Significant Ecological Marine Area Assessment Sheet

Name: Eastern Bay of Island Biogenic Soft Sediment Complex

Summary:

The semi-sheltered areas between the central islands of the Eastern Bay of Islands and the Rawhiti Channel have been scored as a high ranking significant ecological area. The islands within this area include: Motuarohia, Moturua, Motukiekie, Okahu, Waewaetorea and Urupukapuka. These shallow predominantly soft bottom habitats are one of Northland's best known examples of algal turf beds and rhodolith beds. These habitats are commonly referred to as biogenic habitats because they create physical structure on bottom that many marine organisms can settle on, thus creating a community of significant biodiversity value.

Habitat map and mapped significant ecological areas for the Eastern Bay of Islands (biogenic habitats).



Description:

The Eastern Bay of Islands marine environments are exceptionally diverse. The mapped ecological area encompasses the semi-sheltered and sheltered coasts of the chain of islands from Motuarohia to Urupukapuka, generally facing towards and bordering the Rawhiti Channel.

The Eastern Bay of Islands has attracted considerable scientific investigation. NIWA as part of an Ocean Survey 20/20 project carried out extensive sonar survey, sediment and

biodiversity sampling in 2008-9. ¹ This survey was followed by a regional scale marine habitat mapping project in 2010. ² A recent publication shows fine scale habitat mapping and habitat and biological community descriptions for the marine areas around Waeweatorea, Okahu and Urupukapuka Islands.³ This area is unusual in that much of it is exposed to oceanic water masses and offshore currents, with limited amounts of silt being deposited from the inner Bay of Islands water masses. Simultaneously, the area is quite sheltered from the effects of wind and wave energy by the islands. Depths are shallow, ranging from the intertidal habitats to 10-15m. There is a great diversity of substrates ranging from fine sands to gravels with many areas also having high shell content. Some of these coarse substrates allow turfing and coralline algae to establish and form biogenic habitats; these three-dimensional structures provide footholds for other organisms to establish.⁴

An aerial view of the islands central to the Eastern Bay of Islands, the big island on the right is Urupukupuku and the larger island on the left is Moturua Island. In this image the dark streaking shading visible is algal turf beds some with rhodolith communities. In the sheltered bays of Urupukupuku Island you can see darker areas that are seagrass beds. Photo credit; Apple Maps.



¹ Mitchell, J. et al., 2010. Bay of Islands OS20/20 survey report. Chapter 2: Seafloor Mapping. <u>http://www.os2020.org.nz/bay-of-islands-coastal-survey-project/</u>

³ Kerr, V.C., Grace, R. V., 2015. Marine habitats of the proposed Waewaetorea Marine Reserve. A Report prepared for Fish Forever, Bay of Islands Maritime Park Inc.

⁴ Morrison, M.A., Jones, E., Consalvey, M., Berkenbusch, K., 2014. Linking marine fisheries species to biogenic habitats in New Zealand: a review and synthesis of knowledge.

New Zealand Aquatic Environment and Biodiversity Report No. 130. 156 p.

⁵ Nelson, W.,A., 2009. Calcified macroalgae - critical to coastal ecosystems and vulnerable to change: A review. Mar Freshwater Res 60:787–801.

An aerial view of the NIWA study area at Te Miko reef between Motuarohia and Moturua Islands. The dark streaking visible in the channel between the islands are algal turf beds with rhodoliths. Photo credit: Apple Maps.



Rhodilith beds in the NIWA study area near Te Miko Reef in the channel between Motuarohia and Moturua Islands. Photo credit: Roberta D'Archino, NIWA.



Underwater scene of seagrass growing well in a shallow subtidal part of the Okahau Channel. Photo credit: Vince Kerr.



Oceanography

The Eastern Bay of Islands area has a variety of exposures to the oceanic influences of the offshore area. The chain of islands on the outside of the Rawhiti channel is less exposed than the shoreline of the Cape Brett peninsula. However, they are still subject to considerable wave energy during easterly gales. In contrast, the coastline that faces towards the Rawhiti Channel and away from the open sea is quite sheltered, but is regularly bathed in the tidal currents of the outer coast and offshore area. The whole area is strongly influenced by the warm subtropical East Auckland Current, derived from the north-western Tasman Sea flowing south-eastwards adjacent to the coast. 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 unique.

Ecological Values

In 1981 a research team did a detailed investigation of soft-bottom habitats off the southern tip of Urupukapuka extending across the Rawhiti Channel. In this study a mosaic pattern of varying grain size soft-bottom sediments were found and the predominant benthic invertebrate groups were characterised. There were also areas identified as rhodolith beds which are now viewed as important biogenic habitats. ⁵ More recently a NIWA team surveyed areas on both sides of the Rawhiti Channel near Motuarohia Island and documented the abundance and taxonomy of rhodolith species and turfing algae forming habitats there.⁶

⁶ Nelson WA, Neill K, Farr T, Barr N, D'Archino R, Miller S, Stewart R (2012) Rhodolith beds in northern New Zealand: characterisation of associated biodiversity and vulnerability to environmental stressors. New Zealand Aquatic Environment and Biodiversity Report. 99.

The habitats adjacent to the central islands of the Eastern Bay of Islands have been more generally described in two habitat studies. ³⁷ It is expected that there are important algal turf and rhodolith beds scattered throughout this area due to the ideal environmental conditions that exist here. These important habitats are also valuable recreational scallop beds. In recent times the scallop resources have suffered from heavy fishing pressure.

Assessment of Ecological Significance

Table 1 Ranking score of ecological significance of Eastern Bay of Islands Biogenic soft bottom complex ⁸

Eastern Bay of Islands Biogenic soft bottom complex: Assessment of				
		Notos	High	
		diversity good example	підп	
Representati on	supports most taxa expected for habitat type	for its type	М	
	large exemple of its type	Believed to be a large	L	
Rarity and Distinctivene ss	supports indigenous species threatened, at risk.		11	
	or uncommon, nationally or within the relevant	Not oppopped	ΝΔ	
	supports species endemic to the Northland-	NULASSESSEU	INA	
	Auckland region or at distributional limits within			
	the Northland region	Not Assessed	NA	
	distinctive of a naturally restricted occurrence	Habitat very special and unusual	н	
	developed as a result of unusual environmental	Unique combination of		
	factor(s) or is part of an ecological unit that	substrates shelter and		
	occurs within an originally rare ecosystem	currents	Н	
	identified as nationally or regionally rare	Habitat identified in MPA	ы	
Diversity and Pattern	high diversity of indigenous ecosystem or	Algal communites	11	
	habitat types	diverse for type	Μ	
	high diversity of indigenous taxa	Algal communites	N/	
		diverse for type °	IVI	
	its composition reflects the existence of diverse	unusual – high diversity		
	natural features or ecological gradients	of soft bottom substrates	Μ	
	contains intact ecological sequences	Limited sequences	Μ	
Ecological Context		Important nursery		
	provides or contributes to ecological linkages	habitat for fishes and		
	networks, buffering functions	organisms	н	
	supports the natural functioning of freshwater or			
	coastal ecosystems	Not Assessed	NA	
	supports life stages of indigenous fauna	Provides support for early life stages for a	н	
		sally mo stages for a	•••	

⁷ Nelson, W.; D'Archino, R. (2010). Bay of Islands OS20/20 survey report. Chapter 12: Attached benthic macroalgae [pdf]. *In*: Bay of Islands OS20/20 survey report, pp. 31. Retrieved on 16 May 2012 from <u>ftp://ftp.niwa.co.nz/os2020/boi/Final_chapters/Chapter_12_Macroalgae.pdf</u>

⁸ 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

⁹ Nelson, W.A. (1987). Marine algae of the Bay of Islands area: a list of species. *National Museum of New Zealand miscellaneous series* 16. 47 p.

significant number o fish species and oth benthic invertebrates		umber of and other rtebrates			
		_			
Assessed by: Vince Kerr Date: S 2015		Date: Sept 2015	ptember		
Information Source(s) see below					
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					