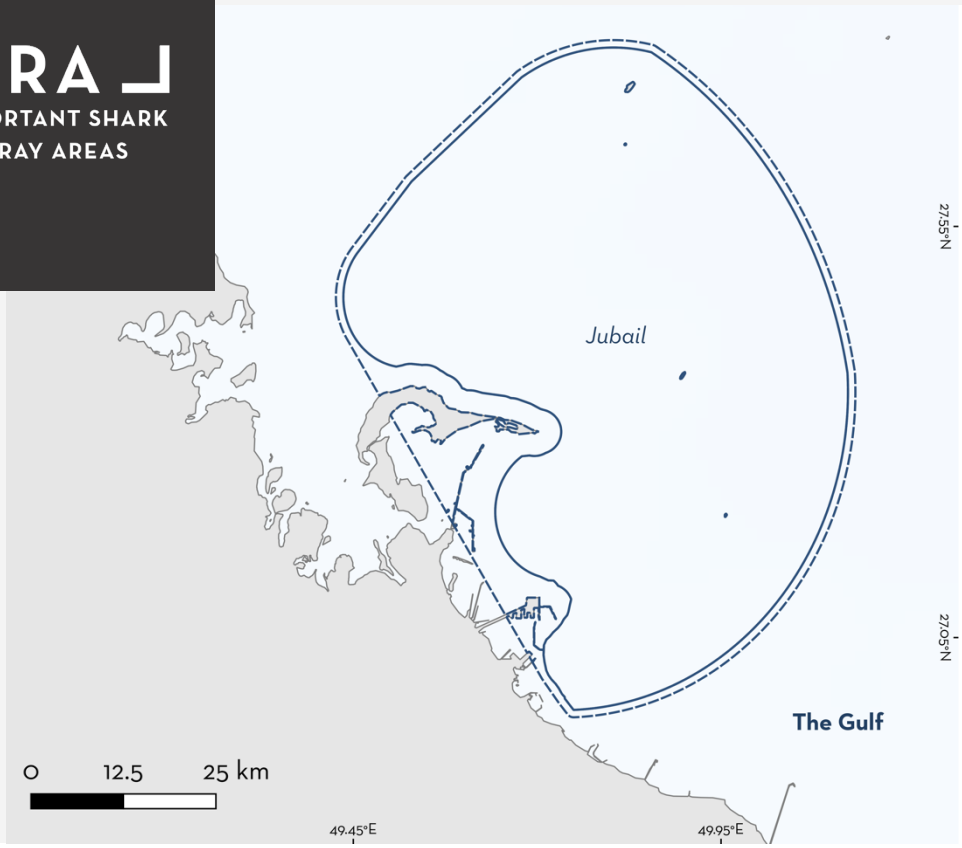
ISRA
IMPORTANT SHARK AND RAY AREAS



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

JUBAIL ISRA

Western Indian Ocean Region

SAUDI ARABIA

0–65 metres

3,723.19 km²

SUMMARY

Jubail lies on the central Gulf coast of Saudi Arabia. It includes coastal and nearshore islands and offshore coral islands, such as Jana Island. The area supports a variety of coastal and marine habitats, including sandy substrates, mangroves, coral reefs, and seagrass beds. Within this area there are: **threatened species** (e.g., Oman Cownose Ray *Rhinoptera jayakari*); **range-restricted species** (Human's Whaler Shark *Carcharhinus humani*); **reproductive areas** (e.g., Whitecheek Shark *Carcharhinus dussumieri*); **feeding areas** (Whale Shark *Rhincodon typus*); and **undefined aggregations** (e.g., Wafic's Eagle Ray *Aetomylaeus wafickii*).

CRITERIA

Criterion A – Vulnerability; Criterion B – Range Restricted;
Sub-criterion C1 – Reproductive Areas; Sub-criterion C2 – Feeding Areas;
Sub-criterion C5 – Undefined Aggregations

DESCRIPTION OF HABITAT

Jubail is located on the central Saudi Arabian coast in the Arabian/Persian Gulf (referred to as 'The Gulf'). It is near the coastal town of Jubail and includes coastal and offshore islands. Coastal islands represent an extension of the coastal environment, having been separated from the mainland due to the forces of storms and wind-driven waves. Other islands are entirely encircled by water channels during low tide. These include coral islands, such as Jana Island, located ~40 km off the coast. Jana Island is situated along the southern edge of a vast, shallow reef flat, which becomes visible during the neap tides (Maneja et al. 2020). Jubail supports a variety of habitats, including sandy substrates, mangroves, coral reefs, and seagrass beds. The area is warmer in summer and cooler in winter than most seas of equivalent latitude. Sea surface temperatures range from <10°C in the boreal winter to >35°C in summer. Extensive evaporation and little precipitation lead to elevated salinity levels of ~40‰ (Price 1981).

This area overlaps with two Key Biodiversity Areas (KBAs: Abu Ali and Gulf Coral Islands) (KBA 2023a, 2023b), and partly overlaps with the Jubail Marine Wildlife Sanctuary (Krupp & Khushaim 1996).

This Important Shark and Ray Area is benthopelagic and is delineated from 0 to 65 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Three Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species™ regularly occur in the area. These are the Endangered Whitecheek Shark (Simpfendorfer et al. 2019), Whale Shark (Pierce & Norman 2016), and Oman Cownose Ray (Sherman et al. 2021).

CRITERION B – RANGE RESTRICTED

Jubail holds the regular presence of Human's Whaler Shark as a resident range-restricted species. This species occurs year-round in the area and is regularly encountered and caught in local fisheries (Hsu et al. 2022). In 135 landing surveys between 2016–2020, 854 specimens were recorded in 80 surveys (59% occurrence; Hsu et al. 2022). Human's Whaler Shark is poorly known and has a patchy distribution (Pollom et al. 2019). The numbers reported here make this the main site for the species in the northern region of its distribution.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

This area is important for the reproduction of two shark species.

Pregnant (n = 20), neonate (n = 6), and young-of-the-year (YOY; n = 6) Whitecheek Sharks were caught during fishery-independent benthic trawls during surveys between 2013 and 2016 (30 min trawl duration; n = 228 stations; 119 stations with shark and ray catch; Hsu et al. 2022). Neonates were defined by an open umbilical scar, and YOY by a healed umbilical scar (H Hsu pers. obs. 2023).

Research trawls captured the specimens in July, and commercial benthic trawlers, operating from August–January, seasonally capture pregnant and neonate Whitecheek Sharks from August–November (H Hsu unpubl. data 2023), indicating that the reproductive season for this species in the area is during the second half of the year.

The same research surveys collected 28 pregnant, 19 neonate, and 25 YOY Human's Whaler Sharks (H Hsu unpubl. data 2023). Additional catches in commercial gillnet operations show that pregnant females are mostly captured in November–April, followed by captures of neonates in May–July (H Hsu unpubl. data 2023).

SUB-CRITERION C2 – FEEDING AREAS

Researchers and recreational scuba divers reported Whale Shark feeding aggregations from Jana Island during September–November in 2018–2020 (Hsu et al. 2019, 2023). Surveys of fishers and other boat captains indicated that Jana Island was the second-most likely location in the Saudi Gulf Exclusive Economic Zone where Whale Sharks are encountered (Hsu et al. 2023). Up to five individuals were seen feeding together in the area (H Hsu unpubl. data 2023). Zooplankton tows showed that prey biomass was higher when Whale Sharks were present (60–100 mg m^{-3}) than when they were absent (~15 mg m^{-3}; n = 7 surveys) and was mostly composed of calanoid copepods (Hsu et al. 2023). Although the reasons for elevated zooplankton biomass are not understood yet, it appears that Whale Sharks come to the area to feed. Of three satellite-tagged individuals, one swam to the region's largest feeding aggregation site at Al Shaheen in Qatar, and one migrated to the Gulf of Oman (similar to individuals tracked from Al Shaheen; Robinson et al. 2017), indicating that they are part of the same population in the Gulf (H Hsu unpubl. data 2023).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Jubail is an important area for undefined aggregations of two ray species. During 135 landing site surveys in 2016–2020, aggregations were defined as >10 individuals caught in the same operation (Hsu et al. 2022). Fishers indicated that they did not sort the catch before landing, meaning that individuals landed together were also caught together (H Hsu unpubl. data 2023).

For the Oman Cownose Ray, aggregations were recorded eight times in landing site surveys, with the largest aggregations occurring in late winter (~10 individuals twice in January, ~80 in February, ~40 and >30 in March, ~20 in April, and 17 and >20 in July) (H Hsu unpubl. data 2023). The species is frequently caught (31% of landing site surveys) and comprised ~10% of the weight of landed sharks and rays in the surveys (Hsu et al. 2022). Oman Cownose Rays often aggregate in large schools (Last et al. 2016).

Six aggregations of Wafic's Eagle Ray were recorded, mostly in spring (>20 individuals twice in April, >10 and >30 in May, >10 in June, >10 in September) from the catch of commercial gillnet operations (H Hsu unpubl. data 2023). This species was newly described in 2022 and detailed information are lacking, although their schooling behaviour has been noted (Jabado et al. 2022).

Acknowledgments

Hua Hsun Hsu (Fisheries Research Institute, Ministry of Agriculture, Taiwan; National Sun Yat-sen University, Taiwan), and Christoph A. Rohner (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2023 ISRA Region 7 – Western Indian Ocean 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. Jubail 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
SHARKS												
Carcharhinus dussumieri	Whitecheek Shark	EN	0–100	X		X						
Carcharhinus humani	Human's Whaler Shark	DD	0–43		X	X						
Rhincodon typus	Whale Shark	EN	0–1,928	X			X					
RAYS												
Aetomylaeus wafickii	Wafic's Eagle Ray	NE	0–44							X		
Rhinoptera jayakari	Oman Cownose Ray	EN	0–50	X						X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus amblyrhynchoides	Graceful Shark	VU
Carcharhinus amboinensis	Pigeye Shark	VU
Carcharhinus brevipinna	Spinner Shark	VU
Carcharhinus leucas	Bull Shark	VU
Carcharhinus limbatus	Common Blacktip Shark	VU
Carcharhinus melanopterus	Blacktip Reef Shark	VU
Carcharhinus sorrah	Spottail Shark	VU
Chaenogaleus macrostoma	Hooktooth Shark	VU
Negaprion acutidens	Sicklefin Lemon Shark	EN
Paragaleus randalli	Slender Weasel Shark	VU
Rhizoprionodon acutus	Milk Shark	VU
Sphyrna lewini	Scalloped Hammerhead	CR
Sphyrna mokarran	Great Hammerhead	CR
Stegostoma tigrinum	Indo-Pacific Leopard Shark	EN
RAYS		
Glaucostegus halavi	Halavi Guitarfish	CR
Rhina ancylostomus	Bowmouth Guitarfish	CR
Rhynchobatus djiddensis	Whitespotted Wedgefish	CR
Rhynchobatus laevis	Smoothnose Wedgefish	CR

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; NE, Not Evaluated.

REFERENCES

Hsu HH, Clardy TR, Panickan P, Nazeer ZM, Loughland R, Qurban MA. 2019. Preliminary study of whale shark occurrences and association with zooplankton biomass in Saudi Arabian waters of the Arabian Gulf. The 5th International Whale Shark Conference, 27–31 May 2019, Exmouth, Australia.

Hsu HH, Yacoubi L, Lin YJ, Le Loc'h F, Katsanevakis S, Giovos I, Qurban MA, Nazeer Z, Panickan P, Maneja RH, et al. 2022. Elasmobranchs of the western Arabian Gulf: Diversity, status, and implications for conservation. *Regional Studies in Marine Science* 56: 102637. https://doi.org/10.1016/j.rsma.2022.102637

Hsu HH, Das P, Alnuwairah MA, Clardy TR, Panickan P, Nazeer Z, Gopalan J, Heinle M, Qasem A, Loughland R, et al. 2023. Occurrence and migration of whale sharks from the Saudi Arabian waters of the Arabian Gulf. Qatar Forum on Whale Shark Conservation 2023, 22–23 May, Ras Matbakh, Qatar.

Jabado RW, Ebert DA, Al Dhaheri SS. 2022. Resolution of the *Aetomylaeus nichofii* species complex, with the description of a new eagle ray species from the northwest Indian Ocean and a key to the genus *Aetomylaeus* (Myliobatiformes: Myliobatidae). *Marine Biodiversity* 52: 15. https://doi.org/10.1007/s12526-021-01234-4

Key Biodiversity Areas (KBA). 2023a. Abu Ali KBA. Available at: https://www.keybiodiversityareas.org/site/factsheet/8260 Accessed November 2023.

Key Biodiversity Areas (KBA). 2023b. Gulf Coral Islands KBA. Available at: https://www.keybiodiversityareas.org/site/factsheet/8259 Accessed November 2023.

Krupp F, Khushaim O, eds. 1996. *A marine wildlife sanctuary for the Arabian Gulf. Environmental research and conservation following the 1991 Gulf War oil spill.* Riyadh and Frankfurt a. M.: NCWCD and Senckenberg Research Institute.

Last PR, White WT, de Carvalho MR, Séret B, Stehmann MFW, Naylor GJP. 2016. *Rays of the world.* Clayton South: CSIRO Publishing.

Maneja RH, Miller JD, Li W, El-Askary H, Flandez AVB, Dagoy JJ, Alcaria JFA, Basali AU, Al-Abdulkader KA, Loughland RA, et al. 2020. Long-term NDVI and recent vegetation cover profiles of major offshore island nesting sites of sea turtles in Saudi waters of the northern Arabian Gulf. *Ecological Indicators* 117: 106612. https://doi.org/10.1016/j.ecolind.2020.106612

Pierce SJ, Norman B. 2016. *Rhincodon typus. The IUCN Red List of Threatened Species* 2016: e.T19488A2365291. https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T19488A2365291.en

Pollom R, Gledhill K, Simpfendorfer C, Jabado RW, Moore A, Elhassan I. 2019. *Carcharhinus humani. The IUCN Red List of Threatened Species* 2019: e.T110834677A139929300. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T110834677A139929300.en

Price ARG. 1981. Studies on the echinoderm fauna of the western Arabian Gulf. *Journal of Natural History* 15(1): 1–15. https://doi.org/10.1080/00222938100770011

Robinson DP, Jaidah MY, Bach SS, Rohner CA, Jabado RW, Ormond R, Pierce SJ. 2017. Some like it hot: Repeat migration and residency of whale sharks within an extreme natural environment. *PLoS One* 12: e0185360. https://doi.org/10.1371/journal.pone.0185360

Sherman CS, Bin Ali A, Bineesh KK, Derrick D, Dharmadi, Fahmi, Fernando D, Haque AB, Maung A, Seyha L, et al. 2021. *Rhinoptera jayakari. The IUCN Red List of Threatened Species* 2021: e.T195474A175221403. https://dx.doi.org/10.2305/IUCN.UK.2021-2.RLTS.T195474A175221403.en

Simpfendorfer C, Jabado RW, Moore A, Valinassab T, Elhassan I. 2019. *Carcharhinus dussumieri. The IUCN Red List of Threatened Species* 2019: e.T70680197A68612632. https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T70680197A68612632.en