

Mediterranean Angel Sharks: SubRegional Action Plan (SubRAP)

GSA 25* (Cyprus – Northern Cyprus)

*SubRAP – GSA 25 consists of two parts

Elizabeth G.T. Bengil¹, Brendan J. Godley², Rebecca L. Gillham³, Ali R. Hood³, Robin T. E. Snape^{1,2}

¹ SPOT – Kuzey Kıbrıs Kaplumbağaları Koruma Cemiyeti ² Centre for Ecology and Conservation – University of Exeter ³ Shark Trust

INTRODUCTION

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

- *Squatina aculeata* **Sawback Angelshark** (EN), **Kedi** (TR)
- *Squatina oculata* **Smoothback Angelshark** (EN), **Kedi** (TR)
- *Squatina squatina* **Angelshark** (EN), **Kedi** (TR)

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.

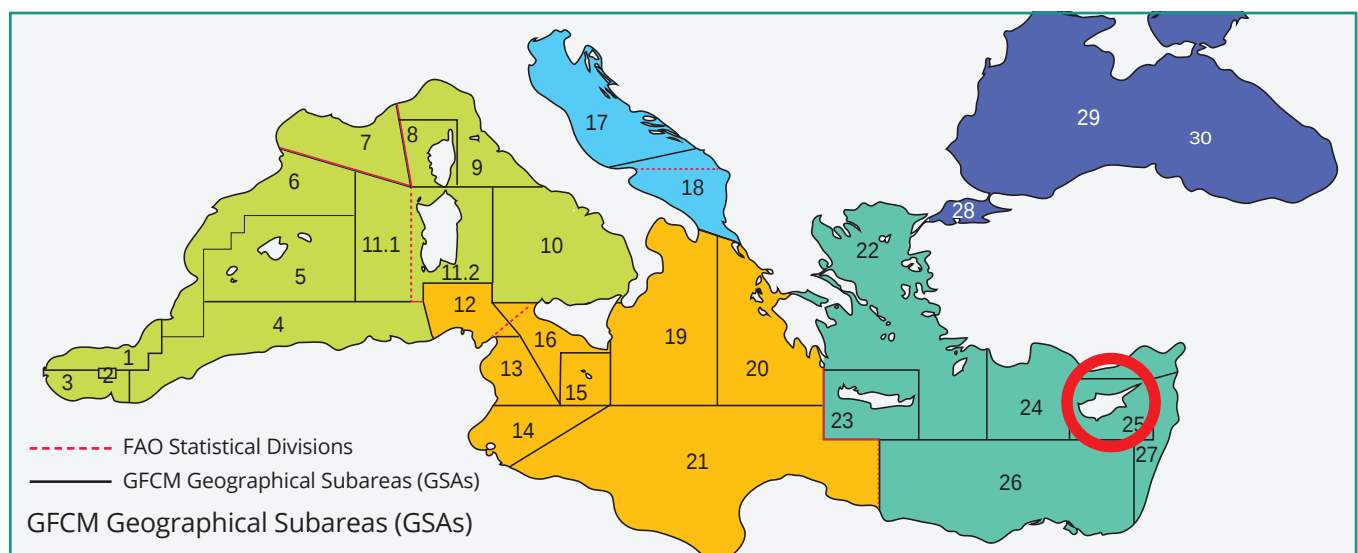
With over 20 coastal states and territories, the complex nature of the Mediterranean creates further need for highly collaborative action to build capacity for angel shark conservation. To allow a tailored approach in priority regions, SubRegional Action Plans (SubRAPs), such as this, are designed to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

IMPORTANCE OF SUBAREA

General Fisheries Commission for the Mediterranean (GFCM) *Geographical Subarea* (GSA) 25 has been identified as a priority region for angel sharks, given the contemporary occurrence of all three species of *Squatina* known in the Mediterranean. There have been recent captures (and subsequent sale) of all three species in Northern Cyprus, currently there are no regulations in place to prohibit this.

Lead partners involved in this SubRAP are the *Shark Trust*, *SPOT – Kuzey Kıbrıs Kaplumbağaları Koruma Cemiyeti* and *Centre for Ecology and Conservation – University of Exeter*



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

EXISTING REGIONAL PROJECTS AND INITIATIVES

Two key projects already established in GSA 25 – Northern Cyprus will be engaged during this process:

Cyprus Bycatch Project (SPOT, Birdlife International, BirdLife Cyprus, Enalia Physis and University of Exeter [Funded by MAVA Foundation]) – assesses and monitors the issue of fisheries bycatch in Cyprus. Through an onboard observation programme developed by the General Fisheries Commission for The Mediterranean (GFCM) for Mediterranean-wide application, measurements and samples are collected by observers and collaborating fishers. Bycatch rates are assessed for species and taxonomic groups and applied to national fishing effort estimates to extrapolate annual bycatch and mortality of vulnerable species including all elasmobranchs. Through data collection and workshops, mitigation measures are examined with a focus to advocate for and implement changes in practices, update national legislation and conservation areas.

Cyprus Elasmobranch Research and Conservation Network (CERECON) (SPOT and Enalia Physis [Funded by MAVA Foundation]) – aims to better understand the diversity and ecology of threatened and data deficient elasmobranchs in Cyprus to better manage populations. Angel sharks encountered through targeted and casual observations, are measured, analysed, and sampled for genetic testing with the objective of feeding additional knowledge into bycatch management plans and proposing conservation measures.

SPECIES MANAGEMENT

Currently there is no national or regional legislation in place for *Squatina* species in Northern Cyprus. All three species can be legally targeted, caught and traded.

RECENT SIGHTINGS AND NON-COMPLIANCE

Contemporary sightings have been recorded for all three Mediterranean *Squatina* species (Bengil and Bengil, 2018; Bengil *et al.*, 2020; Snape *et al.*, 2020), with the most recent sightings in October 2020 for *S. oculata* (Lefke), May 2020 for *S. squatina* (Karpaz), and July 2019 for *S. aculeata* (Karpaz).

Many of these sightings have been documented as bycatch incidents recorded during onboard assessments, and observations from fish mongers and markets.



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

◀ *Squatina oculata*
- Lefke, Cyprus
© Şilvan Yaşlı

▼ *Squatina squatina*
- Yenierenkoy, Cyprus
© Elizabeth Bengil



THREATS

Priority threats in Northern Cyprus remain largely the same as across the Mediterranean. These include species identification issues and a lack of species-specific landing; impact of differing gear types in Small-Scale Fisheries (SSF). The absence of fisheries regulations for *Squatina* species means targeting, capturing and trade of all three *Squatina* species is legal, and catches are unreported and unregulated.

Whilst little is known about the preferred habitat of angel sharks in Northern Cyprus, an additional priority threat is perceived to be habitat degradation caused by an increase in coastal building and infrastructure development.

Secondary threats identified in this subregion include an increasing number of tourists and the impacts of recreational fishing, watersports, and pollution.

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.

CONSTRAINTS

The absence of fisheries regulations for all three *Squatina* species is a major constraint in Northern Cyprus. Regional governance and international conventions do not recognise Authorities in Northern Cyprus and have minimal legislative influence. Political sensitivities have resulted in limited engagement from international NGO's and organisations, in turn limiting the capacity and resources of local NGOs, researchers, and other stakeholders.

Further constraints include lack of awareness of *Squatina* species and species-specific identification issues.

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).

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 25 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.

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 Northern Cyprus 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 NORTHERN CYPRUS

The fleet in Northern Cyprus is compiled of 498 vessels registered in ports across three regions: Gemikonağı, Girne, and Gazimağusa. Of which, 340 vessels have active licenses. All are small-scale vessels using bottom-set trammel nets, bottom-set gillnets, mixed trammel nets and bottom-set longlines. Less than 10% of these vessels also use pelagic longlines. No Large-Scale Fisheries or trawlers operate as part of the Northern Cyprus fleet.

An estimated 500 angel sharks are caught annually in Northern Cyprus (Snape *et al.*, 2020), primarily in bottom-set nets. The majority are retained for trade or used as bait, with some now being released following awareness raising efforts.

In 2020, a SSF co-management regulation was drafted by the Ministry for Agriculture and Natural Resources. This set out a framework for fisheries stakeholders (conservation groups, scientists, authorities, and fishers) to work together to develop fisheries legislation. Through Cyprus Bycatch Project, a co-management pilot site is being established between stakeholders. Area patrols will be carried out to determine if fisheries regulations are adhered to.

Recreational fishing is popular in Northern Cyprus with approximately 20,000 amateur fishers involved in sea fishing from shore and small outboards. Recreational fishers are permitted to use rods, nets and demersal longlines. Non-compliance of existing regulations and permitted gear is prevalent, and illegal trade of catch takes place. The magnitude of catch is unknown, and regulations, monitoring and enforcement is lacking.

GOAL 1 Fisheries based angel shark mortality is minimised in Northern Cyprus.	
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 highlighted in bold text already in progress	By who
1.1.1	Translate identification materials featuring the three species of angel sharks and lookalike/similar species (e.g. guitarfishes) so species-specific reporting is improved.	NGOs, Researchers
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.	NGOs, Government, Fishing Industry, Researchers
1.1.3	ASCN Angel Shark Sightings Map widely advertised through social media to encourage submissions from recreational anglers.	ASCN, NGOs, Researchers
1.1.4	Engage with regional observer programmes to ensure collation of angel shark records.	NGOs, ASCN, Government, Researchers
1.1.5	Comply with existing GFCM and national reporting procedures.	Fishing Industry, Government
1.2.1	Collate data on incidental catch to inform management measures (liaise with programmes such as the Med Bycatch Project).	NGOs
1.2.2	Ascertain the level of bycatch and incidental catch by gear type in order to inform further necessary action.	Government, Fishing Industry, NGOs
1.2.3	Map hotspots for bycatch of angel sharks (spatially and temporally).	NGOs, ASCN, Researchers
1.2.4	Secure spatial/temporal management and gear restrictions based on collated data.	Government, ASCN, NGOs, Researchers
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, Government
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.	NGOs, Governments
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, NGOs
1.3.4	Ascertain other drivers to angel shark retention to inform actions.	NGOs, ASCN
1.4.1	Quantify the level of recreational fishing activity in the Mediterranean, guided by GFCM recreational fisheries handbook.	NGOs, Researchers, Government
1.4.2	Collate information on whether licence systems are in force in each subregion and what requirements are stipulated.	NGOs, ASCN, Researchers, Government
1.4.3	Determine how often recreational fishers encounter angel sharks (contemporary and historic records).	NGOs, ASCN
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, Researchers
1.4.5	Identify angling clubs/shops in each region where guidelines can be distributed.	NGOs, ASCN, Researchers
1.4.6	Encourage participation of recreational fishers in data collection.	NGOs, ASCN, Researchers

HABITATS & NON-FISHING HUMAN IMPACT

GOAL 2: ANGEL SHARK HABITAT IS IDENTIFIED AND PROTECTED

The sea floor habitat around Northern Cyprus is largely unmapped. Potential Natura 2000 (Special Environment Protected Areas) areas were identified in Northern Cyprus based on limited marine biodiversity and fisheries data with sea turtle nesting beaches and terrestrial habitats used as a baseline.

MPAs extend from the coastal areas around the Kormacit Peninsula, Alagadi, Tatlisu, North Karpaz and South Karpaz. MPA boundaries extend to the 35 m bathymetric contour or to 1.5 km offshore and represent over 30% of the coast. All net fishing is banned within these areas. Due to a paucity of marine biodiversity and fisheries information available during the establishment of these MPAs, areas of significant habitat for angel sharks may have been overlooked (Snape *et al.*, 2018).

Management plans were established for potential Natura 2000 areas, but marine areas are yet to be implemented locally. MPAs are difficult to enforce in Northern Cyprus in their current form, as proposed fisheries restrictions may undermine rural fisheries employment.

Trawling has been banned since 1998. Whilst it is not known exactly how this has impacted angel shark habitat, given their demersal nature it is expected to have had a positive effect.

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 highlighted in bold text already in progress	By who
2.1.1	Increase the profile of three species to encourage public reporting to ASCN Angel Shark Sightings Map, complementing fisheries data.	ASCN, NGOs, Government
2.1.2	Liaise with scientific surveys operating throughout the Mediterranean and encourage engagement with this RAP (e.g. through data provision, assessments etc.).	ASCN, NGOs, Researchers
2.1.3	Use fisheries data and other reporting methods to improve spatial data on distribution.	ASCN, Government, Fishing Industry
2.2.1	Engage dive clubs across the Mediterranean to look out for signs of presence (e.g. angel shark 'beds').	NGOs, ASCN, Government, Researchers, Wider industry
2.2.2	Identify and map popular beaches and dive sites and compare with sightings data.	Researchers, NGOs, ASCN, Government
2.2.3	Investigate the impact of tourism near CASAs.	Researchers, NGOs, ASCN
2.2.4	Confirm if noise impacts angel sharks and if there are ways this can be mitigated.	Researchers, ASCN
2.2.5	Identify if areas with high levels of pollution (plastics, agriculture etc.) overlap with important areas for angel sharks.	Researchers, NGOs
2.3.1	Determine general features of potential CASAs based on those habitats in which angel sharks have been sighted on previously.	Researchers, NGOs
2.3.2	Based on Action 2.3.1, examine models to predict potential CASAs.	Researchers
2.3.3	Increase engagement with SPA/RAC habitat mapping programmes to identify potential CASAs.	NGOs, RAC/SPA, Governments, Researchers
2.3.4	Evaluate spatial distribution of threats and existing conservation measures (e.g. MPAs, Natura 2000).	Researchers, NGOs
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).	Researchers, NGOs
2.3.6	Identify activities and develop management plans aiming to conserve and restore CASAs in CMS Range States, in line with CMS Appendix I obligations.	CMS Parties
2.4.1	Engage with Environmental Impact Assessment process prior to coastal developments near CASAs.	Governments, Wider industry, NGOs
2.4.2	Monitor coastal developments near CASAs and mitigate impacts where possible.	Governments, Wider industry, NGOs
2.4.3	Identify what spatial/temporal management measures would be most appropriate according to each subarea.	Governments, Input from NGOs, Researchers
2.4.4	Include CASAs in MPA processes and EIA 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.	Governments, Researchers, NGOs
*2.4.5	Promote a citizen science observatory for angel sharks.	NGOs

**New action for this SubRAP*

Critical Angel Shark Areas – 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

There is no legislation specifically relating to *Squatina* species in Northern Cyprus. All three species found in the Mediterranean can be legally targeted, caught, and traded.

A list of elasmobranchs, containing species listed under Annex II of the Barcelona Convention (including the three Mediterranean species of angel shark), was submitted to the Northern Cyprus authorities in January 2021. It is anticipated that legislation will be developed for these species in 2021 and trade will be prohibited.

The Military Coastguard is the main enforcement body in Northern Cyprus. However, their focus is primarily on military operations with enforcement of SSF's likely considered a secondary role. There is limited capacity and resources to monitor and control fisheries.

A lack of influence of international governance and political isolation of the community from many regional projects and fora has led to low engagement and inaction with respect to fisheries.

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 bold text already in progress	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.	Governments, CMS, ASCN, Researchers
3.1.2	Transpose GFCM/42/2018/2 into national legislation where lacking.	Governments, NGOs
3.1.3	Fulfil obligations under CMS App I & II listing and CMS Sharks MoU Annex I.	Governments, CMS
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.	NGOs, Governments, Researchers
*3.1.6	Register all three species as protected under the Northern Cyprus Environmental law of the Ministry for Environment and Tourism.	Government, NGOs
3.2.1	Implement and enforce GFCM/42/2018/2 & national legislations.	Governments, Fishing Industry, NGOs
3.2.2	Implement CMS Appendix I listing in all Mediterranean and Black Sea Range States.	Governments, NGOs, Researchers
3.2.3	Reinforce compliance reporting processes at regional fora, requiring more detailed documentation.	Governments, NGOs
3.2.4	Highlight 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
3.2.6	Promote RAP at relevant fora (e.g. CMS, GFCM, SPA/RAC).	ASCN, NGOs
3.2.7	Ensure regulatory obligations are reflected in training for fishers, accommodating subregional constraints.	NGOs, Governments
*3.2.8	Ban trade of all three species in Northern Cyprus through the Fisheries Regulation of the Ministry for Agriculture and Natural Resources.	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.	Governments, NGOs, CMS

*New action for this SubRAP

REFERENCES

Bengil, E. G. T. and Bengil, F. (2018) Less known species of North Cyprus: Chondrichthyans. II. International Fisheries Symposium in Cyprus 04-08 November 2018 Girne, Cyprus

Bengil, E. G. T., Snape, R., Akbora, H. D., Çiçek, B. A. and Bengil, F. (in prep. 2020) Less known species of North Cyprus: an updated checklist of Elasmobranchs.

FAO. 2018. The State of Mediterranean and Black Sea Fisheries. General Fisheries Commission for the Mediterranean. FAO, Rome. 172 pp. Licence: CC BY-NC-SA 3.0 IGO.

Gordon, C.A., Hood, A.R., Al Mabruk, S. A. A., Barker, J., Bartolí, A., Ben Abdelhamid, S., Bradai, M.N., Dulvy, N.K., Fortibuoni, T., Giovos, I., Jimenez Alvarado, D., Meyers, E.K.M., Morey, G., Niedermuller, S., Pauly, A., Serena, F. and Vacchi, M. (2019) Mediterranean Angel Sharks: Regional Action Plan. The Shark Trust, United Kingdom. 36 pp

Snape, R. T. E., Bradshaw, P. J., Broderick, A. C., Fuller, W. J., Stokes, K.L., Godley, B.J. (2018) Off-the shelf GPS technology to inform marine protected areas for marine turtles. Biol. Conserv. 227, 301-309.

Snape, R., Bengil, E., Beton, D., Çağlar, Ç., Palmer, J & Broderick, A. (2020) Cyprus Bycatch Project "Understanding multi-taxa 'bycatch' of vulnerable species and testing mitigation a collaborative approach in Cyprus". Technical Report: Results of Phase 1 (2018-20019) of the bycatch monitoring programme in Northern Cyprus. Society for Protection of Turtles (SPOT). Nicosia. Pp45.

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 – GFCM 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.



With support from:



**Shark
Conservation
Fund**

