

Mediterranean Angel Sharks: SubRegional Action Plan (SubRAP)

GSA 21 (Southern Ionian Sea)

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INTRODUCTION

Three species of Critically Endangered angel shark are present in the Mediterranean with overlapping ranges:

- *Squatina aculeata* **Sawback Angelshark** (EN), سفن مشوك شكاطلو **Esfen Moshaoak-shkatleo** (LY)
- *Squatina oculata* **Smoothback Angelshark** (EN), سفن مبيع شكاطلو **Esfen Mobaka-shkatleo** (LY)
- *Squatina squatina* **Angelshark** (EN), سفن شكاطلو **Esfen-shkatleo** (LY)

The *Mediterranean Angel Sharks: Regional Action Plan* (Gordon *et al.*, 2019) sets out a roadmap to help restore these enigmatic species to robust populations in the region. It acts as a call to action for stakeholders to work together to address the challenges faced by these three imperilled species.

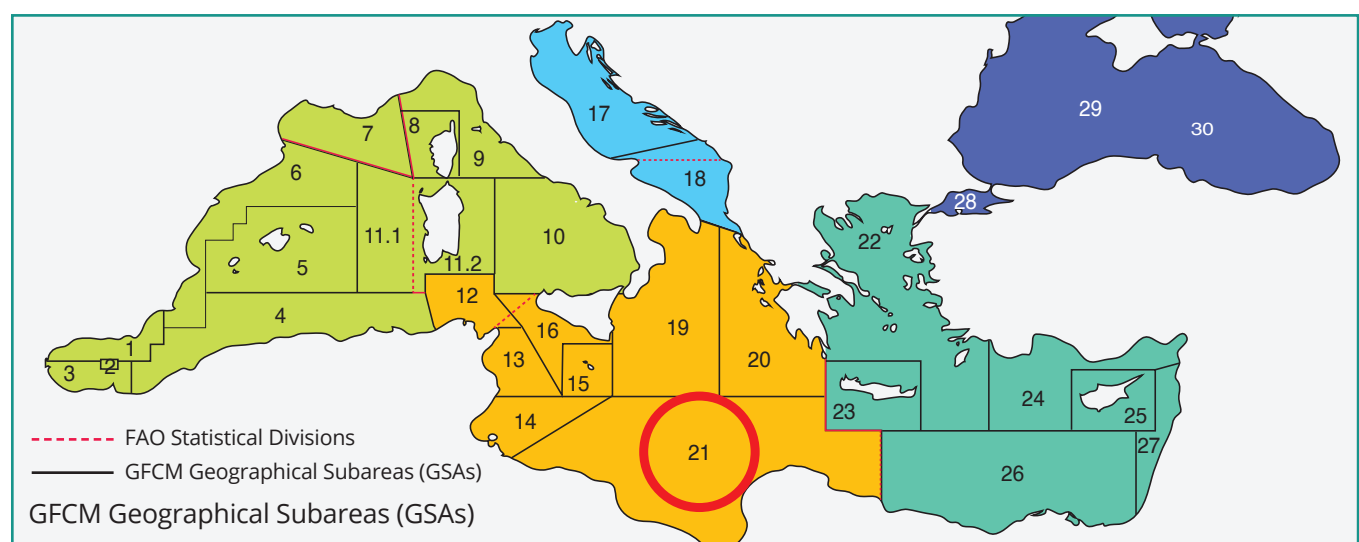
With over 20 coastal states and territories, the complex nature of the Mediterranean creates further need for highly collaborative action to build capacity for angel shark conservation. To allow a tailored approach in priority regions, SubRegional Action Plans (SubRAPs), such as this, are designed to facilitate further coordinated action by engaging regional stakeholders, including governments and industry.

The *Mediterranean Angel Sharks: Regional Action Plan* should be referred to for more detail (available in [Arabic](#), [English](#), [French](#) and [Spanish](#)).

IMPORTANCE OF SUBAREA

General Fisheries Commission for the Mediterranean (GFCM) *Geographical Subarea* (GSA) 21 has been identified as a priority region for angel sharks, given the contemporary distribution of the three species of *Squatina* found in the Mediterranean. There have been recent captures (and subsequent trade) of all three species (Sara A. A Al Mabruk, pers. comm., December 2020). Currently there are no national regulations in place to prohibit this.

Lead partners involved in this SubRAP are *Marine Biology in Libya*, *iSea*, *Universidad Las Palmas de Gran Canaria*, *Zoological Research Museum Alexander Koenig* and *Zoological Society of London* (as part of the Angel Shark Project: Libya) and the *Shark Trust*.



FAO (2018). The State of Mediterranean and Black Sea Fisheries. General Fisheries Commission for the Mediterranean.

EXISTING REGIONAL PROJECTS AND INITIATIVES

Key projects already established in GSA 21 which will be engaged during this process include:

Angel Shark Project: Libya (ASP: Libya) – collects and assesses information on angel shark occurrence from three major fish markets (Benghazi, Misrata and Tripoli) and promotes the reporting of angel shark catch and identification by fishers for better understanding of angel shark presence in Libya. Angel Shark Project: Libya is a collaboration between Marine Biology in Libya, iSea, Universidad de Las Palmas de Gran Canaria, Zoological Research Museum Alexander Koenig and Zoological Society of London.

Marine Biology in Libya – aims to collect and share scientific research results, observations, and sightings on the marine environment in Libya, to raise awareness of the threats facing marine organisms and the environment.

SPECIES MANAGEMENT

All three Mediterranean *Squatina* species are listed under binding Recommendation GFCM/42/2018/2 (amending GFCM/36/2012/3) which was adopted by the 24 Parties to the GFCM. This Recommendation prohibits the retention and sale of 24 elasmobranchs listed on Annex II of the Barcelona Convention. This regulation is operational and requires transposition into national legislation, it has not yet been transposed into Libyan legislation.

Whilst there is no national legislation in place in Libya specifically for *Squatina* species, existing national legislations that address the marine environment and may be of significance to angel sharks are:

- Law No. 14 of 1989 on regulating the exploitation of marine resources
- Law No. 15 of 2003 on the protection and improvement of the environment
- General People's Committee, Decision No. 37/2005 concerning the declaration of a Libyan fisheries protection zone in the Mediterranean Sea
- General People's Committee, Decision No. 271/2004 defining a specific protected area from trawl fishing (prohibiting trawlers from fishing in the defined areas from May to July)

RECENT SIGHTINGS AND NON-COMPLIANCE

Recent sightings have been documented in the Southern Ionian Sea for all three Mediterranean angel shark species (Giovos *et al.*, 2019; Al Mabruk *et al.*, 2019), with sightings as recently as December 2020 for *S. squatina* (Misrata and Benghazi), December 2020 for *S. oculata* (Misrata and Benghazi), and December 2020 for *S. aculeata* (Misrata) (Angel Shark Project: Libya, unpublished data).

Many of these sightings have been documented during fish market surveys in Libya. It is common to see angel sharks landed and sold year-round with some anecdotal evidence of higher angel shark catch between December and April.

Sightings can be reported through the Angel Shark Conservation Network (ASCN) Angel Shark Sightings Map at www.angelsharknetwork.com/#map

(Arabic version available)



THREATS

Priority threats in the Southern Ionian and Central Mediterranean Sea remain largely the same as across the rest of the Mediterranean. These include lack of species-specific landings and identification issues in Small-Scale Fisheries (SSF) and Large-Scale Fisheries (LSF); Illegal, Unreported and Unregulated (IUU) fishing; and impact of differing types of fishing gear in both SSF and LSF. Impact of subsistence fishing has also been identified as a priority threat in this sub-region.

With so little known about habitat preference of angel sharks and the effect of other anthropogenic pressures (other than fishing), secondary threats are perceived to include degradation of habitat; pollution caused by runoff, sewage, and oil spills; coastal infrastructure building and development; and the potential impact of recreational fishing.

CONSTRAINTS

The absence of national fisheries regulations or transposition of international regulation for all three angel shark species in Libya is a major constraint.

Political instability in Libya has resulted in weakened research institutions and monitoring authorities. This has been a major obstacle in advancing species conservation in the region. The recent formation of a national unified government will begin the process of aligning institutions and authorities from the east and west of the country.

Systematic monitoring is lacking in fish market auctions where trade and mislabelling is common. This is largely due to the widespread nature of Small-Scale Fisheries, limited infrastructure, and a lack of species-specific knowledge.

ACTIONS

A working version of this SubRAP is retained by the lead partners outlined in this document. In the working version, actions have been adapted and attributed to relevant bodies working in GSA 21 and they have been assigned approximate timescales (short, medium, long term) and costs (€, €, €, €€€). Where existing projects and initiatives are in place, it is the intention of the authors that necessary actions will be approached in a collaborative manner.

Actions in this SubRAP have been taken from the overarching **Mediterranean Angel Sharks: Regional Action Plan** (MedRAP) and further tailored to a sub-regional level. Refer to the MedRAP for the full set of actions.

Threat – A factor which causes either a substantial decline in numbers of individuals of that species, or a substantial contraction of the species' geographic range.

Priority threat – The most pertinent threats identified for angel sharks in Libya at this time.

Secondary threat – Considered a possible threat for angel sharks in Libya at this time. Further data is required to assess and prioritise these.

Constraints – Factors which contribute to or compound the threats. (For example, lack of political will and resources might contribute to a lack of law enforcement, leading in turn to over-exploitation).

Goal – A description in operational terms to capture what needs to be done and where, to save the species.

Objective – Summary of the approach to be taken to achieve the Vision and Goals, normally relating to a set of threats and constraints.

Headline threat categories are identified with second-level threats outlined below each category. Priority and secondary threats for the Southern Ionian Sea are highlighted.

Table adjusted from Figure 6 in the *Mediterranean Angel Sharks: Regional Action Plan*.

THREAT CATEGORIES							
1 Agriculture & Aquaculture	2 Biological Resource Use	3 Climate Change & Severe Weather	4 Human Intrusion & Disturbance	5 Invasive & Other Problematic Species, Genes & Diseases	6 Pollution	7 Residential & Commercial Development	8 Transportation & Service Corridors
1.1 Aquaculture cages (hormones, food etc.)	2.1 Illegal, Unreported & Unregulated (IUU) fishing	3.1 Changing water temperature	4.1 Degradation of habitat	5.1 Pathogens	6.1 Water pollution/runoff	7.1 Coastal building and infrastructure development	8.1 Pipelines and electrical cables
	2.2 Small-scale & Large-scale fisheries: lack of species-specific landings and identification issues		4.2 Altered seafloor morphology	5.2 Low genetic diversity (genetic bottlenecks/ population fragmentation)	6.2 Micro/macro plastics	7.2 Renewable energy (e.g. wind farms, underwater turbines, lagoons)	8.2 Shipping disturbance (e.g. physical disturbance, noise pollution)
	2.3 Small-scale & Large-scale fisheries: impact of different gear types		4.3 Anchor damage of habitats	5.3 Invasive species	6.3 Sewage	7.3 Extractive Industries (e.g. aggregate, mining, dredging)	
	2.4 Subsistence/ food security		4.4 Recreational watersports		6.4 Oil spills		
	2.5 Recreational and sports fishing (e.g. rod & line, surfcasting, spearfishing)		4.5 Increasing number of tourists		6.5 Eutrophication		
	2.6 Ghost fishing		4.6 Physical disturbance				
	2.7 Alteration of the food web (overfishing of prey species)		4.7 Diver disturbance				
			4.8 Impact of beach users/ activities on coastal nursery areas				

Priority Threat



Secondary Threat



Not a current threat



FISHERIES

GOAL 1: FISHERIES BASED ANGEL SHARK MORTALITY IS MINIMISED IN THE SOUTHERN IONIAN SEA

The Libyan fleet is compiled of approximately 3,687 licensed artisanal vessels (Shakman *et al.*, 2014) and approximately 140 licensed industrial vessels (Sacchi, 2011; Khalfallah *et al.*, 2015). A variety of static and towed gear are used including light traps, trammel nets, gillnets, longlines, bottom trawls, trolling lines, and hook and lines.

Vessels owned or rented by an individual or group often sell their catch at auction markets or ports to small traders or restaurant owners. Owners of Small-Scale Fisheries often have a dedicated place inside the port where they sell their catch. Fish markets inside ports are subject to monitoring from the Marine Wealth Authority, however monitoring tools and species identification is lacking.

Recreational fishers mostly use spearguns, and primarily sell their catch on the side of the road, or more recently because of the COVID-19 pandemic, via Facebook groups with delivery service.

GOAL 1 Fisheries based angel shark mortality is minimised in the Southern Ionian Sea.	
Objective 1.1	Reporting and monitoring in all segments of coastline in the areas of interest, including recreational, is improved for the three species of angel shark.
Objective 1.2	Incidental catch of angel sharks by all fisheries is minimised.
Objective 1.3	Retention is reduced, and post release survival enhanced, through information, training, and education for fishers
Objective 1.4	The extent of interaction between marine recreational fishing activities and angel sharks is ascertained and minimised

Action No.	Actions (adapted from MedRAP) Actions in BOLD text already in progress. Actions highlighted in pink identified as high priority. Other high priority actions will follow.	By who
1.1.1	Translate identification materials featuring the three species of angel sharks and lookalike/similar species (e.g. guitarfishes) in Arabic so species-specific reporting is improved (see Action 1.3.2 for follow-up).	Government, NGOs
1.1.2	Translate guidance documents for reporting procedure in line with GFCM Recommendations for data recording and ensure the document is accessible to industry.	Government, NGOs, Fishing Industry
1.1.3	Angel Shark Sightings Map widely advertised through social media to encourage submissions from commercial fishers and recreational anglers.	NGOs
1.1.4	Engage with regional observer programmes to ensure collation of angel shark records.	RAC/SPA, NGOs, ASCN
1.1.5	Comply with existing GFCM and national reporting procedures.	Government, Fishing Industry
1.2.1	Collate data on angel shark catch to inform management measures (liaise with programmes such as the Med Bycatch Project).	Government, NGOs
1.2.2	Ascertain the level of angel shark catch, and whether it is targeted or incidental, by gear type in order to inform further necessary action.	Government, Fishing Industry, NGOs
1.2.3	Map hotspots for angel shark catch (spatially and temporally).	NGOs, ASCN, Researchers
1.2.4	Secure spatial/temporal management and gear restrictions based on collated data	Government, ASCN, NGOs, GFCM, Fishing Industry
1.2.5	Work with fishers to identify spatial/temporal management and/or gear restrictions options based on collated data. Determine what could be feasible with the fishing community.	Government, NGOs, ASCN, Fishing Industry
1.3.1	Develop angel shark handling guides for fishers to improve post-release survival in the Mediterranean (using existing guidance materials as a basis).	NGOs, ASCN
1.3.2	Identification (see Action 1.1.1) and handling guides (see Action 1.3.1) to be disseminated amongst fishing industry, recreational anglers, enforcement bodies, fish markets, governments etc.	Government, Fishing Industry, NGOs
1.3.3	Develop training programmes to educate fishers about conservation status and prohibited status of angel sharks, as well as best practice handling techniques.	Government, Fishing Industry, NGOs, Researchers
1.3.4	Ascertain other drivers of angel shark retention to inform actions.	NGOs, ASCN
1.4.1	Quantify the level of recreational fishing activity in GSA 21, guided by GFCM recreational fisheries handbook.	Fishing Industry, NGOs
1.4.2	Collate information on licence enforcement systems in GSA 21 and what requirements are stipulated.	Government, NGOs, ASCN
1.4.3	Determine how often recreational fishers encounter angel sharks (contemporary and historic records)	NGOs, ASCN, Fishing Industry
1.4.4	Create recreational fishing best practice guidelines specific to the three <i>Squatina</i> species in the Mediterranean drawing on existing recreational guidelines where available.	NGOs, ASCN
1.4.5	Identify angling clubs/shops in each region where guidelines can be distributed	NGOs, ASCN
1.4.6	Encourage participation of recreational fishers in data collection	NGOs, ASCN

HABITATS & NON-FISHING HUMAN IMPACT

GOAL 2: ANGEL SHARK HABITAT IS IDENTIFIED AND PROTECTED

The Libyan coast extends for ~2,000 kilometres and occupies ~36% of the southern coast of the Mediterranean. Little is known about sea floor habitat in Libyan waters.

Several monitoring and research programs have been carried out in Libya, however large knowledge gaps still exist, particularly regarding cartilaginous fishes.

Trawl fishing is prohibited in defined areas from May to July however law enforcement is lacking. These areas are not monitored, and restrictions not enforced. Twenty-four sites have been proposed as Marine and Coastal Protected Areas based on existing information and the knowledge of experts (Hamza *et al.*, 2011). These sites are coastal (includes terrestrial areas) and not in open sea.

GOAL 2 Angel shark habitat is identified and protected.	
Objective 2.1	Angel shark distribution is better understood.
Objective 2.2	The impact of non-fishing activities on angel sharks in the area is better understood .
Objective 2.3	Angel shark habitat is identified, specifically Critical Angel Shark Areas (CASAs).
Objective 2.4	Angel shark habitat is reflected in marine spatial planning and coastal development.

Action No.	Actions (adapted from MedRAP) Actions in BOLD text already in progress. Actions highlighted in pink identified as high priority. Other high priority actions will follow.	By who
2.1.1	Increase the profile of three species to encourage public reporting to Angel Shark Sightings Map, complementing fisheries data.	NGOs, ASCN
2.1.2	Liaise with scientific surveys operating in the region and encourage engagement with this SubRAP (e.g. through data provision, assessments etc.).	ASCN, NGOs, Researchers
2.1.3	Use fisheries data, sightings data and other reporting methods to improve spatial data on distribution.	Government, Fishing Industry, Researchers, ASCN
2.2.1	Engage divers in the region to look out for signs of presence (e.g. angel shark 'beds').	NGOs, ASCN
2.2.2	Identify and map popular dive sites and compare with sightings data.	Researchers, NGOs, ASCN
2.2.3	Investigate impact of diving near CASAs.	Researchers, NGOs, ASCN
2.2.4	Confirm if noise impacts angel sharks and propose mitigation measures.	Researchers, ASCN
2.2.5	Identify if areas with high levels of pollution (plastics, agriculture etc.) overlap with important areas for angel sharks	Researchers
2.3.1	Determine general features of potential CASAs based on those habitats in which angel sharks have been sighted on previously.	Researchers
2.3.2	Based on Action 2.3.1, examine models to identify potential CASAs.	Researchers
2.3.3	Increase engagement with SPA/RAC habitat mapping programs to identify potential CASAs.	Government, RAC/SPA, NGOs,
2.3.4	Evaluate spatial distribution of threats and existing conservation measures (e.g. MPAs).	Government, Researchers
2.3.5	Identify key habitats that are not protected/not sufficiently protected and make suggestions for improved management of areas (with involvement from stakeholders).	Government, Researchers
2.3.6	Identify activities and develop action plans aiming to conserve and restore CASAs in CMS Range States, in line with CMS Appendix I obligations.	CMS Parties
(2.4.1	<i>Action removed from this SubRAP as not relevant.)</i>	
2.4.2	Monitor coastal developments near CASAs.	Government, NGOs, Researchers
2.4.3	Identify what spatial/temporal management measures would be most appropriate in GSA 21.	Government, NGOs
2.4.4	Include CASAs in MPA processes to ensure these areas are managed sustainably, that important habitat features are conserved and maintained or re-established and that impacts on angel sharks are kept at acceptable levels.	Government, NGOs
*2.4.5	Promote a citizen science observatory for angel sharks.	NGOs, ASCN

*New action for this SubRAP

Critical Angel Shark Areas (CASAs) – A specific geographic area that contains essential features necessary for the conservation of angel sharks. This may include an area that is not currently occupied by the species that will be needed for its recovery or conservation e.g. nursery, mating, aggregation and foraging areas.

LEGISLATION AND REGULATIONS

GOAL 3: NATIONAL LEGISLATION FOR ANGEL SHARKS IS ESTABLISHED, IMPLEMENTED AND ENFORCED

The GFCM Recommendation 42/2018/2 has not been transposed into Libyan legislation.

Libya has ratified several regional and international conventions dealing with marine and coastal conservation. Many marine conservation actions were introduced and still function within the framework of the national implementation of those conventions. However, a lack of law enforcement and monitoring is a major obstacle when implementing convention text.

There is no action plan for the conservation of elasmobranchs in Libya.

UNDERLYING GOAL

National legislation for angel sharks is established, implemented and enforced.

Objective 3.1	Angel sharks are protected by regional and national management measures.
Objective 3.2	Management measures are implemented and enforced.
Objective 3.3	CASAs are protected through appropriate spatial and/or temporal management of non-fishing as well as fishing activities (in line with Goal 2).

Action No.	Actions (adapted from MedRAP) Actions highlighted in pink identified as high priority. Other high priority actions will follow.	By who
3.1.1	Review national legislation and identify gaps in the implementation of relevant international and regional obligations, including those under GFCM and CMS.	Government, CMS, GFCM
3.1.2	Transpose GFCM/42/2018/2 into national legislation.	Government
3.1.3	Fulfil obligations under CMS App I & II listing and CMS Sharks MoU Annex I.	Government
3.1.4	Engage with governments/CMS Range States and industry to aid compliance with existing legislation/policies/regulations.	NGOs, ASCN
3.1.5	Where absent, seek adoption of full protective measures to cover recreational activities and disturbance.	Government, NGOs,
3.2.1	Implement and enforce GFCM/42/2018/2 & national legislations.	Government, Fishing Industry, NGOs
(3.2.2)	<i>Action merged with 3.1.3 for this SubRAP.)</i>	
3.2.3	Reinforce compliance reporting processes at regional fora, requiring more detailed documentation.	Government, GFCM, NGOs
3.2.4	Work with government to deal with cases of non-compliance with existing legislation/policies/regulations to key regional and international fora (e.g. GFCM, SPA/RAC, CMS).	NGOs, ASCN
3.2.5	Engage with CMS Focal Points to seek comment on the RAP.	CMS Secretariat
3.2.6	Promote RAP at relevant fora (e.g. CMS, GFCM, SPA/RAC).	ASCN
3.2.7	Ensure regulatory obligations are reflected in training for fishers, accommodating subregional constraints.	Government, NGOs,
3.3.1	Advocate for adoption of spatial/temporal management in appropriate fora (e.g. GFCM, SPA/RAC) and at country level.	NGOs
3.3.2	Ensure CMS obligations are reflected in marine spatial planning (e.g. MPAs, FRAs, SPAs) and coastal development processes.	Government, NGOs, CMS Parties

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GLOSSARY/ACRONYMS

ASCN – Angel Shark Conservation Network

CASA – Critical Angel Shark Area

CMS – Convention on the Conservation of Migratory Species of Wild Animals

FRA – Fisheries Restricted Area

GFCM – General Fisheries Commission for the Mediterranean

GSA – Geographical Subarea

LSF – Large-Scale Fisheries

MPA – Marine Protected Area

NGO – Non-governmental Organisation

RAC/SPA – Specially Protected Areas Regional Activity Centre

SPA – Special Protection Area

SSF – Small-Scale Fisheries

If you would like to be further involved in this work, please email angels@sharktrust.org with details about the work you are undertaking and we would be pleased to discuss engagement.



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