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Site Assessment for Proposed Extensions at Two Mussel Farms: Kenepuru Sound

Prepared for

United Fisheries Ltd

July 1999

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Prepared for

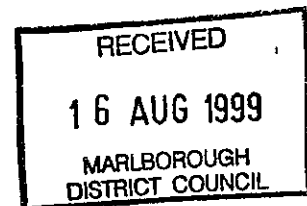
United Fisheries Ltd

by

Stephen Brown

Cawthron Institute
98 Halifax Street East
Private Bag 2
NELSON
NEW ZEALAND

Phone: +64.3.548.2319
Fax: +64.3.546.9464
Email: info@cawthron.org.nz



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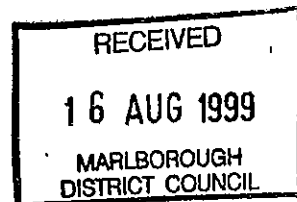
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Report reviewed by: Barrie Forrest

Approved for release by: John Stark



1. INTRODUCTION

United Fisheries has contracted Cawthron to describe the ecological values of the seabed beneath proposed extensions at two mussel farms in Kenepuru Sound (shown in Figure 1), and to assess any potential ecological impacts on the values identified.

Coastal permit U950138 is situated near the head of Kenepuru Sound. Proposed extensions are to the western and eastern ends of this farm and cover an area of 2.018 and 1.37ha respectively.

Coastal permit U950140 is situated adjacent to Fish Bay in Kenepuru Sound. Proposed extensions measuring 1.491 and 2.13ha in area, lie to the western and eastern ends of the farm respectively.

In this report we provide a description of the seabed survey carried out at the sites on July 22, 1999, the seabed values identified, and any potential impacts to these values from the proposed mussel farming activity.

The effects of shellfish farms in general, and with particular reference to mussel farms in the Sounds, has been described in previous reports and publications (Cole & Grange 1996; Davidson 1998; Forrest 1995, 1999; Gillespie 1989, Kaspar *et al.* 1985) and arise primarily from:

- (i) The sedimentation of organic-rich fine-grained particles.
- (ii) The deposition and accumulation of live shellfish and shell litter.
- (iii) The deposition and accumulation of other biofouling plants and animals.

For the purposes of this report, we can assume that mussel farming at the proposed sites will result in moderate organic enrichment of the sediments and infaunal communities beneath the farmed areas, accompanied by an accumulation of shell litter with a variable value as reef habitat.

The aim of the site surveys was to determine the occurrence and distribution of any species, communities or habitats which may have special value for ecological, conservation or scientific reasons, and may support important fisheries (commercial, recreational or traditional). The methods and findings from the survey are described in the following sections.

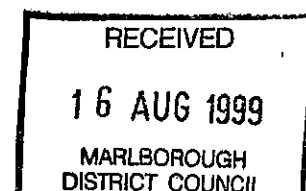
2. SURVEY DESIGN AND METHODS

2.1 Site positioning

The corner boundaries of the proposed sites were located by measurement of distance and bearing from landmarks on the shore using a vessel mounted radar and compass. Buoys were deployed at nearshore corners to provide reference markers for subsequent positioning of sampling transects.

2.2 Survey design

The sites were surveyed using SCUBA divers, grab sampling, and depth sounding. These methods ensured adequate coverage of the surveyed area to a degree appropriate for an investigative study in terms of the requirements outlined in DOC (1995).



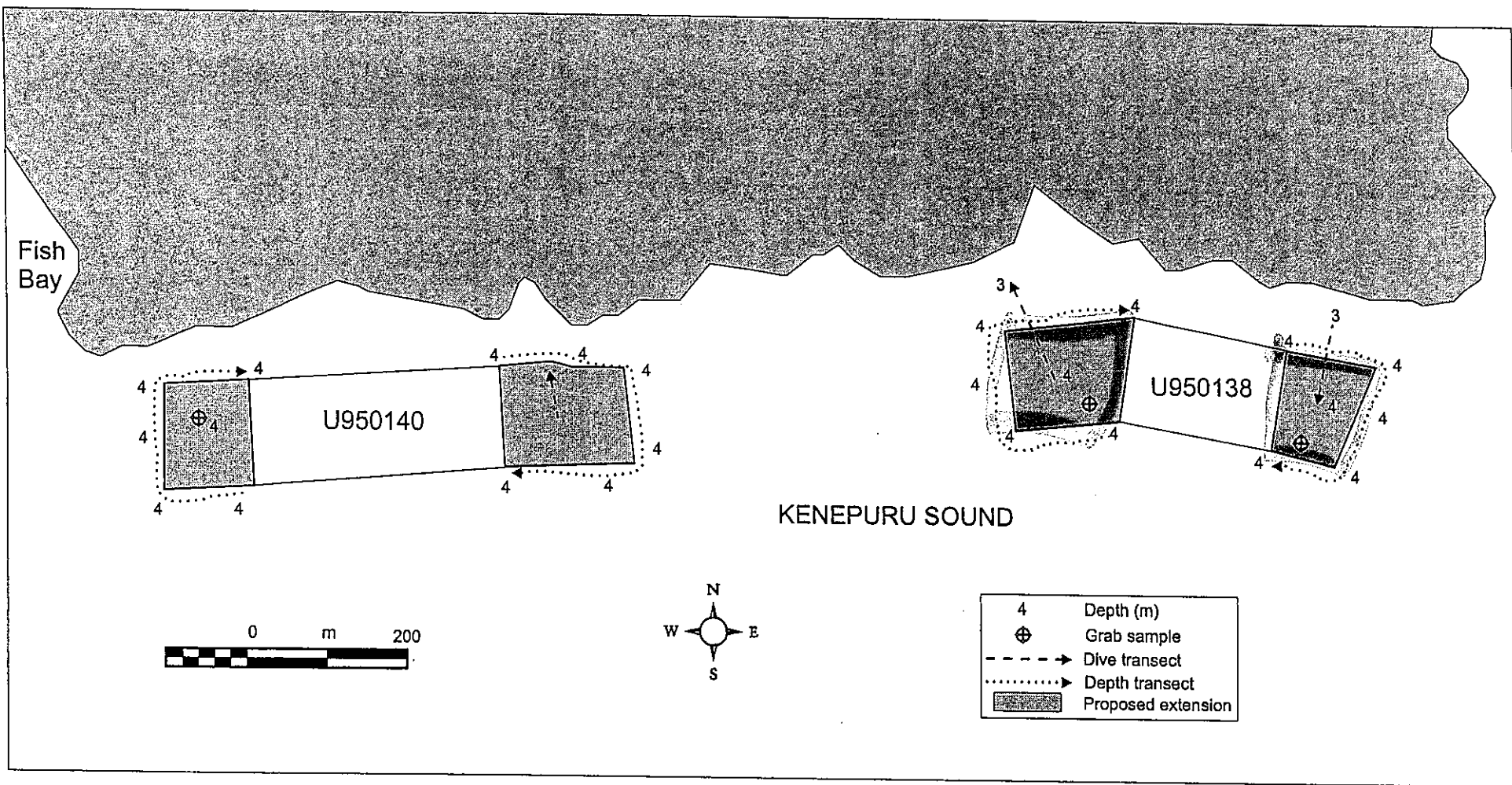


Figure 1 Proposed farm extensions and sampling locations.

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2.3 Depth sounding

Depths at each corner of the proposed extensions were recorded using the vessel's depth sounder. A depth transect running along each boundary of the proposed extensions was made to determine the presence of any bathymetric changes which might indicate seabed features such as reef communities (Figure 1). No such features were noted during soundings. Depths were measured near mid tide (ebb) and have not been adjusted to chart datum.

2.4 SCUBA transect

At U950138, dive transects were performed on the seabed from near the center of each proposed extension to approximately 30 m inshore of the northern boundary (Figure 1). At U950140, a single dive transect was performed from the northern boundary to the center of the western extension. Biota and substrate characteristics observed along each transect were noted.

2.5 Grab samples

A single sediment sample from each extension was collected using a 0.1m² Eckman grab. Texture and colour of samples were noted and grab contents were sieved by gently rinsing the sample through a 0.5mm mesh. After sieving, infaunal samples were preserved in a solution of 4% formalin in sea water, and transported back to Cawthron where they were archived.

3. RESULTS AND DISCUSSION

3.1 Physical features

The proposed extensions to both farms are positioned over a relatively flat area of seabed ranging in depth from approximately 3 to 4m (Figure 2). The substrate is composed of soft mud. A moderate current was moving in an easterly direction across the sites at the time of the surveys. An example of the physical features of the seabed is shown below in Figure 2.

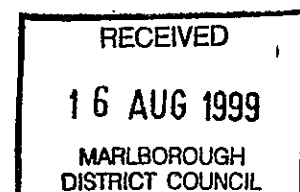
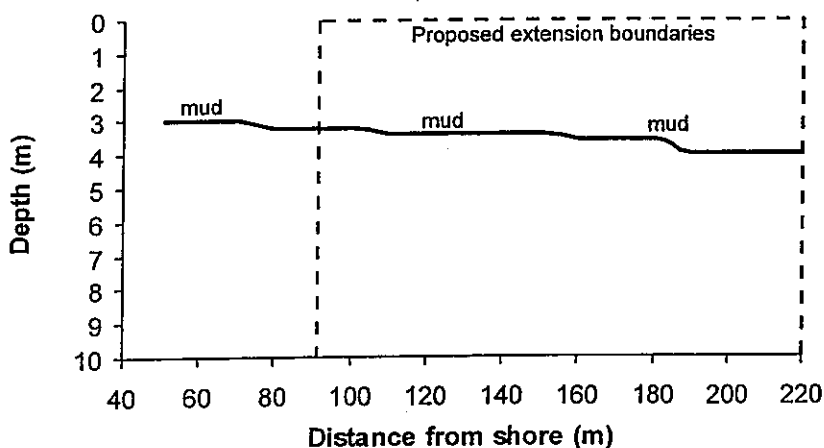


Figure 2 Schematic diagram of shore profile along the dive transect through the western extension at U950138.

3.2 Ecological features

During all the dive transects, no conspicuous biota were observed. Visibility was poor, as expected at these locations. Divers were nevertheless able to observe the characteristics of the seabed. Polychaete worm tubes and holes of unknown origin were the only indication of benthic fauna seen. The only fauna recovered following sieving of all grab samples, was one example of the polychaete worm *Aglaophamus* sp., an unidentified polychaete worm, and five individuals of the non-indigenous bivalve, *Theora lubrica*.

3.3 Features of special ecological interest

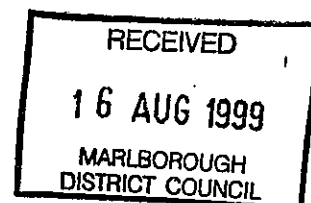
No features of special ecological significance were noted at these sites.

3.4 Fishery resources

No fishery resources were observed at these sites.

3.5 Site suitability

Due to the absence of features of special ecological, conservation, or scientific value, and the absence of fishery resources, the proposed extensions at both U950138 and U950140 are suitable as mussel farming sites.



4. REFERENCES

- Cole, R. & K. Grange 1996: Under the Mussel Farm. Seafood New Zealand, November 1996: 25-26.
- Davidson, R.J. 1998: Preliminary report on ecological issues related to mussel harvesting activities. Prepared by Davidson Environmental Ltd for the Department of Conservation, Wellington. Survey & Monitoring Report No. 158. 23p.
- DOC. 1995: Guideline for ecological investigations of proposed marine farm areas in the Marlborough Sounds. Report Prepared for Marlborough District Council by Department of Conservation, Nelson/Marlborough conservancy. Occasional Publication No. 25. 21p.
- Forrest, B. 1995: Overview of ecological effects from shellfish farms in the Marlborough Sounds: background information for marine farm applications. Cawthron Report No. 282. 18p.
- Forrest, B. 1999: Site assessments for seven proposed mussel farm areas in the Marlborough Sounds. Cawthron report no. 496.
- Gillespie, P.A. 1989: The impact of long-line mussel culture on benthic habitat. Aquatic Resources Group, Cawthron Institute, Nelson. 17p.
- Kaspar, H.F.; Gillespie, P.A.; Boyer, I.C. & A.L MacKenzie. 1985: Effects of mussel aquaculture on the nitrogen cycle and benthic communities in Kenepuru Sound, Marlborough Sounds, New Zealand. *Mar. Biol.* 85: 127-136.
- Morton, J. & M. Miller. 1968: The New Zealand Sea Shore. Collins, London - Auckland. 638p.

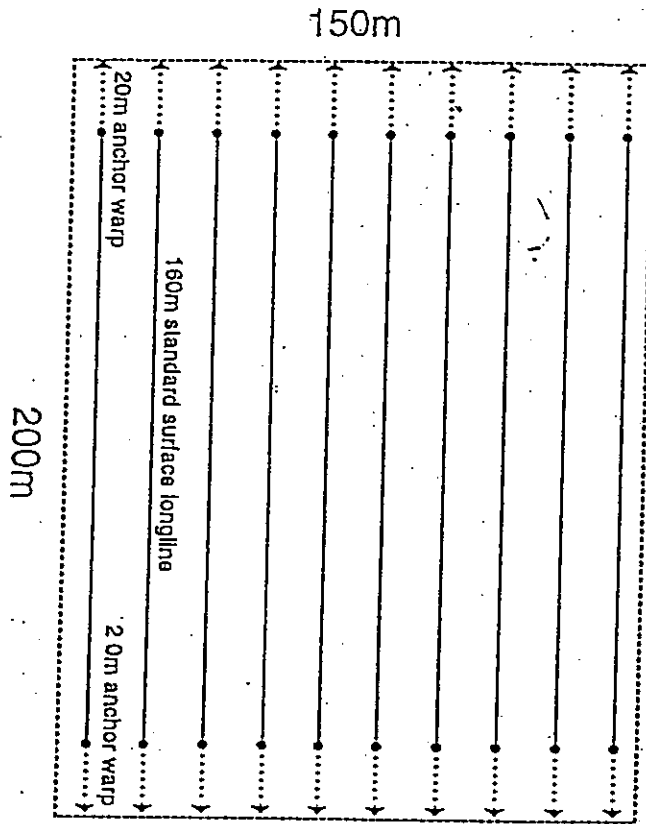
ACKNOWLEDGEMENTS

Thanks to Lincoln McKenzie for assistance in the field and to Paul Barter for assistance with preparation of the maps in this report.



PROPOSED STRUCTURES LAYOUT DIAGRAM

Kenepuru C



Approx Scale 1 : 2000

----- Area Boundary

● End of line start of anchor warp

▼ Anchor

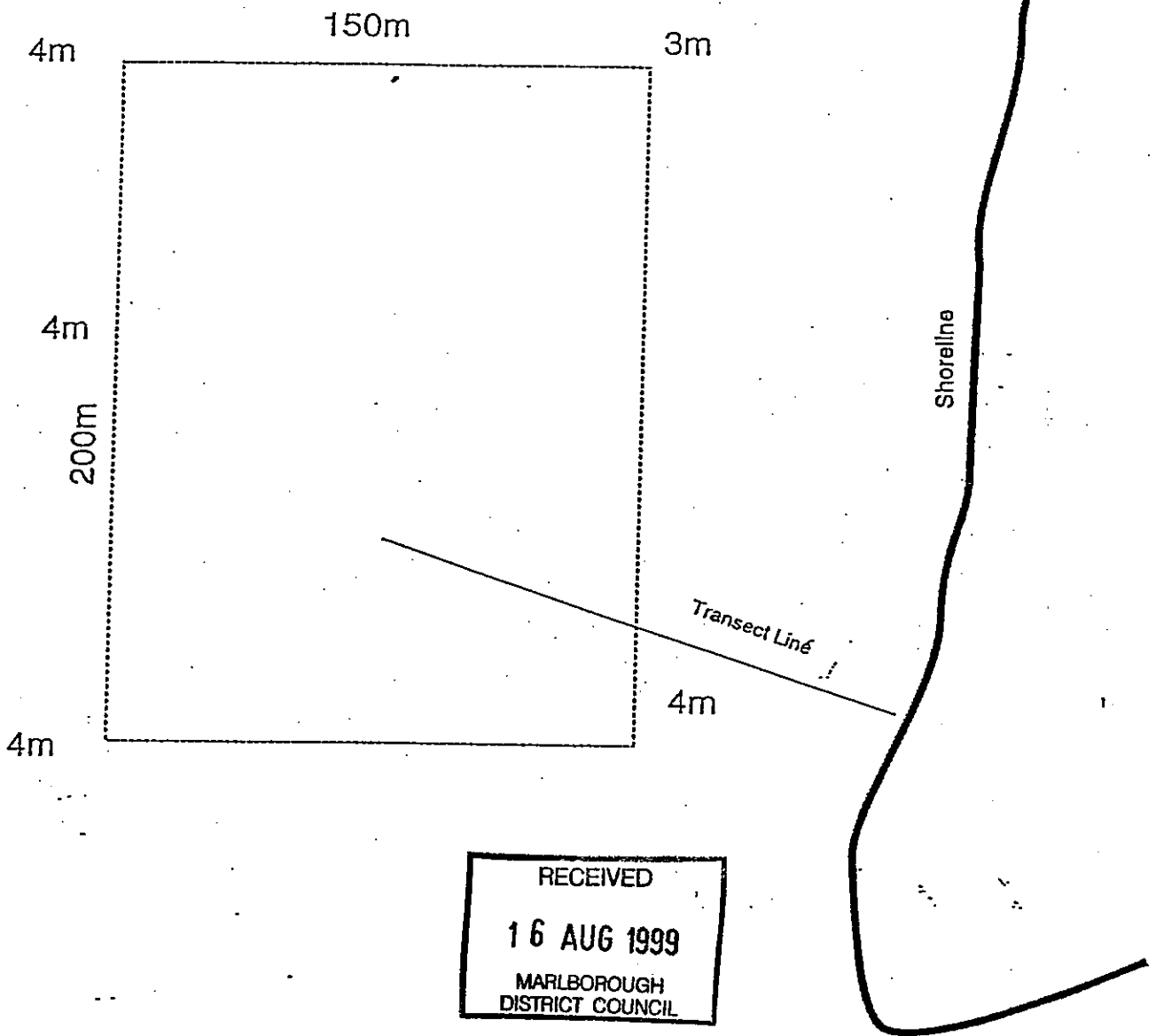
NOTE: (i) All anchors are - Screw

(ii) All anchor warps @ 2 : 1
Ø 24mm

71

Kenspuru C

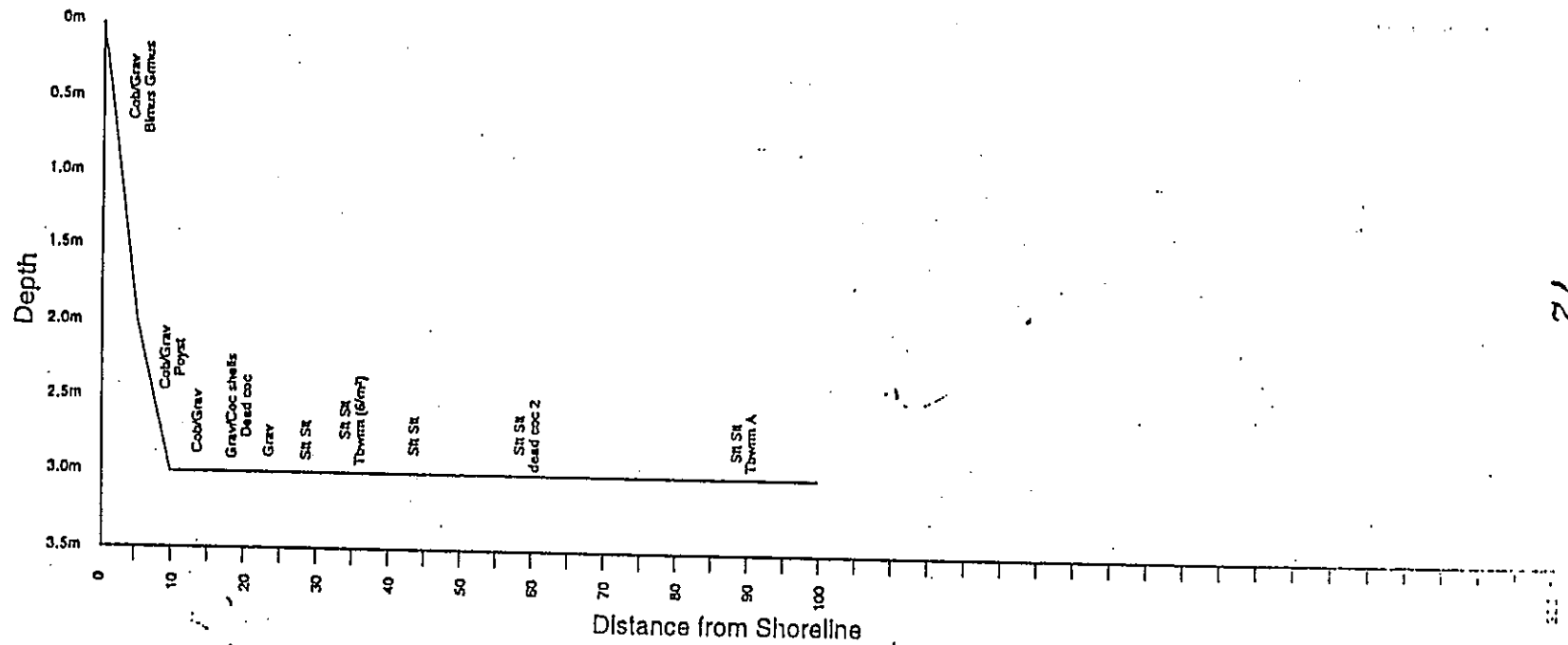
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Kenepuru C



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Date 20/1/95

Time: 6.40pm.

Temp: 18°

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SUB-TIDAL SURVEY

3pp.

Methodology

The boundary of the site was traversed using the Huminbird sonar. As stated in the environmental assessment, the sonar is a precision instrument allowing the operator to determine depth, bottom type, bottom profile and some fish populations. The purpose of this initial appraisal was to identify areas that appeared to be representative of the site in terms of bottom profile and also to identify any areas of reef or other interesting or unusual features. Based on this assessment, assuming there were no interesting or unusual features apparent, a representative area was selected for further investigation.

A 100 metre lead-lined transect line marked at 5 metre intervals was laid out perpendicular to the shore (*see Note 1 below). Two divers then swam the transect using SCUBA, one diver swam directly along the transect not venturing more than one metre either side of the line, recording: depth* (*see Note 2 below), distance from shore, water temperature, substrate type and flora and fauna species present/abundance* (*see Note 3 below). The other diver swam a zig-zag line based around the transect venturing up to 10 metres either side of the line looking for unusual species, communities and significant variation of any sort from the transect.

The surface dwelling biota were identified by their common names and entered on dive profiles. Any species unable to be identified by the divers were collected and preserved and later identified by marine scientist, Mr Rob Davidson.

At the 50 metre transect mark, (the inshore boundary of the farm) the divers swam perpendicular to the transect in both directions to a distance of approximately 50 metres (decided by a pre-determined number of kick cycles). The aim of this was to confirm that the transect was representative of the inshore boundary in terms of substrate type and species present.

* Note 1: At a distance of 100 metres offshore, if there was a noticeable downwards slope, the divers continued the transect using the tape measure to a maximum distance of a further 100 metres or a maximum water depth of 35 metres, whichever came first.

* Note 2: Water depth was checked and verified by US Divers DS3 Pivot Digital Gauge. The DS3 claibrates itself to the ambient atmospheric pressure at the beginning of each dive to give greater precision to the reading.



* Note 3:

Species Abundance

Species counts were carried out at generally five metre intervals along the transect. The species and abundance are recorded on a separate depth profile as follows:

Species counts generally refer to numbers within a one square metre quadrat (refer ** below). Species are identified as rare (A), common (B) or abundant (C) as below:

A:	Rare	1 - 3	present within the square metre
B:	Common	3 - 10	present
C:	Abundant	>10	present

Where instead of a letter, a number is circled, the number indicates the exact number of individuals present per square metre, eg:

Wlk B m2 = Whelks common (3 - 10) in the one metre square quadrat
 Cush (4) m2 = four Cushion Starfish in the one metre square quadrat

** Note: If the "m2" is not present, the species was counted within visual range of the transect, eg:

Tera (2) = two Terakihi seen from the transect;
 Spt C = Abundant spotties (10+) seen from the transect.

QUALITATIVE SURVEY

SPECIES LISTS AND ABBREVIATIONS

Fish

Spt	spotties
Cd	Cod (blue)
Tera	Terakihi
Mki	Moki
LJ	Leatherjacket

Star Fish

Cush	Cushion Starfish
rfx	11 arm Starfish
Brx	Brittle Starfish

Sponges

Tbsp	Tube Sponge
Mspg	Moose Sponge
Fgspg	Finger Sponge

Worms

Wrmmd	Worm mound
Tbwrn	Tube Worm
WH	Worm Holes

Bivalves

Scip	Scallop
Mus	Mussels
Hrs	Horse Mussels
Bikmus	Black Mussels
Glmus	Greenlip Mussels
Bimus	Blue Mussels
Poyst	Pacific Oysters
Coc	Cockles
Dg coc	Dog Cockles

Algae

Fij	Flapjack Algae
Cgrs	Sea Grass
Rd Alg	Sea Weed
Mac	Macrocysts

Others

Cq	Sea Cucumber
Kin	Kina
Lmp	Limpet
Snl	Snail
Wik	Whelk
Anen	Anenomes
HRM	HERMIT CRAB

SUBSTRATE

Sft Slt	soft silt	≥100 ≤ 200mm depth
Slt	silt	≤100mm deep
Sd	sand	Sand. Big cloud
Grav	gravel	pascal pebbles to oddfellows
Cob	cobble	the size of a McCheeseburger plus
Rck	rock	The size of a rugby ball plus
B Rock	big rock	The size of a VW beetle plus

Note: combinations will occur

SUBSTRATE B

FG	Dead shell bed (type of shell e.g. Pp/Coc FG) also a dead shell bed of cockles and pipi.
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