

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

PŪPŪKEA ISRA

New Zealand & Pacific Islands Region

SUMMARY

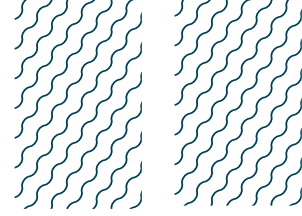
Pūpūkea is located on the North Shore of O'ahu, in the Hawaiian Islands of the United States of America. This area is characterised by diverse marine habitats, including fringing coral reefs, rocky outcrops, and sandy substrates. The oceanographic conditions at Pūpūkea are highly seasonal. During the boreal winter months (November–April), the area is subject to strong north Pacific swells, whereas the summer months (May–October) bring calm seas. Within this area there are: **threatened species** and **feeding areas** (Reef Manta Ray *Mobula alfredi*).

CRITERIA

Criterion A - Vulnerability; Sub-criterion C2 - Feeding Areas

| | |
|----------------------------|---|
| — | — |
| HAWAII | — |
| — | — |
| 0-20 metres | — |
| — | — |
| 4.86 km² | — |
| — | — |





DESCRIPTION OF HABITAT

Pūpūkea is located on the North Shore of O‘ahu, in the Hawaiian Islands of the United States of America. This area is characterised by diverse marine habitats, including fringing coral reefs, rocky outcrops, and sandy substrates (Department of Land and Natural Resources [DLNR] 2024).

The oceanographic conditions at Pūpūkea are highly seasonal. During the boreal winter (November–April), the area is subject to strong north Pacific swells (Stopa et al. 2011). In contrast, the summer months (May–October) bring calm seas. The area experiences dynamic water circulation due to tidal currents and wave action, promoting nutrient mixing and supporting periodic zooplankton blooms. These blooms are crucial for sustaining the marine food web in the region. The combination of nutrient-rich waters and complex reef structures contribute to high primary productivity, which supports a diverse marine ecosystem (DLNR 2024).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 20 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

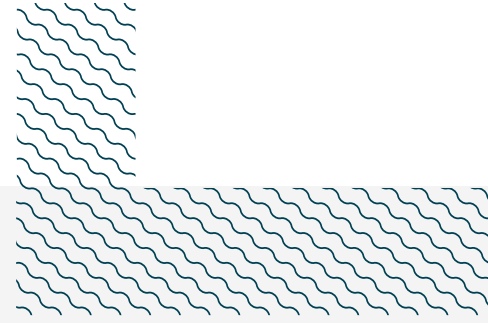
One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Vulnerable Reef Manta Ray (Marshall et al. 2022).

SUB-CRITERION C2 – FEEDING AREAS

Pūpūkea is an important feeding area for one ray species.

Between 2021–2024, 217 sightings were confirmed in the area during summer (O‘ahu Manta Project unpubl. data 2024), comprising 59.3% of all Reef Manta Ray sightings around O‘ahu during this period (n = 366). Sea conditions prevent in-water surveys during the winter months. Reef Manta Rays were encountered on 32.1% of surveys (34/106 surveys per year). Sightings comprised between 1–4 individuals, with an average of two Reef Manta Rays observed together at a time. Reef Manta Rays were observed surface feeding or feeding along the reef ridges in 6–11 m depth during 99.5% of observations (only one sighting of a non-feeding individual). The rays are observed swimming with mouth open through visibly dense zooplankton patches (C Nevels pers. obs. 2024). They circle back to feed along specific reef ridges where zooplankton is concentrated and will often somersault feed through dense patches.

Despite dedicated survey effort and a relatively high number of resightings of Reef Manta Rays in the area, only 12 individuals have been identified in the area via photo identification (O‘ahu Manta Project unpubl. data 2024). This highlights the site fidelity of these individuals to the area and the relatively small population resident to O‘ahu. Using photographic identification on images of Reef Manta Rays, only 96 individuals have been identified around the island of O‘ahu since 2004. No records of inter-island connectivity have been documented, despite collaboration between manta ray research projects using genetics and photo identification techniques (Deakos et al. 2011, Whitney et al. 2023, C Nevels pers. obs. 2024). Of the 12 individuals identified in the area, 11 of them were confirmed as juvenile, suggesting there is some degree of habitat segregation between age classes, however, more information is needed to confirm whether this area is also important for reproduction.



Acknowledgments

Corey R Nevels (O'ahu Manta Project; Hawaii Association for Marine Education and Research [HAMER]), Mark H Deakos (HAMER), and Asia O Armstrong (IUCN SSC Shark Specialist Group - ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2024 ISRA Region 10 - New Zealand and Pacific Islands workshop for their contributions to this process.

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Suggested citation

IUCN SSC Shark Specialist Group. 2024. Pūpūkea ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

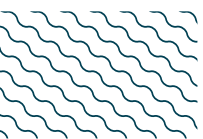
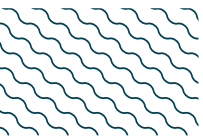
QUALIFYING SPECIES

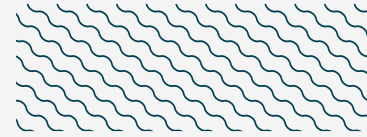
| Scientific Name | Common Name | IUCN Red List Category | Global Depth Range (m) | ISRA Criteria/Sub-criteria Met | | | | | | | | | |
|-----------------------|----------------|------------------------|------------------------|--------------------------------|---|----|----|----|----|----|----|----|--|
| | | | | A | B | C1 | C2 | C3 | C4 | C5 | D1 | D2 | |
| RAYS | | | | | | | | | | | | | |
| <i>Mobula alfredi</i> | Reef Manta Ray | VU | 0-711 | X | | | X | | | | | | |

SUPPORTING SPECIES

| Scientific Name | Common Name | IUCN Red List Category |
|----------------------------|---------------------|------------------------|
| SHARKS | | |
| <i>Triaenodon obesus</i> | Whitetip Reef Shark | VU |
| RAYS | | |
| <i>Aetobatus ocellatus</i> | Spotted Eagle Ray | EN |
| <i>Bathytoshia lata</i> | Brown Stingray | 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

Deakos MH, Baker JD, Bejder L. 2011. Characteristics of a manta ray *Manta alfredi* population off Maui, Hawaii, and implications for management. *Marine Ecology Progress Series* 429: 245-260. <https://doi.org/10.3354/meps09085>

Department of Land and Natural Resources [DLNR]. 2024. Pūpūkea Marine Life Conservation District. Available at: <https://dlnr.hawaii.gov/holomua/pupukea-marine-life-conservation-district-mlcd/> Accessed August 2024.

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Stopa JE, Cheung KF, Chen YL. 2011. Assessment of wave energy resources in Hawaii. *Renewable Energy* 36(2): 554-567. <https://doi.org/10.1016/j.renene.2010.07.014>

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