ANNEX 2

CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

SINGLE SPECIES ACTION PLAN FOR THE NORTHEAST ATLANTIC & MEDITERRANEAN SUB-POPULATION OF TOPE *Galeorhinus galeus*

October 2025

About this plan

The development of this Single Species Action Plan for the Northeast Atlantic and Mediterranean subpopulation of tope shark was led by the Government of The Netherlands on behalf of the EU CMS working group.

The Dutch Elasmobranch Society was contracted to coordinate the drafting process and write the report. This was done by Dr. Paddy Walker and Drs Irene Kingma with editorial support from Eleanor Greenway Msc. Throughout the process input was gathered from a wide-ranging expert network and through review rounds by the range states.

Experts Consulted

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Process overview

July 2024 – agreement in EU CMS working group on development of SSAP
October 2024 – kick off meeting meeting Thessaloniki
December 2024 – 1st virtual expert meeting
January 2025 – range state introductory webinar
February 2025 – 2nd virtual expert meeting
May 2025 – 1st range state meeting
June 2025 – in person expert meeting Plymouth
July 2025 - 2nd range state meeting
August 2025 – final review round by experts and range states

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GLOSSARY

List of Acronyms

CMS – Convention on the Conservation of Migratory Species of Wild Animals
CPUE – Catch per Unit Effort
CR – Critically Endangered (IUCN Red List)
EN – Endangered (IUCN red list)
EU – European Union
FAO – Food and Agriculture Organization of the United Nations
GFCM - General Fisheries Commission for the Mediterranean
ICES – International Council of Exploration of the Seas
IUCN – International Union for Conservation of Nature
IUU – Illegal, unreported, unregulated
MOU - Memorandum of Understanding
MSY – Maximum Sustainable Yield
PA – Precautionary Approach
TAC – Total Allowable Catch
TL – Total Length
UK – United Kingdom
VU – Vulnerable (IUCN red list)
WGEF – Working Group of Elasmobranch Fishes from ICES

Terms used

- Bioaccumulation – the process by which a chemical accumulates within an organism over time
- Biomagnification - The increase in contaminant concentrations from one trophic level to the next due to accumulation from food
- Genetic Admixture -– mixing of genetic material between two or more previously isolated populations of the same species, resulting in a new gene pool that reflects contributions from all source populations
- Haplotype Diversity – a measure of genetic variation in the mitochondrial DNA that reflects the probability that two randomly chosen individuals from a population will have different haplotypes
- Neonates – newborn individuals also called young-of-the-year (YOY), which for tope are individuals smaller than 45cm
- Nucleotide Diversity – a measure of genetic variation at the DNA sequence level representing the average number of nucleotide differences per site between any two randomly chosen DNA sequences in a population, reflecting a rich history of selection, migration, recombination, and mating systems
- Philopatry - tendency of an organism to stay in or habitually return to a particular area
- Viviparous – where embryos develop inside the body of the mother where the mother gives birth to fully developed young, which are metabolically independent

Executive summary

1. Tope (*Galeorhinus galeus*) is a slow-growing, and highly migratory elasmobranch, growing up to 2 m in length, listed as *Critically Endangered* on the IUCN Red List in most of its global range, including the Northeast Atlantic and Mediterranean subpopulations. Globally, the species has experienced severe population declines due to overfishing, bycatch, habitat degradation, and insufficient management.

2. The species was included in CMS Appendix II in 2020 and added to Annex 1 of the Sharks MOU in 2023. While some regional protections exist (e.g., GFCM recommendations and national measures in the UK), enforcement and implementation remain inconsistent, and a comprehensive international conservation approach is urgently needed.

3. To address these issues, a draft SSAP for tope in the Northeast Atlantic and Mediterranean was developed. This plan outlines coordinated actions to support recovery, promote international cooperation, and address key threats through science-based management, protection of essential habitats, and improved data collection.

4. The SSAP was developed through expert input, literature review, consultation with Range States, and consideration of existing conservation frameworks. It includes a threat and barrier analysis, as well as measurable recovery criteria to guide implementation.

5. Five overarching objectives were identified:
    - Implement fisheries management measures based on scientific advice.
    - Identify and protect essential life-stage habitats.
    - Improve scientific knowledge through targeted studies.
    - Enhance international collaboration.
    - Secure long-term funding for implementation.

6. These objectives align with CMS and Sharks MOU mandates and reflect a collaborative, multi-sectoral approach, emphasizing the importance of Range State cooperation and coordination with relevant bodies such as ICES, GFCM, and national authorities.

7. The SSAP provides an action-oriented roadmap with clearly defined priorities and timelines, designed to be adaptive and regularly reviewed to respond to new data and shifting environmental conditions.

Introduction

Tope, *Galeorhinus galeus*, are medium-sized sharks (up to 2 m) with a widespread distribution. They primarily occur in continental shelf demersal habitats, mainly in demersal cold to warm temperate coastal areas. However, they have also been recorded in oceanic environments, at depths beyond 800 m. The species is distributed in temperate waters including the Northeast, Eastern Central, Southwest, and Southeast Atlantic, the Mediterranean Sea, the Eastern Indian, and across the Pacific, with a notable absence from the Northwest Pacific and Northwest Atlantic (Walker et al. 2020). According to Fricke et al. (2025), tope distribution includes Western Atlantic from Brazil south to Argentina; eastern Atlantic: from Norway to Senegal (including the western Baltic Sea; North Sea; Mediterranean Sea; Sea of Marmara; Azores, Madeira, Canary Islands and Cabo Verde) in the north, and Namibia to South Africa in the south.; southwestern Indian Ocean: Western Cape and Eastern Cape (South Africa); North Pacific; Eastern Pacific: Canada (British Columbia) to Mexico, including Gulf of California in the north, and from Ecuador to Chile in the south; temperate waters of Southern Hemisphere (Figure 1).

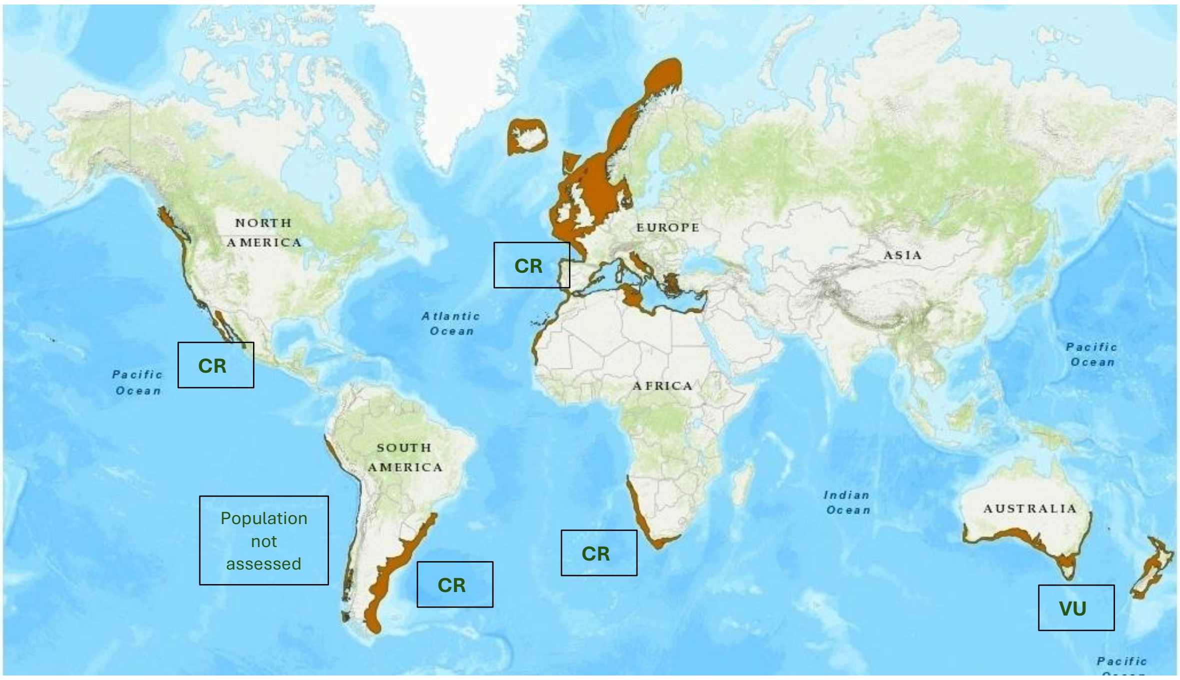


Figure 1. Geographical distribution of *Galeorhinus galeus* (Carcharhiniformes, Chondrichthyes) including the IUCN red list assessment of each sub-populations, adapted from Walker et al. (2020). This SSAP deals with the sub-populations in the Northeast Atlantic and Mediterranean Sea.

Tope undertake extensive and wide-ranging seasonal latitudinal and inshore-offshore migrations between Range States in the northern hemisphere. In the Southwestern Atlantic, some latitudinal migrations of more than 1400 km have been reported. In Australia, which shares a population with New Zealand, mixing occurs along the southern part of the continent with long-shore migrations of more than 4000 km, 2000 km crossings of the Tasman Sea to New Zealand, and migrations throughout that country. Although little is known about the movements of tope in their South African distribution range in the Atlantic Ocean, seasonal differences in catch composition and locations indicate migrations between possible nursery and feeding grounds. In the Northeast Pacific, seasonal latitudinal but also offshore migrations have also been shown. At least six sub-populations have been identified world-wide with varying levels of conservation status.

In most parts of its distribution, tope have been targeted in response to the demand for meat, fins and liver oil with gillnets and longlines (Walker et al, 2020). The species is frequently caught as bycatch in trawl and other fisheries, due to the high market value this bycatch is often landed (Dominguez-Bustos et al., 2025). All populations assessed by IUCN are considered depleted to varying degrees.

The most recent Red List Assessment identified 4 of the 5 assessed sub-populations of tope as Critically Endangered (Northeast Atlantic and Mediterranean, Southwest Atlantic, Northeast Pacific, Southern Africa), and in the fifth, Australia and New Zealand, as Vulnerable. The Southeast Pacific sub-populations were not assed due to lack of data availability. The species was evaluated globally as Critically Endangered (CR) and facing an extremely high risk of extinction in the wild, due to a reduction in population size equal to or greater than 80% over the last three generations (IUCN criteria A2bd; Walker et al., 2020). At present, only a few conservation measures exist for some sub-populations of tope, despite growing international awareness of common threats. New Zealand and Australia have put in places strict catch limits to either rebuild (Australia) or maintain (New Zealand) their stocks. Both countries also manage tope under an Individual Transferable Quota (ITQ) system, which has limited growth in fishing capacity and has largely prevented fishing fleet overcapacity.

Tope shark sub-populations in the Northeast Atlantic and the Mediterranean.

In the Northeast Atlantic and Mediterranean, tope have been recorded in the waters of all CMS Range States and there are known aggregation sites, feeding grounds, and pupping and nursery areas in inshore areas in many countries (Bovcon et al., 2018; Thorburn et al., 2019; Cameron et al., 2025). Information on habitat use in the Northeast Atlantic has recently been collated in a process to Important Shark and Ray Areas (ISRAs) led by the IUCN Shark Specialis Group, results became available in September 2025.. For the Mediterranean these areas have already been identified, with a number of areas both in the eastern and western Mediterranean relevant for tope, see Chapter 1.5 for more information

The International Council for the Exploration of the Sea (ICES) provides landings advice every four years. Due to the lack of data (e.g. a robust survey biomass index and discard estimates) it is not possible for ICES to conduct a quantitative assessment. Current ICES advice is based on the precautionary approach. A full overview of the ICES advice for tope can be found in section 2.2.

Concerns about the conservation status of tope has led to the adoption of national conservation measures in some countries within its range. In the UK, daily catch limits (45 kg a day with head and fins attached) and gear restrictions are in place in England and Wales under the Tope (Prohibition of Fishing) Order 2008 and the Tope (Prohibition of Fishing) (Wales) Order 2008 respectively. In Scotland, The Sharks, Skates and Rays (Prohibition of Fishing, Trans-shipment and Landing) (Scotland) Order 2012 also bans tope fishing, other than by rod and line or hand-line', and prohibits any landings.

The EU has no agreed catch limits for the species in the Northeast Atlantic, but under EU Council Regulation 2024-257, the landing of tope are prohibited when taken by longline in EU waters of ICES Division 2.a and subarea 4, and EU and international waters of subareas 1, 5-8, 12 and 14). In the Mediterranean, Annex II of the Protocol Concerning Specially. Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) of the Barcelona Convention and Recommendation GFCM/42/2018/2 of the GFCM provides full protection of the tope shark (GFCM, 2018) and has been reinforced by the 2021 Resolution GFCM/44/2021/12 on a GFCM 2030 Strategy for sustainable fisheries and aquaculture in the Mediterranean and the Black Sea and the GFCM Regional Plan of Action and approach to mitigating interactions between fisheries and vulnerable species. At EU level, GFCM decisions are transposed through Regulation (EU) 2023/2124, but in several non-EU Mediterranean coastal states this has not yet happened.

1. BIOLOGICAL ASSESSMENT

Taxonomy

Class: Chondrichthyes

Subclass: Elasmobranchii

Order: Carcharhiniformes

Family: Triakidae

Genus/species: *Galeorhinus galeus* (Linnaeus 1758)

Figure 2. Graphical representation of a tope shark (*Galeorhinus galeus*),(source NOAA fisheries)

1.1 Characteristics

Tope are one of the largest houndshark species, growing up to a maximum total length (TL) of 2 m. They are slender sharks with a long snout, large mouth with sharp blade-like teeth, distinct spiracles behind the large, almond-shaped eyes, two dorsal fins and a conspicuous notch in the dorsal caudal (tail) lobe. The first (anterior) dorsal fin is much larger than the second, which is a similar size as the anal fin (Figure 2). The colour ranges from bluish to dusky grey on the dorsal surface, fading to white beneath. Small juveniles, categorised as individuals smaller than 60 cm total length (TL), have black tips to their dorsal and caudal fins, and a white trailing edge on the pectoral fins. Houndsharks comprise the family Triakidae, which is one of the larger families of sharks in the order Carcharhiniformes (Compagno, 1984). Biological characteristics vary between different geographical locations (Table 1). Pups are born at around 30 cm TL. Females mature between 118 and185 cm TL (10–15 years), and males between 107 and 170 cm TL. Maximum age, based on tag returns, is estimated 40–60 years, with a generation time of about 26 years (Olsen, 1954; Ferriera & Vooren, 1991; Freer, 1992; Francis & Mulligan, 1998; Walker, 1999). Tope have a highly conservative life history characterised by slow growth, late maturity, and a long life-span of at least 54 years (Coutin, 1992; Kohler & Turner, 2001).

Table 1. Comparison of life history parameters for tope (*Galeorhinus galeus*). Table modified from 1) Capapé et al. (2005) with additional information from 2) Peres & Vooren (1991), 3) Francis & Mulligan (1998), 4) Ebert and Stehmann (2013), 5) Dureuil & Worm (2015), and 6) Olsen (1954).

Location	*Size at Birth (TL, mm)*	*Size at maturity (TL, mm)*		*Age at maturity*	*Maximum size (TL, mm)*		*Oocyte diameter (mm)*	*Litter size*	*Reference*
		Male	Female		Male	Female			
Northeast Atlantic					1750	1950			4, 5
California	350-370	1400	1700	-	1550	1950	40-60	16-54	1
Southern Australia	310	1200	1350	12-17	1550	1740	40-50	17-41	6
New Zealand	350	1250	1350	12-17	1420	1790			3
Southern Brazil	303	1170	1280	-	1480	1545	46-55	4-41	1 & 2
Argentina	310	1190	1250	-	1528	1532	42-57.5	25	1
Mediterranean	240-320	1260	1400	-	1580	1990	42-48	8-41	1

Tope are viviparous whereby the mother gives birth to live young (Hurst et al. 1999). The gestation period is generally agreed to be ~12 months (Ripley, 1946; Peres & Vooren, 1991; Lucifora et al., 2004; Walker 2005) with pups born in sheltered nursery grounds, where they spend their early years of life (Olsen, 1954; McAllister et al., 2015; McMillian et al., 2021). The duration of the female reproductive cycle has been reported to be annual to triennial across different regions. However, studies with large sample sizes and intensive sampling indicate that it is likely to be triennial with resting, oocyte maturation, and copulation and gravid (gestation) stages (Peres & Vooren, 1991; Lucifora et al., 2004; Walker 2005). The average litter size is 20-35 pups, varying with maternal size and age, ranging from four in small recently matured females to a maximum reported 52 pups (Capapé et al., 2005). Tope undertake extensive seasonal migrations of up to 4000 km, moving between coastal feeding and breeding grounds, occasionally offshore, and sometimes crossing deepwater.

1.3 Diet and trophic levels

Tope are high trophic level predators, mainly feeding on teleost fish and cephalopods (Walker, 1999; Ebert & Stehmann, 2013), with an estimated trophic level of 4.2. This is higher than average for shark species (Cortés, 1999) but varies ontogenetically with juveniles predating on lower trophic levels such as crustaceans and gastropods (Lucifora et al., 2006). Regional variation in diet composition (Ellis et al. 1996, West & Stevens 2001, Morato et al. 2003, Lucifora et al. 2006) suggests tope adapt their diet to available resources and trophic positioning varies between populations and ecosystems (Torres et al., 2014). Tope (especially juveniles) are known to be preyed upon by white shark (*Carcharodon carcharias*), sevengill shark (*Notorynchus cepedianus*), and possibly marine mammals (Ripley, 1946; Ebert & Stehmann, 2013). There is evidence of tope exhibiting regular diel vertical migrations, especially when moving from continental shelf areas into deep water reaching depths over 800 m (Thorburn et al 2019, Schaber et al. 2022). These extensive vertical movements are hypothesised to be linked to predatory behaviour and food availability, with deeper-diving individuals likely feeding on squid (West & Stevens, 2001; Schaber et al. 2022).

1.4 Distribution and connectivity

Tope are globally but discontinuously distributed in coastal areas of the Northeast and Southeast Pacific, Australasia, Northeast Atlantic, Mediterranean, Southwestern and Southeastern Atlantic, with the latter stock just entering the Southwestern Indian Ocean (Figure 1; Compagno, 1984; Walker, 1999; Walker et al., 2020). The species is generally found in coastal waters (Chabot & Allen 2009; Thorburn et al., 2019; Cameron et al., 2025) but are also caught in oceanic environments and has been recorded at depths of up to 850 m (Thorburn et al. 2019). There is some indication that depth use is linked to age, as depth range seems to increase with body size (Thorburn et al., 2019). Despite the migratory capability of this species (Holden & Horrod 1979; Sutcliffe 1994; Hurst et al., 1999; Chabot & Allen, 2009), there appears to be a lack of gene flow across equatorial waters (Chabot & Allen, 2009; Chabot 2015), and between ocean basins (Chabot & Allen, 2009; Chabot 2015; Hernández et al., 2015). Unusually, trans-equatorial genetic differentiation in the Pacific is stronger than between northern Pacific and the Northeast Atlantic, suggesting trans-Arctic gene flow may have occurred after the North/South population divergence (Chabot & Allen 2009).

Genetic and tagging data indicate up to 5-7 separate subpopulations (Figure 1): 1. Northeast Atlantic and Mediterranean; 2. Northeast Pacific; 3 Southern Africa; 4a. Australia; 4b. New Zealand; 5a. Southwestern Atlantic; 5b. Southeast Pacific. It is possible that there are one or populations in Oceania and that the southeast Pacific and southwest Atlantic populations may be linked. Individuals make extensive seasonal migratory movements within each of these subpopulations, but there is no evidence of genetic mixing between subpopulations (Bester-van der Merwe et al., 2017; Chabot 2015; Chabot & Allen 2009). There appears to be a genetic admixture of tope within the Northeast Atlantic, where gene flow is high with relatively low genetic diversity.

1.4.1 Distribution and connectivity in the Northeast Atlantic and Mediterranean

In the Northeast Atlantic, tope range from Iceland and Scandinavia to the Azores, the Canary Islands and Senegal (Capapé et al., 2005). They are also reported in the Mediterranean, but the extent of connectivity between the Mediterranean and the Northeast Atlantic remains uncertain, although there is limited evidence of some separation within the Mediterranean, with a few genotypes being different from the rest of the Northeast Atlantic (Thorburn et al., 2015).

Conventional tagging data suggests some level of connectivity within the Northeast Atlantic, primarily through North – South seasonal migrations (Capapé et al., 2005; Thorburn et al., 2019; Cameron et al., 2025). However, it is unclear whether these movements represent exchanges between distinct regional populations or the dispersal of individuals within a single, larger population. Limited connectivity between the Mediterranean and Northeast Atlantic has also been shown (Colloca et al., 2019).

Seasonal movements of tope are believed to be linked to their reproductive cycle (Holden & Horrod, 1979; Sutcliffe, 1994; Little, 1995; Thorburn et al., 2019; Nosal et al., 2021). In the Northeast Atlantic, it has been suggested that females undertake more extensive migrations to southern regions during winter to give birth in warmer waters (Sutcliffe, 1994; Little, 1995; Thorburn et al., 2019). It is thought that females travel from different regions to aggregate at nursery grounds in shallow coastal areas, such as bays and harbours (Capapé et al., 2005; Hurst et al., 1999).

Differences in movement patterns among age and sex classes can complicate efforts to track annual migrations (Hurst et al., 1999). Tope are known to seasonally and locally segregate by sex and size and display ontogenetic shifts in habitat use with size-based variation in movement patterns, with juveniles and subadults utilising different habitats compared to mature individuals (Thorburn et al., 2019; Cameron et al., 2025). This suggests that ontogenetic habitat shifts may play a role in structuring population connectivity across the Northeast Atlantic and the Mediterranean. Juveniles in the Northeast Atlantic are thought to migrate into UK waters from more southerly regions (Holden & Horrod 1979; Sutcliffe, 1994; Little, 1995), yet there is limited data on smaller individuals (35–40 cm) to substantiate this movement pattern. The presence of tope <40 cm in UK waters suggests some pupping may occur in areas, including the southern North Sea, Severn Estuary, Cardigan Bay, Liverpool Bay and the Thames (Thorburn et al., 2019). Similarly, neonates have been recorded from Irish coastal waters of the Irish Sea and Southwest coast, with likely young-of-the-year recorded around much of Ireland's coastline, from Dublin to Galway Bay (Cameron et al., 2025). Data on the presence of tope neonates and adults around the Wadden Sea (off the northern Dutch coast) suggest that this area is a nursery area (Edwards et al., in press). A report on Local Ecological Knowledge of sharks in the Wadden Sea supports this (Noorlander et al., 2019).

Animals tagged in the UK showed mixing throughout their distribution range in the Northeast Atlantic and were recaptured as far away as Iceland, the Canary Islands, the Azores and in the Mediterranean more than 2000 km away from their release location (Thorburn et al., 2019). Parallel tagging work in Ireland showed a similar pattern, with recaptures spanning the Norwegian waters of the Arctic circle to the Azores & Canary Islands, and with further recaptures from the Mediterranean Sea and Danish straits (Cameron et al., 2025). Notably, Sutcliffe (1994) and Little (1995) found no evidence of large-scale, population-wide migrations. However, Cameron et al. (2025) found that females did exhibit some degree of North-South cyclical movement, in line with the classical migratory paradigm, albeit with a high degree of individual variation. The above study found no evidence of such movements in males, with smaller females also displaying less pronounced annual movements. Based on capture locations of pregnant females, the authors of this study speculated that such behaviour may be linked to reproduction in females, with pregnant females potentially utilising more southerly waters, including the Mediterranean and Western coasts of Spain and Portugal, during gestation.

Tope have low levels of genetic (haplotype (h) and nucleotide (π)) diversity in the Northeast Atlantic (UK; h = 0.79, π = 0.001). These values are comparable to that of other global populations, New Zealand: h = 0.735, π = 0.001; Australia: h = 0.729, π = 0.001; Chile: h = 0.8, π = 0.002 (Chabot and Allen, 2009; Hernández et al., 2015; Thorburn, 2015), suggesting Northeast Atlantic tope have demographic histories similar to tope from Australasia, which underwent a population bottleneck, compared to the Chile subpopulation which is historically a stable population (Hernández et al., 2015). There are currently no available data on the genetic population structure of Mediterranean subpopulations. The lack of information on historic exploitation and the decline of tope in the Mediterranean suggest it may be cause for concern that the diversity observed in the Northeast Atlantic and Mediterranean is similar to regions where this species has been heavily depleted, especially as tope in the two regions are managed as a single stock (McCully et al., 2015). Low levels of diversity may negatively affect a population's survival and viability (Larson, 2012). There is no evidence of genetic structuring between the Northeast Atlantic and Mediterranean sampling sites, suggesting a single genetic population. Although there have been some unique genotypes found in the Mediterranean that suggests further investigation is needed. ICES considers there to be one population in the Northeast Atlantic and Mediterranean: "T*he Northeast Atlantic tope stock is distributed mainly in the ICES subareas 4 to 10 and extends off Northwest Africa and into the Mediterranean Sea, but the assessment is only for subareas 1-10, 12 and 14 due to data limitations*". For this SSAP the Mediterranean will be treated separately from the Northeast Atlantic, not only because there may be uncertainty about the level of connectivity between the two regions and possible regionalisation of tope (Thorburn, 2015), but also because the area has its own legislative and management frameworks.

1.5 Habitats

Tope occur in temperate waters on continental shelves and upper to mid slopes, from inshore to offshore, to depths of 826 m, but most frequently 0–200 m (Weigmann, 2016; Thorburn et al., 2019; Walker et al., 2020). They usually occur in schools, partially segregated by size and sex (Walker et al., 2008). Some large individuals travel long oceanic distances offshore, well away from continental shelves and slopes, making diurnal vertical migrations into mesopelagic layers, but have not crossed ocean basins (Walker, 1999; Walker et al., 2008; Colloca et al., 2019; Schaber et al., 2022).

Tope are highly dependent upon shallow, protected bays and estuaries for essential pupping and nursery areas, where neonates and juveniles can remain for up to two years while building up the essential energy stores that enable juveniles to disperse (Stevens & West, 1997; Walker, 1999; Bovcon et al., 2018; McMillan et al., 2018 & 2021). The species is highly philopatric (COSEWIC, 2021; Nosal et al., 2021). Tope less than 50 cm TL appear to remain in water at a depth of <45 m (Thorburn et al., 2019). Reproductively separate populations use different pupping grounds and appear to be philopatric to these areas (Thomson et al., 2020).

Pupping / nursery grounds have been identified in the Dutch Delta and Wadden Sea, the English Channel around the Channel Islands, the Irish Sea and the Azores islands.

These habitats are vulnerable to coastal development (e.g. industrial, urban, recreational, and aquaculture uses), run off, deteriorating water quality, and deoxygenation. The impact of climate change, including ocean warming, severe weather events and reduced dissolved oxygen, compounds these problems (Oliver et al., 2017 & 2018). Several well-documented former nursery grounds on the coast of Australia appear no longer to support tope pups (Stevens & West, 1997). It is uncertain to what extent this is due to the reduction of available habitat caused by the impacts above, severe depletion of individuals of the population that formerly bred in Australia, or the extirpation of philopatric populations. However, Ward and Gardner (1997) suggested little interbreeding between Australian and New Zealand sharks.

1.5.1 Aggregation sites

Aggregations of large numbers of tope have been recorded in several places such as the coastal waters around Scotland (Luce Bay and The Inner Hebrides – *(SSTP and Thorburn pers. Comms.), Isle of Wight and the Solent region (Hall, pers. Comms). Mixed sex aggregations have also been recorded in several areas along the Irish east coast, spanning the North Channel to the Northern Celtic Sea, during the summer months. Additionally, larger females may specifically aggregate within the same regions from late summer into early winter, with mating areas putatively identified around the UK and Ireland in the North Channel, Irish Sea and northern Celtic Sea (Cameron et al., 2025). The presence of mating scars indicates that this area is important for procreation.

1.5.2 Important Shark and Ray areas

The IUCN Shark Specialist group has recently finished work on mapping Important Shark and Ray areas (ISRA) for the Northeast Atlantic, the results became available in September 2025. This analysis includes an overview of all known and potential areas of high importance for tope, based on what is known about which areas are used for reproduction (pupping and nursery areas), feeding and migration this information will be incorporated into this SSAP at the next stage. For the Mediterranean this information is already available, with areas for tope designated in the eastern and western Mediterranean (https://sharkrayareas.org/e-atlas/).

1.6 Population productivity and trend

There are no data available for large-scale changes in tope distribution its subpopulations, although some former nursery grounds (e.g. in Australia; Stevens & West, 1997) no longer appear functional. The most recent tope IUCN Red List Assessment (Walker et al., 2020) concluded that the species has undergone a global population reduction of 88% over the past three generations (79 years), with the highest probability of >80%, resulting in a global and several regional assessments of Critically Endangered (Table 2). The following information draws *inter alia* upon the IUCN Red List assessment (Walker et al., 2020), the proposal prepared in 2019 to list tope in CMS Appendix II (UNEP/CMS/COP13/Doc. 27.1.10), and the Assessment and Status Report on the Tope *Galeorhinus galeus* in Canada (COSEWIC, 2021). Reported catches are often the only source of trend data.

1.6.1 Northeast Atlantic and Mediterranean

Walker et al. (2020) excluded the North Sea trawl survey data from their analyses due to concerns regarding taxonomic confusion between tope and smoothhound (*Mustelus* spp.). Their trend analysis of the fishery-independent survey data combined for 1990–2018 (29 years) revealed annual rates of reduction of 1.7%, consistent with an estimated median reduction of 76.6% over three generation lengths (79 years), with the highest probability of >80% reduction over three generations (CR). This trend is primarily driven by higher catch rates at the start of the time-series, with data from the latter part of the time-series indicating more stable trends (ICES 2019). Tope now only rarely recorded in the Mediterranean, following severe historic depletions (Ferretti et al., 2013; Ramírez-Amaro et al., 2020;). Limited species-specific data were available for Mediterranean waters, therefore, declines in catch from Europe, and disappearances from Mediterranean surveys, were used to infer continuing declines in the Mediterranean, and tope was assessed as Vulnerable in 2016 (McCully et al., 2015). This stock has some demonstrated connectivity with the Northeast Atlantic population (Colloca et al., 2019), so the three datasets described above were also applied for the Mediterranean by Walker et al. (2020) in the Global assessment (CR), although excluding decline data from the MEDITS trawl survey programme (1994–2015) because these are not reported as CPUE.

2. FISHERIES & TRADE

2.1 Global

Walker (1999) and Chiaramonte (2023) describe global tope fisheries. Tope have likely been a traditional target of artisanal fisheries in shallow coastal waters throughout its range since prehistoric times. Industrial scale target fisheries over the past 100 years have become unsustainable and there is a well-documented history of fishery collapse. Gillnets are particularly damaging to stocks, because tope is vulnerable to bycatch in gillnets set for other more resilient shark species (e.g. *Mustelus* spp), even when stocks are severely depleted. They are also threatened by line and trawl fisheries, *inter alia*, and are a target of recreational fishers. Except in New Zealand, all largescale fisheries have collapsed due to overfishing. Rebuilding efforts are hindered by an extremely low intrinsic rate of population increase and continued bycatch. Sustainable management is also hampered by this species' highly migratory nature, particularly when several range and fishing States exploit a single stock and it is easy to target inshore pupping females.

Most populations of tope have declined severely due to unsustainable target fisheries mortality, driven by trade demand for their valuable meat, fins and (formerly) liver oil. Utilised bycatch from depleted populations, often in fisheries targeting other houndsharks, continues to force these declines.

The global scale of target and bycatch tope fisheries, domestic consumption, and trade in their products, is obscured by the aggregation of records into higher taxonomic groups. These include 'dogfish and smoothhounds' (FAO, 2020) and 'dogfish and other sharks' (UN COMTRADE https://comtradeplus.un.org/).

2.2 Northeast Atlantic

In the early 1990s, 6% of shark landings composed of tope and it was commercially the third most important shark species in the Northeast Atlantic, despite a steady decrease in landings from ~1100t in 1982 to 225t in 1992 (Bonfil, 1994). France is currently the largest fisher (ICES, 2024b), supplying French and Italian markets. ICES estimates of fisheries mortality in the Northeast Atlantic and adjacent waters (excluding the Mediterranean) are incomplete, because not all range states report species-specific data, some report in aggregated categories such as 'Dogfish and Hounds' (Cazon, in Spanish, combines *Galeorhinus* and *Mustelus* species), and discard rates and discard survival are unknown. Tope is one of the main elasmobranch species caught by the Azorean bottom longline fleet (Morato et al., 2003) and artisinal fisheries (Torres et al. 2016) and was reported in 29% of the trips, representing up to 2% of the total catch landed during the studied period.

2.2.1 Stock assessment

ICES (2023) examined trends from five fishery-independent surveys. These covered the areas of the North Sea (1992–2022), west of Scotland and Ireland (2005–2022), the Celtic Sea and the Bay of Biscay (1997–2022) – all using trawl data, while the Islands and banks around the Azores were surveyed by longline (1995–2021). The standardised catch per unit effort (CPUE) indicated declining CPUE until the 2000s, when a slow increase began as commercial landings fell. However, these trends are noisy, with large inter-annual variability and peaks associated with large catches in individual hauls and ICES excluded the North Sea data from trend analysis (ICES, 2023). Combined with low catchability of tope in fishery-independent surveys, resulting in low and variable catch rates, these trend data should be viewed with care and may not be fully representative of stock status. The Red List assessment excluded the North Sea trawl survey data from their analyses due to concerns regarding taxonomic confusion between tope and smoothhound (*Mustelus* spp.) in some of these surveys (Walker et al., 2020).

Detailed investigations of NS-IBTS-Q3 data on DATRAS were undertaken by WGEF in 2023 in terms of the length and spatial distribution by nations (ICES, 2023). Length-frequency distributions indicate that data for tope and *Mustelus* spp. may have been confounded. It is likely that some tope have been attributed to *Mustelus* in some years, and so until further analyses of these data are undertaken, the temporal trends in catch rates exclude the relevant data. Furthermore, WGEF note that the apparent 'peak' in tope in 1992 in driven by a single large catch at one station (*RV "*Thalassa" in 35F1, haul number 15 with CPUE of 182 ind/hr). Further examination of these data is required.

ICES (2023) was therefore unable to assess the stock and exploitation status relative to maximum sustainable yield (MSY) and precautionary approach (PA) reference points, and advised that when the precautionary approach is applied, landings should be no more than 241 tonnes in each of the years 2024–2027. This advice contains a 20% precautionary buffer. ICES cannot quantify the corresponding catches (ICES, 2023). Annual landings of between 340–715 t have been reported to ICES (2005-2022), which have been largely stable since 2012. Landings advice between ≤ 241 t and ≤ 376 t has been issued since 2016, with reported landings exceeding these values annually.

ICES states the following "*WGEF 2024: Catch data are of poor quality, and biological data are not collected under the Data Collection Regulations. Some generic biological data are* *available **Summary:** WGEF considers that any trend analysis should be viewed with care, due to the low catchability in fishery-independent surveys. Given the low and variable catch rates, WGEF does not consider that catch rates are wholly appropriate for quantitative advice on stock status….."*

And on management consideration ICES states "***Management considerations:** Tope is considered highly vulnerable to overexploitation, as this species has low population productivity, relatively low fecundity and a protracted reproductive cycle. Unmanaged targeted fisheries elsewhere in the world have resulted in stock collapse (e.g. off California and South America).*

Tope is an important target species in recreational fisheries; though there are insufficient data to examine the relative economic importance of tope in the recreational angling sector, this may be high in some regions."

2.2 Mediterranean

Despite a prohibition on landing tope and releasing all specimens unharmed (see Chapter 3) for the whole Mediterranean coming into effect in 2026, data from FAO's FishStat (Figure 3) show that, even though landing went down significantly, the species is still being reported in landings in some Mediterranean countries.

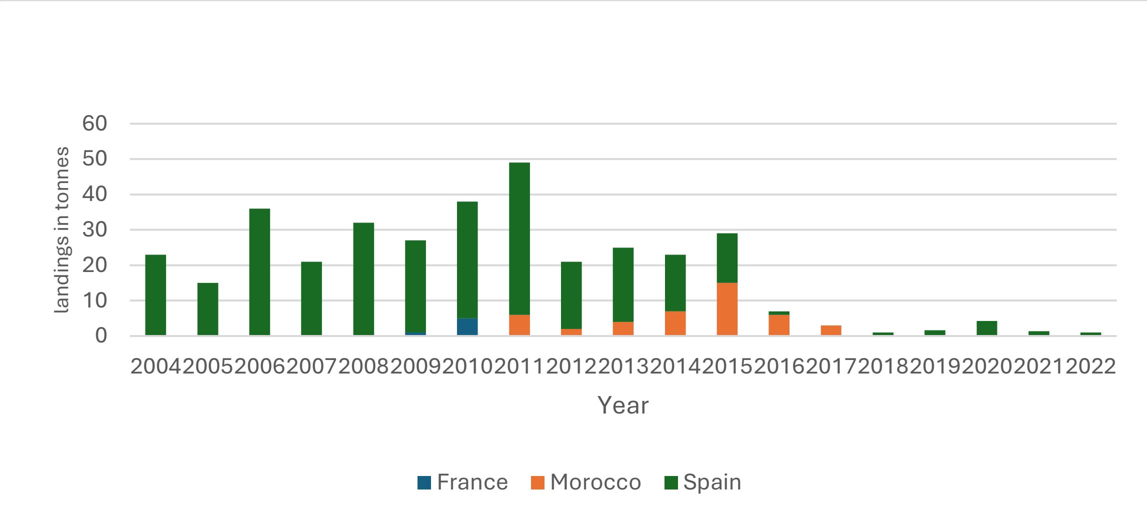


***Figure 3**: Tope landings in the Mediterranean as reported in FAO FishStat*

Data from GFCM show no landings in the same period, except for incidental landings in 2012 and 2013, it should however be noted that there is a high prevalence of aggregated landings reported in the Mediterranean which may mask landings of tope.

2.3 West Africa

The first records of tope shark in Mauritanian waters in West Africa date back to the 1920s, with one specimen in Port-Etienne, now Nouadhibou (Maurin & Bonnet, 1970). Scientific trawl surveys on the Mauritanian continental shelf since 1980s reported the presence of the species between 1988 and 1998, most often during the second half of the year. Individuals of the species were found from the north to the south of the Mauritanian continental shelf at depths between 10 and 128 m (Source: IMROP database; El Vadhel, 2016).

The species is probably landed as part of artisanal and coastal fishing catches. In general, elasmobranchs are not the subject of targeted fishing, and no conservation care is taken to maintain the freshness of the specimens caught. Expert report that fins are removed and dried after landing for sale to international traders from the Central African Republic, the carcasses are then left to decompose on land, making identification difficult. For non-initiated observers, the species can be confused with *Mustelus mustelus* or *Leptocharias smithii*.

2.4 Recreational fisheries

Tope are an important target species for recreational sea angling in several countries , with anglers, angling clubs and charter boats. In the UK, all anglers operate under a catch and release obligation, in other range states such an obligation does not exist. In The Netherlands there is a voluntary catch and release protocol in place. In Spain there are anecdotal reports of recreational tope catches are being retained for human consumption. It is used in the popular tapas dish ‘Cazón en adobo’.

The Inland Fisheries Ireland Marine Sportfish Tagging Programme tagged 6,406 tope between 1970 and 2009 off the coast of Ireland, most commonly in Tralee Bay, with a large increase in tagging effort by charter skippers fishing for tope over the years (https://www.fisheriesireland.ie/fish-species/tope-galeorhinus-galeus). Similar tagging programmes have been undertaken in the UK: UK and Scottish Tagging programmes and the Glasgow Museum Tagging Programme. Collectively, 2,043 tope have been tagged in the UK. Combined, these tagging programmes have shown that tope migrate long distances after tagging, with recaptures north to the Shetland Islands and south along the coast of Europe to as far away as the Azoresthe Canaries and the Mediterranean. These movements provide further evidence that tope in the Northeast Atlantic form a single population (Thorburn et al., 2019; Cameron et al., 2025).

Catches of tope in recreational fisheries are rare in Sweden, and individuals are usually released.

2.5 Data Gaps; landings, mislabelling & misidentification

2.5.1 Landings

No accurate estimates of historical catch are available, as many nations that land tope report an unknown proportion of landings in aggregated landings categories (e.g. dogfish and hounds). Recent estimated landings data from 2005–2022 for tope appear relatively stable in recent years, with the exclusion of Covid-19 years 2019 and 2020 (Figure 4).

Based on the best available data, France is the main nations landing tope, accounting for 77% during 2019–2022 and 76% in 2023 (Figure 4), with the English Channel and Celtic Seas remaining important fishing grounds. UK fisheries also land tope, although species-specific data are lacking for the earlier years, and reported landings have declined since precautionary management measures (trip limits of no more than 45 kg per day) were introduced in England and Wales. Since 2001, Ireland, Portugal and Spain have also declared species-specific landings. However, it is believed that some of the Portuguese landings recorded as tope may also include unknown proportions of other sharks, including smoothhounds and deep-water sharks (ICES, 2024b).

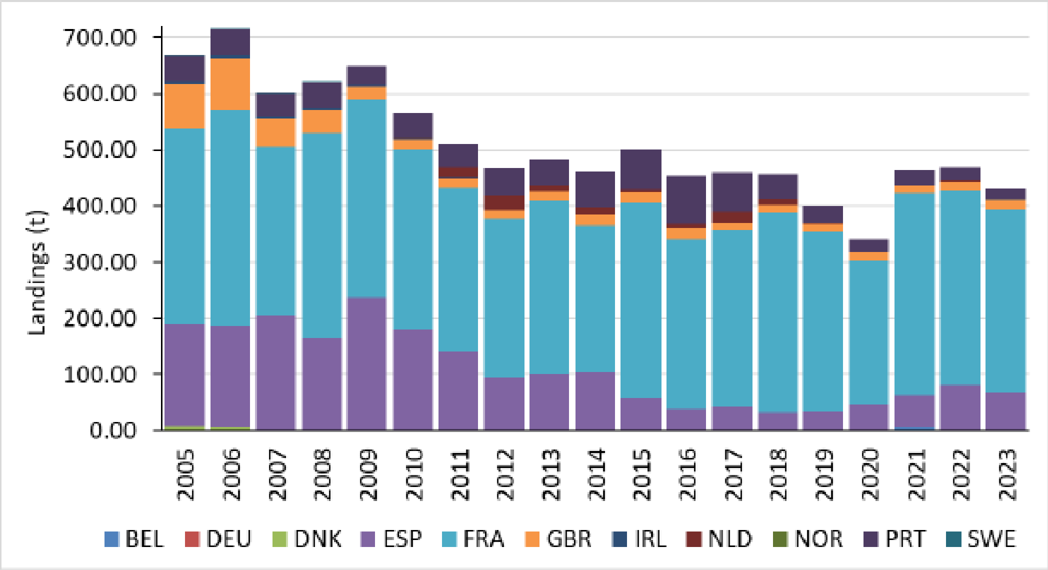


Figure 4. *Tope landings (tons) in the Northeast Atlantic, reported per country, in the period 2005-2023 (ICES, 2024b)*

2.5.2. Discards

ICES (2024b) reports that there is limited discard information available for most countries and fisheries, this may be an artifact of limited coverage of vessels encountering tope shark in discard observer programs. Data from observer programs in the UK indicated that the introduction of conservation measures (catch limit per fishing trip, see chapter 3) have influenced the discard-retention patterns.

2.5.3 Trade

Although tope was historically caught for their liver oil, currently meat and fins are traded. Meat is traded as fresh or frozen trunks and fillets, and exported to Australia, Japan, Europe, and South America, in as dried or salted form it is sent to markets in Africa and South America and known as biltong (McCord, 2005; da Silva et al., 2015; Chiaramonte, 2023). Fins are traded as a by-product.

Cardeñosa et al., (2024) analysed trade in small shark fins through Hong Kong, SAR. One third of species present in samples were members of family Triakidae (which includes *Mustelus* and *Galeorhinus*), and over 20% were species of *Mustelus.* Tope was the 14th most highly traded species in the fin trade. Due to under reporting by many Range States, the global scale of this trade is not fully accessed.

Estimates by MacNeil et al., 2025 for tope indicate that average annual global landings during 2012 to 2019 were around 5,067 t, ranging between 4,163 t and 6,480 t (about 1,000 t higher than reported to FAO). New Zealand, Australia and France had the highest landings with 2,969, 349 and 324 t respectively. Estimates of average annual exports of tope meat again place New Zealand first with 1,969 tons, followed by South Africa with 185 tons and France with 97 tons. These three countries export more than 80% of the global annual tope catch (MacNeil et al., 2025).

2.5.4 Mislabelling & Misidentification

Mislabelling:
The term 'mislabelling' refers to the incorrect display of information on shark products in terms of originating species. This may be an intentional deception or accidental misinformation carried through the system. Mislabelling comes with several problems, not only does it hinder effective management due to non-transparent species use, but it also does not allow consumers to make an informed decision. Reasons for intentional mislabelling may include higher profit margins if 'cheap' shark meat is sold as a more valuable commercial species, such as swordfish; or hiding the use of legally protected species to avoid consequences such as financial penalties. In the Northeast Atlantic and Mediterranean tope are often reported under aggregated common fishery names, such as 'houndsharks', 'dogfish' or the Spanish 'cazón'. Though not technically mislabelling as the overall category is correct this impedes collection of species-specific data needed for management.

Misidentification:
Unintentional mislabelling, such as those resulting from the misidentification of species landed may be connected to a lack in species knowledge and training of fishermen, brokers and other responsible parties along the value chain. The problem occurs at all scales from global to local. Identification guides have been developed specifically to address this. Figure x shows an example from the Shark Trust brochure on "Sustainable shark, skate and ray fisheries in Northern English waters".
EU Regulation No 1379/2013 requires EU Member States to label fishery products. Article 35 includes mandatory label information such as the species name (common and scientific), the origin (fished area/location), and gear used to catch it. Article 39 of this regulation entails additional options for voluntary information that may be included on labels such as environmental information.

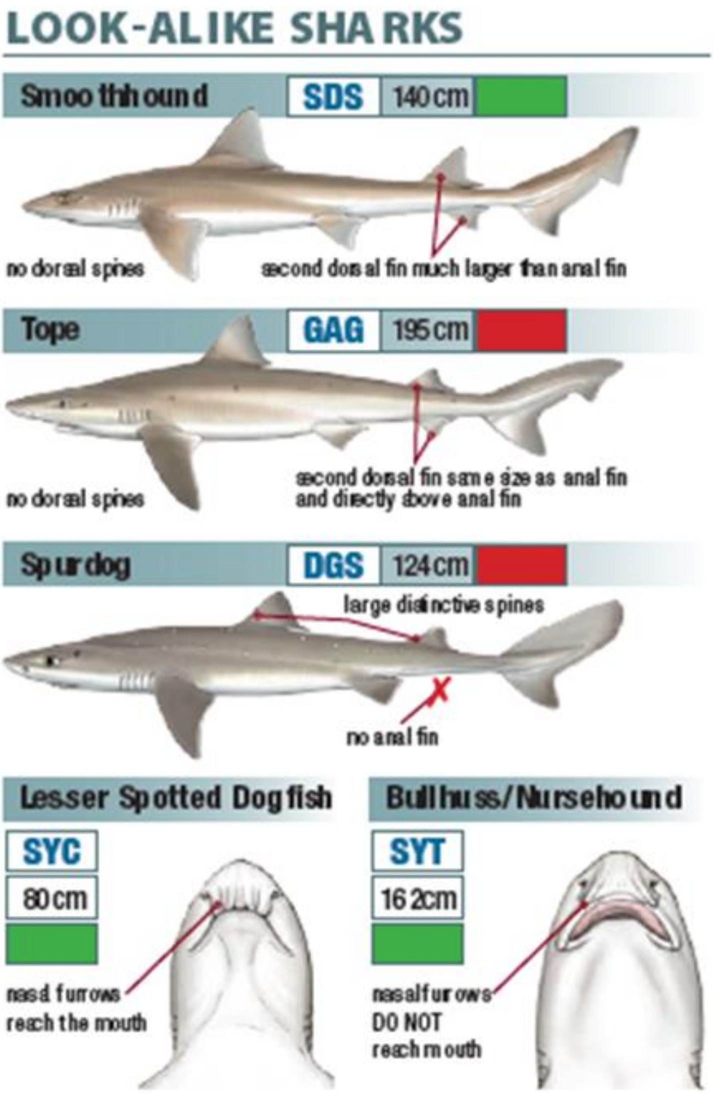


Figure 5. *Identification guide created by the Shark Trust showing the key differences between common shark species.*

As tope stocks have declined, fisheries have also begun to target and trade the smaller smoothhounds, including *Mustelus mustelus* (Dominguez-Bustos et al., 2025). Meat is traded internationally fresh-frozen, and dried-salted (Castro, 2011). Several Mediterranean countries have identified mislabelling as an existing and persisting problem. Genetic tools have discovered the occurrence of mislabelling tope and other sharks in multiple countries such as Greece (Pazartzi et al., 2019; Giovos et al., 2020) Spain (Pardo et al., 2020), Egypt (Galal-Khallaf et al., 2014), Australia (Parker Kielniacz et al., 2024), Argentina (Delpiani et al., 2020), and Germany (Niedermeier et al., 2023).

3. POLICIES AND LEGISLATION RELEVANT FOR MANAGEMENT

At present, conservation management measures are in force specifically for tope only in some regions, despite growing international awareness of common threats.

In Australia, a combination of legal minimum and maximum lengths, legal minimum and maximum gillnet mesh sizes, closed seasons and closed nursery areas have been applied as fisheries management measures (ICES, 2023). While both Australia and New Zealand use some form of input controls, such as mesh size limits, closed areas and season etc., both countries use the far more effective output controls including enforced quotas or Total Allowable Catches and an Individual Transferable Quota system, which tends to limit fishing capacity to sustainable levels. In the United States, tope (known in the US as soupfin shark) are neither actively managed nor recognized as a Highly Migratory Species; however, given the highly migratory behaviour, this designation should be revisited by the US Pacific Fishery Management Council (Nosal et al., 2021). In the US a petition under the Endangered Species Act (ESA) is pending and in Canada tope is protected under the Committee on the status of Endangered Wildlife in Canada (COSEWIC, 2021)

3.1. Northeast Atlantic

3.1.1 EU

The EU does not set a catch limit (Total Allowable Catch, TAC) for tope shark in the Northeast Atlantic. Between 2005 and 2011, no advice was provided by ICES; between 2013 and 2015, the advice was to reduce the catch by 20%, and since 2016 ICES provides landings advice based on the precautionary approach, at first biannually and since 2020 on a quadrennial basis (ICES 2024).

Although there is currently no TAC limit set based on this advice, the reported landings for tope shark overshoot the advised landings every year (Figure 4; ICES, 2024b), see Figure 6 and Table 2 below.

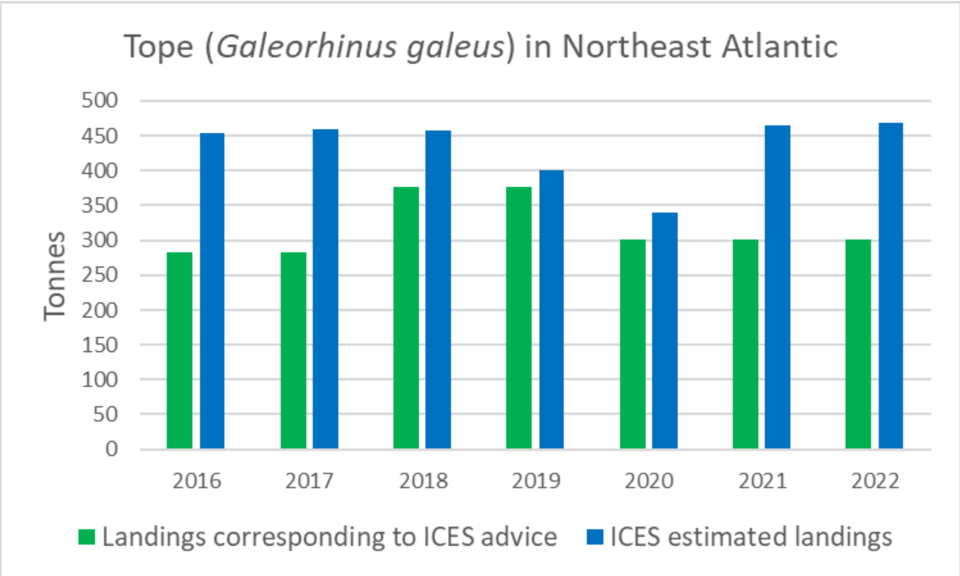


***Figure 6**. Overview of ICES estimated landings of tope (Galeorhinus galeus) and landings corresponding to ICES advice for the period 2016 – 2022, based on the precautionary approach*

Between 2013 and 2015 ICES advice was to reduce catches by 20%. Although the catches cannot be quantified, the landings estimated by ICES between 2013 and 2015 did not show a decrease based on the ICES advice in 2013 to reduce by 20%. See Table 2 below

Table 2, ICES estimated landings of tope (*Galeorhinus galeus*) for the period 2012-2015. In 2013-2015, ICES advice was to reduce catches by 20%. Although there is no data on catches, the landings did not decrease in this period.

Year	**ICES advice**	**ICES estimated landings in tonnes**	**Percent change in relation to 2012**
2012		466	
2013	Reduce catch by 20%	483	104%
2014	Reduce catch by 20%	462	99%
2015	Reduce catch by 20%	501	108%

It is also noted in the same advice that there is substantial mislabelling of tope at many points of landing (see section on mislabelling above) the actual amount of tope landed is likely to be higher.

The prohibited species list of the EU TAC and quota regulations prohibits the targeting, retention, transhipment and landing of tope caught in longline fisheries over a substantial part of their northern European range (EU waters of ICES Division 2.a and subarea 4, and EU as well as international waters of subareas 1, 5-8, 12 and 14). This prohibition applies to longline fisheries only and is meant as a preventative measure for the development of a longline fishery for the species. This measure believed not to have led to a reduction in tope mortality as, in the part of the range this measure applies to, tope is mainly (by)caught in demersal and setnet fisheries (STECF, 2025).

3.1.2 UK

Concern in the UK regarding commercial advertisements offering to purchase tope fins led to the adoption of the Tope (Prohibition of Fishing) Order 2008. Under this order it is prohibited to target Tope other than with rod and line - rod and line anglers fishing from boats must not land their catches ashore alive or dead and bycatch in other commercial gears is limited to 45 kilograms per day. Additional protection for tope is offered in Scottish waters via the Sharks, Skates and Rays (Prohibition of Fishing, Trans-shipment and Landing) (Scotland) Order 2012 which prohibits tope fishing, other than by rod and line or hand-line and prohibits all landings'.

3.2 Mediterranean

In 2012, tope were listed in Annex II (Endangered or Threatened Species) of the Barcelona Convention Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol), which requires Parties to ensure the maximum possible protection and recovery of listed species (UNEP/MAP-SPA/RAC, 2018). The General Fisheries Commission for the Mediterranean (GFCM) subsequently adopted Recommendation GFCM/42/2018/2 on fisheries management measures for the conservation of sharks and rays (amending Recommendation GFCM/36/2012/3), which initially banned retention and sale and mandated careful release for 24 elasmobranch species listed on Annex II of the Barcelona Convention, later increasing to 30 species. Contracting Parties and cooperating non-contracting Parties (CPCs) are directed to *"ensure that tope sharks (Galeorhinus galeus) caught with bottom-set gillnets, longlines and in tuna traps shall be* *promptly released unharmed and alive, to the extent possible".* Further GFCM decisions intended to strengthen the management of elasmobranch conservation: Recommendation GFCM/44/2021/16 on additional mitigation measures for the conservation of elasmobranchs in the Mediterranean Sea and the Resolution GFCM/46/2023/4 on a regional plan of action to monitor and mitigate interactions between fisheries and vulnerable species in the Mediterranean and the Black Sea.

Under this Order, Mediterranean Countries that are signatory to the Barcelona convention are required to ensure the maximum possible protection and recovery of Tope shark through compliance with measures adopted under the Barcelona Convention and General Fisheries Commission for the Mediterranean, and to report on implementation. Even though this would imply that all landings are prohibited in the Mediterranean the fact that not all countries have transposed this agreement into their national fisheries legislation means that the enforcement framework needed for implementation is lacking.

3.3 Skagerrak/Kattegat

Tope are considered to be rare visitors to the HELCOM area (the Baltic Sea incl. Kattegat and parts of the Skagerrak). The HELCOM Red List of threatened and declining species (2013) identifies Tope as Vulnerable and a priority species.

Tope in Swedish waters

Tope are relatively common in scientific demersal surveys in the rest of the North-East Atlantic (in 327 hauls) but have not been recorded in trawl surveys in the Skagerrak or Kattegat. Since 2011, tope caught with longlines in the North Sea may not be landed and specimens must be immediately released, in order to increase the survival rate. With the exception of a limited fishery for dogfish, there is no longer any directed fishing for sharks and rays in Swedish fisheries. However, between 2003 and 2008, tope were landed from the Skagerrak (27 trips) and Kattegat (two trips) by Swedish vessels, on average three times/year. All landings except one reported from the Skagerrak were caught with shark nets, i.e. large-meshed nets. One of the landings from the Kattegat was caught with bottom trawls, the other is unknown. Since 2010, no further landings of tope have been recorded in the Skagerrak and Kattegat. For further specifics see SLU Aqua report 2022:14 https://publications.slu.se/?file=publ/show&id=116702 .

3.4 West-Africa

In 2006, under the agreement between Mauritania and the European Union, a ban on the capture of a range of shark species, including the tope shark, was imposed on pole-and-line tuna vessels and surface longliners operating in waters under Mauritanian jurisdiction.

3.5 International

Tope sharks were listed in CMS Appendix II in 2020, and in Annex 1 of the CMS Sharks MOU in 2023. No Concerted Actions have yet been adopted.

The In-depth Review of the Conservation Status of individual CMS-Listed Species (UNEP/CMS/COP14/DOC.21.3 provided the following information on Regional Fisheries Management Organizations (RFMOs)

Tope are not listed as a target or key species under any RFMO and no species-relevant provisions were identified.

In the Atlantic the International Commission for the Conservation of Atlantic Tunas (ICCAT) is the relevant RFMO. Tope bycatch can be reported to ICCAT under the group 'Other Sharks' and it has a specific reporting code (GAG) which aligns with the code used by ICES (ICCAT, 2019). Bycatch data are available from 1999 to 2023, with limited reporting of bycatch (> 5 tons per annum) for the past 10 years, see screengrab below (Figure 7).

ICCAT has general recommendations to limit mortality and improve data and compliance for sharks 'caught in association with ICCAT fisheries' are considered:

- Recommendation 04-10: (2005) concerning the conservation of sharks caught in association with fisheries managed by ICCAT (ICCAT, 2004).
- Recommendation 18-06: (2019) on the improvement of compliance review of conservation and management measures regarding sharks caught in association with ICCAT fisheries(ICCAT, 2018).

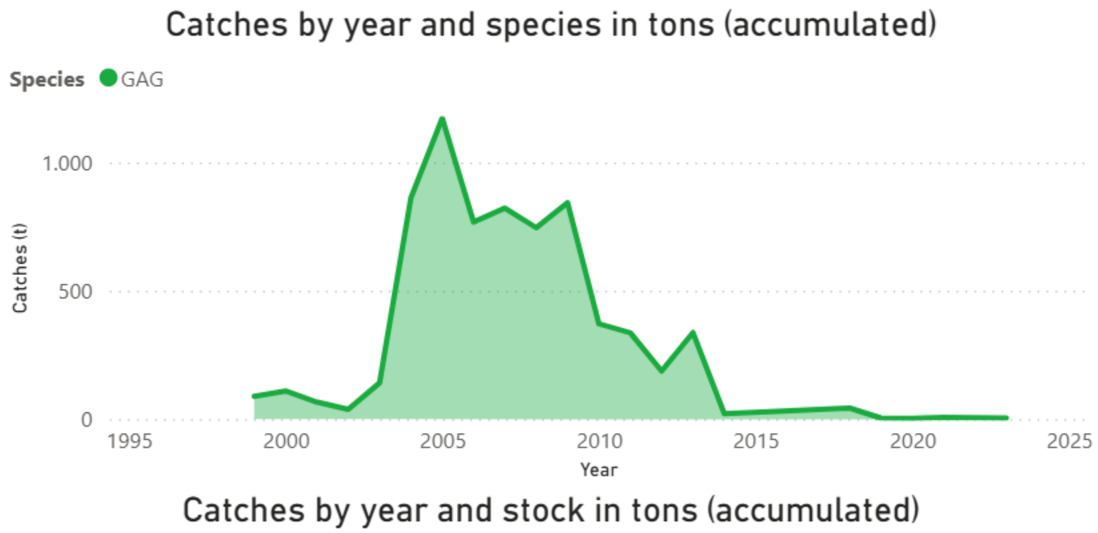


***Figure 7**. Screengrab from ICCAT data on catches of tope in the Atlantic and Mediterranean by all fleets. Source: iccat.int*

4. THREATS AND BARRIERS

Sustainable management of tope should address both the direct threats the species faces as well as barriers that prevent effective management and conservation. In this section we define threats as 'activities and events that directly contribute to tope mortality' and barriers as 'factors that need to be addressed to ensure policies and measures have the intended effect'.

4.1 Threats

4.1.1 Overexploitation

Despite the lack of targeted fisheries for tope throughout the Northeast Atlantic range, it is retained as bycatch in many demersal fisheries as there is a market for it in many EU countries. Tope are taken as bycatch in mixed fisheries using gillnets, trawl gear, and longlines. Historically in some regions, directed fisheries focused on larger, mature individuals due to their larger livers and greater value, directly impacting breeding stock. Their slow growth and late maturity mean that populations recover slowly from depletion, making them especially susceptible to sustained fishing pressure (Francis & Mulligan, 1998; Dureil et al., 2015). As outlined in chapter 2 the current landings advice provided by ICES has been overshot each year.

For the West African part of the population there are no quantitative catch or landings data. There are reports from Mauritania of tope bycatch being landed and only the fins removed and sold, while the rest of the carcass left to rot on land.

In the Mediterranean tope is a prohibited species under the Barcelona convention but data from FishStat (FAO) indicated there are still landings of tope from the Mediterranean occurring. These would qualify as Illegal, Unreported and Unregulated (IUU) landings. The overlap between the critical reproductive habitats of tope and heavily fished coastal areas increases the likelihood of aggregations being intercepted during peak reproductive periods. Without adequate spatial and temporal protections in place, these pressures can lead to localized depletions and, over time, broader population declines. The protection of key aggregation sites is therefore essential to safeguarding the reproductive capacity of this species.

To manage recreational fisheries, there are prohibitions on landings of tope in Scotland, England and Wales and the overall prohibition in the Mediterranean. In other range states there are no conservation measures aimed at recreation fisheries in place. There is indication that tope are retained for direct consumption in some recreational fisheries. In areas where catch and release is obligatory there is a possibility of unintended mortality if the animal does not survive the capture process.

As a predator, tope are dependent on an abundance of prey species for its survival. Tope are opportunistic feeders, feeding on a variety of teleost fish and some invertebrate species. It is therefore unlikely that the availability of prey species such as mackerel in the Northeast Atlantic will severely impact the full sub-population.

At this time there are no targeted fisheries for tope known in the Northeast Atlantic and the chance that this may occur is considered unlikely. Specific threats related to over-exploitation and unsustainable fisheries:

- Landings of tope above ICES landings advice
- Fisheries overlapping with pupping/nursery/feeding areas
- Landings in the Mediterranean reported to FAO, which are considered to be IUU as there is currently a prohibition on landing

- Retention in recreational fisheries and unintended mortality in recreational fisheries.

4.1.2 Habitat degradation

The disturbance and degradation of aggregation sites, specifically coastal zones where individuals congregate for pupping and mating, can affect the reproductive potential of the species. These sites are typically shallow, inshore waters that provide optimal conditions for reproductive success and juvenile development. Disruption of these critical habitats, whether through fishing activity, or coastal development, can severely reduce juvenile survival and impede recruitment, thus threatening long-term population stability. Protection of such sites should be complemented by broader conservation measures to ensure population survival (Stevens et al., 2002).

Coastal nursery areas face degradation from industrial, urban, and recreational development, which can not only affect the physical habitat, but also lead to deterioration in water quality due to high levels of organic matter in the water. Climate change compounds these issues by affecting water quality, temperature, and habitat availability. For example, some nursery grounds in Australia may no longer be functional due to habitat loss, possibly coupled with extirpation of philopatric populations (McAllister et al., 2018). There is ongoing research into effects of electro-magnetic fields on elasmobranchs (Hermans et al., 2024), but effects are not yet clear.

Specific threats associated with habitat degradation:

- Habitat degradation of areas vital to tope life history caused by infrastructure / developments in coastal areas
- Water quality degradation due to run off (pollution, sedimentation, change in salinity
- Electromagnetic fields from wind farms acting as a barrier
- Disturbance to key habitats from diving/water sports

4.1.3 Other factors (climate change and pollution)

Seasonal distribution and migrations could be affected by ocean warming, forcing this species to move closer to the poles during its summer migrations, but also excluding it from shallow coastal nurseries due to high temperatures and oxygen depletion. Ocean warming may also shift seasonal distribution away from optimal juvenile habitats. It is unknown if these changes could also make new (juvenile) habitats available. Fossil records show that tope had a historical distribution in the Northwest Atlantic prior to the closure of the Panamanian Isthmus (Chabot and Allen 2009). It has been suggested that rising temperatures, driven by the acceleration of the Gulf Stream during the Pliocene (Kaneps 1979), led to the disappearance of tope from the Northwest Atlantic (Chabot and Allen 2009). This implies that tope are sensitive to warmer waters, a hypothesis supported by the lack of trans-equatorial gene flow observed in the species (Chabot & Allen 2009), despite archival tagging indicating they can tolerate temperature of range of 8.1°C−27°C (West and Stevens, 2001; Cuevas et al., 2014; Rogers et al., 2017).

Pollution
As a long-lived predatory species, large adults bioaccumulate and may biomagnify toxic heavy metals such as mercury, cadmium and lead which travel up the food chain (Boldrochhi et al., 2021). Bioaccumlation and biomagnfication of organic compounds such as PCBs have also been identified (Weijs et al., 2015) Although the impact of bioaccumulated toxins on shark health is unknown (Torres et al. 2014), these tend to exceed U.S. EPA guidance levels (EPA, 2001). The effects on the health of the sharks themselves is uncertain (Weijs et al., 2015; Boldrocchi et al., 2021).

There is limited published information on the effects of plastic in sharks, but some studies show that sharks and rays ingest plastics (Lipej et al., 2022) and that microplastics are found in their gills and skin (Pasalari et al., 2025). There is no data on what the effects of microplastics are on the life-cycle of the species. Macro plastics are unlikely to have adverse effects on elasmobranchs as they have the capability to expel their entire stomach content if they ingest indigestible substances.

Elasmobranch, as many marine species, can become entangled in man-made debris at sea, and a systematic overview of 26 papers on the subject showed that 74% was caused by ghost-fishing, especially in the Pacific and Atlantic Oceans, also in the Northeast Atlantic (Godley et al., 2019).Specific threat associated with other factors

- Climate change affecting food availability and habitat suitability
- Climate change affecting seasonal distribution so that essential habitats cannot be reached
- Bioaccumulation of toxins
- Plastic pollution
- ghost fishing

4.2 Threat prioritization

Threat matrix showing the combination of likelihood of occurrence (considering existing management measures) and impact of each threat.

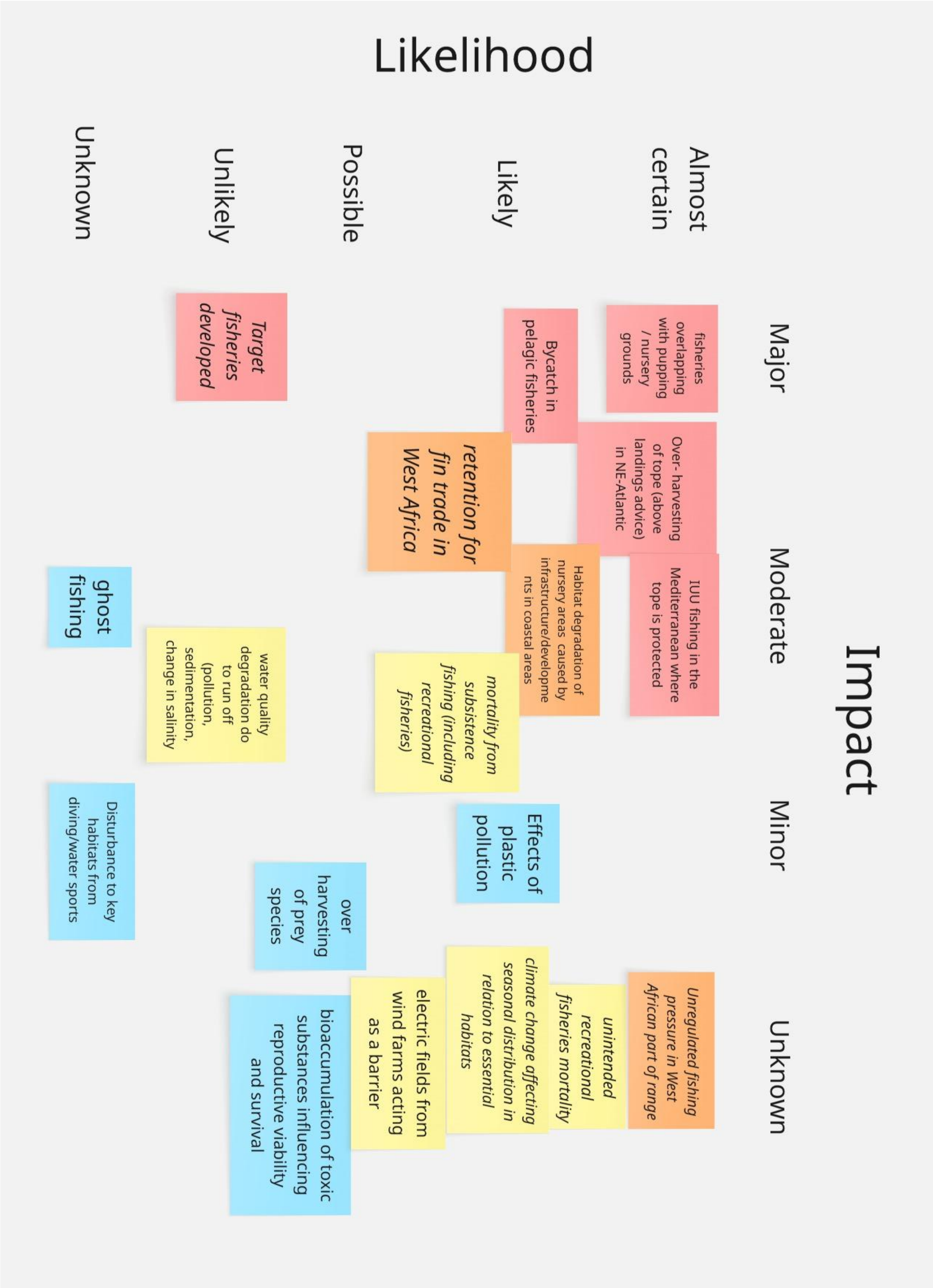
Likelihood of occurrence has been categorised as ‘Almost Certain’, ‘Likely’, ‘Possible’, ‘Unlikely’, and ‘Unknown’. Threat classifications are defined as follows:

i. Major – Could result in significant declines of species in an area if not addressed.
ii. Moderate – Could contribute to species decline, but not an immediate threat.
iii. Minor – Possible, but not known, contribution to species decline. Should not be prioritised over other threats.
iv. Unknown/Not yet evaluated – No known impact on species decline if not addressed.

The matrix uses a qualitative assessment drawing on the bibliographic review above and assessment by the expert panel. Levels of risk and the associated priority for action are defined as follows.

Very High:	immediate action required
High:	mitigate action and the precautionary approach should be applied
Moderate:	obtain additional information and develop additional action if required
Low:	monitor the occurrence of threat an reassess the level if the likelihood or impact changes

Threat prioritization adapted from Gordon et al. (2019).


Impact
Major
Moderate
Minor
Unknown
Likelihood
Almost certain
Likely
Possible
Unlikely
Unknown
fisheries overlapping with pupping / nursery grounds
Over- harvesting of tope (above landings advice) in NE-Atlantic
IUU fishing in the Mediterranean where tope is protected
Unregulated fishing pressure in West African part of range
Bycatch in pelagic fisheries
retention for fin trade in West Africa
Habitat degradation of nursery areas caused by infrastructure/developments in coastal areas
mortality from subsistence fishing (including recreational fisheries)
Effects of plastic pollution
unintended recreational fisheries mortality
climate change affecting seasonal distribution in relation to essential habitats
electric fields from wind farms acting as a barrier
bioaccumulation of toxic substances influencing reproductive viability and survival
over harvesting of prey species
Target fisheries developed
water quality degradation do to run off (pollution, sedimentation, change in salinity
ghost fishing
Disturbance to key habitats from diving/water sports

4. 3. Barriers

4.3.1 Gaps in data collection

One of the recurring themes in the information on tope is the lack of species-specific data with regards to life-history parameters, locations of essential habitats in the life-cycle and insights into migratory routes.

Moreover, the species specific data needed to carry out robust stock assessments and to gain insight into trade volumes and trade routes are lacking as there are no fisheries independent studies and it is well documented that tope are often reported in aggregate categories ('hound shark', 'dog fish') at landing which makes it impossible to calculate landing accurately.

Lastly there is little know about impacts external stressors such as climate change, pollution and electromagnetic fields have on tope.

To address these knowledge gaps, improvements are needed for:

Biological and ecological data collection:

- invest in research programmes to identify migratory routes, critical habitats (e.g. pupping and feeding grounds) and habitat use throughout the life-cycle;
- Invest in research programmes to determine levels of physical and genetic connectivity between critical habitats both between regions and within regions
- Assess climate-related threats and incorporate climate resilience into adaptive management strategies
- Investigate the scope and sources of bioaccumulation of toxic substances in the tope (sub)population

Invest in research to quantify the impact of offshore development on tope movements, connectivity and critical habitat use

Data for fisheries management

To facilitate the introduction of any fisheries measures through the CFP in a later stage, it is desirable that the priority level is supported by scientific findings on the importance of the measures for the recovery of tope.

- Improve accuracy of reporting on catches, discards and landings
- Improve estimates of discard survival to enable estimation of total removals (landings plus dead discards
- request relevant national scientific bodies to carry out dedicated data collection and undertake new assessments at regional level (ICES/IUCN/GFCM)
- collaborate with recreational fisheries to make better use of existing databases on catches (or set up databases where needed), and to evaluate the ecological impact Improve species specific monitoring and identification at fish markets
- Address the limitations of aggregated data and lack of harmonised custom codes which would provide information on the level of species-specific trade

Mislabelling & misidentification:

Improve species identification of tope and similar species (e.g, smoothhound) among fisheries scientists, market inspectors, and fishers, e.g. through training and use of illustrated guides use DNA barcoding to investigate and quantify the scale of mislabelling in seafood supply chains involving tope and smoothhounds.
Long term monitoring:

- invest in monitoring of coastal areas to identify population trends in areas not covered by current sampling programmes

Recovery criteria (informed by threat analysis and biological assessment)

It is important to design recovery criteria to measure and monitor progress, these should both relate to actions that stop or deal with threats and the ecological recovery itself (indicators for species recovery, e.g. positive sighting trends, genetic indicators, etc.). The use of scenario modelling might be helpful here as well to define what results actions should achieve.

- develop indicators or tools to measure recovery of (sub)population – see explanation below

4.3.2 Limited attention for coherence in international collaboration

One of the conclusions from the In-depth Review of the Conservation Status of individual CMS-Listed Species (UNEP/CMS/COP14/DOC.21.3, was that the species would benefit from continued international cooperation under its Appendix II listing, through the Sharks MOU. Moreover, it was noted that "all geographic populations would benefit from collaborative studies". In the light of these recommendations, it is suggested to focus on the following:

- Expand the current expert group where necessary with representatives from Range States, especially those in the Mediterranean and Northwestern African part of the subpopulation, and include RS representatives from other sub-populations
- Invest in capacity building
- Undertake collaborative workshops among researchers studying tope to consolidate data resources and support the development of broader-scale ecological and management insights
- Invest in coordination between the relevant authorities for conservation and management in West Africa, Mediterranean and further Northeast Atlantic and ensure coherent legislation for tope shark across the range of the sub-population
- Invest in coordination between the fisheries bodies in West Africa, Mediterranean (GFCM) and further Northeast Atlantic (ICES) shark across the range of the sub-population and to share fisheries data (catches, landings, discards) to ensure the development of coherent fisheries advice

4.3.3. Funding needed for implementation of measures

Research, management and enforcement at sea is complex and costly and as tope has not been a high priority species in conservation or management there has been little attention and budget made available to address the gaps described above.

- Ensure tope is incorporated in marine policies focussed on conservation (e.g. national plans for the nature restoration law etc.)
- Incorporate research on tope in large scale research (horizon etc)
- Facilitate collaborative workshops

5 FRAMEWORK FOR ACTION

Threats to Northeast Atlantic population of tope were identified and attributed a level of risk using the threat matrix (Table 3). The framework for action prioritizes the threats classified as having the highest risk.

The overarching goal of the SSAP:
"By 2030 all barriers that currently impede the ability of the Northeast Atlantic and Mediterranean population of tope shark to fulfil its life-cycle have been identified and a mitigation strategy has been developed, with a commitment for further implementation, thereby ensuring that the sub-population can reach an abundance and distribution commensurate with its biological potential"

To reach this goal five objectives have been formulated that address the threats and barriers described in chapter 4, together they provide the enabling conditions for the long-term sustainable management of tope shark.

Overall aim: the main threats to tope population survival are identified and effectively mitigated

- *Objective 1, Fisheries policy and management measures based on best available scientific advice are implemented and enforced*
- *Objective 2, Essential habitats in the life-cycle of tope are identified and protected*
- *Objective 3, Studies to improve the scientific knowledge base on tope are undertaken*
- *Objective 4, International collaboration is facilitated*
- *Objective 5, Funding for SSAP implementation over time is secured*

Objectives Framework

To specify the actions and results needed to reach each of the objectives, the following framework (Tables xxx) has been created. For each objective, there is an intended result that will be achieved through several actions, each of which has a priority, time scale, and Range States responsible for the action specified.

Actions below have been prioritized as:

- Essential
- High
- Medium
- Low

Timescales have also been attached to each Action using the following scale:

- Immediate: completed within the next year
- Short: completed within the next 3 years
- Medium: completed within the next 5 years
- Long: completed within the next 10 years
- Ongoing: currently being implemented and should continue

Table 3. Objectives, outcomes and actions with priorities, time scales and responsible Range States

Objective 1: Fisheries policy and management measures based on best available scientific advice are implemented and enforced (in alignment with actions under objective 3: improve knowledge base)				
Outcome	Action	Priority	Time Scale	Range States
1.1 Landings and or catches are within sustainable levels based on best available scientific advice	1.1a:If needed initiate a process to identify catch or trip limits for tope in the NE Atlantic based on ICES catch advice , taking account of any unintended consequences with regard to the landing obligation	Essential	Medium Limits already in place for England and Wales	EU* + UK; (Scotland and N-Ireland have prohibitions) *This action does not apply uniformly to all EU member states, relevant countries will be specified in the next stage of the process
	1.1 b: Assess the situation with regard to fisheries and conservation in West Africa i further in a series of expert sessions in order to produce a strategy to reach the objective	Essential	Immediat e	All Range States*, in particular from West Africa *This action does not apply uniformly to all range states, relevant countries will be specified in the next stage of the process
1.2 Bycatch of vulnerable life stages of tope is minimised	1.2a: Test gear specific measures that avoid capture of tope (escape hatch etc.) and initiate a process to explore how to make these mandatory for fisheries active in known tope high abundance sites (example nursery areas). 1.2b: Consider temporary closure of areas for fisheries at times when tope species are known to aggregate in these areas (examples feeding grounds) guided by information available on habitat use of tope (e.g. ISRA (see chapter 1.5)	Essential Essential	Medium Short	All All
1.3 Recreational and subsistence catches are regulated and mortality is reduced	1.3 a For recreational fisheries mandate “catch and release” only for tope	High For Countries with negligible recreation catches of tope this measure is of low priority (Sweden)	Short	All (apart from countries where this is already implemented)

	1.3 b For recreational fisheries develop (i.) best-practices to limit mortality and (ii.) a data collection framework for reporting catches to relevant national authorities (iii) quantify post-release survival and best practices to limit mortality in recreational, subsistence and commercial fishery.			
	1.3 c For subsistence fishery engage with local communities to develop best-practices to limit mortality and to develop a reporting system to relevant national authorities	High	Short	All

Objective 2: Essential habitats in the life stages of tope are identified and protected (in alignment with actions under objective 3: improve knowledge base)				
Outcome	Action	Priority	Time Scale	Range States
2.1 Full protection of vulnerable life stages of tope in specific area	2.1: Grant protective status to key coastal tope habitat	High	Short	All
2.2 Mortality of vulnerable life stages of tope is minimized	2.2: Implement measures that protect vulnerable life stage (pups, gravid females etc.) in key habitats	High	Short	All
2.3 Mitigation measures are part of planning process for infrastructure development	2.2: Include possible impacts on tope in environmental impact assessment for coastal and open sea infrastructure development	High	Short	All

Objective 3: Studies to improve the scientific knowledge base on tope are undertaken				
Outcome	Action	Priority	Time Scale	Range States
3.1 Data for underpinning fisheries management is improved	3.1a Improve data collection on catches, discards and landings by (i.) increasing the coverage of observer programmes and (ii.) improving ID skills of all those involved in data collection, if financially feasible	Essential	Short	All Range States
	3.1b Consider a request to ICES by EU, UK and Norway to carry out dedicated data collection and undertake new stock-assessment	Essential	Short	All Range States

	3.1 c Improve species specific monitoring at fish markets and auctions, including improving ID skills through the provision of ID guidance and-or training materials where necessary	Essential	Short	All Range States carrying our market surveys
	3.1d Develop a strategy to address aggregated data and lack of harmonised custom codes with view to ensuring species-specific data collection and reporting	High	Short	All Range States which report catch and landings data
	3.1e For recreational fisheries develop a report on catches under the data collection framework	High	Medium	EU All other range states with recreational fisheries
	3.1f Collaborate with recreational fisheries to make better use of existing databases on catches (or set up new databases where needed), and to evaluate the ecological impact			
3.2 Data on biology and ecology of tope is improved	3.2a Organise a workshop to share (i.) current knowledge on migration and movement of tope, (ii.) information on complementary research techniques (e.g. blood sampling and ultrasound investigations) and (iii.) to develop a multi-annual tagging programme. Share methods on complementary research techniques such as blood sampling and ultrasound investigations	Essential	Immediat e	All Range States
	3.2b invest in research programmes to identify migratory routes, critical habitats (e.g. pupping and feeding grounds) and habitat use throughout the life-cycle	High	Short	
	3.2c Invest in research programmes to determine levels of physical and genetic connectivity between critical habitats both between regions and within regions	High	Medium	All Range States
3.3 Effects of stressors on tope are understood and quantified	3.3a Investigate the scope and sources of bioaccumulation of toxic	Medium	Medium	All Range States

	substances in the tope (sub)population 3.3b Assess climate-related threats and incorporate climate resilience into adaptive management strategies			
	3.3c invest in research to quantify the impact of offshore development on tope movements, connectivity and critical habitat use	High	Medium	
3.4 Long-term monitoring across the range of the sub-population is secured	3.4 Invest in monitoring of coastal areas to identify population trends in areas not covered by current sampling programmes	Essential	Short	All Range States
3.5 Tools to measure recovery of sub-population are available	3.5a Organise an expert session with the aim to decide how to address recovery based on the life-cycle of tope and related to actions that stop or deal with threats as well the ecological recovery; taking into account current indicators and/or tools	Essential	Short	All Range States
	3.5b Develop indicators or tools to measure recovery of the (sub)population based on the life-cycle approach	Essential	Medium	All Range States
3.6 A strategy is developed to address mislabelling and misidentification	3.6a Improve species identification of tope and similar species (e.g, smoothhound) among fisheries scientists, market inspectors, and fishers, e.g. through training and use of illustrated guides	Essential	Immediat e	All Range States
	3.6 b Use DNA barcoding to investigate and quantify the scale of mislabelling in seafood supply chains involving tope and smoothhounds	Essential	Short	All Range States

Objective 4: International collaboration is facilitated				
Outcome	Action	Priority	Time Scale	Range States
4.1 A network of experts is established	4.1a Expand the current expert group, where necessary, with representatives from Range States, especially those in the Mediterranean and Northwestern	High	Immediate	All Range States

	African part of the subpopulation, and include RS representatives from other sub-populations			
	4.1 b Invest in capacity building on tope where needed, with regards to expertise in fisheries, policy and management, as well as scientific experts;	Essential	Immediate	All Range States
	4.1c Undertake collaborative workshops among researchers studying tope to consolidate data resources and support the development of broader-scale ecological and management insights	Essential	Short	All Range States
4.2 Collaboration between relevant competent bodies is improved	4.2a Invest in coordination between the relevant authorities for conservation and fisheries management in West Africa, the Mediterranean and the North East Atlantic and ensure coherent legislation for tope shark across the range of the sub-population	Essential	Short	All Range States
	4.2b Invest in coordination between the fisheries bodies in West Africa, the Mediterranean (GFCM) and the North East Atlantic (ICES) across the range of the sub-population to share fisheries data (catches, landings, discards) and to ensure the development of coherent fisheries advice	Essential	Short	All Range States

Objective 5: Funding for SSAP implementation over time is secured				
Outcome	Action	Priority	Time Scale	Range States
5.1 Tope included in marine policies	5.1 Ensure tope is incorporated in marine policies focussed on conservation (e.g. national plans for the nature restoration law etc.) and sustainable fisheries	High	Short	All Range States
5.2 Tope included in large-scale research projects	5.2 Incorporate research on tope in large scale research programmes (e.g .EU Horizon programme, etc.)	High	Short	All Range States

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