

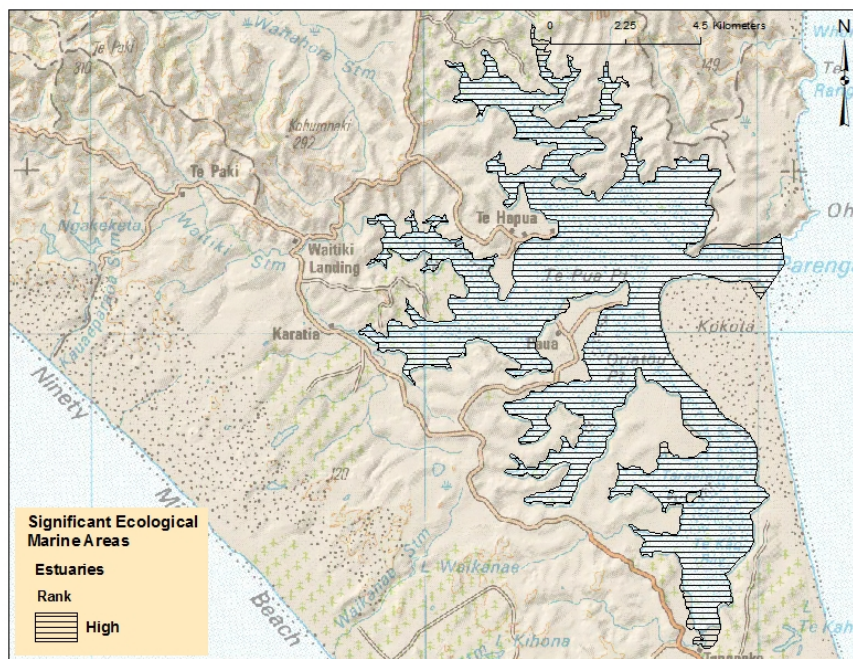
Significant Ecological Marine Area Assessment Sheet

Name: Parengarenga Harbour Marine Values

Parengarenga Harbour is as an outstanding example of a northern estuary with a true tropical and subtropical influence and has been given a high ranking of ecological significance for marine values. In biodiversity diversity terms it is amongst our most valuable estuaries in New Zealand and is significant internationally as a fine example of a subtropical estuarine environment. ¹

The harbour's large size supports an elevated level of marine biodiversity values and the resulting estuarine ecological functions. The tidal flats have large areas of seagrass beds *Zostera muelleri*, which have been recognised as significant biogenic habitats. Seagrass communities add to the diversity of an already extremely diverse benthic invertebrate community. ¹ In the many upper arms of the harbour extensive mangrove forests connect with valuable saltmarsh areas. These systems in Parengarenga - especially the seagrass beds - have been recognised as the very best examples of feeding and nursery areas for the juvenile stages of many coastal fishes. The proximity of the Houhora and Rangaunu Harbours have special significance because of the connectivity between these estuaries and the high value reef and soft bottom marine habitats offshore. The movement of seabirds between these habitats is evidence of this. Also in the marine environment there is similar dispersal - or movement - between these habitats: notably with pelagic fish species and their spawning cycles; and, more generally, the movement of larval forms of the life stages of marine organisms, especially in the case of subtropical species which arrive with the warm East Auckland currents coming down the east coast. The marine habitats of Parengarenga Harbour play a crucial role in preserving water quality of the waters passing through this estuary to the high value surrounding coastal area. The estuarine habitat provides vital connectivity between the coastal and estuarine habitats and the fresh water systems of the catchment.

Map of Parengarenga Harbour.



¹ Hayward, B.W., Stephenson, A.B., Morley, M.S., Blom, W.M., Grenfell, H.R., Brook, F.J., Riley, J.L., Thompson, F. and Hayward, J.J. 2001. Marine biota of Parengarenga Harbour, Northland, New Zealand. *Rec. Auckland Institute. Mus.* 37:45-80.

Description:

Much of the distinctive habitat and biodiversity richness of Parengarenga Harbour is owing to its relatively pristine state, unique catchment characteristics and its northerly location on the Northland east coast. The influence of the warm subtropical East Auckland Current has a profoundly positive influence on the diversity of the marine communities found here. ¹ Parengenga supports nationally and internationally important seabird communities and levels of tropical and subtropical marine diversity not seen in any other New Zealand estuary. ¹

Parengarenga Harbour is a drowned valley system with many meandering branches that were flooded 6,500–7,000 years ago after last glaciation. This estuarine harbour is sheltered from the Pacific Ocean by a large silica sand spit (Kokota Spit). The harbour is situated on the east coast just south of North Cape; it is the most northerly harbour in mainland New Zealand. It has an area of 6,300 ha, 90% of which consists of intertidal flats of sand/mud, mangrove, seagrass and saltmarsh. Subtidal reefs are also present but have a highly restricted distribution. The harbour is shallow and has an array of tidal mangrove-lined inlets that radiate inland from the entrance and terminate in numerous saltmarsh areas. The creeks and streams that enter the harbour do not contribute a substantial freshwater flow.

Despite Parengarenga's great size and relatively healthy condition as an estuary, there have been impacts from sedimentation and runoff from the catchment. Improving riparian protection in some areas of the catchment would protect the connectivity between these valuable estuarine habitats, freshwater wetlands, stream corridors and the bush covered fringes of the estuary and catchment. Estuarine habitats and species generally will benefit from the combined effects of buffering sediments and nutrients entering the marine environment. Parengarenga's position is a sensitive one in that its waters drain into the far north of the Aupouri Peninsula, which is a very pristine and productive coastal area.

A 3D aerial image of Parengarenga Harbour looking from the east. The dark areas on tidal flats are seagrass habitat. Mangrove habitats fringe the upper reaches of the Harbour.



Parengarenga has large areas in tidal sand flats with very productive seagrass and shellfish beds. Photo Credit: Vince Kerr



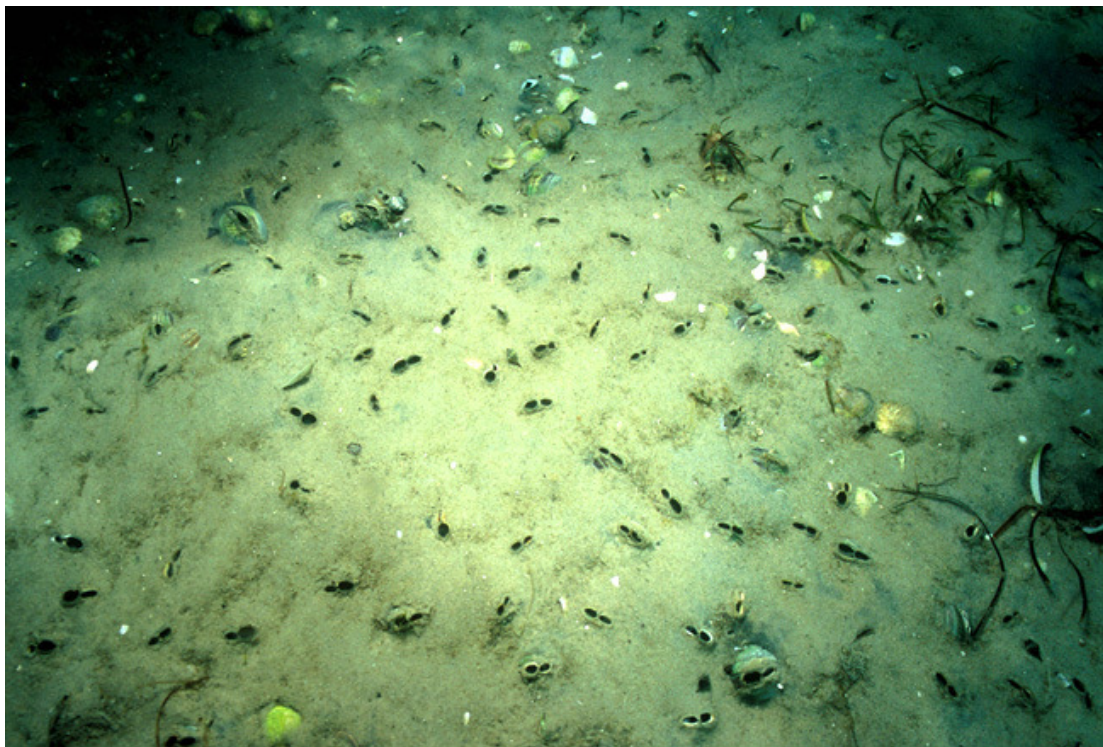
A close-up view of snapping shrimp in a typical seagrass habitat. Photo Credit: Vince Kerr



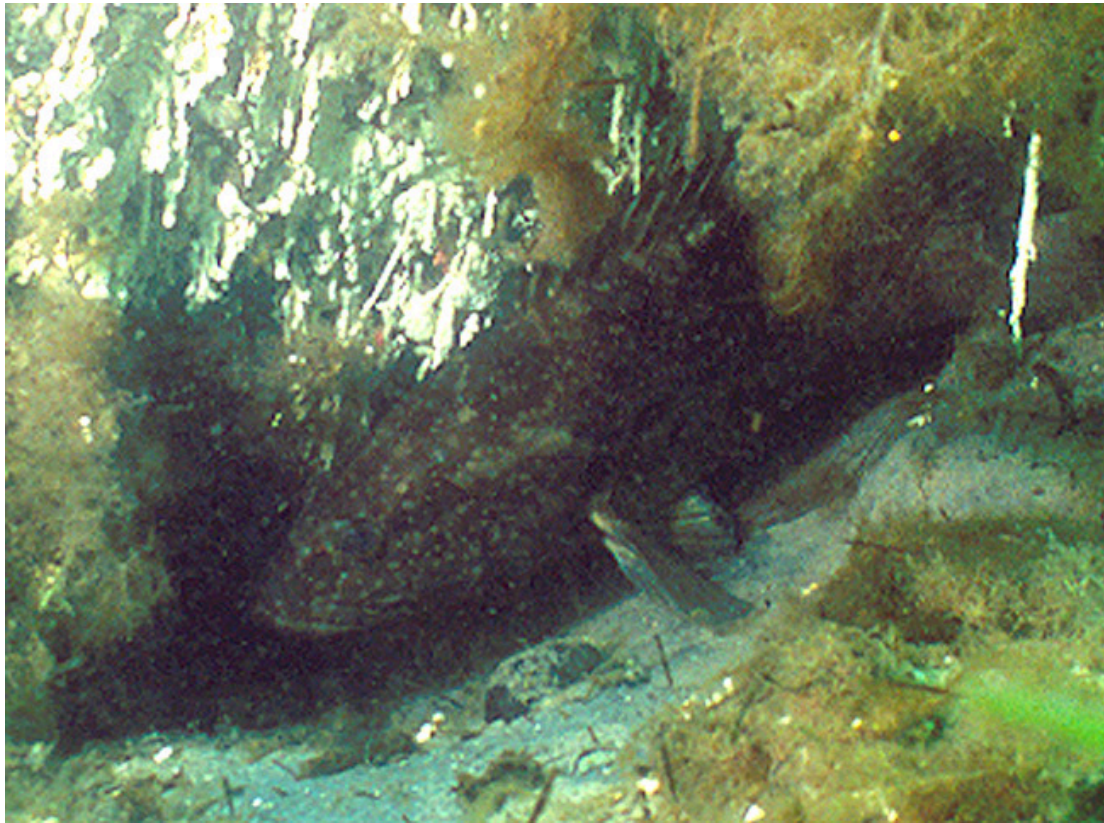
A crayfish forages for shell fish in the middle of an extensive tidal flat seagrass habitat. Picture here opening a pipi. Photo Credit: Vince Kerr



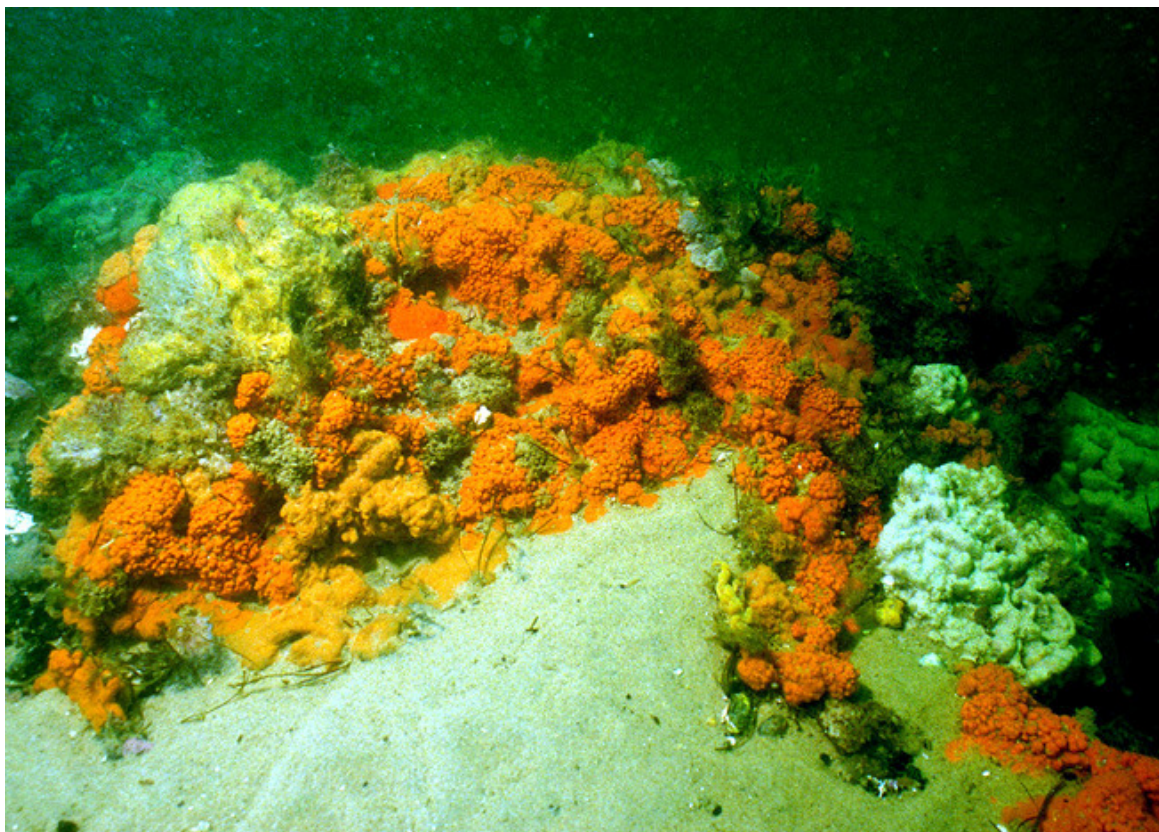
A cockle bed in clean sand tidal flat photographed at high tide showing their feeding tubes open. Photo Credit: Roger Grace.



A rare spotted black grouper, found in a fringing rocky reef area in the up harbour from Paua. Photo Credit: Roger Grace.



A shallow reef inside the Harbour showing a very rich and diverse sponge dominated community.



A typical shell bank high tide roost formed from the pure white silica sands near the Harbour entrance. Waders in large numbers feed and roost in this Harbour. Photo Credit: Vince Kerr



Ecological Values

The marine ecology of the Parengarenga Harbour is more generally summarised in the Nearshore Classification produced by the Department of Conservation ². A further review of natural features and ecology was completed by NIWA in 2005.³ Both publications have comprehensive references covering previous descriptive work done in Northland. The later report summarises some of the local scale habitat mapping work done in the region. The most recent habitat map of the harbor was produced in 2010 ⁴

Parengarenga's large area of shallow habitats means that the harbour is well flushed with coastal waters. This daily flow of tides results in a harbour that is well connected to the rich marine biodiversity of this northern part of Northland's east coast. The northern harbours in general have been shown to have high benthic invertebrate diversity, high productivity and are characterised by significant numbers of subtropical species owing to the affects of the East Auckland current carrying subtropical species larvae from warmer regions to the north and east of New Zealand. ^{1 2 3}

² Department of Conservation, 2005. Near Shore Marine Classification System. Compiled by Vince Kerr for Northland Conservancy, Department of Conservation. Revised September 6, 2005. http://www.marinenz.org.nz/nml/files/documents/3_northland-mpa.html

³ Morrison, M., 2005. An Information Review of the Natural Marine Features and Ecology of Northland. Prepared for the Department of Conservation. NIWA Client Report: AKL 2005-50.

⁴ Kerr, V. 2009: Marine habitat map of Northland: Mangawhai to Ahipara vers. 1. Northland Conservancy, Department of Conservation, Whangarei. 33 p.

The intact sequences of mangrove and saltmarsh are significant in Parengarenga and play an important role in providing ecological connections between the expansive tidal flat communities, coastal waters and the wetlands and fresh water streams of the catchment. The role of these habitats in filtering and buffering sediments and nutrients as they enter the estuarine system is a vital one that has significance to the wildlife values of the estuary and the aquaculture established there.⁵ The large tidal flat areas are a rich area of benthic invertebrate diversity. In a 2001 report¹ Hayward recorded 452 species of marine invertebrates living in the harbour. The extensive tidal flats support large and valuable areas of seagrass beds. Combined with the areas of seagrass beds in neighbouring Rangaunu and Houhora Harbours these northern seagrass beds are the largest in the country. In total 2,699 ha of seagrass beds have been mapped in the Parengarenga Harbour.⁴ Seagrass beds are an important biogenic habitat supporting diverse benthic invertebrate communities and are identified as a key habitat for the early life stages of many coastal fish species.⁶ The system in Parengarenga Harbour is described as one of the best examples of a nursery area for coastal fish species in the country.

Assessment of Ecological Significance

Table 1 Ranking score of ecological significance of Parengarenga Harbour⁷

Parengarenga Harbour: Assessment of Ecological Significance			Rank
Overall Ranking		Notes	High
Representati on	supports most taxa expected for habitat type	Soft bottom communities are diverse and include high quality seagrass beds, juvenile fish diversity and abundance is high – an excellent example	H
	large example of its type	A large example	H
Rarity and Distinctivene ss	supports indigenous species threatened, at risk, or uncommon, nationally or within the relevant ecological scale	Invertebrate community is diverse and includes many tropical and sub tropical species rarely or not seen elsewhere in New Zealand	H
	supports species endemic to the Northland-Auckland region or at distributional limits within the Northland region	Invertebrate community is diverse and includes many tropical and sub tropical species rarely or not seen elsewhere in New Zealand	H
	distinctive of a naturally restricted occurrence	Excellent example distinctive due to its large size and complexity of intertidal habitats in particular, silica sand habitats very rare	H

⁵ Morrison, M.A.; Lowe, M.L.; Parsons, D.M.; Usmar, N.R.; McLeod, I.M., 2009. A review of land-based effects on coastal fisheries and supporting biodiversity in New Zealand. *New Zealand Aquatic Environment and Biodiversity Report No. 37*. 100 p.

⁶ Morrison, M.A.; Jones, E.G.; Parsons, D.P.; Grant, C.M., 2014. Habitats and areas of particular significance for coastal finfish fisheries management in New Zealand: A review of concepts and life history knowledge, and suggestions for future research. *New Zealand Aquatic Environment and Biodiversity Report No. 125*. 202 p.

⁷ Table 1 details the ranking criteria and scoring that was used to determine the overall high ranking given to the ecological significance of this area. The criteria used have been adopted from Appendix 5 of the Northland Regional Council Proposed Policy Statement. See reference to Methodology report or other council documents to call up

	developed as a result of unusual environmental factor(s) or is part of an ecological unit that occurs within an originally rare ecosystem	Excellent example distinctive due to its large size and complexity of intertidal habitats, silica sand habitats very rare	H
	identified as nationally or regionally rare habitat(s) in MPA Plan	Not Assessed but would be expected to be classified as unique and special	NA
Diversity and Pattern	high diversity of indigenous ecosystem or habitat types	Habitat sequences excellent, salt marsh, mangrove, tidal flat and seagrass beds and subtidal channels, is an important estuaries on East Coast and nationally significant	H
	high diversity of indigenous taxa	Soft bottom communities are very diverse and include high quality seagrass beds, juvenile fish diversity and abundance is at the very highest levels compared to other estuaries in New Zealand	H
	its composition reflects the existence of diverse natural features or ecological gradients	The range of estuarine habitats are well represented and large in extent and complexity, full sequence of habitats along gradient of fresh to coastal waters	H
	contains intact ecological sequences	Areas identified are all connected as part of the whole estuarine system.	H
Ecological Context	provides or contributes to ecological linkages, networks, buffering functions	All habitats areas are strong contributors to providing ecological connections between coastal waters and the harbour habitats, the estuarine buffering functions are significant	H
	supports the natural functioning of freshwater or coastal ecosystems	All habitat areas are strong contributors to providing ecological connections and the estuarine buffering functions	H
	supports life stages of indigenous fauna	Provides significant support for various life stages for shorebirds juvenile coastal fish species and diverse benthic invertebrate communities	H
Assessed by: Vince Kerr			Date: September 2015
Information Source(s) <i>see below</i>			1-7
Reliability of Information <i>see below</i>			+++
Rank (overall score) H = high, M = moderate, L = low, DD = data deficient, R = recommended for further investigation			
Information Source(s) 1 = quantitative report, 2 = qualitative report, 3 = habitat map or classification, 4 = expert opinion, 5 = personal communication, 6 = anecdotal information, 7 = visit and observation			
Reliability of Information expressed as a scale of confidence ranging from high (+++) to low confidence (---)			
Criteria Rank - score for each individual criteria) H = high ranking, M = moderate ranking, L = low ranking, DD = data deficient, R = recommended for further investigation, NA = not assessed for this criteria			