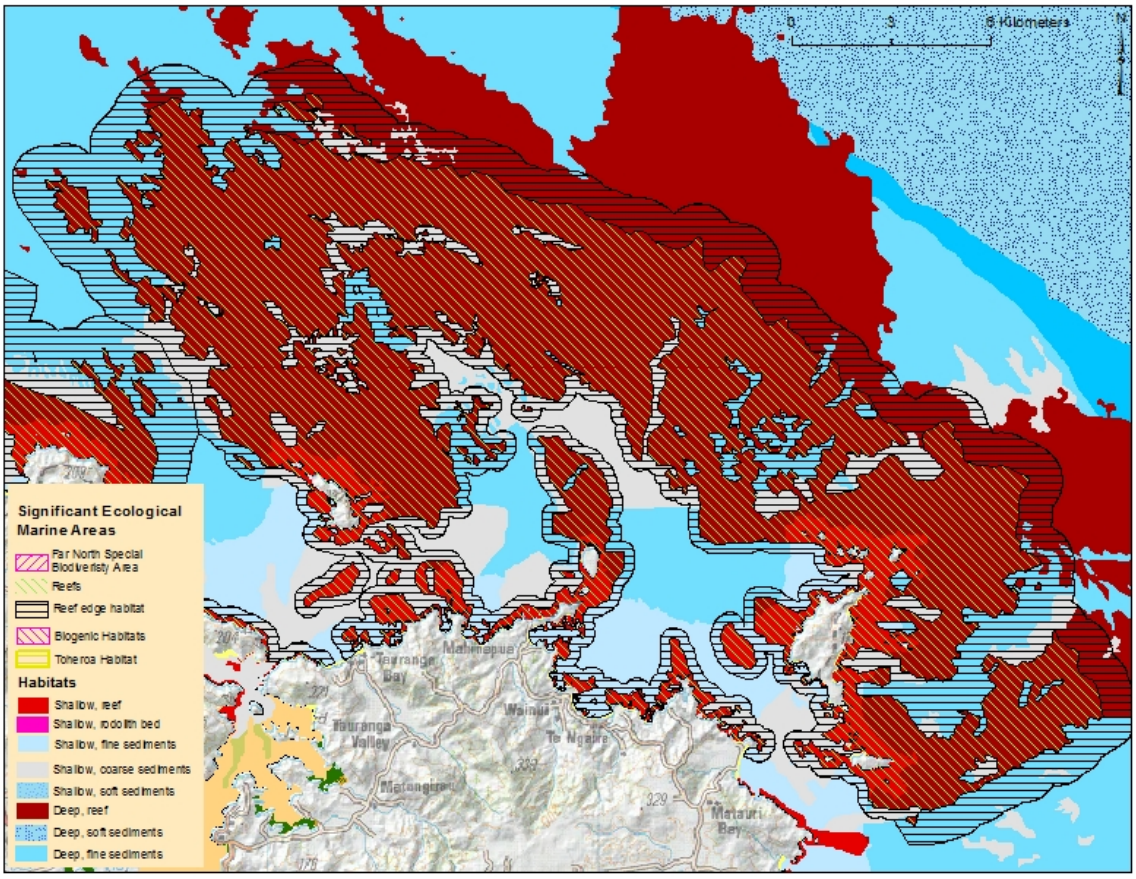
Significant Ecological Marine Area Assessment Sheet

Name: Cavalli Islands and Coast

Summary:

The reef systems of Cavalli Islands and Coast and adjoining reef edges of soft bottom habitat score as a high ranking ecological area. This reef system is extensive, with large areas of coastal fringing shallow reefs connected to a large and complex deep reef system extending more than 13 kms offshore in places. These complex reefs, coastline and islands create a significant sequence of high quality marine habitats. In addition the Cavalli Islands and Coast creates an ecological sequence and connectivity with important conservation areas on Cavalli Islands themselves.[1] The islands add a great deal of complexity to the area's habitats and marine biodiversity values.

Habitat map and mapped significant ecological areas of Cavalli Islands and Coast



[1] Kerr, V.C., Langford, C., Wright, D., 2014. Proposal for two marine reserves and a scientific reserve in the Bay of Islands: results of community consultation. Prepared for and published by Fish Forever, Bay of Islands Maritime Park Inc.

The Cavalii Islands look from the mainland at Matauri Bay. Photo credit: DOC.

Landing beach at the DOC hut on Motukawanui Island. Photo credit DOC.

A view of the inside shores of the outer chain islands in the Cavalli group, Not the healthy shallow kelp forest growth on the fringing reefs. Photo credit: Dean Wright Photography.

The northern tip of the outer island chain of the Cavalli group. Photo credit: Dean Wright Photography

An underwater view of rich encrusting reef and kelp forest typical of the Cavalli Islands. Photo credit: Roger Grace

The northern tip of the main island, Motukawanui showing extensive fringing shallow rocky reef habitats and lush algal forests typical of the Cavalli Islands. Photo credit: Dean Wright Photography.

Rhodolith colonies growing amongst a Tawera speciosa bed, a significant biogenic habitat found in the Cavalli passage. Photo credit: Roger Grace.

Description:

Cavalli Islands and Coast is an area of exposed coastline with some semi-sheltered areas. It is situated to the east of Whangaroa on Northland's northeast coast. The east coast of Northland is part of the Northeastern Biogeographic Region [2] and is generally characterised by series of rocky headlands and steep and ragged shorelines, and a number numerous small and medium sized islands and pinnacles. The Cavalli Islands cover an area of around 29 sq km and contain 28 islands, 82 rocks, and 25 stacks. The largest (and most modified) island is Motukawanui (350 ha), followed by Motukawati (47 ha), and Panaki (16.5 ha). [3] Cavalli Islands and Coast is exceptionally diverse and has some of the best examples of coastal rocky reef communities in Northland. The mapped ecological area encompasses the exposed rocky shores and offshore reef areas from 3km north of Takou Bay in the southeast to the eastern end of Tauranga; it includes the soft bottom habitats making up the reef edge habitats of this area. The deep reef (greater than 30m depth) runs out seaward from Stephenson Island and Cavalli Islands with significant areas of soft bottom habitats between.

Cavalli Islands and Coast area has attracted considerable scientific investigation. NIWA as part of an Ocean 20/20 project carried out extensive sonar survey, sediment and

[2] Department of Conservation & Ministry of Fisheries, 2008. Marine Protected Areas: Classification, Protection Standard and Implementation Guidelines.

[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

biodiversity sampling in 2008-9. [4] This survey was followed by a regional scale marine habitat mapping project in 2010.[5]

Oceanography

The Cavalli Islands and Coast area has a variety of exposure to the oceanic influences and the warm East Auckland Current. The islands and the more exposed parts of the mainland coast are subject to considerable wave energy during easterly gales. The seaward extremes of the islands extend a significant distance (approx. 5-7 kms) outwards into the offshore area and are battered at times from easterly storms. The whole area is strongly influenced by the warm subtropical East Auckland Current eddying towards the coast in a typically south-eastwards direction. This current brings with it a variety of Indo-Pacific larvae. The mix of these surviving subtropical species with the many endemic species makes these areas ecologically important.

Ecological Values

The reef habitats at Cavalli Islands and Coast are very diverse due to the great range in exposures and complex topograph generally. There is great diversity in the algal communities that dominate the shallow reef areas. This ranges from semi sheltered shores with mixed red algal and *Carpophyllum sp.* shallow mixed weed zones giving way to the dominant *Ecklonia radiata* forests, to the exposed shores where wave energy is high and the more exposed algal communities, represented by *Carpophyllum maschalocarpum* and *Lessonia variegata,* make up the shallow mixed weed zone with *Ecklonia radiata* forest below and extending down to 30m.

At between 100 to 500m off shore the reefs drop to depths beyond 30 m. At these depths and beyond the light is insufficient to support the algal forests and the reef communities become dominated by a diverse filter-feeding encrusting invertebrate community. Sponges play a key role in these communities. This invertebrate community provides protection and food sources for a complex community of marine species and trophic food webs culminating in the top order predators who frequent these biodiversity hotspots and at times become residential. [1] There are several areas in the deep reefs that have considerable relief, some rising as much as 20m off the ocean floor, thus creating eddy currents and upwellings which attract marine life.

There are extensive bottom habitat areas around the reef systems of the Cavalli Islands and Coast. These soft-bottom habitats making up the reef edge habitats are important to reef species as feeding areas for invertebrates and shellfish. A detailed study in the 1980s identified four distinct faunal groups of invertebrates that characterized the soft-bottom habitats there. In addition, between Motukawanui and the small islands to the north, and the small islands to the south, large beds of rhodoliths (both living and dead) were found. These red algae, which create a calcareous structure, form a dense mat or turf cover on the bottom giving it a three-dimensional structure that is attractive to many forms of marine life; these are important biogenic habitats. [6]

A study of Northeast New Zealand reef fish biogeography by Brook[7] presents the results

[4] Mitchell, J. et al., 2010. Bay of Islands OS20/20 survey report. Chapter 2: Seafloor Mapping. http://www.os2020.org.nz/bay-of-islands-coastal-survey-project/

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

[6] Grace, R.V., & Hayward, B.W. (1980). The macrobenthos of the Cavalli Islands, northern New Zealand. Tane 26: 189–209.

[7] Brook, F.J. (2002). Biogeography of near-shore reef fishes in northern New Zealand. Journal of the Royal Society of New Zealand 32: 243-274

of a comprehensive survey effort and review of past survey efforts. The reef fish diversity of Cavalli Islands and Coast is towards the top of the list of Northland coastal sites, with 71 species recorded. Cavalli Islands and Coast area showed high numbers of subtropical species and is very diverse compared to other regions of New Zealand.

The marine ecology values of the Cavalli Islands and Coast area and Northland's east coast are summarised in the Nearshore Classification produced by the Department of Conservation[8]. A further and more detailed 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.

Northland Marine Mammals

Information on the presence and conservation status of marine mammals in relation to Northland's coasts and estuaries has been reviewed by Baker. [9] [10] Thirty-five species of marine mammals are known from Northland waters (within the 12 n ml limit). Some marine mammal species are resident or semi-resident and breed along the Northland coast, and others are transients. Three threatened species are amongst the species most often encountered in inshore waters: Bryde's whales *Balaenoptera edni*, bottlenose dolphins *Tursiops truncates*, and Orca *Orcinus orca*. The common dolphin *Delphinus delphis,* which is not threatened, is also commonly seen in the Cavalli Islands area. Less common, but occasionally encountered in the Eastern Bay of Islands are pilot whales *Globicephala spp.*, false killer whales *Pseudorca crassidens*, and some of the large baleen whales.

Assessment of Ecological Significance

Table 1 Ranking score of ecological significance of Cavalli Islands and Coast Reefs[11]

Cavalli Islands and Coast Reefs: Assessment of Ecological Significance			**Rank**
Overall Ranking		**Notes**	**High**
Representation	supports most taxa expected for habitat type	High diversity of marine species	H
	large example of its type	Good size example of complex sequence of habitats.	H
Rarity and Distinctiveness	supports indigenous species threatened, at risk, or uncommon, nationally or within the relevant ecological scale	Important area for threatened marine mammals species and	H

[8] 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

[9] Baker, A. N., 2005. Sensitivity of marine mammals found in northland waters to aquaculture activities. Report to the Department of Conservation, Northland Conservancy. A. N. Baker Cetacean Biology Consultant, Kerikeri.

[10] Baker, C.S, Chilvers, B.L., Constantine, R., DuFresne, S., Mattlin, R.H., van Helden, A. & Hitchmough, R., 2010. Conservation status of New Zealand marine mammals. New Zealand Journal of Marine and Freshwater Research, 44:2, 101-115.

[11] 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

		rare subtropical species	
	supports species endemic to the Northland-Auckland region or at distributional limits within the Northland region	Level of endemism of marine species not well studied	NA
	distinctive of a naturally restricted occurrence	Diversity of habitats is exceptional	H
	developed as a result of unusual environmental factor(s) or is part of an ecological unit that occurs within an originally rare ecosystem	Diversity of habitats is exceptional	H
	identified as nationally or regionally rare habitat(s) in MPA Plan	Diversity and quality of habitats is recognised as regionally significant	H
Diversity and Pattern	high diversity of indigenous ecosystem or habitat types	Diversity of habitats is exceptional	H
	high diversity of indigenous taxa	One of the better east coast sites for high diversity	H
	its composition reflects the existence of diverse natural features or ecological gradients	Very complex ecological gradients	H
	contains intact ecological sequences	Excellent examples	H
Ecological Context	provides or contributes to ecological linkages, networks, buffering functions	Has complete marine habitat sequences and connects to important terretrial (island) conservation areas with diverse habitats	H
	supports the natural functioning of freshwater or coastal ecosystems	Some connection with small streams and wetlands	M
	supports life stages of indigenous fauna	High diversity well supported by habitats	H

Assessed by: Vince Kerr	Date: September 2015
Information Source(s) *see below*	**2-7**
Reliability of Information *see below*	**+**

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