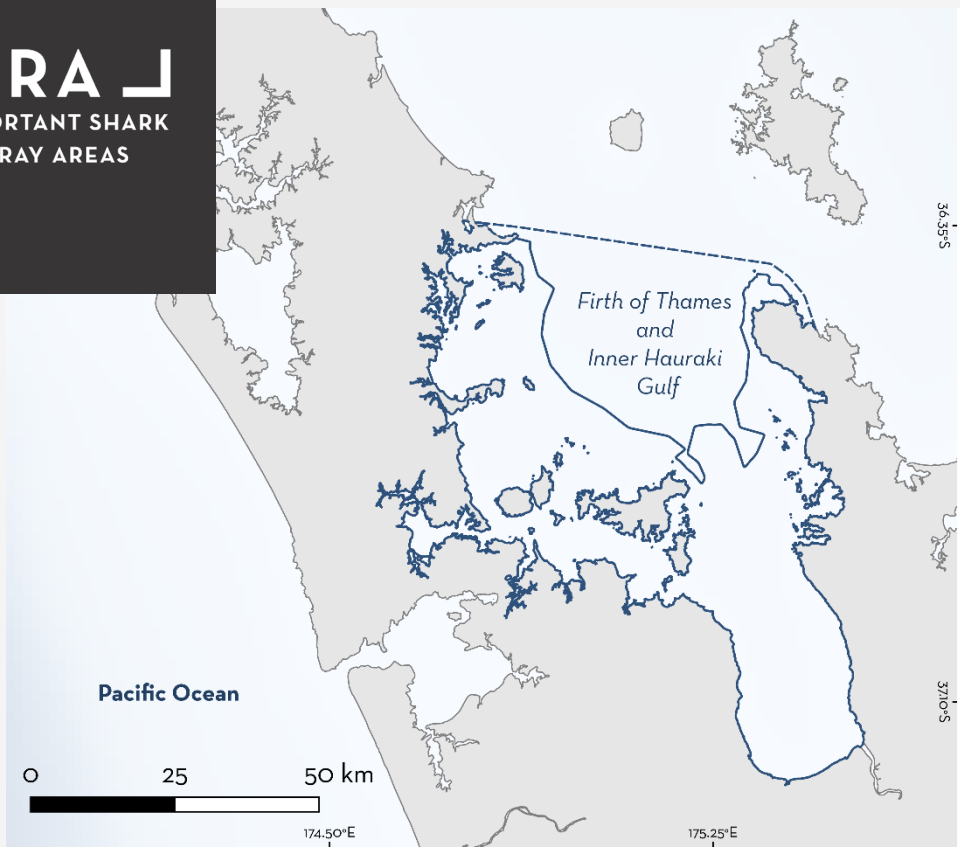
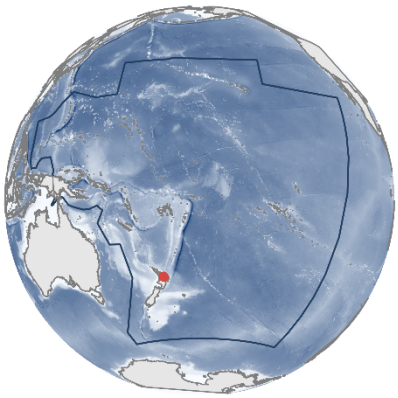
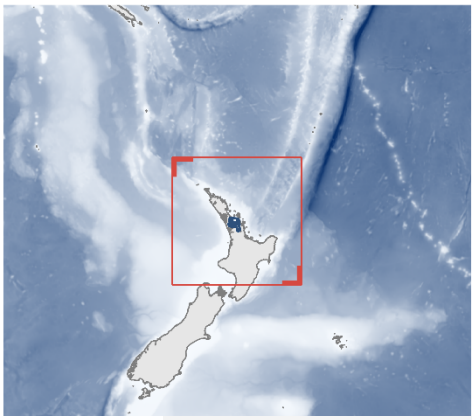
ISRA
IMPORTANT SHARK AND RAY AREAS







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

FIRTH OF THAMES AND INNER HAURAKI GULF ISRA

New Zealand & Pacific Islands Region

NEW ZEALAND

0–50 metres

2,882.1 km²

SUMMARY

Firth of Thames and Inner Hauraki Gulf is a large, complex drowned river system located on the northeast coast of the North Island in New Zealand. The area is characterised by extensive areas of muddy substrates, biogenic habitats in areas of high tidal flows, and large estuarine habitats. It also includes large areas of mangrove and intertidal seagrass beds. The area overlaps with one Key Biodiversity Area, five protected areas, and one Ramsar site. Within the area there are: **threatened species** (e.g., Smooth Hammerhead *Sphyrna zygaena*); **range-restricted** species (Rig *Mustelus lenticulatus*); and **reproductive areas** (e.g., Tope *Galeorhinus galeus*).

CRITERIA

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

DESCRIPTION OF HABITAT

Firth of Thames and Inner Hauraki Gulf is located on the northeast coast of the North Island in New Zealand. The area covers a large, complex drowned river system comprised of the Inner Hauraki Gulf, Firth of Thames, and Waitemata Harbour (Aguirre et al. 2016). Rocky reefs occur around much of the coastline, except at the head of the Firth of Thames and in sheltered estuarine sites where the predominant substratum is mud (Morrison et al. 2002, 2003; Aguirre et al. 2016; Jackson & Lundquist 2016). Fringing vegetation includes large areas of manawa/Grey Mangrove *Avicennia marina australasica* and intertidal seagrass *Zostera muelleri novozelandica* beds in many of the inlets and estuaries (Aguirre et al. 2016; Jackson & Lundquist 2016).

Pelagic biological productivity throughout the region is strongly influenced by seasonal and interannual variation in the East Auckland Current (EAUC; Bradford-Grieve et al. 2006). Temperature variability in the surface mixed layer of the EAUC is dominated by the annual cycle, with differences between years highly correlated with the Southern Oscillation Index and wind speed and direction (Bradford-Grieve et al. 2006). Circulation over the inner continental shelf is dominated by tides, local winds, and the southeast flow of the EAUC. Upwelling of slope water onto the shelf and into Hauraki Gulf during austral autumn and winter is driven by shelf winds (Bradford-Grieve et al. 2006). The input of nutrients from oceanic and terrestrial sources makes this area one of New Zealand's most productive shelf regions (Bradford-Grieve et al. 2006). Phytoplankton blooms in spring and early summer support a high biomass of large zooplankton (euphausiids, hyperiids, salps, siphonophores, pteropods) that in turn supports squids and small fishes that are important in the diets of sharks, rays, large teleosts, seabirds, and cetaceans (Bradford-Grieve et al. 2006).

The area overlaps with the North Eastern North Island (offshore) Key Biodiversity Area (KBA 2024). In addition, it overlaps with the Hauraki Gulf Marine Park, Te Matuku Marine Reserve, Motu Manawa Pollen Island Marine Reserve, Long Bay–Okura Marine Reserve, and Tawharanui Marine Reserve (UNEP-WCMC & IUCN. 2024). It also overlaps with the Firth of Thames Ramsar site (Ramsar 2024).

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

Three Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Critically Endangered Tope (Walker et al. 2020); and the Vulnerable 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 resident range-restricted species. Individuals have been recorded in the area using net surveys conducted in the 1980s, 2000–2001 and 2011. Neonates and young-of-the-year (YOY) occupy shallow estuaries and higher numbers are recorded here than in other sites from New Zealand (Hendry 2004; Francis et al. 2012; CAJ Duffy pers. obs. 2024). In addition, historically this has been one of the areas with higher catches of adults in all New Zealand

since the 1990s (Blackwell & Francis 2010). This species is endemic to the New Zealand Shelf Large Marine Ecosystem.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Firth of Thames and Inner Hauraki Gulf is an important reproductive area for four shark species.

A pregnant White Shark measuring 550 cm total length (TL) and containing five near-term embryos (~150 cm TL) was caught off Gannet Rock in 2003 representing one of the few observations of pregnant White Sharks with embryos worldwide (Beston 2003). Between 1919–2022, 47 White Sharks were documented from the area with 37 (78.7%) recorded since 2000 (CAJD unpubl. data 2024; iNaturalist 2024a). Most records are from Tamaki Strait, Rangitoto Channel, Whangaparaoa Peninsula, and Kawau Bay (CAJD unpubl. data 2024). Observed lengths of 45 free-living White Sharks from the area ranged from 160–550 cm TL, with an average of 314 cm TL. Of these, 21 (47%) were <250 cm TL, two measured 180 cm TL, and one 160 cm TL (CAJD unpubl. data 2024). Estimated size-at-birth for the species in the area is ~152 cm TL while for YOY it is ~180 cm TL (Finucci & Ó Maolagáin 2022), confirming that individuals observed were YOY and small juveniles.

Aggregations of gravid female Tope have been reported in the area between Te Kouma Harbour and Deadman's Point, in Inner Channel off Mahurangi Peninsula, and off northeast Kawau Island from catches by commercial fishers and recreational anglers since the 1990s. Further, YOY have been reported throughout the Firth of Thames and Tamaki Strait (Hurst et al. 2000; Morrison et al. 2002, 2003; D Kellian pers. comm. 2014). Reports since 2017 have shown the regular presence of neonates and YOY based on their size (<60 cm TL; iNaturalist 2024b; CAJ Duffy pers. obs. 2024). Size-at-birth in the area is ~30–35 cm TL while YOY measure <50 cm TL (Francis & Mulligan 1998).

Female Rig enter shallow inlets and estuaries to pup in spring and summer with neonates found in Tamaki Estuary and Waitemata Harbour, but pupping likely occurs in other sheltered inlets and estuaries in the area (Francis et al. 2012; Getzlaff 2012; Aguirre et al. 2016). Between February–March 2011, set net surveys were conducted in 14 major harbours and estuaries throughout New Zealand (Francis et al 2012). Sixty-five of the 120 Rig sampled in the area were neonates or YOY individuals according to their size (<45 cm TL; Francis & Francis 1992; Francis et al. 2012). All individuals were caught at <6 m depth (Francis et al. 2012). Waitemata Harbour and Tamaki Estuary were reported as high-value nursery habitats for Rig based on the high number of neonates and YOY recorded compared to other areas in New Zealand (Francis et al. 2012). Neonates and YOY Rig have been reported as abundant in the area in spring and summer since the 1980s (Francis et al. 2012) and between 2000–2001 (Hendry 2004). Recent observations between 2016–2024 confirm the regular and contemporary presence of these life stages (CAJ Duffy pers. obs. 2024; iNaturalist 2024c).

Commercial catch data (set nets, bottom longlines, and bottom trawls) from 2005–2014 and from trawl surveys conducted between 1961–2014 showed that neonate and YOY Smooth Hammerheads are regularly caught in the Firth of Thames and Inner Hauraki Gulf (Francis 2016). Of 208 individuals recorded in trawl surveys, 55.3% (n = 115) were <60 cm TL, with smaller sharks observed from January–March (Francis 2016). The reported size-at-birth for the species is 49–63 cm TL, and juveniles probably grow about 25 cm per year during the first four to five years of life, confirming these are either neonates or YOY (Ebert et al. 2021; Coelho et al. 2011). Three specimens found discarded on sandflats at Firth of Thames in February 2003 ranged from 56-61.5 cm TL (CAJ Duffy unpubl. data 2024). In addition, juveniles are sometimes observed in large aggregations in the area (CAJ Duffy pers. obs. 2024). Estuarine areas in the Firth of Thames provide a large abundance of prey (e.g., Anchovy *Engraulis australis*) for these early life stages to feed on. These life stages are still observed in the area by recreational anglers (CAJ Duffy pers. obs. 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												
Carcharodon carcharias	White Shark	VU	0–1,277	X		X						
Galeorhinus galeus	Tope	CR	0–826	X		X						
Mustelus lenticulatus	Rig	LC	0–1,000		X	X						
Sphyrna zygaena	Smooth Hammerhead	VU	0–200	X		X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Alopias vulpinus	Common Thresher	VU
Carcharhinus brachyurus	Copper Shark	VU
Cephaloscyllium isabellum	Carpet Shark	LC
Isurus oxyrinchus	Shortfin Mako	EN
Notorynchus cepedianus	Broadnose Sevengill Shark	VU
Prionace glauca	Blue Shark	NT
Squalus griffini	Northern Spiny Dogfish	LC
RAYS		
Bathytoshia brevicaudata	Smooth Stingray	LC
Bathytoshia lata	Brown Stingray	VU
Myliobatis tenuicaudatus	Southern Eagle Ray	LC
Tetronarce nobiliana	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 Firth of Thames is potentially an important reproductive area for one shark species, and an important area for undefined aggregations of one shark species.

Egg cases of Carpet Shark have been reported on shallow inshore reefs between August and September (iNaturalist 2024d). More Information is needed to confirm the regularity of the egg cases and the reproductive importance of the area.

Large aggregations (>50 individuals) of Copper Sharks have been reported in the Gulf on social media channels. Juveniles and adults are commonly found in summer, feeding on demersal and pelagic fishes, including small sharks such as juvenile hammerheads. More information is needed to confirm the regularity and nature of these aggregations.

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