in trade include fillets, steaks, portions, backs, and belly flaps (smoked) (Vannuccini, 1999). Fins may also be in trade although their value is lower than from larger species, and derivatives (cartilage) may also be traded (proposal). It is difficult to determine from available information the extent to which Spiny dogfish products might be distinguishable from other shark or fish products in trade, but this would probably be difficult. Identification guides and DNA testing could be used, however the latter techniques are not considered practical as initial screening tools although they may be useful for secondary inspections or enforcement (CITES, 2006). The high value of spiny dogfish meat should ensure that it is correctly labelled and differentiated in the marketplace. Further, international markets appear to be reasonably narrow and focused in the EU. These factors, combined with the stricter domestic measures of the EU, which require the grant of an import permit for Appendix II specimens, would help facilitate identification of meat products were the species to be listed on Appendix II.</p>	
46	<p>"Look-alike" issues</p> <p>Listing for "look-alike" reasons (i.e., listing on Appendix II under Article II, para 2b of the Convention) is justified when enforcement officers who encounter specimens of CITES-listed species are unable to distinguish between them. Trade in spiny dogfish product is predominantly as meat as belly flaps and backs, though the fins, cartilage and hides may also be traded. If the trade in by-products was undermining the conservation effectiveness of a spiny dogfish listing, and tools such as identification</p>	

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
	guides and DNA tests were not feasible, there would be potential justification for listing other species of shark species on the basis that their products resemble those of spiny dogfish in trade.	
47	<p>Potential socio-economic impacts of the proposed listing</p> <p>Socio-economic impacts will depend on whether existing trade is brought under regulation (the intent of an Appendix II listing) or is restricted (as would be the case if, for example, adequate non-detriment findings could not be developed). Spiny dogfish populations in the north Atlantic are already subject to restrictions on catch though an Appendix II listing could result in further reductions in catch levels. With respect to other waters, regulation of trade is unlikely to result in any reductions in current catch levels therefore the socio-economic impacts would be minimal. Costs are likely to arise from additional paperwork for exporters.</p>	
48	<p>The imposition of an Appendix II listing may require tightening of management measures in order to secure non-detriment findings for export. In the short-term this may impose costs and restrictions on fishing and processing opportunities however, experience suggests that in the absence of strong management, target fisheries for spiny dogfish are relatively short-lived.</p>	<p>Tightening of management measures in order to produce no-detriment findings would result in long-term socio-economic benefits to fisheries by preventing stock depletion and fishery collapse.</p>
49	<p>Likely effectiveness of a CITES Appendix II listing for species conservation</p> <p>An Appendix II listing, imposing global regulation on a species which may only be unsustainably harvested in some parts of its global range, would be an inefficient management measure. A listing of spiny dogfish in Appendix II could impose unnecessary regulations on trade from a number of populations where available information indicates that directed fishing mortality is low.</p>	<p>If fishing mortality is low and increased management effort unnecessary, it would presumably be relatively easy to develop non-detriment findings and thus benefit from access to valuable international markets. The US federal government has been unsuccessful in attempts to keep Atlantic state fishing limits in line with US federal recovery efforts for dogfish. Implementation of a CITES Appendix II listing provides a more reliable tool for meeting mortality objectives.</p>
50	<p>With respect to the spiny dogfish populations of primary conservation concern, restrictions on catch are already in place for the northwest Atlantic population although improved coordination between federal and state fishery management measures in the USA, and between the USA and Canada, is required if rebuilding efforts are to succeed.</p>	<p>The gap between USA state and federal catch limits is widening. In 2007, states raised dogfish trip limits to five times federal limits (600 v 3,000 lbs) to allow for reopening of targeted fisheries. The state quota is 50% higher than that for federal waters (6 million pounds versus 4 million pounds).</p>
51	<p>In regard to the northeast Atlantic spiny dogfish population, the Panel noted that while the majority of catch from this stock was consumed domestically within the EU a requirement for non-detriment findings for that part of the catch taken by non-EU members may assist in securing a closer alignment between scientific advice and management measures for the stock in its entirety. However, it is imperative that EU</p>	<p>The European Commission is working on proposals for further restrictions on the catch of this species for consideration of European Ministers at the December 2007 Council meeting.</p>

	FAO text	Reviewer comments
52	<p>members prohibit target fisheries for spiny dogfish and severely curtail bycatch.</p> <p>The Panel noted that market demand for high-value spiny dogfish products had the potential to drive increased exploitation of currently under-exploited stocks.</p>	<p>This statement explains why criterion B is so important for many stocks of this species; it was unfortunate that the Panel did not consider it during their appraisal.</p>
53	<p>Key implementation issues identified by the Panel included the need for a coordinated approach to facilitate non-detriment finding for catches taken in high seas areas of the Mediterranean; difficulties in differentiating products from spiny dogfish and other sharks in trade; and a closer alignment between management measures and scientific advice to underpin non-detriment findings.</p>	<p>In relation to the Mediterranean: the Panel did, however, acknowledge that the GFCM would be in a good position to advise and coordinate criteria for non-detriment findings in the Mediterranean (see 40 above). i.e the potential for introduction from the sea is not reason to oppose a listing. As noted already (see response to 4), a closer alignment between management measures and scientific advice is an outcome of, not an impediment to, an effective listing.</p>
54	<p>Fisheries management considerations</p> <p>Apart from New Zealand's non-restrictive quota and Argentina's closed areas (for hake) that may also protect spiny dogfish, the Panel was not aware of management measures in any other part of the southern hemisphere; however, it is also believed that most of these populations are only lightly to moderately exploited.</p> <p>In the northeast Pacific, Canada has implemented a non-restrictive TAC and the US Pacific Fishery Management Council has implemented trip limits. No fishery management measures are in place in the northwest Pacific.</p> <p>In the northwest Atlantic, fishery management plans are in place in both Canada and the USA. These have succeeded in substantially reducing catches in recent years. However, there is discord between federal and state TACs in the USA, with the latter needing to be reduced to federally recommended levels. There is also a need for improved coordination between the USA and Canada in managing the northwest population.</p>	<p>The NZ TAC was introduced in recognition that fishing pressure is likely to increase in order to meet international trade demand and to ensure that this does not drive depletion of NZ stocks.</p> <p>USA catches from the NW Atlantic population are again rising (see 34 above), with no mechanisms in place to curb state limits to federally adopted levels. Landings increased from 1,637,790 lbs in 2005 to 2,469,443 lbs in 2006 and jumped to 6,230,636 in 2007. 2007 landings were not incorporated into the projections noted here. Discord between state and federal catch limits is increasing. In 2007, the state commission raised trip limits to five times the federal limit (600 versus 3,000 lbs) in order to allow for targeted fisheries to resume. The state annual quota was raised to 6 million lbs or 50% higher than the 4 million lb federal quota. Previous scientific advice has recommended a two million pound quota, but was never adopted by either management body.</p>
55	<p>In the northeast Atlantic, ICES has recommended a TAC of zero for the stock, but landings continue to be substantial. Management is largely ineffective, and a CITES listing by itself will do little to resolve the problem as the majority of the trade is between EU members. It is imperative that meaningful management measures be developed and implemented.</p> <p>The lack of effective management in the northeast Atlantic, the paucity of mature females in the northwest Atlantic and the potential for exploitation to increase</p>	<p>The European Commission is working on proposals for further restrictions on the catch of this species for consideration of European Ministers at the December 2007 Council meeting.</p> <p>The potential for high international market demand to drive exploitation, recognised by the Expert Panel, indicates the</p>

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
	<p><u>substantially in other areas due to high market demand means that the global status of the species should continue to be monitored.</u></p>	<p>relevance of criterion B and the importance of a CITES listing for this species.</p>
56	<p>The fisheries management record for <i>Squalus acanthias</i> is poor to extremely poor throughout the world. The Panel noted agreement of states to implement effective management of the International Program of Action for sharks and further noted that sustainable management would require that, where they had not done so, range States develop and implement National Plans of Action for Sharks to ensure that catches of spiny dogfish (and other sharks) from both directed and non-directed fisheries are sustainable.</p>	<p>A CITES listing for commercially exploited shark species should encourage States and RFMOs to accelerate the process of introducing shark fisheries management plans and ensure that fisheries are sustainable. The implementation of effective management for spiny dogfish cannot be delayed on the assumption that the States involved will undertake a Shark Assessment Report, develop an NPOA and implement effective management as a result. The voluntary approach of the IPOA has had limited impact on shark management, but a CITES listing can bind CITES Parties to taking action.</p>
57	<p>Overall conclusions The FAO Ad Hoc Expert Advisory Panel concluded that the available evidence does not support the proposal to include <i>Squalus acanthias</i> under CITES Appendix II. Globally, the species does not meet the biological decline criteria for listing under CITES Appendix II. The northeast Atlantic population meets the decline criterion for listing on Appendix II. The northwest Atlantic population does not meet the criterion if the entire population is taken into account, although it may if mature females alone are considered. The northeast Pacific has not shown declines consistent with the Appendix II criterion, while in the northwest Pacific a decline to Appendix II level was evident only in areas believed to be at the margins of the distributional range. In the southern hemisphere, surveys in the southwest Atlantic and southwest Pacific indicate stable or increasing abundance.</p>	<p>The above evaluation of the expert panel report primarily differs from FAO's for the following reasons:</p> <ul style="list-style-type: none"> - it includes consideration of Criterion B, particularly for the southern hemisphere and the NE Pacific; - it focuses upon declines in the mature female part of the stock; - it reviews evidence for a major decline in the NW Pacific. <p>Taking the above into account leads to a different conclusion – that the available evidence does support an Appendix II listing.</p>
58	<p>The listing proposal states that North Atlantic, Mediterranean, Black Sea and North Pacific <i>Squalus acanthias</i> stocks qualify under criterion 2a, A (that the species can be inferred or projected to become eligible for inclusion in Appendix I in the near future). However, the Expert Panel concluded that this statement was not supported by the available information, except for the northeast Atlantic population.</p>	<p>See differing conclusions above.</p>
59	<p>The global population size of <i>Squalus acanthias</i> is estimated to be one billion or more.</p>	
60	<p>International trade of <i>Squalus acanthias</i> is the key driver of exploitation in all areas, except the northeast Atlantic where most of the catch is traded internally within EU markets. The catch imported into the EU from harvests by non-EU members from</p>	

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

	FAO text	Reviewer comments
	the northeast Atlantic stock is, however, appreciable.	
61	<p>There are serious fisheries management failures for some individual populations. Catches from the northeast Atlantic stock, both internally traded in the EU and imported, need to be curtailed. Federal and state US fishery management plans exist for the northwest Atlantic stock and have succeeded in reducing catches, but they are not well coordinated. All other areas in which <i>Squalus acanthias</i> is harvested need to be closely monitored to ensure that catches remain sustainable. Sustainable management requires that, where they had not done so, range States develop and implement National Plans of Action for sharks.</p>	See 34 and 54 above.
62	<p>If <i>Squalus acanthias</i> is listed on Appendix II, key implementation issues will include difficulties in differentiating <i>Squalus acanthias</i> products from other sharks in trade, and the need for a closer alignment between management measures and scientific advice to underpin non-detriment findings.</p>	
63	<p>The Expert Panel considered the option of a split listing for <i>Squalus acanthias</i>, with the northeast Atlantic population alone being listed on Appendix II. However, given that EU members are both the main harvesters and consumers of northeast Atlantic spiny dogfish, it was concluded that the development and implementation of effective management measures would have a far greater positive impact on the sustainability of the population. Moreover, the Panel considered that, in addition to the implementation difficulties under CITES, such a split listing could facilitate IUU fishing for spiny dogfish on the Northeastern Atlantic, with catches laundered as taken from nonlisted stocks.</p>	

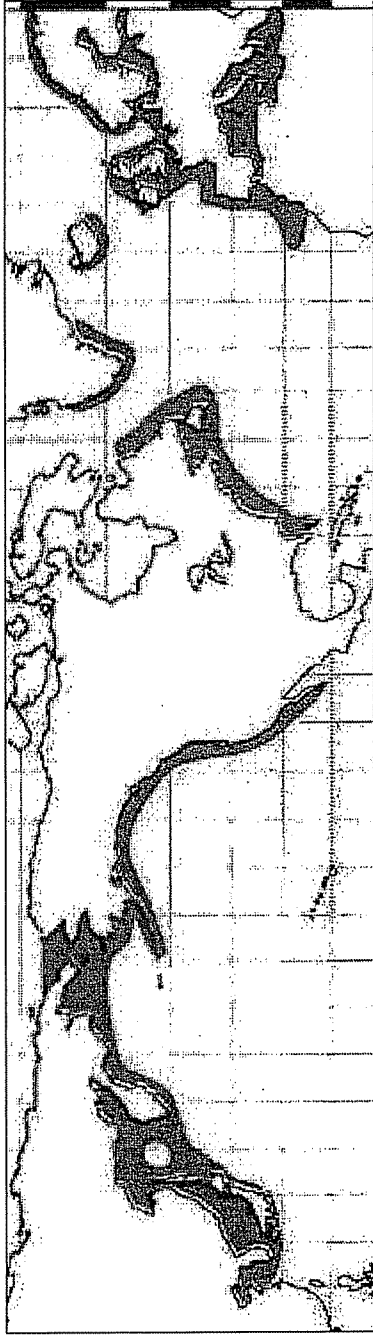


Figure 1. Northern Hemisphere distribution of *Squalus acanthias* (from Last and Stevens 1994)

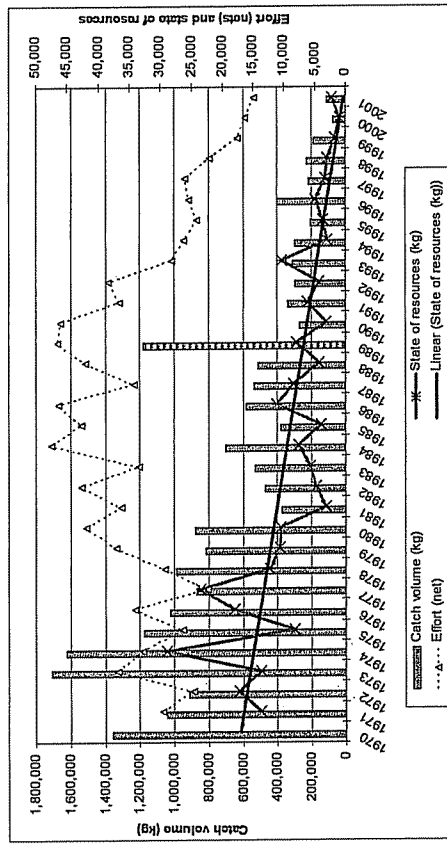


Figure 2. Catch volume (kg), effort and state of resources for Spiny dogfish in offshore trawl-net-fishery in the Sea of Japan, 1970-2001. Fishery Agency of Japan 2003. (1989 data include 'all sharks')

Table 3. Approximate global population estimate for spiny dogfish (reviewer comments gray underlined)

Area	Population assessment (million)	FAO Landings (tonnes, average 2003–2004)	Source/method	Estimated population (million)	Mature female population (million)
Northeast Atlantic	50	9 065	Population assessment: 100 000 t biomass, individual average weight 2 kg	50	
			<u>100 000 to 500 000 matures in 2000 (DELASS stock assessment)</u>		<u>0.05 – 0.25 (50% of total matures; 0.1–0.5) is an over-estimate since mature females are targeted</u>
Northwest Atlantic - USA	195	2 777	390 000 t biomass, average weight 2 kg.	195	
			<u>Mature female biomass 1998–2004 = 60 000 t (Note 3)</u>		<u>15</u>
Northwest Atlantic – Canada	200		Trawl survey numbers	200	
			<u>Based on ~6% mature female proportion of population</u>		<u>12</u>
(Nova Scotia Bank, part of NW Atlantic)			<u>Wallace et al. 2006 surveys</u>		<u>13.5–3% of whole population</u>
		205	By ratio of landings to NW Atlantic 205/2 777 x 395m	29	
Mediterranean and Black Sea			<u>Based on 6% mature females in population</u>		<u>0.54</u>
		6 121	At least as large as Northwest Atlantic (see note 1)	395	
Northeast Pacific			<u>Based on 6% mature females in population</u>		<u>23.7</u>
		3 237	Note 2	100	
Southwest Pacific	50 for New Zealand		<u>Based on 6% mature females in population</u>		<u>6</u>
	50 for Argentina shelf		100 000 tonnes survey biomass, 2 kg individual average weight per	50	
Approximate			<u>Based on 6% mature females in population</u>		<u>6</u>
				1 019	

Comments to the FAO Assessment of the CITES Amendment Proposals to list the Porbeagle and the Spiny Dogfish on Appendix II

global population					R60
-------------------	--	--	--	--	-----

Note 1. Northeast Pacific landings 6 121 tonnes, northwest Atlantic 2 777 tonnes; northeast Pacific less heavily exploited than northwest Atlantic; therefore northeast Pacific population must be at least as large as northwest Atlantic

Note 2. New Zealand trawl survey biomass 100 000 t; individual average weight 2 kg; therefore NZ numbers about 50 m. This being a small part of the distribution area in southwest Pacific, total population estimated at twice NZ.

Note 3: The average weight of mature females in the Northwest Atlantic stock in 1998 was ~4kg.

Considerations: The proportion of mature females in each stock is calculated as 6% of total numbers, taken as an average of the proportion of females in those cases where stock assessments have provided this information. However, when mature females are targeted, as in the Northeast Atlantic, their number can fall as low as 0.5% of the whole stock.