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#### KEY INFORMATION

##### Areas of Concern

Newfoundland, Canada to Massachusetts, and seasonally to New Jersey.

**Year Identified as “Species of Concern”**  
2006

##### Factors for Decline

- Fishing

##### Conservation Designations

IUCN: Critically Endangered- Northeast Atlantic and Mediterranean, Endangered – Northwest Atlantic, Vulnerable globally

#### Brief Species Description:

The porbeagle reaches a maximum reported size of 11.6 feet (355 cm) TL (Francis et al. 2005 cited by Fowler et al. 2005). Males mature at approximately eight years and 5.5 feet (170 cm) TL while females mature at 13 years and 6.4 feet (195 cm) TL (Fowler et al. 2005). They are ovoviviparous (give birth to live young that were nourished in utero with egg yolk) and oophagous (egg eating) with females producing on average four young per year. Gestation is thought to be eight to nine months.

This is a large, cold-temperate coastal and oceanic species with a heavy spindle-shaped body. It is dark bluish grey dorsally and white ventrally. Greatest body depth is found at the dorsal fin. Porbeagle sharks can be distinguished from white sharks by their spike-like smooth-edged teeth and by the position of the second dorsal fin, which is found directly over the anal fin (Collette and Klein-MacPhee 2002). The presence of tooth cusplets and secondary caudal fin keels distinguish this species from shortfin mako sharks (Collette and Klein-MacPhee 2002). Porbeagle sharks are **endothermic**, possessing countercurrent heat exchangers in the circulatory system. This allows porbeagles to maintain body temperatures that are 13 to 18°F (7-10°C) above ambient water temperature (Carey and Teal 1969; Carey et al. 1971 cited in COSEWIC 2004).

Porbeagle sharks in the Gulf of Maine feed predominantly on mackerel and herring and other small fishes, other species of sharks, and squids (Collette and Klein-MacPhee 2002). This species is **pelagic** and rarely enters shallow, coastal waters (Collette and Klein-MacPhee 2002). They are found from the surface to depths of up to 1000 feet (300 meters), and

apparently, move to the deeper water in the winter to avoid low surface water temperatures (Collette and Klein-MacPhee 2002).

Porbeagles are distributed across the North Atlantic and in a circumglobal band in the southern Atlantic, southern Indian, southern Pacific, and Antarctic Oceans. The International Commission for the Conservation of Atlantic Tunas (ICCAT) is an intergovernmental fishery organization that performs stock assessments and develops management advice based on scientific results. When assessing porbeagle sharks, ICCAT separated the population into stocks: the Northwest Atlantic, Northeast



# Species of Concern

NOAA National Marine Fisheries Service

Atlantic, Southwest Atlantic, and Southeast Atlantic. The species of concern range in the Northwest Atlantic is shown in Figure 1.

Porbeagle sharks are highly migratory, but conventional and satellite tagging data indicate that they remain within the range of the particular stock; thus, there is little exchange between the geographically dispersed stocks in the Northeast and Northwest Atlantic (COSEWIC 2004, ICES/ICCAT 2009); only a single transatlantic migration has been recorded (ICES/WGEF 2007).

While the tagging data indicate that there is little movement between populations in the North Atlantic, which could lead to limited genetic exchange, mitochondrial DNA studies have indicated that there is no differentiation among the stocks within the North Atlantic (Pade et al. 2006, Shivji 2010). These studies did, however, show marked differences in haplotype frequencies between the northern and southern hemispheres, which support the contention that there is restricted gene flow between the North and South Atlantic populations (Pade et al. 2006; ICES/ICCAT 2009; Shivji 2010).

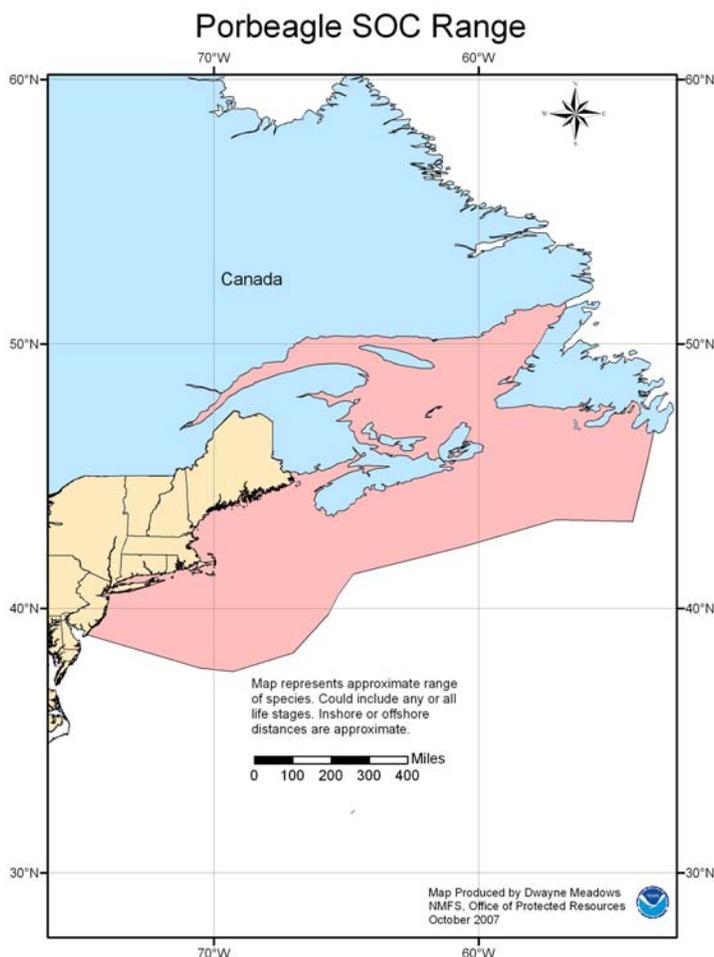


Figure 1. Range of the porbeagle species of concern in the Northwest Atlantic.

## Rationale for “Species of Concern”

### Listing:

#### **Demographic and Genetic Diversity Concerns:**

Since the start of commercial exploitation in 1961, the Northwest Atlantic population has declined by about 90% (COSEWIC 2004); however, the most recent stock assessment indicates that this stock is increasing in biomass, and although they are **overfished**, **overfishing** is not currently occurring (ICES/ICCAT, 2009). This species is slow growing and has a relatively late age at maturity (eight years for males and 13 for females) and thus has low productivity rates (Natanson et al. 2002). They mature considerably after the age at which they first appear in the fishery, making them more vulnerable to fishing pressure (Campana et al. 2002). Due to the species’ life history characteristics, the intrinsic rate of increase ( $r$ ) of the porbeagle is low; however, a recent Ecological Risk Assessment for Atlantic pelagic sharks found that porbeagle sharks ranked among the less vulnerable species in terms of their biological productivity and susceptibility to pelagic longline fisheries (Cortes et al.



# Species of Concern

NOAA National Marine Fisheries Service

2010). Although biomass is increasing and overfishing is not occurring, stock rebuilding is still projected to take decades (ICES/ICCAT 2009).

### Factors for Decline:

This species has been heavily fished and utilized for human consumption in the North Atlantic and the Mediterranean. Norwegian long-liners initiated the first commercial fishery for the Northwest Atlantic population of porbeagles in 1961 (Campana et al. 2002). Detailed catch records exist for this early fishery and indicate that the species was heavily fished in the early 1960s. The fishery supported annual catches of up to 9,000 metric tons (mt) until it collapsed in 1967 (Campana et al. 2002). Low and apparently sustainable catch rates of approximately 350 mt in the 1970s and 1980s allowed the population to partially rebuild before the new fishery arose in the 1990s (Campana et al. 2002). Figure 2 represents NMFS data on commercial landings in the U.S. from 1987 through 2007. North Atlantic populations have been seriously over-exploited in longline fisheries. Currently, the species is primarily caught with pelagic longlines; also pelagic and bottom trawls, handlines and gillnets (Compagno 1984 cited by COSEWIC 2004).

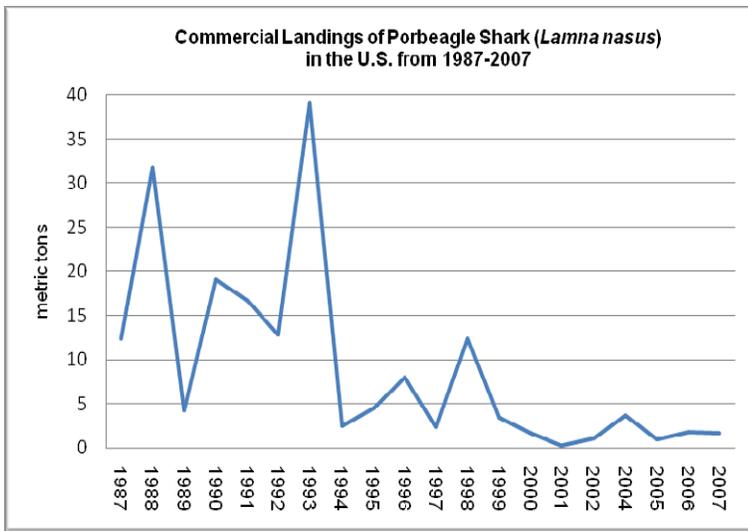


Figure 2. Commercial landings for porbeagle sharks in the United States from 1987-2007. NMFS.

Porbeagle sharks represent a highly valuable retained component of multispecies fisheries that target other species. There is also some concern that porbeagle abundance could be adversely affected by declining groundfish stocks as they represent a significant forage base for porbeagle (COSEWIC 2004). However, some studies have shown squid as the primary forage, and as they are opportunistic feeders, they will forage on whatever prey is available (Compagno 2001, Collette and Klein-MacPhee 2002, Joyce et al. 2002).

Although longline catch on the high seas was once considered a significant factor in total catch from the Northwestern Atlantic stock of porbeagle (DFO 2005), the most recent stock assessment determined that high-seas longline catch occurs at low levels and is not considered a significant portion of total catch of the stock (ICES/ICCAT, 2009). Porbeagle sharks are encountered



## Species of Concern

NOAA National Marine Fisheries Service

infrequently by recreational anglers from Maine to Virginia, with only 2 being landed and 20 reported released alive between 2005 and 2009 (NMFS/HMS 2008).

There is some evidence that Japanese catches of porbeagle sharks outside of the Canadian Exclusive Economic Zone (EEZ) may be substantial, and may comprise a significant portion of total catches from the Northwestern Atlantic population (DFO 2005). The most recent stock assessment indicates that catches within the Canadian EEZ are well accounted for, and that high seas catches are low in proportion to the total catch (ICES/ICCAT, 2009).

As stated previously, based on the most recent stock assessment it has been determined that porbeagle sharks in the NW Atlantic are overfished and biomass has been depleted; however, biomass is currently increasing, and overfishing is no longer occurring (ICES/ICCAT 2009, NMFS/HMS 2009).

### **Status Reviews/Research Underway:**

In January, 2010, NMFS received two petitions to list the porbeagle shark under the Endangered Species Act (ESA). After reviewing the information contained in the petitions, and that which was readily available in NMFS's files, we found that neither petition presented substantial information indicating that the petitioned actions warranted (75 FR 39656).

### **Data Deficiencies:**

Information on mating and nursery grounds for this species is lacking, and other general life history information is needed. Also, accurate population estimates are currently not available.

### **Existing Protections and Conservation Actions:**

In the U.S., this species is managed in the Highly Migratory Species (HMS) Fishery Management Plan (FMP) and its amendments (see [http://www.nmfs.noaa.gov/sfa/hms/hmsdocument\\_files/FMPs.htm](http://www.nmfs.noaa.gov/sfa/hms/hmsdocument_files/FMPs.htm)). There are restrictions on the commercial and/or recreational shark fisheries including landing all sharks with fins naturally attached (no "finning" allowed), limited access, trip limits, gear restrictions, a weight quota, and a minimum size. Additionally, there are hook and bait restrictions, and time/area closures for pelagic longliners. The annual commercial quota for this species in the Atlantic is 1.7 metric tons (mt) dressed weight (dw)(NMFS/HMS, 2009).

Internationally, the European Union (EU) regulates fisheries in EU waters and for EU vessels. In January, 2010, the EU passed a new regulation that prohibits vessels to fish for, retain, transship, or land porbeagle sharks in international waters (EU, 2010). Furthermore, the European Commission (EC) bans the practice of "finning" in EU waters and on EU vessels, even if they are fishing outside of EU waters (EU, 2010).

At a 2004 meeting of the Convention on the International Trade in Endangered Species (CITES) Animals Committee, Germany introduced a draft proposal listing the porbeagle under CITES. The CITES Shark Working Group concluded that North Atlantic populations have been severely depleted, and most members agreed that the species appears to meet the criteria for listing in CITES Appendix II, but it was not listed at that time. At the 16<sup>th</sup> Conference of the Parties to CITES in March 2013 the porbeagle was added to Appendix II of CITES, effective 14 September 2014. An Appendix II listing



## Species of Concern

NOAA National Marine Fisheries Service

requires the collection of information on trade in the species and allows trade that is legal and sustainable

In May 2004, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recommended to the Canadian Minister of Fisheries that this species be listed as endangered under the Species at Risk Act (SARA). In 2006, the Canadian government decided not to list the porbeagle shark under SARA due to the economic impact of a listing, both on the commercial fishing industry and on the government who would have to expend over \$50,000 annually in monitoring funds (Canada Gazette 2006).

### Links:

Highly Migratory Species Management: <http://www.nmfs.noaa.gov/sfa/hms/>

Atlantic States Marine Fisheries Commission webpage: <http://www.asmfc.org>

Essential Fish Habitat (EFH) Mapper: [http://sharpfin.nmfs.gov/website/EFH\\_Mapper/map.aspx](http://sharpfin.nmfs.gov/website/EFH_Mapper/map.aspx)

CITES: <http://www.cites.org>

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## Species of Concern

NOAA National Marine Fisheries Service

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### **Point(s) of contact for questions or further information:**

For further information on this Species of Concern, or on the Species of Concern Program in general, please contact NMFS, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, (301) 713-1401, [soc.list@noaa.gov](mailto:soc.list@noaa.gov); <http://www.nmfs.noaa.gov/pr/species/concern/>, or Sarah Laporte, NMFS, Northeast Region, 55 Great Republic Drive, Gloucester, MA 01930-2295, (978) 282-8477, [Sarah.Laporte@noaa.gov](mailto:Sarah.Laporte@noaa.gov).