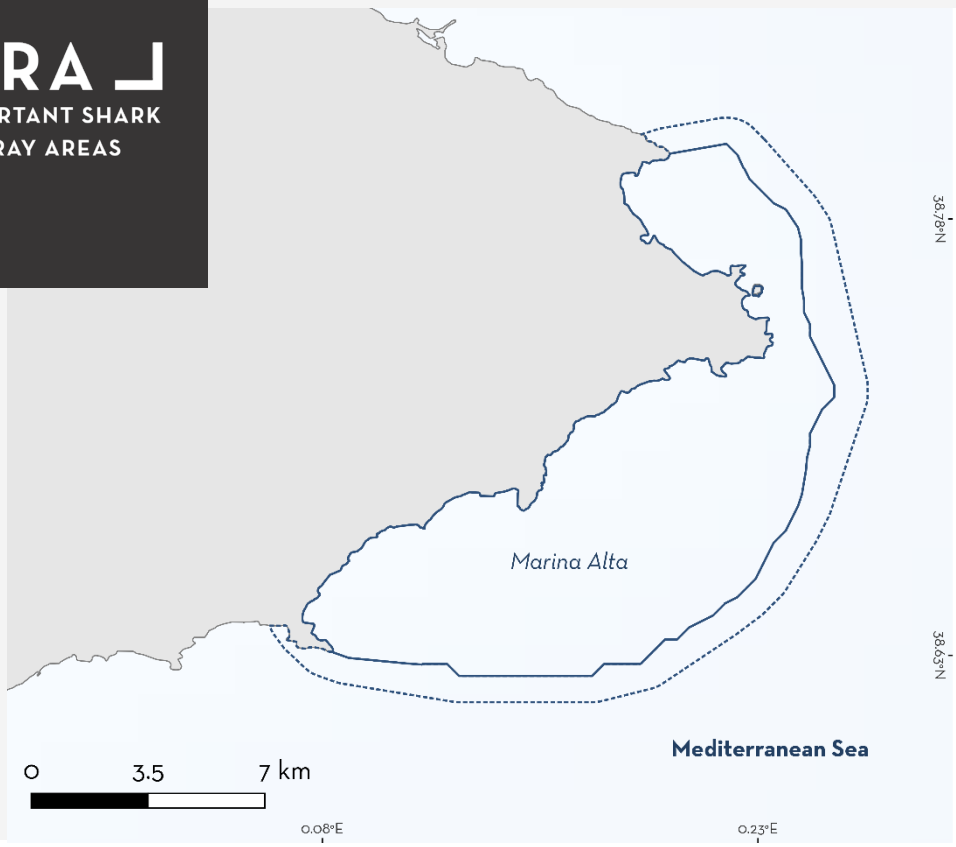
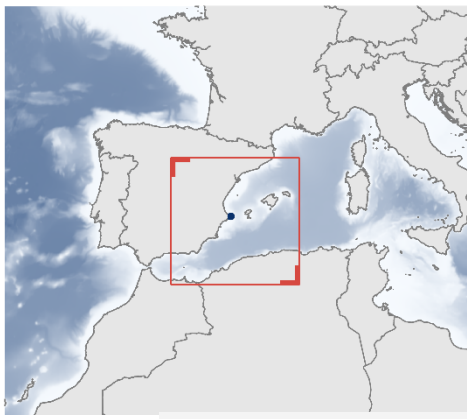
ISRA
IMPORTANT SHARK AND RAY AREAS





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

MARINA ALTA ISRA

Mediterranean and Black Seas Region

SPAIN

0–50 metres

134.23 km²

SUMMARY

Marina Alta is a coastal area located on the southeastern Iberian Peninsula in the western Mediterranean Sea. It is characterised by diverse habitats including large seagrass meadows surrounded by sandy substrates. It overlaps with the North-western Mediterranean Benthic Ecosystems Ecologically or Biologically Significant Marine Area, three Marine Protected Areas, a Key Biodiversity Area, a Natura 2000 site, and is classified as Site of Community Importance and/or Special Protection Area. Within this area there are: **threatened species** (e.g., Rough Skate *Raja radula*); **range-restricted species** (e.g., Starry Skate *Raja asterias*); **reproductive areas** (Spiny Butterfly Ray *Gymnura altavela*); **feeding areas** (Spiny Butterfly Ray); and **resting areas** (Spiny Butterfly Ray).

CRITERIA

Criterion A – Vulnerability; Criterion B – Range Restricted;
Sub-criterion C1 – Reproductive Areas; Sub-criterion C2 – Feeding Areas;
Sub-criterion C3 – Resting Areas

DESCRIPTION OF HABITAT

Marina Alta is a coastal area located on the southeastern Iberian Peninsula in Spain. It is characterised by its karstic geography with diverse habitats including large seagrass meadows surrounded by sandy substrates. The coastal topography, comprised of mountainous terrains and towering cliffs, provides protection against the wind, creating small-sized sheltered bays. The area experiences a diurnal tide with a maximum tidal range of 1 m. The inshore seabed consists of extensive rocky platforms, covered by muddy and fine sediment mainly composed of limestone and loam debris. Offshore, sandy sediment becomes coarser along a gentle slope. The river inflow is scarce and water supply occurs mostly through freshwater submarine emergences from aquifers originating inland and emanating from the seabed. Sea surface temperature ranges from 13ºC in the cold months to 30ºC in the warm months.

The area overlaps with the North-western Mediterranean Benthic Ecosystems Ecologically or Biologically Significant Marine Area (CBD 2023), three Marine Protected Areas, the Plataforma-talud Marinos del Cabo de la Nao Key Biodiversity Area (KBA 2023), a Natura 2000 site, and is classified as Site of Community Importance and/or Special Protection Area.

This Important Shark and Ray Area is benthopelagic and delineated from surface and inshore waters (0 m) to a depth of 50 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Two Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species™ regularly occur in the area. These are the Critically Endangered Spiny Butterfly Ray (Dulvy et al. 2021), and the Endangered Rough Skate (Mancusi et al. 2016).

CRITERION B – RANGE RESTRICTED

This area holds the regular presence of Starry Skate, Speckled Skate, and Rough Skate as resident range-restricted species. These species occur year-round and are regularly encountered and captured in local fisheries, as confirmed in interviews conducted with fishers to collect local ecological knowledge and catch data records (Navarro et al. 2016; Ruiz-García et al. 2023; Monterde et al. in prep.). Rough Skates have also been observed in the area during diving surveys. All three species occur primarily in the Mediterranean Sea Large Marine Ecosystem (LME). Starry Skate also occurs marginally in the Canary Current LME and Iberian Coastal LME.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Marina Alta is an important reproductive area for one ray species.

Spiny Butterfly Rays occur in particularly high abundances in comparison to the adjacent areas from Delta del Ebro to Alboran Sea (Monterde et al. in prep.), and the presence of young-of-the-year and pregnant females have been reported as regular and predictable. The area was monitored monthly during 2018 and 2019, by scuba diving surveys (19 surveys) recording a total of 36 specimens and 136 body print marks on the sand bed (Penadés et al. in prep.). Young-of-the-year, determined by disc width (DW) of 32–60 cm (size-at-birth DW = 20.47 ± 3.86 cm [Parsons et al. 2018; Gajic et al. 2023]),

were observed only during spring and summer (n = 12; 4 specimens and 8 marks). Three pregnant females, determined by their extended abdomens (45–160 cm DW), were found in the boreal winter and spring.

SUB-CRITERION C2 – FEEDING AREAS

Marina Alta is an important feeding area for one ray species.

This is an important feeding area for Spiny Butterfly Ray. This species mainly feeds on fish (such as clupeids and gobies) and cephalopods (Neifar et al. 2002; Psomadakis et al. 2008; Yemışken et al. 2018), which are abundant in the area (Plá Masià 2000; García-Rodiguez et al. 2011). The high productivity of this area, associated with the seagrass meadows, guarantees the supply of these prey items for the species all year-long and for all its life-history stages (Valle et al. 2001). At night they can be observed actively feeding in sandy areas ambushing their prey with striking fin movements (Henningsen 1996; Penadés et al. unpubl. data 2023).

SUB-CRITERION C3 – RESTING AREAS

Marina Alta is used as a resting area for one ray species.

Butterfly rays burrow into the substrate, covering their body with sand to camouflage themselves either to ambush prey, or to rest in the seabed, leaving a characteristic mark or 'body print' in the sediment after leaving (Smale et al. 2001; Jacobsen & Bennett 2013). The Spiny Butterfly Ray found in this area spend most of the daytime resting, buried in the sediment within the seagrass extensions and use the nighttime to feed (Penadés et al. unpubl. data 2023). Adults are predominantly found buried next to the Neptune Grass *Posidonia oceanica* meadows, particularly, in the area swept by the leaves, which eliminates the regular ripple marks, allowing Spiny Butterfly Ray to better camouflage. On the other hand, young-of-the-year and juveniles are more frequently found buried in the sandy sediment within the Little Nepture Grass *Cymodecea nodosa* meadows, where adults cannot camouflage themselves due to their larger size (Penadés et al. unpubl. data 2023).

Acknowledgments

Pablo García-Salinas (Associación LAMNA; Fundación Oceanogràfic), David Ruiz-García (Catsharks; Institut de Ciències del Mar, CSIC; Universitat de València), Alvaro Almagro-Rodríguez (Universidad Católica de Valencia), Jaime Penadés-Suay (Associación LAMNA; Fundación Oceanogràfic), Ana I. Colmenero (Catsharks; Institut de Ciències del Mar, CSIC), and Claudio Barría (Catsharks; Institude de Ciències del Mar, CSIC; UNiversitat Autònoma de Barcelona) contributed and consolidated information included in this factsheet. We thank all participants of the 2023 ISRA Region 3 – Mediterranean and Black Seas workshop for their contributions to this process.

This factsheet has undergone review by the ISRA Independent Review Panel prior to its publication.

This project was funded by the Shark Conservation Fund, a philanthropic collaborative pooling expertise and resources to meet the threats facing the world's sharks and rays. The Shark Conservation Fund is a project of Rockefeller Philanthropy Advisors.

Suggested citation

IUCN SSC Shark Specialist Group. 2023. Marina Alta ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

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
RAYS												
Gymnura altavela	Spiny Butterfly Ray	CR	0–150	X		X	X	X				
Raja asterias	Starry Skate	NT	0–700		X							
Raja polystigma	Speckled Skate	LC	20–633		X							
Raja radula	Rough Skate	EN	0–350	X	X							

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Scyliorhinus canicula	Smallspotted Catshark	LC
RAYS		
Aetomylaeus bovinus	Duckbill Eagle Ray	CR
Dasyatis pastinaca	Common Stingray	VU
Leucoraja naevus	Cuckoo Skate	NT
Myliobatis aquila	Common Eagle Ray	CR
Pteroplatytrygon violacea	Pelagic Stingray	LC
Raja brachyura	Blonde Skate	NT
Raja clavata	Thornback Skate	NT
Raja undulata	Undulate Skate	EN
Torpedo marmorata	Marbled Torpedo Ray	VU
Torpedo torpedo	Ocellate Torpedo	VU

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.

SUPPORTING INFORMATION

There are additional indications that Marina Alta is an important feeding area for one ray species.

The Duckbill Eagle Ray feeds on benthic invertebrates, mainly anomuran crustaceans, opistobranch gastropods, and bivalves, by digging holes in the sandy substrates (Capapé 1977; Šlejkovec et al. 2014; Mulas et al. 2021). They have also been recorded feeding on fishes and cephalopods (Capapé 1977; Bradai et al. 2012) and are therefore considered to be generalist feeders. Their prey are found in abundance in the sandy stretches between the patches of seagrass in the area (Soriano et al. 2003; Plá Masià 2000; Valle et al. 2001; García-Rodríguez et al. 2011). Further evidence such as direct observations of feeding activity is required to understand the importance of the area for feeding.

REFERENCES

Bradai MN, Saidi BB, Enajjar SS. 2012. Elasmobranchs of the Mediterranean and Black Sea: status, ecology and biology. Bibliographic analysis. Studies and Reviews. General Fisheries Commission for the Mediterranean.

Capapé C. 1977. Etude du régime alimentaire de la Mourine vachette, *Pteromylaeus bovinus* (Geoffroy Saint-Hilaire, 1817) (Pisces, Myliobatidae) des côtes tunisiennes. *ICES Journal of Marine Science* 37(3): 214–220.

Convention on Biological Diversity (CBD). 2023. North-western Mediterranean Benthic Ecosystems Ecologically or Biologically Significant Areas (EBSAs). Available at: https://chm.cbd.int/ Accessed May 2023.

Dulvy NK, Charvet P, Carlson J, Badji L, Blanco-Parra MP, Chartrain E, De Bruyne G, Derrick D, Dia M, Doherty P, et al. 2021. *Gymnura altavela. The IUCN Red List of Threatened Species* 2021: e.T63153A3123409. https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T63153A3123409.en

Gajić AA, Karalić E, Beširović H, Sulikowski J. 2023. The first record of gravid spiny butterfly ray (*Gymnura altavela*) in the northern Mediterranean Sea, with description of near-term fetuses. *Journal of Fish Biology* 102: 1506–1509. https://doi.org/10.1111/jfb.15387

García-Rodríguez M, Abelló P, Fernández A, Esteban A. 2011. Demersal assemblages on the soft bottoms off the Catalan-Levante coast of the Spanish Mediterranean. *Journal of Marine Biology* 2011: 976396. https://doi.org/10.1155/2011/976396

Henningsen AD. 1996. Captive husbandry and bioenergetics of the Spiny Butterfly Ray, *Gymnura*. *Zoo Biology* 15: 135–142.

Jacobsen IP, Bennett MB. 2013. A comparative analysis of feeding and trophic level ecology in stingrays (Rajiformes; Myliobatoidei) and electric rays (Rajiformes: Torpedinoidei). *PloS One* 8(8): e71348. https://doi.org/10.1371/journal.pone.0071348

Key Biodiversity Areas (KBA). 2023. Key Biodiversity Areas factsheet: Plataforma-talud Marinos del Cabo de la Nao. Available at: http://www.keybiodiversityareas.org Accessed May 2023.

Mancusi C, Morey G, Serena F. 2016. *Raja radula. The IUCN Red List of Threatened Species* 2016: e.T161339A16527984. https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T161339A16527984.en

Monterde L, Ruiz-García D, Raga JA, Barría C. In prep. Using fishers local ecological knowledge to estimate distribution and abundance of threatened elasmobranchs in western Mediterranean.

Mulas A, Bellodi A, Carbonara P, Cau A, Marongiu MF, Pesci P, Porcu C, Follesa MC. 2021. Bio-ecological features update on eleven rare cartilaginous fish in the Central-Western Mediterranean Sea as a contribution for their conservation. *Life 2021* 11: 871. https://doi.org/10.3390/life11090871

Navarro J, Cardador L, Fernández ÁM, Bellido JM, Coll M. 2016. Differences in the relative roles of environment, prey availability and human activity in the spatial distribution of two marine mesopredators living in highly exploited ecosystems. *Journal of Biogeography* 43(3): 440–450.

Neifar L, Euzet L, Ben Hassine OK. 2002. *Anthobothrium altavelae* sp. n. (Cestoda: Tetraphyllidea) from the spiny butterfly ray *Gymnura altavela* (Elasmobranchii: Gymnuridae) in Tunisia. *Folia Parasitologica* 49(4): 295–298.

Parsons KT, Maisano J, Gregg J, Cotton CF, Latour RJ. 2018. Age and growth assessment of western North Atlantic spiny butterfly ray *Gymnura altavela* (L. 1758) using computed tomography of vertebral centra. Environmental Biology of Fishes 101: 137–151. https://doi.org/10.1111/jfb.15387

Penadés J, Ruiz-García D, García-Salinas P. In prep. Baselines for butterfly babies: towards a Mediterranean flagship species.

Plá Masià E. 2000. Moluscos, gasterópodos y bivalvos de la Marina Alta y Baleares. Ayuntamiento de Denia, Denia.

Psomadakis PN, Dalù M, Scacco U, Vacchi M. 2008. A rare batoid fish *Gymnura altavela* (Chondrichthyes, Gymnuridae) captured in the Tyrrhenian Sea. *Marine Biodiversity Records* 1: e6. https://doi.org/10.1017/S1755267206000662

Ruiz-García D, Raga JA, March D, Colmenero AI, Quattrocchi F, Recasens L, Barría C. 2023. Spatial distribution of the demersal chondrichthyan community from the western Mediterranean trawl bycatch. *Frontiers in Marine Science* 10: 1145176. https://doi.org/10.3389/fmars.2023.1145176

Šlejkovec Z, Stajnko A, Falnoga I, Lipej L, Mazej D, Horvat M, Faganeli J. 2014. Bioaccumulation of arsenic species in rays from the northern Adriatic Sea. *International Journal of Molecular Sciences* 15(12): 22073–22091.

Smale M, Sauer W, Roberts M. 2001. Behavioural interactions of predators and spawning chokka squid off South Africa: towards quantification. *Marine Biology* 139: 1095–1105.

Soriano S, Sanchez Lizaso JJL, Guerra Á. 2003. Cephalopod species collected in the upper continental slope off Alicante (Western Mediterranean). *Iberus* 21: 57–66.

Valle C, Bayle-Sempere JT, Ramos Esplá AA. 2001. Estudio multiescalar de la ictiofauna asociada a praderas de *Posidonia oceanica* (L.) Delile, 1813 en Alicante (sudeste ibérico).

Yemışken E, Forero M, Megalofonou P, Eryilmaz L, Navarro J. 2018. Feeding habits of three batoids in the Levantine Sea (north-eastern Mediterranean Sea) based on stomach content and isotopic data. *Journal of the Marine Biological Association of the United Kingdom* 98(1): 89–96. https://doi.org/10.1017/S002531541700073X