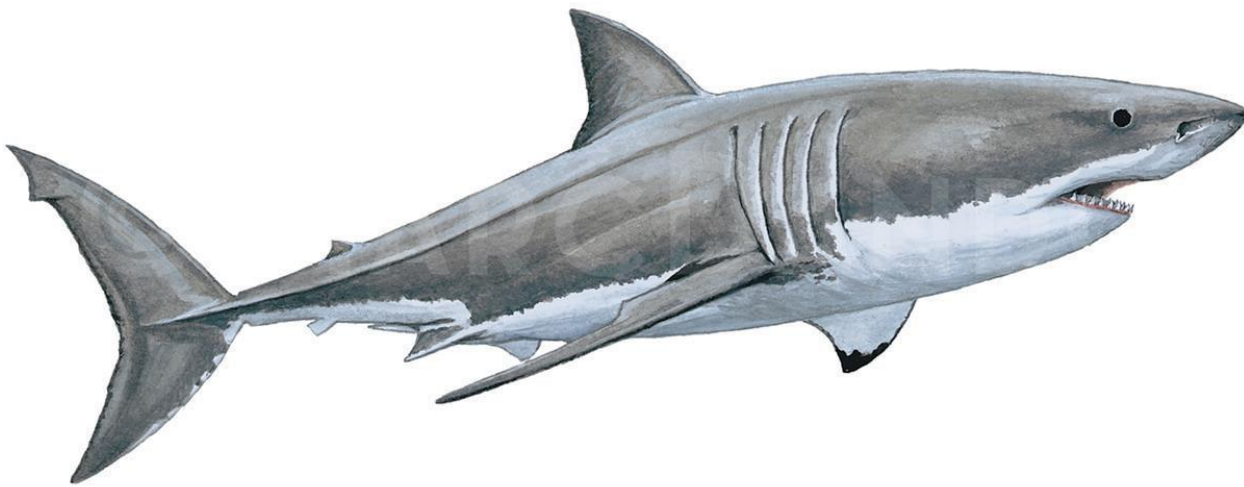


Fact Sheet

GREAT WHITE SHARK
GRAND REQUIN BLANC
JAQUETÓN BLANCO



Great White Shark
Carcharodon carcharias

GREAT WHITE SHARK

Class: *Chondrichthyes*

Order: *Lamniformes*

Family: *Lamnidae*

Species: *Carcharodon carcharias*

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This fact sheet was produced by the Advisory Committee of the Memorandum of Understanding on the Conservation of Migratory Sharks (Sharks MOU).

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1. Biology

The Great White Shark or White Shark (*Carcharodon carcharias*) inhabits coastal and offshore pelagic waters of subtropical and temperate seas. Great White Shark has low fecundity (2- 17 pups per female every other year; Bruce 2008), and females attain sexual maturity at a late age (33 years) and size (4.5 m). Based on bomb radio-carbon signatures, the maximum age of White sharks is up to 73 years (Hamady et al. 2014).

2. Distribution

The White Shark is distributed throughout all oceans, with seasonal concentrations in temperate coastal areas (Compagno 2001), including California, USA to Baja California, Mexico (Ainley et al. 1985; Klimley 1985; Domeier and Nasby-Lucas 2007; Lowe et al. 2012; Onate-Gonzalez et al. 2017), the Northwest Atlantic (Casey and Pratt 1985; Curtis et al. 2014), Australia (Bruce 1992; Bruce and Bradford 2012; McAuley et al. 2017), and South Africa (Ferreira and Ferreira 1996; Dudley 2012). The Mediterranean Sea is thought to host a fairly isolated population with little or no contemporary immigration from the Atlantic (Gubili et al. 2010).



Figure 1: Distribution of Great White Shark (*Carcharodon Carcharias*)ⁱ.

Additionally, there is a seasonal offshore aggregation region in the subtropical Northeastern Pacific (Weng et al. 2007; Domeier and Nasby-Lucas 2008; Jorgensen et al. 2009).

ⁱ Map obtained from the International Union for Conservation of Nature (IUCN) on 20 November 2017.

3. Critical Sites

Critical sites are those habitats that may have a key role for the conservation status of a shark population, and may include feeding, mating, pupping, overwintering grounds and other aggregation sites, as well as corridors between these sites such as migration routes. Critical subadult and adult aggregation sites are often associated with pinniped colonies, including locations along the central California coast (Klimley 1985; Weng et al. 2007; Jorgensen et al. 2009); Guadalupe Island, Mexico (Domeier and Nasby-Lucas 2007; 2008); South Africa (Dudley 2012; Kock et al. 2013), South Australia (Bruce 1992; Bruce et al. 2018), off the east coast of New Zealand (Duffy et al. 2012), and Massachusetts (Skomal et al. 2012; 2017). Overwintering grounds have been identified in coastal and offshore subtropical waters (Weng et al. 2007; Domeier and Nasby-Lucas 2008; Duffy et al. 2012; Curtis et al. 2014). Potential nursery and juvenile aggregation areas have been identified off southern California and Baja California (Lowe et al. 2012; Onate-Gonzalez et al. 2017), eastern Australia (Bruce and Bradford 2012), and the New York Bight (Casey and Pratt 1985; Curtis et al. 2018).

4. Population Status and Trends

There are no stock assessments for White Shark. However, there are estimates of population sizes from South Africa, California, and Australia with varying levels of uncertainty (Chapple et al. 2011; Dewar et al. 2013; Burgess et al. 2014; Andreotti et al. 2016; Irion et al. 2017; Bruce et al. 2018; Hillary et al. 2018) and information on population trends are available for some populations and areas. The current IUCN Red List status for the global population of White Sharks is 'Vulnerable' (Fergusson et al. 2009). More details of the population status and trends can be found in the IUCN assessmentⁱⁱ.

5. Threats

- **Fisheries:** The majority of annual captures is assumed to occur incidentally in commercial fisheries operating longlines, setlines, gillnets, trawls, fish-traps and other gear. Great White Sharks are caught in recreational fisheries and shark culling (Compagno 2001; Fergusson et al. 2009).
- **International trade:** Shivji et al. (2005) demonstrated that White Shark fins of various sizes are illegally traded, indicating their utilization as both, food and trophies.
- **Habitat degradation:** The degradation caused by coastal development, pollution, and prey depletion in inshore habitats utilized by White Sharks might have negative impacts on the health, range, and abundance of White Sharks (Fergusson et al. 2009).
- **Shark meshing (bather protection):** Bather protection nets or Shark Meshing is used to protect humans on some popular coastal areas from shark attacks. Drum lining (Australia) and protective nets (Australia and South Africa) do result in shark mortality, but the impact on White shark populations is uncertain (Dudley and Simpfendorfer 2006; Reid et al. 2011).
- Data is needed on population estimates and trends.

ⁱⁱ The IUCN Red List of Threatened Species uses a set of criteria to evaluate the extinction risk of species and subspecies. For more information see <https://www.iucnredlist.org/>.

6. Key Knowledge Gaps

- Data is needed on population estimates and trends;
- Estimates of total discards and post-release mortality rates across fisheries and regions;
- Better understanding of reproductive biology and productivity;
- Understanding the potential impacts of protective beach meshing and drum line programs.

7. Key Management and Conservation Gaps

- Critical habitats in some regions have not been identified and delineated;
- Catch monitoring and reporting;
- Ecological impacts of ecotourism activities;
- Population dynamics modeling of the effects of protective beach meshing and drum line programs.

8. Suggestions for Conservation and Management Action

a) Incorporate conservation measures for White Sharks into national legislation of all Parties/Signatories (in compliance with the obligations of the for the Appendix I listed species of CMSⁱⁱⁱ and line with the objectives of the Sharks MOU)

- Evaluate and revise the current implementation/compliance with CITES^{iv} Appendix I and CMS Appendix I obligations.

b) Improve the understanding of White Sharks through strategic research, monitoring and information exchange

- Identify new White Shark critical sites;
- Focus on key habitats and oceanic movements for future research to support development of spatial fisheries management;
- Undertake genetic studies to determine population structures and effective population sizes;
- Undertake research to better quantify the potential impacts of protective beach meshing and drum line programs on White Shark populations, and mitigate those impacts if necessary;
- Share research results and expertise with other stakeholders/Range States/Sharks MOU Secretariat.

ⁱⁱⁱ Convention on the Conservation of Migratory Species of Wild Animals (CMS).

^{iv} Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

c) Improve multilateral cooperation among regions and RFBs^v

- Identify synergies with other Range States/stakeholders to support coordinated and resource-effective research and conservation programs;
- Establish a working group on shark bycatch mitigation techniques with other affected Range States;
- Share methodological and technological advancements between Range States, with a focus on improving baseline population information collection from data-poor regions.

d) Minimize interactions between fisheries and White Sharks

- Relevant organizations concerned with the management of fisheries should improve the collection and reporting of standardized data;
- Review fishing gears to evaluate potential modifications for reducing bycatch mortality of White sharks;
- Consider gear restrictions in White Shark critical sites that would help minimize bycatch mortality.

e) Eco-tourism

- Establishment of ecotourism in aggregation sites to support acceptance of White Sharks by local communities through generation of economic benefits;
- Promote best practice guidelines for White Shark tourism (cage diving, boat based breaching tours).

f) Spatial management

- Include critical sites in marine and coastal spatial planning activities;
- Undertake stakeholder consultations to ensure ownership and equitable access to resources;
- Involve local communities in the management of coastal fisheries.

g) Raise awareness about the threats to White Sharks

- Inform the public about the need of White Shark conservation via educational, social media and local outreach campaigns;
- Where shark attack mitigation programs are deemed necessary for public safety, encourage the use of non-invasive methods and training of the public on best behavior to handle threats to humans from entering the marine environment.

^v Regional Fishery Bodies (RFBs).

9. Legal Instruments

Instrument:	Description:
Barcelona Convention Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean	<u>Annex II:</u> Endangered or threatened species; Parties shall ensure the maximum possible protection and recovery of, while prohibiting the damage to and destruction of, these species.
CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora	<u>Appendix I:</u> Species threatened with extinction; trade in specimens of these species is permitted only in exceptional circumstances.
CMS Convention on the Conservation of Migratory Species of Wild Animals	<u>Appendix I:</u> Migratory species threatened with extinction; CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. <u>Appendix II:</u> Migratory species that have an unfavorable conservation status and need or would significantly benefit from international cooperation; CMS Parties shall endeavor to conclude global or regional agreements to benefit these species.
EU European Union	<u>Council Regulation (EC) No 1185/2003:</u> Establishes a general prohibition of the practice of ‘shark finning’, whereby a shark’s fins are removed and the remainder of the shark is discarded at sea. <u>Council Regulation (EU) 2018/120:</u> Prohibits for Union vessels to fish for, to retain on board, to transship or to land Great White Shark in all waters. The regulation also prohibits third-country vessels to fish for, to retain on board, and to tranship Great White Sharks in Union waters.
FAO Food and Agriculture Organization	<u>IPOA Sharks:</u> International Plan of Action for Conservation and Management of Sharks based on which states should adopt and implement a national plan of action for conservation and management of shark stocks (NPO Sharks) if their vessels conduct directed fisheries for sharks or if their vessels regularly catch sharks in non-directed fisheries.

Instrument:	Description:
GFCM General Fisheries Commission for the Mediterranean	<u>Rec. GFCM/36/2012/3</u> : Under which shark species listed under Annex II of the Barcelona Convention cannot be retained on board, transhipped, landed, transferred, stored, sold or displayed or offered for sale and must be released unharmed and alive to the extent possible.
Sharks MOU Memorandum of Understanding on the Conservation of Migratory Sharks	<u>Annex 1</u> : Signatories should endeavor to achieve and maintain a favorable conservation status for these species based on the best available scientific information and taking into account their socio-economic value.
SPRFMO South Pacific Regional Fisheries Management Organisation	Standards for trawl fishing activities to collect data on species of concern, including White Sharks, were introduced in 2017.

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About the Sharks MOU

The Memorandum of Understanding on the Conservation of Migratory Sharks (Sharks MOU) is the first global instrument for the conservation of migratory species of sharks, rays, skates and chimaeras.

The Sharks MOU is an instrument of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) that engages all relevant stakeholders in addressing threats to migratory species in concert with all other aspects of wildlife conservation and management.

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