

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

KAIPARA HARBOUR ISRA

New Zealand & Pacific Islands Region

SUMMARY

Kaipara Harbour is located on the west coast of the North Island of New Zealand. The area is a large, drowned river system that contains extensive areas of mangroves, tidal flats, and deep subtidal channels. The area overlaps with the Kaipara Harbour Key Biodiversity Area. Within the area there are: **threatened species** (e.g., Tope *Galeorhinus galeus*); **range-restricted** species (*Rig Mustelus lenticulatus*); and **reproductive areas** (e.g., White Shark *Carcharodon carcharias*).

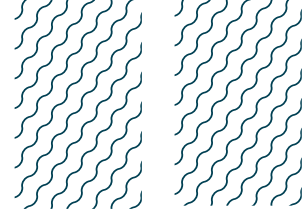
CRITERIA

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

NEW ZEALAND

0-40 metres

771 km²



DESCRIPTION OF HABITAT

Kaipara Harbour is located on the upper west coast of the North Island of New Zealand. The area is the largest harbour in New Zealand and encompasses a large, drowned river system of which 60% is subtidal. The upper reaches are estuarine and contain extensive areas of mangroves. The Okahukura Peninsula divides the harbour into northern and southern basins. Large volumes of fine terrigenous sediment are discharged into the northern part of the harbour by the Wairoa River. Seven other rivers discharge into other arms of the harbour, three more in the north and four in the south. Despite the high sediment loads Kaipara Harbour contains the most extensive subtidal seagrass meadows on the northwest North Island. Shallow subtidal parts of Kaipara Flats and some parts of the deeper channels contain complex biogenic habitats created by sponges and bryozoans. Extensive intertidal and subtidal shellfish beds occur throughout the harbour. Muddy sediments in the estuarine reaches grade into coarse sands near the mouth. The circulation is dominated by strong tidal currents (Morrison et al. 2014).

The area overlaps with the Kaipara Harbour Key Biodiversity Area (KBA 2024).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 40 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Four Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Endangered Tope (Walker et al. 2020), and the Vulnerable Copper Shark (Huveneers et al. 2020), White Shark (Rigby et al. 2022), and Smooth Hammerhead (Rigby et al. 2019).

CRITERION B – RANGE RESTRICTED

This area holds the regular presence of the Rig as a resident range-restricted species. Individuals have been recorded to occur in the area based on net surveys with neonates and young-of-the-year (YOY) occupying shallow muddy habitats. Kaipara Harbour is considered the most important nursery habitat for Rig in New Zealand due to its size, high habitat suitability, and the high catch rates of neonates and YOY reported from it. The latter are the highest recorded anywhere in New Zealand (Hendry 2004; Francis et al. 2012; Getzlaff 2012). This species only occurs in the New Zealand Shelf Large Marine Ecosystem.

SUB-CRITERION C₁ – REPRODUCTIVE AREAS

Kaipara Harbour is an important reproductive area for five shark species.

Pregnant female Copper Sharks containing near-term embryos are regularly caught by sport fishers in Kaipara River, and YOY are caught annually during the austral summer in the subtidal channels and over the shallow flats (CAJ Duffy pers. obs. 2024). Observed individuals commonly measure <80 cm total length (TL; Tindale Marine Research Charitable Trust unpubl. data 2024; CAJ Duffy pers. obs. 2024; iNaturalist 2024a). The size-at-birth of this species is 59–70 cm TL (Ebert et al. 2021).

This area hosts the largest aggregation of immature White Sharks identified in New Zealand waters. Small juvenile and YOY White Sharks regularly occur in Kaipara Harbour (CAJ Duffy unpubl. data 2024). Since the 1990s, the presence of White Sharks has been documented through multiple catch records, direct observations, and tagged individuals. White Sharks are predictably observed mostly from December–February, with the majority measuring between 150–350 cm TL (CAJ Duffy unpubl. data 2024). Of these, ~40% of individuals recorded were <250 cm TL. The size-at-birth of the species is 107–160 cm TL (Ebert et al. 2021). Satellite tagging indicates that White Sharks spend several weeks at a time in the harbour before moving out of the area, with some individuals returning to the tagging location. At most, eight White Sharks have been observed in one day of tagging, with an additional three reports by fishers in different parts of the harbour (CAJ Duffy unpubl. data 2024). The number of individuals recorded in this area is comparable to the two largest adult White Shark aggregations in New Zealand (Stewart Island and Chatham Islands).

Anecdotal information from fishers confirms that the fishery in the area targets pregnant Tope females entering the harbour to pup (Morrison et al. 2014). Mature and pregnant females are commonly caught from October–March in locations such as North and South Heads, Pouto Point, Tapora, Fitzgerald Bank, Bushy Point, Tauhoa Channel, Hargreaves Bay, Oruawharo River, and Kaipara River (Paul & Sanders 2001; Morrison et al. 2014). Twenty-five female Tope satellite tagged in the harbour between 2021–2022 were between 137–165 cm TL (Alex Burton pers. Comm. 2024; Tindale Marine Research Charitable Trust unpub. data 2024). Reported size at maturity for females is 135–140 cm TL (Francis & Mulligan 1998). Pregnant females examined in December 2013 contained embryos at different stages of development ranging from blastodisc stage to near-term (CAJ Duffy unpubl. data 2024). Pregnant females are still observed in the area (Alex Burton unpubl. data 2024). Additionally, neonate and YOY Tope are regularly observed in spring and summer over Omokoiti Flats and along the channel margin up to Shelly Beach, Kaipara River (Tindale Marine Research Charitable Trust unpubl. data 2024; CAJ Duffy pers. obs. 2024). All 89 individuals collected in 2011 during set net surveys for Rig measured <50 cm TL (Francis et al. 2012). The size-at-birth of the species is 30–40 cm TL (Ebert et al. 2021). Given that Tope has a reported three-year reproductive cycle, not all the females are pupping at the same time in the harbour. Those in the early stages of pregnancy may be using the warm temperatures in the harbour over summer to accelerate embryonic development, as well as using the harbour as a feeding ground (CAJ Duffy pers. obs. 2024).

Based on set net surveys conducted between February and March 2011 in 14 harbours and estuaries throughout New Zealand, Kaipara Harbour was identified as the most important Rig nursery area in the country (Francis et al. 2012). Of 475 Rig collected in Kaipara Harbour, 406 (85%) were classified as YOY based on their size, with most measuring <50 cm TL. Size-at-birth for this species is 20–32 cm TL (Ebert et al. 2021). Neonates and YOY Rig are commonly found in the north (Arapaoa), north-east (Oruawharo), and southern (between Shelly Beach and Kaipara Heads) parts of the area where there are estuarine arms and shallow muddy areas that are suitable for these life stages. Females pup in the harbour and mature males enter the area to mate with the females (Hendry 2004; Francis et al. 2012). Reported commercial catches and observations since 2017 confirm the regular and contemporary presence of all life stages (CAJ Duffy pers. obs. 2024; iNaturalist 2024b).

Neonate and YOY Smooth Hammerheads are regularly caught by recreational fishers during the summer over the shallow flats in this area (CAJ Duffy pers. obs. 2024; iNaturalist 2024c). Between December 2008–February 2023, 51 Smooth Hammerheads were recorded in the area by researchers targeting other shark species (A Burton & CAJ Duffy unpubl. data 2024). Sharks ranged between 40–150 cm TL (68.6 cm TL average) with 70% (n =36) <63 cm TL (A Burton & CAJ Duffy unpubl. data 2024). The size-at-birth of the species is 49–63 cm TL (Ebert et al. 2021) confirming these individuals

were either neonates or YOY. Further, 23 of the Smooth Hammerheads recorded had an open or unhealed umbilical scar and 13 had a partially healed umbilical scar (A Burton unpubl. data 2024).

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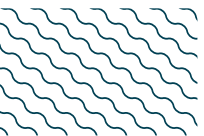
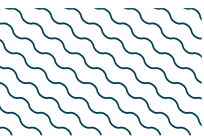
QUALIFYING SPECIES

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>Carcharhinus brachyurus</i>	Copper Shark	VU	0-145	X		X						
<i>Carcharodon carcharias</i>	White Shark	VU	0-1,200	X		X						
<i>Galeorhinus galeus</i>	Tope	EN	0-285	X		X						
<i>Mustelus lenticulatus</i>	Rig	LC	0-100		X	X						
<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU	0-200	X		X						

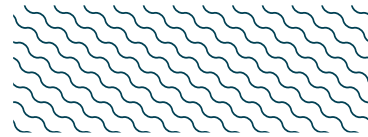
SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Cephaloscyllium isabellum</i>	Carpet Shark	LC
<i>Notorynchus cepedianus</i>	Broadnose Sevengill Shark	VU
RAYS		
<i>Bathytoshia brevicaudata</i>	Smooth Stingray	LC
<i>Myliobatis tenuicaudatus</i>	Southern Eagle Ray	LC
<i>Tetronarce nobiliana</i>	Great Torpedo Ray	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.



SUPPORTING INFORMATION



There are additional indications that Kaipara Harbour may be an important feeding area for one shark species.

Stomach content analysis of 21 YOY Rig (2 with empty stomachs) in March 2011 showed that their diet consists primarily of crabs (e.g., Stalk-eyed Mud Crab *Hemiplax hirtipes*), shrimps (e.g., *Periclimenes batei*), nereid polychaetes, and the stomatopod Japanese Mantis *Oratosquilla oratoria* (Getzlaf 2012). The spatial distribution of YOY Rig in this area is driven by the aggregation sites of crabs (Hailes et al. 2010). More information is needed to confirm the regularity of this process and the feeding importance of the area for this species.

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