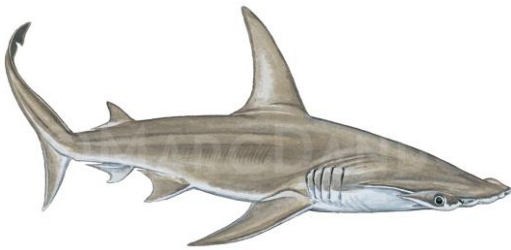
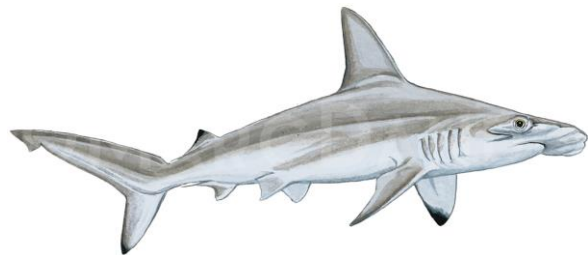


Memorandum of Understanding on the Conservation of Migratory Sharks

Great and Scalloped Hammerhead Sharks Fact Sheet



Sphyrna mokarran



Sphyrna lewini

Class:	Chondrichthyes	Hammerhead sharks
Order:	Carcharhiniformes	Requins-marteaux
Family:	Sphyrnidae	Tiburones martillo
Species:	<i>Sphyrna mokarran</i> - Great Hammerhead <i>Sphyrna lewini</i> - Scalloped Hammerhead	Illustration: © Marc Dando

1. BIOLOGY

Great hammerhead (*Sphyrna mokarran*) and Scalloped hammerhead (*Sphyrna lewini*) sharks are long lived, late maturing, and relatively slow growing. Great hammerhead sharks can live to up to 44 years and have a gestation period of 11 months producing 6-33 pups biennially (Stevens and Lyle 1989, Piercy et al. 2010). Scalloped hammerhead sharks can live to up to 35 years and have a gestation period of 8-12 months producing 15-31 pups biennially (Branstetter 1987, Castro 2011).

2. DISTRIBUTION

Sphyrna mokarran and *Sphyrna lewini* are globally distributed species, but usually inhabit coastal waters and continental shelves in warm temperate and tropical seas (Compagno 1984).



Sphyrna mokarran



Sphyrna lewini

Figure 1: Distribution of hammerhead shark species courtesy of IUCN.

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. While a number of aggregation sites can be highlighted for *Sphyrna lewini*, basic knowledge about important habitats acting as nursery grounds or for other important life history stages is lacking. Knowledge about *S. mokarran* is limited. Critical sites have not been accurately defined in all areas, but some potentially important grounds may exist (especially for the eastern Pacific for *S. lewini*).

4. POPULATION STATUS AND TRENDS

Most information available on the status and trends consists of fisheries catch data for these species. However, catch data are often aggregated due to species identification issues. Data on the status of hammerhead shark species come from multiple sources including stock assessments, analysis of fishery landings data and bycatch in shark control programs. Stock units have not been defined. The current IUCN status for both species is Endangered globally (Baum et al. 2009, Denham et al. 2007)¹.

Species	Population trend	Region	Time period	Reference
ATLANTIC				
<i>Sphyrna mokarran</i>	3% decrease	NW Atlantic	1995-2012	(Miller et al. 2014)
<i>Sphyrna spp.</i>	50% decline	NE Atlantic	2000-2010	(Diop & Dossa 2011)
<i>Sphyrna lewini</i>	83% decline ▼	NW Atlantic	1981-2005	(Hayes et al. 2009)
<i>Sphyrna spp.</i>	72% decline ▼	NW Atlantic	1981-2005	(Jiao et al. 2008)
<i>Sphyrna mokarran</i>	57% decline ▼	NW Atlantic	1981-2005	(Jiao et al. 2008)
INDO-PACIFIC				
<i>Sphyrna lewini</i>	64% decline ▼	Western Indian Ocean	1978-2003	(Dudley & Simpfendorfer 2006; Brown et al. 2016)
<i>Sphyrna lewini</i>	50-75% decline ▼	Eastern Indian Ocean	1997-1998 / 2004-2005	(Heupel & McAuley 2007)
<i>Sphyrna lewini</i>	60-90% decline ▼	South West Pacific	1993-2001	(Vooren & Klippel 2005)
<i>Sphyrna lewini</i>	71% decline ▼	Eastern Pacific	1992-2004	(Myers et al. 2007)
<i>Sphyrna spp.</i>	85% decline ▼	Western Pacific	1963-2007	(De Jong & Simpfendorfer 2009)
<i>Sphyrna spp.</i>	51% decline ▼	Eastern Pacific	2004-2006	(Martínez-Ortiz et al. 2007)

5. THREATS

- **Fisheries:** Hammerhead sharks are taken both as target and bycatch in longline (surface and bottom), gill net and purse-seine, where they exhibit very low at-vessel and post release survival (Morgan & Burgess 2007; Ellis et al. 2017). Recreational fishing can also be a significant threat especially in the United States and Australia (Miller et al. 2014).

¹ See the IUCN website for further details of the population assessments: <http://www.iucnredlist.org/details/39386/0>, and <http://www.iucnredlist.org/details/39385/0>.

- **International trade:** Hammerhead shark products (e.g. meat) appear on domestic markets and contribute to subsistence needs in some coastal communities. However, the predominant demand is rooted in the international shark fin trade, where their fins are some of the highest value of all sharks (Denham et al. 2007). Other products such as Head cartilage, including rostral and jaws structures, coming from Asian countries are marketed as naturalistic curiosities (Vacchi, unpublished data, 2016).
- **Habitat degradation:** Hammerheads rely on coastal habitats for several years, particularly as nursery areas for juveniles (e.g. mangrove habitat use by *S. lewini*). This reliance on coastal habitats exposes them to a variety of anthropogenic threats (e.g. mining operations, pollution and land reclamation).
- **Shark Control Programmes:** Scalloped hammerhead and great hammerhead sharks have experienced decreases in population size off south Africa and Australia from beach protection programs (Miller et al. 2013; Miller et al. 2014).

6. KEY KNOWLEDGE GAPS

- Accurate estimates of species-specific population sizes and trends, stock structure and critical sites are lacking for many parts of the range;
- Data on *Sphyrna mokarran*, including life history and ecological data, are particularly scarce;
- Bycatch mitigation measures are lacking, which is critical due to high at-vessel mortality of hammerhead sharks.

7. KEY MANAGEMENT AND CONSERVATION GAPS

- Limited actions for hammerheads are present in RFMOs, although hammerheads are no retention species in ICCAT (noting high at-vessel mortality);
- National fishery or conservation measures are limited;
- Full stock assessments have only been conducted in the NW Atlantic (e.g. Jiao et al. 2008)
- Bycatch mitigation measures are limited;
- Hammerhead catches are largely underreported compared to trade statistics, based in part on take of these species in artisanal fisheries and associated lack of data;
- Critical habitats have not been delineated for *S. mokarran*.

8. RECOMMENDATIONS FOR CONSERVATION AND MANAGEMENT ACTION

a) Incorporate conservation measures for hammerhead sharks into national legislation of all Parties/Signatories (in line with CMS Appendix II & the Objective of the Sharks MOU)

- Evaluate and implement relevant international measures (e.g. CITES, CMS and RFMOs);
- Consider adopting fins attached measures to effectively prohibit finning.

b) Conserve and restore suitable habitats

- Focus on key habitats and connectivity via migration corridors for future research to support the development of spatial fisheries management;
- Conserve mangroves and other suitable habitats (e.g. coral reefs).

c) Improve the understanding of hammerhead sharks through strategic research, monitoring and information exchange

- Identify critical sites (especially for *S. mokarran*);

- Prioritize research on the population structure of hammerheads;
- Address data gaps in ecological and biological knowledge (life history parameters) of hammerhead sharks;
- Investigate post-release survivorship of hammerhead sharks to improve handling and release protocols;
- Collect species-specific data on catch and bycatch especially in coastal and artisanal fisheries;
- Develop stock assessments in cooperation with RFMOs for both species.

d) Improve multilateral cooperation among regions & RFBs

- Support the development and implementation of appropriate management plans for hammerhead sharks;
- Support proposals for "look-alike provisions" or "head-attached policy" (or to develop carcass ID guides) to close loop-holes and improve species-specific data collection;
- Engage neighboring countries, including non-Signatory Range States to protect and foster their integration in conservation planning and implementation workshops;
- Promote better regional cooperation between RFMOs, RFBs (e.g. data-sharing or involvement in the Kobe process²);
- Identify synergies with other Range States/stakeholders to support coordinated and resource-effective research and conservation programs.

e) Enhance or develop where necessary collection of fishery data (including landings, discards, size frequency, catch and effort)

f) Identify effective approaches to reduce bycatch and improve survivorship of hammerheads

- Identify gear modifications and fishing practices (e.g. soak time and safe release handling guidelines) to reduce interactions and increase survival;
- Encourage the development and application of sustainable fishing techniques (e.g. exploration of fishing depth as a means of avoiding capture);
- Reduce the soaking time of pelagic longlines or gillnets to increase survivorship.

9. LEGAL INSTRUMENTS

Instrument	Description	Species
<p>Barcelona Convention Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean</p>	<p>Annex II: Endangered or threatened species; Parties shall ensure the maximum possible protection and recovery of, while prohibiting the damage to and destruction of, these species.</p>	<p><i>S. mokarran</i> <i>S. lewini</i></p>

² <http://www.tuna-org.org>

Instrument	Description	Species
Cartagena Convention Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region	Annex III: Parties may regulate the use of these species of flora and fauna in order to ensure and maintain their populations at the highest possible levels.	<i>S. mokarran</i> <i>S. lewini</i>
CCSBT Commission for the Conservation of Southern Bluefin Tuna	CCSBT encourages both Members and Cooperating Non-Members to comply with a variety of binding and non-binding measures in order to protect species ecologically related to Southern bluefin tuna, including sharks.	<i>S. mokarran</i> <i>S. lewini</i>
CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora	Appendix II: Species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.	<i>S. mokarran</i> <i>S. lewini</i>
CMS Convention on the Conservation of Migratory Species of Wild Animals	Appendix II: Migratory species that have an unfavourable conservation status and need or would significantly benefit from international cooperation; CMS Parties shall endeavour to conclude global or regional agreements to benefit these species.	<i>S. mokarran</i> <i>S. lewini</i>
EU European Union	Council Regulation (EU) 2017/127: prohibits to fish for, to retain on board, to transship or to land both hammerhead species for Union vessels in the ICCAT Convention Area.	<i>S. mokarran</i> <i>S. lewini</i>
FAO Food and Agriculture Organization	IPOA Sharks: 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.	<i>S. mokarran</i> <i>S. lewini</i>
GFCM General Fisheries Commission for the Mediterranean	Rec. GFCM/36/2012/3: shark species listed under Annex II of the Barcelona Convention cannot be retained on board, transshipped, landed, transferred, stored, sold or displayed or offered for sale and must be released unharmed and alive to the extent possible.	<i>S. mokarran</i> <i>S. lewini</i>
IATTC Inter-American Tropical Tuna Commission	Res. C-16-01: Amendment of resolution C-15-03 on the collection and analysis of data on fish-aggregating devices Res. C-16-04: Amendment to resolution C-05-03 on the conservation of sharks caught in association with fisheries in the eastern Pacific Ocean Res. C-16-05: Resolution on the management of shark species	<i>S. mokarran</i> <i>S. lewini</i>
ICCAT International Commission for the Conservation of Atlantic Tunas	Res. 95-02: Cooperation with FAO to study status of stocks & shark by-catches Res. 03-10: Resolution by ICCAT on the sharks fishery Rec. 04-10: Recommendation by ICCAT concerning the conservation of sharks caught in association with fisheries managed by ICCAT Rec. 07-06: Supplemental recommendation by ICCAT concerning sharks Rec. 10-08: Recommendation by ICCAT on Hammerhead Sharks (Family Sphyrnidae) caught in association with fisheries managed by ICCAT Rec. 11-10: Recommendation by ICCAT on information collection and harmonization of data on bycatch and discards in ICCAT fisheries Rec. 13-10: Recommendation on Biological Sampling of Prohibited Sharks Species by Scientific Observers	<i>S. mokarran</i> <i>S. lewini</i>

Instrument	Description	Species
IOTC Indian Ocean Tuna Commission	<p>Res. 13/06: On a scientific and management framework on the conservation of sharks species caught in association with IOTC managed fisheries</p> <p>Res. 15/09: On a fish aggregating devices (FADs) working group</p> <p>Res. 17/05: On the conservation of sharks caught in association with fisheries managed by IOTC</p> <p>Res. 17/07: On the prohibition to use large-scale driftnets in the IOTC Area</p> <p>Res 17/08: Procedures on a FADs Management Plan including limitation on number of FADs, more detailed specifications of catch reporting from FAD sets, & development of improved designs to reduce incidence of entanglement of non-target species</p>	<p><i>S. mokarran</i></p> <p><i>S. lewini</i></p>
NAFO Northwest Atlantic Fisheries Organization	<p>In order to safeguard the marine ecosystems in which the Convention Area's fisheries resources are found, NAFO develops and adopts conservation and enforcement measures to protect shark species in its region.</p>	<p><i>S. mokarran</i></p> <p><i>S. lewini</i></p>
Sharks MOU Memorandum of Understanding on the Conservation of Migratory Sharks	<p>Annex 1: Signatories should endeavour to achieve and maintain a favourable conservation status for these species based on the best available scientific information and taking into account their socio-economic value.</p>	<p><i>S. mokarran</i></p> <p><i>S. lewini</i></p>
UNCLOS United Nations Convention on the Law of the Sea	<p>Annex I: States whose nationals fish in the region for the highly migratory species listed in Annex I shall cooperate directly or through appropriate international organizations to ensure the conservation and optimum utilization of such species throughout the region, both within and beyond the exclusive economic zone.</p>	<p><i>S. mokarran</i></p> <p><i>S. lewini</i></p>
WCPFC Western & Central Pacific Fisheries Commission	<p>CMM 2008-04: Conservation and management measures to prohibit the use of large sale driftnets on the high seas in the Convention Area</p> <p>CMM 2009-02: Conservation and management measures on the application of high seas FAD closure and catch retention</p> <p>CMM 2010-07: Conservation and management measures for sharks</p> <p>CMM 2014-05: Conservation and management measures for sharks</p>	<p><i>S. mokarran</i></p> <p><i>S. lewini</i></p>

10. KNOWN CRITICAL SITES

Information on critical sites is limited. There are potential areas in the eastern Pacific Ocean in and around the Galapagos Islands (e.g. Hearn et al. 2010; Ketchum et al. 2014) and Central America (e.g. Bessudo et al. 2011; López-Garro & Zanella 2015). Ongoing and future research will help to further identify these areas.

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