



**CONVENTION ON
MIGRATORY
SPECIES**

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MEETING TO IDENTIFY AND ELABORATE AN OPTION FOR
INTERNATIONAL COOPERATION ON MIGRATORY SHARKS
UNDER THE CONVENTION ON MIGRATORY SPECIES
Mahe, Seychelles, 11-13 December 2007

**COMMONALITIES BETWEEN THE THREE SHARK SPECIES
LISTED ON THE CONVENTION ON MIGRATORY SPECIES:
BASKING SHARK, GREAT WHITE SHARK AND WHALE SHARK**

(Submitted by Australia)

Commonalities Between the Three Shark Species Listed on the Convention on Migratory Species: Basking Shark, Great White Shark and Whale Shark

Purpose of Paper

To provide information on the shared aspects of the biology and ecology of, and the threats to, the three migratory sharks listed on the Appendices of the Convention on Migratory Species (CMS), with the aim of informing the development of a global instrument for the conservation of migratory sharks. This paper is intended to be a summary document and is based on information available from existing documents – links to these are included at the end of this paper.

Geographic distribution

The near global distribution of the great white shark results in substantial overlap with the ranges of the whale and basking sharks.

The distributions of the great white shark and whale shark overlap in warmer coastal temperate waters including in northern Australia, southern Africa, China, south east Asia, southern states of the USA and parts of the Caribbean.

The ranges of the great white shark and basking shark overlap in the cooler temperate waters of the Atlantic and Indo-Pacific including in Canada, the northern USA, South America, Japan, China, New Zealand, southern Australia, and the Mediterranean.

Whale shark and basking shark seldom appear to overlap except in a few specific areas such as off the coast of Brazil where warm and cold water currents meet. Distribution maps for the three species are included at Annex 1.

Biological characteristics

Basking sharks, great white sharks and whale sharks are all long-lived, slow to sexually mature and have low fecundity, with small litter sizes and/or long intervals between pregnancies. As a result of these K-selected life history traits, the species' have low resilience to population perturbation.

Records of long distance migration exist for all three species. A great white shark tagged in South Africa crossed the Indian Ocean to Western Australia, and subsequently returned to South Africa (Bonfil *et al.* 2005). Basking sharks migrate through waters of Northeast Atlantic states, with a single individual sometimes seen in more than one state in the course of a single year. Tagging and genetic studies of whale sharks have demonstrated that sharks undertake transoceanic migrations. The highly migratory nature of these shark species requires protection across their entire range to prevent conservation efforts in one State being undermined by actions in waters of adjacent States or on the high seas.

Despite undertaking extensive migrations, all three species of sharks form temporal aggregations at key feeding sites: great white sharks aggregate around pinniped colonies in California, South Africa, the Chatham Islands, New Zealand, and in the Great Australian Bight; whale sharks gather to feed during spawning events in Western Australia, Belize and Christmas Island, and in primary productivity hotspots such as in Holbox and Bahaia de Los Angeles in Mexico; the bay of Tadjoura in Djibouti; Mahe Island, Seychelles; and Tofo Bay,

Mozambique; and basking sharks concentrate to feed in a few favoured coastal areas including the United Kingdom and Japan. Data for all three species suggests that some individuals display site fidelity, returning to the same feeding aggregations in subsequent years. Temporal mating aggregations may also occur, however these have not been formally identified, but there are strong indications that one such area for whale sharks may exist in the north of the Indian Ocean.

Coupled with the low resilience of the species, the forming of aggregations make these sharks particularly vulnerable to threats in aggregation areas.

Conservation status

The basking shark, great white shark and whale shark are recognised as threatened under a number of international conventions. The three species are listed on the IUCN Red List of Threatened Species on the basis of Criterion A, which relates to declining populations. All three species are listed as Vulnerable globally, with the North Pacific and Northeast Atlantic stocks of the basking shark assessed as Endangered.

The three species of sharks are all listed on Annex I of the United Nations Convention on the Law of the Sea (UNCLOS), under Appendix II of the Convention on International Trade in Endangered Species (CITES), and under Appendix II of the Convention on Migratory Species (CMS). The great white shark and basking shark are also listed under Appendix I of the CMS.

Major Threat

The major threat to the basking shark, whale shark and great white shark comes from fisheries, through a combination of targeted, incidental and sport/trophy take. For each species, there are multiple examples of severe population declines which can be attributed to fisheries activity. Catch trends in fisheries targeting basking sharks in the Northeast Atlantic, Ireland, Scotland, Japan and Norway all show declines of 90% or more, with fisheries in the Canadian Pacific and California showing declines of at least 30%; some recorded declines occurred in as little as 10 years. Catch of whale shark in targeted fisheries in the Philippines declined by an average of 27% per year between 1990 and 1997, and in Taiwan by 60-70% between 1995 and 2002. Reductions in catch per unit effort of great white sharks of over 70% have been recorded in the US pelagic longline fishery, in tuna traps and other fishing gear in the Adriatic Sea, and in game fisheries in South and southeastern Australia.

Targeted fisheries (Commercial, subsistence and recreational eg. Sports fishing)

All three species have been, or continue to be, subject to targeted fishing. Whale and basking sharks have been targeted for meat, fins and liver oil, while the great white shark is targeted by sport fishers for game fish records or trophies of jaws and teeth. The three species are particularly vulnerable in their feeding aggregations as feeding tends to occur close to the surface, making aggregations easy to locate.

Fisheries targeting aggregation sites have potentially devastating consequences for the shark populations as it allows for the rapid removal of large numbers of individuals from the population. Targeted fishing in aggregation sites, where large numbers of individuals of a species are present, also provides the opportunity for fishers to selectively take larger, more valuable individuals; however, larger individuals are also those most likely to be sexually mature, resulting in a disproportionate impact on the reproductive capacity of a population. Targeted fisheries throughout the range of the basking shark have caused rapid local population declines, with no sign of subsequent recovery even after the closure of fisheries. Data from directed whale shark fisheries in Asia suggest drastic population declines, although there is a lack of data available on the recovery of these populations. The low productivity of all three species precludes the existence of sustainable targeted fisheries.

Incidental capture

Significant numbers of individuals of all three species show evidence of previous interactions with fishing gear. All three species are caught incidentally in nets, with whale sharks also caught in fish traps and great white sharks in longline and hook and line fisheries. Even though individuals may be captured alive, the value of fins of whale and basking sharks, and the jaws and teeth of great white sharks, is a strong disincentive to release incidentally caught individuals.

Other threats

Habitat degradation has the potential to affect all three species of migratory shark. Whale and great white sharks frequent coastal waters for feeding and/or breeding, and are therefore vulnerable to the impacts of coastal development and pollution. As a result of basking and whale sharks feeding near the surface in shallow water areas, collisions with boats occur relatively frequently; scarring of dorsal surfaces is commonly observed and boat strike may be a significant cause of mortality for these species at aggregation sites.

Climate change is likely to result in higher sea surface temperatures, altered winds and ocean currents and changes in patterns of upwelling. In addition, the ocean will become more acidic as concentrations of dissolved carbon dioxide increase. These changes are likely to have adverse impacts on a range of marine species and habitats, but the probable effects on sharks have received little attention to date.

Ecotourism operations involving observing whale or great white sharks from vessels, or cage-diving with great white sharks, are increasing. Without appropriate regulation, there is potential for these activities to disrupt the natural behaviours of the sharks.

References

Unless otherwise cited, the information presented in this paper comes from the following documents:

Basking shark

Convention on International Trade in Wild Species of Flora and Fauna, Prop. 12.36, 2002.
<http://www.cites.org/eng/cop/12/prop/E12-P36.pdf>

Convention on the Conservation of Migratory Species of Wild Animals, Proposal I/11 and II/16, 2005.
http://www.cms.int/bodies/COP/cop8/documents/meeting_docs/en/species_proposals/I_11_II_16_Cetorhinus_maximus_GBR_E.pdf

Whale shark

Convention on International Trade in Wild Species of Flora and Fauna, Prop. 12.35, 2002.
<http://www.cites.org/eng/cop/12/prop/E12-P35.pdf>

Whale Shark Issues Paper, Department of the Environment and Heritage, 2005.
<http://www.deh.gov.au/biodiversity/threatened/publications/recovery/r-typus-issues/pubs/r-typus-issues-paper.pdf>

Great white shark

Convention on International Trade in Wild Species of Flora and Fauna, Prop. 32 Rev. 1, 2004.
<http://www.deh.gov.au/coasts/publications/pubs/great-white-cites-appendix2-english.pdf>

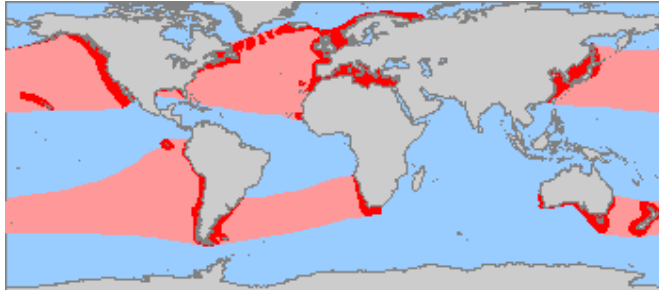
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Additional references

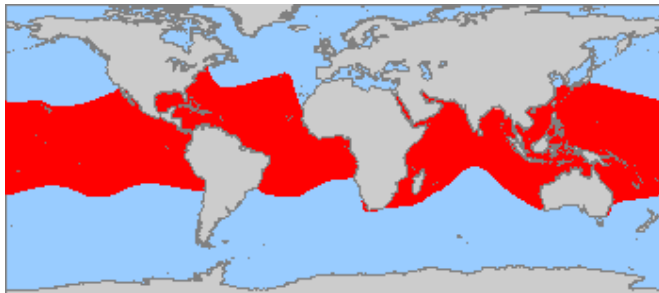
Bonfil R, Meyer M., Scholl M. C., Johnson R., O'Brien S., Oosthuizen H., Swanson S., Kotze D. and M. Paterson (2005) Transoceanic migration, spatial dynamics, and population linkages of white sharks. *Science* **310**: 100-103

Annex 1 – Distribution maps for the three CMS-listed sharks

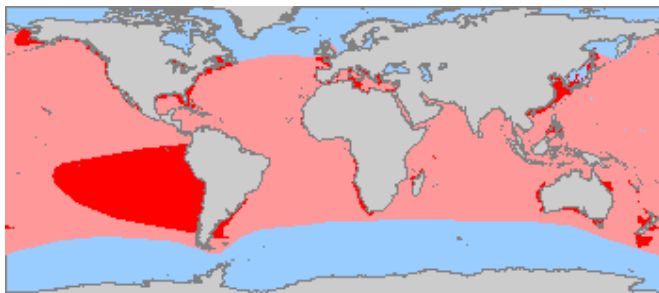
Basking shark



Whale shark



Great white shark



Source FAO FIGIS:

http://www.fao.org/figis/servlet/static?dom=root&xml=species/species_search.xml