

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

OTAGO HARBOUR ISRA

New Zealand & Pacific Islands Region

SUMMARY

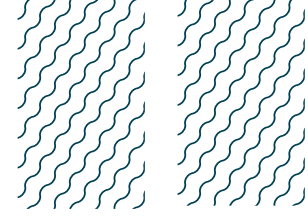
Otago Harbour is located on the southeast side of New Zealand's South Island. Its narrow inlet extends from Port Dunedin to Taiaoroa. The area includes multiple bays, peninsulas, and islands, and is characterised by the presence of sandy and muddy substrates as well as shell communities and seagrass beds. The area overlaps with two Key Biodiversity Areas. Within this area there are: **threatened species** and **undefined aggregations** (Broadnose Sevengill Shark *Notorynchus cepedianus*).

CRITERIA

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

—	—
NEW ZEALAND	—
—	—
0-50 metres	—
—	—
47.5 km²	—
—	—





DESCRIPTION OF HABITAT

Otago Harbour is located next to Dunedin, on the southeast side of New Zealand's South Island. This narrow inlet has a length of ~20 km and the mouth is ~0.5 km wide, and extends from Port Dunedin to Taiaroa (Grove & Probert 1999). The area includes multiple bays, peninsulas, and islands (e.g., Rakiri and Kamau Taurua) and is divided into two basins: the Upper Harbour and Lower Harbour. The area is characterised by the presence of sandy and muddy substrates as well as shell communities and seagrass beds. While conditions in the harbour are similar to marine habitats outside, Otago Harbour receives the input of the Water of Leith River which produces lower salinities in the inner part of the area (Grove & Probert 1999). Sea surface temperatures range between 5–17°C (Grove & Probert 1999).

The area overlaps with the Dunedin Coast (offshore) and Taiaroa Head Key Biodiversity Areas (KBA 2024a, 2024b).

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

ISRA CRITERIA

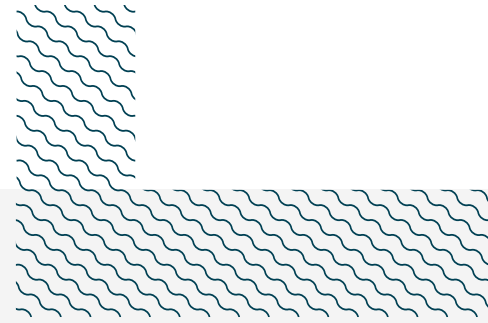
CRITERION A - VULNERABILITY

One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. This is the Vulnerable Broadnose Sevengill Shark (Finucci et al. 2020).

SUB-CRITERION C5 - UNDEFINED AGGREGATIONS

Otago Harbour is an important area for undefined aggregation of one shark species.

Broadnose Sevengill Sharks aggregate in Otago Harbour during the austral summer months (Housiaux et al. 2019; Lewis & Carson 2020). Shore-based surveys (n = 71) using chum were conducted every three weeks from July 2013 to May 2015 to confirm anecdotal reports of aggregations of Broadnose Sevengill Sharks in this small bay. Animals measuring between 150–250 cm total length (TL) were found to aggregate in the area (Housiaux 2016; Housiaux et al. 2019). Broadnose Sevengill Sharks were recorded on 86% of trips during summer months (mean = 2.1 sharks per trip) and were detected in smaller numbers (mean = 0.7 sharks per trip) during autumn (Housiaux et al. 2019). The study was conducted in adjacent bays where records of Broadnose Sevengill Sharks were not detected. Despite similar effort across seasons, no Broadnose Sevengill Sharks were detected in winter or spring. Additionally, Broadnose Sevengill Shark was the most commonly reported species from baited remote underwater video station (BRUVS) surveys in 2020 and 2021 and were almost exclusively recorded in summer confirming their regular occurrence in the area (Lewis & Carson 2020). Otago Harbour is one of the few locations around New Zealand where this species regularly aggregates in a specific season. Broadnose Sevengill Sharks have been found to seasonally aggregate during summer in bays in other parts of the globe for feeding or reproductive process (Ebert 1989; Lucifora et al. 2005; Barnett et al. 2010; Abrantes & Barnett 2011; Williams et al. 2012; Stehfest et al. 2014; Hammerschlag et al. 2019). The nature and function of Broadnose Sevengill Shark aggregations in this area could be for feeding purposes. This is because their presence may be driven by a high abundance of potential demersal prey in the area during summer (Housiaux et al. 2019). Further information is required to determine the nature and function of these aggregations.



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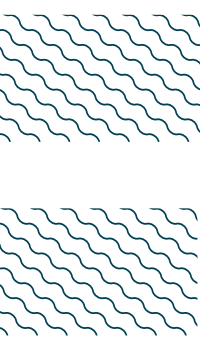
QUALIFYING SPECIES

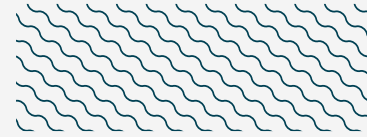
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met									
				A	B	C1	C2	C3	C4	C5	D1	D2	
SHARKS													
<i>Notorynchus cepedianus</i>	Broadnose Sevengill Shark	VU	0-570	X							X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Alopias vulpinus</i>	Common Thresher	VU
<i>Cephaloscyllium isabellum</i>	Carpet Shark	LC
<i>Galeorhinus galeus</i>	Tope	CR
<i>Mustelus lenticulatus</i>	Rig	LC
<i>Squalus acanthias</i>	Spiny Dogfish	VU
RAYS		
<i>Bathytosia brevicaudata</i>	Smooth Stingray	LC
<i>Tetronarce nobiliana</i>	Great Torpedo Ray	LC
<i>Zearaja nasuta</i>	Rough Skate	LC
CHIMAERAS		
<i>Callorhinchus milii</i>	Elephant Fish	LC
<i>Hydrolagus novaezealandiae</i>	Dark Ghostshark	LC

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

- Abrantes KG, Barnett A. 2011.** Intrapopulation variations in diet and habitat use in a marine apex predator, the broadnose sevengill shark *Notorynchus cepedianus*. *Marine Ecology Progress Series* 442: 133-148. <https://doi.org/10.3354/meps09395>
- Barnett A, Stevens JD, Frusher SD, Semmens JM. 2010.** Seasonal occurrence and population structure of the broadnose sevengill shark *Notorynchus cepedianus* in coastal habitats of South-East Tasmania. *Journal of Fish Biology* 77: 1688-1701. <https://doi.org/10.1111/j.1095-8649.2010.02810.x>
- Ebert DA. 1989.** Life history of the sevengill shark, *Notorynchus cepedianus* (Peron 1807), in two Northern California Bays. *California Fish and Game* 75: 102-112.
- Finucci B, Barnett A, Cheok J, Cotton CF, Kulka DW, Neat FC, Pacoureau N, Rigby CL, Tanaka S, Walker TI. 2020.** *Notorynchus cepedianus*. *The IUCN Red List of Threatened Species* 2020: e.T39324A2896914. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T39324A2896914.en>
- Grove SL, Probert PK. 1999.** Sediment macrobenthos of upper Otago Harbour, New Zealand. *New Zealand Journal of Marine and Freshwater Research* 33: 469-480. <https://doi.org/10.1080/00288330.1999.9516892>
- Hammerschlag N, Williams L, Fallows M, Fallows C. 2019.** Disappearance of white sharks leads to the novel emergence of an allopatric apex predator, the sevengill shark. *Scientific Reports* 9: 1908. <https://doi.org/10.1038/s41598-018-37576-6>
- Housiaux JA. 2016.** Exploring the murky world of the sevengill shark, *Notorynchus cepedianus*, in southern New Zealand. Unpublished Master Thesis, University of Otago, Dunedin.
- Housiaux JA, Hepburn, CD, Rayment W. 2019.** Seasonal variation in occurrence of the sevengill shark, *Notorynchus cepedianus*, in two inshore habitats of southern New Zealand. *New Zealand Journal of Zoology* 46: 48-60. <https://doi.org/10.1080/03014223.2018.1482930>
- Key Biodiversity Areas (KBA). 2024a.** Key Biodiversity Areas factsheet: Dunedin Coast (offshore). Available at: <https://www.keybiodiversityareas.org/site/factsheet/44643> Accessed September 2024.
- Key Biodiversity Areas (KBA). 2024b.** Key Biodiversity Areas factsheet: Taiaroa Head. Available at: <https://www.keybiodiversityareas.org/site/factsheet/31248> Accessed September 2024.
- Lewis R, Carson S. 2020.** Otago participatory science platform 2020. Shark spy, monitoring Otago sharks report. University of Otago: Dunedin.
- Lucifora L, Menni R, Escalante A. 2005.** Reproduction, abundance and feeding habits of the broadnose sevengill shark *Notorynchus cepedianus* in north Patagonia Argentina. *Marine Ecology Progress Series* 289: 237-244. <https://doi.org/10.3354/meps289237>
- Stehfest KM, Patterson TA, Barnett A, Semmens JM. 2014.** Intraspecific differences in movement, dive behavior and vertical habitat preferences of a key marine apex predator. *Marine Ecology Progress Series* 495: 249-262. <https://doi.org/10.3354/meps10563>
- Williams GD, Andrews KS, Katz SL, Moser ML, Tolimieri N, Farrer DA, Levin PS. 2012.** Scale and pattern of broadnose sevengill shark *Notorynchus cepedianus* movement in estuarine embayments. *Journal of Fish Biology* 80: 1380-1400. <https://doi.org/10.1111/j.1095-8649.2011.03179.x>