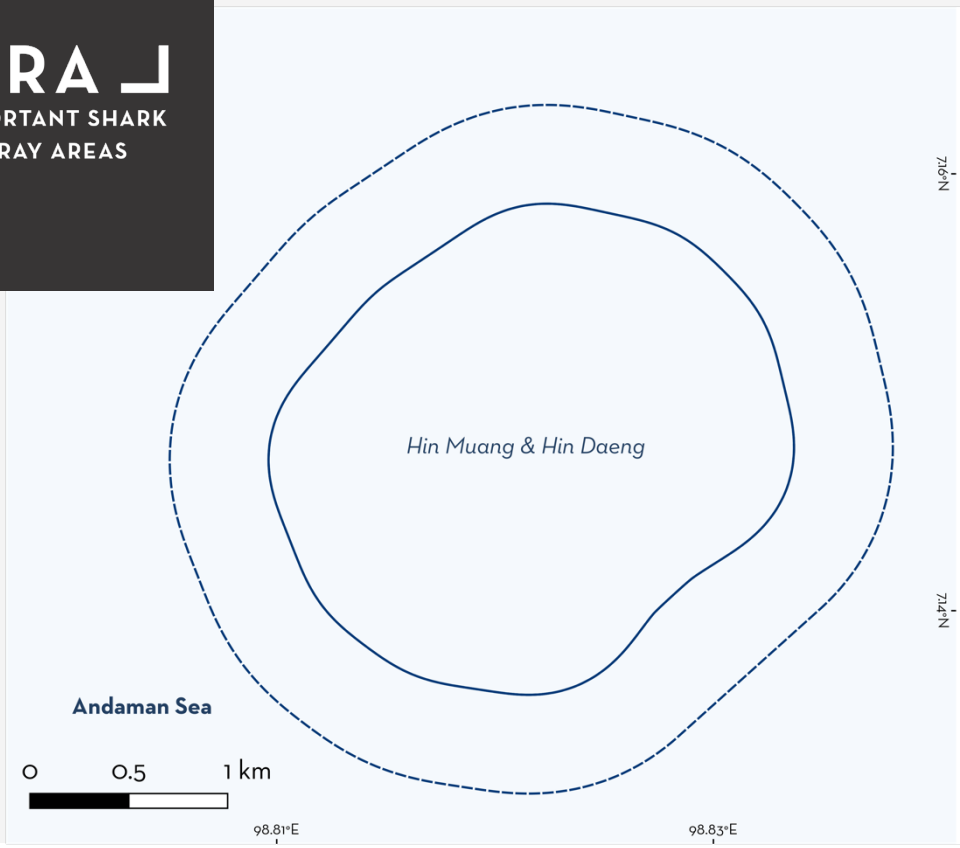
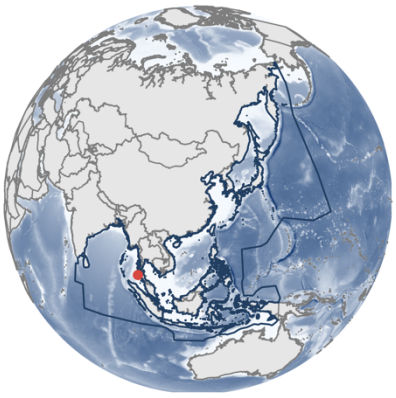
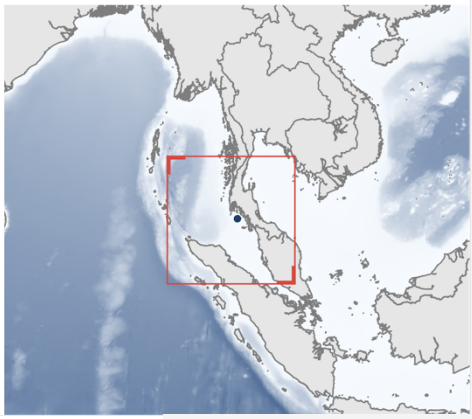
ISRA
IMPORTANT SHARK AND RAY AREAS







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

HIN MUANG & HIN DAENG ISRA

Asia Region

THAILAND

0–70 metres

4.83 km²

SUMMARY

Hin Muang & Hin Daeng is located on the southern Andaman coast of Thailand, in the Bay of Bengal. It comprises two limestone seamounts located ~200 m from one another. The seamounts are characterised by soft coral communities of the genus *Dendronephthya*. The area is part of the Mu Koh Lanta National Park and the Lower Western Coastal Sea Ecologically or Biologically Significant Marine Area. Within this area there are: **threatened species** and **undefined aggregations** (Oceanic Manta Ray *Mobula birostris*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C5 – Undefined Aggregations

DESCRIPTION OF HABITAT

Hin Muang & Hin Daeng is located on the southern Andaman coast of Thailand, in the Bay of Bengal. The area includes the adjacent limestone seamounts of Hin Muang and Hin Daeng. In Thai, Hin Muang means 'purple rock' and Hin Daeng means 'red rock', corresponding to the predominant soft coral communities on the respective seamounts. The seamounts extend to a depth of 70 m. Hin Muang comes within 8 m of the water's surface and is ~20 m wide by 200 m long. Hin Daeng is circular, slightly breaks the surface of the water, and is ~200 m east of Hin Muang. The area is subject to the large amplitude internal waves of the Andaman Sea, which facilitate mixing of nutrient-rich deeper waters and plankton blooms (Alpers & Vlasenko 2018).

In the Andaman Sea, the circulation near the coasts and islands is mainly driven by equatorial forces. These significantly induce changes in water circulation during the monsoon-transition periods (April to May and October to November) and can result in upwelling events (Chatterjee et al. 2017).

The area is part of the Mu Koh Lanta National Park (WPAD 2023) and sits within the Lower Western Coastal Sea Ecologically or Biologically Significant Marine Area (EBSA; CBD 2024).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 70 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

One Qualifying Species within the area is considered threatened with extinction according to the IUCN Red List of Threatened Species. The Oceanic Manta Ray is assessed as Endangered (Marshall et al. 2022).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Hin Muang & Hin Daeng is an important area for undefined aggregations of one ray species.

Since 2006, 141 encounters with 118 individual Oceanic Manta Rays have been recorded through citizen science submissions (MantaMatcher.org 2023). This accounts for 25% of Oceanic Manta Ray sightings in Thailand. As part of the Mu Koh Lanta National Park, these sites are only accessible to divers from October through May. Oceanic Manta Rays are seen in all these months, but sightings peak between February and April, with this period accounting for 68% of sighting records (MantaMatcher.org 2023). Oceanic Manta Rays have been observed in the area every year from 2013–2019 (MantaMatcher.org 2023).

This area is likely an important socialisation hub, with a mean group size of four individuals, and up to 19 individuals identified in a single day together. Of the 35% of Oceanic Manta Ray encounters with a recorded age class, 88% were mature based on clasper development, mating scars, or visible pregnancy (as defined by Marshall & Bennett 2010; MantaMatcher.org 2023). Pregnant Oceanic Manta Rays have been observed twice in the area (MantaMatcher.org 2023). Hin Muang & Hin Daeng has several cleaning stations where small cleaner fish remove dead tissue and parasites from other fish. Oceanic Manta Rays have been observed cleaning in this area, but only on occasions when there are few divers (A Flam pers. obs. 2023; M Larsson pers. comm. 2023).

In addition, between 2006 and 2020, there were 111 observations of Oceanic Manta Rays from the Department of Marine and Coastal Resources (DMCR) database within the Hin Muang & Hin Daeng area. Thirty of these observations (27%) were of more than one individual, with up to eight individuals on a single day (DMCR unpubl. data 2024). A heatmap of Oceanic Manta Ray sightings produced by DMCR also supports Hin Muang & Hin Daeng as one of the areas of highest Oceanic Manta Ray sightings in Thailand (MCRRDI 2021). Further information is needed to understand the nature and 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
RAYS												
Mobula birostris	Oceanic Manta Ray	EN	0–1,246	X						X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Rhincodon typus	Whale Shark	EN

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 this area is important for the movement of one ray species.

Oceanic Manta Rays have shown regular and predictable movement between aggregation sites in southern Myanmar and Thailand including Hin Muang & Hin Daeng. Photo-identification data from 2003–2020 has shown that 23 individuals have moved between aggregation sites of Black Rock, North Twin, and South Twin in Myanmar, and the Similan Islands, Koh Lanta, and Hin Muang & Hin Daeng in Thailand (MantaMatcher.org 2023; Marine Megafauna Foundation unpubl. data 2020). The actual number of Oceanic Manta Rays utilising this movement corridor is likely to be far higher but the potential importance of Hin Muang & Hin Daeng as part of this movement corridor requires further investigation.

REFERENCES

Alpers W, Vlasenko V. 2019. Internal waves in the Andaman Sea. In: Barale V, Gade M, eds. *Remote sensing of the Asian seas.* Cham: Springer, 395–410. https://doi.org/10.1007/978-3-319-94067-0_22

Chatterjee A, Shankar D, McCreary JP, Vinayachandran PN, Mukherjee A. 2017. Dynamics of Andaman Sea circulation and its role in connecting the equatorial Indian Ocean to the Bay of Bengal. *Journal of Geophysical Research: Oceans* 122(4): 3200–3218. https://doi.org/10.1002/2016JC012300

Convention on Biological Diversity (CBD). 2024. Lower Western Coastal Sea. Ecologically or Biologically Significant Areas (EBSAs). Available at https://chm.cbd.int/database/record?documentID=237761 Accessed February 2024.

Marine and Coastal Resources Research and Development Institute (MCRRDI). 2021. Rare and endangered species report on elasmobranch species designated as preserved and protected species within 6 years between 2016-2021. Department of Marine and Coastal Resources. Available at: https://www.dmcr.go.th/detailLib/6703 Accessed January 2024.

Marshall AD, Bennett MB. 2010. Reproductive ecology of the reef manta ray *Manta alfredi* in southern Mozambique. *Journal of Fish Biology* 77(1): 169–190. https://doi.org/10.1111/j.1095-8649.2010.02669.x

Marshall A, Barreto R, Carlson J, Fernando D, Fordham S, Francis MP, Derrick D, Herman K, Jabado RW, Liu KM, et al. 2022. *Mobula birostris* (amended version of 2020 assessment). *The IUCN Red List of Threatened Species* 2022: e.T198921A214397182. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T198921A214397182.en

World Protected Area Database (WPAD). 2023. Mu Koh Lanta Marine National Park. Available at: https://www.protectedplanet.net/29034 Accessed January 2024.