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Benthic survey of a proposed marine farm extension to Li131 and Pe305 in Croisilles Harbour

NIWA Client Report: MUS00430
April 2000

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CONTENTS

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INTRODUCTION

This report presents the results from a benthic ecological survey of a proposed marine farm extension in Croisilles Harbour, at the mouth of Whakitenga Bay. The owner wishes to extend existing farms, Li131 and Pe305, to include the area of water between them (Figure 1). The total area of the proposed extension is 2.85 ha.

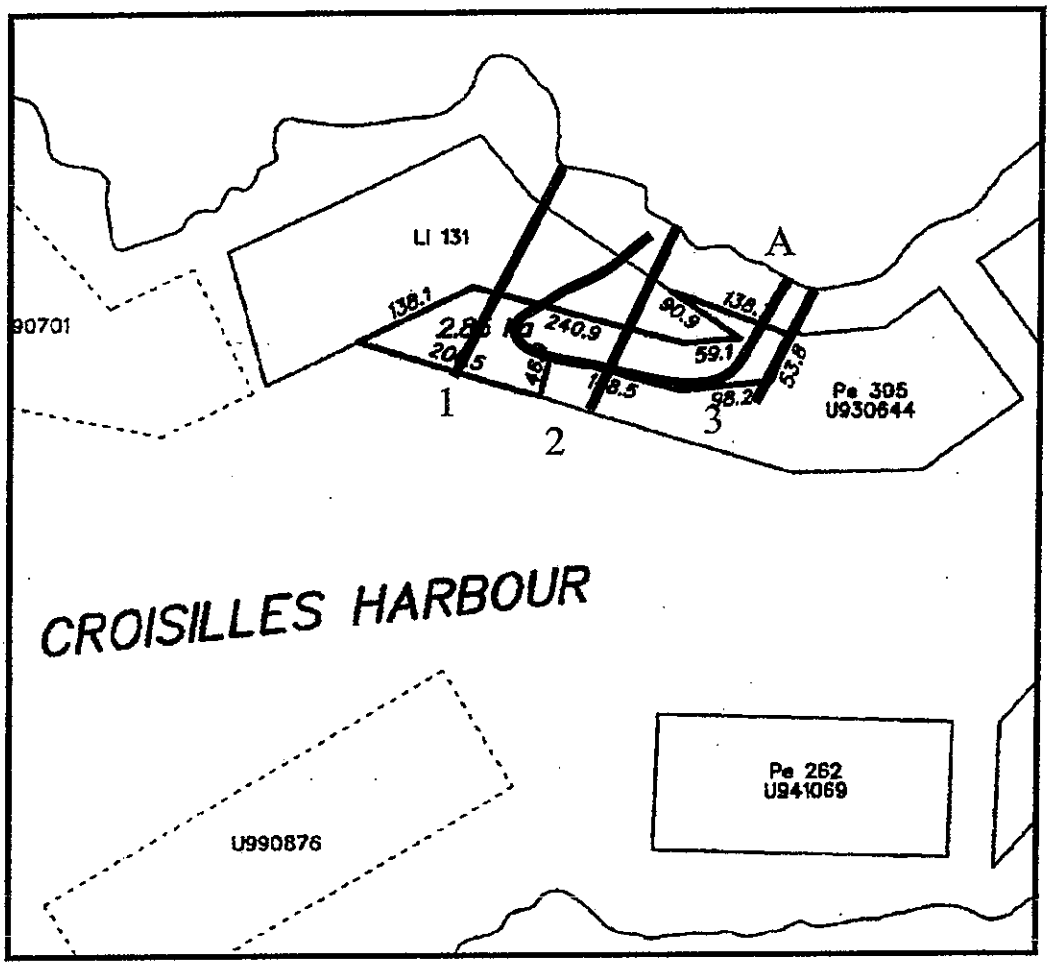


Figure 1. Proposed extension to existing licences, Li131 and Pe305, in Croisilles Harbour. The Red lines (1-3) indicate depth sounding transects and the blue line (A) denotes SCUBA transect.

METHODS

The area of the proposed extension was surveyed in April 2000. Three depth sounding transects were run (see Figure 1) –

1. from shore, through Li131, to the far western corner of the proposed extension,

2. from the southern proposed border, at the edge of Pe305, back towards shore,

3. and, along eastern border of proposed extension to edge of Pe305.

Distance from shore was measured using laser range-finder binoculars while simultaneously reading depths from the vessel's echo sounder approximately every 10 metres. These data were then used to construct bathymetric profiles of the site. The vessel was also manoeuvred along-shore approximately 50 m from the shore to detect the presence of any rocky outcrops on the 3-D echo sounder.

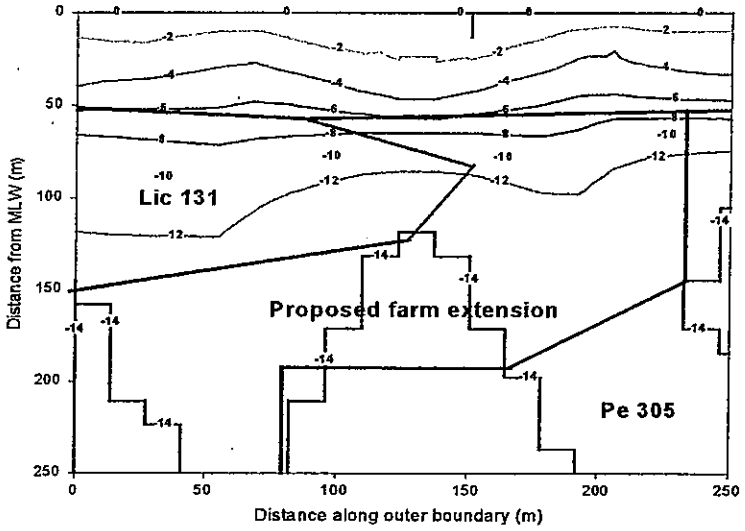
The SCUBA survey was conducted in a 'U-shape' transect line to inspect the area of the proposed extension (see Figure 1). Biologists recorded benthic substrata and conspicuous flora and fauna by depth. Underwater video footage was also taken to record benthic community composition to support the biological observations.

RESULTS

Depth profiles

Three echo sounder transects revealed a gentle slope in the proposed extension area, levelling off at 14 m depth approximately 100 – 150 m from the shore (Figure 2A). No offshore reefs or boulder areas were observed. Figure 2B shows that the inner proposed boundary would lie in depths of 6 – 7m with the farm extending another 100 m offshore to lie in water of 14 m depth.

A.



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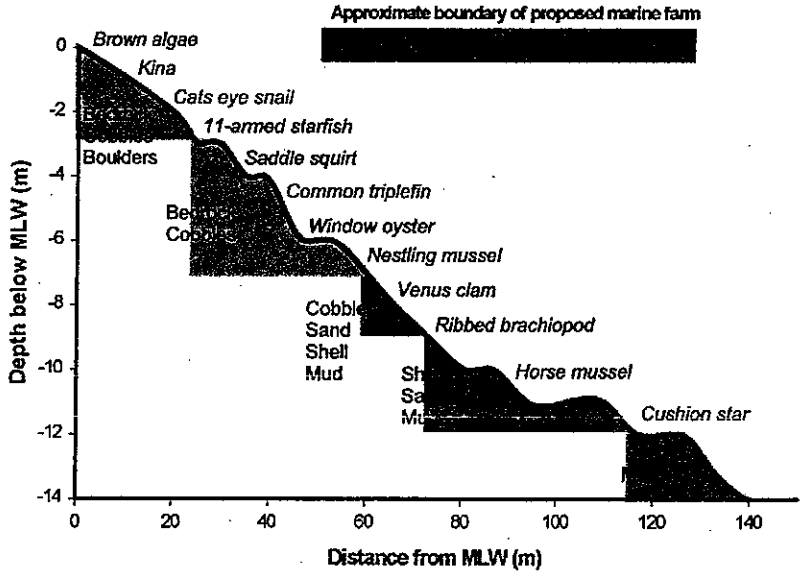

Figure 2. Depth profiles of proposed marine farm extension to Li131 and Pe305, Croisilles Harbour. A. 2-D contour diagram with positions of farm sites indicated. B. Profile of benthic substrate and corresponding biological community assemblage, identified by SCUBA near depth transect 3.

SCUBA survey

The benthic survey was carried out near to high tide with the intertidal area submerged. The shore comprised of bedrock and boulders interspersed with cobbles. We entered the water at an obvious shallow reef and swam offshore (Figure 1). The low lying reef comprising bedrock was colonised with brown seaweeds, Neptune's necklace in the shallows, and *Carpophyllum* and *Cystophora* growing down towards the base of the bedrock at 7 m depth. In the intertidal zone, cats-eye snails, blue mussels and whelks were seen. Moving down the shore, kina, 11-armed starfish, cushion stars and tubeworms were observed.

Between 3-7 m depth, the seafloor was cobbles overlying bedrock and here colonial ascidians, fan worms, red finger sponges, starfish, snakestars, kina, saddle squirts, sea cucumbers and tubeworms were recorded.

The greatest diversity of species was recorded between 7 and 9 m depth where cobbles overlaid sandy mud and shell material. Here, most of the species seen in the habitat zone above were recorded as well as yellow finger sponge, a yellow nudibranch, clam species, small hydroids, turret shells and nestling mussels.

At approximately 70 m from the high tide mark and between 9-12 m depth the substratum was more muddy sand with shell where golf ball sponges were observed, occasional horse mussels including juveniles, saddle squirts, clam species and the occasional ribbed brachiopod.

Below 13 m cushion stars were the only obvious species above the soft muddy sediments, and there were numerous small holes and occasional larger holes, probably the homes of infaunal polychaete worm species.

Table 1. List of conspicuous species recorded in each depth zone/habitat during SCUBA inspection of proposed extension area to Li131 and Pe305 in Croisilles Harbour. Occ= occasional, juv= juvenile

Species	Common name	0-3m Bedrock, Bolders, Cobbles	3-7m Bedrock, Cobbles	7-9m Cobbles, Sand, Shell, Mud	9-12m Shell, Sand, Mud	12-14m Mud
Forsterygion lapillum	Common triplefin		✓			
Forsterygion varium	Variable triplefin			✓		
Notolabrus celidotus	Spotty	✓	✓	✓		
Carpophyllum flexuosum	Brown alga	✓				
Codium sp.	Green encrusting alga	✓				
Cystophora sp.	Brown divaricating seaweed	✓				
Hormosira banksii	Neptune's necklace	✓				
Coscinasterias muricata	11-armed starfish	✓	✓	✓	✓	
Evechinus chloroticus	Kina	✓	✓	✓		
Ophiopsammus maculata	Snakestar		✓	✓		
Patiriella regularis	Cushion star	✓	✓	✓	✓	✓
Stichopus mollis	Sea cucumber		✓			
	Purple encrusting ascidian			✓		
	Orange colonial ascidian		✓			
Cnemidocarpa bicornuta	Saddle squirt		✓	✓	✓	
Hydrodendron sp.	Hydroid tree			✓		
Atrina zelandica	Horse mussel				✓ occ+juv	
Cominella sp.	Whelk	✓				
Cookia sulcata	Turban shell	✓				
Dendrodoris sp.	Yellow nudibranch			✓		
Dosinula zelandica	Clam			✓	✓	
Magasella sanguinea	Ribbed brachiopod				✓ occ	
Maoricolpus roseus	Turret shell			✓	✓	
Modiolarca impacta	Nestling mussel			✓		
Monia zelandica	Window oyster		✓	✓		
Mytilus edulis	Blue mussel	✓				
Ruditapes largillierti	Venus clam			✓	✓	
Turbo smaragdus	Cats eye snail	✓	✓			
Branchiomma sp.	Sabellid fan worm (purple-banded)		✓	✓		
Galeolaria hystrix	Spiny tube worms (keeled)	✓	✓	✓		
Pomatoceros terraenovae	Pink calcareous tube worms		✓	✓		
Aptos sp.	Golf-ball sponge				✓	
Callyspongia	Finger sponges		✓ red	✓red+yellow		
Total no.	**33**	**13**	**15**	**19**	**9**	**1**

CONCLUSIONS

The proposed marine farm extensions would lie above cobble, sand, shell and mud habitats. There are no reef or rock outcrops in this area. The various invertebrates present here are common and widespread in the Marlborough Sounds. The brachiopods and horse mussels recorded here are both species considered by DOC to be of scientific and ecological importance in the Marlborough Sounds (DOC 1995). However, both species are recorded as 'occasional' therefore not in sufficient numbers to trigger a more detailed study.

The siting of the inshore margin of the extension area over mixed cobble, sand, and shell habitat may conflict with observed blue cod habitat. However, the shape of the farm means that only some of this habitat will be overlaid by the mussel lines, and the surrounding areas east and west of this small extension have already been granted (Fig. 2A). The original applicant for LicPe305 did not mention this habitat in his assessment of environmental affects (Trathen 1993) and Lic131 was granted under the Marine Farming Act. It is not possible to determine the actual impacts on this habitat type by the existing licences 131 & Pe305 as these farms have only the seaward lines currently in place. We, however, predict that there will be shell drop-off and some increase in localised sedimentation due to the sheltered nature of the site. No blue cod were seen on this survey. We do not, therefore, have any direct evidence that the cobble substrata inshore of this application is an important blue cod habitat.

REFERENCES

Department of Conservation. 1995. Guidelines for ecological investigations of proposed marine farm areas. *Occasional Publication 25, Nelson/Marlborough Conservancy.*

Trathen, K. B. 1993. Assessment of environmental affects – application by K. B. Trathen, Whakatenga Bay, Croisilles Harbour.

ACKNOWLEDGEMENTS

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