

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

JERBA-ZARZIS ISRA

Mediterranean and Black Seas Region

SUMMARY

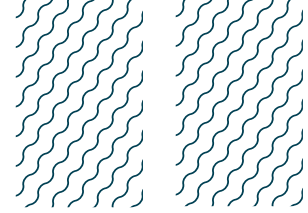
Jerba-Zarzis is located in the south-eastern side of the Gulf of Gabès, Tunisia. This area is characterised by shallow waters with a wide continental shelf. It is one of the most productive areas of the Western Mediterranean Sea, as this area contains the most extended and continuous Neptune Grass (*Posidonia oceanica*) meadow in this body of water. The area overlaps with the Le Golfe de Gabès Ecologically or Biologically Significant Marine Area, and partially overlaps with Côtes De L'île De Djerba Key Biodiversity Area. Within this area there are: **threatened species** (e.g., Blackchin Guitarfish *Glaucostegus cemiculus*); **range-restricted species** (Rough Skate *Raja radula*); and **reproductive areas** (e.g., Sandbar Shark *Carcharhinus plumbeus*).

CRITERIA

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

—	—
TUNISIA	—
—	—
0-40 metres	—
—	—
5,178.2 km²	—
—	—





DESCRIPTION OF HABITAT

Jerba-Zarzis is located in the Gulf of Gabès in south-eastern Tunisia. This area is situated on the south-eastern side of the gulf, next to Djerba island and the lagoon of El Bibane. The Gulf of Gabès is characterised by a semi-diurnal tide with a high amplitude (to 2 m), and a wide and shallow continental shelf (60 m depth occurs at 110 km from the coast), which are uncommon in the Mediterranean Sea (Ben Othman 1973). This area includes extensive seagrass beds of Neptune Grass (*Posidonia oceanica*) which support much of the benthic and demersal communities associated with this habitat in the Mediterranean Sea (El Lakhraçh et al. 2012, 2019; Mabrouk et al. 2013).

Jerba-Zarzis is characterised by sandy-mud substrates with the Brown Algae (*Arthrocladia villosa*) and Neptune Grass well distributed and forming meadows to 27 m deep (El Lakhraçh et al. 2019). These areas remain in good ecological condition and are considered critical habitats in the region (Sánchez-Jérez & Ramos-Esplá 1996; El Lakhraçh et al. 2012, 2019).

The area is within the Le Golfe de Gabès Ecologically or Biologically Significant Marine Area (EBSA) (CBD 2023) and partially overlaps with the Côtes De L'île De Djerba Key Biodiversity Area (KBA) (KBA 2023).

This Important Shark and Ray Area is benthopelagic and is delineated from surface and inshore waters (0 m) to a depth of 40 m based on the bathymetry of the area and vertical distribution of the Qualifying Species.

ISRA CRITERIA

CRITERION A - VULNERABILITY

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

CRITERION B - RANGE RESTRICTED

This area holds the regular presence of the Rough Skate as a resident range-restricted species. The species is a regular bycatch of commercial fisheries (trawl, longline, and demersal gillnet) that operate in the area (Kadri et al. 2013, 2014). Rough Skate is restricted to the Mediterranean Sea Large Marine Ecosystem (LME).

SUB-CRITERION C1 - REPRODUCTIVE AREAS

Jerba-Zarzis is important for the reproduction of three shark and two ray species.

Pregnant Sandbar Sharks appear between March and July in the area. From July to October neonates and young-of-the-year are reported in the area. From January 2001 to May 2004, 932

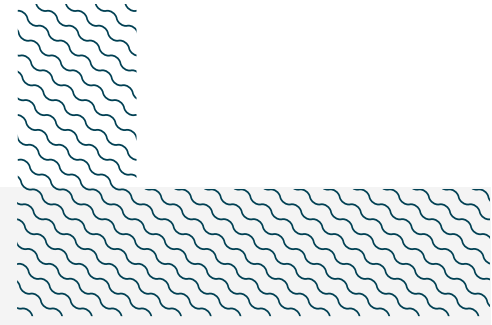
animals were collected from commercial fisheries and embryos, neonates, juveniles, and adult females dominated catches. Adult females significantly outnumbered males (8.4:1.0) and parturition occurred in July (Saïdi et al. 2005). Between 2004–2008, of 1,114 Sandbar Sharks examined (50–218 cm total length [TL] with the highest frequencies between 60 and 90 cm TL), 82% were neonates and juveniles. Neonates were captured from July to October at depths between 10 and 30 m especially on sandy substrates. Pregnant females were caught through March to July and then disappeared from landings (Enajjar et al. 2015). From July to September in 2007 and 2008, 547 Sandbar Sharks were examined in which juveniles, including specimens with umbilical scars, dominated captures (Echwikhi et al. 2013). From May to July 2009, 11 Sandbar Sharks were examined with sizes ranging from 60.5 to 93 cm TL including neonates and juveniles (Saïdi et al. 2016).

Between 2004–2008, of 2,068 Common Smoothhounds examined (34–165 cm TL), 12% were neonates and 62% were juveniles. Neonates with unhealed umbilical scars were captured from April to July at depths between 10 and 30 m. Pregnant females were captured from February to April at depth between 10 and 30 m on sandy-muddy substrates (Enajjar et al. 2015). From May–July 2009, 706 Common Smoothhounds were sampled which were either neonates or young-of-the-year, with a dominance of neonates (Saïdi et al. 2016). This species has a defined annual reproductive cycle, based on the study of reproductive tracts (Saïdi et al. 2008). Mating occurred during May and early June, fertilisation occurred from early June to early July, and parturition occurred during late April and early May, after a gestation period of 10–11 months (Saïdi et al. 2008).

Between January 2002 and December 2005, 565 Blackspotted Smoothhounds were examined (24.5–122 cm TL) which included neonates with unhealed umbilical scars (n = 52) observed in June, and pregnant females with full-term embryos or post-partum females observed from mid-May to early June (Saïdi et al. 2009). From May to July 2009, 117 neonate Blackspotted Smoothhounds were examined (25–34 cm TL) with umbilical scars (Saïdi et al. 2016). In the Gulf of Gabès, the size-at-birth is of 24.5–30.5 cm TL (Saïdi et al. 2009). Mating occurred through late-May and June and parturition occurred from mid-May to early June, after a gestation period of 11 months, based on the reproductive cycle assessed by examining reproductive tracts (Saïdi et al. 2009).

Between 2004–2008, 2,292 Blackchin Guitarfish were examined (35–205 cm TL) and 60% were immature (Enajjar et al. 2015). In the Gulf of Gabès, the size-at-birth is of 35–38 cm TL (Enajjar 2009). Neonates (n = 95) were captured from September to November at depth <30 m (Enajjar et al. 2015). Pregnant females with eggs (n = 100) or embryos (n = 31) were observed from September to June at depths less than 50 m, while pregnant females with near-term embryos (n = 20) were observed in spring and summer (Enajjar et al. 2015). From July to September in 2007 and 2008, of 123 Blackchin Guitarfishes examined, 69% were pregnant females (with near-term embryos) or post-partum females (Echwikhi et al. 2013).

From September 2007 to August 2009, 1,250 Rough Skates were sampled with body sizes ranging from 15 to 80 cm TL; some of these individuals (n = 16) measured 15–18.4 cm TL and were determined to be young-of-the-year (Kadri et al. 2014). From January to December of 2007, 950 Rough Skates were sampled and of these 20 are considered young-of-the-year due to their body sizes (<20 cm TL); from the 550 females sampled, 155 were egg-bearing (Kadri et al. 2013). This species displayed a continuous reproductive cycle and females carrying developed oocytes and egg cases were observed year-around (Kadri et al. 2013).



Acknowledgments

Mohamed Nejemeddine Bradai (Association pour la Conservation de la Biodiversité dans le Golfe de Gabès), Bechir Saidi (Faculté des Sciences et Techniques Sidi Bouzid), Samira Enajjar (Institut National des Sciences et Technologies de la Mer), and Adriana Gonzalez-Pestana (IUCN SSC Shark Specialist Group - ISRA Project) 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. Jerba-Zarzis ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

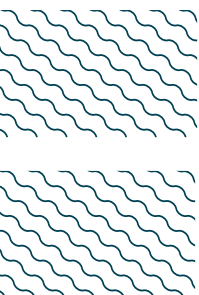
QUALIFYING SPECIES

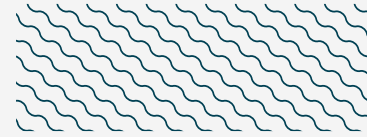
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met							
				A	B	C1	C2	C3	C4	C5	D1
SHARKS											
<i>Carcharhinus plumbeus</i>	Sandbar Shark	EN	0-280	X		X					
<i>Mustelus mustelus</i>	Common Smoothhound	EN	5-800	X		X					
<i>Mustelus punctulatus</i>	Blackspotted Smoothhound	VU	0-300	X		X					
RAYS											
<i>Glaucostegus cemiculus</i>	Blackchin Guitarfish	CR	0-100	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>Carcharhinus brevipinna</i>	Spinner Shark	VU
<i>Carcharodon carcharias</i>	White Shark	VU
<i>Isurus oxyrinchus</i>	Shortfin Mako	EN
RAYS		
<i>Aetomylaeus bovinus</i>	Duckbill Eagle Ray	CR
<i>Dasyatis pastinaca</i>	Common Stingray	VU
<i>Dasyatis tortonesei</i>	Tortonese's Stingray	DD
<i>Gymnura altavela</i>	Spiny Butterfly Ray	CR
<i>Myliobatis aquila</i>	Common Eagle Ray	VU
<i>Pteroplatytrygon violacea</i>	Pelagic Stingray	LC
<i>Raja clavata</i>	Thornback Skate	NT
<i>Raja miraletus</i>	Brown Skate	LC
<i>Rhinobatos rhinobatos</i>	Common Guitarfish	CR
<i>Taeniurops grabatus</i>	Round Fantail Stingray	DD
<i>Torpedo torpedo</i>	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.





REFERENCES

- Ben Othman S. 1973.** Le sud tunisien (golfe de Gabès), hydrologie, sédimentologie, flore et faune. Unpublished Thesis, University of Tunis, Tunis.
- Convention on Biological Diversity (CBD). 2023.** Gulf of Gabès. Available at: <https://chm.cbd.int> Accessed May 2023.
- Echwikhi K, Saïdi B, Bradai MN. 2013.** Elasmobranchs longline fisheries in the Gulf of Gabes (southern Tunisia). *Journal of the Marine Biological Association of the United Kingdom* 94(1): 203-210. <https://doi.org/10.1017/S0025315413000726>
- El Lakhrach H, Hattour A, Jarbouï O, Ramos-Esplà AA. 2012.** Spatial distribution and abundance of the megabenthic fauna community in Gabès gulf (Tunisia, eastern Mediterranean Sea). *Mediterranean Marine Science* 13(1): 12-29. <https://doi.org/10.12681/mms.19>
- El Lakhrach H, Hattour A, Jarbouï O, Bradai MN, Ramos Esplà AA. 2019.** Spatial and temporal variations of inshore demersal fishes in the Gulf of Gabes (Tunisia, Central Mediterranean Sea). *Journal of Coastal Conservation* 23: 521-530. <https://doi.org/10.1007/s11852-019-00681-3>
- Enajjar S. 2009.** Diversité des Rajiformes et étude éco-biologique de *Rhinobatos rhinobatos* et *Glaucostegus cemiculus* (Famille des Rhinobatidae) du Golfe de Gabès (Tunisie). Unpublished PhD Thesis, Université de Sfax, Sfax.
- Enajjar S, Saïdi B, Bradai MN, Bouain A. 2015.** The Gulf of Gabès (central Mediterranean Sea): A nursery area for sharks and rays (Chondrichthyes, Elasmobranchs). *Cahier de Biologie Marine* 56: 143-150.
- IUCN. 2023.** The IUCN Red List of Threatened Species. Version 2022-1, Available at: <https://www.iucnredlist.org/> Accessed April 2023.
- Kadri H, Marouani S, Bradai MN, Bouain A. 2013.** Age, growth and reproductive biology of the rough skate, *Raja radula* (Chondrichthyes: Rajidae), off the Gulf of Gabès (southern Tunisia, central Mediterranean). *Marine and Freshwater Research* 64(6): 540-548. <https://doi.org/10.1071/MF12218>
- Kadri H, Marouani S, Bradai MN, Bouain A, Morize E. 2014.** Age, growth and length-weight relationship of the rough skate, *Raja radula* (Linnaeus, 1758) (Chondrichthyans: Rajidae), from the Gulf of Gabes (Tunisia, Central Mediterranean). *Journal of Coastal Life Medicine* 2(5): 344-349.
- Key Biodiversity Areas (KBA). 2023.** Key Biodiversity Areas factsheet: Côtes De L'île De Djerba. Available at: <http://www.keybiodiversityareas.org/> Accessed May 2023.
- Mabrouk L, Hamza A, Ben Brahim M, Bradai MN. 2013.** Variability in the structure of epiphyte assemblages on leaves and rhizomes of *Posidonia oceanica* in relation to human disturbances in a seagrass meadow off Tunisia. *Aquatic Botany* 108: 33-40. <https://doi.org/10.1016/j.aquabot.2013.03.002>
- Saïdi B, Bradai MN, Bouain A, Guélorget O, Capapé C. 2005.** The reproductive biology of the sandbar shark, *Carcharhinus plumbeus* (Chondrichthyes: Carcharhinidae), from the Gulf of Gabès (southern Tunisia, central Mediterranean). *Acta Adriatica: International Journal of Marine Sciences* 46(1): 47-62.
- Saïdi B, Bradai MN, Bouain A. 2008.** Reproductive biology of the smooth-hound shark *Mustelus mustelus* (L.) in the Gulf of Gabès (south-central Mediterranean Sea). *Journal of Fish Biology* 72(6): 1343-1354. <https://doi.org/10.1111/j.1095-8649.2008.01801.x>
- Saïdi B, Bradai MN, Bouain A. 2009.** Reproductive biology and diet of *Mustelus punctulatus* (Risso, 1826) (Chondrichthyes: Triakidae) from the Gulf of Gabès, central Mediterranean Sea. *Scientia Marina* 73(2): 249-258. <https://doi.org/10.3989/scimar.2009.73n2249>
- Saïdi B, Enajjar S, Bradai MN. 2016.** Elasmobranch captures in shrimps trammel net fishery off the Gulf of Gabès (Southern Tunisia, Mediterranean Sea). *Journal of Applied Ichthyology* 32(3): 421-426. <https://doi.org/10.1111/jai.13061>

Sánchez-Jérez P, Ramos-Esplá AA. 1996. Detection of environmental impacts by bottom trawling on *Posidonia oceanica* (L.) Delile meadows: sensitivity of fish and macroinvertebrate community. *Journal of Aquatic Ecosystem Health* 5: 239-253.