

Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

THRACIAN SEA SHELF ISRA

Mediterranean and Black Seas Region

SUMMARY

Thracian Sea Shelf is located in the northernmost part of the Aegean Sea. It is characterised by a diverse coastal and shelf morphology including several gulfs and two islands (Thasos and Samothraki). It has an extended continental shelf, primarily covered with seagrass meadows and sandy-muddy substrates. The nutrient-rich rivers and Black Sea waters support high biological productivity in the area. The area overlaps with an Ecologically or Biologically Significant Marine Area, 12 Key Biodiversity Areas, 10 Natura 2000 sites, five Ramsar sites, and two national parks. Within this area there are **threatened species** (e.g., Duckbill Eagle Ray *Aetomylaeus bovinus*), **range restricted species** (Rough Skate *Raja radula*); **reproductive areas** (e.g., Smallspotted catshark *Scyliorhinus canicula*); and **undefined aggregations** (Common Stingray *Dasyatis pastinaca*).

CRITERIA

Criterion A - Vulnerability; Criterion B - Range Restricted;
Sub-criterion C1 - Reproductive Areas; Sub-criterion C5 - Undefined Aggregations

— —
GREECE
TÜRKIYE

— —
0-300 metres

— —
9,980.6 km²
 — —





DESCRIPTION OF HABITAT

Thracian Sea Shelf is located in the northernmost part of the Aegean Sea. The area is characterised by a diverse coastal and shelf morphology including several gulfs and islands. The deepest parts are found at the margin of the North Aegean Trough, while the mean depth is around 150 m. Most of the area is characterised by an extended continental shelf with sandy to muddy substrates (Vasquez et al. 2021). The coastal areas (down to ~35 m) are covered with Neptune Grass *Posidonia oceanica* meadows while in the brackish waters of river mouths, other marine plants and algae are present (UNEP WCMC 2021). Hard substrates are limited to waters >200 m mostly near the rocky shores of Mount Athos, and around Samothraki Island (Vasquez et al 2021). Rare species of corals are found there, both in muddy banks (soft corals, sea pens) and on the hard substrate of rocky shorelines (octocorals).

The area is influenced by the intrusion of the brackish and nutrient/carbon rich Black Sea Water (BSW; Kokkos & Sylaios 2016). A well-defined frontal zone is formed as a result of the interaction of the low salinity BSW and the more saline Levantine Intermediate Water (LIW) originating from the Levantine Sea (Lykousis et al 2002; Kokkos & Sylaios 2016). The wider area is subjected to significant upwelling events, especially during the boreal summer, under the prevailing northerly (Etesian) winds. The primary production in the area is particularly high, due to the input of trans-frontal river waters, upwellings, and the input of nutrient-rich water from the Black Sea (Lykousis et al 2002).

The area overlaps with the North Aegean Ecologically or Biologically Significant Marine Area (CBD 2018), 12 marine Key Biodiversity Areas (Thasos Island and Xironisi Islet; Gelibolu Kemikli Headland; Saros Bay; Meriç Delta; Evros Delta; Samothraki Island; Lake Ismarida [Mitrikou]; Porto Lagos, Lake Vistonida and Coastal Lagoons; Nestos Delta and Coastal Lagoons; Strymona Estuary; Gulf of Kavala and Marine Area of Thasos Island; and, Mount Athos and Surrounding Marine Area; KBA 2023), 10 Natura 2000 sites, five Ramsar sites (Wetlands of International Importance; Evros Delta; Lake Vistonis; Porto Lagos; Lake Ismaris & adjoining lagoons; Nestos delta & adjoining lagoons).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 300 m depth based on the bathymetry of the area.

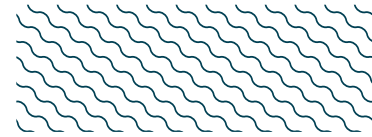
ISRA CRITERIA

CRITERION A - VULNERABILITY

Six Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species™ regularly occur in the area. Threatened sharks comprise one Endangered species; threatened rays comprise two Critically Endangered species, two Endangered species, and one Vulnerable species (IUCN 2023).

CRITERION B - RANGE RESTRICTED

Thracian Sea Shelf holds the regular presence of the Rough Skate as a resident range-restricted species. It is found year-round in the area and is regularly caught or taken as bycatch in different fishing gears particularly during late summer to autumn (Yeldan & Avsar 2006; Yigin & Ismen 2014; ElasmCatch unpubl. data 2019–2020; Giovos et al. 2021; Martin et al. 2022; PunPuffinus unpubl. data 2023). This species only occurs in the Mediterranean Sea Large Marine Ecosystem.



SUB-CRITERION C₁ – REPRODUCTIVE AREAS

Thracian Sea Shelf is an important reproductive area for one shark and two ray species.

Mature Smallspotted Catshark females (4% of 3,476 sampled individuals) and juveniles <20 cm total length (TL) (19.5%) have been regularly reported in the area throughout the year during 2014–2021 (size-at-birth is 8–10 cm TL; Serena 2005; Karampetsis et al. 2022). Preliminary fishery-dependent data indicate that parts of the area are egg-laying sites for Smallspotted Catsharks (By Elasmocatch unpubl. data 2020). In late spring to late summer of 2019, live egg cases attached to bamboo corals, sea pens, and litter were observed in all 26 monitored hauls, in some cases exceeding 50 egg cases per haul. Immature individuals in spring ranged from 31–63% of the total individuals, while in the summer this increases to 42–100% (By Elasmocatch unpubl. data 2020).

Common Eagle Rays are considered abundant in the area (Yigin & Ismen. 2008; By Elasmocatch unpubl. data 2020; Giovos et al. 2021). According to fisher local ecological knowledge, the species aggregates by size and depth during specific seasons. Fishers report that annually in May, up to 20 individuals of 7–15 cm disc width (DW) are captured in ~3.5 m depth using 4.5 km trammel nets targeting Common Sole *Solea solea*, while individuals near or above size-at-maturity aggregate in the same period in deeper waters (>5 m). This was reported from a majority of fishing trips (~20) during May by the local fleet (10 active vessels). Fishers also suggest that individuals aggregating in deeper waters are often pregnant females who either abort onboard or have large oocytes which they observe during the removal of intestines. This reportedly happens annually during May and July. During August 2019, at the Alexandroupoli landing site, neonates, young-of-the-year (YOY), and juveniles were caught in groups of 10–15 individuals per fishing trip (individuals measured 21–27 cm DW; size-at-birth is <19 cm DW; Otero 2019). In contrast, no catches of this species were reported at the nearby Kavala’s landing site (Giovos et al. 2021), and in 2020, juveniles were caught between Evros Estuary and Northeastern Samothraki by benthic trawlers (By Elasmocatch unpubl. data 2020). The seasonality of juvenile occurrence aligns with the reported reproductive cycle in other areas of the Mediterranean Sea (Capapé et al. 2007).

Juveniles, including neonates and YOY, four pregnant, and 10 post-natal female Rough Skate were observed in small-scale fisheries in Kavala, Ierissos Bay, and Alexandroupoli in mid-summer with two individuals in September releasing their egg cases onboard, and eight additional egg cases collected directly from females from March–May (Gubili 2019; By Elasmocatch unpubl. data 2020; Giovos et al. 2021). Specifically, between August 2019 and October 2020 (62 fishing trips), 341 specimens were collected over the course of monthly surveys. Immature males (<30 cm DW) and females (<34 cm DW) represented 97.9% (n = 190) and 92.9% (n = 137), respectively, of the total number of individuals (By Elasmocatch unpubl. data 2019–2020). Two individuals were of size-at-birth (6–7 cm DW; Capapé et al. 2007) and 38 individuals were considered YOY at 9–12 cm DW. In Saros Bay, 255 specimens were collected during monthly surveys from February 2005 to September 2008 (Yigin & Ismen 2014). Two individuals were considered YOY while 53% of females were mature.

SUB-CRITERION C₅ – UNDEFINED AGGREGATIONS

Thracian Sea Shelf is an important area for the aggregations of one shark and three ray species. Various locations in the area, specifically in shallow waters of river mouths and the deeper banks formed by Evros River and Nestos River, host aggregations of species.

Common Smoothhound is regularly reported from the area (Ismen et al. 2007, 2009; Maravelias et al. 2012; By Elasmocatch unpubl. data 2020; Giovos et al. 2021). According to local ecological knowledge, the species aggregates in May off Evros delta (~2 km from shore) for 15 to 20 days each

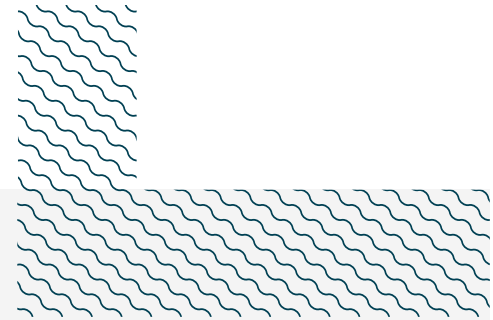
year at a depth of 29–46 m at ~the mid-point between the Greek/Turkish border. Here, fishers target them during two weeks with specific thick gillnets called ‘dognets’. Each net (3.7 km in length; R. Naasan Aga Spyridopoulou pers. obs.) can catch up to 55 individuals per fishing trip, ranging from 6.5–9 kg per individual. This weight corresponds to individuals of 140 – 150 cm TL which are considered mature (Filiz & Bilge 2004; Saïdi et al. 2008). This phenomenon has been known for the last two generations of fishers (over 40 years). The fishers’ assumption is that the species aggregate to mate, which aligns with the mating season reported from the Mediterranean Sea (Saïdi et al. 2008). Further information is however required to understand the function of this aggregation.

The Common Stingray is regularly reported from the area (Yigin & Ismen 2012; By Elasmocatch unpubl. data 2020; Giovos et al. 2021). The species is known to inhabit brackish waters (Yigin & Ismen 2012), and animals are especially found around Nestos and Evros estuaries (Giovos et al. 2021). Between 2005–2008, 91 individuals were collected in Saros Bay, of which 52 were female (57% of the total number of individuals), ranging 37.5–114 cm TL (54.7% of which were considered mature; Yigin & Ismen 2012). Thirty-two were males (43%), ranging 40–110 cm TL (33.3% of which were considered mature; Yigin & Ismen 2012). During August 2019, 17 individuals were observed in one fishing operation (5 km long net) of which nine were immature and two were of undetermined maturity level. In the same year, a pregnant female was captured during early July (By Elasmocatch, unpubl. data 2019). According to fisher knowledge, the species aggregates by size and depth in late spring to mid-summer along with the other reported species in the same fishing fleets targeting Common Sole (40 mm). According to fishers, each fishing operation can catch up to 25 individuals in a net (4.5 km long). Mature females and males were also observed in late September to early October in 2020 in benthic trawlers off Nestos and Evros estuaries (By Elasmocatch unpubl. data 2020). More information is needed to determine the function of these aggregations.

The Duckbill Eagle Ray has a confirmed presence in the area and is captured with multiple fishery gear types (Yigin & Ismen. 2008; By Elasmocatch unpubl. data 2020; Giovos et al. 2021). A large proportion of the small-scale fisheries bycatch is attributed to brackish waters (Giovos et al. 2021). Nestos and Evros are the largest estuaries of the area and sustain seasonal aggregations of mixed-age and sex groups. According to fisher knowledge in the area, young individuals of 7–15 cm (Disc Length), likely neonates, are captured in ~3.5 m depth using trammel nets targeting Common Sole in May. Based on an average of 20 fishing trips a month by 10 active fishing vessels, each fishing operation yields up to 20 individuals in 4.5 km nets and individuals near or above size-at-maturity aggregate in the same period in deeper waters (>5 m). From the landing site of Alexandroupoli and Kavala, juveniles were observed year-round while adults were only observed in October (Elasmocatch project 2019). In contrast, no Duckbill Eagle Rays were reported from landing site surveys on the Chalkidiki Peninsula and Ierissos Gulf, southwest of the area. More information is needed to determine the function of these aggregations.

The Spiny Butterfly Ray is regularly caught as bycatch in multiple fishing gears (Yigin & Ismen 2008; By Elasmocatch unpubl. data 2020; Giovos et al. 2021). Nestos and Evros estuaries sustain seasonal aggregations of mixed age and sex groups (Giovos et al. 2021). According to fisher knowledge, the species aggregates by size and depth in specific seasons in both estuaries along with the abovementioned species. In May, up to 15 YOY and juveniles of ~7–15 cm disc length (as estimated by fishers), are captured per fishing trip in ~3.5 m of depth using 4.5 km long trammel nets targeting Common Sole. Fishers also report similar sized groups (10–20 individuals) near or above size-at-maturity aggregating in the same period in deeper waters (>5 m). In August 2019, two YOY were observed (~56 cm DW; size-at-birth is 38–44 cm DW; Otero et al. 2019) while a very large female individual was recorded in July (By Elasmocatch unpubl. data 2019). Spiny Butterfly Rays have

previously been observed in late gestation during March in Syria (Alkusaairy et al. 2014) which aligns with the observations of neonates by fishers in early May. More information is needed to determine the function of these aggregations.



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QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
<i>Mustelus mustelus</i>	Common Smoothhound	EN	5-800	X						X		
<i>Scyliorhinus canicula</i>	Smallspotted Catshark	LC	0-800			X						
RAYS												
<i>Aetomylaeus bovinus</i>	Duckbill Eagle Ray	CR	0-150	X						X		
<i>Dasyatis pastinaca</i>	Common Stingray	VU	0-200	X						X		
<i>Gymnura altavela</i>	Spiny Butterfly Ray	EN	10-150	X						X		
<i>Myliobatis aquila</i>	Common Eagle Ray	CR	0-537	X		X						
<i>Raja radula</i>	Rough Skate	EN	0-350	X	X	X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Centrophorus uyato</i>	Little Gulper Shark	EN
<i>Dalatias licha</i>	Kitefin Shark	VU
<i>Etmopterus spinax</i>	Velvet Belly Lanternshark	VU
<i>Galeus melastomus</i>	Blackmouth Catshark	LC
<i>Hexanchus griseus</i>	Bluntnose Sixgill Shark	NT
<i>Isurus oxyrinchus</i>	Shortfin Mako	EN
<i>Mustelus asterias</i>	Starry Smoothhound	VU*
<i>Oxynotus centrina</i>	Angular Roughshark	EN
<i>Prionace glauca</i>	Blue Shark	CR*
<i>Scyliorhinus stellaris</i>	Nursehound	VU
<i>Squalus blainville</i>	Longnose Spurdog	DD
<i>Squalus acanthias</i>	Spiny Dogfish	VU
RAYS		
<i>Dasyatis marmorata</i>	Marbled Stingray	NT
<i>Dasyatis tortonesei</i>	Tortonese's Stingray	DD
<i>Dipturus oxyrinchus</i>	Longnosed Skate	NT
<i>Pteroplatytrygon violacea</i>	Pelagic Stingray	LC
<i>Raja brachyura</i>	Blonde Skate	NT
<i>Raja clavata</i>	Thornback Skate	NT
<i>Raja miraletus</i>	Brown Skate	LC
<i>Rostroraja alba</i>	White Skate	EN
<i>Torpedo marmorata</i>	Marbled Torpedo Ray	VU
CHIMAERAS		
<i>Chimaera monstrosa</i>	Rabbitfish	VU

*Assessed as threatened in a Mediterranean regional assessment but considered NT globally.

IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org. Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.

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