



Convention on the Conservation of  
Migratory Species of Wild Animals



**Range State Meeting on the Single Species Action Plan  
for the Angelshark in the Mediterranean Sea  
(online, 5 & 6 July 2022)**

CMS/Angelshark-SSAP/Doc.3/Rev.1

**Draft Single Species Action Plan for the Angelshark  
(*Squatina squatina*) in the Mediterranean Sea**

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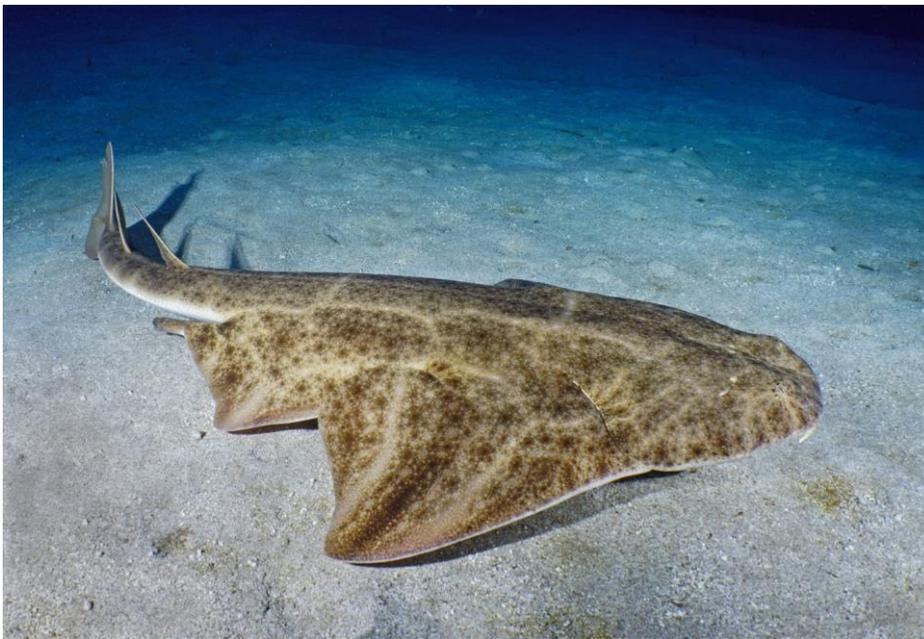


Photo credit: Michael Sealey

***Comments from the Range State Meeting***

***05 July 2022***

## INTRODUCTION

Alongside the inclusion of the Angelshark (*Squatina squatina*) at the 12<sup>th</sup> Conference of the Parties to the Convention (CMS COP12) in Appendices I and II, Parties approved Concerted Action for the species, which was updated and extended until 2023 at CMS COP13 (Concerted Action 12.5 (Rev.COP13))<sup>1</sup>. Among other activities, it was agreed to develop regional Conservation Plans, including for the Mediterranean region.

In March 2019, a workshop was hosted by the Shark Trust and the National Institute of Marine Sciences and Technologies (INSTM) in Tunisia, , bringing together members of the Angel Shark Conservation Network (ASCN) along with local and global experts, to create the Mediterranean Angel Sharks: Regional Action Plan (MedRAP)<sup>2</sup>. This action plan collated information on three species of Angel Shark within the Mediterranean Sea and developed a strategy for Angel Shark conservation within the region. The MedRAP was designed for a range of stakeholders including governments, researchers, NGOs, as well as commercial and recreational fishing industries.

To implement parts of the CMS Concerted Action and build upon the work developed by the MedRAP, CMS has developed this Single Species Action Plan (SSAP) for the Angelshark (*Squatina squatina*) in the Mediterranean region to work alongside the MedRAP. The SSAP provides a clearly defined plan for CMS Parties, Signatories of the Sharks-MOU, and other Range States, to officially adopt and implement with specific guidance on how this could be achieved.

## ACKNOWLEDGEMENTS

The development of the SSAP was led by James Ellis, vice-chair of the Advisory Committee of the Sharks MOU, and Marino Vacchi, Committee member for Europe. Significant advice was provided by other Committee members and experts from the Angel Shark Conservation Network (ASCN), including the Angel Shark Project (a collaboration led by Universidad de Las Palmas de Gran Canaria, Zoological Research Museum Alexander Koenig and Zoological Society of London), the Shark Trust, supported by the Secretariat and CMS interns Jennifer Pytka, Manon Seyssaut, and Fenella Wood.

[This SSAP will be annexed to the Mediterranean Angel Sharks: Regional Action Plan \(MedRAP\) - which was compiled by Cat Gordon and Ali Hood at the Shark Trust - and as such content including the threats and actions have been adapted from there.](#)

The Principality of Monaco spear-headed this action by submitting the proposal to list Angelsharks on CMS Appendices I and II and proposing the Concerted Action1. It also provided financial support for the development of this Single-Species Action Plan.

<sup>1</sup> Concerted Action 12.5 (Rev.COP13): <https://www.cms.int/en/document/concerted-action-angelshark-squatina-squatina-1>

<sup>2</sup> Mediterranean Angel Sharks: Regional Action Plan (Gordon *et al.* 2019): [https://www.cms.int/sites/default/files/document/Med-Angel-Sharks-Regional-Action-Plan\\_2019\\_EN.pdf](https://www.cms.int/sites/default/files/document/Med-Angel-Sharks-Regional-Action-Plan_2019_EN.pdf)

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## ACRONYMS

ASCN	Angel Shark Conservation Network
CASA	Critical Angel Shark Area
CBD	Convention on Biological Diversity
CECAF	Fishery Committee for the Eastern Central Atlantic
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CPUE	Catch Per Unit Effort
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FRA	Fisheries Restricted Area
GFCM	General Fisheries Commission for the Mediterranean
GFCM GSA	Geographical Subareas of the General Fisheries Commission for the Mediterranean Geographical Subareas
ICES	International Council for the Exploration of the Sea
IUU	Illegal, Unreported and Unregulated Fishing
LEK	Local Ecological Knowledge
MPA	Marine Protected Area
MedRAP	Mediterranean Angel Sharks: Regional Action Plan
NGO	Non-Governmental Organisation
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
Sharks MOU	Memorandum of Understanding on the Conservation of Migratory Sharks
SPA	Specially Protected Area
SPA/RAC	Specially Protection Areas Regional Activity Centre
SSAP	Single-Species Action Plan
UNEP-MAP	United Nations Environment Programme -Mediterranean Action Plan (Barcelona Convention)

**GLOSSARY**

Aggregate extraction	The extraction of sands and gravels for supplying construction industries.
Angelshark	Used for species common names, for example Angelshark ( <i>Squatina squatina</i> ).
Angel Shark	Refers to multiple species of the family <i>Squatinaidae</i> .
Anterior	Located on or near the front of the body.
Artisanal fisheries	Traditional fisheries involving fishing households, using a relatively small amount of capital and energy, relatively small fishing vessels (if any), short fishing trips, close to shore, mainly for local consumption.
At-vessel mortality	The proportion of the individuals caught by a fishing gear that are dead when the gear is retrieved (see also post-release mortality).
Bifurcated	Forked or divided into two parts or branches.
Bottom longline fisheries	Commercial fishing technique that deploys a long main line, with small anchors or weights to keep it on the seafloor, with side traces and baited hooks targeting demersal fish species.
Bottom trawl	A cone-shaped net that is towed by boat(s) along the seafloor.
Bycatch	The capture of a non-target species in fisheries.
Caudal/caudal fin	Relating to, resembling, or in the position of the tail.
Cephalopods	Group of molluscs comprising octopus, cuttlefish and squid.
Critical Angel Shark Area (CASA)	A specific geographic area that contains essential features necessary for the conservation of Angel Sharks. This may include an area not currently occupied by the species that will be needed for its recovery or conservation e.g. nursery, mating, aggregation and foraging areas.
Decapod crustaceans	Group of crustaceans that comprised shrimps, prawns, crabs and lobsters.
Dorsal/dorsal fins	Situated on or toward the upper side of the body, equivalent to the back.
eDNA	Environmental DNA – DNA that can be extracted from environmental samples such as seawater or sediment, which can identify the presence of an organism in the area.
Eutrophication	Excessive richness of nutrients in a body of water, frequently due to run-off from land, which causes a dense growth of plant life.
Extant	Still in existence.
Genetic bottleneck	A sharp reduction in population size reducing the gene pool of the population. The remaining smaller population has a low genetic diversity, which remains low even after repopulating. Genetic diversity only increases with the influx from another population via gene flow.
Genetic diversity	Genetic variability present within a species or population.
Ghost fishing	When discarded, lost, or abandoned fishing gear continues to trap, entangle, or kill marine life.

Gillnet	An entangling net which sits vertically in the water, either at the surface, midwater, or bottom. Mesh size can be altered to target specific fish, designed to catch fish by their gills.
Hypoxia	Low or depleted oxygen levels in a water body. It is often associated with the overgrowth of certain species of algae, which can lead to oxygen depletion when they die, sink, and decompose. Hypoxia causes 'dead zones'.
Invasive Species	An organism that causes ecological or economic harm in a new environment where it is not native.
Nasal barbel	Slender, whisker-like tactile organ extending from the head of certain fishes.
Ocelli	A marking that resembles an eye.
Pathogens	A bacterium, virus, or other microorganism that can cause disease.
Population fragmentation	When groups of animals become separated from other groups of the same species and are no longer connected in a way that allows for gene flow between groups. Increases the risk of inbreeding and lowers genetic diversity.
Posterior	Located on or near the rear of the body.
Post-release mortality	The proportion of specimens that are released alive after being captured by a fishing gear, but subsequently die due to the direct or indirect effects of the capture process (see also at-vessel mortality).
Pseudobranchial lamellae	Various thin layers of membranes which make a structure resembling a gill. Has respiratory role during the embryonic stage, but not as an adult.
Recreational fisheries	Activity of catching or attempting to catch fish, principally by rod and line, pole or hand-held line for non-commercial purposes.
Rod and Line	Rod with fishing line attached with hooks.
Spatulate	Broad at the apex and tapered to the base.
Spearfishing	Activity of fishing using a spear, either underwater or from the surface (either from a boat or standing in shallow water).
Spiracles	Small respiratory opening behind the eye of sharks and rays.
Surfcasting	Fishing by casting a line into the sea from the shore.
Tangle net	An entangling net with a headline much shorter than the length of the netting panel. So that the net hangs in folds. Mesh size is smaller than a gillnet, designed to catch fish by their nose or jaw.
Trammel net	An entangling net which sits vertically in the water, usually comprised of a small inner mesh between two panels of large mesh netting within which fish will entangle.

## 1. BIOLOGICAL ASSESSMENT

### 1.1. Taxon

Three species of Angel Shark occur in the Mediterranean Sea: Angelshark (*Squatina squatina*; Table 1), Smoothback Angelshark (*Squatina oculata*) and Sawback Angelshark (*Squatina aculeata*). All species have a broadly similar morphology, and misidentifications can be made between the three species. Only one species, Angelshark *Squatina squatina*, is listed on the Appendices of the Convention on the Conservation of Migratory Species (CMS) and is the subject of this Single Species Action Plan.

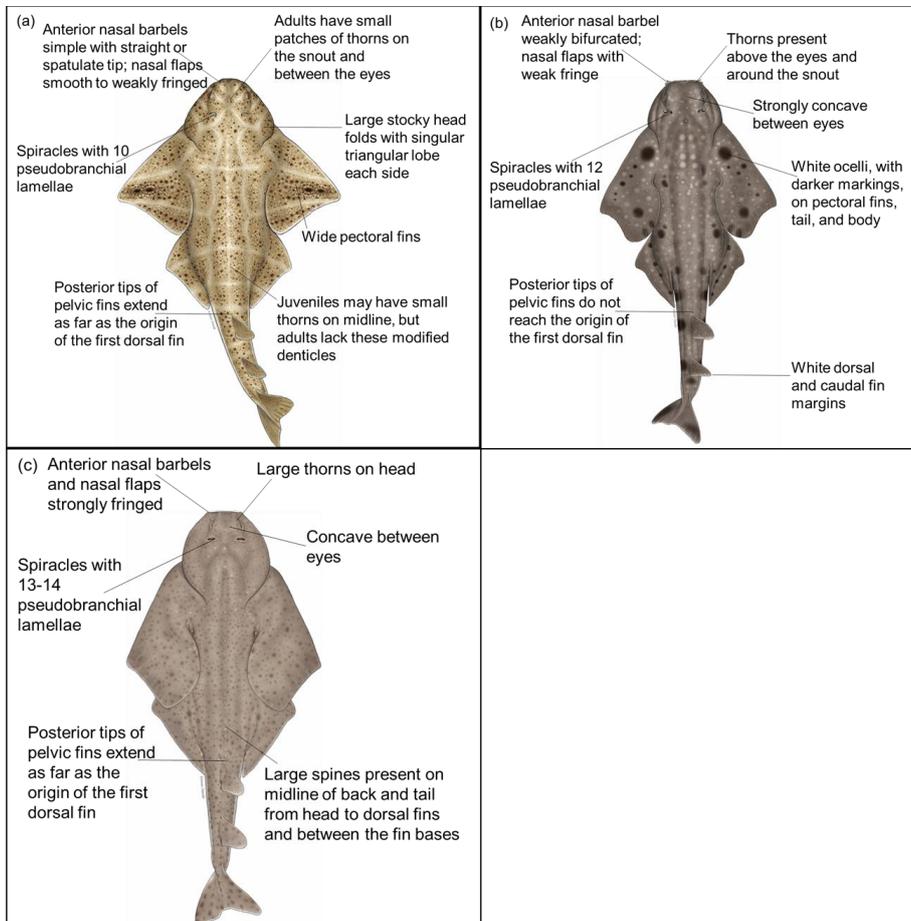
**Table 1:** Taxonomic classification of the Angelshark (*Squatina squatina*) and common names in multiple languages.

1.1. <u>Class:</u>	Elasmobranchii <sup>3</sup>
1.2. <u>Order:</u>	Squatiniformes
1.3. <u>Family:</u>	Squatinidae
1.4. <u>Genus:</u>	<i>Squatina</i> (Duméril, 1805)
1.5. <u>Species:</u>	<i>Squatina squatina</i> (Linnaeus, 1758)
1.6. <u>Common names:</u> <sup>4</sup>	English: Angelshark; European angelshark; Fiddlefish, Monkfish French: Ange de mer; Ange de mer commun; Angelot Spanish: Angel; Angelote; Pez ángel Arabic: القرش الملاك

The three Mediterranean Angel Shark species can be described as (i) Angelshark (*Squatina squatina*; Figure 1 a); reddish or greenish brown with scattered small white spots with dorsal dark dots. Lacks ocelli and midline spines (in adults). Max size: (M) 183 cm and (F) 244 cm. (ii) Smoothback Angelshark (*Squatina oculata*; Figure 1 b); smallest of three Mediterranean species. Grey-brown, with small white and dark spots, with dark ocelli. Lacks midline spines. Max size: (M) 145 cm and (F) 160 cm. (iii) Sawback Angelshark (*Squatina aculeata*; Figure 1 c); colouration is light grey/brown mottled with darker brown. Large dorsal spines present on the midline and head. Lacks ocelli. Max size: 188 cm. See Figure 1 for further detail.

<sup>3</sup> Taxonomic classification according to Fricke *et al.* (2022).

<sup>4</sup> Common names in official UN languages. For names in additional languages, please see Chapter 2 (page 9) of the MedRAP (Gordon *et al.*, 2019) or search FishBase..

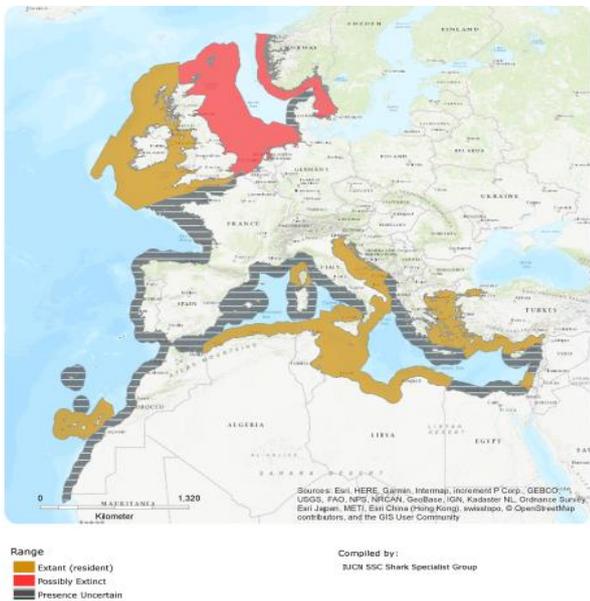


**Figure 1:** Diagram highlighting distinguishing features of the three species of Angel Shark occurring in the Mediterranean Sea. Adapted from Compagno (1984), Roux (1984), Gordon *et al.* (2019) and Ebert *et al.* (2021). Illustrations © Marc Dando. (a) *Squatina squatina*, (b) *Squatina oculata*, (c) *Squatina aculeata*.

## 1.2. Distribution

Angelshark (*S. squatina*) is distributed along the coasts and continental shelf of the North-east Atlantic, from Scotland in the North to as far south as North-west Africa, including the Canary Islands, and extending throughout the Mediterranean Sea (Lawson *et al.*, 2020; Figure 2). Whilst not distributed over the wider Black Sea, occasional specimens are reported from those areas close to the Turkish Strait system (Sea of Marmara) (Kabasakal *et al.*, 2021). The southern limits of this species along the coast of North-west Africa are somewhat uncertain. The maximum depth is unknown, though they are generally reported from waters less than

200 m deep. As such, it occurs in FAO Areas 27 (North-east Atlantic), 34 (Central Eastern Atlantic) and 37 (Mediterranean Sea). *S. squatina* records in an analysis of Pike et al. (2019) supported published literature on habitat preference, with 62 % of sightings in the Mediterranean located shallower than 50m depth on soft sediments.



**Figure 2:** Range of Angelshark, *Squatina squatina*. Source: Morey *et al.* (2019) and Lawson *et al.* (2019).<sup>5</sup>

### 1.3. Population productivity and trend

Angelshark populations are considered to have declined over much of its geographical range, with the majority of the evidence originating from northern Europe and the Mediterranean region. Population decline has been inferred largely due to documented losses from former parts of the species range over the last century. Life-history studies for Angelshark in the Mediterranean Sea are limited (e.g. Capapé *et al.*, 1990) and quantitative data on populations or indices of abundance are lacking, due to there being limited published contemporary data. Population trends off the Atlantic coast of north-western Africa are uncertain.

The decline of *S. squatina* was first reported by Quérou and Cendrero (1996), who noted that the species had declined along the Atlantic coast of France, which included areas such as the Baie d'Arcachon where it had historically been subject to targeted fisheries. Subsequent studies have highlighted the decline in *S. squatina* records from the North Sea (Sguotti *et al.*, 2016; Bom *et al.*, 2020), English Channel (Rogers & Ellis, 2000; McHugh *et al.*, 2011), Irish Sea and Bristol Channel (Ellis *et al.*, 2002; Hiddink *et al.*, 2019), Adriatic Sea (Fortibuoni *et al.*, 2016), and west coast of Ireland (Shephard *et al.*, 2019), with extant populations in some of

<sup>5</sup> See Table 5 for list of Range States.

these areas, including coastal waters around Wales (Barker *et al.* 2020, Hiddink *et al.* 2019) and Ireland (Fitzmaurice *et al.*, 2003; Shephard *et al.*, 2019, Quigley 2021).

Within the Mediterranean Sea, the absence of *S. squatina* in recent trawl surveys (in comparison with historical trawl surveys), has been shown for the Adriatic Sea (Jukic-Peladic *et al.*, 2001, Fortibuoni *et al.*, 2016) and elsewhere in the Mediterranean (Ragonese *et al.*, 2013). Giovos *et al.* (2019), Lawson *et al.* (20), and Giovos *et al.* (2022) have provided overviews of the Mediterranean distribution of *S. squatina*, with available information also summarised by Ellis *et al.* (2021).

Historical data on the quantity of Angelshark catches in the Mediterranean are limited. However, one example is a report by Vinciguerra (1884), who indicated Angelshark to be the most abundant species of cartilaginous fish caught in the Gulf of Tunis (Tunisia), with an annual catch of 2700 kg in 1879. Quantitative data relating to a declining population were provided by Vacchi *et al.* (2000), who analysed historical catch information for *Squatina* spp. in “tonnarella” tuna traps. These traps were set at depths of 2–15 m in the Gulf of Baratti (Tyrrhenian Sea). The number of *Squatina* spp. recorded (and the annual frequency of occurrence) declined from 134 (100%) in the period 1898–1905, to 95 (87.5%) over the years 1906–1913, and then to 15 (33.3%) for the final period of the study (1914–1922). These data also indicated that the decline of *S. squatina* records has been a longer-term trend, occurring over much of the 20<sup>th</sup> century (Vacchi *et al.*, 2000). Similarly, Soldo (2006) reported that Angelshark was caught regularly in the Adriatic Sea during the 19<sup>th</sup> century but has been considered to be Critically Endangered (both globally and within the Mediterranean) since the early 21<sup>st</sup> century. Recent analyses based on local ecological knowledge have helped identify sites with recent occurrence, including the Molat Island archipelago in Croatia (Pike *et al.*, 2019), and comparable studies are required for other parts of the Mediterranean Sea.

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## 2. THREATS

The primary threats to the distribution and abundance of Angelsharks in the Mediterranean Sea have been identified as capture in fishing activity and habitat destruction (Gordon *et al.*, 2019).

### 2.1. Unsustainable exploitation

Historically, Angelshark was utilised for both food and its skin. In the first half of the 20th century, Angelsharks were subject to some localised targeted fisheries performed by specialized types of nets, often named after the local name of the species: *Escatera* (Spain), *Squaenera* (Italy), *Sklatarata* (Croatia), *Martramou* (France). Over the latter half of the 20th century, Angelsharks continued to be a bycatch in a range of fisheries, including bottom trawl and bottom net fisheries (e.g. gillnet, trammel net, and tangle net) and, to a lesser extent, bottom longline fisheries. In some parts of its range, there has been additional fishing mortality through recreational fisheries and in others through continued targeted fisheries.

Excessive fishing pressure has been identified as the most probable impact at the population level, given the broadscale decline in geographical extent. Given the largely coastal distribution of Angelshark, though noting that there can be seasonality in their distributions, there is usually a high overlap between their populations with commercial, artisanal, and recreational fisheries. In addition to a reduction in population size and range, overfishing can result in population fragmentation and subsequent impacts on genetic population structure.

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Prohibitions on the retention of Angelshark now exist in various parts of the Mediterranean (see Table 7), and so any bycaught Angelshark should be discarded. The degree of discard survival is unquantified.

## 2.2. Habitat degradation (including pollution)

Given that contemporary data on the habitat and distribution of Angelsharks are limited, the potential impacts of habitat degradation and other anthropogenic pressures on this species are uncertain. Angelsharks often occur on sandy habitats close to more complex features (e.g. seagrass meadows and reefs) and have an inshore distribution, especially gravid females and neonates that may occupy very shallow waters (Meyers *et al.* 2017, Jiménez *et al.* 2020). Angel Shark Project: Canary Islands have identified and mapped key potential stressors for juvenile Angelsharks in the Canary Islands (Barker *et al.* 2019) and it is likely that other anthropogenic activities (e.g. infrastructure development, coastal defence and beach nourishment, aggregate extraction, habitat loss, and coastal pollution) may have had a negative impact. There have also been hypoxic events in some parts of the Mediterranean Sea (Riedel *et al.*, 2008; Giani *et al.*, 2012), including inshore areas, which can be important pupping and nursery grounds for Angelsharks. Whilst the effect of hypoxia on Angelsharks has not been studied, reduced levels of dissolved oxygen, which may be due to natural or anthropogenic factors may influence their localised distributions, given that Angelshark partially bury in soft sediments and have restricted breathing movements of the gills, as part of their cryptic nature (Tomita *et al.*, 2018).

Various forms of contaminant, including heavy metals and organic pollutants, can biomagnify and bioaccumulate in long-lived predatory fish, especially those occurring in anthropogenically-disturbed coastal waters. However, few studies have examined the levels of such contaminants in Angelshark tissues, and so the potential impacts on the health of individual fish, as well any potential population-level effects, are unknown. Similarly, the potential impact of plastic pollution is also unknown.

The potential disturbance on *Squatina* spp. due to the magnetic fields generated by underwater cables, including offshore wind farms (currently under development in some Mediterranean coastal areas), also needs to be investigated (Gill & Taylor, 2001).

### 2.3. Other factors

Whilst there has been some consideration of other factors that may affect Angelsharks, including prey availability, multi-species interactions, genetic bottlenecks due to fragmented populations and climate change, these are not considered here to be of significant impact at the population level.

Angelsharks are ambush predators that are known to predate on a range of demersal fish species, both commercial and non-commercial, and larger invertebrates (e.g. cephalopods and decapod crustaceans). Given the diverse range of potential prey, it is unlikely that prey availability has impacted the global population.

In relation to climate change, it may be noted that some warmer-water fish species have displayed a northward extension in geographic range. However, this has not been observed for the Angelshark, perhaps due to sparsity of records, so we cannot currently assess whether increased water temperatures have, or would, impact the population.

### 2.4. Threat prioritisation

Each threat outlined above has been assessed using a pre-defined matrix (Table 3) to determine its relative impact on Angelsharks across their range.

The matrix considers the consequences of a threat or impact on Angelsharks and the likelihood of occurrence of that threat. Where mitigation/management measures do exist and have been implemented, the likelihood of the threat has been assessed assuming that these measures continue to be applied appropriately.

Likelihood of occurrence has been categorised as 'Almost Certain', 'Likely', 'Possible', 'Unlikely', and 'Rare/Unknown'. Consequence classifications are defined as follows:

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

The threat matrix has been considered for this action plan for the Mediterranean region only. The matrix uses a qualitative assessment drawing on peer-reviewed literature and expert opinion from CMS and outputs from the Mediterranean Workshop hosted in Tunisia to develop the MedRAP (Gordon *et al.*, 2019). Levels of risk and the associated priority for action are defined as follows:

Very High	immediate additional action required
High	additional action and the precautionary approach should be applied

Moderate	obtain additional information and develop additional action, if required
Low	monitor the occurrence of threats and reassess the level of threat if the likelihood or consequences change

It is very important to recognise that addressing individual threats in isolation – both geographically, and in the context of other impacts - is likely to have limited effects and that interventions should be coordinated where possible.

**2.5. Threat matrix**

**Table 3:** Threat matrix showing the combination of likelihood of occurrence (considering existing mitigation measures) and consequence of each threat, to determine the level of risk to the Angelshark in the Mediterranean Sea. Risk is categorised into four ratings: green – low, blue – moderate, yellow – high, red – very high. Threat matrix adapted from Gordon *et al.* (2019).

		Consequences				
		Unknown / Not yet evaluated	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain			Degradation of habitat.	Bycatch in small-scale & large-scale fisheries (including bycatch mortality <sup>6</sup> ).	
	Likely	Pollution from micro/macroplastics <sup>7</sup> .	Water pollution/runoff leading to accumulation of contaminants.	Low genetic diversity (genetic bottlenecks/population fragmentation).	Mortality from targeted and accidental catch due to recreational and sports fishing (e.g. rod & line, surf casting, spearfishing).	
		Renewable energy (e.g. wind farms, underwater turbines, lagoons).	Water pollution/runoff and sewage leading to eutrophication.	Coastal building and infrastructure development that alter seafloor morphology.	Bycatch in small-scale and large-scale fisheries and illegal retention.	
		Extractive industries (e.g. aggregate, mining, dredging).		Changing water temperature.	Degradation of Critical Habitats	
		Anchor damage of habitats.	Increasing number of tourists and recreational			

<sup>6</sup> Bycatch mortality included the proportion that is dead when the gear is retrieved (at-vessel mortality) and the proportion of specimens released alive that subsequently die due to the capture process (post-release mortality).

<sup>7</sup> Impact of plastic pollution is currently not well understood. Further research is required, and the risk category may be revised with further information.

		Consequences				
		Unknown / Not yet evaluated	Minor	Moderate	Major	Catastrophic
<b>Likelihood</b>	<b>Likely</b>	Pipelines and electrical cables. Shipping disturbance.	activity in coastal waters. Recreational watersports (including diver disturbance and boating).			
	<b>Possible</b>	Pathogens. Disturbance or competition from non-indigenous species	Alteration of the food web (overfishing of preferential prey species) <sup>8</sup> .	Ghost fishing. Hypoxia.		Targeted / IUU fisheries or retained bycatch in small-scale inshore fisheries.
	<b>Unlikely</b>					
	<b>Rare / Unknown</b>			Oil spills.		

<sup>8</sup> Any localised overfishing may result in a greater threat on a local scale.

### 3. POLICIES AND LEGISLATION RELEVANT FOR MANAGEMENT

#### 3.1. Conservation and legal status

**Table 4:** Details of international conservation instruments that list Angelshark, *Squatina squatina*. Numbers in parentheses indicate the year a species was assessed or listed on an agreement.

International legal and non-legal instruments	Angelshark listed under protection measure or assessment
International Union for Conservation of Nature (IUCN) Red List of Threatened Species	Critically Endangered A2bcd (2019) <sup>9</sup> :  Population reduced an observed, estimated, inferred, or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on the following:  a) an index of abundance appropriate for the taxon, b) a decline in area of occupancy, extent of occurrence and/or quality of habitat, c) actual or potential levels of exploitation.
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Angelshark listed in Appendix I (2017) Angelshark listed in Appendix II (2017)
Memorandum of Understanding on the Conservation of Migratory Sharks (CMS Sharks-MOU)	Angelshark listed in Annex 1 (2018)
Barcelona Convention and the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol)	Angelshark listed in Annex II “list of endangered or threatened species”
General Fisheries Commission for the Mediterranean (GFCM)	Article 6 of GFCM/42/2018/2 states that “CPCs shall ensure a high protection from fishing activities for elasmobranch species listed in Annex II of the SPA/BD Protocol of the Barcelona Convention, which must be released unharmed and alive, to the extent possible”. This listing applies to Angelshark ( <i>S. squatina</i> ).  Article 7 of GFCM/42/2018/2 states that “Specimens of shark species listed in Annex II of the SPA/BD Protocol shall not be retained on board, transhipped, landed, transferred, stored, sold or displayed or offered for sale”. This listing applies to Angelshark ( <i>S. squatina</i> ).

<sup>9</sup> Angelshark was globally assessed as Critically Endangered.

	<p><i>Part II of GFCM/44/2021/16 states management measures that apply to Angelshark (S. squatina):</i></p> <p>(4) CPCs are invited to take the necessary steps to reduce the mortality of any elasmobranchs species incidentally caught during fishing operations by adopting relevant mitigation measures including the establishment of a system that provides incentives to vessel captains to reduce incidental elasmobranch mortality, as well as a system of technical training and certification for captains; and by conducting research to improve fishing gear, equipment and fishing techniques to reduce bycatch elasmobranch mortality and increase post-release survival rate<sup>10</sup>.</p> <p>(5) CPCs are invited to adopt mitigation measures to minimize and eliminate where possible incidental catch of elasmobranchs during fishing operations in high-risk bycatch fisheries determined by the SAC and where possible in low-risk bycatch fisheries, accompanied by appropriate monitoring to establish the efficacy of the actions. Such mitigation measures may include, inter alia,</p> <ul style="list-style-type: none"> <li>- gear modifications and alternative gear types;</li> <li>- improvements on gears' marking and detection;</li> <li>- time-area fishing restrictions or closures, if appropriate;</li> <li>- implementation of maximum potential bycatch thresholds;</li> <li>- implementation of magnetic deterrent devices, when based on scientific studies and after a cost-benefit evaluation.</li> </ul> <p>(6) CPCs may also consider on a voluntary basis other types of management such as "incentive-based management", which rewards</p>
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<sup>10</sup> See Accobams/GFCM/FAO Good practice guide for the handling of sharks and rays caught incidentally in fisheries <http://www.fao.org/gfcm/publications/projectsandinitiatives/en/>

	<p>low impact operators while simultaneously driving poorly performing operators to adopt better practices or leave the industry; “market-based incentive management” by employing, for example, “elasmobranch-safe” (or “elasmobranch-friendly”) labelling in medium to high-risk fisheries.</p> <p>(7) CPCs shall require fishing vessels, catching accessorially and incidentally sharks species, to limit bycatch of sharks listed in Annex III of the SPA/BD Protocol to a maximum percentage of the total catch by fishing trip in weight or no more than three specimens. In 2023, the SAC shall assess the most up-to-date species-level catch and composition data. Based on the scientific advice, the 46th session of GFCM will decide of a maximum percentage of catch limit, expressed in weight.</p> <p>In addition, Part III – Article 12 in GFCM Rec. 2021/44/16 states another requirement which applies to Angelshark (<i>S. squatina</i>): CPCs shall report by 30 April 2026 at the latest on at least one activity per species/gender from Annex 1 present in the GSA area where fishing activities are carried out, or at least five species-specific actions in total 1 to improve the conservation status of elasmobranch species, mitigate and where possible eliminate the risk of incidental taking of elasmobranch in fishing operations and the associated mortality</p>
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### 3.2. Range State Status under CMS Instruments

The table below (Table 5) provides the presence status of Angelshark in each Range State, considering a subset of four of the six IUCN presence codes. The presence statuses were determined and defined by Lawson *et al.* (2019), adapted from IUCN (2019).

- i. Extant - the species is known or thought very likely to occur presently in the area, usually encompassing current or recent localities where suitable habitat at appropriate altitudes remains (or depths in the case of aquatic species).
- ii. Possibly Extant - There is no record of the species in the area, but the species may possibly occur, based on the distribution of potentially suitable habitat at appropriate altitudes, although the area is beyond where the species is Extant, and the degree of probability of the species occurring is lower.

- iii. Possibly Extinct - there is no record of the species in the area, but the species was formerly known or thought very likely to have occurred, but it is most likely now locally extinct from the area because habitat loss/other threats are thought likely to have eliminated the species and/or owing to a lack of records in the last 30 years.
- iv. Presence Uncertain - the species was formerly known or thought very likely to occur in the area, but it is no longer known if it still occurs.

**Table 5:** List of the Range States of the Mediterranean Sea with the presence status of Angelshark (*Squatina squatina*) and whether they are a member party or signatory of either CMS or Sharks-MOU. Presence statuses are based on Lawson *et al.* (2019) or if available, most recent information. It has been described in the following footnotes where Morey *et al.* (2019) or another source provided a differing presence status to Lawson *et al.* (2019). Unless specified, both sources (Lawson *et al.* 2019 & Morey *et al.* 2019) determined the same presence status per Range State. 'Not Evaluated' means that Angelsharks have not been assessed in the area by either Morey *et al.* (2019) or Lawson *et al.* (2019). ✓ indicates CMS Party and Sharks MOU Signatory. - indicates non-CMS Party and non-Sharks MOU Signatory.

Range State (or Party/Signatory)	Presence Status	CMS	Sharks - MOU
European Union	Extant	✓	✓
Albania	Presence Uncertain	✓	-
Algeria	Extant	✓	-
Bosnia and Herzegovina	Presence Uncertain	✓	-
Croatia	Extant	✓	-
Cyprus <sup>11</sup>	Extant	✓	-
Egypt	Presence Uncertain	✓	✓
France:		✓	✓
Mediterranean Coast	Presence Uncertain		
Corsica	Extant		

Greece:		✓	-
Mainland	Extant		
Crete	Presence Uncertain		
Ionian Sea	Not present		
Aegean Sea	Extant		
Israel	Extant	✓	-
Italy: <sup>9, 12</sup>		✓	✓
Mainland	Extant		
Sardinia, Sicily Strait and Pelagie Islands	Extant		

<sup>11</sup> [Possibly Extant according to Morey \*et al.\* \(2019\). However, there has been further evidence of \*S. squatina\* in Cyprus as documented in the SubRegional Action Plans for GSA 25 \(Giovos \*et al.\*, 2021 & Bengil \*et al.\*, 2021\).](#)

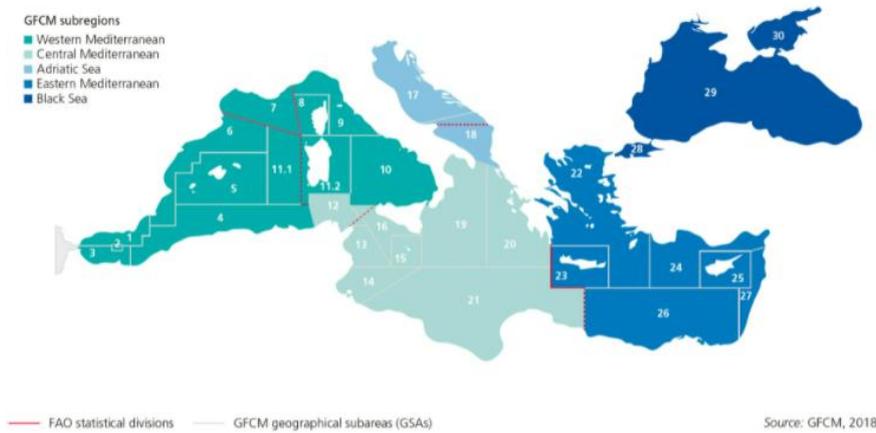
<sup>12</sup> Presence Uncertain according to Lawson *et al.* (2019) and Morey *et al.* (2019). However, it is Extant due to recent literature and information on social media reporting occurrences of the species in Eastern Sardinian and South Sicilian waters (Marino Vacchi, personal communication) and off Lampedusa Island (Bottaro *et al.*, in preparation).

Range State (or Party/Signatory)	Presence Status	CMS	Sharks - MOU
Lebanon	Presence Uncertain	✓	-
Libya	Extant	✓	✓
Malta	Extant	✓	-
Monaco	Presence Uncertain	✓	✓
Montenegro	Presence Uncertain	✓	-
Morocco	Presence Uncertain	✓	-
Slovenia	Extant	✓	-
Spain:		✓	-
Mediterranean Coast	Presence Uncertain		
Balearic Islands	Presence Uncertain		
Syrian Arab Republic	Presence Uncertain	✓	✓
Tunisia	Extant <sup>13</sup>	✓	-
Turkey	Extant	-	-
United Kingdom:		✓	✓
Gibraltar	Presence Uncertain <sup>14</sup>		
Sovereign Base Areas of Akrotiri and Dhekelia (on Cyprus)	Not Evaluated <sup>15</sup>		

<sup>13</sup> Presence Uncertain according to Morey et al. (2019) \_- However, during the MedRAP workshop, their presence in the region was confirmed (Mohamed Neimeddine Bradai, personal communication).

<sup>14</sup> Morey et al. (2019) has not assessed the status of Angelsharks in Gibraltar.

<sup>15</sup> Presence is not evaluated for the Sovereign Base Areas of Akrotiri and Dhekelia as is extant elsewhere around the Island of Cyprus.



**Figure 3:** Map of the Mediterranean region, FAO Major Fishing Area 37, showing the geographical position of the various GFCM Geographical Subareas (GSAs) and their respective borders. Source: FAO, 2020.<sup>16</sup>

<sup>16</sup> <https://www.fao.org/documents/card/en/c/cb2429en>

**Table 6:** List of GFCM Geographical Subareas (GSAs) with presence status of Angelsharks (*Squatina squatina*). Angelsharks were deemed 'extant' in a GSA, when one or more Range State in the area was classified as extant by Lawson *et al.* (2019) or if available, most recent information. Angelsharks were deemed 'presence uncertain' in a GSA, when all Range States were classified as 'presence uncertain' by Lawson *et al.* (2019). It is described in the following footnotes where Morey *et al.* (2019) or another source provided a differing presence status to Lawson *et al.* (2019). Unless specified, both sources (Lawson *et al.* 2019 & Morey *et al.* 2019) determined the same presence status per Range State.

GFCM Geographical Subareas (GSAs)		Presence Status
1	Northern Alboran Sea	Presence Uncertain
2	Alboran Island	Presence Uncertain
3	Southern Alboran Sea	Presence Uncertain
4	Algeria	Extant
5	Balearic Islands	Presence Uncertain
6	Northern Spain	Presence Uncertain
7	Gulf of Lion	Presence Uncertain
8	Corsica	Extant
9	Ligurian Sea and Northern Tyrrhenian Sea	Extant
10	Southern and Central Tyrrhenian Sea	Extant
11.1	Western Sardinia	Presence Uncertain
11.2	Eastern Sardinia	Extant <sup>17</sup>
12	Northern Tunisia	Extant <sup>13,18</sup>
13	Gulf of Hammamet	Extant <sup>13</sup>
14	Gulf of Gabès	Extant <sup>13</sup>
15	Malta	Extant
16	Southern Sicily	Extant <sup>19</sup>
17	Northern Adriatic Sea	Extant
18	Southern Adriatic Sea (part)	Extant
19	Western Ionian Sea	Extant
20	Eastern Ionian Sea	<del>Presence Uncertain</del> Extant
21	Southern Ionian Sea	Extant
22	Aegean Sea	Extant
23	Crete	Presence Uncertain
24	Northern Levant Sea	Extant
25	Cyprus	Extant <sup>1,20</sup>
26	Southern Levant Sea	Presence Uncertain
27	Eastern Levant Sea	Extant
28	Marmara Sea	Extant
29	Black Sea	Extant <sup>21</sup>
30	Azov Sea	Species does not occur

<sup>17</sup> Presence Uncertain according to Lawson *et al.* (2019) and Morey *et al.* (2019). However, it is Extant due to recent literature and information on social media reporting occurrences of the species in Eastern Sardinian waters (Marino Vacchi, personal communication).

~~<sup>18</sup> Presence Uncertain according to Morey *et al.* (2019).~~

<sup>19</sup> Angelsharks have not been assessed in the area by either Morey *et al.* (2019) or Lawson *et al.* (2019). However, it is Extant due to recent literature and information on social media reporting occurrences of the species in South Sicilian waters (Marino Vacchi, personal communication).

~~<sup>20</sup> Possibly extant according to Morey *et al.* (2019).~~

<sup>21</sup> Present, but only in close proximity to GFCM GSA 28 (Jim Ellis, personal communication).

**3.3. Relevant organisations operating in the Angelshark range**

CECAF:	Fishery Committee for the Eastern Central Atlantic
CMS:	Convention on the Conservation of Migratory Species of Wild Animals
CBD:	Convention on Biological Diversity
EU:	European Union
GFCM:	General Fisheries Commission for the Mediterranean
ICES:	International Council for the Exploration of the Sea
OSPAR:	Convention for the Protection of the Marine Environment of the North-East Atlantic
UNEP-MAP:	United Nations Environment Programme -Mediterranean Action Plan (Barcelona Convention)

**3.4. National/EU legislation and management measures specific to the Angelshark**

This table contains national and EU legislation, including management measures of Range States in the Mediterranean that protects Angelshark specifically. An overview of general legislation on fishery or biodiversity that is relevant to the conservation of Angelshark, is provided in Annex III for countries where species-specific legislation and measures are absent.

**Table 7:** Details of national and EU legislation of Mediterranean Range States that specifically protects Angelshark, *Squatina squatina*, or in general due to umbrella categories such as 'all sharks'.

Commented [A62]: To be annexed.

Range State	Specific legislation exists for:	Reference to legislation and disposition. If not explicit to Angelsharks, see Annex III	
EUROPEAN UNION	ANGELSHARK	REGULATION (EU) 2015/2102 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 October 2015 amending Regulation (EU) No 1343/2011 on certain provisions for fishing in the GFCM (General Fisheries Commission for the Mediterranean) Agreement area.	<p><b>Article 16j</b> 1. Shark and ray species which are included in Annex II to the Protocol concerning specially protected areas and biological diversity in the Mediterranean ("Protocol to the Barcelona Convention") shall not be retained on board, transhipped, landed, transferred, stored, sold or displayed or offered for sale. 2. To the extent possible, fishing vessels that have incidentally caught sharks and rays of the species included in Annex II to the Protocol to the Barcelona Convention shall promptly release them unharmed and alive.</p> <p><b>Article 16k</b> Beheading and skinning of sharks on board and before landing shall be prohibited. Beheaded and skinned sharks may not be marketed at the first sale markets after landing.</p> <p><b>Annex I</b> lists <i>Squatina squatina</i> as a prohibited species, for which there is a prohibition "to fish for, retain on board, tranship, land, store, sell, display or offer for sale" Angelshark for all EU waters.</p>

		EU Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019.	
ALBANIA	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
ALGERIA	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
BOSNIA-HERZEGOVINA	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
CROATIA	ANGELSHARK	Strictly protected species under the <u>Nature Protection Act OG 80/2013, 15/2018, 14/19, 127/19</u>	<p><b>B) STRICTLY PROTECTED SPECIES</b></p> <p>1. Declaration of strictly protected species</p> <p>Article 151</p> <p>(1) Strictly protected species are native wild species that are endangered or are narrowly distributed endemics or wild species for which such protection is</p>

Commented [A63]: Accepted as amended by Croatia on 5 July;

		<p>Ordinance on Strictly Protected Species OG 144/13, 73/16</p>	<p>prescribed by European Union regulations governing the conservation of wild plant and animal species or international treaties to which the Republic of Croatia is a party.</p> <p>(2) Strictly protected species, based on the Red List, taking into account the precautionary principle and other criteria prescribed by this Act, shall be declared by the Minister in an ordinance.</p> <p>(3) The Ordinance referred to in paragraph 2 of this Article shall also prescribe general measures for the protection of strictly protected species and their habitats, detailed content of applications for permits for derogations from strict protection measures, handling of dead or injured specimens of strictly protected species, content, method of preparation and the procedure for adopting a management plan with an action plan and other rules for dealing with strictly protected species.</p> <p>(4) The Red List shall be determined by the Ministry and shall be in charge of its updating. The Red list is published on the Ministry's website.</p> <p>2. Prohibited actions with strictly protected species</p> <p>Article 153</p> <p>(1) It is prohibited to pick, cut, dig, collect or destroy specimens of strictly protected plants, fungi, lichens and algae from nature in their natural area of distribution.</p> <p>(2) The following actions with strictly protected animals from nature in their natural area of distribution are prohibited:</p> <ul style="list-style-type: none"> <li>- all forms of deliberate capture or killing,</li> <li>-deliberate disturbance, especially during breeding, rearing, hibernation, and migration,</li> <li>- deliberate destruction or taking of eggs,</li> <li>-intentional destruction, damage, or removal of their developmental forms, nests</li> </ul>
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			<p>or litters,</p> <p>-damage or destruction of their breeding or resting areas.</p> <p>(3) The keeping, transport, sale, exchange, and offering for sale or exchange of live or dead specimens of strictly protected species referred to in paragraphs 1 and 2 of this Article, taken from the nature, shall be prohibited.</p> <p>(4) The prohibitions referred to in paragraphs 1, 2 and 3 of this Article shall apply to all developmental forms of strictly protected species.</p> <p>The <i>Squatina squatina</i> is listed in the Annex I of the Ordinance on Strictly Protected Species OG 144/13, 73/16, as the strictly protected species, according to the Article 151 paragraph 2 of the Act on Nature Protection OG 80/2013, 15/2018, 14/19, 127/19.</p>
CYPRUS	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
EGYPT	ALL SHARKS	Decree 444/20112	Prohibited to fish sharks of all species in the Mediterranean Sea and to place sharks (whole or parts) on the market.
FRANCE	ANGELSHARK	Décret n° 2014-1195 du 16 octobre 2014 portant publication de l'amendement de la liste des annexes II et III du protocole relatif aux aires spécialement protégées et à la diversité biologique	Listed in annex as a species in danger or threatened.

		en Méditerranée, signé à Barcelone le 10 juin 1995, adopté à Marrakech le 5 novembre 2009 (1)	
GREECE	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
ISRAEL	ALL SHARKS	National Parks, Nature Reserves, National Sites and Memorial Sites Law, [5758-1998]  Declaration on National Parks, Nature Reserves, National Sites and Memorial Sites (Protected Natural Assets), Proclamation, 2005 (5765-2005)	The Schedule of the Declaration on National Parks, Nature Reserves, National Sites and Memorial Sites (Protected Natural Assets), Proclamation, 2005 lists all species within Class Elasmobranchii, Order Sellachii and Order Batoidea as protected natural assets.  Chapter Five of the National Parks, Nature Reserves, National Sites and Memorial Sites Law provides for the provisions on protected natural assess. To that end, Section 33 paragraphs c and d prohibits damaging and trading protected natural assets, where damage refers to “destruction, demolition, breakage, injury, plucking, uprooting, taking, removing, poisoning, alteration of appearance or of the natural position of a natural asset or interference in the process of its natural development, its reproduction or its preservation”, and trade refers to “purchase, sale, exchange, export, reexport, introduction from the sea and also an offer of trade”.
ITALY	No specific legislation exists for Angelsharks, see Annex III for general legislation.		

**Commented [CMS4]:** What is the correct legislation number for this law? Research shows there to be another law with this number. Which one is correct?

**Commented [A15R4]:** This is the legislation number I was told by Sharks In Israel when developing the MedRAP, however I can follow up with them to check if you still need a response to this.

LEBANON	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
LIBYA	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
MALTA	ANGELSHARK	Flora, Fauna and Natural Habitats (Amendment) Regulations, 2013, Flora, Fauna and Natural Habitats Protection Regulations, 2006 (L.N. 311 of 2006)	Schedule VI of both the Flora, Fauna and Natural Habitats Regulations, 2006, and later the amended 2013 Regulations list the <i>Squatina squatina</i> under “ <b>Animal and Plant Species of National Interest in Need of Strict Protection</b> ”.  Pursuant to Article 25 of the Flora, Fauna and Natural Habitats Regulations, 2006 “no person shall pursue, take or attempt to take, deliberately capture or kill or attempt to kill, deliberately destroy, keep, transport, by any method sell, buy, exchange, offer for sale or for exchange, import or export any specimen of species listed in the Schedules V (a) and VI (a) to these regulations”
MONACO	ANGELSHARK	Code de la mer	Article O. 244-11 code de la mer  “Sont interdites de pêche les espèces suivantes : [...] 15° ange des mers ( <i>Squatina squatina</i> ) ;” “Sont interdits la vente, l'achat, le transport et l'emploi à un usage quelconque des produits des pêches interdites.”
MONTENEGRO	ANGELSHARK	Order on the Closed Season for Age Classes of Fish and Other Marine Organisms (Pursuant to the Article 18 of the	Article 1 of the Order lists <i>Squatina squatina</i> as prohibited catch.  The Law amending the Law on Marine Fisheries and Mariculture amends: - Article 7 of the Law on Marine Fisheries and Mariculture on “ <b>Measures on the protection of biodiversity and environmental conditions</b> ” to include:

		Law on Marine Fisheries and Mariculture), Law on Marine Fisheries and Mariculture, Law Amending the Law on Marine Fisheries and Mariculture	<p>“8) It shall be prohibited beheading, skinning and finning to all cartilaginous fishes - sharks and rays, while keeping on board of fishing vessels, transshipment and landing;</p> <p>9) It shall be prohibited turning or throwing back into water shark’s bodies whose fins, head or any body part is removed;</p> <p>10) It shall be prohibited to purchase, offer for sale or sell shark fins which have been removed, retained on board, transhipped or landed in contravention of this aw;”</p>
MOROCCO	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
SLOVENIA	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
SPAIN	ANGELSHARK	<p>Law 42/2007, of December 13, on Natural Heritage and Biodiversity.</p> <p>Order AAA/75/2012 of 12 January 2012 included the three species of Angelshark in the</p>	<p>"The inclusion of a taxon or population in the LESRPE will entail the periodic evaluation of its conservation status".</p> <p>Article 57:  1. "The inclusion in the LESRPE of a species, subspecies or population entails the following prohibitions: .... any action taken for the purpose of killing, capturing, pursuing, or disturbing them, as well as the destruction or deterioration of their nests, nurseries and breeding, or resting places ... possessing, transporting, selling, trading or exchanging, offering for sale or exchange, importing or exporting live or dead specimens ... These prohibitions shall apply</p>

**Commented [A16]:** Possibly new shark legislation here as at recent GFCM meetings, Morocco flagged legislation - so worth following up to check on this.

		<p><i>List of Wild Species under Special Protection Regime</i> for their adaptation to Annex II of the Protocol on Specially Protected Areas and Biodiversity in the Mediterranean.</p> <p>Royal Decree 139/2011, of February 4, for the development of the List of Wild Species under Special Protection Regime and the Spanish Catalog of Endangered Species.</p> <p>In 2019, Angelshark was included in the category "in danger of extinction" on the Spanish Endangered Species List "Catálogo Español de Especies Amenazadas" (BOE. Núm. 134, de 5 de junio de 2019)</p>	<p>to all phases of the biological cycle of these species, subspecies or populations".</p> <p>2. "The State Administration and the Autonomic Governments... shall establish a system for monitoring incidental capture or killing and, on the basis of the information collected therein, shall adopt the necessary measures to ensure that these do not have a significant negative impact on the species... and are minimised in the future".</p> <p>There is a higher category of protection called the '<i>Spanish Catalogue of Threatened Species</i>'. The Angelshark populations of the Canary Islands were included in the Catalogue in 2019, but the Mediterranean populations are not.]</p> <p>"The inclusion of a taxon or population in the category of "in danger of extinction" will entail, within a maximum period of three years, the adoption of a recovery plan, which includes the most appropriate measures for the fulfillment of the objectives sought and , where applicable, the designation of "critical areas".</p> <p>In the "critical areas", and in the areas of potential reintroduction or expansion of these taxa or populations defined as such in the recovery plans, conservation measures and management instruments will be established, specific to these areas or integrated into other plans, that avoid negative effects on the species that have motivated the designation of these areas."</p> <p>Angel Shark Project: Canary Islands have developed a draft Recovery Plan, under contract from the Canary Island Government, which is currently in review.</p>
<p>SYRIA</p>	<p>No specific legislation exists for Angelsharks, see</p>		

**Commented [A67]:** Actually it is the same level of protection, the only difference between the species listed in the LESRPE and the Spanish Catalogue of Threatened species is that for the species in the Catalogue it is mandatory to develop a recovery plan in a certain time (in 3 years if the species is listed as Endangered and 5 years if the species is declared vulnerable). For the species in the LESRPE is not mandatory develop any recovery plan.

	Annex III for general legislation.		
TUNISIA <sup>22</sup>	No specific legislation exists for Angelsharks, see Annex III for general legislation.		
TURKEY	ANGELSHARK	Fisheries Law No:1380 of 1971, Fisheries Regulation of 1995, Communiqué 2018/19 updates Article 5 of the Turkish Prohibited Species Lists (Communiqué 2016/35). The updated Ministerial Notification No. 5/1 Regulating Commercial Fishing (2020-2024	Article 23 paragraph b of the Fisheries Law No:1380 stipulates that prohibitions, restrictions and obligations concerning, among others, species shall be enacted by a regulation. To that end, Article 16 paragraph 14 of the Fisheries Regulation of 1995 expands on the Fisheries Law and provides that aquaculture production prohibitions, restrictions and obligations concerning, among others, species shall be determined by way of notifications published by the Ministry of Agriculture and Forestry. Communiqué 2016/35, later amended by the Communiqué 2018/19, states in Article 5 that <i>Squatina aculeata</i> , <i>S. oculata</i> and <i>S. squatina</i> , are under protection, and fishing, killing, having on board, landing, transshipping and selling of these species are prohibited. The updated Ministerial Notification No. 5/1 Regulating Commercial Fishing (No: 2020/20) establishes a general prohibition of fishing for <i>Squatina aculeata</i> , <i>S. oculata</i> ve <i>S. squatina</i> that includes their catching, retaining on board, landing, transporting and selling (Article 16). (Official Gazette Dated 22 August 2020, No:3122)

<sup>22</sup> Law No. 1994-13 relating to the practice of fishing is under review to include all the species listed in Annex II of the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean and to prohibit their fishing. In December 2020, Tunisia introduced a temporary measure banning the fishing, killing, landing & trading of 21 species of sharks and rays including all three Mediterranean *Squatina* species. This process is now in its final ratification phase.

<p>UNITED KINGDOM OVERSEAS TERRITORIES</p> <ul style="list-style-type: none"> <li>• GIBRALTAR</li> <li>• SOVEREIGN BASE AREAS OF AKROTIRI AND DHEKELIA</li> </ul>	<p>No specific legislation exists for Angelsharks, see Annex III for general legislation.</p>		
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## 4. FRAMEWORK FOR ACTION

Threats to Angelshark abundance and distribution were identified and attributed a level of risk using the threat matrix (see Table 3). Threats classified as very high risk were the focus of the following framework for action.

### 4.1. Goal

To strengthen coordination, harmonisation, delivery of data collection, conservation, and management efforts for the Angelshark across its range within the Mediterranean Sea.

### 4.2. Objectives, Actions, and Results

A collaborative Regional Action Plan for three Angel Shark species in the Mediterranean was developed in 2019 (Gordon *et al.*, 2019) and, under this, the suggested actions were broadly spread across three higher-level goals, namely:

- (1) National legislation for Angel Sharks is established, implemented and enforced;
- (2) Fisheries-based Angel Shark mortality is minimised in the Mediterranean; and
- (3) Angel Shark habitat is identified and protected.

The various objectives and actions identified in the earlier Regional Action Plan (Gordon *et al.*, 2019), under which governments and CMS Parties had been identified as best placed to act on some selected actions, are summarised in Annex I.

Consequently, CMS Parties could usefully consider more focused work on Angelshark, *Squatina squatina*, including furthering the progress of the Concerted Action for Angelshark in the Mediterranean Sea, specifically in relation to:

- Species protection
- Identification of Critical Angel Shark Areas (CASAs) and spatial management if required
- Scientific studies and data collection
- Secure further resources

These four broad topics, which would also address the various potential actions (as indicated by the Regional Action Plan), would all be in alignment with the CMS Convention Text, and demonstrate the commitment of the Parties to the Concerted Action Plan.

The objectives and corresponding actions and results are set out in the tables below (Tables 8, 9, 10, and 11) for the threats identified for Angelshark.

### 4.3. Species protection

The main anthropogenic sources of mortality of Angelshark are expected to be the result of (i) commercial fisheries (including artisanal and subsistence fisheries), and (ii) recreational fisheries.

Recommendation GFCM/42/2018/2 states that "Specimens of shark species listed in Annex II of the SPA/BD Protocol shall not be retained on board, transhipped, landed, transferred, stored, sold or displayed or offered for sale"<sup>23</sup>. Given the listing of *S. squatina* on the Barcelona Convention, this

<sup>23</sup> Recommendation GFCM/42/2018/2, on fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3.

indicates that it should be a 'prohibited species' in relation to commercial fisheries.

Whilst GFCM/42/2018/2 and the legislation referred to in table 7 confer a degree of species protection, depending on levels of education, monitoring, compliance, enforcement, and implementation, they may not confer full protection. For example, Angelshark may also be taken in a range of recreational fisheries, including rod-and-line and spearfishing.

In addition, GFCM/44/2021/16 strengthens GFCM recommendation 42/2018/2 as it requests that the SAS advises requires contracting parties to adopt mitigation measures within both commercial and recreational fisheries in order to eliminate the bycatch of elasmobranch, including Angelshark.

Hence, there is a rationale for Parties to determine whether there are other national legislative instruments that can provide more wide-ranging species protection. Furthermore, improved education, monitoring and enforcement to facilitate compliance by fishers may also be required.

Such efforts would align with the Convention (Article II, Section 3(b); Article III, Section 5).

#### **4.4. Identification of Critical Angel Shark Areas (CASAs)**

A range of scientific studies have provided overviews of some of the recent occurrences of Angelshark. However, such studies may not have had full access to all available national data, both historical and contemporary.

Hence, national programmes to collate information on the sites of Angelshark occurrence (both historical and contemporary) would be useful, with potential data sources including: fisheries reports, commercial landings and observer data, historical accounts, fisher knowledge, citizen science programmes, social media, local ecological knowledge (LEK) and dedicated non-destructive surveys. Habitat modelling and environmental DNA (eDNA) could also be useful tools to identify potential sites of occurrence. The collation of national data (in a standardised format) would allow Parties to determine the current occurrence of Angelsharks and suitable Angelshark habitats in both national waters, and regional seas, and would allow subsequent aggregation of available data for the wider Mediterranean region. Such data could then be used to inform on (1) habitat modelling and identification of other potential sites, (2) potential role of spatial management, and (3) options for non-destructive surveys to monitor trends in stock size.

Such efforts would align the Convention (Article III, Section 4(a)).

#### **4.5. Scientific studies, data collection and liaison with the fishing industry**

In support of the Concerted Plan of Action, there is a rationale for national programmes to improve scientific data collection as well as improved liaison between fisheries scientists with fishing industries and fishing communities (including artisanal and subsistence fisheries, and recreational fisheries).

Such initiatives could facilitate improved knowledge of historic and contemporary distribution of Angelshark, a better understanding of the current levels of bycatch, and estimates of discards (including dead and live discards).

Projects involving science-fisher collaboration can enhance scientific data collation and provide assistance to educational initiatives (e.g. in relation to GFCM recommendations and any national management measures).

There is also a strong rationale for the results of scientific studies to be used in collaborative scientific studies with other Parties. In particular, population genetics could reveal insight into connectivity between fragmented populations.

Such efforts would be in alignment with the Convention (Article II, Section 3(a)).

**Commented [A68]:** •Based on the results, the SAC shall advise regarding the setting of new measures with the objective to improve the status of elasmobranchs listed in Annex II and III of the SPA/BD Protocol in the Mediterranean and Black Sea, such as, but not limited to:

- Establishment of the maximum of % (in weight) or no more than three specimens by vessel, of the total bycatch per species listed in Annex III of the SPA/BD Protocol, per fishing trip.
- Adoption of a species-specific minimum and maximum landing sizes that take into account the gestation and the reproductive strategy of the species listed in Annex III and not covered by d.);
- Restriction of elasmobranch recreational fisheries;
- Restriction of catching, landing, and selling species covered by this recommendation.

#### 4.6. **Secure sufficient resources for ongoing Angelshark conservation**

To successfully achieve the results of this Action Plan, sufficient resources need to be secured to implement actions at a national and regional scale. Parties might consider establishing national working groups that consist of local experts and stakeholders to support implementation on a national level.

#### 4.7. **Objectives Framework**

To address the objectives, actions and results, as introduced in section 4.2, the following framework (Tables 8, 9, 10, and 11) 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. 'Range States Responsible' contains two categories, 'All Range States' and 'Range States where Angelsharks are extant', the categorisation of Range States corresponds to Table 5.

**Actions** below have been prioritized as:

- Essential
- High
- Medium
- Low

Commented [A69]: Croatia MA DoF: it is unclear which are the criteria to determine which activities fall under which priorities, and how these are connected to the timescales.

**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
- Completed: completed during review of Action Plan

Commented [A610]: Croatia comment (MA DoF):  
- please supplement information to be clear that time scales are starting from the adoption of Action Plan or certain date if that is the case

All Range States should aim to undertake Actions 1.1-1.4, Actions 2.1-2.3, Action 3.1, and Actions 4.1 and 4.2. The outcomes of these Actions will inform on the practicalities and merits of undertaking subsequent Actions in national waters, and as to how more collaborative, regional studies could be conducted.

#### 4.8. **National Implementation**

This plan forms a guide for all Range States and other stakeholders. Not all aspects will be relevant for all countries. In addition, some national governments may need additional capacity building to be able to undertake some aspects of this plan. Governments are encouraged to develop their own workplans to organize national implementation guided by this Single Species Action Plan and agreed priorities.

#### 4.9. **Resources, guidelines and tools available**

In order to streamline efforts across the range, Parties and implementing partners shall strive to make use of available guidance and tools already developed by members of the Angel Shark Conservation Network (ASCN). These include fisheries guidelines, research

techniques and protocols following an ethically approved standard. A full overview of the resources available is provided in Annex ## to this document.  
The ASCN may also serve as a reference partner and advisory body for the development of any further guidance materials, protocols and capacity-building materials to aid countries in the implementation of the SSAP.

<b>Table 8: Objective 1 - Ensure appropriate species-level protection for Angelshark <i>Squatina squatina</i></b>				
<b>Result</b>	<b>Action</b>	<b>Priority</b>	<b>Time Scale</b>	<b>Range States Responsible</b>
Appropriate species protection in line with CMS Appendix I listing, and relevant GFCM recommendations (GFCM/42/2018/2) and GFCM/44/2021/16) are enforced or introduced for Angelshark <i>Squatina squatina</i> .*	1.1 Prohibition in fisheries regulations: Secure national fisheries regulations to ensure that it is prohibited to fish for, retain, tranship and land Angel Sharks ( <i>Squatina</i> spp.) in support of GFCM Recommendation GFCM/42/2018/2 and GFCM/44/2021/16. Note it is important to also prohibit intentional catches of Smoothback Angelshark ( <i>Squatina oculata</i> ) and Sawback Angelshark ( <i>Squatina aculeata</i> ) due to the difficulty to identify and distinguish between the three Angel Shark species found within the Mediterranean.	Essential	Immediate	All Range States.
Such protection may need to apply to both commercial and recreational fisheries (and should also consider other potential sources of anthropogenic mortality), in order to comply fully with obligations to protect CMS Appendix I listed species.	1.2 Species-protection: Establish national species-level protection against the deliberate killing, injuring or taking of Angelshark. This is of particular importance for those nations where prohibited species regulations (see 1.1) only apply to commercial fishing vessels, as additional protection against other sources of potential mortality (e.g. artisanal and recreational fisheries) may be required.	Essential	Short	All Range States.
Awareness programme to ensure relevant stakeholders are aware of regulations protecting Angelsharks and subsequent monitoring of compliance and enforcement, where necessary.  [* and other relevant species]	1.3 Awareness programmes: Initiate educational and awareness programmes with relevant stakeholder groups in both the fisheries sector (e.g. enforcement officials, fishing industry, fish markets) and recreational sector (e.g. recreational fishers, spearfishers, and amateur divers) as to the prohibited and/or protected status of Angelsharks With a particular focus on species identification to distinguish between the three <i>Squatina</i> spp., but also for classification purposes as Angelsharks are often reported as rays and not sharks. Share resources already developed by the Angel Shark Project for <u>best practice to safely release Angelsharks</u> if accidentally caught and the Angel Shark Sightings Map to report sightings.	Essential	Medium	Range States where Angelsharks are extant.

	<p>1.4 Monitoring and enforcement: Ensure that enforcement staff undertake appropriate monitoring of commercial fisheries and landings, particularly regarding those fleets that are more likely to encounter Angelsharks. Develop, or extend, national reporting framework for collating the number of inspections undertaken (by port, fleet, and month) and instances of infringement with regards to Angelsharks.</p>	<p>High</p>	<p>Ongoing</p>	<p>Range States where Angelsharks are extant.</p>
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<b>Table 9: Objective 2 - Identification of sites and habitats of Angelshark <i>Squatina squatina</i></b>				
<b>Result</b>	<b>Action</b>	<b>Priority</b>	<b>Time Scale</b>	<b>Range States Responsible</b>
To identify former, current and potential Critical Angel Shark Areas (CASAs) and ascertain the status of Angelshark in these areas.	<p>2.1 Data collation: Collate national data (including both contemporary and historic sources) regarding the presence of Angelsharks <i>Squatina squatina</i> (and sister taxa) from relevant sources (including published studies, commercial and recreational fisheries data, fish market data, fisher and diver interviews, citizen science programmes, trawl survey data, discard observer data, museum specimens, Angelshark survey data and historical resources) to better document the contemporary and historical occurrence of Angelsharks in national waters. Such data may also be enhanced through the collection of data on the current presence of Angelshark through the use of social media.</p> <p>Such data could be usefully collated in a common format (see Annex II), with institutes collating national data collaborating with other national institutes in order that more robust regional data are available. The collation of comparable data for other species of Angel Shark should also be undertaken, in order to aid in the interpretation of data for <i>Squatina squatina</i>. The <u>Angel Shark Sightings Map</u><sup>24</sup>, hosted by the Angel Shark Conservation Network, is already established, open access and widely used and could be utilised for this purpose.</p>	High	Ongoing	All Range States.
	<p>2.2 Habitat modelling: Based on data from action 2.1, undertake Angelshark habitat modelling in national waters and regional seas, in order to better understand and predict Critical Angel Shark Areas (CASAs), including habitats used by key life-history stages, including nursery, mating grounds, pupping and overwintering grounds.</p>	High	Ongoing	All Range States.

**Commented [A611]:** Croatia Ma DoF general comment:  
 - it is unclear if some actions listed in Table 9 should be conducted continuously on a yearly basis, or as one-time activities. It is necessary to include information in case some activities can be conducted one time, such as action 2.3.  
 - it would also be beneficial to add another column where it is indicated which activities are mandatory and which are optional (given a cost-benefit analysis and funding possibilities and priorities)

Croatia MA DoF: in our opinion it is not possible to conduct all actions listed under 2.2, 2.3 and 2.4 intended to determine relevant habitats) – we suggest to give the country the possibility to choose one or more actions which would best suit their particular situation, taking into consideration data collated and available funding.

**Commented [A612R11]:** None of the activities is mandatory under the Convention. All is voluntary. Countries have the flexibility to chose their own priorities and to include those in their workplans. See new sections 4.8. and 4.9 above.

<sup>24</sup> Angel Shark Sightings Map: <https://angelsharknetwork.com/#map>

	2.3 Environmental DNA (eDNA) sampling: undertake eDNA sampling of appropriate areas (i.e. former, current and potential Angelshark habitats identified in 2.2) to gauge potential presence of Angelshark in the region.	Medium	Medium	All Range States.
	2.4 Non-destructive site sampling: Depending on the results of 2.1, 2.2, and/or 2.3, undertake non-destructive surveys (e.g. underwater visual census) of contemporary/potential Angelshark habitat to determine whether effective non-extractive field programmes could be developed in order to monitor localised populations of Angelshark.	High	Medium/Long	All Range States.
	2.5 Role of current MPA network: Undertake appropriate sampling (e.g. eDNA sampling, underwater visual census) of existing Marine Protected Areas which may provide suitable habitat for Angelshark, in order to ascertain the likely presence/absence of Angelshark and the effectiveness of conservation measures in place in the current MPA network.	Medium	Long	All Range States.
	<del>2.6 Occurrence on fishing grounds: Based on the results of 2.1, 2.2, and/or 2.3, initiate (or expand) observer programmes to ensure robust observer coverage of those commercial fleets that may interact with Angelshark, in order to improve contemporary data on the presence of Angelshark and their interactions with fisheries.</del>	High	Medium	Range States where Angelsharks are extant.

**Commented [A613]:** Croatia MA DoF comment:  
 - it is necessary to clarify if action 2.6 s related to **scientific** observer programmes.  
 - Action should be moved under actions 3 (improved scientific data)

**Table 10: Objective 3 - Support and undertake scientific studies, including data collection and liaison with the fishing sectors, to improve scientific knowledge of Angelsharks *Squatina squatina*, including population trends.**

Result	Action	Priority	Time Scale	Range States Responsible
	<del>3.1 Scientific monitoring Occurrence on fishing grounds: Based on the results of 2.1, 2.2, and/or 2.3, initiate (or expand) scientific observer programmes to ensure dedicated and robust observer coverage of those commercial fleets that may interact with Angelshark, in order to improve contemporary data on the presence of Angelshark and their interactions with fisheries., and associated biological information (length, gender, females that are pregnant or giving birth.)</del>	High	Medium	Range States where Angelsharks are extant.
Improved scientific data from commercial fisheries on Angelsharks becomes available, to inform on the status of the species, pressures and enable more robust monitoring of population trends.	3.24 Commercial fishery-dependent catch-per-unit-effort data: Improved reporting of interactions with commercial fishing fleets, including data on the numbers of Angelsharks caught, fate (discarded alive or discarded dead), <del>and associated biological information (length, gender, females that are pregnant or giving birth).</del> Comparable data on fishing effort, especially for those fleets expected to have a higher number of interactions with Angelsharks, should also be recorded. Such work could utilise the existing reporting requirements of GFCM and potentially focus on a particular 'reference fleet' as a case study.	High	Short (Implementation)  Ongoing (monitoring)	Range States where Angelsharks are extant.
Improved scientific data from recreational fisheries and other recreational activities on Angelsharks becomes available, to inform on the status of the species, pressures and enable more robust monitoring of population trends.	<del>3.32 Recreational fishery catch reporting: Introduce obligation of recreational fishers to report accidental captures of Angelsharks periodically to a governing body as a condition of obtaining a licence (where relevant).</del> Encourage reporting of sightings to both the relevant national fisheries institute and the <u>Angel Shark Sightings Map</u> <sup>25</sup> . Adapt and distribute a code of conduct to safely release Angelsharks if accidentally	High	Ongoing	Range States where Angelsharks are extant.

**Commented [A614]:** Croatia MA DoF comment:  
- Suggested change: moved from 2.6 and amended to "scientific monitoring" (according to GFCM/44/2021/16 para 17: "onboard dedicated scientific observers")  
- Action should be moved under actions 3 (improved scientific data)

**Commented [IV15]:** Moved from previous 3.1

**Commented [A116]:** As with earlier comment on page 34, check GFCM 44/2021/16 and new GFCM recreational fishers WG.

**Commented [A617R16]:** GFCM WG framework for reporting. Footnote?

**Commented [A618]:** Croatia MA DoF: we suggest deleting or revising as it is not in line with EU and GFCM legislation. Licensing system in recreational fishing is not a standard applied across the Mediterranean, and reporting is not obligatory. This issue might be addressed through existing monitoring programmes, i.e. the one focused on assessing the catches in recreational fishery.

<sup>25</sup> Angel Shark Sightings Map: <https://angelsharknetwork.com/#map>

	caught (already developed by the Angel Shark Project) to the recreational fishing community.			
	<p>3.43 Citizen science: Through awareness programmes developed in Action 1.3, encourage reporting of Angelshark sightings to both the relevant national fisheries institute and the <u>Angel Shark Sightings Map</u><sup>20</sup>, whether amateur or commercial divers, recreational fishers or someone sighting them in a market.</p> <p>Adapt and share a <u>code of conduct for scuba and snorkel</u><sup>26</sup> (already developed by Angel Shark Project) with the diving community.</p>	Medium	Ongoing	Range States where Angelsharks are extant.
	<p>3.54 Fishery-independent survey trends: For any areas of localised Angelshark abundance or suitable Angelshark habitat (as surveyed under Actions 2.2, 2.3 and 2.4), initiate standardised, longer-term, non-destructive monitoring programmes to understand seasonal and annual trends in the presence and relative abundance of Angelsharks. Such work could involve collaborative studies with relevant stakeholder groups (e.g. commercial fishers, recreational fishers, divers etc.).</p>	High	<p>Medium (Implementation)</p> <p>Ongoing (monitoring)</p>	Range States where Angelsharks are extant.
	<p>3.65 Quantification and characterization of discarded Angelshark survival and options for minimising discard mortality: Depending on the results of (Action 3.1 and 3.2), detailed studies are needed to provide more robust estimates of discard survival (at-vessel mortality and post-release mortality) of Angelsharks from commercial fleets. Such work should be undertaken in conjunction with current levels and patterns of fleet activity and should be designed in such a way that would decrease fishing mortality on Angelsharks. Such work should also identify where changes in fisher behaviour</p>	High	Long	Range States where Angelsharks are extant.

Commented [A619]: Croatia: Scientific observers (new 3.1.) and logbook data (new 3.2)

<sup>26</sup> Code of conduct for scuba and snorkel: <https://angelsharknetwork.com/wp-content/uploads/sites/16/2018/08/Code-of-Conduct-English.pdf>

	(e.g. soak times of nets) can prevent or minimise mortality of incidentally caught Angelshark.			
	3.76 Tagging: For any areas of localised Angelshark abundance (as surveyed under Action 2.4), consider the utility of visual and/or electronic tagging to inform on seasonality, habitat use, home range and movement. Such studies should be designed carefully and follow an ethical review process, to avoid increasing mortality.	Medium	Long	Range States where Angelsharks are extant.
	3.87 Population structure and connectivity: Collect opportunistic tissue samples (e.g. from dead bycatch) and ensure appropriate longer-term archiving and storage. Subsamples of this material should be made available for scientific studies to facilitate Atlanto-Mediterranean genetic analyses to understand Angelshark connectivity in the region and global range.	Medium	Long	All Range States.
	3.98 Life-history studies: Depending on studies being undertaken under the Concerted Action Plan, relevant national institutes could usefully collect life-history information (length, sex, weight, maturity, collection of biological material for supporting studies, including genetic samples, stomach contents, tissue samples, and parasites). In accordance with the “no taking” rule described in CMS Article III (5 <sup>27</sup> ) such work should only be undertaken when based on specimens of incidental dead bycatch and under authorised derogation from relevant national regulatory frameworks (see Objective 1).	Medium	Ongoing	Range States where Angelsharks are extant.

<sup>27</sup> CMS Article III (5):

Parties that are Range States of a migratory species listed in Appendix I shall prohibit the taking of animals belonging to such species. Exceptions may be made to this prohibition only if:

- a) the taking is for scientific purposes;
- b) the taking is for the purpose of enhancing the propagation or survival of the affected species;
- c) the taking is to accommodate the needs of traditional subsistence users of such species; or
- d) extraordinary circumstances so require.

	<p>3.109 Longer-term, historical population dynamics: Depending on the data available (see Action 2.1), undertake analyses of longer-term population trends of Angelsharks for national waters and regional seas to understand historical population trends.</p>	<p>Low</p>	<p>Long</p>	<p>All Range States.</p>
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<b>Table 11: Objective 4 - Sufficient resources secured for long-term Angelshark <i>Squatina squatina</i> conservation actions</b>				
<b>Result</b>	<b>Action</b>	<b>Priority</b>	<b>Time Scale</b>	<b>Range States Responsible</b>
Resources shall be secured on a long-term basis for the implementation of the Single Species Action Plan.	4.1 Provide Resources: National and regional governments secure the necessary funds for the implementation of the actions at national and regional levels. Parties shall strive to provide funds to implement priority actions in the plan and financially contribute to staff time and coordination.	High	Ongoing	All Range States.
	4.2 Establish an international working group (IntWG) for the Mediterranean region: An IntWG will be established to coordinate and monitor the implementation of this Single Species Action Plan.	High	Ongoing	All Range States.
	4.3 <del>Increase</del> Appraise protected areas: Expand the existing MPA network to include any identified CASAs and the effectiveness of MPA networks is continually monitored.	Medium	Long	All Range States.

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**ANNEXES**

**Annex I: Goals, Objectives, and Actions adapted from Gordon et al., 2019.** This table is adapted from the Mediterranean Angel Sharks: Regional Action Plan (Gordon et al., 2019). Only actions most relevant to this Single Species Action Plan have been included in Annex I. The original numbering and wording of each goal, objective and action remain.

<b>Goal 1: Fisheries-based Angelshark mortality is minimised in the Mediterranean.</b>	
	<b>Objective 1.1: Reporting and monitoring in all segments of Mediterranean fisheries, including recreational, is improved for the three species of angel shark.</b>
	Action 1.1.2: Develop guidance documents for reporting procedure in line with GFCM Recommendations for data recording and ensure the document is accessible to industry.
	Action 1.1.5: Comply with existing GFCM and national reporting procedures.

<b>Objective 1.2: Incidental catch of angel sharks by all segments of Mediterranean fisheries is minimised.</b>	
	Action 1.2.2: Ascertain the level of bycatch and incidental catch by gear type in order to inform further necessary action.
	Action 1.2.4: Secure spatial/temporal management and gear restrictions based on collated data.
<b>Objective 1.3: Retention is reduced, and post-release survival enhanced, through information, training, and education for fishers.</b>	
	Action 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.
	Action 1.3.3: Develop training programmes to educate fishers about conservation status and prohibited status of Angelsharks, as well as best practice handling techniques.
<b>Objective 1.4: The extent of interaction between marine recreational fishing activities and angel sharks is ascertained and minimised.</b>	
	Action 1.4.1: Quantify the level of recreational fishing activity in the Mediterranean, guided by GFCM recreational fisheries handbook.
<b>GOAL 2 Angelshark habitat is identified and protected.</b>	
<b>Objective 2.1: Angel shark distribution is better understood.</b>	
	Action 2.1.3: Use fisheries data and other reporting methods to improve spatial data on distribution.
<b>Objective 2.3: Angel shark habitat is identified, specifically Critical Angel Shark Areas (CASAs).</b>	
	Action 2.3.3: Increase engagement with UNEP-MAP SPA/RAC habitat mapping programmes to identify potential CASAs.
	Action 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.

<b>Objective 2.4: Angel shark habitat is reflected in marine spatial planning and coastal development.</b>	
	Action 2.4.1: Engage with Environmental Impact Assessment (EIA) process prior to coastal developments near CASAs.
	Action 2.4.2: Monitor coastal developments near CASAs and mitigate impacts where possible.
	Action 2.4.3: Identify what spatial/temporal management measures would be most appropriate according to each subarea.
	Action 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.
<b>Goal 3: National legislation for angel sharks is established, implemented and enforced.</b>	
<b>Objective 3.1: Angelsharks are protected by regional and national management measures (where GFCM/42/2018/2 has been adopted, go to Action 3.1.5 or Objective 3.2).</b>	
	Action 3.1.1: Review national legislation and identify gaps in the implementation of relevant international and regional obligations, including those under GFCM and CMS.
	Action 3.1.2: Transpose GFCM/42/2018/2 <a href="#">and GFCM/44/2021/16</a> into national legislation where lacking.
	Action 3.1.3: Fulfil obligations under CMS App I & II listing and CMS Sharks MOU Annex I.
	Action 3.1.5: Where absent, seek adoption of full protective measures to cover recreational activities and disturbance.
<b>Objective 3.2: Management measures are implemented and enforced.</b>	
	Action 3.2.1: Implement and enforce GFCM/42/2018/2 <a href="#">and GFCM/44/2021/16 as well as</a> & national legislations.
	Action 3.2.2: Implement CMS Appendix I listing in all Mediterranean and Black Sea Range States.

	Action 3.2.3: Reinforce compliance reporting processes at regional fora, requiring more detailed documentation.
	Action 3.2.7: Ensure regulatory obligations are reflected in training for fishers, accommodating subregional constraints (see Action 1.3.3).
<b>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).</b>	
	Action 3.3.2: Ensure CMS obligations are reflected in marine spatial planning (e.g. MPAs, FRAs, SPAs) and coastal development processes.

**Annex II: Suggested field headings and descriptions for collation of data on Angelshark presence.** The table includes a list of data fields and accompanying formats that could be used to collect information on sightings or captures of Angelsharks. The fields align with those captured through the Angel Shark Sightings Map, in addition to some others (denoted by \*), which may be useful. More fields are available through the Angel Shark Sightings Map, not included here for brevity, including the option to upload photos and videos.

Data field	Format and description
Latitude	- Latitude in decimal degrees
Longitude	- Longitude in decimal degrees
*Longitude (East/West)	- Whether longitude is East or <del>West</del>
Estimated/actual	- 'Estimated' [i.e. position was estimated from a place name] - 'Actual' [i.e. position was as recorded]
Country	- Insert country of record
GFCM GSA	- Insert GFCM Geographic Sub-Area (i.e. GSA1– <del>GSA29</del> <u>GSA279</u> )
Species	Text field, either - <i>Squatina squatina</i> - <i>Squatina oculata</i> - <i>Squatina aculeata</i> - <i>Squatina</i> spp. ( <del>indet.</del> ) <u>unidentified to species level</u>
Accuracy of species identification	- 'Verified' [i.e. species identification is considered reliable] - 'Tentative' [i.e. species identification may not be accurate]
Day of sighting	- Day (1-31) or 'NA' if unavailable
Month of sighting	- Month (1-12) or 'NA' if unavailable
Year of sighting	- Year (YYYY) or 'NA' if unavailable

Commented [A320]: They use of decimal degrees removes the need to have East/West

Commented [ABG21]: GSA 28 and 29 refer to Marmara and Black Seas and are not included in the GFCM recos on sharks

Season	<ul style="list-style-type: none"> <li>- 'Q1' [January to March]</li> <li>- 'Q2' [April to June]</li> <li>- 'Q3' [July to September]</li> <li>- 'Q4' [October to December]</li> <li>- 'NA' if not available</li> </ul>
How many angel sharks did you see	<ul style="list-style-type: none"> <li>- Option to say more than one shark sighted together</li> </ul>
Shark length	<ul style="list-style-type: none"> <li>- Total length in 'cm' if known</li> <li>- 'NA' if length not available</li> <li>- Length categories if estimated <ul style="list-style-type: none"> <li>- '39 cm or shorter'</li> <li>- '40 – 60 cm'</li> <li>- '61 – 100 cm'</li> <li>- '101 cm or longer'</li> </ul> </li> </ul>
Shark sex	<ul style="list-style-type: none"> <li>- 'Male'</li> <li>- 'Female'</li> <li>- 'Unknown'</li> </ul>
*Maturity stage	<ul style="list-style-type: none"> <li>- If a female is 101 cm or longer, if possible, maturity can be described: <ul style="list-style-type: none"> <li>- 'Mature (gravid)' [only applies to those females containing embryos]</li> <li>- 'Mature (pupping)' [only applies to females which contain term pups, or from which terms pups have been shed]</li> <li>- 'Mature (post-partum)' [applies to females that have recently given birth]</li> <li>- 'Unavailable'</li> </ul> </li> <li>- If a male: <ul style="list-style-type: none"> <li>- 'Immature' when claspers not or partly calcified</li> <li>- 'Mature' when claspers are fully calcified, elongated and rotatable.</li> </ul> </li> <li>- 'Unknown'</li> </ul>
Shark depth	<ul style="list-style-type: none"> <li>- Depth 'in metres' if known</li> <li>- Depth categories if estimated: <ul style="list-style-type: none"> <li>- '0 – 10 m'</li> <li>- '11 – 20 m'</li> <li>- '21 – 40 m'</li> <li>- '41 – 100 m'</li> <li>- '101 m or deeper'</li> </ul> </li> <li>- 'Unknown'</li> </ul>
*Shark habitat	<ul style="list-style-type: none"> <li>- 'Mud'</li> <li>- 'Sand'</li> <li>- 'Gravel'</li> <li>- 'Rock'</li> <li>- 'Rock/Reef'</li> <li>- 'Mixed Habitat'</li> <li>- 'Seagrass'</li> <li>- 'Unknown'</li> <li>- 'Other' [blank field option]</li> </ul>
Shark Behaviour	<ul style="list-style-type: none"> <li>- 'Buried in the sand'</li> <li>- 'Resting on the surface'</li> </ul>

	<ul style="list-style-type: none"> <li>- 'Swimming'</li> <li>- 'Mating'</li> <li>- 'Pregnant'</li> </ul>
*Photo/video documented	<ul style="list-style-type: none"> <li>- 'Yes'</li> <li>- 'No'</li> </ul>
*How did you see the <del>a</del> Angelshark?	<ul style="list-style-type: none"> <li>- 'Scientific fishing survey'</li> <li>- 'Commercial fishing vessel'</li> <li>- 'Commercial fishing from shore'</li> <li>- 'Fish market or landing port'</li> <li>- 'Recreational fishing vessel'</li> <li>- 'Recreational fishing from shore'</li> <li>- 'Spearfishing'</li> <li>- 'In-water sighting: diving, freediving, snorkelling'</li> <li>- 'Other' [blank field option]</li> </ul>
*Gear type (if caught in commercial fishing gear)	<ul style="list-style-type: none"> <li>- 'Bottom trawl'</li> <li>- 'Bottom beam trawl or dredge'</li> <li>- 'Set nets (gill net, trammel net, tangle net)'</li> <li>- 'Bottom longline'</li> <li>- 'Other' [blank field option]</li> <li>- 'Unknown'</li> <li>- 'NA' if Angelshark was not caught in commercial gear</li> </ul>
*Fate of Angelshark (if caught in a commercial gear)	<ul style="list-style-type: none"> <li>- 'Discarded alive'</li> <li>- 'Discarded dead'</li> <li>- 'Dead specimen retained for scientific purposes or museum'</li> <li>- 'Live specimen retained for aquarium'<sup>28</sup></li> <li>- 'Other' [blank field option]</li> <li>- 'Unknown'</li> <li>- 'NA' if Angelshark was not caught in commercial gear</li> </ul>
*Specimen and/or biological material	<ul style="list-style-type: none"> <li>- Name of institute that has archived the material</li> </ul>
*Set time (if caught in commercial gear)	<ul style="list-style-type: none"> <li>- Trawl duration or soak time less than 3 hours</li> <li>- Trawl duration or soak time 3 – 6 hours</li> <li>- Trawl duration or soak time 6 – 12 hours</li> <li>- Trawl duration or soak time greater than 12 hours</li> <li>- 'Unknown'</li> <li>- 'NA' if Angelshark was not caught in commercial gear</li> </ul>
What is the name of the fish market	
Any other comments on this sighting (including presence of tags)	

Commented [A322]: This is just focused on trawls, needs to be widened for all commercial vessels

<sup>28</sup> CMS Article III states that Parties that are Range States of a migratory species listed in Appendix I shall prohibit the taking of animals belonging to such species. Exceptions may be made to this prohibition if 'the taking is for scientific purposes' of benefit to the population or 'the taking is for the purpose of enhancing the propagation or survival of the affected species.'

**Annex III: Legislation related to fishery or biodiversity.** This table includes national legislation of Range States in the Mediterranean, related to fishery or biodiversity, which is relevant for but not species-specific for Angelshark. Where available, species-specific legislation is included in Table 7.

COUNTRY	LEGISLATION	ARTICLES
ALBANIA	<u>National legislation in English could not be located.</u>	
ALGERIA	<p>Ordonnance n° 06-05 du 19 Jomada Ethania 1427 correspondant au 15 juillet 2006 relative à la protection et à la préservation de certaines espèces animales menacées de disparition</p> <p>Décret exécutif 12-235 du 3 Rajab 1433 correspondant au 24 mai 2012 fixant la liste des espèces animales non domestiques protégées. ]</p> <p>Loi n° 01-11 relative à la pêche et à l'aquaculture</p> <p>Loi n° 15-08 du 12 Jomada Ethania 1436 correspondant au 2 avril 2015 modifiant et complétant la loi 01-11</p>	<p><u>Law n° 01-11 dated on July 3rd 2001 related to Fisheries and Aquaculture provides in Article 13 that "The capture, the breeding, the handling the transformation, the distribution and the marketing of the fishing and aquaculture products, are practiced/practised in the framework of a durable biological resources use, especially in order to: [...]</u></p> <p><u>Protect the biological diversity, decrease the biological resources wasting, by using selective tackles or techniques and practicing/practising a responsible fishing for the environment/environmental protection."</u></p>
BOSNIA-HERZEGOVINA	<u>National legislation in English could not be located.</u>	
CROATIA	See Table 7 for species-specific legislation	
CYPRUS	See Table 7 for species-specific legislation	
EGYPT	Constitution	<p>Article 45 (unofficial translation of the Constitution):</p> <p>"The State shall protect its seas, shores, lakes, waterways and natural protectorates. Trespassing, polluting or misusing any of them is prohibited. Every citizen is guaranteed the right to enjoy them. The State shall protect and develop the green space in the urban areas; preserve plant, animal and fish resources and protect</p>

**Commented [CMS23]:** These two laws do not list any marine animals as endangered. Therefore, do they also apply to sharks?

		those under the threat of extinction or danger; guarantee humane treatment of animals, all according to the law.”
	Law No 102 of 1983 for Nature Protectorates	<p>Article (2): It is forbidden to commit actions (deeds or activities or undertakings) which will lead to the destruction or deterioration of the natural environment or harm the biota (terrestrial, marine or fresh water), or which will detract from the esthetic (beauty) standards within protected areas.</p> <p>In particular, the following acts are forbidden: “Catching transporting killing or disturbing wildlife;”</p>
EUROPEAN UNION	<p>See Table 7 for species-specific legislation</p> <p><a href="#">For legislation related to fishery or biodiversity that benefit the Angelshark: the Common Fisheries Policy Regulation<sup>29</sup>, Control Regulation<sup>30</sup>, the Data Collection Framework as set out in Regulation (EU) 2017/1004, the European Maritime, Fisheries and Aquaculture Fund (EMFAF) as established by Regulation (EU) 2021/1139<sup>31</sup> and the Shark Finning Regulation<sup>32</sup> and Regulation (EU) 2015/2102<sup>33</sup>, the Marine Strategy Framework Directive<sup>34</sup>, the Habitats Directive<sup>35</sup> (although the Angelshark is not listed there, protection of other species and their habitats will benefit the Angelshark indirectly), as well as European Green Deal with its EU Biodiversity Strategy for 2030</a></p>	
FRANCE	See Table 7 for species-specific legislation	
GREECE	See Table 7 for species-specific legislation	
ISRAEL	See Table 7 for species-specific legislation	

<sup>29</sup> [OJ L 354, 28.12.2013, p. 22](#)

<sup>30</sup> [OJ L 343, 22.12.2009, p. 1](#)

<sup>31</sup> [OJ L 247, 13.7.2021, p. 1](#)

<sup>32</sup> [OJ L 167, 4.7.2003, p. 1](#)

<sup>33</sup> [OJ L 308, 25.11.2015, p. 1](#)

<sup>34</sup> [OJ L 164, 25.6.2008, p. 19](#)

<sup>35</sup> [OJ L 206, 22.7.1992, p. 7](#)

ITALY	Legislative Decree No. 4 rearranging the national legislation on fisheries and aquaculture, 2012	Article 7, comma 1, lett.c: "It is prohibited to retain, land, transport and offer for sale the species, at any stage of growth, for which the capture is prohibited in violation of the current law in force.
LEBANON	Environment Protection Law 444/2002  decision 676/1 27/07/2011 - prohibiting fishing transporting selling and consuming some fish species	Article 48
LIBYA	Law 14 – 1989: Basic legislation to establish marine wealth sector competition and regulation of marine wealth use and preservation  Law number 7 / 1982: Regarding the protection of <u>the</u> environment The third chapter addressed the protection of marine biology and the hazards of oil pollution on fish species	Article 4) "à interdire la capture des espèces protégées ou la pêche dans les zones protégées" (source: <a href="http://webco.faocopemed.org/old_copemed/vldocs/0000539/review_reglementations.pdf">http://webco.faocopemed.org/old_copemed/vldocs/0000539/review_reglementations.pdf</a> )
MALTA	See Table 7 for species-specific legislation	
MONACO	See Table 7 for species-specific legislation	
MONTENEGRO	<a href="#">See Table 7 for species-specific legislation</a>	
MOROCCO	Loi n° 11-03 relative à la protection et à la mise en valeur de l'environnement  Dahir n° 1-93-401 du 1 <sup>er</sup> ramadan 1432 (2 août 2011) portant publication de la Convention sur la conservation des espèces migratrices appartenant à la	Articles 21 and 22

	faune sauvage, faite à Bonn le 23 juin 1979	
SLOVENIA	See Table 7 for species-specific legislation	
SPAIN	See Table 7 for species-specific legislation	
SYRIA	Legislative Decree No. 30 on the protection of aquatic life (Deere! legislatif NO 30 sur la protection des etres aquatiques). - 25 August 1964	Article 32 protection of public water against pollution
TUNISIA	Loi n° 94-13 du 31 janvier 1994, relative à l'exercice de la pêche	Article 12 "L'autorité compétente fixe par arrêté les espèces aquatiques dont la pêche est interdite. Il est interdit d'enfreindre les dispositions relatives aux normes de qualité et aux conditions sanitaires des espèces aquatiques, et qui sont fixées par arrêté de l'autorité compétente."  Article 13 "Les espèces aquatiques dont la pêche est interdite doivent être immédiatement rejetées à l'eau, ou en cas d'empêchement avant l'arrivée de l'unité au port. Toutefois, une part déterminée d'espèces dont la pêche est interdite, est tolérée parmi les quantités débarquées. Cette part est fixée par arrêté de l'autorité compétente."  Article 14 "Il est interdit de transporter, de vendre, de stocker, de transformer ou d'utiliser comme appât, les espèces aquatiques dont la pêche est prohibée, à l'exception de la part visée à l'article précédent."
TURKEY	See Table 7 for species-specific legislation	
UNITED KINGDOM OVERSEAS TERRITORIES	See Table 7 for species-specific legislation	

**Commented [A624]:** For non species-specific:  
- Law 42/2007 of Natural Heritage and Biodiversity (not just Mediterranean. It is the basic law of Biodiversity protection)