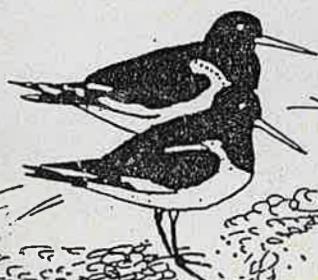




CONSERVATION

Coastal Wetland Inventory

Auckland REGION



Nigel to see
24/10/80 →

ACKNOWLEDGEMENTS

Firstly special thanks must be given to the Environment Auckland Region without whose financial assistance this document could not have been published.

In the course of researching this document many people were consulted, in particular special thanks must be given to Professor J Morton, who provided much information, support and encouragement throughout the early stages of its production. Many other people supplied valuable information by personal communication. Their names have been included in the bibliographies associated with the information sheets.

During the editing stage, sections of the report were sent to various groups and organisations for comment and opinions. Their's was a difficult task which was much appreciated. The following groups made responses and should be commended:

- ✓ Ngati ^aPoa Development Society
- Te Runanga O Ngati Whatua
- Huakina Development Trust
- North Shore Branch, Royal Forest and Bird Protection Society
- Mid North Branch, Royal Forest and Bird Protection Society
- Waitemata Harbour Maritime Planning Authority
- Manukau Harbour Protection Society
- Miranda Naturalist Trust.

Finally special thanks must go to Anne Fenn and Margorie van Roon who did all the hard work but were unable to complete the project.

e

FOREWORD

Vol. 1
Initial work on gathering wetland information began in 1976 with a preliminary inventory of estuarine systems by C L McLay in Proceedings NZ Ecological Society/23. Such preliminary work, plus a recognition of the need for more attention to be given to wetlands led to the Environmental Council in 1983 publishing "Wetlands: A Diminishing Resource". As a result of this initial publication a Task Group was set up to report on the management of wetlands.

The Task Group concluded that estuarine systems/coastal wetlands, needed to be inventorised. To accomplish this a Working Group on wetlands inventory was established in 1984, under the guidance of the Environmental Council. This led directly to the beginnings of two wetland inventory systems, WERI (Wetlands of Ecological and Representative Importance), and the National Wetland Inventory (NWI), the latter being under the auspices of the Acclimatisation Societies.

Both WERI and NWI were motivated by the need for information to assist in wetland protection. WERI's primary aim was to identify wetlands based on their ecological values and classification type where—as habitat, wildlife, and recreational uses are predominant in NWI. The differences reflect basic objectives of the controlling organisations, to identify representative wetlands in WERI, and to provide a data base for management of the local wildlife resource in NWI.

With the dissolution of the Environmental Council, the Nature Conservation Council (NCC) assumed all wetland work. In recognition of the value of coastal wetlands, the NCC established the Mangrove Advisory Committee, and in 1984, they released a discussion document on strategies for the management of New Zealand mangrove forests.

In 1986 the New Zealand Government officially recognised the value of wetlands with the signing of the "New Zealand Wetlands Management Policy". This policy, however, was not the means to implement protection of wetlands but rather a national statement that the New Zealand Government recognised the value of wetlands.

The NCC is presently being dissolved as part of the restructuring of conservation quangos. The Department of Conservation now has the responsibility for wetland protection.

x ?? This document brings together all available information on the coastal wetlands from Miranda/Waikato Heads to the Kaipara Harbour (inclusive) and will form the principle document upon which such protection will stem.

CONTENTS

Acknowledgements

Foreword

Introduction 1

Methodology 3

List of Coastal Wetland Areas 5

Wetland Areas 8

Key to Maps 405

Index 407

LIST OF FIGURES AND MAPS

FIGURE 1	Coastal Wetland Inventory Boundary	2
FIGURE 2	Wetland Inventory Areas	4

MAP NUMBER NUMBER	WETLAND AREA	AREA CODE	PAGE
1	Kaiaua - Miranda	S12/1	14
1	Wharekawa	S12/2	14
2	Orere	S11/3	21
3	Wairoa River	S11/4	26
4	Maraetai	S11/5	31
5	Waikopua Creek Estuary	R11/6	35
No Map	Ponui Island	S11/7	-
6	Te Matuku Bay	S11/8	41
7	Awaawaroa Bay	S11/9	45
8	Putiki Bay	S11/10	49
8	Waiheke West	S11/11	49
9	Waiheke North	S10/12	54
6	Waiheke East	S11/13	57
5	Turanga Creek	R11/14	61
5	Maungamaungaroa Creek	R11/15	61
10	Eastern Beaches	R11/16	68
11	Tamaki Estuary	R11/17	72
11	Wakaaranga Creek	R11/17A	72
11	Pakuranga Creek	R11/17B	72
11	Otara Creek	R11/17C	72
11	Curlew Bay	R11/17D	72
11	Otahuhu Creek	R11/17E	72
11	Panmure Basin	R11/17F	72
11	Omaru Creek	R11/17G	72
11	East Tamaki	R11/17H	72
12	Tamaki Drive	R11/18	98
12	Hobson Bay	R11/19	98
13	Auckland Central Business District	R11/20	107
No Map	Waitemata Harbour	R11/20A	-
13	Cox Creek	R11/21	107
13	Motions Creek	R11/22	107
13	Meola Creek	R11/23	107
14	Oakley Ck, Traherne Is, Pollen Is,	R11/24	126
14	Whau River	R11/25	126

15	Te Atatu Peninsula	R11/26	134
15	Henderson Creek	R11/27	134
15	Limeburners	R11/28	134
16	Upper Waitemata Harbour	R10/29	146
16	Waiarohia Inlet	R11/29A	146
16	Whenuapai	R11/29B	146
16	Brighams Creek	R11/29C	146
16	Rangitopuni	R10/29D	146
16	Paremoremo	R10/29E	146
16	Lucas Creek	R10/29F	146
16	Hellyers Creek	R11/29G	146
13	Kauri Point - Little Shoal Bay	R11/30	172
17	Shoal Bay	R11/31	178
17	Ngataranga	R11/32	178
17	Devonport	R11/33	178
17	Takapuna	R11/34	178
17 + 18	Wairau	R11/35	178&191
18	East Coast Bays	R10/36	191
19	Okura	R10/37	198
20	Weiti	R10/38	202
20	Whangaparaoa	R10/39	202
21	Orewa	R10/40	208
No Map	Inner Hauraki Gulf Islands	R10/41	-
21	Hatfields	R10/42	208
21	Waiwera	R10/43	208
21	Puhoi	R10/44	208
21	Te Muri	R10/45	208
22	Mahurangi Harbour	R09/46	227
22	Snells Beach	R09/47	227
23	Matakana Harbour	R09/48	233
24	Tawharanui	R09/49	237
25	Kawau	R09/50	241
26	Whangateau Harbour	R09/51	246
26	Cape Rodney	R09/52	246
No Map	Tasman Coast Kaipara North	P08/103	-
27 + 28	Wairoa River	P08/104	255&256
No Map	Kaipara Harbour	Q09/104A	-
29	Coates Bay	Q09/105A	264
30	Raepere Creek	Q09/105B	267
31	Kirikiri	Q08/105C	270

31	Whakapirau	Q08/105D	270
31	Hokoraka	Q08/105E	270
32	Otamatea	Q08/105F	277
33	Whakaki	Q09/105G	280
34	Oruawharo	Q09/105H	284
35	Otekawa	Q09/105I	287
35	Waikiri	Q09/106	287
36	Tapora	Q09/107A	294
37	Gum Store Creek	Q09/107B	297
38	Tauhoa/Hoteo	Q09/107C	301
39	Araparera	Q09/107D	305
40	Makarau River	Q10/107E	308
41	Matawhero	Q10/107F	312
42	Kaipara River	Q10/107G	316
43	Waioneke	Q10/107H	319
44	Mairetahi	Q10/107I	322
44	Omokoiti	Q10/107J	322
45	Okaka	Q09/107K	328
46	Waionui Inlet	Q09/107L	332
No Map	Auckland West Coast - Northern Manuakau Head	Q10/108	-
47	Huia Creek	Q10/109	339
47	Cornwallis	Q10/110	339
No Map	Manukau Harbour	R11/110A	-
48	Big Muddy Creek	R11/111	353
48	Little Muddy Creek	R11/112	353
49	Northern Coast Manukau Harbour	R11/113	358
49	Mangere Inlet	R11/114	358
50	Airport	R11/115	368
51	Pukaki/Waokauri	R11/116	372
51	Puhinui Creek	R11/117	372
52	Waimahia Creek	R11/118	378
52	Pahurehure Inlet	R12/119	378
52	Karaka	R12/120	378
53	Clark's Creek/Seagrove	R12/121	389
54	Taihiki River	R12/122	392
55	Waiuku	R12/123	396
56	Awhitu	R12/124	399
47	South Manukau Head	R12/125	402
No Map	Tasman Coast to Waikato River	R12/126	-

INTRODUCTION

Coastal wetlands form the interface between the terrestrial, freshwater and marine ecosystems. Over the period of development and expansion of European colonisation of New Zealand these wetlands have come under increasing pressure as areas for dumping, reclamation and modification. These same areas are now seen as major areas of marine primary productivity. Pressure now is not from developers but from conservation groups for protection of these areas. In order to facilitate protection this comprehensive inventory of coastal wetlands has been formulated.

For the purposes of this report a 'coastal wetland' has been identified as:

"A wetland which is wholly or partially inundated by saline waters and which exhibit, saline tolerant plant and animal associations."

does it mean??

There are a number of wetlands which are located near to the coast, but which are not completely saline. These wetlands generally follow a gradation from freshwater through brackish to saline as they near the coast. Such wetlands have been noted in this inventory.

The Coastal Wetland Inventory covers an area from a line adjoining the north head of the Waikato River and Miranda in the south to Cape Reinga in the north (see Fig. 1). The inventory has been divided into two volumes, approximately corresponding to regional council boundaries. This volume covers an area from Miranda/North Waikato Head then north to encompass the whole of the coastal wetland area of the Kaipara Harbour, i.e. that area occupied by the Auckland Regional Authority plus the remainder of the Kaipara Harbour catchment. (See Fig. 2).

The Coastal Wetland Inventory; lists, codes, classifies, and maps each individual coastal wetland. It covers both biological and physical features of each wetland including information on both human induced and naturally occurring modifications to the wetland.

The inventory records the characteristics of the catchment of each wetland, indicating areas of potential influence and possible future modifications, culminating in management recommendations.

COASTAL WETLAND INVENTORY BOUNDARIES

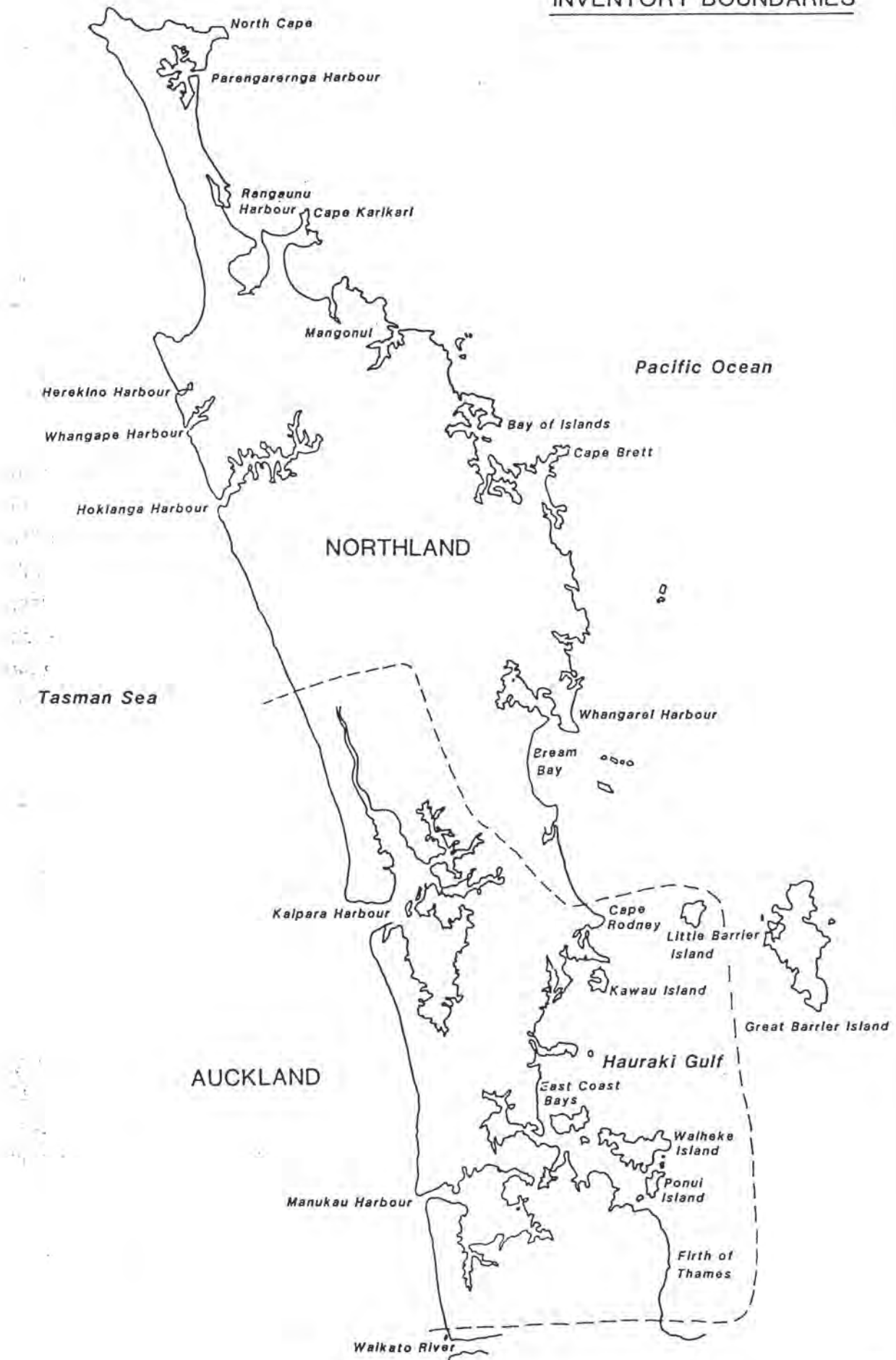


FIG. 1

The inventory has been compiled primarily from previously published and unpublished information, and from interpretation of recent aerial photographs. Liaison and consultation was established with various conservation groups and the tangata whenua to facilitate information gathering.

The aim of this publication is to provide comprehensive information on all existing coastal wetlands within the area from Miranda/Waikato Heads to and including the Kaipara Harbour. Such information will be of use to policy makers, administrators, and technical staff involved directly with the declaration, establishment, management, and protection of coastal wetland areas.

METHODOLOGY

The first requirement of the inventory was to establish a filing system within which gathered information could be stored and retrieved. The health and vulnerability of all wetlands are strongly influenced by activities in catchment areas. For this reason the northern region (as defined) was first divided into 126 coastal areas each with associated catchments. Natural units of the coastline were the basis of area division, e.g. small harbours and sub-estuaries with catchments were first delineated and each coastal strip between adjacent harbours formed other areas. The extent of area included in each unit also depended upon the abundance and complexity of wetlands within the area.

Areas were mapped at 1:50,000 scale on transparency, with the aid of topographical maps and catchment maps. Each catchment area was assigned a code number and name. Data filing sheets for each area were prepared and filed by area code number. Each area number consists of the topographical sheet number (NZMS 260 map series) followed by an area-specific number. Area-specific numbers follow the coastline anticlockwise from Miranda to Cape Reinga to the Waikato River Heads, e.g. R11/24. (See Fig. 2).

Information was extracted from district schemes, regional schemes, maritime planning schemes, harbour studies, Protected Natural Area (PNA) survey results, Department of Conservation faunal and floral survey results, Nature Conservation Council literature, WERI, and various additional sources of literature. All sources are referenced, as part of the inventory.

A map which diagrammatically depicts the localities accompanies the relevant text for each area.

WETLAND INVENTORY AREAS

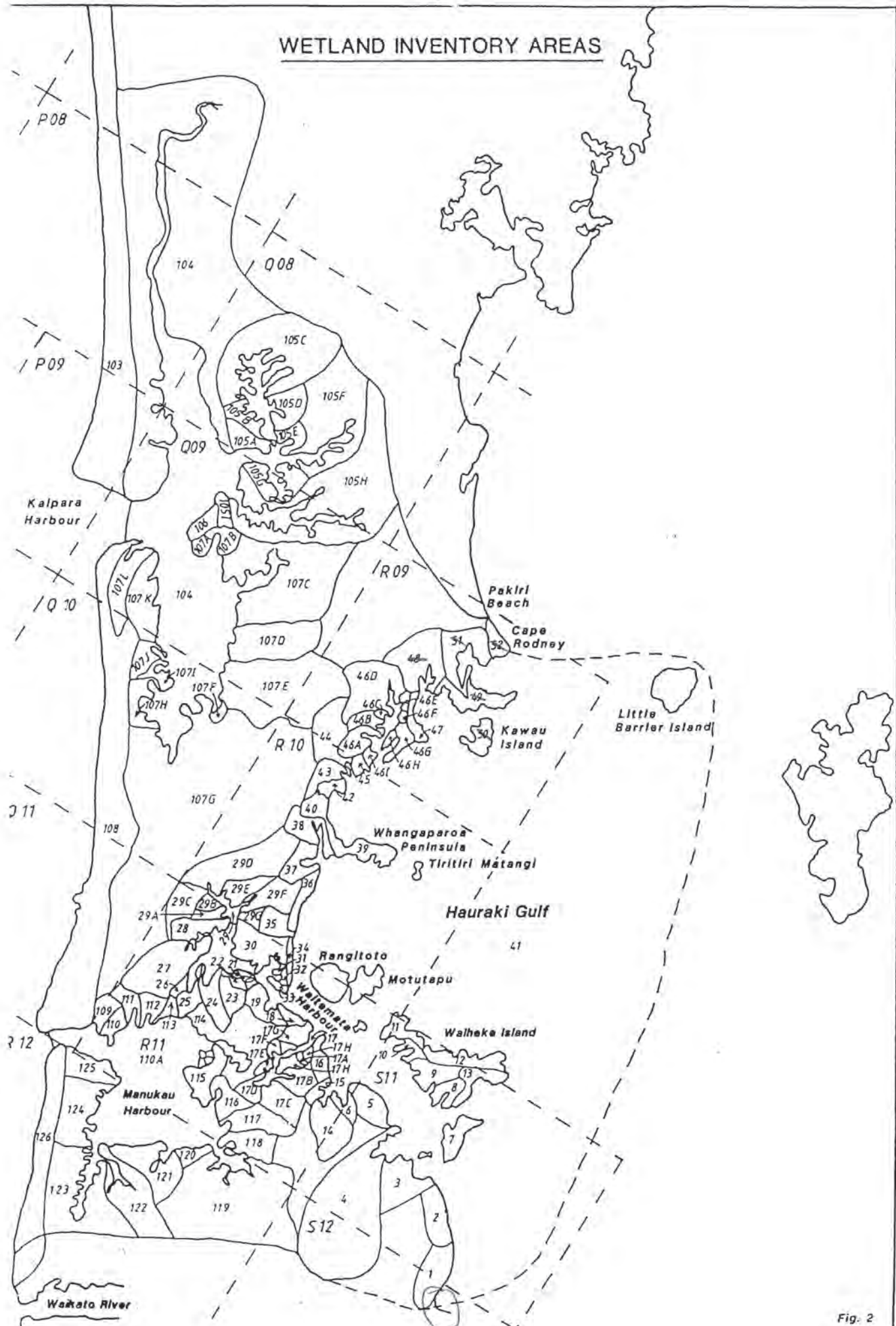


Fig. 2

LIST OF WETLAND AREAS

WETLAND AREA NUMBER	AREA CODE	MAP NUMBER	PAGE
✓ Kaiaua - Miranda	S12/1	1	8
Wharekawa	S12/2	1	15
Orere	S11/3	2	18
✓ Wairoa River (Hunua)	S11/4	3	22
✓ Maraetai (Te Riri)	S11/5	4	27
✓ Waikopua Creek Estuary	R11/6	5	32
Ponui Island	S11/7	No Map	36
✓ Te Matuku Bay	S11/8	6	38
✓ Awaawaroa Bay	S11/9	7	42
✓ Putiki Bay	S11/10	8	46
✓ Waiheke West <i>Tomahua Bay</i>	S11/11	8	50
Waiheke North	S10/12	9	52
✓ Waiheke East <i>Waiheke East</i>	S11/13	6	55
✓ Turanga Creek	R11/14	5	58
✓ Maungamaungaroa Creek	R11/15	5	62
Eastern Beaches	R11/16	10	65
✓ Tamaki Estuary	R11/17	11	69
✓ Wakaaranga Creek	R11/17A	11	73
Pakuranga Creek	R11/17B	11	76
Otara Creek	R11/17C	11	79
✓ Curlew Bay	R11/17D	11	81
Otahuhu Creek	R11/17E	11	84
Panmure Basin	R11/17F	11	87
✓ Omaru Creek <i>Tamaki Estuary</i>	R11/17G	11	90
East Tamaki	R11/17H	11	93
Tamaki Drive	R11/18	12	95
✓ Hobson Bay	R11/19	12	99
Auckland Central Business District	R11/20	13	104
Waitemata Harbour <i>Waiheke</i>	R11/20A	No Map	108
Cox Creek	R11/21	13	113 X
✓ Motions Creek	R11/22	13	116 X
✓ Meola Creek	R11/23	13	118 X
✓ Oakley Ck, Traherne Is, Pollen Is,	R11/24	14	121
✓ Whau River	R11/25	14	127

✓ Te Atatu Peninsula	R11/26	15	131✓
✓ Henderson Creek	R11/27	15	135✓
✓ Limeburners	R11/28	15	138✓
Upper Waitemata Harbour	R10/29	16	141
✓ Waiarohia Inlet	R11/29A	16	147✓
✓ Whenuapai	R11/29B	16	150✓
✓ Brighams Creek	R11/29C	16	153✓
✓ Rangitopuni	R10/29D	16	156✓
✓ Paremoremo	R10/29E	16	159✓
✓ Lucas Creek	R10/29F	16	162✓
✓ Hellyers Creek	R11/29G	16	162✓
✓ Kauri Point - Little Shoal Bay	R11/30	13	168
✓ Shoal Bay	R11/31	17	173
✓ Ngataranga	R11/32	17	179
Devonport	R11/33	17	182
Takapuna	R11/34	17	185
Wairau	R11/35	17 + 18	188
East Coast Bays	R10/36	18	192
✓ Okura	R10/37	19	194
✓ Weiti	R10/38	20	199
Whangaparaoa	R10/39	20	203
✓ Orewa	R10/40	21	205
Inner Hauraki Gulf Islands	R10/41	No Map	209
✓ Hatfields	R10/42	21	212
✓ Waiwera	R10/43	21	215
✓ Puhoi	R10/44	21	218
✓ Te Muri	R10/45	21	221
✓ Mahurangi Harbour	R09/46	22	223
Snells Beach	R09/47	22	228
✓ Matakana Harbour	R09/48	23	230
Tawharanui	R09/49	24	234
Kawau	R09/50	25	238
✓ Whangateau Harbour	R09/51	26	242
Cape Rodney	R09/52	26	247
Tasman Coast Kaipara North	P08/103	No Map	249
✓ Wairoa River (Dargaville)	P08/104	27 + 28	251
✓ Kaipara Harbour	Q09/104A	No Map	257
Coates Bay	Q09/105A	29	261
✓ Raepere Creek	Q09/105B	30	265
✓ Kirikiri	Q08/105C	31	268

✓ Whakapirau	Q08/105D	31	271
Hokoraka	Q08/105E	31	273
✓ Otamatea	Q08/105F	32	275
✓ Whakaki	Q09/105G	33	278
✓ Oruawharo	Q09/105H	34	281
✓ Otekawa	Q09/105I	35	285
✓ Waikiri	Q09/106	35	288
✓ Tapora	Q09/107A	36	291
✓ Gum Store Creek	Q09/107B	37	295
✓ Tauhoa/Hoteo	Q09/107C	38	298
* ✓ Araparera	Q09/107D	39	302
✓ Makarau River	Q10/107E	40	306
✓ Matawhero	Q10/107F	41	309
✓ Kaipara River	Q10/107G	42	313
✓ Waioneke	Q10/107H	43	317
Mairetahi	Q10/107I	44	320
Omokoiti	Q10/107J	44	323
Okaka	Q09/107K	45	326
* ✓ Waionui Inlet	Q09/107L	46	329
✓ Auckland West Coast - Northern	Q10/108	No Map	333
✓ Manukau Head			
Huia Creek	Q10/109	47	336
Cornwallis	Q10/110	47	340
✓ Manukau Harbour	R11/110A	No Map	342
✓ Big Muddy Creek	R11/111	48	350
✓ Little Muddy Creek	R11/112	48	354
Northern Coast Manukau Harbour	R11/113	49	356
Mangere Inlet	R11/114	49	359
* Airport	R11/115	50	364
✓ Pukaki/Waokauri	R11/116	51	369
✓ Puhinui Creek	R11/117	51	373
✓ Waimahia Creek	R11/118	52	376
* ✓ Pahurehure Inlet	R12/119	52	379
✓ Karaka	R12/120	52	383
✓ Clark's Creek/Seagrove	R12/121	53	386
✓ Taihiki River	R12/122	54	390
✓ Waiuku	R12/123	55	393
✓ Awhitu	R12/124	56	397
South Manukau Head	R12/125	47	400
✓ Tasman Coast to Waikato River	R12/126	No Map	403

1. NAME Kaiaua-Miranda
2. AREA CODE S12/1 Map 1
3. MAP REFERENCE NZMS 260 S12 160 440 to S12 145 520
4. LOCATION DESCRIPTION Southwestern coast of Firth of Thames.
5. TYPE OF WETLAND Mangrove, Saltmarsh, Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
 Miranda (throughout intertidal on saline muds)
Gracilaria secundata algae (present 1972)
Avicennia marina var resinifera (spreading)
Sarcocornia quinqueflora, glasswort
Atriplex novae zelandiae, goose-foot
Suaeda maritima
Spergularia media
Samolus repens, small-leaved pimpernel
Selliera radicans
Plantago coronopus, crows-foot plantain
Cotula coronopifolia, bachelor button
Triglochin striatum
Mimulus repens, saltmarsh musk - at low damp levels on the shore.

 Miranda: (on shell)
Atriplex - at lower edges
Echium plantageneum, Viper's bugloss
Geranium robertianum, herb-robert above high tide

 Miranda: (on higher earth banks)
Erodium cicutarium
Geranium molle
Malva neglecta
Modiola caroliniana, creeping mallow
Anagallis arvensis, scarlet pimpernel

 Miranda: (at roadside)
Verbena officianallis
Portulaca oleracea

 Miranda: (in more tidal ground)
 Sedges
Leptocarpus simplex
Baumea juncea
Juncus maritimus var. australiense
Stipa teretifolia
Plagianthus divaricatus

 Taramaire: (S12 155 470)
Avicennia marina var. resinifera mangrove along main channels (1988)
Zostera sp. eelgrass beds present throughout intertidal (1972)
Gracilaria secundata algae throughout intertidal (1972)

(Ref 9)

Kaiaua: (S12 145 520)

Avicennia marina var resinifera - mangroves along main channels numerous and up to 4 metres high. Other wetland species dominate away from channels (Ref 6)

Zostera sp. lower intertidal (Ref 2)

Gracilaria secundata algae lower intertidal (Ref 2)

Vegetation sample taken during PNA Survey 1988. This may be representative of Kaiaua Estuary

Area covered

<u>Plagianthus divaricatus</u>	25-50%
<u>Leptocarpus simplex</u>	25-50%
<u>Sarcocornia quinqueflora</u>	15-25%
<u>Avicennia marina</u> var <u>resinifera</u>	1-5%
<u>Juncus maritimus</u>	1-5%
<u>Baumea juncea</u>	1-5%
<u>Selliera radicans</u>	)
	) Specimens present
<u>Samolus repens</u>	)

8. WILDLIFE VALUES

The Kaiaua-Miranda coast is one of the three areas in the Auckland region which is of national and international ornithological significance, attracting tens of thousands of birds each year from the South Island and from the Arctic and sub-Arctic regions. The reader is referred to Bacon 1973 for a detailed ornithological description. The extensiveness of the wetlands increases habitat value. Species occurring include the following:

! rare
* endangered
threatened (Ref 12)
(bm) breeding/Miranda
(bt) breed/Taramaire

long-billed curlew	curlew sandpiper !	red-necked stint !
pectoral sandpiper	bairds sandpiper	large sand dotterel
Terek sandpiper	sharp-tailed sandpiper !	broad-billed sandpiper
black stilt #	golden plover !	grey plover!
grey warbler	fantail	marsh sandpiper
least sandpiper	asiatic whimbrel !	american whimbrel!
blue penguin	white-faced heron	reef heron #
white heron #	cattle egret	black shag
little black shag	Little shag	pied shag
paradise shelduck	grey duck	grey teal
mallard	bittern #	banded rail # (bm)
arctic tern	white-winged black tern	kingfisher
little tern	caspian tern #	white-fronted tern (bt)
black-billed gull (bm)	red-billed gull	southern black-backed gull (bm)
arctic skua	pied stilt	bar-tailed godwit
black-tailed godwit	variable oystercatcher #	knot
wrybill #	NZ dotterel # (bm)	banded dotterel # (bm)
turnstone	south island pied oystercatcher	

(Refs 2, 8 and 5)

Although the marine feeding areas for this large bird population (probably exceeding 30,000) stretches over the Firth's mudflats, the shellbanks north of Miranda provide the only large roosting area in the Firth (Ref 2).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Firth of Thames is a valuable regional and national fishery resource. Its comparatively shallow waters and tidal flats, with bottom sediments rich in benthic marine life, are important feeding and nursery areas for flounder, and rich feeding areas for snapper and gurnard.

10. STABILITY OF WETLAND Losses of saltmarsh by farm draining. Loss of mangrove to Kaiaua refuse tip. Natural reclamations by mangroves and subsequent reformation of offshore shellbanks.

Illegal reclamation by and for the Kaiaua Boat Club (1987-88) (Ref 11)

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Predominantly Crown.

Management agencies: Department of Conservation

	Name
Catchment authority	Hauraki Catchment Commission
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	Part QEII National Trust Covenant

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Bird watching, duck shooting, fishing, shellfishing, boating, picnicking.

14. WETLAND MODIFICATIONS PROPOSED

Threats:

- (1) Increased recreational use of the coastline and coastal waters is likely to cause birds to move away (e.g. close to Kaiaua).
- (2) Mining or dredging activities in the area, could have the same effect, and may partly destroy the birds' habitat (both in the Firth, and in nearby land areas).
- (3) Draining of adjacent swamp lands may destroy the habitats or feeding areas of some species.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

- (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Swing moorings for small boats at Kaiaua.

Waste disposal: Septic tanks only at Kaiaua.

Refuse land fill: Refuse tip south of Kaiaua. Dumping of inorganic rubbish along road margins.

Recreation: Bird watching, net fishing, small boats. Recreational pressure from South Auckland urban area.

Fishing: Flounder netting. Recreational and commercial.

Sand extraction: No

Mining and dredging: An application was made in 1980 by a large overseas mining company for a mining exploration licence covering the whole of the Firth up to MHWM. Although this application was subsequently withdrawn it illustrates an interest in off-shore mining in the area.

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No current problems.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|----|-------------|------------|
| in: | forest | 10 | residential | bare earth |
| | pasture | 90 | industrial | |

Other land use likely to affect wetland: cattle grazing in wetland fringe.

Reserves present:

- (1) Department of Conservation Taramaire Wildlife Management Reserve. Approximately eight hectares north and south of Taramaire Stream mouth is a wildlife management reserve. This reserve should be extended to include the shell banks and intertidal area to low water mark. At the request of the previous Department of Internal Affairs much of the land between the road and the coast from Kaiaua to Miranda has been designated as a proposed coastal reserve.
- (2) Miranda Naturalists Trust have leasehold use of road to coastline block north of Miranda estuary. Lease from A Lane.

Land use changes anticipated up to year 2000:

- (1) Little change expected.
- (2) Proposal for a marine park or reserve under revised Marine Reserves Act. Ministry of Agriculture & Fisheries 1985 (ref. 10).

District scheme - zoning provisions:

Franklin district scheme (1985) recognises the wildlife value of this coast and aims to protect it from incompatible uses. Pastoral farming is considered compatible.

Catchment Rural 1 zoning to encourage food production. Coastal fringe Rural 2 - to recognise conservation needs of this coast while still allowing farming as a predominant use.

Controls other than District scheme likely to influence future land use:

The Auckland Regional Authority will support the Miranda Naturalist Trust and other concerned organisations in the extension of the wildlife reserve along the coast from Miranda to Kaiaua.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Coastal plain with erosion prone Hunua Ranges rising behind.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

- (1) Fauna and Flora Survey DOC 1988 recommends:

Allow no residential growth between Kaiaua and Miranda. Purchase land between road and shore for wildlife management. Appoint permanent caretaker.

- (2) Proposed Auckland Regional Planning Scheme (1987) recommends:

Further development in the area should be provided for only at existing settlements, and in such a way that the natural landscape features of each locality are preserved and remain dominant. Mining, or other forms of exploitation of coastal land flats, tidal flats, shell banks, swamps and mangrove areas along the coast from Kaiaua to Miranda should not be permitted if such are likely to result in destruction or disturbance of important birdlife habitats.

- (3) Bring the remaining privately owned land between road and shore from Kaiaua to Miranda into Crown ownership for wildlife management purposes.

This area is of such ornithological importance that it deserves wildlife reserve status and protection.

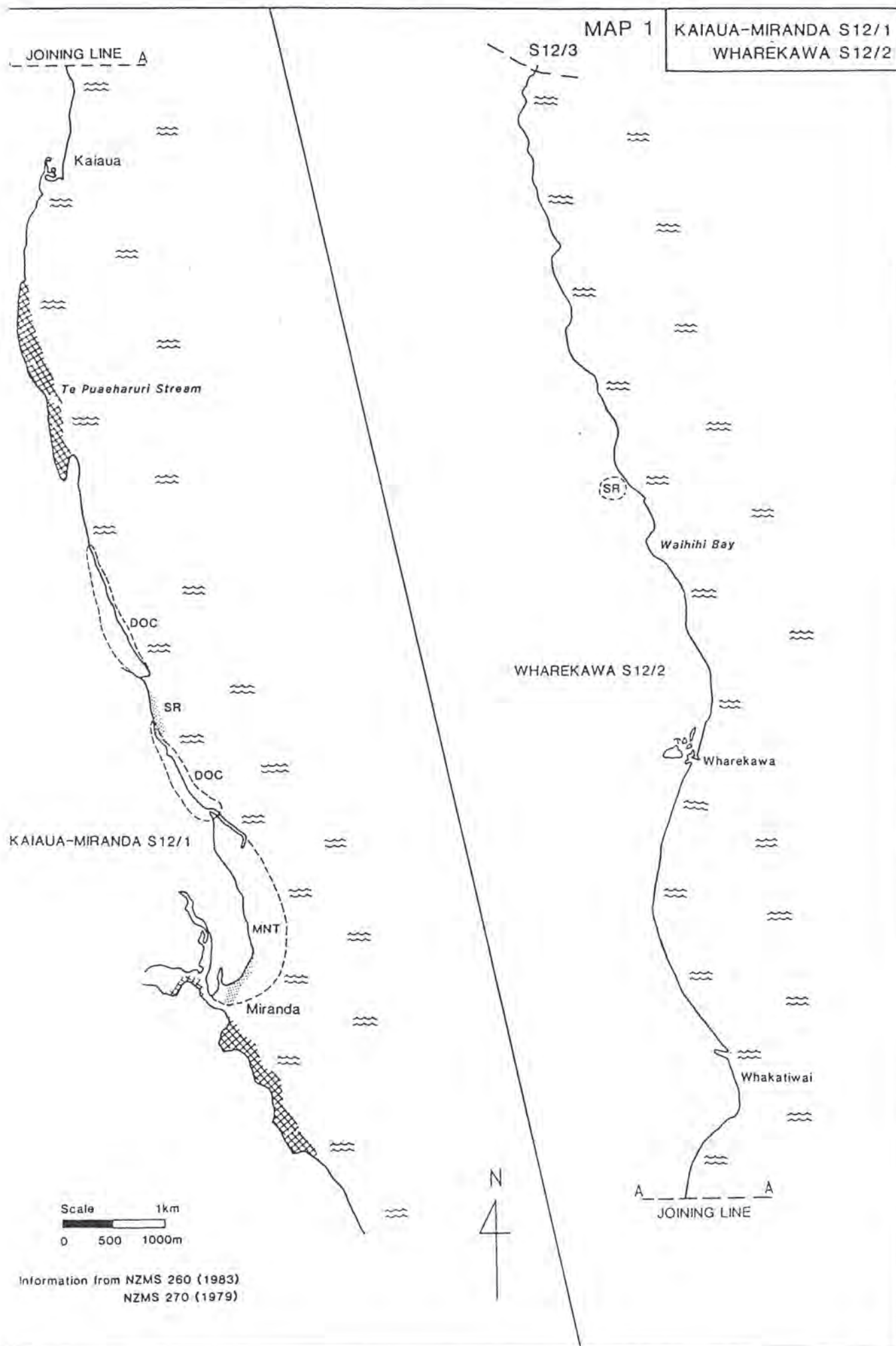
19. RELEVANT REFERENCES:

- (1) Bacon M.R. (1972) Coastal Resource Area; Kawakawa Bay to Miranda; Printed and published by the Auckland Regional Authority.
- (2) Bacon M.R. (1973) Ecology of A Coastal Resource Area: Kawakawa Bay to Miranda. Printed and published by the Auckland Regional Authority.
- (3) Ornithological Society Census data for wildlife.
- (4) Franklin County Council District Scheme (1985).
- (5) Auckland Regional Authority (1987) Proposed Regional Planning Scheme.
- (6) Department of Conservation (1988) Protected Natural Area Survey; Hunua Ecological District; Unpublished.
- (7) Ogle C.C. (1982). A botanical inventory of the Miranda area. Prepared at the request of Miranda Naturalists Trust.

- (8) Department of Conservation Faunal Survey. Unpublished.
- (9) Morton J E (1981) The Shore and Saltmarsh Plants of Miranda; Miranda Nature Notes No. 1. Produced for the Miranda Naturalists Trust.
- (10) Ministry of Agriculture and Fisheries, Auckland (1985); Auckland Region Marine Reserves Plan.
- (11) Department of Conservation Northern Region (1988) internal files.
- (12) Bell B (1986) The Conservation Status of New Zealand Wildlife. New Zealand Wildlife Service Occasional Publication No. 12.

MAP 1

KAIAUA-MIRANDA S12/1
WHAREKAWA S12/2



1. NAME Wharekawa
2. AREA CODE S12/2 Map 1
3. MAP REFERENCE NZMS 260 S12 145 520 to S11
4. LOCATION DESCRIPTION Western Firth of Thames coast
5. TYPE OF WETLAND None: Wharekawa gravel pit ponds, (S12 145 575); freshwater ponds with marine influence.
6. AREA OCCUPIED BY WETLAND (ha) 23
7. DOMINANT WETLAND VEGETATION/ASSOCIATION At gravel pits, raupo, rush, sedges, water lilies found where salinity is low.
8. WILDLIFE VALUES Limited waterfowl usage; roosting area of little shag. Mullet present in one pond.

Dominant species Caspian tern, australasian harrier

Rare species/endangered species NZ dabchick
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Unique coastal landforms in this area.
10. STABILITY OF WETLAND There have been changes in wetland vegetation since 1970.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Private.
Management agencies:

	Name
Catchment authority	Hauraki Catchment Commission
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Wharekawa gravel pit ponds form an important coarse fishery, fossicking, recreational fishing.
14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Septic tanks

Refuse land fill: No

Recreation: General coastal water activities

Fishing: In firth

Sand extraction: Closed gravel extraction site

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No problems.16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha):(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	50%	residential	-	bare earth
	pasture	50%	industrial		

Other land use likely to affect wetland:

Reserves present: - Two regional reserves at Waharau and Whakatiwai.
Water conservation reserves in Hunuas at headwaters of catchment.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Predominantly Rural 2 zoning in Franklin district scheme. Farming is the main activity but conservation needs are also recognised.

Controls other than District scheme likely to influence future land use:

(c) Description of topography (soil type, slope, erosion susceptibility):
Flat coastal strip, hills behind.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Landscape protection of coastal zone.

19. RELEVANT REFERENCES:

- (1) Department of Conservation faunal survey unpublished.
- (2) Bacon M (1972) Recreation Resource Area Kawakawa Bay to Miranda. Printed and published by the Auckland Regional Authority.
- (3) Bacon M (1973) The Ecology of a Recreation Resource Area Kawakawa Bay to Miranda. Printed and published by the Auckland Regional Authority. Reprinted by the Auckland Education Board.

1. NAME Orere
2. AREA CODE S11/3 Map 2
3. MAP REFERENCE NZMS 260 S11 142 633 to S11 013 727
4. LOCATION DESCRIPTION North west coast of Firth of Thames
5. TYPE OF WETLAND Saltmarsh, eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Small amounts of saltmarsh and eelgrass at Kawakawa Bay.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
At Kawakawa Bay

Zostera sp. (Refs 1 and 4)

Cotula coronopifolia
Selliera radicans
Samolus repens
Triglochin striatum
Plantago coronopus (Ref. 2)
8. WILDLIFE VALUES The wildlife value of Kawakawa Bay has been reduced by residential development of the foreshore. Banded rails no longer occur here.

Dominant species

Kawakawa Bay: South Island pied oystercatcher, godwit, white-fronted tern, black-backed gull, red-billed gull, pied stilt, caspian tern, variable oystercatcher, white-faced heron, little shag, reef heron, cattle egret, black-billed gull, wandering tattler, curlew, golden plover, spotted shag, knots.

Rare species/endangered species NZ dotterel (Ref. 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
Management agencies: Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	NIL
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

No

13. USE OF WETLAND BY MAN Kawakawa Bay: fossicking, shell fishing.

14. WETLAND MODIFICATIONS PROPOSED None.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Boating club on headland near Kawakawa Bay.
Jetty and boatramp.

Waste disposal: Septic tanks - Kawakawa Bay.

Refuse land fill: No

Recreation: Swimming/fossicking

Fishing: Yes

Sand extraction: Kawakawa Bay is the major point in the western Firth of Thames Sand Production Group and may therefore be open to future commercial extraction (Ref. 3).

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No present problems.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): No information.

(b) Land use of catchment: Approximate percentage of total catchment
 in: forest 50 residential bare earth
 pasture 50 industrial /

Other land use likely to affect wetland: Headlands frequently quarried.

Reserves present: Te Morehu Scenic Reserve. Part of catchment in Auckland Regional Water Board water catchment reserve.

Manukau City Council recreational reserve on Te Iwira Hirahi Pt.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Catchment in Rural 1 & 2 zones. Residential zoning within confines of existing residential area with infilling permissible.

Controls other than District scheme likely to influence future land use: Proposed Auckland Regional Planning Scheme (1987) policy for this area: "Pressure for development should be restricted to the general boundaries of existing developments".

(c) Description of topography (soil type, slope, erosion susceptibility):
 Erosion prone hills.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Prevent access of dogs, horses and any vehicle access onto beach.

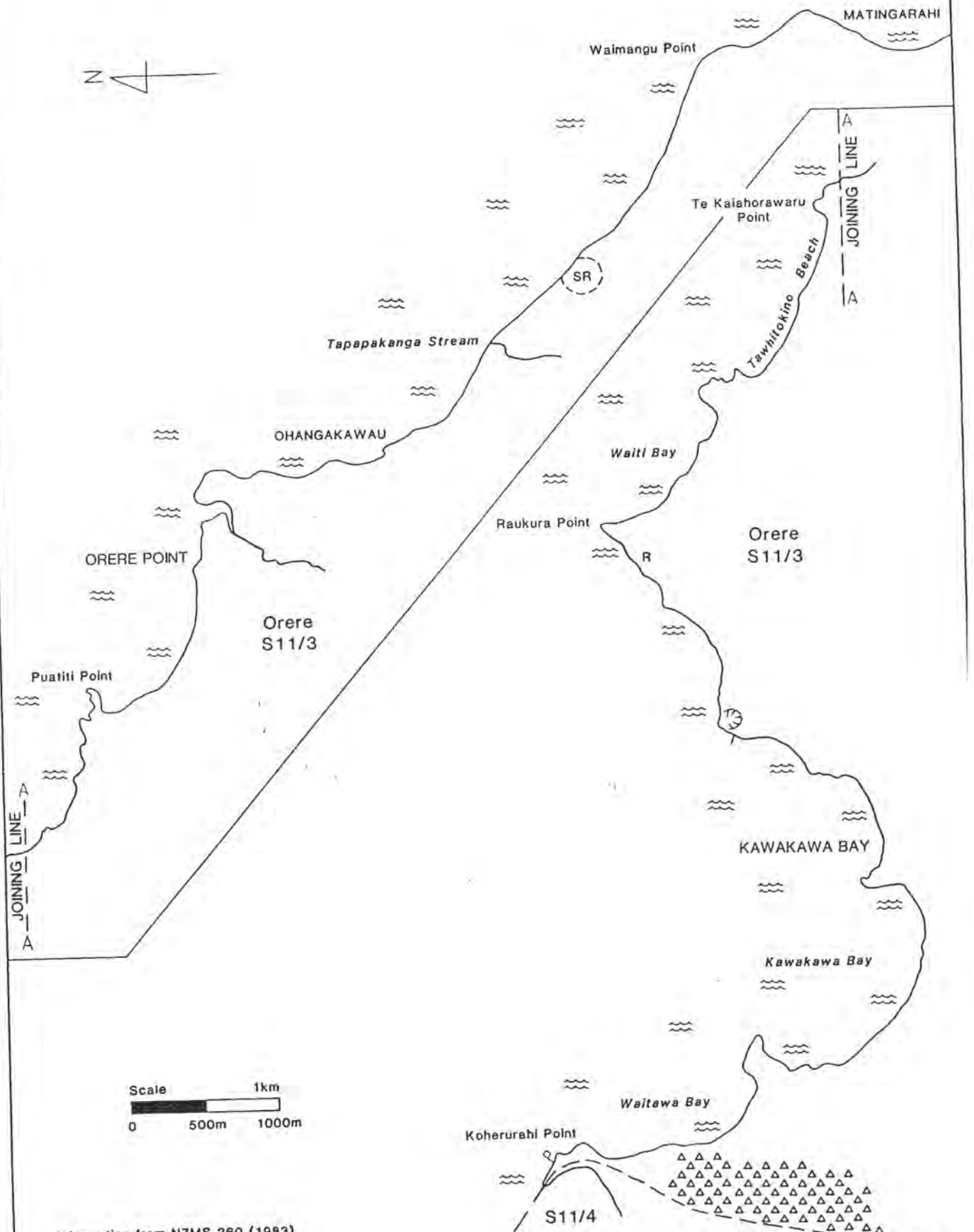
19. RELEVANT REFERENCES:

- (1) Bacon M. Auckland Regional Authority (1972-73) Coastal Resource Area, Kawakawa Bay to Miranda. Also companion volume on Ecology. Printed/published by Auckland Regional Authority.
- (2) Department of Conservation Faunal Survey unpublished.
- (3) Applied Geology Associates (1982) Coastal Sand and Shingle Resources of Auckland and Northland.
- (4) Armiger, L C (1965) A Contribution to the Autecology of Zostera. Unpublished. M.Sc Thesis Auck University.
- (5) Manukau City Council District Scheme (1984).
- (6) Auckland Regional Authority (1987) Proposed Regional Planning Scheme. Printed by the ARA.

MAP 2

ORERE
S11/3

S11/2



Information from NZMS 260 (1983)
 NZMS 270 (1978)
 Aerial photographs (1987)

1. NAME Wairoa River
2. AREA CODE S11/4 Map 3
3. MAP REFERENCE NZMS 260 S11 013 727 to S11 974 757
4. LOCATION DESCRIPTION Mainland coast south of Waiheke Island. Large estuarine ecosystem consisting of four parts - Duders Estuary (S11 955 740), Wairoa River mouth (S11 960 710), Kauri Bay (S11 985 705), Wairoa Bay (S11 000 714).
5. TYPE OF WETLAND Mangrove, Saltmarsh, Eelgrass, Spartina (unconfirmed)
6. AREA OCCUPIED BY WETLAND (ha) 80 ha mangroves, 85 ha other intertidal wetland.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Wairoa Bay: Saltmarsh of good diversity and quality (Ref. 4) - Sarcocornia quinqueflora, Juncus maritimus, Plagianthus divaricatus, Samolus repens.

Wairoa River mouth: Avicennia marina var. resinifera (Ref. 4), Typha orientalis, Scirpus sp., Sarcocornia quinqueflora.

Kauri Bay (Pukurau Bay): Avicennia marina (low-lying, stunted, prostrate), 18 hectares saltmarsh, 8.5 hectares Juncus maritimus, Zostera sp.

Duders estuary: Sarcocornia quinqueflora, Juncus maritimus.

Any special features: This is a very valuable, little modified, ecosystem. Wairoa River: In the main channel, mangrove cover forms a dense belt along either side, petering out in the upper channel. Towards the open coast, mangrove cover becomes more sparse and the plants themselves are much lower in height (0.5 m), being over a wide area behind the shellbanks (Ref. 4)

8. WILDLIFE VALUES

Dominant species White-faced heron, spur-winged plover, caspian tern, white-fronted tern, mallard duck, grey duck, red-billed gull, little shag, spotted shag, reef heron, black swan, fairy tern, white heron (Ref. 1). Intertidal benthic species include Helice crassa, Macrophthalmus hirtipes, Mactra lubrica, Austrovenus stutchburyi, Boccardia polybranchia, Nicon aestuariensis, Pectinaria australis, Pereneieisi spp (Ref. 2).

Rare species/endangered species Habitat for: dabchick, fernbird, bittern, banded rail. Breeding for: NZ dotteral (Kauri Bay, Duders estuary) (Ref.1).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The notable areas of wildlife habitat, both of which have a high ecological value, are the extensive maritime/mangrove habitats on the western side of the estuary mouth and the eastern habitats between Poutu Point and Kahura Point. The intertidal habitats adjacent to these areas also have a high ecological value. NZ dotterel have been recorded as breeding on shellbanks in Kauri Bay (NZ dotterel is rated as a threatened species because of coastal development and disturbance of nesting habitat). The western mangrove/saltmarsh habitat and adjoining shellbanks are a notable roosting area for wading birds. Mangrove/maritime fringe area adjacent to intertidal sandflats on west of estuary mouth: breeding wading birds non-existent. White-faced heron use these area for feeding (Ref. 4).

10. STABILITY OF WETLAND In 1960 there were over 250 hectares of mangroves in the Duders to Kawakawa area. Some 130 hectares were reclaimed for farming between 1960 and 1980 (Ref. 8). A small stopbank indicates attempts at reclamation (Ref. 4). Stability is impaired by erosion of wetland banks possibly from boat-wakes (Ref. 4).

A large illegal reclamation reported to Department of Conservation in May 1988. Unauthorised reclamation adjacent to the Sanctuary Cove marina site (Ref. 9).

According to local residents, the vast areas of silt and mud at the mouth of the estuary are a recent phenomena (Ref. 4). Mangroves opposite Poutu Point are dying (due to reclamation work).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Recreational activities, shellfish gathering, picnicking.

14. WETLAND MODIFICATIONS PROPOSED Continued pressure for boat facilities.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Swing moorings for pleasure craft present.

Proposals: 1) Applications for further mooring piles in Wairoa River (Ref. 9).

2) Proposed Sanctuary Cove marina (Ref. 2).

Waste disposal: Cowshed effluent western shore near river mouth (Ref. 10).

Refuse land fill: No

Recreation: Duck shooting, bird watching, boating

Fishing: Rich shellfish bed near Sanctuary Cove

Sand extraction:

Other: Dredging of river for maintenance of boat mooring sites

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No significant pollution.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): No information.

(b) Land use of catchment: Approximate percentage of total catchment in:

forest	15%	residential	10% (Clevedon township)
industrial		pasture	75% bare earth

Other land use likely to affect wetland: Stock grazing/trampling.

Reserves present: None.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Catchment zoned Rural 1 (Refs 5, 6). Construction of marina would require specified departure.

Controls other than District scheme likely to influence future land use: Proposed Auckland Regional Planning Scheme (1987) relevant policy: "Pressure for development should be restricted to the general boundaries of existing developments." (Ref. 7).

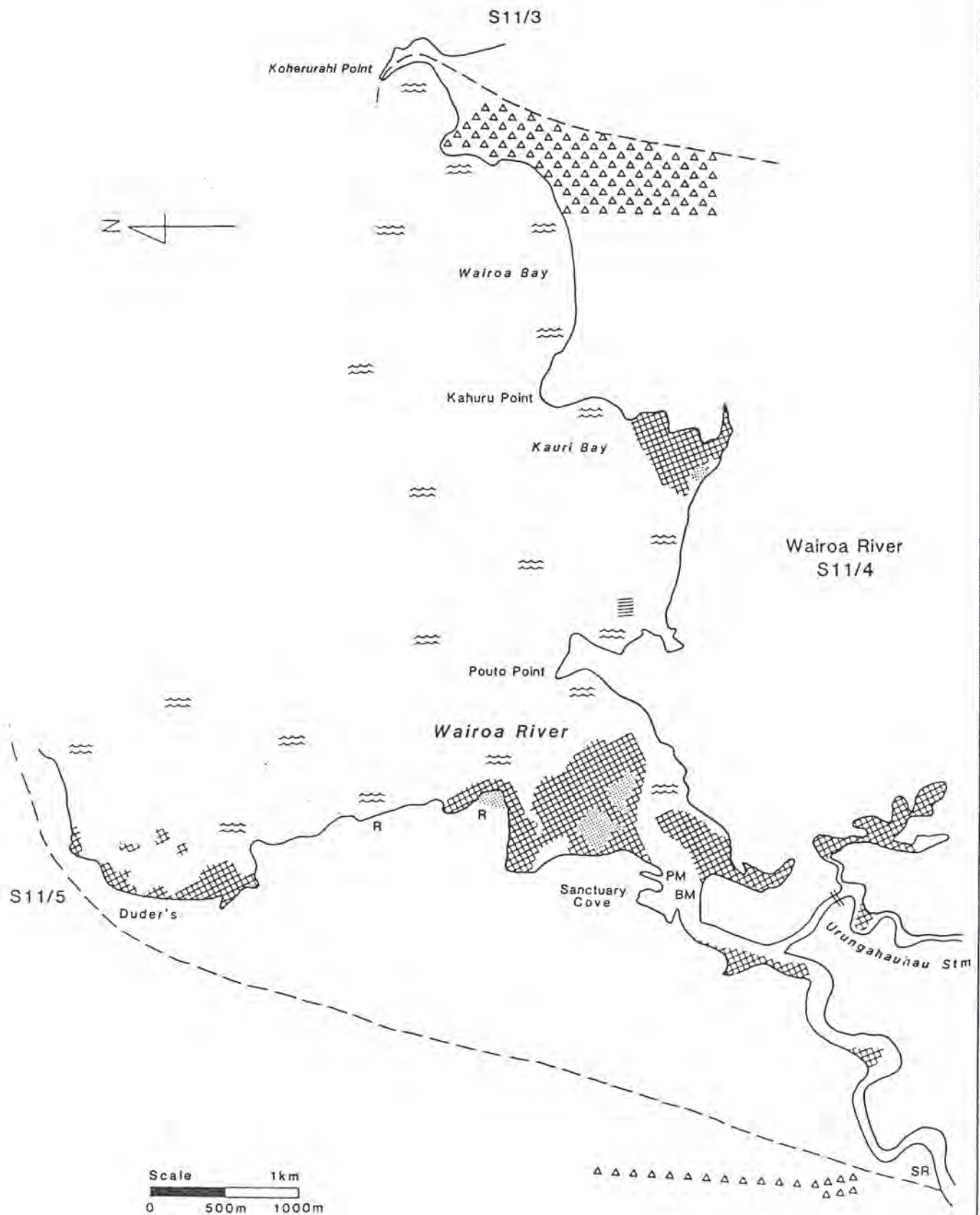
(c) Description of topography (soil type, slope, erosion susceptibility): Flat river plain immediately adjacent to river, rising to gently undulating hills.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: High priority for protection of dotterel breeding sites, high tide roosts, mangrove and saltmarsh areas. Eradicate spartina grass. Shoreline fencing needed to protect wetlands from stock. Prevent helicopters landing on Dunders, as this disturbs wildlife. Minimise ecosystem damage from marina construction or any other catchment development (Ref. 1).

19. RELEVANT REFERENCES:

- 1) Department of Conservation unpublished faunal survey.
- 2) Beca Carter Holdings Ltd (1987) "The Effects of the Proposed Sanctuary Cove Marina on Aquatic and Terrestrial Habitats".
- 3) Hobson Marinas Ltd (1987) Sanctuary Cove Marina, Clevedon. Preliminary Concept Report.
- 4) Department of Conservation, Auckland Regional Authority, University of Auckland (1988) - Priority Natural Areas Survey Hunua Ecological District. Unpublished notes.
- 5) Franklin County District Scheme (1984).
- 6) Manukau City Council (1984) Reviewed District Scheme.
- 7) Auckland Regional Authority (1987) Proposed Regional Planning Scheme.
- 8) Veitch R (1980) Proposed Marina - Wairoa River. Letter from Internal Affairs Department, Auckland, to Wildlife Service, Wellington.
- 9) Department of Conservation, Auckland region files, especially file 54/71/14.
- 10) Henderson K (1988) pers. comm., Auckland Regional Water Board staff.



Information from NZMS 260 (1983)

NZMS 270 (1979)

Aerial photographs (1987)

1. NAME Maraetai
2. AREA CODE S11/5 map 4
3. MAP REFERENCE NZMS 260 S 11 97H 757 to R 11 762 875
4. LOCATION DESCRIPTION Mainland coast between Wairoa and Turanga Estuaries.
5. TYPE OF WETLAND Mangrove, Saltmarsh,
6. AREA OCCUPIED BY WETLAND Te Puru Estuary
7. DOMINANT WETLAND VEGETATION/ASSOCIATION

Mangrove area	Small mangrove - saltmarsh strip (Refs 5 & 3) <u>Avicennia marina</u> var. <u>resinifera</u> 100% 0.5-3.5 metres high, very dense.
Saltmarsh area	<u>Scirpus</u> spp. 15-25% by area <u>Leptocarpus simplex</u> 5-15% <u>Scirpus cernuus</u> 5-15% <u>Juncus maritimus</u> 1-5% <u>Samolus repens</u> 1-5%
Raupo swamp	<u>Typha orientalis</u> 25-50% <u>Scirpus</u> spp. 25-50% <u>Sophora microphylla</u> <u>Plagianthus divaricatus</u> <u>Phormium tenax</u> (Ref. 5)
8. WILDLIFE VALUES The outer intertidal shore throughout the area is important as a feeding area for birds, particularly waders but also shags and terns (Ref. 1)
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The extensive sandflat areas provide nursery grounds for juvenile flounder during summer (Refs 1 and 2).
10. STABILITY OF WETLAND No information.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Manukau City Council
 Management agencies: Manukau City Council

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	NIL
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.13. USE OF WETLAND BY MAN Educational - Te Puru estuary adjoins Omana Regional Park.14. WETLAND MODIFICATIONS PROPOSED No information.15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Marina proposed. Pine Harbour Marina and extensions. (R11 875 770)

Waste disposal: Maraetai and Beachlands septic tank seepage.

Refuse land fill: No

Recreation: Shellfish include cockles, pipis, oysters, mussels.

Fishing: Recreational

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: None presently known.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): No information.
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-----|-------------|-----|------------|
| forest | 30% | residential | 10% | bare earth |
| pasture | 60% | industrial | | |

Other land use likely to affect wetland: Exotic production forest in headwaters may affect Te Puru wetland by sediment deposition during harvesting.

Reserves present: Omana Regional Park.

Land use changes anticipated up to year 2000: Forest felling a possibility.

District scheme - zoning provisions: Under the Harbours Act 1950, all marina and extension works landward of MHWM will require a Specified Departure approval from Manukau City Council. Manukau City Council has been nominated Grant of Control for management and administration of water below Mean High Water Mark (Ref. 6).

Controls other than District scheme likely to influence future land use: The proposed Auckland Regional Planning Scheme (1987) Policy for this area is: "Pressure for development should be restricted to general boundaries of existing developments". Also Section 1(1985) deals with recreation use and management of open space on this coastline (Ref. 7).

- (c) Description of topography (soil type, slope, erosion susceptibility): Low lying rolling hill country.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: The Auckland Regional Authority Parks Department states: "The native plant succession association with the mangrove community will be encouraged." (Ref. 3)

19. RELEVANT REFERENCES:

- (1) Bioresearches Ltd (1985) The Effects of the proposed Pine Harbour Marina on aquatic and terrestrial habitats. Produced for Wilkins and Davies Ltd.
- (2) Wilkins and Davies Ltd (1987) Pine Harbour Marina Extensions Specialist Reports Volumes 2 and 3 (Ecological Studies by Bioresearches Limited).
- (3) Auckland Regional Authority Parks Department (1980). Omana Regional Park Management Plan.
- (4) Wilkins and Davies Ltd (1985) Pine Harbour Marina Statutory Application and Environmental Impact Assessment.

- (5) Department of Conservation, Auckland Regional Authority, University of Auckland (1988) Priority Natural Areas Survey Hunua Ecological District. Unpublished notes.
- (6) Manukau City Council (1984) Reviewed District Scheme.
- (7) Auckland Regional Authority (1987) proposed Auckland Regional Planning Scheme.

MAP 4

MARAETAI
S11/5

S11/4

Umupuia Beach

TAMAKI STRAIT

Maraetai

Omana Beach

SR

Shelly Bay

Beachlands

Pine Harbour
Marina

Motukaraka Island

S11/6

Scale 1km
0 500 1000m

Information from NZMS 260 (1983)
NZMS 270 (1979)
and aerial photographs (1987)

1. NAME Waikopua Creek Estuary
2. AREA CODE R11/6 Map 5.
3. MAP REFERENCE R11 880 750
4. LOCATION DESCRIPTION Eastern of three estuaries converging south of Motukaraka Island.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Approximately 100 ha total, mangrove 20 ha, 3 ha rough pasture with Juncus and gorse. (Ref 2).
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Avicennia marina var resinifera
Juncus maritimus dominant species
 Small amounts of:

<u>Plagianthus divaricatus</u>	<u>Cypensis</u>
<u>Samolus repens</u>	<u>Glyceria</u>
<u>Scirpus</u> spp	<u>Scirpus nodosus</u>
<u>Selliera radicans</u>	<u>Leptocarpus simplex</u>
<u>Sarcocornia quinqueflora</u>	<u>Solanum maritimum</u>
<u>Pampus</u>	Gorse

 (Ref 2).
8. WILDLIFE VALUES
Dominant species Black backed gull, Caspian tern, little shag, black shag, pukeko, kingfisher, welcome swallow, pied stilt, white faced heron, harrier, shining cuckoo, grey warbler, fantail, silvereye, pheasant, Californian quail, mallard, grey duck, green finch, dunnoek, chaffinch (Ref 1).
Rare species/endangered species Banded rail. New Zealand dotterel have been recorded breeding on shell banks between Waikopua and Turanga Creeks (Ref 3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Good habitat diversity (Ref 1). Shellbanks behind the beach.
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT Ownership status of wetland: Manukau City Council.
 Management agencies: Crown.
 Department of Conservation.

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	
12. <u>CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?</u>	
No.	
13. <u>USE OF WETLAND BY MAN?</u> No information.	
14. <u>WETLAND MODIFICATIONS PROPOSED</u> No information.	
15. <u>CHARACTERISTICS OF ADJOINING WATER AREAS</u>	
(a) <u>Use of adjoining water areas:</u>	
Marine farming: No.	
Ports: No.	
Marinas/moorings: Pine Harbour - proposed extention.	
Refuse land fill: Whitford Tip - negligible leachate problems.	
Recreation: No boating, duck shooting.	
Fishing: Yes.	
Sand extraction: No.	
Other:	
(b) <u>Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland</u> No information.	
16. <u>CHARACTERISTICS OF WETLAND CATCHMENT</u>	
(a) <u>Approximate total area of catchment (ha):</u> No information.	
(b) <u>Land use of catchment</u> Approximate percentage of total catchment in	
forest 40%	pasture 60% residential
industrial	bare earth
Other land use likely to affect wetland: Quarry in catchment.	
Illegal removal of shell bank material near the mouth of Waikopua Creek.	
Stock trampling wetland.	
Production forestry in upper catchment may result in future sediment deposition in wetland.	

Reserves present: Manukau City Council foreshore reserve on western foreshore of estuary near mouth.

Land use changes anticipated up to year 2000? No information.

District scheme - zoning provisions: Manukau City Council grant of control over water areas. Zoned Rural 1 (Ref 4).

Controls other than District scheme likely to influence future land use? Proposed Auckland Regional Planning Scheme (1987) policy on this area: "Pressure for development should be restricted to the general boundaries of existing developments", (Ref 5).

(c) Description of topography (soil type, slope, erosion susceptibility)

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

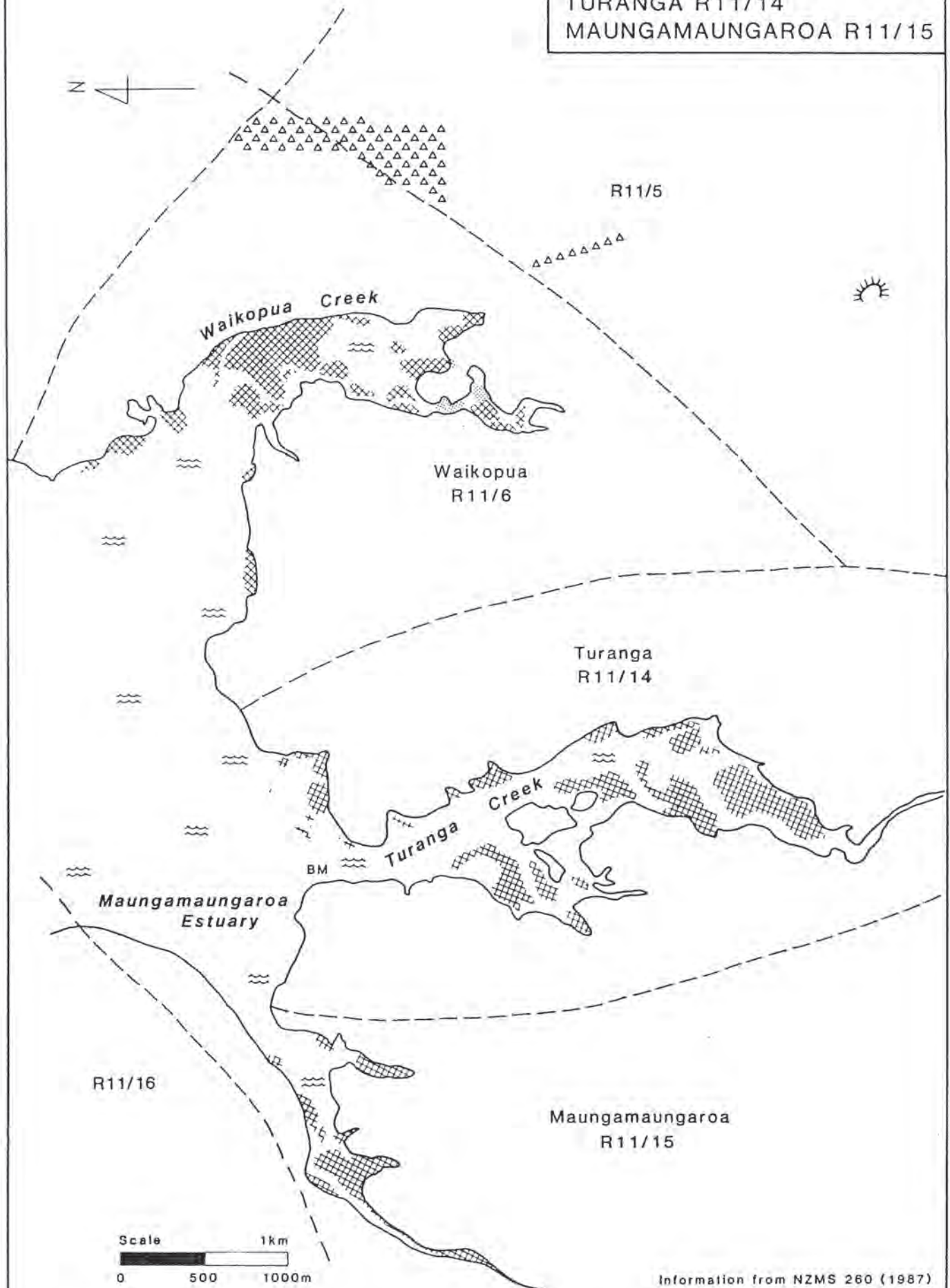
18. FUTURE MANAGEMENT RECOMMENDATIONS: Monitoring possible effects of marina on local ecology.

19. RELEVANT REFERENCES:

- 1) Department of Conservation (1988) unpublished faunal survey.
- 2) Department of Conservation, Auckland Regional Authority, University of Auckland (1988) Protected Natural Area Study, Hunua Ecological District - unpublished notes.
- 3) Bioresearches Limited (1985) Pine Harbour Marina extensions. Specialist reports Vols 2 and 3; ecological studies.
- 4) Manukau City Council (1984) reviewed District Scheme.
- 5) Auckland Regional Authority (1987) proposed Auckland Regional Planning Scheme.

MAP 5

WAIKOPUA CREEK R11/6
 TURANGA R11/14
 MAUNGAMAUNGAROA R11/15



Information from NZMS 260 (1987)
 NZMS 270 (1977)
 Aerial photographs (1988)

1. NAME Ponui Island
 2. AREA CODE S11/7 No map
 3. MAP REFERENCE NZMS 260 S11 055790
 4. LOCATION DESCRIPTION Ponui Island
 5. TYPE OF WETLAND None
 6. AREA OCCUPIED BY WETLAND (ha)
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION In the 1950's a Zostera bed was present on the Waiheke Channel coastline (ref 1).
 8. WILDLIFE VALUES Not covered by the Department of Conservation's faunal survey. The following species were recorded in Bacon and Bradbourne (1977):

Dominant species South west coast; caspian tern, native pigeon, tui, kaka, kiwi, spotless crane, pukeko.

Rare species/endangered species New Zealand dotterel (nesting), bittern.
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
 10. STABILITY OF WETLAND Zostera bed diminished.
 11. CONTROL OF WETLAND AND CATCHMENT
- Ownership status of wetland: Crown.
Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.
13. USE OF WETLAND BY MAN Recreational fishing, boating.
14. WETLAND MODIFICATIONS PROPOSED No information.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: No.
- Ports: No.

Marinas/moorings: No.

Waste disposal: No.

Refuse land fill: No.

Recreation: Fishing, boating.

Fishing: Yes.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No information.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): No information.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|------------|-------|-------------|------------|
| in: forest | - 40% | residential | bare earth |
| pasture | - 60% | industrial | |

Other land use likely to affect wetland:

Reserves present:

Land use changes anticipated up to year 2000:

District Scheme - zoning provisions: 1982 Waiheke District Scheme policy, reinforced in 1987 pre review statement. "To continue the existing rural uses and to preserve the existing character". Present zoning rural. Ref 3.

Controls other than District Scheme likely to influence future land use: Auckland Regional Planning Scheme.

- (c) Description of topography (soil type, slope, erosion susceptibility): Gently rolling.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: No information.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Haughey, A. pers comm 1988. Chief chemist, Mangere Sewage Purification Works. Auckland Regional Authority.
- 2) Bacon, M.R. and A.B. Bradbourne (1977). A recreation resource: inner Hauraki Gulf islands. A report prepared for the Planning Division, Auckland Regional Authority.
- 3) Waiheke County Council (1982) District Scheme
(1987) Pre-review statement

1. NAME Te Matuku Bay
2. AREA CODE S11/8 Map 6
3. MAP REFERENCE NZMS 260 S11 005 835
4. LOCATION DESCRIPTION South-east Waiheke
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Unknown
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
Avicennia marina var. resinifera (mangrove forest)

Juncus maritimus var australiense)
Leptocarpus simplex) salt-marsh
Baumea juncea)

Sarcocornia quinqueflora)
Triglochin striatum) salt meadow
Plantago coronopus)

Scirpus spp
Typha orientalis reed (Ref. 3)
8. WILDLIFE VALUES Tidal inlets and mangrove swamps on the southern coast of Waiheke are feeding areas for wading birds.

Dominant species: Variable oyster catcher, banded dotterel, white faced heron, blue reef heron (n), godwit, turnstone, pied stilt*, sharptailed sandpiper, white fronted tern, sandpiper, South Island pied oystercatcher, red-legged gull*, harrier hawk*, black shag*, caspian tern, white throated shag*, brown duck*.
* Present in 1977 but not observed in 1988. (n) = nesting.

Rare species/endangered species: New Zealand dotterel (on shell banks), bittern (2 pairs 1974), possibly brown teal, probably banded rail and fern bird. (Refs 1, 2, 3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This is the largest area of exposed mudflats and of coastal wetland on Waiheke Island (Ref. 3).

The area has been identified as an area of high regional and district ecological significance (Ref. 3).
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT Ownership status of wetland: Crown.
Management agencies: Department of Conservation, Waiheke County Council.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN No information.

14. WETLAND MODIFICATIONS PROPOSED No information.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Oyster farm existing.

Ports: No.

Marinas/moorings: No.

Waste disposal: Nil.

Refuse land fill: No.

Recreation: Casual boat mooring.

Fishing: Yes.

Sand extraction: No.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good quality water.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): No information.

(b) Land use of catchment:

Approximate percentage of total catchment in:

forest - 70% residential bare earth

pasture - 30% industrial

Other land use likely to affect wetland:

Reserves present: Nil.

Land use changes anticipated up to year 2000? No information.

District Scheme - zoning provisions: Rural. Relevant objectives from Waiheke pre-review statement: "To protect and preserve all sites of significant wildlife, historic, scenic, scientific interest or visual appeal including forest, bush, wetlands, coastal estuaries, habitats, headland, etc." (Ref. 4b). "To integrate conservation techniques into rural zoning policy." "To maintain an inventory of sites of wildlife and conservation interest in the District Scheme." (Ref 4a).

Controls other than District Scheme likely to influence future land use: Auckland Regional Planning Scheme.

(c) Description of topography (soil type, slope, erosion susceptibility): No information.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS Nil.

18. FUTURE MANAGEMENT RECOMMENDATIONS This regionally valuable wetland succession and wildlife habitat should be conserved in its present state. Allow no marine farming in the upstream 2/3 of the estuary, and maintain catchment in present pastoral/bush coverage. Provide incentives for the maintenance of remaining bush coverage in catchment.

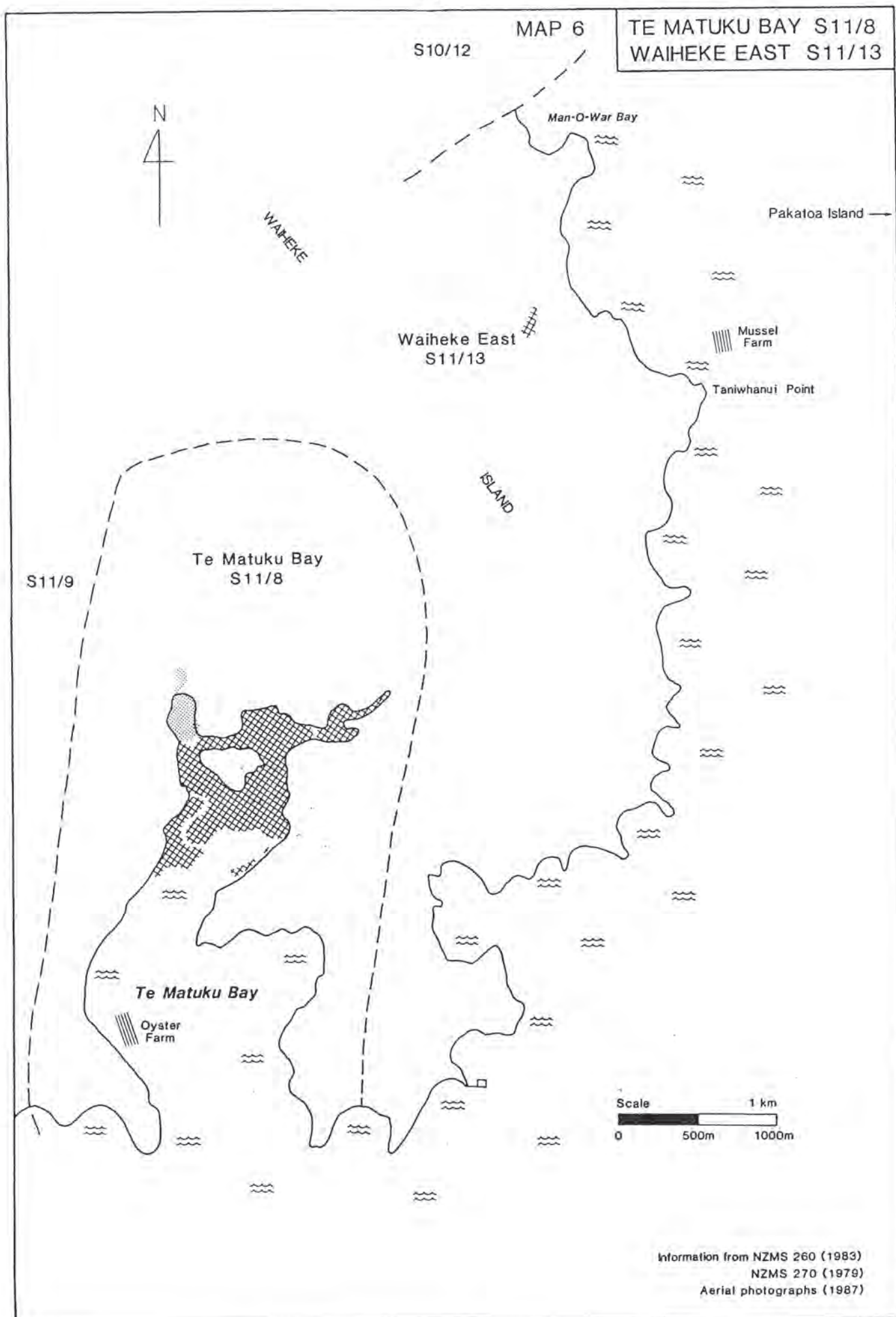
Marine farming and boat mooring acceptable in the estuary mouth only.

Recreational usage of this area needs careful control, with any potentially disruptive activities being prohibited (Ref. 4).

It has been recommended to the Auckland Regional Authority that part of the Te Matuku catchment be given reserve status in recognition of its high habitat value (Ref. 1)

19. RELEVANT REFERENCES:

- 1) Bacon, M R and A B Bradbourne (1977). A recreation resource area, Inner Hauraki Gulf islands. A report of the Auckland Regional Authority Planning Division.
- 2) Searle, Colin (1977) pers. comm. Ornithological Society.
- 3) D Slaven and P Anderson, C Green, T Fitzgibbon (1988) Waiheke Island. Sites of ecological significance, a survey sponsored by the Waiheke County Council (in press).
- 4) Waiheke County Council 4a (1982) District Scheme
4a (1987) Pre-review statement



1. NAME Awaawaroa Bay
2. AREA CODE S11/9 Map 7
3. MAP REFERENCE NZMS 260 S11 983840
4. LOCATION DESCRIPTION South-east Waiheke Island
5. TYPE OF WETLAND Mangrove Saltmarsh Salt meadow
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Avicennia marina var resinifera
 - dominant in Awaawaroa Bay.
 A small area in Rocky Bay of saline wetland - including mangroves.
 Refer to species list for Te Matuku Bay for both.

 'Within the saline wetlands there is a small island which supports large numbers of (a locally significant species) Pomaderris rugosa'. Ref 4.
8. WILDLIFE VALUES The Rocky Bay wetlands support an impressive range of bird species including the threatened 'banded rail, reef heron and' spotless crane'. (Ref 4).

Dominant species: Godwit, pied stilt,* South Island pied oystercatcher, pied shag,* mallard, grey duck and little shag.
 * = Awaawaroa Bay

Rare species/endangered species: New Zealand dotterel at Awaawaroa Bay (Refs 1, 4).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Awaawaroa Bay is the second largest wader habitat on Waiheke Island, (Ref 4). The saline wetlands of Rocky Bay have one of the highest plant species diversities of any on Waiheke Island, as well as being an area of one of the more important bird habitats on this island, (Ref 4).
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT Ownership status of wetland: Crown
 Management agencies: Department of Conservation, Waiheke County Council.

Name

Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	

incorrect
this island
is in fact
at Rocky
Bay

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Waiheke County Council grant of control of foreshore only.
13. USE OF WETLAND BY MAN? Nil.
14. WETLAND MODIFICATIONS PROPOSED Nil.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: Oyster farm.
- Ports: No.
- Marinas/moorings: No.
- Waste disposal: No.
- Refuse land fill: No.
- Recreation: Casual boat mooring especially good on west side of entrance.
- Fishing: Yes.
- Sand extraction: No.
- Other:
- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good.
16. CHARACTERISTICS OF WETLAND CATCHMENT
- (a) Approximate total area of catchment (ha): No information.
- (b) Land use of catchment:
- Approximate percentage of total catchment in forest - 60%
pasture - 40%
residential
industrial
bare earth
- Other land use likely to affect wetland: Cattle browsing in the mangrove forest.
- Reserves present:
- Land use changes anticipated up to year 2000? Little.
- District scheme - zoning provisions: Rural (Ref 2). See also area S11/8.
- Controls other than District scheme likely to influence future land use? None.

- (c) Description of topography (soil type, slope, erosion susceptibility): Predominantly clay soils catchment rises to 150 m

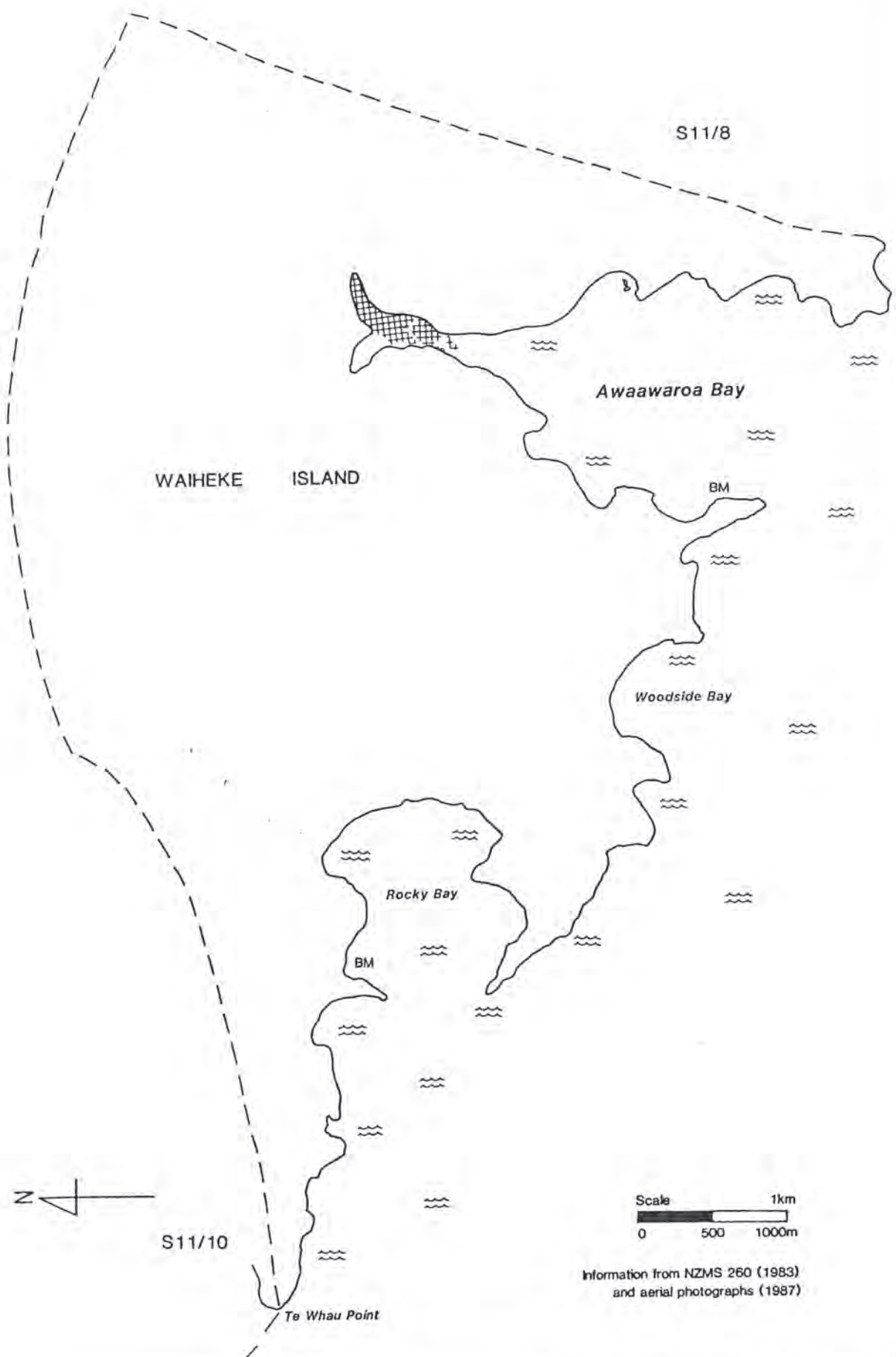
17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: No information.

18. FUTURE MANAGEMENT RECOMMENDATIONS: Marine farming would not conflict with wetland or wildlife values only be conserving the terrestrial river wetlands can the habitat quality of the bay be maintained.

Rocky Bay wetland should be fenced to prevent cattle browsing.

19. RELEVANT REFERENCES:

- 1) Bacon, M.R. and A. Bradbourne (1977). A recreation resource area, Inner Hauraki Gulf islands. A report prepared for the Auckland Regional Authority Planning Division.
- 2) Waiheke County Council (1982) District Scheme.
(1987) Pre-review statement.
- 3) Auckland Regional Authority (1987) Proposed Regional Planning Scheme, Marine Section.
- 4) Slaven, D. and P. Anderson, T. Fitzgibbon, C. Green (1988) Waiheke Island sites of ecological significance, a survey sponsored by the Waiheke County Council.



Information from NZMS 260 (1983)
and aerial photographs (1987)

1. NAME Putiki Bay
2. AREA CODE S11/10 Map 8
3. MAP REFERENCE NZMS 260 S11 935 865
4. LOCATION DESCRIPTION South Coast - Waiheke Island
5. TYPE OF WETLAND Mangrove, saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Avicennia marina var. resinifera

Saline wetland of saltmarsh, saltmeadow, and mangrove forest (see Te Matuku file 511/8) in Putiki Bay.

Saline wetland at Okahuiti Creek.

8. WILDLIFE VALUES

Dominant species pied shag (nesting) Kennedy's Bay 1972. ref: Millener quoted in (Ref 1).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.
10. STABILITY OF WETLAND Causeway reclamations across upper estuary arms.

Illegal reclamations in this area (Ref 4), e.g. reclamation by County Works Department to facilitate neighbouring quarrying operations.

Okahuiti Creek "has been impounded to a significant degree via too narrow a culvert beneath Causeway Road" (Ref 4).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Waiheke County Council. Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	NIL
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Waiheke County has grant of control over the foreshore only.

13. USE OF WETLAND BY MAN Refuse tip.

14. WETLAND MODIFICATIONS PROPOSED None known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Several oyster farms

Ports: Ferry wharves

Marinas/moorings: No

Waste disposal: Septic tank seepage

Refuse land fill: Waiheke refuse tip in mangroves behind causeway.

Recreation: Boating, fossicking, swimming, good boat anchorages.

Fishing: Yes

Sand extraction: No

Other: Permanent houseboat moorings (Ref 4).

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No information.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): No information.

(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	40%	residential	30%	bare earth
	pasture	30%	industrial		

Other land use likely to affect wetland: Quarry present in 1977 Rangihoua Creek (Ref. 1).

Reserves present:

Land use changes anticipated up to year 2000: Increasing urbanisation.

District scheme - zoning provisions: Rural zoning of southern headland and part of Kennedy Point Peninsula, otherwise predominantly residential zoning.

Quarry zone on north side of Rangihoua Creek. Industrial zone at Tahi Road. Some concern about noxious waste disposal (Ref. 2b) (see also area S11/8.

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme.

(c) Description of topography (soil type, slope, erosion susceptibility):

Predominantly clay soils

Catchment rises over 100 metres

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

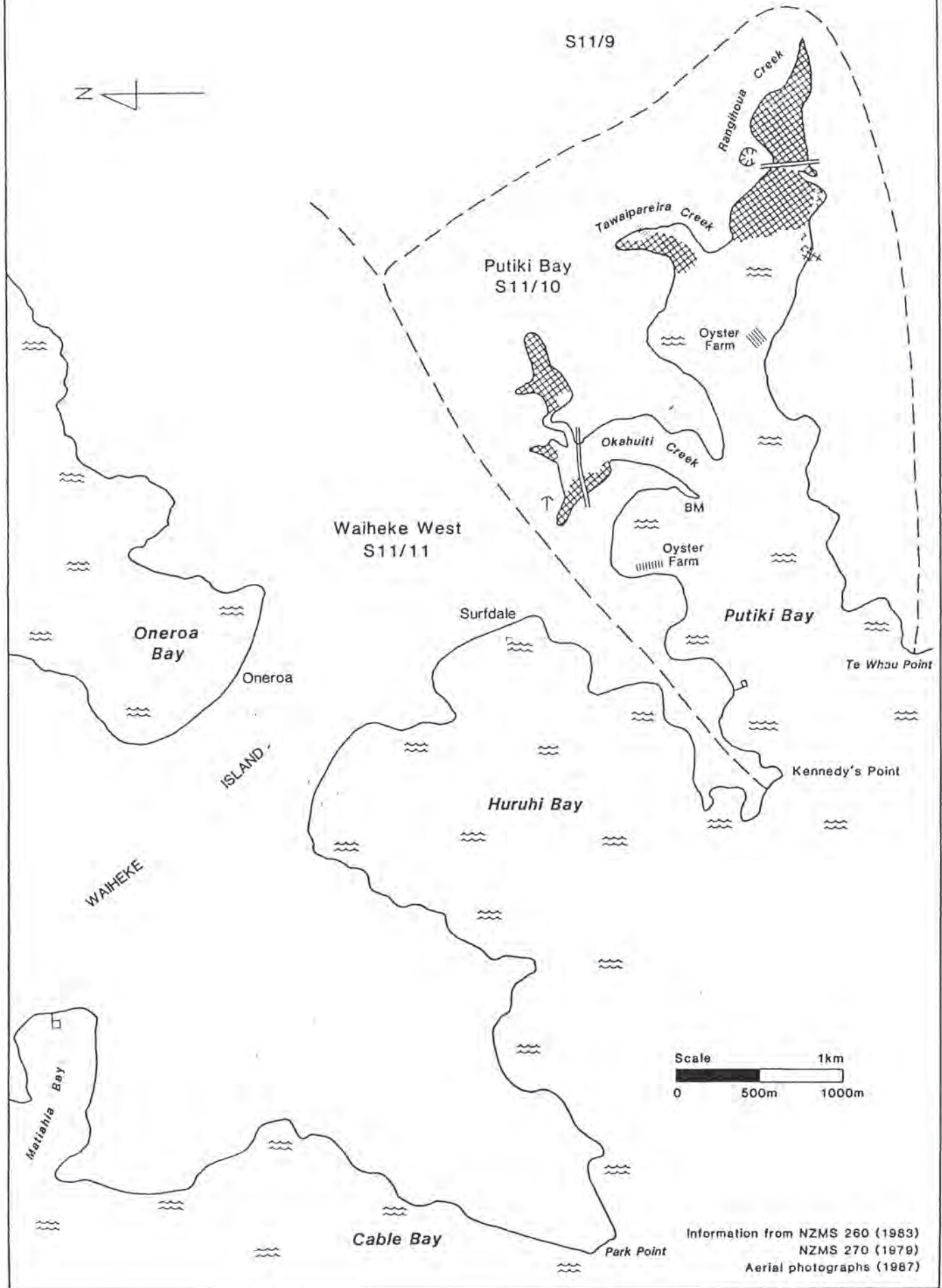
18. FUTURE MANAGEMENT RECOMMENDATIONS: "The tip is unsuitably located and should be closed, sealed off below the watertable and environmentally rehabilitated. Additionally, both the illegal reclamation alongside the quarry and the use of lime stabilisers on this reclamation must be halted." (Ref 4). Extend the width of the culvert beneath Causeway Road in Okahuiti Creek (Ref. 4).

19. RELEVANT REFERENCES:

- (1) Bacon - M R and A Bradbourne (1977). A Recreation Resource Area, Inner Hauraki Gulf Islands. A report prepared for the Auckland Regional Authority Planning Division.
- (2) Waiheke County Council (2a) (1982) District Scheme
(2b) (1987) Pre-Review Statement
- (3) Auckland Regional Authority (1987) Proposed Regional Planning Scheme. Special report on marine areas.
- (4) Slaven D, P Anderson, T Fitzgibbon, C Green (1988) Waiheke Island. Sites of Ecological Significance - a survey sponsored by the Waiheke County Council.

MAP 8

PUTIKI BAY S11/10
WAIHEKE WEST S11/11



Information from NZMS 260 (1983)
NZMS 270 (1979)
Aerial photographs (1987)

1. NAME Waiheke West
2. AREA CODE S11/11 Map 8
3. MAP REFERENCE NZMS 260 S11 945 905 to S11 905 856
4. LOCATION DESCRIPTION Western side of Waiheke Island.
5. TYPE OF WETLAND: Raupo swamp
6. AREA OCCUPIED BY WETLAND (ha) Small.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Church Bay)
)Raupo swamp (Ref.1)
 Owhanake Bay)
8. WILDLIFE VALUES Church Bay and Owhanake Bay (Ref. 1)

Dominant species Pukeko, spotless crane

Rare species/endangered species Bittern
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Waiheke County Council. Department of Conservation.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN See 15.
14. WETLAND MODIFICATIONS PROPOSED
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: No
- Ports: Waiheke Ferry Terminal, Matiatia

Marinas/moorings: Matiatia

Waste disposal: Septic tank seepage

Refuse land fill: No

Recreation: Intensive - swimming, boating

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not available.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|-----|---------|-----|-------------|-----|------------|
| in: | forest | 10% | residential | 70% | bare earth |
| | pasture | 20% | industrial | | |

Other land use likely to affect wetland:

Reserves present: Small local authority reserves

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Catchments of following western bays are zoned rural:

Owhanaki, Matiatia, Church, Cable, Te Wharau, Waiheke Bays.

Catchments of following bays zoned residential:

Hekerua, Oneroa, Huruhi Bays. See also area S11/8

Controls other than District scheme likely to influence future land use:

- (c) Description of topography (soil type, slope, erosion susceptibility):

Predominantly clay soils. Catchment rises to 90 metres.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

Bacon M R and A Bradbourne (1977) A Recreation Resource area - Inner Hauraki Gulf Islands. A report prepared for the ARA Planning Division.

Waiheke County Council (1982) District Scheme.

(1987) Pre-review Statement

1. NAME Waiheke North
2. AREA CODE S10/12 Map 9
3. MAP REFERENCE NZMS 260 S11 945 905 to S10
4. LOCATION DESCRIPTION North side of Waiheke
5. TYPE OF WETLAND None.
6. AREA OCCUPIED BY WETLAND (ha) None.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION None.
8. WILDLIFE VALUES
Rare species/endangered species NZ dotterel nesting at Pie Melon Bay (Ref.1).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT
Ownership status of wetland: Crown.
Management agencies: Waiheke County Council. Department of Conservation.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN No wetland.
14. WETLAND MODIFICATIONS PROPOSED None known.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
(a) Use of adjoining water areas:
Marine farming: No

Ports: No

Marinas moorings: No

Waste disposal: Onetangi septic tank seepage

Refuse land fill: No

Recreation: Yes - intensive use for swimming, boating

Fishing: Yes - predominantly recreational

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment:

Approximate percentage of total catchment in:
forest - 20% residential - 10% bare earth
pasture - 70% industrial

Other land use likely to affect wetland:

Reserves present: Royal Forest & Bird protection bush reserve at Onetangi.

Land use changes anticipated up to year 2000: Infilling of urban areas.

District scheme - zoning provisions: Present Onetangi residential area only included in residential zoning (Ref. 2). Remainder of this coast in rural zoning. See also area S11/8.

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme.

- (c) Description of topography (soil type, slope, erosion susceptibility):

Predominantly clay soils. Catchment rises to 200 metres.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

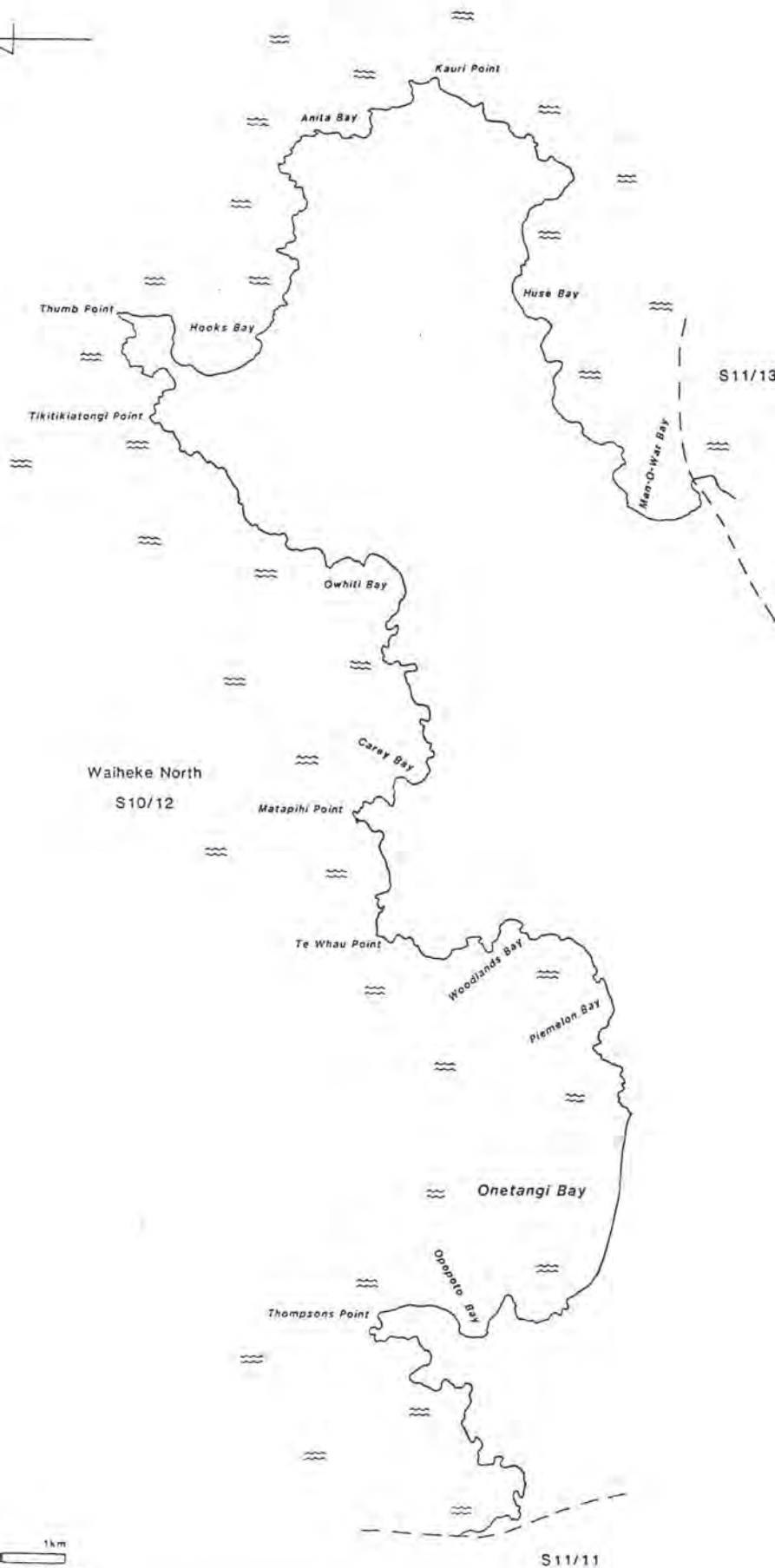
18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

Bacon - Van Roon M R and A Bradbourne (1977) A Recreation Resource Area: Inner Hauraki Gulf Islands. A report prepared for the Planning Division, Auckland Regional Authority.

Waiheke County Council (1982) District Scheme.
(1987) Pre-review Statement.

MAP 9

WAIHEKE NORTH
S10/12

Scale 1km
0 500m 1000m

Information from NZMS 260 (1983)
NZMS 270 (1979)

1. NAME Waiheke East
2. AREA CODE S11/13 Map 6
3. MAP REFERENCE NZMS 260 S11 028 886 to 104 817
4. LOCATION DESCRIPTION Eastern side of Waiheke Island.
5. TYPE OF WETLAND Raupo
6. AREA OCCUPIED BY WETLAND (ha) Small
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Saline wetlands are associated with a stream at Man O' War Bay (Ref. 3). Raupo - Man O' War Bay (Ref. 1).
8. WILDLIFE VALUES
Rare species/endangered species Caspian tern (Ref. 1), Banded rail (Ref. 3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND
11. CONTROL OF WETLAND AND CATCHMENT
Ownership status of wetland: Crown
Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Waiheke County Council has grant of control over foreshore.
13. USE OF WETLAND BY MAN No information.
14. WETLAND MODIFICATIONS PROPOSED No information.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
(a) Use of adjoining water areas:
Marine farming: Mussel farm. Man O' War Bay south.
Ports: No.

Marinas/moorings: No, good boat anchorage at Man O' War Bay.

Waste disposal: Treated sewage discharge points at Pakatoa Island and Rotorua Island.

Refuse land fill: No.

Recreation: Very popular boating area, swimming.

Fishing: Yes.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality good.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not available

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|------------|-------|-------------|------|------------|-------|
| in: forest | - | residential | - 5% | bare earth | - 10% |
| pasture | - 85% | industrial | - | | |

Other land use likely to affect wetland:

Reserves present: Crown bush reserve Man O' War Bay.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Rural (Ref. 2). See also area S11/8

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme.

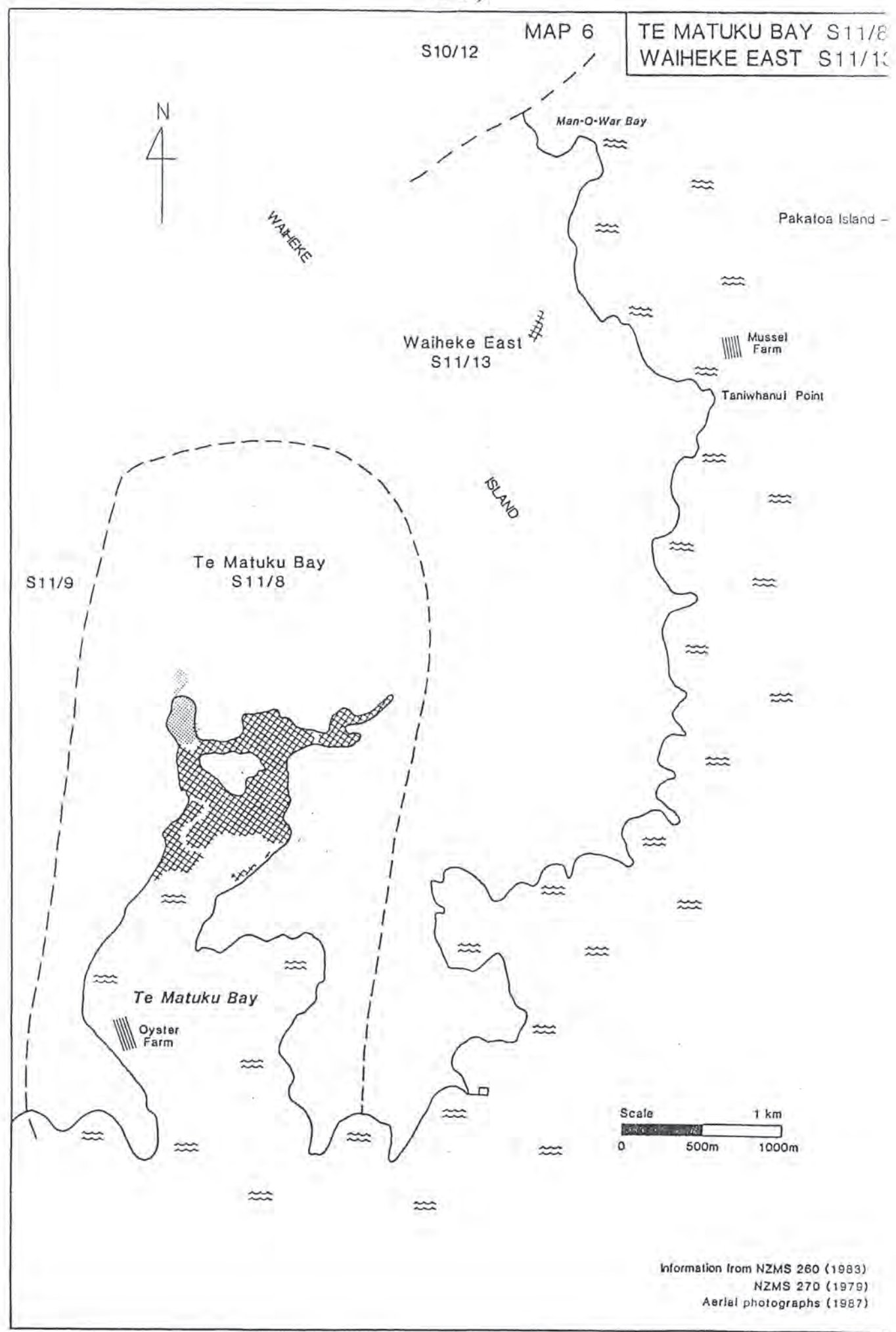
- (c) Description of topography (soil type, slope, erosion susceptibility):
Predominantly clay soils. Catchment rises to 200 metres - area surrounding saline wetland is of steep terrain (Ref. 3).

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Bacon - van Roon, M.R. and A. Bradbourne (1977) A Recreation Resource Area : Inner Hauraki Gulf Islands. A report prepared for Planning Division, Auckland Regional Authority.
2. Waiheke County Council (1982) District Scheme.
(1987) Pre-Review Statement.
3. Slaven, D., P. Anderson, T. Fitzgibbon, and C. Green (1988) Waiheke Island Sites of Ecological Significance, a survey sponsored by the Waiheke County Council.



1. NAME Turanga Creek
2. AREA CODE R11/14 Map 5
3. MAP REFERENCE NZMS 260 R11. 853 740
4. LOCATION DESCRIPTION Mainland coast south of Motuihe Island
5. TYPE OF WETLAND Mangrove Salt-marsh
6. AREA OCCUPIED BY WETLAND (ha) Approximately 700 hectares in R11/14 and R11/15 combined occupies: Mangrove 22% of bay, salt-marsh 1% of bay.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION On exposed mudflat: Avicennia marina var. resinifera. Plagianthus divaricatus. Juncus maritimus. Baumea juncea. Sarcocornia quinqueflora - beds at Turanga headland, Ref. 2. Coprosma propinqua. Selliera radicans. Samolus repens. Phormium tenax. Stipa stipoides. Scirpus nodus.

Turanga vegetation is in definite bands from sea to land. Creeks are mangrove lined with areas of good quality salt-marsh and brackish swamp.
8. WILDLIFE VALUES Areas R11/14 and R11/15 combined, Refs 1 and 2.

Dominant species Godwit, pied stilt, black-backed gull, red-bill gull, white-faced heron, little shag, pied shag, south island pied oystercatcher, black shag, mallard duck, variable oystercatcher, banded dotterel.

Rare species/endangered species Caspian tern, banded rail, NZ dotterel (no longer breeding). Good water habitat supporting over 500 birds on extensive mudflats.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Moderate to high habitat value in spite of catchment modification (Refs 1 and 2). Dotterel high tide roost on shell-bank at mouth of creek (Ref. 1).
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Manukau City Council, Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	nil
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau City Council: Grant of control over water area.
13. USE OF WETLAND BY MAN No information.
14. WETLAND MODIFICATIONS PROPOSED None known.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: No
- Ports: No
- Marinas moorings: No
- Waste disposal:
- Refuse land fill: No
- Recreation: Little
- Fishing: Limited
- Sand extraction: No
- Other:
- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Nutrient status acceptable.
16. CHARACTERISTICS OF WETLAND CATCHMENT
- (a) Approximate total area of catchment (ha): Not available.
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|-----|-------------|------------|
| in: | forest | 10% | residential | bare earth |
| | pasture | 90% | industrial | |
- Other land use likely to affect wetland:
- Cattle grazing (Ref. 1)
 - Major residential areas on headlands of bay into which estuary discharges.
- Reserves present: Esplanade reserve in upper Turanga Creek. Other areas of domain and DOC leased land
- Land use changes anticipated up to year 2000: Possible development of this estuary for recreational purposes.
- District scheme - zoning provisions: Rural

Controls other than District scheme likely to influence future land use: Proposed Auckland regional planning scheme (1987) - delineation of Auckland metropolitan area. Relevant policy for this area: "Pressure for development should be restricted to the general boundaries of existing developments."

- (c) Description of topography (soil type, slope, erosion susceptibility):
No erosion present.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

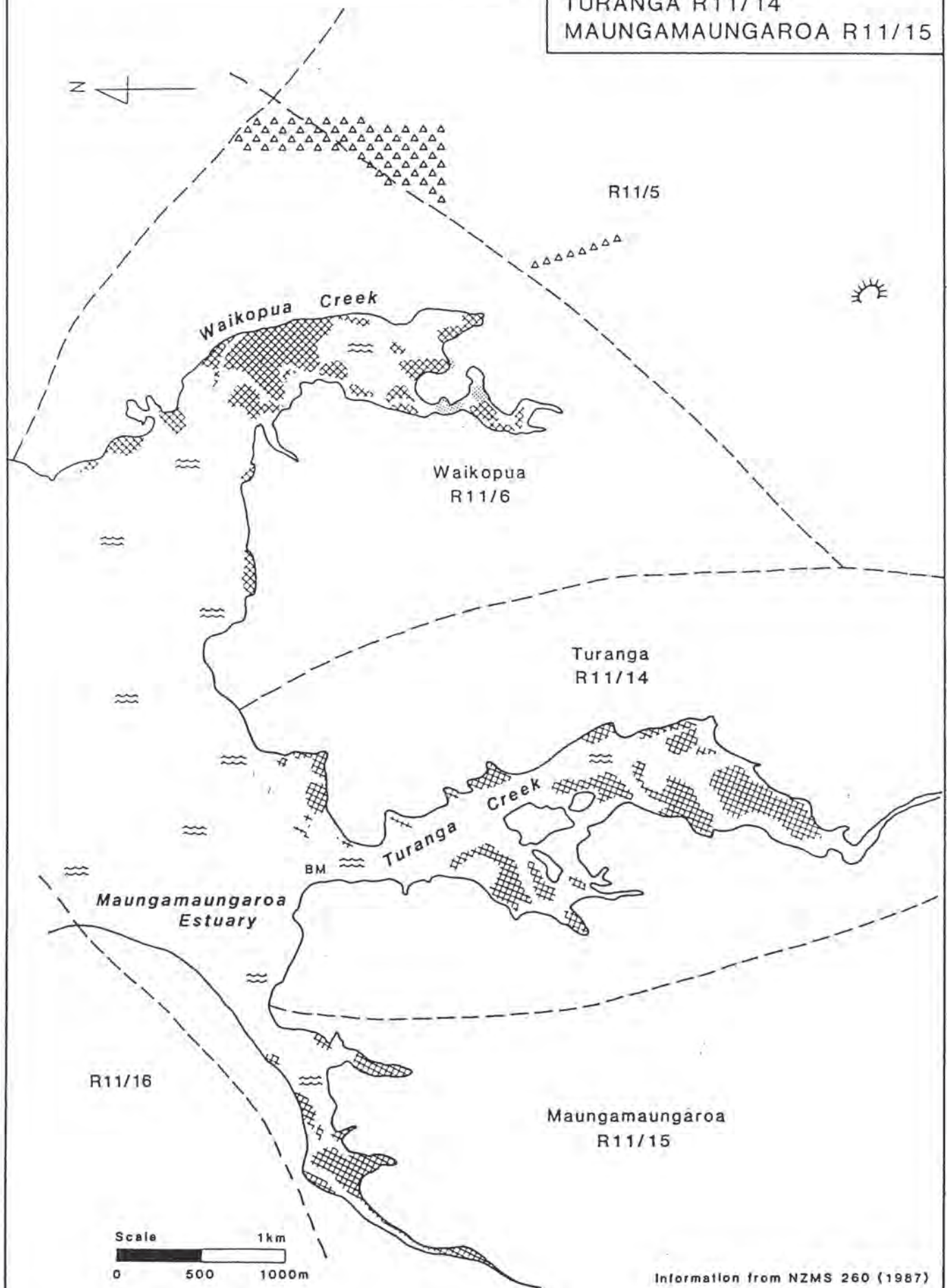
18. FUTURE MANAGEMENT RECOMMENDATIONS: Restrict access, especially of horses and motor-bikes to bird roosting areas/shellbanks and salt-marshes at the end of Clifton Road. Breeding activity could occur again on shellbanks if disturbances are removed. Designate this area as some form of 'wildlife refuge'. Implement controls to protect edge of estuarine system from grazing and further reclamation. These recommendations were made by the Wildlife Service (now DOC) in 1981 (Ref. 1)

19. RELEVANT REFERENCES:

- 1) Department of Conservation (1988) faunal survey - unpublished.
- 2) Department of Conservation, Auckland Regional Authority, and University of Auckland (1988) Priority Natural Areas Survey Hunua Ecological District. Unpublished notes.
- 3) Manukau City Council (1984) District Scheme.
- 4) Auckland Regional Authority (1987) Proposed Auckland Regional Planning Scheme.

MAP 5

WAIKOPUA CREEK R11/6
 TURANGA R11/14
 MAUNGAMAUNGAROA R11/15



Information from NZMS 260 (1987)
 NZMS 270 (1977)
 Aerial photographs (1988)

1. NAME Maungamaungaroa Creek
2. AREA CODE R11/15 Map 5
3. MAP REFERENCE NZMS 260 R11. 840 745
4. LOCATION DESCRIPTION Mainland coast south of Motuihe Island.
5. TYPE OF WETLAND Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) See R11/14
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Refs 1 and 2.
Avicennia marina var. resinifera

Reedland: Scirpus fluviatilis

<u>Plagianthus divaricatus</u>	)	
<u>Phormium tenax</u>	)	
<u>Leptocarpus sp</u>	)	Concentrated in one small area
<u>Stipa stipoides</u>	)	
<u>Sarcocornia quinqueflora</u>	)	
<u>Juncus maritimus</u>	)	

Creeks are mangrove lined with areas of salt-marsh and brackish swamp.

8. WILDLIFE VALUES Refer area R11/14 Refs 1 and 2.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Turanga/Maungamaungaroa system has been designated as a Site of Special Wildlife Interest of Moderate to High value by the recent PNA survey.
10. STABILITY OF WETLAND Recent reclamations - extensive drainagage.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Manukau City Council. Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	ARA
Harbour board	Nil
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau City Council: Grant of Control over water area.

13. USE OF WETLAND BY MAN Reclamations.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

- (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas moorings: No

Waste disposal:

Refuse land fill: No

Recreation: Little

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Nutrient status: Acceptable

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): No information.

- (b) Land use of catchment: Approximate percentage of total catchment
in: forest 40% residential bare earth
pasture 60% industrial

Other land use likely to affect wetland: Cattle grazing. Ref. 1.

Reserves present: One small local authority reserve.

Land use changes anticipated up to year 2000: Urbanisation of north-west shoreline. Marina or similar 'recreational' development within the estuary highly likely.

District scheme - zoning provisions: Council recently proposed a scheme change which allows for marina development in coastal areas as a conditional use. Future development zone along north-west shoreline; although this could be amended, as the land is steep and unstable. Balance of catchment zoned 'Rural'. Most land adjacent to Maungamaungaroa estuary is zoned rural.

Controls other than District scheme likely to influence future land use: Proposed Auckland Regional Planning Scheme (1987) relevant policy for this area: "Pressure for development should be restricted to the general boundaries of existing developments." Manukau City Council: Grants of control over both water and foreshores.

The council is also looking to produce a coastal management plan for the entire northern coastline, and is in the process of developing policies for this area.

- (c) Description of topography (soil type, slope, erosion susceptibility):
No erosion apparent..

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Department of Conservation (1988) faunal survey - unpublished.
- 2) Department of Conservation, Auckland Regional Authority, and University of Auckland (1988) Priority Natural Areas Survey Hunua Ecological District. Unpublished notes.
- 3) Manukau City Council (1984) District Scheme.
- 4) Auckland Regional Authority (1987) Proposed Auckland Regional Planning Scheme.

1. NAME Eastern Beaches
2. AREA CODE R11/16 Map 10
3. MAP REFERENCE NZMS 260 R11, 800 820 to R11, 845 758
4. LOCATION DESCRIPTION Open coast between Tamaki River and Maungamaungaroa Estuary.
5. TYPE OF WETLAND None.
6. AREA OCCUPIED BY WETLAND (ha) None.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION There used to be a Zostera bed at Howick Beach but it seems to have disappeared. Largely attributed to a disease by Labyrinthula slime mould, but also perhaps to increased sediment load, reduced salinity or pollutants (1).
8. WILDLIFE VALUES Limited in urban areas.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Zostera bed previously at Howick Beach has disappeared.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Manukau City Council. Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Manukau City Council.
	Howick Borough Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau City Council has a grant of control over water areas not adjacent to Howick Borough District.

13. USE OF WETLAND BY MAN No wetland.

14. WETLAND MODIFICATIONS PROPOSED None known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas moorings: No

Waste disposal: Storm water.

Refuse land fill: No

Recreation: Swimming, small boating, fossicking

Fishing: Yes

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Nutrient status - acceptable.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): No information.

(b) Land use of catchment: Approximate percentage of total catchment
in: forest residential 80% bare earth
pasture 20% reserves in grass industrial

Other land use likely to affect wetland:

Reserves present: Musick Point Reserve and golf course

Land use changes anticipated up to year 2000: No

District scheme - zoning provisions: Residential

Controls other than District scheme likely to influence future land use:

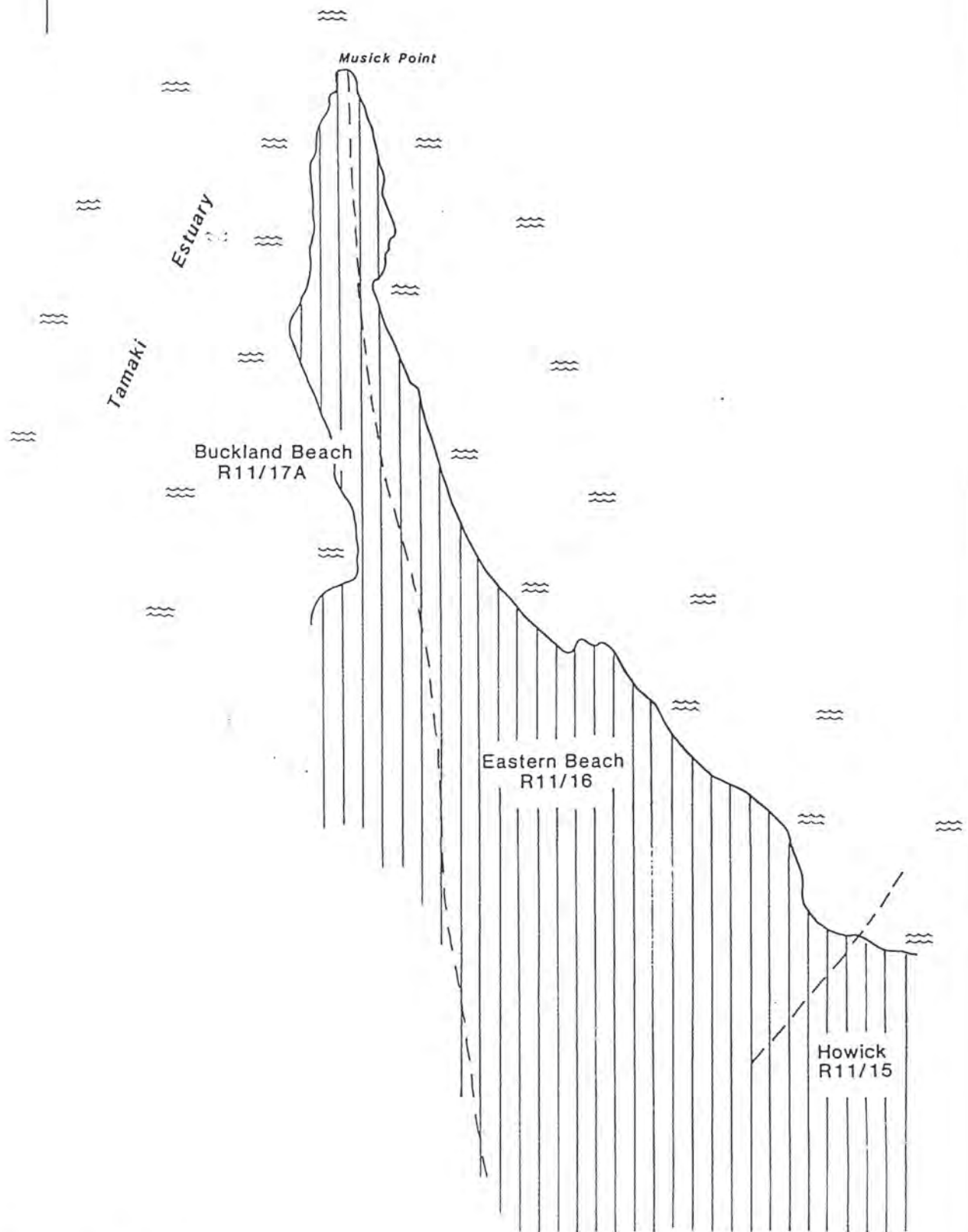
(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Dromgoole F I and B A Foster (1983) Changes to the Marine Biota of Auckland Harbour. Tane 29
- 2) Manukau City Council (1984) District Scheme.
- 3) Howick Borough (1984) District Scheme.



Scale 1km.
0 500m 1000m

Information from NZMS 260 (1987)
NZMS 270 (1979)

1. NAME Tamaki Estuary
2. AREA CODE R11/17 Map 11
3. MAP REFERENCE NZMS 260 R11 780780
4. LOCATION DESCRIPTION Those parts of the Tamaki Estuary which are not included in the subcatchments R11/17 A to H inclusive. It also includes general discussions about Tamaki Estuary as a whole.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND Total area of wetland in Tamaki Estuary.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION At R11/764740.
Avicennia marina var. resinifera (Ref 1).
Sarcocornia australis.
Cotula coronopifolia.

Any special features? Recovery evident following ICI fire/herbicide spill and ecological damage in 1984. Tamaki ecosystem shows general signs of long term stress, e.g. many Amphibola crenata (mud snail) are small. Man is 'ecodominant' in the Tamaki Estuary. (Ref 1).

8. WILDLIFE VALUES Estuarine system with extensive mudflat feeding areas and an area of coastal/semi-coastal forest, moderately high habitat value. A very good diversity of bird species utilising the wide variety of habitat zones. (Ref 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This area provides an interesting complex of marine, intertidal, freshwater and terrestrial habitats for a wide range of birds (Ref 2).
10. STABILITY OF WETLAND Mangroves were defoliated and/or killed, while snails, crabs and associated invertebrates were badly damaged in 1984 by spillage of toxic chemicals from ICI factory fire (at R11 760740). Also dead/mutilated mangroves on Glendowie foreshore. (Ref 1).

Tamaki Estuary is one of the 'hot spots' of illegal dumping and reclamation. DOC files indicate: reclamation of Pt Tamaki river bed (file 54/4/pt 3); rubbish dumping and reclamation 1975 (two incidences); illegal reclamation of 3550m² 1983. In 1980 land was reclaimed for building the Otahuhu sub station. There is the possibility of construction of natural gas pipeline in this area.

Zostera beds were recorded as being in the estuary in 1965. They have now disappeared and whilst this can largely be attributed to a disease by the Labyrinthula slime mould, it is conceivable that pathogenic susceptibility is enhanced by unfavourable growth conditions such as increased sediment load (Ref 9).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: See 17 a to h for details.
 Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Manukau city, Tamaki city, Papatoetoe, Auckland city.
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Illegal rubbish dumping in headwaters.
Fossicking and nature study at Tahuna Torea.

14. WETLAND MODIFICATIONS PROPOSED See 10.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Half Moon Bay. Many boats on moorings.

Waste disposal: Thermal pollution from Otara powerstation 300 m downstream of motorway crossing. Contaminated urban stormwater. Constant threat of industrial pollution.

Refuse land fill: Several closed tips now in other uses (Ref 5).

Recreation: Swimming, boating, fossicking.

Fishing: Recreational.

Sand extraction: No.

Other: High degree of public access. A lot of illegal rubbish dumping, illegal building of coastal structures and illegal discharge/run-off of pollutants.

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Poor water quality throughout the Tamaki Estuary stresses all marine life. Water quality is characterised by very low dissolved oxygen saturation, high nutrient and faecal coliform values (Ref 6). Water quality at Great South Road is poor. There is a steady improvement in water quality downstream towards Half Moon Bay (Ref 8).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 1000 ha.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|------------|-----|-------------|-----|
| in: forest | | residential | 30% |
| bare earth | | | |
| pasture | 30% | industrial | 15% |

Other land use likely to affect wetland: Refer sheets R11/17 A to H.

Reserves present: Tahuna-Torea Reserve, Auckland City Council.
Numerous other small local reserves.

Land use changes anticipated up to year 2000: Possible dredging of estuary (Ref 7).

District scheme - zoning provisions: Refer sheets R11/17 A to H.

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme (1988).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Mainly surrounded by urban development.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: The direct effects of various pollutants on aspects of the estuary's ecology.

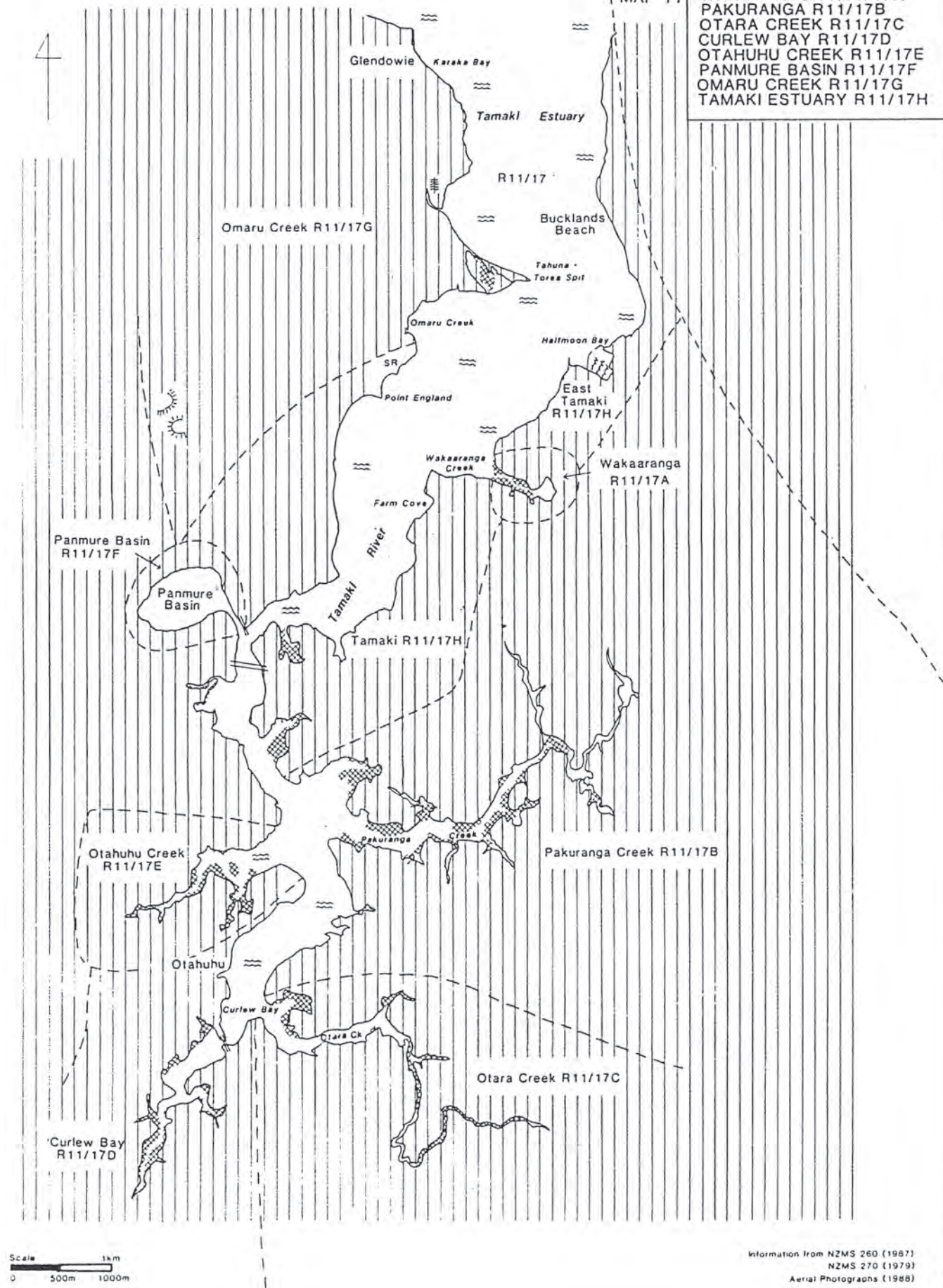
18. FUTURE MANAGEMENT RECOMMENDATIONS: A concerted effort is required to upgrade water quality in the Tamaki Estuary and to prevent illegal dumping and reclamation.

19. RELEVANT REFERENCES:

- (1) Maxwell, G.S. (1987) The Ecological Recovery of the Tamaki Estuary. A report prepared for ICI New Zealand Limited.
- (2) Department of Conservation (1980-1988) Faunal Survey unpublished Notes.
- (3) Department of Conservation Auckland Region (1988); Departmental Files.
- (4) Armiger, L.C. (1965). A Contribution to the Autecology of Zostera. Unpublished M.Sc. thesis, Auckland University.
- (5) Auckland Regional Authority/Auckland Harbour Board (1975) Waitemata Harbour Plan.
- (6) Auckland Regional Water Board (1987) Tamaki Estuary Water Quality Survey. ARWB Technical Publication No 42.
- (7) Manukau City Council (1984) District Scheme.
- (8) Auckland Regional Water Board (1978) Twelve Localities Subject to Environmental Pressure.
- (9) Dromgoole, F.I. and B.A. Foster (1978) Changes to the Marine Biota of the Auckland Harbour. Tane 29.

MAP 11

WAKAARANGA R11/17A
 PAKURANGA R11/17B
 OTARA CREEK R11/17C
 CURLEW BAY R11/17D
 OTAHUHU CREEK R11/17E
 PANMURE BASIN R11/17F
 OMARU CREEK R11/17G
 TAMAKI ESTUARY R11/17H



1. AREA CODE Wakaaranga Creek
2. NAME R11/17A Map 11
3. MAP REFERENCE NZMS 260 R11 790770
4. LOCATION DESCRIPTION Wakaaranga Creek is a tidal inlet off the Tamaki River.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Approximately 12 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Juncus maritimus var australis occasional clumps.
Sarcocornia quinqueflora occasional small patches (Ref 1).
Avicennia marina var. resinifera - covers most of the upstream half of the estuary Ref 1. Mangroves are smaller inshore (60 cm to 1 m) and increase in size towards the channel (2.5 m). The mangroves are generally healthy apart from small areas adversely affected by sediments from adjacent reclamations (Ref 1).
8. WILDLIFE VALUES The Wakaaranga Creek is of moderate ecological value only; largely because most of the area is at a high intertidal level and there are no dense concentrations of low intertidal invertebrates and no resident body of water to shelter fish at low tide (Ref 1).

Because of the small size of the creek and its high intertidal level, large concentrations of birds are not to be expected. No important breeding or roosting sites.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES A habitat type not common to the area (Ref 2).
10. STABILITY OF WETLAND This area is a 'hot spot' for dumping and reclamation. Incidences documented in Department of Conservation files include:
 - Proposals for reclamation; 'beautification' plans to turn part of the creek into as fresh water lake.
 - Reclamation of land from river bed 1971 by contractors completing a nearby authorised reclamation. Reclaimed land used for reserve - unalienated Crown land, reclamation approximately 1700 m² (Ref 1). A fresh-water habitat was filled in for housing in the 1970's. This caused silting in the estuarine areas (Ref 2).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Auckland Harbour Board Waitemata Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board

Territorial local authority	Manukau City Council
Crown	
Other	Waitemata Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND See 15.

14. WETLAND MODIFICATIONS PROPOSED Impounding of tidal water.
Reclamation/dredging (ref 1).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas moorings: Unauthorised jetties (Ref 3)

Waste disposal: Illegal waste discharges to tidal areas. Run-off from residential land.

Refuse land fill: No

Recreation: Fossicking

Fishing: No information.

Sand extraction: No.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment – likely to affect wetland: The ecology of Wakaaranga Creek is being adversely affected by sediment deposition and organic enrichment. Sediment deposition is occurring at a rapid rate, particularly in the upper part of the creek where large quantities of clay have been carried into the area by freshwater runoff from the watershed during development (Ref 1).

Oxygen saturation values are low.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Less than 20 ha.

(b) Land use of catchment: Approximate percentage of total catchment in:

forest	residential 80%	bare earth
pasture 20%	industrial	

Other land use likely to affect wetland: Not known.

Reserves present: - Esplanade reserve fringes most of estuary.
 - Pidgeon mountain reserve (Ref 4).

Land use changes anticipated up to year 2000: Continuing residential development.

District scheme - zoning provisions: Residential (Ref 4).

Controls other than District scheme likely to influence future land use or water use? Waitemata Harbour Maritime Planning Scheme (1987). Conservation zoning (Ref 5).

(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- (1) Bruce Wallace and Partners (1974). Wakaaranga Creek Development Environmental Impact Report.
- (2) Department of Conservation (1977-1987) Wetlands of Ecological and Representative Importance. An inventory compiled by the Biological Resources Centre.
- (3) Department of Conservation, Auckland Region files.
- (4) Manukau City Council (1984) District Scheme.
- (5) Waitemata Maritime Planning Authority (1987) Waitemata Harbour Maritime Planning Scheme.

1. NAME Pakuranga Creek
 2. AREA CODE R11/17B Map 11
 3. MAP REFERENCE NZMS 260 R11 780734
 4. LOCATION DESCRIPTION Eastern arm of Tamaki Estuary
 5. TYPE OF WETLAND Mangrove Saltmarsh
Gracilaria secundata
 6. AREA OCCUPIED BY WETLAND (ha) Not known.
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION Avicennia marina var. resinifera (ref 3). Sensitive marsh habitats (Purewa Creek) (Ref 3).
Gracilaria secundata - seasonally present (Ref 2).
 8. WILDLIFE VALUES Wading bird feeding areas.

Dominant species Pied stilts, white-faced herons, godwits, knots (Ref 3).
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
 10. STABILITY OF WETLAND Frost kill of mangroves in 1982 with subsequent recovery. A 'hot spot' for reclamations, both legal and illegal, also rubbish dumping. Department of Conservation files include:
An authorised reclamation at Kerswill Place, 1982 -
An unauthorised reclamation of 23 perches 1976 -
Reclamations at Sanctuary Point (1 acre 3 roods invested as part of public reserve) (Ref 5).
 11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Auckland Harbour Board. Waitemata Harbour Maritime Planning Authority.
- | | Name |
|-----------------------------|---------------------------------------|
| Catchment authority | Auckland Regional Water Board |
| Regional planning authority | Auckland Regional Authority |
| Harbour board | Auckland Harbour Board |
| Territorial local authority | Manukau City Council |
| Crown | Department of Conservation |
| Other | Waitemata Maritime Planning Authority |
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.
 13. USE OF WETLAND BY MAN See 15.

14. WETLAND MODIFICATIONS PROPOSED15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Application to build a sewer pipeline and a stormwater outfall in Pakuranga Creek 1987 (Ref 5).

Refuse land fill: Greenmount Quarry refuse land fill receives regular domestic refuse plus Auckland's hazardous wastes (Ref 6).

Recreation: Water-sport activities.

Fishing: Unknown.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment – likely to affect wetland: Eutrophic; severe oxygen depletion especially in summer months – sufficiently low to cause death of many marine animals (Ref 1).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 320 ha

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|-----|---------|-----|-------------|-----|------------|
| in: | forest | 5% | residential | 40% | bare earth |
| | pasture | 25% | industrial | 30% | |

Other land use likely to affect wetland: Greenmount landfill – hazardous wastes (Ref 6). Quarry in south of catchment.

Reserves present: Esplanade reserve along most of northern shore Lloyd Elmore Park (Ref 8).

Land use changes anticipated up to year 2000:

District scheme – zoning provisions:

- Large industrial zones to south and headwaters of catchment.
- North of catchment zoned predominantly residential.
- Balance of catchment zoned for future development (Ref 8).

Controls other than District scheme likely to influence future land use or water use? Waitemata Harbour Maritime Planning Scheme (1987). Whole Pakuranga subestuary habitat zoned except extreme headwaters which are unzoned. Maint Tamaki Estuary channel to south of Pakuranga Creek entrance is zoned Recreation B (Ref 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: A concerted effort is required to improve water quality.

19. RELEVANT REFERENCES:

- (1) Auckland Regional Water Board (1987) Tamaki Estuary Water Quality Survey. ARWB Technical Publication No 42.
- (2) Maxwell G (1987) The Ecological Recovery of the Tamaki Estuary. A report Prepared for ICI New Zealand Limited.
- (3) Bioresearches Limited (1987) Huntly-Marsden Power Station Proposed Gas Line Sector 2. A report prepared for the New Zealand Electricity Department.
- (4) Swales Andrew (1988) The Impacts of Urbanisation on Sediment Deposition in Pakuranga Creek. University thesis in preparation. Geography Department, Auckland University.
- (5) Department of Conservation Auckland region files.
- (6) Auckland Regional Authority (1987) Auckland Region Refuse Strategy. A discussion document.
- (7) Waitemata Harbour Maritime Planning Authority (1987) Waitemata Harbour.
- (8) Manukau City Council (1984) District Scheme.

1. NAME Otara Creek
2. AREA CODE R11/17C Map 11
3. MAP REFERENCE NZMS 260 R11 770710
4. LOCATION DESCRIPTION Otara Arm (subcatchment of Tamaki Estuary)
5. TYPE OF WETLAND Mangrove.
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Avicennia marina var resinifera prior to 1968.
8. WILDLIFE VALUES Little information as to the ecology of this creek, due to the intensity of human impact there.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND The New Zealand Electricity Department in 1968 impounded the estuarine portion of Otara Estuary to provide cooling water for Otara Power Station.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Crown.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Impounded area is controlled by Manukau City Council District Scheme within which it has been zoned for Maritime Recreation Purposes (Ref 1).
13. USE OF WETLAND BY MAN Limited other than refuse reclamation.
14. WETLAND MODIFICATIONS PROPOSED
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Run-off from residential area

Refuse land fill: Completed Manukau city refuse landfill on southern shore (ref 2).

Recreation: Limited

Fishing: Limited.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Otara Estuary has poor water quality with high nutrient concentrations and oxygen depletion and rapid siltation (ref 3).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 330 ha
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-----|-------------|-----|------------|
| forest | 5% | residential | 30% | bare earth |
| pasture | 60% | industrial | 5% | |

Other land use likely to affect wetland: Otara Power Station
Quarry

Reserves present: Ngati Otara Park

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: A mosaic of urban zones commercial, residential, industrial and special purposes surround estuary. Rural zoning in catchment headwaters. Quarry zone. (Ref 1).

Controls other than District scheme likely to influence future land use or water use? Waitemata Harbour Maritime Planning Scheme (1987). Otara Creek excluded from this scheme as impoundment results in exclusion of the creek from harbour limits (Ref 4).

- (c) Description of topography (soil type, slope, erosion susceptibility): Information on the ecology of the creek, and the extent of human impact here.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- (1) Manukau City Council (1984) District Scheme.
- (2) Auckland Regional Authority/Auckland Harbour Board (1975) Waitemata Harbour Plan. Printed and published by Auckland Regional Authority/Auckland Harbour Board.
- (3) Auckland Regional Water Board (1987) Tamaki Estuary Water Quality Survey. ARWB Technical Publication No 42.
- (4) Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

1. NAME Curlew Bay
2. AREA CODE R11/17D Map 11
3. MAP REFERENCE NZMS 260 R11 757 710
4. LOCATION DESCRIPTION The most upstream tributary of the Tamaki Estuary
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION *Avicennia marina* var *resinifera* (Ref. 1).

Curlew Bay is one of the few remaining undeveloped transitional habitats remaining within the Tamaki Estuary. *Amphibola crenata* (mud snail) are present in high densities.

8. WILDLIFE VALUES Limited
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	This catchment falls under the jurisdiction of both Otahuhu Borough and Manukau City
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.
13. USE OF WETLAND BY MAN None
14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Urban stormwater

Refuse land fill: No

Recreation: Limited

Fishing: Limited

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality throughout the headwaters of Tamaki Estuary is poor with high nutrient concentrations (especially ammonia) and oxygen depletion (Ref. 2).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 100 ha.

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|---|-------------|-------|------------|---|
| forest | - | residential | - 90% | bare earth | - |
| pasture | - | industrial | - 5% | | |

Other land use likely to affect wetland: Middlemore Hospital.

Reserves present: Esplanade Reserves and golf course fringe more than half of shoreline.

Land use changes anticipated up to year 2000: Little.

District scheme - zoning provisions: Predominantly residential with small areas of commercial and industrial zoning.

Relevant District Scheme Policies:

"Public access along the foreshores will be maintained, improved and increased where possible."

"The use and development of coastal related land shall be controlled to ensure that any adverse effects on the quality of coastal waters are kept to a minimum. Where any site abuts the MHWM of the sea or its bays, inlets or tidal creeks, or a local purpose reserve (esplanade), a yard of not less than 20 metres from the MHWM will be required. Coastal protection yards will be established on industrial sites."

"Otahuhu industries adjacent to the coastline will be controlled to ensure that there is no pollution from discharge or from dumping of rubbish on the foreshore."

"The Council will co-operate with Auckland Harbour Board to clean river margins of rubbish. Further reclamation of tidal waters will be severely questioned."

(Refs 3, 4, 5)

Controls other than District scheme likely to influence future land use or water use: Waitemata Harbour Maritime Planning Scheme 1987. Curlew Bay has "habitat zoning" (Ref. 6).

(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Information as to the ecological systems of this creek, e.g. the flora and fauna there.
18. FUTURE MANAGEMENT RECOMMENDATIONS: Improve water quality, resist reclamation.
19. RELEVANT REFERENCES:
 1. Bioresearches Ltd (1987) Huntly-Marsden Power Station Proposed Gas Line, Sector 2. A report prepared for the NZ Electricity Department.
 2. Auckland Regional Water Board (1987) Tamaki Estuary Water Quality Survey, ARWB Tech. Publ. No 42.
 3. Tamaki Borough-Otahuhu Ward (1987) District Scheme.
 4. Papatoetoe Borough Council (1986) District Scheme.
 5. Manukau City Council (1984) District Scheme.
 6. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

1. NAME Otahuhu Creek
2. AREA CODE R11/17E Map 11
3. MAP REFERENCE NZMS 260 R11 760 730
4. LOCATION DESCRIPTION Otahuhu tributary of the Tamaki Estuary
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION *Avicennia marina* var *resinifera*.
8. WILDLIFE VALUES Limited
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Refuse landfill closed before 1975 on southern headland of estuary mouth (Otahuhu Borough Council)(Ref. 1).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Otahuhu Creek Falls within the jurisdiction of Mt Wellington Borough and Otahuhu Borough
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Refuse landfill
14. WETLAND MODIFICATIONS PROPOSED None known
15. CHARACTERISTICS OF ADJOINING WATER AREAS
(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Urban stormwater

Refuse land fill: Yes (see 10)

Recreation: Limited

Fishing: No

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality throughout the upper Tamaki Estuary is poor with high ammonia concentrations and oxygen depletion (Ref. 2). Southern motorway stormwater probably also increases concentrations of lead and hydrocarbons in wetlands.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 25 ha.
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|------------|---|-------------|-------|------------|---|
| in: forest | - | residential | - 95% | bare earth | - |
| pasture | | industrial | - | | |

Other land use likely to affect wetland: Otahuhu commercial area. Motorway crosses estuary. Proposed extension of Otahuhu motorway bridge (1988).

Reserves present: None

Land use changes anticipated up to year 2000:

District scheme - zoning provisions:

Relevant District Scheme policies:

"Where any site abuts the MHW of the sea or its bays, inlets, or tidal creeks, or a local purpose reserve (esplanade) a yard of not less than 20 m from the MHW will be required."

"Industries adjacent to the coastline are controlled to ensure that there is no pollution from discharge of from dumping of rubbish on the foreshore."

"Most land adjacent to the foreshore is residentially zoned, and the majority is for low density development."
(Refs 3, 4).

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987) Habitat zoning except for recreation B zone in Creek entrance. Recreation zone B covers a major part of Tamaki Estuary making provision for pile and swing moorings.

Requirements of Recreation B zone:

- Comprehensive stormwater management plans be implemented,
- natural habitats be maintained and conserved,
- public access to the foreshore and water be improved,
- reclamations and structures be authorised by the Maritime Planning Authority,
- water quality be maintained and harmful emissions controlled (Ref. 5).

(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Improve water quality, minimise reclamation.

19. RELEVANT REFERENCES:

1. Auckland Regional Authority/Auckland Harbour Board (1975) Waitemata Harbour Plan.
2. Auckland Regional Water Board (1987) Tamaki Estuary Water Quality Survey, ARWB Tech. Publ. No. 42.
3. Tamaki Borough Otahuhu Ward (1987) District Scheme.
4. Mt Wellington Borough Council District Scheme.
5. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

1. NAME Panmure Basin
2. AREA CODE R11/17F Map 11
3. MAP REFERENCE NZMS 260 R11 753 758
4. LOCATION DESCRIPTION Just Panmure Basin within entire Tamaki Estuary system.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The flora of the Basin is not ecologically important. Small patches of mangrove are present in the south western and north eastern corners of the Basin. Mangroves may become established over a wider area as the substrate reaches a suitable intertidal height (Ref. 1).
8. WILDLIFE VALUES Large populations of birds utilised the Basin for feeding in the lower intertidal regions. There are tide related variations in birdlife present (Ref. 1).

Dominant species Pied shag, white faced heron, pied stilt, black-backed gulls, red billed gulls, kingfisher (Ref. 1).

Rare species/endangered species Caspian tern, banded dotterel (Ref. 1).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Basin is important as a feeding area for some fish species especially juvenile flounder and yellow-eyed mullet (Ref. 1).
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Mount Wellington Borough Council
Management agencies: Mount Wellington Borough Council

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Tamaki Borough Mt Wellington Ward
Crown	Department of Conservation
Other	Waitemata

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN See 15.
14. WETLAND MODIFICATIONS PROPOSED None known

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Auckland Regional Authority sewer pumphouse and MWBC pumphouse on Basin foreshore (Ref. 1).

Refuse land fill: Mt Wellington Compost plant to north west.

Recreation: Skiing, sailing, swimming, boating, fishing, rowing, rafting (Ref. 1).

Fishing: Yes - recreational

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The waters of the Basin carry a substantial amount of sediment. There is no apparent serious pollution occurring in the Basin at present. The fine sediment environment of the Basin is particularly sensitive to pollution by enrichment, or incorporation of nutrients or organic material (Ref. 1).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 25 ha.

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|---|-------------|-------|------------|---|
| forest | - | residential | - 95% | bare earth | - |
| pasture | - | industrial | - | | |

Other land use likely to affect wetland:

Reserves present: Panmure Basin Reserve, Panmure Basin Foreshore Reserve, Peterson Road Reserve, Watene Road Reserve, Foreshore Reserver (Ref. 1).

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: The entire area encompassed in the Panmure Basin Recreation Reserve is designated 'Recreation' in the current District Scheme (Ref. 1). The area below MHWL (i.e. all water out to the Tamaki River) has an underlying zone of 'Rural' - the only other areas in the Borough with underlying rural zones are Mts Wellington and Richmond. All the remaining foreshore areas, including Peterson Road Reserve and Swimarama have underlying zones of 'Residential A, B, or C' (Ref. 1).

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987) Recreation E zone (Ref. 2).

(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Mt Wellington Borough Council (1981) Panmure Basin Recreation Reserve Draft Management Plan.
2. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

1. NAME Omaru Creek
2. AREA CODE R11/17 G Map 11
3. MAP REFERENCE NZMS 260 R11 777 785 to R11 773 823
4. LOCATION DESCRIPTION Glen Innes area, western headland of Tamaki Estuary mouth.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known

7. DOMINANT WETLAND VEGETATION/ASSOCIATION Tahuna-Torea Spit:
Calystegia soldanella native shore convolvulus, several patches.
Muelenbeckia complexa native pohuehue.
Plagianthus divaricatus ribbonwood
Avicennia marina var resinifera
Sarcocornia quinqueflora glasswort
Samolus repens salt meadow primula
Juncus maritimus sea rush
Leptocarpus simplex jointed rush
Selliera radicans
Cotula coronopifolia

The salt marsh at Tahuna Torea is found on the seaward margins of mangrove communities, and is essentially unmodified (Ref. 9).

8. WILDLIFE VALUES The estuarine area behind the base of the Tahuna-Torea spit has been dammed and developed by the Tamaki Estuary Protection Society as a brackish pond for feeding and roosting birds. It is a major wader feeding and roosting ground (Ref. 2).

Dominant species Pied stilt, godwit, knot, turnstone, golden plover, black-backed gull, red-billed gull, blue reef heron, South Island pied oystercatcher, white fronted tern, ducks (Ref. 9).

Rare species/endangered species Banded dotterel, NZ dotterel, wrybill, caspian terns, banded rail (Ref. 2). The latter is particularly dependent on mangroves. Bittern (Ref. 9).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Damming has damaged former Maori fish traps.
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board, Auckland City Council

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Auckland City Council
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

13. USE OF WETLAND BY MAN Bird watching, passive recreational activities.

14. WETLAND MODIFICATIONS PROPOSED None known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Half Moon Bay Marina on opposite shore of Tamaki Estuary.

Waste disposal: Sewage overflows from sewage pump stations frequent in 1988.

Refuse land fill: No

Recreation: Very valuable educational reserve at Tahuna-Torea

Fishing: Limited

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Very poor water quality in the upstream parts of Tamaki River results in some degradation at Omaru (Ref. 3).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Approximately 100 ha

(b) Land use of catchment: Approximate percentage of total catchment

in: forest	-	residential	- 95%
bare earth	-		
pasture	-	industrial	-

Other land use likely to affect wetland: None known

Reserves present:

Auckland City Council Reserve. Tahuna-Torea - Glen Innes Sandspit. Proposal by Ministry of Agriculture and Fisheries to create a Marine Park or reserve in the waters around Tahuna-Torea and Glendowie Spit (Ref. 8).

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Predominantly residential zoning. Foreshore area around Omaru Creek is in Recreation 3 zoning for passive recreation. Tahuna-Torea/Glen Innes Sandspit is zoned Recreation 2 for conservation.

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987). Conservation zone extends north to R11 783 807 and south to R11 777 785. Karaka Bay area unzoned at foreshore with Recreation zone offshore.

(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Department of Conservation (1970-1988) faunal survey unpublished notes.
2. Auckland Regional Water Board (1987) Tamaki Estuary Water Quality Survey 1985-1986. ARWB Tech. Publ. No. 42.
3. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
4. Auckland City Council (1987) District Scheme.
5. Henderson, K. (1988) pers. comm. Auckland Regional Water Board staff.
6. Auckland Regional Water Board files (approx. 1978) an application by Tamaki Estuary Protection Society to impound estuary.
7. Ministry of Agriculture and Fisheries, Auckland (1982) Auckland Region Marine Reserves Plan.
8. Auckland City Council (1976) Tahuna-Torea Nature Reserve, Glendowie Sandspit. A pamphlet for public information.
9. van Roon, M.R. (1980) Report on the Tahuna-Torea Reserve for water right applications ke/1895 and kg/1896, Auckland Regional Water Board.

1. NAME East Tamaki
2. AREA CODE R11/17 H Map 11
3. MAP REFERENCE NZMS 260 R11 765 738 to R11 800 820
4. LOCATION DESCRIPTION Eastern foreshore of Tamaki River entrance excluding Wakaaranga Creek.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION *Avicennia marina* var. *resinifera* in small inlets opposite Panmure Basin.
8. WILDLIFE VALUES Farm Cove is an extensive and diverse feeding ground for birds.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT
 Ownership status of wetland: Crown, Auckland Harbour Board
 (Half Moon Bay)
 Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime
 Planning Authority, Auckland City Council

<u>Name</u>	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
None
13. USE OF WETLAND BY MAN Nil
14. WETLAND MODIFICATIONS PROPOSED
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 (a) Use of adjoining water areas:
 Marine farming: No
 Ports: No

Marinas/moorings: Half Moon Bay

Waste disposal: Urban stormwater

Refuse land fill: No

Recreation: Extensive swimming, small boating

Fishing: Recreational

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Influenced by poor water quality of upper Tamaki Estuary (Ref. 1).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 50 ha
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|------------|---|-------------|-------|------------|---|
| in: forest | - | residential | - 95% | bare earth | - |
| pasture | - | industrial | - | | |

Other land use likely to affect wetland:

Reserves present:

Land use changes anticipated up to year 2000: Little

District scheme - zoning provisions: Predominantly residential zoning (Ref. 2). Musick Point recreation zone.

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987). Habitat zoning off Musick Point and either side of Wakaaranga Creek entrance otherwise unzoned or recreation B and C (Ref. 3).

- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Department of Conservation (1980-1988) WERI. (Computerised Wetland Inventory).
2. Auckland Regional Water Board (1987) Tamaki Esturay Water Quality. ARWB Tech. publ. No. 42.
3. Manukau City Council (1984) District Scheme.
4. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

1. NAME Tamaki Drive
2. AREA CODE R11/18 Map 12
3. MAP REFERENCE NZMS 260 R11 770 824 to R11 717 818
4. LOCATION DESCRIPTION Open coastline between Tamaki River and Hobson Bay
5. TYPE OF WETLAND None
6. AREA OCCUPIED BY WETLAND (ha) None
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Previously Zostera beds at Okahu Bay. Disappearances largely attributed to a disease by the Labyrinthula slime mould, increased sediment load, reduced salinity, and pollution (Refs 1 and 2).
8. WILDLIFE VALUES Limited
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Zostera bed disappeared.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Part vested in Auckland Harbour Board, part Crown.

Management agencies: Auckland Harbour Board/Auckland City Council joint Grant of control. Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Auckland City Council
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN No Wetland. This area is one of Auckland's prime marine recreational areas.
14. WETLAND MODIFICATIONS PROPOSED Possible marina development near Pokanoo Point.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: No. Wharf at Orakei

Marinas/moorings: Okahu Bay

Waste disposal: Urban stormwater/sewage overflows

Refuse land fill: No

Recreation: Extensive/constant. Swimming, boating

Fishing: Recreational

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment – likely to affect wetland: Water quality on this foreshore is reasonable. Occasionally high faecal coliform numbers are recorded after heavy rain or sewage overflows (Ref. 4).

In 1953 a bacteriological survey of beaches to the east of the Orakei outfall, reported serious pollution at Mission Bay. Discharge of sewage at Orakei ceased in 1963-65 (Ref. 3).

16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha): Approximately 75 ha(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	-	residential	- 95%	bare earth	- 5%
	pasture	-	industrial	-		

Other land use likely to affect wetland: None known

Reserves present: Orakei Marae. Bastion Point.

Land use changes anticipated up to year 2000: Little

District scheme – zoning provisions: Residential (Ref. 5).

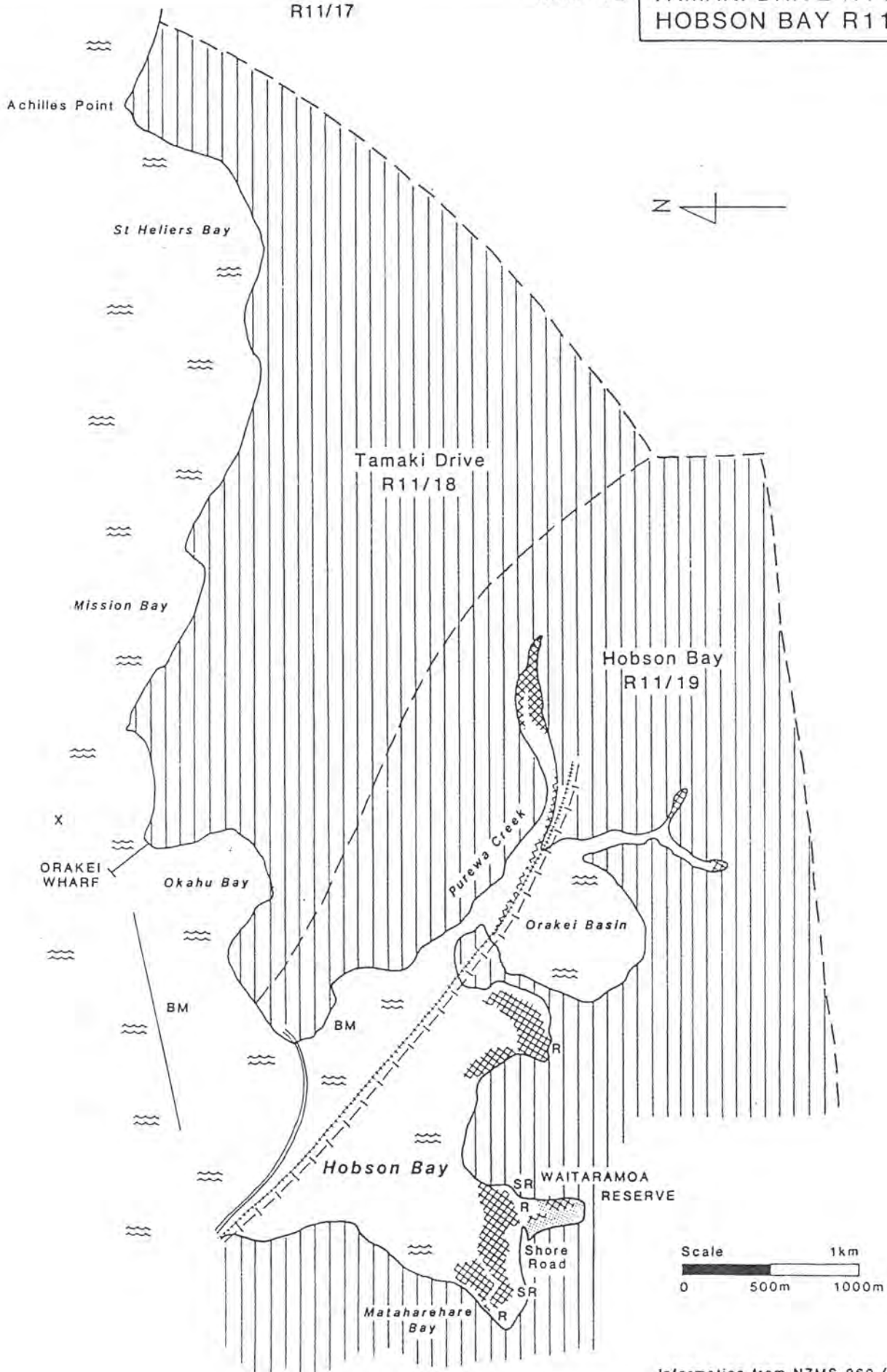
Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987) unzoned except habitat zone Archilles Point to West Tamaki Head (Ref. 6).

(c) Description of topography (soil type, slope, erosion susceptibility):17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Dromgoole, F.I. and B.A. Foster (1983) A change in the Marine Biota of the Auckland Harbour. Tane 29.
2. Armiger, L.C. (1965) A contribution to the Autecology of Zostera M.Sc thesis Auckland University.
3. Wallace, G.E., L. Newman (1953) Bacteriological survey of Auckland Harbours Extent of Sewage fields in Waitemata Harbour NZ Journal of Science and Technology 34.
4. Auckland Regional Water Board (1970-1988) Bathing Beach Surveys.
5. Auckland City Council (1987) District Scheme.
6. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

MAP 12

TAMAKI DRIVE R11/18
HOBSON BAY R11/19

R11/20

1. NAME Hobson Bay.
2. AREA CODE R11/19 Map 12
3. MAP REFERENCE NZMS 260 R11 710810
4. LOCATION DESCRIPTION Southern mouth of Waitemata Harbour, includes Hobson Bay and Orakei Basin.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha)
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Hobson Bay mangrove/saltmarsh association is greatly modified. Such a diversity of species (see table below) is unusual in one location only occurring elsewhere in the Waitemata Harbour at Pollen Island and to a lesser extent in Shoal Bay.

There has been radical changes in the vegetation of Hobson Bay since 1952, probably in response to extensive reclamations. The glasswort Sarcocornia quinqueflora has gained dominance in the salt marsh (Ref 4).

In 1958 there were good examples of mangrove/salt marsh established in the lee of a bar which moves slowly landward under wave influence.

In 1974 Morton and Chapman observed that the mangroves in the small areas at the head of the Bay appeared healthy and there was a normal amount of detrital material on the flats beneath them. The inshore mangrove in the southern part of the bay was observed to be typical high level mangrove, with small stunted trees (Ref 2). In 1985 Sutcliffe noted that there were both dead and healthy trees at Waitaramoa Reserve (Ref 4).

DOMINANT WETLAND VEGETATION/ASSOCIATION HOBSON BAY

<u>Species</u>	<u>Date Sited (Ref)</u>	<u>Comment</u>
<u>Avicennia marina</u> var. <u>resinifera</u>	1958(1), 1974(3)	
<u>Salicornietum</u>	1958(1)	
<u>Triglochin striatum</u>	1958(1), 1967(5), 1974(3), 1985(4)	)) Pioneer community
<u>Juncetum maritimi</u>	1958(1)	)
<u>Samolus repens</u>	1958(1), 1967(5), 1974(3), 1985(4)	) Pioneer where soil
<u>Juncus maritimus</u>	1958(1), 1974(3), 1985(4)	) Dominant behind) the above
<u>Leptocarpus similis</u>	1958(1), 1974(3)	) pioneers.
<u>Aster subulatus</u>	1958(1)	) Associated with
<u>Stipa teretifolia</u>	1958(1), 1974(3)	) <u>Juncus</u> and
<u>Selliera radicans</u>	1958(1) 1974(3), 1985(4)	) <u>Leptocarpus</u>
<u>Apium prostratum</u>	1958(1)	)

<u>Rhizoclonium hookers</u>	1958(1)	) At high tidal
<u>Enteromorpha clathrata</u>	1958(1)	) levels
<u>Lilaeopsis orbicularis</u>	1976(2)	) Rare salt marsh
<u>Triglochin cernuum</u>	1976(2)	) plants
<u>Sarcocornia quinqueflora</u>	1974(3), 1985(4), 1967(5)	
<u>Muehlenbeckia complexa</u>	1974(3)	
<u>Suaeda novae-zelandiae</u>	1974(3)	
<u>Plagianthus divaricatus</u>	1974(3), 1967(5)	
<u>Opium filiforme</u>	1974(3)	1985(4)
<u>Cotula coronopifolia</u>	1974(3), 1985(4)	These species present in salt marsh adjacent to Awaitamaroa Reserve in 1985.
<u>Calystegia sepium</u>	1974(3)	
<u>Phormium tenax</u>	1974(3)	
<u>Juncus gregiflorus</u>	1974(3)	1967(5). These species present in Portland Road salt marsh.
<u>Microtis unifolia</u>	1974(3)	
<u>Scirpus medianus</u>	1974(3), 1984(4)	
<u>Scirpus nodosus</u>	1974(3), 1967(5)	
<u>Scirpus cernuus</u>	1974(3)	
<u>Baumea juncea</u>	1974(3)	
<u>Gahnia setifolia</u>	1974(3)	
<u>Cyperus ustulatus</u>	1974(3)	
<u>Deyeuxia billardiera</u>	1974(3)	
<u>Plantago coronopus</u>	1967(5)	
<u>Festuca arundinacea</u>	1967(5)	

8. **WILDLIFE VALUES** A notable bird feeding area. Good habitat quality but subject to city influences and high public use (Ref 7).

Dominant species Pied stilt, South Island pied oystercatcher, black backed gull, red billed gull, white faced heron, pied shag (roosting and breeding 1987 in Orakei Basin), little shag, mallard duck, kingfisher, pukeko, pigeon (Ref 6).

9. **OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES** 'The Hobson Bay area is the largest bay on the Auckland isthmus' (Ref 19). For summary see (Ref 19). It is a breeding area for certain fish species.

10. **STABILITY OF WETLAND**

- 1911 - Sewer line built east to west across bay.
- 1920 - Large Zostera beds present (ref 1, 8).
- 1925 - Railway embankment built across bay NW to SE (Ref 4).
- 1928 - Large areas of mangrove in Orakei Basin.

- 1929 - Tamaki Drive embankment built, Orakei Basin impounded with tide gates. Basin mangroves removed (Refs 9, 4).
 1920 to 1930 - Zostera disappears. Hounsell (1935) (Ref 10) suggested that this was due to rapid silting following construction of embankments; Powell (1937) suggested geological causes whilst Armiger (1965) suggested disease as the cause (Refs 15, 11).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Hobson Bay - part vested in New Zealand Railways/part vested in Auckland Harbour Board. Orakei Basin - vested in Auckland Harbour Board.

Management agencies: Hobson Bay, Auckland Harbour Board) Waitemata Harbour
 Orakei Basin, Auckland City) Maritime Planning
 Council) Authority)

Name	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Auckland City Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority. Railways Corporation.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 In 1971 the ownership of Hobson Bay was to be offered to Auckland city as a gift to commemorate the Auckland Harbour Board centennial (Ref 19).

13. USE OF WETLAND BY MAN (Refer stability of wetland).

14. WETLAND MODIFICATIONS PROPOSED The bay continues to be threatened by reclamations and rapidly spreading exotic plant species. Proposed marina development, Whakatakataka Bay. Proposed south eastern arterial road adjacent to the railway through Hobson Bay.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

- (a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Adjacent to Okahu Bay.

Waste disposal: Pollution by dumping of mostly inorganic material in the north-east part of the bay. This rubbish is spread by the tide, sewage overflows, used swimming pool water.

Refuse land fill: 1950's, now reclaimed.

Recreation: School biology trips, walking, fossicking, waterskiing - Orakei Basin.

Fishing: Recreational.

Sand extraction: No.

Other: For summary see (Ref 19).

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: In 1977 the Regional Water Board reported satisfactory dissolved oxygen and bacterial concentration as well as biochemical oxygen demand at all sites sampled within the seawall at Hobson Bay. For summary of water quality see (Ref 19).

In 1978 the Regional Water Board observed: 'There is obvious serious organic pollution of the sediments and water in the south-western corner of the bay. This pollution is a result of industrial and sewage effluent entering the bay via drains near the bottom of Ayr Street' (Refs 14, 19).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|-----|---------|-------------|------------|------------|----|
| in: | forest | residential | 85% | bare earth | 5% |
| | pasture | 5% | industrial | 5% | |

Other land use likely to affect wetland: For summary of land uses see (ref 19).

Reserves present: Waitaramoa Reserve (9 ha). In the early 1970's the Auckland Harbour Board commissioned a proposal to create a large scale marine park in Hobson Bay (Ref 19).

Land use changes anticipated up to year 2000: Possible further reclamation of wetland areas inland from the actual bay. Possible alterations to the sewer lines across the bay.

District scheme - zoning provisions: Residential zoning predominant. Extensive areas of recreation zoning on foreshore of Purewa Creek, Orakei Basin and Shore Road area of Hobson Bay (Ref 18).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987). Habitat zone throughout Hobson Bay south west of railway line. Conservation zone in head of Purewa Creek. Habitat zone either side of Purewa Bridge. Recreation zones in Orakei Basin and either side of Tamaki Drive. Auckland Harbour Board Hobson Marine Park Empowering Bill (proposed 1973) (Ref 19).

- (c) Description of topography (soil type, slope, erosion susceptibility): In the small remaining areas of mangrove marsh, substrates consist of soft sediments of fine silts and muds which vary considerably in depth. Outside the mangrove marsh and over the greater area of the bay, the sediments consist of fine sand which is firm to walk on (Ref 12).

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Protect remaining salt marsh and mangrove areas from reclamation or other damage.

19. RELEVANT REFERENCES:

- (1) Chapman, V. J. and J. W. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus.
- (2) Morton, J. E. and V. J. Chapman (1976) in proceedings of symposium "Why are Mangroves Important" organised by Nature Conservation Council.
- (3) Gardner, R. O. (1974) Tane volume 20.
- (4) Sutcliffe, K. et al (1985). An Assessment of the Status of Waitaramoa Mangrove Salt Marsh and its Associated Wildlife. Auckland University student project paper 39.314.
- (5) Ward, J. M. (1967). Studies in Ecology on a Shell Barrier Beach, section 1, Vegetation 14, 241-96.
- (6) Bioresearches Limited (1987). Huntly-Marsden Power Station Proposed Natural Gas Pipeline, sector 2.
- (7) Department of Conservation (1988) Auckland Region faunal survey unpublished notes.
- (8) Dromgoole, F. I. and B. A. Foster (1983). Changes to the marine biota of the Auckland Harbour, Tane vol. 29.
- (9) Nature Conservation Council (1976). 'Why are mangroves important' symposium Whangarei.
- (10) Hounsell, W. K. (1935). Hydrological observations in Auckland Harbour. Trans. of the New Zealand Institute volume 11, 328.
- (11) Armiger, L. C. (1965). A contribution to the autecology of *Zostera*. M.Sc. thesis University of Auckland.
- (12) Chapman, V. J. and M. F. Larcombe (1974). Waitemata Harbour Study, ecological report on the Hobson Bay region. Prepared for the Auckland Harbour Board and Auckland Regional Authority.
- (13) Department of Conservation (1988) Auckland Region internal files.
- (14) Auckland Regional Water Board (1978). Twelve localities subject to environmental pressure.
- (15) Powell, A.W.B. (1937). Animal communities of the sea-bottom in Auckland and Manukau Harbours. Trans Royal Society of New Zealand, volume 66, 345-401.
- (16) Vaughan, J. L. (1979). Zooplankton changes in seawater impounded in the Orakei Basin.
- (17) Community concern group: Waitaramoa Working Team.
- (18) Auckland City Council (1987) District Scheme.
- (19) Auckland City Council and Auckland Harbour Board (1979). Hobson Bay - a planning review.

1. NAME Auckland Central Business District.
2. AREA CODE R11/20 Map 13
3. MAP REFERENCE NZMS 260 R11 690827
4. LOCATION DESCRIPTION Central Auckland area/port.
5. TYPE OF WETLAND None.
6. AREA OCCUPIED BY WETLAND (ha) None.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
8. WILDLIFE VALUES None.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Extensive reclamation for wharf facilities.
11. CONTROL OF WETLAND AND CATCHMENT
 Ownership status of wetland: Auckland Harbour Board, foreshore and seabed.
 Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

	<u>Name</u>
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Auckland City Council.
Crown	Department of Conservation.
Other	Waitemata Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN No wetland.
14. WETLAND MODIFICATIONS PROPOSED Further reclamations in wharf area (Ref 2). Proposed Princess Wharf redevelopment.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 (a) Use of adjoining water areas:
 Marine farming: No.
 Ports: Yes.
 Marinas moorings: Marina at Westhaven.

Waste disposal: Sewage overflows, ship sewage, industrial stormwater.

Refuse land fill: No.

Recreation: Boating.

Fishing: Recreational.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quite badly polluted by proximal urban development.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): No information.

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-------------|-----|------------|-----|
| forest | residential | 30% | bare earth | |
| pasture | industrial | 20% | commercial | 50% |

Other land use likely to affect wetland: Urban stormwater polluted by high density traffic; fuel storage tanks on waterfront.

Reserves present: None.

Land use changes anticipated up to year 2000: Further industrial/commercial development. Changes to wharves (Ref. 1).

District scheme - zoning provisions: Recreation zoning around Westhaven Marina. Industrial zones cover wharf areas. Residential zoning Herne Bay. CBD area a mix of industrial and commercial zones.

Controls other than District scheme likely to influence future land use:

- (1) Auckland Regional Planning Scheme (ref 4) defines seaward limits of port (refer map).
- (2) Waitemata Harbour Maritime Planning Scheme (1987).
Herne Bay area unzoned on foreshore; Recreation C and extensive habitat zone seaward.
Westhaven Recreation A zone.
Port areas port zoning (Ref 3).
- (3) Relevant legislation to this area (Ref 1). Dangerous Goods Act 1974, Marine Pollution Act 1974, Auckland Harbour Board By-Laws 1958, Auckland Metropolitan Drainage Act 1944, Harbours Act 1950, Health Act 1956, Explosives Act 1957, Territorial Sea and Fish Act, Animal Disease Provisions Regulations 1966, Water and Soil Conservation Act 1967, Litter Act 1968, General Harbour Regulations 1968, Clean Air Act 1972.

- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

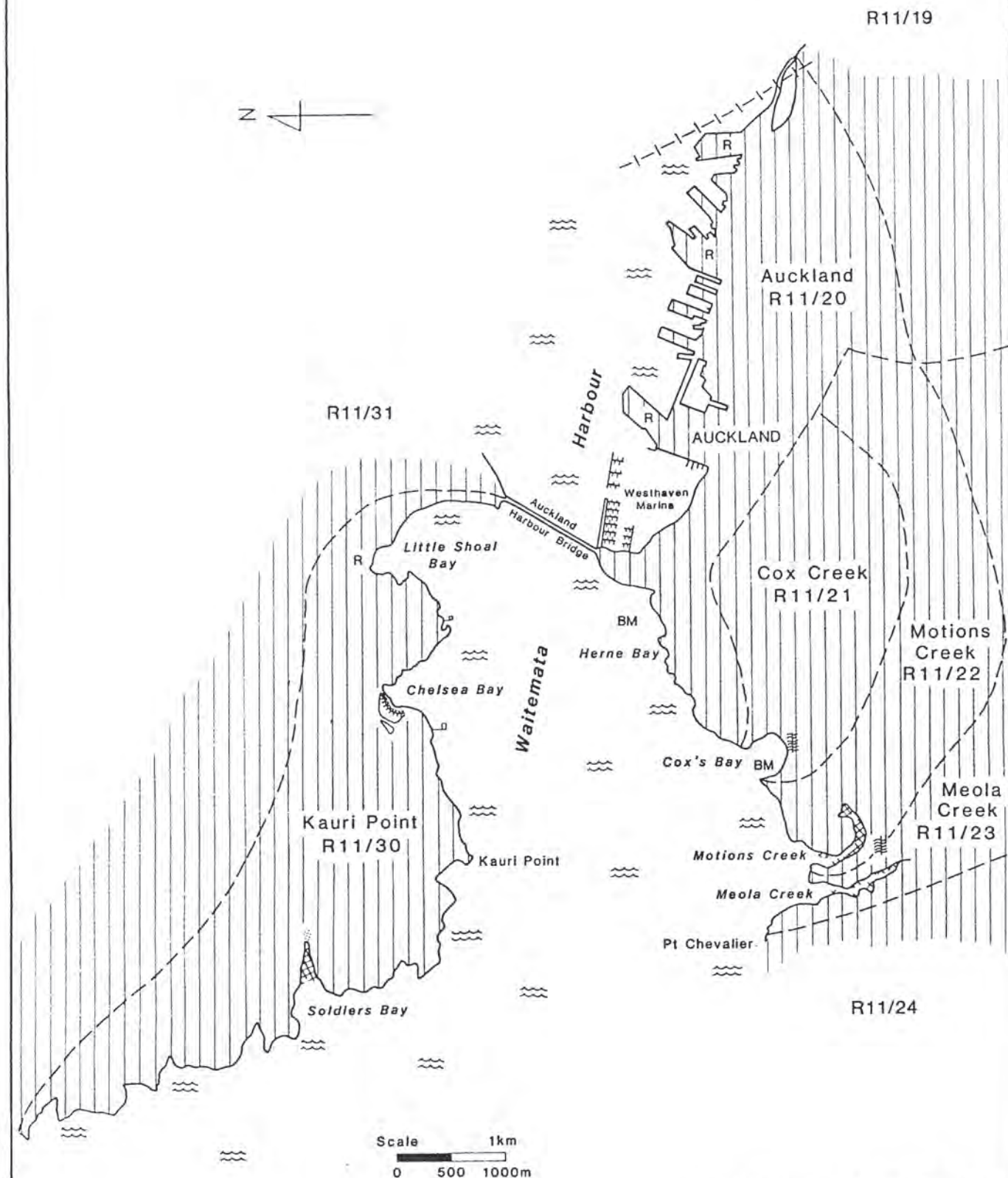
18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- (1) KRTA (1976) Auckland Harbour Board - Fergusson Wharf Stage III - supplementary information to environmental impact report.
- (2) Bioresearches Limited (1982). Biological and water quality effects of proposed reclamation and wharf construction at Kings Wharf, Auckland.
- (3) Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
- (4) Auckland Regional Authority (1987). Proposed Regional Planning Scheme.

MAP 13

AUCKLAND R11/20
 COX CREEK R11/21
 MOTIONS CREEK R11/22
 MEOLA CREEK R11/23
 KAURI POINT R11/30



Information from NZMS 260 (1987)

NZMS 270 (1977)

Aerial photographs (1988)

Lower

1. NAME Waitemata Harbour
2. AREA CODE R11/20A No map
3. MAP REFERENCE NZMS 260 R11
4. LOCATION DESCRIPTION Overview of the Waitemata Harbour (also see R11 21 to 30.
5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Entire harbour, 6000 ha
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The Waitemata Harbour, flanked by New Zealand's largest city, has extensive areas of mangrove in its most sheltered bays. The most valuable and diverse salt-marshes within the Waitemata occur in three areas:
 - i) Pollen Island/Traherne Island.
 - ii) Shoal Bay/Ngataringa Bay.
 - iii) Hobson Bay.

(Details of individual areas are outlined in areas R10 or R11, 18 to 33).

Spartina townsendii was planted in the Waitemata in 1926 and after 41 years grew to five patches totalling 0.024 ha (Ref 1).
8. WILDLIFE VALUES Wildlife habitats of particular value in the Waitemata are those where shell-banks provide roosting adjacent to mangrove forests/salt-marshes. These are Pollen Island, Traherne Island, Shoal Bay, and Herald Island (refer areas R10 or R11 - 18 to 33).

Rare species/endangered species NZ dotterel breeding since 1978 in three different areas. Fernbird colony of 20 to 40 birds in the harbour.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Recent research indicates that sediment input in the Upper Harbour has increased fourfold since the 1950s as a result of land use changes in the catchment (Ref. 5).
10. STABILITY OF WETLAND Maritime reclamation in Auckland Harbour dates back to about 1860 (Ref. 4). In the middle harbour 45% of the shoreline has been modified by reclamation (Ref. 2) (see areas 18 to 33 for further details).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board. NZ Railways.
 Management agencies: Auckland Harbour Board. Waitemata Harbour Maritime Planning Authority. Auckland City Council.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland (area includes Tamaki Estuary. Outer boundary is a line between Musick Point and North Head, Devonport)
Territorial local authority	Waitemata City, Takapuna City, Birkenhead City, Northcote Borough, Devonport Borough, Auckland City, Tamaki city, Manukau City, Rodney County.
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 In 1979 the Waitemata Harbour Maritime Planning Authority was formed by the ARA and AHB (Ref. 4).

13. USE OF WETLAND BY MAN See areas 18 to 33

14. WETLAND MODIFICATIONS PROPOSED See areas 18 to 33

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: Auckland Central: Kauri Point: Devonport Naval Base

Marinas/moorings: Numerous boat mooring areas. Westhaven, West Park, Bayswater (proposed), Half Moon Bay, Okahu Bay, plus most sheltered bays and inlets.

Waste disposal: Waitemata Harbour receives overflows from combined stormwater/sewerage systems. Sites particularly affected are Meola Creek, Coss Bay, and port areas. Industrial pollution affects south-western inlets.

Refuse land fill: In the Waitemata Harbour eleven separate tidal areas have been used for refuse disposal, but only one, in Ngatarina Bay, is still in use. All foreshore refuse landfills are now closed, although some leachate may still reach the harbour. In the past there have been sanitary landfills at Henderson Creek, Meola Road, Motions Road, Coks Creek, Barrys Point, Ngatarina Bay, Otara Creek and Brady Road (Ref. 4). Ninety-five hectares of tidal space have been reclaimed specifically as refuse disposal sites.

Recreation: Extensive recreational use for boating, swimming, fishing. For further details see areas 18 to 33 and Ref. 3.

Fishing: Extensive use.

Sand extraction: None

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Mildly polluted overall. Grossly polluted areas include Shoal Bay, Coks Creek, Motions Creek, Remuera Stream. Moderately polluted areas include Henderson Creek, Whau River, Tamaki Estuary, southern Orakei Basin, west of Wairoa Estuary (Ref. 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not available.

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-----|-------------|-----|------------|
| forest | | residential | 40% | bare earth |
| pasture | 35% | industrial | 20% | |

Other land use likely to affect wetland: Commercial areas. Port facilities.

Reserves present: Numerous local authority reserves.

Land use changes anticipated up to year 2000: Expansion of urban development in upper harbour areas.

District scheme - zoning provisions: Refer sheet R10 or R11, 18 to 33

Controls other than District scheme likely to influence future land use: 1) Waitemata Harbour Planning Scheme (1987). An extract from the Waitemata Harbour Maritime Planning Scheme is printed below outlining the reasons for inclusion in conservation and habitat zones.

2) Auckland Regional Planning Scheme (1987).

3) Regional Water Board restrictions (this Board could ensure that remedial work is undertaken by the appropriate authority as required),

4) Harbours Act.

- 5) Auckland Harbour Board Loan & Empowering Act 1967.
The following is an extract from the Waitemata
Harbour Maritime Planning Scheme (1987):

"Reasons for inclusion of conservation and habitat zones

The reasons for adopting these zones and the basis used to identify and define each area are:

Conservation

- i) To preserve areas which collectively contain significant examples of the range of major habitat types and combinations of habitats present within the maritime planning area.
- ii) To provide special areas for education, research, viewing and wildlife appreciation.
- iii) To preserve examples of rare habitats or habitats supporting relatively rare species, with the aim of retaining maximum habitat and species diversity, and encouraging the presence of uncommon animals and plants.

Habitat

- iv) The matters set out in i), ii) and iii) above, but where the areas or examples are of lesser quality or value.
- v) To protect concentrations of particular habitats or species, such as certain areas of mangrove afforestation and salt-marsh.
- vi) To protect areas which make a significant contribution to the continued health and quality of areas zoned 'conservation'.
- vii) To provide buffer zones or additional protection to conservation zones.

While the Authority recognises that the Pollen Island vicinity has ecological and visual values, it has not been included as a conservation zone because it has been identified in both the regional planning scheme and this scheme as the possible location for future major wharf and terminal facilities outside the commercial port areas. For these reasons a special Pollen Island zone has been provided (refer 4.2.23 - 4.2.27.

Whilst conservation and habitat zones are allocated only to certain areas within the harbour, the approach of the scheme is such as to provide a substantial level of protection for the ecology of the whole harbour (refer in particular to paragraph 1.5)."

(c) Description of topography (soil type, slope, erosion susceptibility):

The Auckland area, although not steep, has the type of soils which are readily transported to the harbour, where they form deep fine deposits suitable for mangrove colonisation in suitably sheltered areas. The Waitemata Harbour for the same reason has a high turbidity which limits productivity. Excessive or accelerated sediment transport such as that resulting from urban earthworks, results in the smothering and eventual death of mangrove and salt-marshes receiving this burden.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: The ecology of the Waitemata Harbour has been adequately documented.
18. FUTURE MANAGEMENT RECOMMENDATIONS: So many of the wetlands of the Waitemata Harbour have already been modified or destroyed that extreme care should be taken of those remaining, to ensure that their value as educational resources, public open spaces, and habitat for fish and birds, remain within the heart of New Zealand's largest city.
19. RELEVANT REFERENCES:

Partridge T R (1987). *Spartina* in NZ; NZ J. of Bot. 25:567-575

F I Dromgoole and B A Foster (1983). Changes to the Marine Biota of the Auckland Harbour - Tane 29; pp 79.

Auckland Regional Authority/Auckland Harbour Board (1974). Recreation in the Waitemata Harbour. Waitemata Harbour Study.

Auckland Regional Water Board (1978). Twelve localities subject to environmental pressure.

Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

Auckland Regional Authority/Auckland Harbour Board (1975) Waitemata Harbour Study.

Hume A (1987): Sediments of the upper Waitemata Harbour, specialist's report Harbour Study.

Swales A (1987): Reclamation in the Waitemata Harbour, a review - research report 20.441.

1. NAME Cox Creek
2. AREA CODE R11/21 Map 13
3. MAP REFERENCE NZMS 260 R11 642 820
4. LOCATION DESCRIPTION Bay between Herne Bay and Pt Chevalier
5. TYPE OF WETLAND None.
6. AREA OCCUPIED BY WETLAND (ha) None
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Zostera reported in Cox's Creek 1965 (Ref. 1). No longer present.
8. WILDLIFE VALUES No outstanding habitat values.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Zostera which was present is now gone.

Refuse reclamation before 1970.

An unauthorised reclamation at Cox's Creek (Ref. 2). The Council has title to the reclaimed land - it was to have been incorporated into either the Annual Reserves and Other Lands Disposal Act, or the Local Legislation Act (1984-85).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Vested in Auckland City Council
 Management agencies: Vested in Auckland City Council and Waitemata
 Harbour Maritime Planning Authority

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Auckland City Council
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Too polluted for water contact recreation.
14. WETLAND MODIFICATIONS PROPOSED None known

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Swing moorings in Cox Creek Bay.

Waste disposal: Combined sewer/stormwater overflows.

Refuse land fill: Retired in 1970

Recreation: Boating.

Fishing: Recreational.

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Sewage pollution from combined stormwater/sewers. Acute in 1988 (Ref. 3).16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha): Approximately 38 ha(b) Land use of catchment: Approximate percentage of total catchment in:

forest	-	residential	- 95%	bare earth	-
pasture	-	industrial	-	commercial	- 5%

Other land use likely to affect wetland: None known

Reserves present: Local reserve on reclamation.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Residential (Ref. 4)

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987) zoned Recreation E. Whole of Cox's Creek (Ref. 5).

(c) Description of topography (soil type, slope, erosion susceptibility): Rolling hills, complete urban development.17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:18. FUTURE MANAGEMENT RECOMMENDATIONS: Improve water quality by upgrading of sewers.19. RELEVANT REFERENCES:

1. Armiger, L.C. (1965) A contribution to the Autecology of Zostera. MSc. thesis, Auckland University.

2. Department of Conservation (1988) Auckland Region, Internal File 54/4.
3. Henderson, K. (1988) Personal communication. Water Quality Officer, Auckland Regional Water Board.
4. Auckland City Council (1987) District Scheme.
5. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.

1. NAME Motions Creek
2. AREA CODE R11/22 Map 13
3. MAP REFERENCE NZMS 260 R11. 630 814
4. LOCATION DESCRIPTION Central southern coast of Waitemata
5. TYPE OF WETLAND Mangrove.
6. AREA OCCUPIED BY WETLAND (ha) Approximately eight hectares.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Avicennia marina var. resinifera
8. WILDLIFE VALUES Limited.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.
10. STABILITY OF WETLAND Reclamation by refuse in early 1970s
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Vested in Auckland City Council.
Management agencies: Vested in Auckland City Council: Waitemata Harbour
Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Auckland City Council) Each has) jurisdiction Mt Albert City Council) over part of) Motions Creek) catchment
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Receives drainage from zoo.
14. WETLAND MODIFICATIONS PROPOSED None known.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: No
- Ports: No

Marinas/moorings: No

Waste disposal: Stormwater/sewer overflows. Run-off from zoo and Western Springs Stadium.

Refuse land fill: Refuse landfill in mangroves, closed 1970s

Recreation: Little

Fishing: No

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Sewage overflow pollution

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approx. 50 ha

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | |
|------------|-----------------|-----------------------------|
| in: forest | residential 60% | bare earth |
| pasture | industrial | Western Springs/
Zoo 40% |

Other land use likely to affect wetland: Zoo, old refuse tips, Western Springs Stadium/Motor sports

Reserves present: Zoological

Land use changes anticipated up to year 2000: Little

District scheme - zoning provisions: Recreation zoning throughout zoo area. Residential zoning in upper catchment (Ref. 1)

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Schemes (1987). Meola Creek unzoned. However, offshore there is a conservation zone over Meola Reef (Ref. 2)

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating hills surrounding wetland.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Prevent further tipping and/or reclamation.

19. RELEVANT REFERENCES:

- 1) Auckland City Council (1987) District Scheme.
- 2) Waitemata Harbour Maritime Planning Scheme (1987) Maritime Scheme.

1. NAME Meola Creek
2. AREA CODE R11/23 Map 13
3. MAP REFERENCE NZMS 260 R11. 628 810
4. LOCATION DESCRIPTION Southern margin of Waitemata Harbour
5. TYPE OF WETLAND Mangrove, Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION *Avicennia marina* var. *resinifera* in creek entrance. Appears that *Zostera* is returning here (Ref. 1).
8. WILDLIFE VALUES Limited by urban development.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Flooding problems are known to occur in the vicinity of Meola Creek. Flood alleviation work has been undertaken (Ref 2).
10. STABILITY OF WETLAND Refuse reclamation early 1970s, Auckland City Council.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Vested in Auckland City Council.
 Management agencies: Vested in Auckland City Council: Waitemata Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Auckland City Council, Mt Albert city, Mt Eden Borough and Mt Roskill Borough.
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Relevant District Scheme Policy - "No change which alters a water course, affects the natural flow, overflow or ponding of a stream or floodwaters, or involves any filling or raising of existing ground levels in the vicinity of a watercourse, will be permitted without Council's prior consent."

13. USE OF WETLAND BY MAN
14. WETLAND MODIFICATIONS PROPOSED
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Stormwater from Western Springs and surrounding suburbs. Stormwater/sewer overflows.

Refuse land fill: Yes; closed

Recreation: Yes; Meola Creek aquatic area - boating, sail-boarding, bathing.

Fishing: No

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Sewage overflow pollution. Recognised as one of the twelve most pollution prone areas in the Waitemata Harbour (Ref. 2).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 162 ha.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | | |
|-----|---------|---|-------------|-----|------------|---|
| in: | forest | - | residential | 90% | bare earth | - |
| | pasture | - | industrial | 10% | | |

Other land use likely to affect wetland: Not known.

Reserves present: Includes part of Museum of Transport & Technology. Chamberlain Golf Course

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Where this catchment goes into the Mt Roskill borough it goes into the Water Protection Area. This limits the activities in the area to protect the water in the aquifers which supply Onehunga. Mt Albert City district scheme imposes mechanisms to stop contamination of the ground water supply, the storage of harmful substances, and places restrictions on the types of industry (Refs 3, 4).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987) unzoned.

Responsibilities with respect to sewer overflows: Bulk sewage is the responsibility of ARA. Local councils are responsible for local reticulation.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating landscape surrounding wetland.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Foster B A (1988) pers. comm. Zoology Department, Auckland University.
- 2) Auckland Regional Water Board (1978). Twelve localities subject to environmental pressure.
- 3) Mt Roaskill Borough (1983) District Scheme.
- 4) Mr Albert City (1986) District Scheme.

1. NAME Oakley Creek, Traherne Island, Pollen Island.
2. AREA CODE R11/24 Map 14.
3. MAP REFERENCE NZMS 260 R11 624820 to R11 586810.
4. LOCATION DESCRIPTION South-west Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION A comprehensive description of this area was given by Larcombe in 1973 (ref 10) and is reproduced here in full. Details are supported by refs 1 and 9.

Mangrove marsh The small area of mangrove adjacent to the reserve at Walker Road retains permanent water in some areas which has permitted the growth of large quantities of green algae - mainly Enteromorpha sp.

Within the Waterview Inlet there is a fringe of mangrove around the entire shoreline. On the eastern side there are quite large trees at lower tidal levels, while towards the western side and in the vicinity of Traherne Island the size of the trees is limited by the high intertidal levels. At present the whole area is ecologically healthy.

Salt marsh There are extensive areas of high tidal salt marsh adjacent to Pollen and Traherne Islands. Mangrove occupies lower ground than Salicornia, (Sarcocornia) while Juncus and Leptocarpus occupy the highest marsh. In the area behind Pollen Island three types of marsh are easily recognisable.

Mangrove

Salicornia (Sarcocornia quinqueflora)

Sedge

Amongst the Leptocarpus - Juncus marsh may also be found.

Stipa teretifolia.

Plagianthus divaricatus.

Selliera radicans.

Samolus repens.

On the higher levels of the stabilised shell bank there has been considerable growth of flax (Phormium) with the shrubs.

Plagianthus.

Cassinia retorta.

Leptospermum scoparium.

Grasses

Festuca arundinacea.

Arundo conspicua.

on top of the shell

Aster subulatus.

Rumex sp.

Anagallis arvensis.

Plantago lanceolata.

Plantago coronopus.

The marshes of this area are probably rising slowly with the consequent spread of the above communities over what was previously open sand flat in the sheltered area.

In 1958 there were dense almost inaccessible mangroves on the eastern side of Rosebank Peninsula (Ref 1).

Pollen Island, Traherne Island and their surrounding areas contain the most important intertidal marsh and shell bar habitat in the Waitemata Harbour. The islands and adjacent marine and maritime habitat are important bird roosting, feeding and breeding areas. The general area has a very high natural environment ranking supported by the recognition of three conservation zones (Henderson Creek, Te Atatu South, Traherne Island) and five habitat zones in the Waitemata Maritime Scheme.

8. WILDLIFE VALUES Pollen and Traherne Islands are important wading bird roosts, being the main roosts for banded dotterel and wrybill in the Waitemata Harbour.

Dominant species Pied stilt, white-faced heron, pied shag, little black shag, duck, pukeko, white heron (Ref 10).

Rare species/endangered species Fernbird breeding at Pollen Island (Ref 2).

Banded dotterel	)
Wrybill	) Traherne Island
New Zealand dotterel	)

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

Feeding area for snapper, flounder and yellow-eyed mullet (Ref 10).

10. STABILITY OF WETLAND Because of the industrial nature of Rosebank Peninsula, problems related to reclamation (and rubbish dumping) of areas which were previously wetlands is significant (Ref 3).

Construction of the North Western Motorway isolates the harbour inlet from the rest of the Waitemata Harbour. The Pollen Island and Traherne Island swamps have been materially modified by the construction of a major road across them (Ref 1).

Inside the motorway there has been rapid accumulation of fine sediments in the central basin. This resulted in a rise in substrate level and the mangrove moving steadily outward from the shore (Ref 10).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.

Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Auckland City Council, Mt Albert City Council and Mt Roskill Borough Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Construction of motorway embankment across the estuarine area for the North Western Motorway must have had effects on hydrology with consequent changes in sedimentation and mangrove settlement.

14. WETLAND MODIFICATIONS PROPOSED Auckland Harbour Board may some day use this area for a new port of Auckland (Ref 7). Proposed in 1987 to construct a high pressure gas pipeline with complete clearance of vegetation from part of Traherne Island and adjacent intertidal area. Dredging and reclamation next to North Western Motorway.

The Auckland Regional Authority is investigating Pollen Island as one of a number of possible sites for hazardous goods storage (1987).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: No.

Waste disposal: Stormwater disposal from residential and industrial areas. Stormwater from Rosebank industry pollutes Waterview Basin (Ref 4).

Refuse land fill: Water sports. No recreational facilities are available in the inlet east of Rosebank Peninsula, however, the tidal inlet has a scenic and significant ecological value.

Recreation: Net fishing for flounder.

Fishing: See recreation.

Sand extraction: No.

Other: Much reclamation and rubbish dumping. Many industries are responsible for damage to the coastal protection yard and trespass into the mudflat region.

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Three broad sources of pollution resulting in damage to intertidal ecosystems:

- (1) Industrial effluents.
- (2) Illegal reclamations.
- (3) Illegal rubbish dumping (Ref 3).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 187 ha.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|------------|-------------|-----|------------|
| in: forest | residential | 60% | bare earth |
| pasture | industrial | 40% | |

Other land use likely to affect wetland: None known.

Reserves present:

Land use changes anticipated up to year 2000: Infilling of urban development.

District scheme - zoning provisions: Mt Albert City District Scheme demands precautions to prevent contamination of ground water. Care taken in the storage of harmful substances, restrictions in types of industry. Zoning in Mt Albert District Scheme to protect the natural flow, overflow and ponding of the Oakley Stream.

The Rosebank Peninsula is bounded along its coastal perimeter by a 12 m coastal protection yard. This yard is required to be kept in a 'clean and natural' state, but there appears a definite lack of regard for this covenant (Ref 5).

Controls other than District scheme likely to influence future land use: The Proposed Auckland Regional Planning Scheme (Ref 6) states 'Until a decision has been made on the use of Pollen Island for port development, the wildlife value of this locality should be protected from other activities'.

Waitemata Maritime Planning Scheme (1987)(ref 7). A special Pollen Island zone covers the foreshore from the Whau River entrance south east to R11 615780. Seaward of this zone is abroad conservation zone (off Pollen Island) and habitat zone in Oakley Creek entrance. The eastern shoreline from Oakley Creek entrance to Pt Chevalier is unzoned.

Extract from Waitemata Harbour Maritime Planning Scheme - 'The Authority considers that the Pollen Island vicinity is the most likely location for possible future major wharf and terminal facilities outside the Commercial Port. The region planning scheme provides that this area be preserved for that purpose. The design and implementation of development proposals should, wherever possible have regard to the natural qualities of the area. Pollen Island is an area having ecological qualities equivalent to those locations included in the conservation zone. To recognise its potential as a future major wharf and terminal facility and at the same time to conserve its ecological values a special zone has been provided.

'In some circumstances limited works within the Pollen Island zone may be desirable. For example, the extension of bird roosts and the fostering of sensitive species or habitats. Such works will be exceptions to the scheme because the sensitivity of this area is such that the Authority should ensure that no unacceptable damage is done when the work is undertaken. Works to assist public access would be inappropriate in this area because its isolation has been an important contributing factor to its present ecological condition.'

- (c) Description of topography (soil type, slope, erosion susceptibility):
Fairly flat land, heavily urbanised.

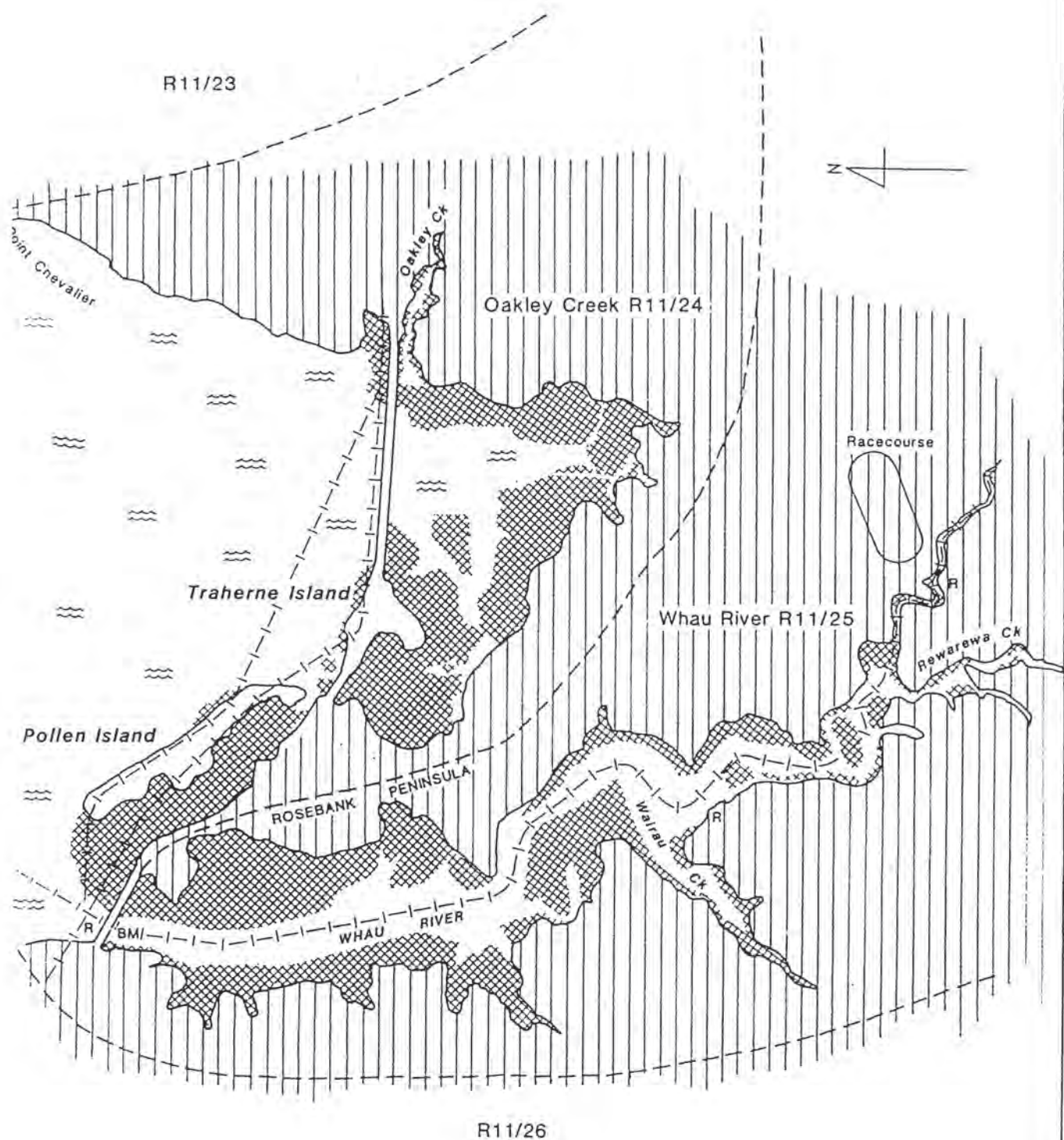
17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: This regionally significant wetland unique to the Waitemata Harbour should be given maximum possible

protection barring port development. Impose industrial performance standards to control potential sources of water contamination from industries.

19. RELEVANT REFERENCES:

- (1) Chapman, V. J. and J. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus. DSIR Bulletin No. 125.
- (2) Department of Conservation (1980-1980) WERI.
- (3) Auckland Regional Water Board (1984) Water Pollution of Rosebank Peninsula - A Case Study of Water Pollution and Related Impacts of an Industrial Area. Auckland Regional Water Board/Auckland City Council. Joint study. Working report No. 18.
- (4) Henderson, K. (1988) pers. comm. Auckland Regional Water Board staff.
- (5) Mt Albert City Council (1986) District Scheme.
- (6) Auckland Regional Authority (1987). Proposed Regional Planning Scheme.
- (7) Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
- (8) Bioresearches Limited (1987). Huntly-Marsden Power Station Natural Gas Pipeline Sector 2, Traherne Island.
- (9) Ward, J. M. (1967). Studies in Ecology on a Shell Barrier Beach Section 1, Vegetation 14, 241-96.
- 10 Larcombe, M. (1973) Ecology Report; Waitemata Harbour Study. Auckland Regional Authority/Auckland Harbour Board.



Scale 1km
0 500 1000m

Information from NZMS 260 1987
NZMS 270 1979
Aerial photographs 1988

1. NAME Whau River.
2. AREA CODE R11/25 Map 14.
3. MAP REFERENCE NZMS 260 R11 585800.
4. LOCATION DESCRIPTION Sub-estuary in south west of Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND Approximately 40 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Where the intertidal region widens, mangroves occur in a fringe near the shore and there are extensive areas of open mud flat below the mangrove level. Sedges and salt marsh plants are found in some high tidal areas where substrates are relatively firm (Ref 1).
Fringing salt marsh species: Leptocarpus simplex.
Juncus maritimus var australiensis.
Sarcocornia quinqueflora.
Selliera radicans.
Samolus repens.
8. WILDLIFE VALUES Known for bird feeding (Ref 2).
Dominant species White-faced heron, pied stilt, red-billed gull, duck, pied shag, little pied shag, little black shag (Ref 1).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Probably a feeding area for yellow-eyed mullet, flounder and parore (Ref 1).
10. WESTERN STABILITY OF WETLAND Construction of the North Western Motorway across estuary mouth has influenced wetlands.
Extensive reclamation at the End of Archibald Road (1973). Inorganic refuse tip in 1972 at end of Canal Road (Ref 1).

A lot of private unauthorised reclamations at the rear of private properties. This plus rubbish dumping has intruded on wetland areas (Refs 3, 4). New Lynn Borough Council hard filled small arms in the Upper Whau Estuary in the early 1970's.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.
Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Auckland City, Waitemata City, Glen Eden Borough, New Lynn Borough.

Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Rubbish dumping, receives industrial stormwater (Ref 4).

14. WETLAND MODIFICATIONS PROPOSED Continuing unauthorised industrial reclamations if controls are not tightened. Minor foreshore works proposed.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Mooring of boats in river. The lower reaches of the estuary are used extensively for yacht moorings and small craft can easily be launched from boat ramps near the north-western motorway.

Waste disposal: Wastes discharged into river from industrial and commercial establishment.

Refuse land fill: None.

Recreation: Limited.

Fishing: No commercial fishing, some recreational fishing.

Sand extraction: No.

Other: Much reclamation and rubbish dumping. Many industries are responsible for damage to the coastal protection yard and trespass into the mud flats region.

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Whau river is a long, narrow, poorly flushed estuary, as such it is moderately sensitive to pollution. This is a fully urbanised catchment with a large industrial and commercial component in the suburbs of New Lynn and Avondale (Ref 5). Water coming from the Whau River is turbid and has high coliform concentrations. In Rewarewa Creek the water is a little brackish, but water quality has improved. Water at the mouth of the Wairua Creek is estuarine, but even considerable dilution by seawater cannot mask the input of polluted water from the surrounding urban development (Ref 5).

Three broad sources of pollution -

- (1) Industrial effluents.
- (2) Illegal reclamations.
- (3) Illegal rubbish dumping (Ref 2).

Foulwater discharges into the stormwater system.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 325 ha.
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|------------|---|-------------|-----|
| in: forest | - | residential | 70% |
| bare earth | | | |
| pasture | - | industrial | 30% |

Other land use likely to affect wetland: The industrial area of Rosebank Peninsula has a large impact on the Whau Creek.

Reserves present: All residential zone is bounded at foreshore by local reserves.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: The Rosebank Peninsula is bounded along its coastal perimeter by a 12 m coastal protection yard (upon every industrial zoned site on the peninsula). This yard is required to be kept in a 'clean and natural' state, but there appears to be a definite lack of regard for this covenant (Ref 4).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987). Almost the entire shoreline and upper estuary are habitat zoned. The mouth and a wide channel in the downstream area are zoned recreation B (Ref 6).

Area adjoining Rosebank Peninsula of Whau River is authorised reclamation zone by the Auckland Harbour Board Empowering Act 1967.

Area of river at mouth of Wairau Creek is: authorised reclamation zone Auckland Harbour Board and Waitemata City Council Empowering Act 1967.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating area, heavily built-up.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: The means must be found to arrest continual foreshore abuse by unauthorised reclamation and refuse dumping. Impose Industrial Performance Standards to control potential sources of water contamination from industries.

19. RELEVANT REFERENCES:

- (1) Larcombe, M. (1973) Ecology Report; Waitemata Harbour Study prepared for Auckland Regional Authority and Auckland Harbour Board.
- (2) Bioresearches Limited (1987). Huntly-Marsden Power Station. Proposed natural gas pipeline, Sector 2.
- (3) Department of Conservation internal files.
- (4) Auckland Regional Water Board (1984). Rosebank Peninsula - A Case Study of Water Pollution and Related Impacts of an Industrial Area. Carried out jointly by the Auckland Water Board and Auckland City Council. Auckland Regional Water Board working report No. 18.
- (5) Auckland Regional Water Board (1978). Twelve localities subject to environmental pressure.

- (6) Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
- (7) Chapman, V. J. and J. W. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus. DSIR Bulletin No. 125.

1. NAME Te Atatu Peninsula.
2. AREA CODE R11/26 Map 15
3. MAP REFERENCE NZMS 260 R11 582812 to R11 575850.
4. LOCATION DESCRIPTION Western margin of Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Large area of mangroves north of Te Atatu. The area here is either pure mangrove swamp or bare sand flat. The sand flat is generally unsuitable for plant colonisation (Ref 1). Mangroves at the back of channels grow to 3 m high (Ref 3). An extensive saltmarsh area fringes the shore to the south of Harbour View Road. In this region are found healthy sedge and rush communities and meadows of the glasswort Sarcocornia quinqueflora and other small succulents (Ref 2). The stable part of the high tidal shell barrier supports a variety of plants listed under area R11/31 Shoal Bay.
8. WILDLIFE VALUES The shellbanks form valuable bird roosts in combination with feeding areas in mangroves and on mud flats.

Dominant species Kingfisher, red-billed gull, white-faced heron, pied stilt, pied shag, gannet (Refs 2, 3).

Rare species/endangered species Caspian tern (roosting) (Ref 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The shell barrier and extensive tidal saltmarsh are natural habitats under considerable threat in the Waitemata Harbour.
10. STABILITY OF WETLAND The wetland has remained fairly stable.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Part Crown/part Auckland Harbour Board.
Management agencies: Auckland Harbour Board. Waitemata Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Waitemata City Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN A valuable educational resource close to city schools.
14. WETLAND MODIFICATIONS PROPOSED Auckland Harbour Board have a large area of this foreshore authorised for reclamation for future port purposes. The area extends down the eastern margin of Te Atatu Peninsula to the motorway. Minor foreshore works proposed.
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: No.
- Ports: No.
- Marinas/moorings: No.
- Waste disposal: Industrial stormwater problems here (Ref 5).
Sewer overflow off end of peninsula (Ref 6a).
- Refuse land fill: No.
- Recreation: Walking, fossicking.
- Fishing: Flounder, snapper.
- Sand extraction: No.
- Other:
- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Better water quality than in Whau Estuary to the south.
16. CHARACTERISTICS OF WETLAND CATCHMENT
- (a) Approximate total area of catchment (ha): Approximately 37 ha.
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|-----|---------|-------------|----------------|
| in: | forest | residential | 50% bare earth |
| | pasture | 50% | industrial |
- Other land use likely to affect wetland:
- Reserves present: Residential areas are bounded by foreshore reserves.
- Land use changes anticipated up to year 2000: Port development a possibility.
- District scheme - zoning provisions: North of Harbour View Road zoned residential with coastal fringe of recreation zoning or proposed reserve. South of Harbour View Road zoned industrial (Ref 7).
- Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987), a mix of habitat and conservation zoning extend throughout this Te Atatu shoreline. Protection areas extends far north and east towards the main harbour channel. Conservation zoned areas cover present mangrove areas (ref 6b).

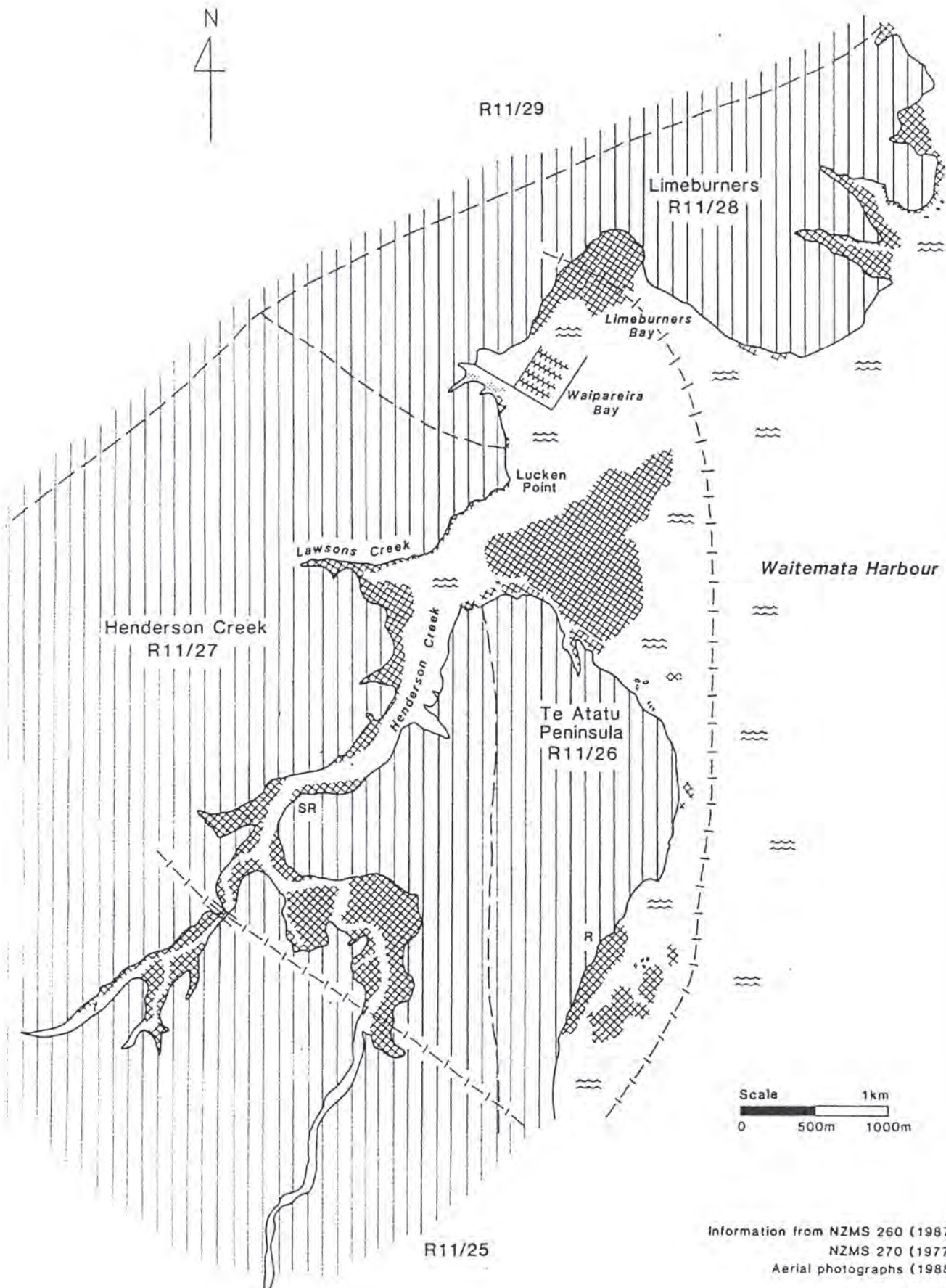
- (c) Description of topography (soil type, slope, erosion susceptibility):
Development of the industrially zoned land to the south could result in severe sediment deposition on this foreshore.
17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Adequate information.
18. FUTURE MANAGEMENT RECOMMENDATIONS: If the port development does not eventuate, the high tidal marsh, mangrove marsh and shell barrier region to the south of Harbour View Road should be protected for wildlife and educational purposes.
19. RELEVANT REFERENCES:
- (1) Chapman, V. J. and J. W. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus DSIR Bulletin No. 125.
 - (2) Larcombe, M. (1973) Ecology Report, Waitemata Harbour Study, Auckland Regional Authority/Auckland Harbour Board.
 - (3) Cox, G. J. (1977). Utilisation of Mangrove Swamps by Birds, M.Sc. Thesis, Auckland University.
 - (4) Bioresearches Limited (1987). Huntly-Marsden Power Station Natural Gas Pipeline, Sector 2. Marine biological assessment.
 - (5) Henderson, K. pers. comm. Auckland Regional Water Board staff.
 - (6) Waitemata Harbour Maritime Planning Authority.
 - (6a) 1985 Draft Maritime Scheme.
 - (6b) 1987 Maritime Scheme.
 - (7) Waitemata City Council (1984) District Scheme.

MAP 15

TE ATATU PENINSULA R11/26

HENDERSON CREEK R11/27

LIMEBURNERS R11/28



1. NAME Henderson Creek.
2. AREA CODE R11/27 Map 15
3. MAP REFERENCE NZMS 260 R11 567847
4. LOCATION DESCRIPTION Extreme western margin of Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND 147 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The edges of Henderson Creek are lined with mature mangroves (Refs 1, 2). Huruhuru Creek is narrow intertidally with few mangroves (Ref 2).

The entrance to Henderson Creek has: Avicennia marina var. resinifera, Leptocarpus simplex and Sarcocornia quinqueflora. Mangroves and sedge species as above occur in the middle creek area plus small patches of Zostera amongst high tidal mangroves. Small patches of sedge at high tide mark occur in the upper creek area (ref 2).
8. WILDLIFE VALUES Birds feed mainly near the entrance to the creek where intertidal flats are widest.

Dominant species Kingfisher, pied stilt, white-faced heron, red-billed gull, black-backed gull, pied shag, little black shag, pukeko, white-fronted tern, duck.

Rare species/endangered species Caspian tern.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Flat fish, yellow-eyed mullet and parore are thought to depend on the estuary (Ref 1).
10. STABILITY OF WETLAND
Reclamations in this area include:
(1) Waitemata City refuse reclamation near Taikata Road (closed 1974).
(2) Taikata Sailing Club reclamation near creek entrance.

Illegal reclamations in Henderson Creek include:

A 150 m² use in 1980 (to cover up rubbish dumped prior to present occupation of site). It is proposed to make this reclaimed land a reserve.

In 1985 there was an unauthorised industrial reclamation below HWM and dumping of fill and rubbish from a council reserve (Ref 3).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

<u>Name</u>	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.

Territorial local authority	Henderson Borough Council, Waitemata City Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Illegal rubbish dumping.

14. WETLAND MODIFICATIONS PROPOSED Possible clearance and dredging of streamways to reduce flooding of catchment. Minor foreshore works proposed.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: No.

Waste disposal:

Residential and horticultural stormwater. Major waste discharge to saline water at Waitemata City is from the solid waste baling and processing station. Some leachate and silt loss to harbour is adversely affecting mangroves (Ref 5).

Refuse land fill: Taikata Road Tip closed 1974.

Recreation: Water sports.

Fishing: Limited.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The Taikata Road refuse reclamation has resulted in increased sedimentation in the estuary (Ref 1). Other than this, water quality is satisfactory.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 10,000 ha.

- (b) Land use of catchment: Approximate percentage of total catchment
in: forest residential 30% bare earth
pasture 40% industrial

Other land use likely to affect wetland: Intensive horticulture (large areas of orchards and vineyards). Two refuse baling stations at Massey and at Kay Road (Ref 6).

Reserves present: Boundary of waterway - proposed public reserve.
A few public reserves at foreshore (Ref 7).

Possible land use changes anticipated up to year 2000: Further residential development.

District scheme - zoning provisions: Mostly residential, residential deferred or rural-residential zoning. Small area zoned for broadcasting purposes, rural zoning on fringes of catchment.

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987) (Ref 8).
Downstream half of creek up to Huruhuru Creek mouth is unzoned.
Huruhuru Creek habitat zoned.
Henderson Creek - headwaters and south western shores habitat zoned.
- north eastern shore conservation zoned.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently rolling.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Rigorously protect estuary from sediment deposition during urbanisation of catchment. Care needed in use of pesticides in horticulture to prevent losses to estuary.

19. RELEVANT REFERENCES:

- (1) Larcombe, M. (1973) Ecology Report; Waitemata Harbour Study. Auckland Regional Authority/Auckland Harbour Board.
- (2) Bioresearches Limited (1987). Huntly-Marsden Power Station Natural Gas Pipeline Sector 2.
- (3) Department of Conservation Northern internal files.
- (4) Auckland Regional Water Board (1986). Draft Catchment Management Plan, Opanuku Stream, Henderson. Summary report and drawings.
- (5) Henderson, K. pers. comm. Auckland Regional Water Board staff.
- (6) Auckland Regional Authority (1987). Auckland Region Refuse Disposal Discussion Document.
- (7) Henderson Borough Council (1987) District Scheme.
- (8) Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
- (9) Waitemata City Council (1984) District Scheme.

1. NAME Limeburners.
2. AREA CODE R11/28 Map 15
3. MAP REFERENCE NZMS 260 R11 568855 to R11 595890.
4. LOCATION DESCRIPTION North western margin of Waitemata Harbour.
Southern headland of upper Waitemata.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND Approximately 50 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
Avicennia marina var. resinifera.
Extensive mangrove marshes sheltered by shell barriers. Small patches of sedge west of Henderson Creek mouth (Ref 1).
8. WILDLIFE VALUES Wader roosts on shell bars. Major wader feeding area to east of proposed natural gas pipeline route (Ref 2).

Dominant species Pied stilts, red-billed gulls, black-backed gulls, kingfisher, pukeko, white-faced heron, pied shag, white-fronted terns.

Rare species/endangered species Caspian tern.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Valuable fish feeding area especially for juvenile flounder (Ref 1).
10. STABILITY OF WETLAND Development of West Park Marina approximately 1985. Dredging, reclamation and loss of some mangroves (Ref 3).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

	<u>Name</u>
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Waitemata City Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.
13. USE OF WETLAND BY MAN Fossicking/fishing.

14. WETLAND MODIFICATIONS PROPOSED Proposal for a natural gas pipeline (Ref 2). Construction of pipeline would disturb birds roosting on shell banks and may damage some roost areas. Westpark Marina may propose further reclamations.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: West Park Marina, Waipareira Bay.

Waste disposal: Residential stormwater. Hobsonville airbase stormwater.

Refuse land fill: No.

Recreation: Boating associated with marina. Walking, fossicking.

Fishing: Flounder netting to south, line fishing to north.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Reasonable water quality and flushing. Some marina influence.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 750 ha.

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | |
|---------|-------------|------------|------------|
| forest | residential | 10% | bare earth |
| pasture | 80% | industrial | |

Other land use likely to affect wetland: Hobsonville Air Force Base and village. Intensive horticulture.

Reserves present: A lot of reserved foreshore land. A few local authority parks and reserves (including Luckens Reserve) (Ref 4).

Land use changes anticipated up to year 2000: Further residential development.

District scheme - zoning provisions: Small area of rural zoning to north of Limeburners Bay. Remainder of catchment, except Hobsonville Air Base, is in residential zoning (ref 4).

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987) habitat zoning extends from northern headland of Bomb Bay to headland between Limeburners Bay and Waipareira Bay. The northern half of Waipareira Bay is zoned recreation A and the balance to the south west is unzoned (Ref 5a). Area out from Waipareira Bay: Waitemata City Council Empowering Act 1979 authorised port reclamation (Ref 5b).

- (c) Description of topography (soil type, slope, erosion susceptibility): Not subject to erosion, gently rolling, clay soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Conserve shellbanks and mangrove areas.

19. RELEVANT REFERENCES:

- (1) Larcombe, M. (1973) Ecology Report; Waitemata Harbour Study, Auckland Regional Authority/Auckland Harbour Board.
- (2) Bioresearches Limited (1987). Huntly-Marsden Power Station. Natural gas pipeline sector 2; Marine bio-assessment.
- (3) Jackson, Clapperton, Goldschmidt and partners (1983). Westpark Marina Development Scheme Report, volume 4.
- (4) Waitemata City Council (1984) District Scheme.
- (5) Waitemata Harbour Maritime Planning Authority
 - (5a) 1987 Maritime Scheme.
 - (5b) 1985 Draft Maritime Scheme.

1. NAME Upper Waitemata Harbour
2. AREA CODE R10/29 Map 16
3. MAP REFERENCE NZMS 260 Topo R10 580 905
4. LOCATION DESCRIPTION Overview of the upper Waitemata Harbour. North western extremity of the Waitemata Harbour area. Also see R10 29A-C R11 29D-G.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND 7.4 km² - seven subestuaries - Rangitopuni Creek, Brighams Creek, Paremoremo Creek, Hellyers Creek, Lucus Creek, Waiarohia Creek, Rarawaru Creek.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Mangroves fringe low tidal channels throughout the arms of the harbour and only spread out in area at the confluence of creeks or open parts of the harbour, such as Herald Island, where they are generally low - (1-2 m tall).

Despite the large area of the main harbour there are only scattered areas of mangroves round the periphery. The largest mangrove area is near Herald Island, refer Waiarohia Creek file (R11 29A).
8. WILDLIFE VALUES This is a stopover area for birds going to Kaipara and Parengarenga. It is regionally significant.

The most common birds frequenting the mangrove zone of the Upper Waitemata Harbour in 1979 were kingfisher, (Halcyon Sancta), pukeko (Porphyrio melanotus) skylark (Alauda arvensis) and banded rail (Rallus philippensis), turnstone, red-necked stint, red-billed gull.

Many other wading birds frequent and feed on the adjoining mudflats which are enriched and dependent upon the primary productivity of the adjacent mangrove swamps. A total of 55 bird species were recorded in the Upper Waitemata Harbour. Other common sitings were banded dotterel*, wrybill* South Island pied oystercatcher, variable oystercatcher*, pied stilt, white-faced heron, blue reef heron, knot, stints, sandpipers, gulls and terns.

* Species declining with urbanisation/development of harbour margins (Refs 2, 9).

The Upper Waitemata is important in providing habitats for feeding, roosting and breeding for birds.

This is also true of the major part of the Waitemata and more relevant to the Pollen Island/Te Atatu mudflat area. To have this detail here and not on other pages is grossly misleading.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Twenty one species of fish were identified and their gut contents analysed (Ref. 3). Obvious trophic and habitat dependence upon the mangrove areas could be shown for many of the dominant species such as flounder, and yellow eyed mullet.

Mangrove biomass present and productivity throughout the Upper Waitemata Harbour were calculated as part of the UWHCS giving a total of 6687.5 tonnes biomass.

Productivity was measured in terms of leaf litter production, the highest productivity being calculated for Lucas Creek. As a result of these and other New Zealand studies it appears that Auckland mangroves are at least as productive as mangroves in Queensland and Florida. Tall mangroves produced 8.10t per hectare per year and low mangroves 3.65t per hectare per year in one particular year at Luff Crater. These values were applied to Upper Waitemata Harbour mangroves to give total productivity values for the harbour (Ref. 12)

10. STABILITY OF WETLAND Small areas of reclamation, e.g. Upper Waitemata Harbour bridge causeway, refuse tip Waiarohia Creek, boat yard at Lucas Creek, Herald Island causeway.

Mangroves have increased adjacent to Herald Island causeway.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown, small areas adjoining Herald Island
private

Management agencies: Auckland Harbour Board - Waitemata Harbour Maritime
Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City, Rodney County, Takapuna City
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Landfill reclamations.

14. WETLAND MODIFICATIONS PROPOSED Proposed marina Herald Island, 1982/83
Minor foreshore work proposed, e.g. sea walls, jetties.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No, but boat building operation with slipways.

Marinas/moorings: Moorings.

Waste disposal: Treated sewage effluents at Hobsonville, Paremoremo
and Whenuapai. Eel processing factory, pig farm effluent.

Refuse land fill: Previously at Waiarohia Inlet.

Recreation: Boating, bathing, fossicking.

Fishing: Commercial and recreational. Shellfishing in Hellyers Creeks only. Dominant species fished for: snapper, mullet, flatfish.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality in the Upper Waitemata Harbour is characterised by:

- (a) High suspended solids concentrations.
- (b) Nitrogen and phosphorus concentrations just below those known to cause nuisance weed growths.
- (c) Oxygen saturation values generally adequate but declining to less than 50% in headwaters during high temperatures.
- (d) Faecal coliform values at recreationally acceptable levels except close to sewage effluent outfalls (Ref. 4).

The upper harbour, being shallow, confined by a narrow entrance, and receiving drainage from about 200 km² of land is likely to be particularly sensitive to pollution. In addition, the rivers flowing into and the waters of the Waitemata Harbour will be subject to increasing pressures for recreational and waste disposal uses.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 190 km²
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|-------|-------------|------|------------|---|
| forest | - 20% | residential | - 5% | bare earth | - |
| pasture | - 70% | industrial | - 5% | | |
- (Ref. 5).

Other land use likely to affect wetland: Intensive horticulture.

Reserves present: Not known

Land use changes anticipated up to year 2000: The eastern part of the catchment is on the verge of rapid urban development.

District scheme - zoning provisions: Refer sheet R11, 10 29A to G.

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987): Conservation zonings in Lucas, Paremoremo and the head of Rangitopuni subestuaries. Habitat zoning in lower Rangitopuni, Brighams, Wairohia, upper Hellyers subestuaries and some intertidal fringes of northern main channel shore and large mangrove area to west of Herald Island. Recreation C zoning on boat mooring areas of main channels and entrances to Lucas and Hellyers subestuaries (Ref. 7).

Auckland Regional proposed planning scheme (1987) (Ref. 13).

- (c) Description of topography (soil type, slope, erosion susceptibility): Mostly gently rolling topography with clay soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Relevant objectives from the Upper Waitemata Harbour study (Ref. 14).

To protect significant areas of ecological value such as patches of mangrove, mudflats and swamps.

To prevent any acceleration of existing sedimentation rates in the Upper Waitemata Harbour, whether resulting from increased sediment discharge from the land or from structures or reclamations in the harbour.

To conserve as a matter of the highest priority the fundamental basis of biological productivity in the Upper Harbour by maintaining the health and extent of the mangrove and intertidal areas.

To promote the maximum numbers and diversity of fish, bird and invertebrate species in the Upper Harbour.

To limit both nitrogen and phosphorus inputs to the upper Harbour to present levels.

To limit turbidity and sediment delivery to no more than existing average levels.

To limit inputs of oxygen demanding materials to the upper reaches of the Upper Harbour to present levels especially during summer months.

The reader is referred also to the following policies of the Upper Waitemata Harbour Study (Ref. 14) which are relevant to marine wetland conservation in the Upper Waitemata Harbour: Policies 15, 16, 17, 18, 19, 21, 24, 25, 26, 28, 30, 31

Policy 31 is of special significance: "Prohibit any reclamation, dredging or impoundment of Upper Harbour Waters, unless there is no alternative on land and such work is of at least regional importance."

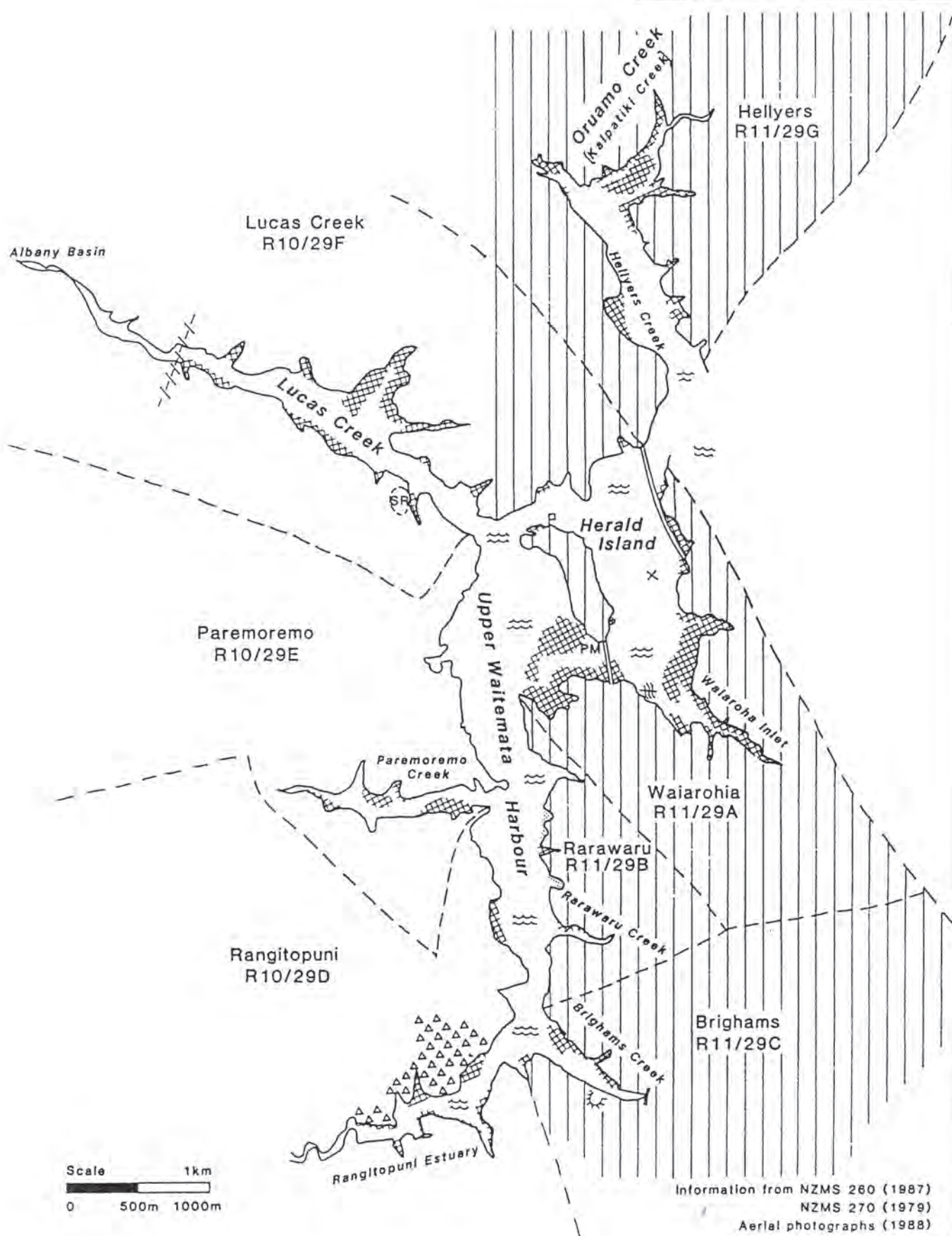
19. RELEVANT REFERENCES:

1. Larcombe, M. (1973) Ecology Report; Waitemata Harbour Study. Auckland Regional Authority/Auckland Harbour Board.
2. Gillespie, G. (1982) A bird survey of the Upper Waitemata Harbour and surrounding catchment. Working Report, Upper Waitemata Harbour Catchment Study, Auckland Regional Water Board.
3. Briggs, I.W. (1981) Fish survey of the Upper Waitemata Harbour Working Report 17. Upper Waitemata Harbour Study.
4. van Roon, M.R. (1983) Water Quality of the Upper Waitemata Harbour and Streams.
5. Amand, M. (1979) Land use of the Upper Waitemata Harbour Catchment. Working Report 3, Upper Waitemata Harbour Catchment Study.
6. Rodney County Council (1987) District Scheme.
7. Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
8. Auckland Regional Water Board (1978) Twelve localities subject to environmental pressure.

9. Knox, G. (1983) Ecology of the Upper Waitemata Harbour. Specialist Report, Upper Waitemata Harbour Catchment Study. Auckland Regional Water Board.
10. Bioresearches Ltd (1987) Huntly-Marsden Power Station Natural gas pipeline Sector 2. Marine Bioresearch Assessment.
11. Brickell, D. and P. Williams (1983) Land and Water Management Plan (LAWMP) Upper Waitemata Harbour Study. Auckland Regional Water Board.
12. Woodroffe, C. (1982) Mangroves of the Upper Waitemata Harbour; Biomass, Productivity and Geomorphology. Upper Waitemata Harbour Catchment Study working Report No. 36. Unpublished report of the Auckland Regional Authority.
13. Auckland Regional Authority (1987) proposed Regional Planning Scheme. Special report and planning policies for marine areas, lakes and rivers.
14. Auckland Regional Authority (1983) Land and Water Management Plan. Upper Waitemata Harbour Catchment Study. Auckland Regional Authority published.
15. van Roon, M.R and L.D, Ritchie (1987) Herald Island foreshore : an assessment of habitat value and ecological impacts. A report prepared for the Waitemata Harbour Maritime Planning Authority.
16. West Harbour Marinas Ltd (1979) Proposed Marina at Herald Island Planning and Environmental Impact Report.
17. Waitemata City Council (1984) District Scheme.
18. Takapuna City Council (1982) District Scheme.

MAP 16

WAIAROHIA R11/29A
 RARAWARU R11/29B
 BRIGHAMS R11/29C
 RANGITOPUNI R10/29D
 PAREMOREMO R10/29E
 LUCAS CREEK R10/29F
 HELLYERS R11/29G



Scale 1km
 0 500m 1000m

Information from NZMS 260 (1987)
 NZMS 270 (1979)
 Aerial photographs (1988)

1. NAME Waiarohia Inlet.
2. AREA CODE R11 29A Map 16
3. MAP REFERENCE NZMS 260 R11 575890.
4. LOCATION DESCRIPTION South western Upper Waitemata Harbour (including Herald Island).
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND Approximately 60 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION This area (including northern and southern sides of Herald Island) contains the greatest area of mangroves in the upper Waitemata Harbour (66 ha), more than 36% of the total area. They are generally of low stature and not very dense. Less than 25% of the mangroves are taller than 2 m.

Only 13% of the mangroves here fall in the highest density class (c.f. 70% for Rangitopuni mangroves). Total mangrove biomass 1981 estimated at 1290 tonnes. This area accounts for 28% of the leaf litter production in the upper Waitemata Harbour (Refs 9, 15, 12).

The mangrove habitat appears to be in a good condition (Ref 16).

Species Present

Mangrove Avicennia marina var. resinifera.
 Salt marsh Samolus repens.
Selliera radicans.
Leptocarpus simplex.
Juncus maritimus var. australiensis.
Stipa teretifolia. (Ref 1).

8. WILDLIFE VALUES The grassy margins in nearby airfields are important bird roosting areas. This is the most valuable wading bird habitat in the upper Waitemata Harbour as expansive areas of mudflat are not found elsewhere (Ref 15).

Dominant species White heron, asiatic whimbrel, eastern knot, pied stilt, white-faced heron, red-billed gull, sharptailed sandpiper, godwit, black-backed gull, kingfisher, pied shag, little terek sandpiper, pied shag, little black shag, white-fronted tern, South Island pied oystercatcher, gannet, variable oystercatcher, turnstone (Refs 1, 2, 15).

Rare species/endangered species Wrybill, rednecked stint, banded dotterel, banded rail.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This habitat appears to have a high micro-algal productivity which adds to its importance in the upper Waitemata ecosystem (Ref 15).

The Herald Island mangrove/mudflat area is a nursery and feeding area for many fish including yellow-eye mullet, grey mullet, parore, snapper, yellow belly flounder, dab and spotty (Ref 15).

10. STABILITY OF WETLAND Southern foreshore reclamation for the approach to the Greenhithe Bridge and the construction of causeway to Herald Island have resulted in loss of mangrove area.

The marshes in the area appear to be expanding slowly, with young mangroves establishing in areas outside the boundaries of areas colonised by older trees. This expansion is a result of the construction several decades ago of the Herald Island causeway after which sediment accretion both sides created new habitats for mangrove colonisation (Refs 4, 15, 16).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Waitemata City Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Flounder fishing, walking, fossicking.

14. WETLAND MODIFICATIONS PROPOSED Proposal for West Harbour Marina at north west end of Herald Island 1987 (Ref 16).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No. Jetties at eastern end of Herald Island and at Hobsonville.

Marinas/moorings: Herald Island and upper Waitemata nearby - moorings only (1988). Herald Island proposed marina at west end of Island.

Waste disposal: Hobsonville treated sewage effluent discharge at approximately R11 580892.

Refuse land fill: Air Force refuse tip in mangroves of Awiarohia Creek.

Recreation: The estuary is used for recreational purposes such as fossicking, kayaking, swimming.

Fishing: Enjoyment/commercial and sport fishing especially for flounder.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Although the upper Waitemata Harbour is vulnerable to pollution, this well flushed area has quite good water quality. High concentrations of nitrogen and phosphorous are sometimes recorded in Waiarohia Inlet and streams during storms. The Hobsonville sewage effluent is well mixed and flushed from the basin (Ref 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 1000 ha.
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-----|-------------|----|------------|
| forest | 1% | residential | 7% | bare earth |
| pasture | 86% | industrial | | |
- (Ref 5).

Other land use likely to affect wetland: Most land catchment is rural/defence airfield land.

Reserves present: Most of the Waiarohia Inlet foreshore is Waitemata City Council proposed public reserve (Ref 17).

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Most of Waiarohia Inlet catchment is in rural 1 zoning. Herald Island and the western headland of the inlet are in non-urban residential zoning. Land along south eastern headland is zoned for defence purposes (Ref 17).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987) habitat zoning covers all mangrove areas (Ref 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Not susceptible to erosion, low lying, clay soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Protect all mangrove areas from reclamation or dredging. Discourage the building of a marina on the shallow north western shore of Herald Island.

19. RELEVANT REFERENCES:

Refer R10/29.

1. NAME Whenuapai
2. AREA CODE R11/29B Map 16
3. MAP REFERENCE NZMS 260 R10 548 906
4. LOCATION DESCRIPTION Rarawaru Inlet plus fringing shoreline on southern side of Upper Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) No information
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Extensive areas of healthy mangrove along the southern shore opposite Paremoremo Inlet as well as inside Rarawaru Creek. Mangroves in Rarawaru Creek are shorter than those in nearby Paremoremo and Lucas Creeks.

Patches of salt marsh with Samolus repens, Juncus maritimus var australiensis, Leptocarpus simplex (Ref. 1).
8. WILDLIFE VALUES Wading birds feed intertidally and roost or nest in grassy margins of Whenuapai airfield.

Dominant species Pied stilt, white-faced heron, red-billed gull, black-backed gull, kingfisher, white-fronted shag little black shag (Ref. 1). Turnstone, asiatic whimbrel, eastern knot, sharp-tailed sandpiper, terek sandpiper, curlew sandpiper, South Island pied oystercatcher (Ref. 2).

Rare species/endangered species Red-necked stint, wrybill (Ref. 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Nursery/feeding area for fish such as snapper, yellow-eyed mullet, yellow belly flounder, dab, sole, trevally, jack mackerel, johndory (Ref. 15).
10. STABILITY OF WETLAND Small unauthorised reclamations along foreshore of main channel. Spoil pushed over cliff face.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board - Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Authority
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City Council
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Sewage effluent disposal Rarawaru.

14. WETLAND MODIFICATIONS PROPOSED Minor foreshore works proposed.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Adjacent to proposed marina at Herald Island

Waste disposal: Major sewage effluent discharge from Whenuapai Air Base to Rarawaru Creek (Ref. 4).

Refuse land fill: No

Recreation: Little as access is difficult and affected by sewage effluent

Fishing: Flounder netting, commercial and recreational

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Whenuapai sewage effluent has resulted in water quality deterioration in Rarawaru Creek with high nutrient concentrations and seasonally depressed percentage oxygen saturation (Ref. 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|-------|-------------|-------|------------|---|
| forest | - 5% | residential | - 10% | bare earth | - |
| pasture | - 75% | | | | |
- (Ref. 5).

Other land use likely to affect wetland: Sawmill in catchment.
Air base - aviation fuel spills/loss to stormwater.
Horticulture

Reserves present:

Land use changes anticipated up to year 2000: Increasing horticulture.

District scheme - zoning provisions: Rural (Ref. 17).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1977) unzoned area (Ref. 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Fairly flat.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: This ecosystem would be improved by the piping of Whenuapai sewage effluent to the mouth of Rarawaru Creek for discharge into the main Upper Waitemata channel.

19. RELEVANT REFERENCES:

Refer R10/29

1. NAME Brigham's Creek.
2. AREA CODE R11/29C Map 16
3. MAP REFERENCE NZMS 260 R11 533900
4. LOCATION DESCRIPTION Extreme south west arm of upper Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND Approximately 20 ha

7. DOMINANT WETLAND VEGETATION/ASSOCIATION Discontinuous band of mangroves less than 100 m wide along creek margin. Most extensive area is in the lower reaches to the east of the creek. 95% of the mangroves are shorter than 3 m and 46% are shorter than 2 m. Only 20% of the mangroves fall in the highest density class (compared with 70% for the Rangitopuni Creek).

Total biomass of mangrove calculated to be 419 tonnes (1981). Brigham's accounts for 7% of the leaf litter production in the upper Waitemata Harbour. (Ref 9).

Wetland species at Brigham's

Avicennia marina var. resinifera.

Samolus repens.

Leptocarpus simplex.

Juncus maritimus var. australiensis (Ref 1).

8. WILDLIFE VALUES The relatively narrow intertidal zone provides little suitable habitat for wading birds.

Dominant species Turnstone, pied stilt, white-faced heron, red-billed gull, South Island pied oyster catcher, black-backed gull, kingfisher, white fronted shag, little black shag, duck (Ref 1, 2).

Rare species/endangered species Red necked stint, wrybill.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This upper estuary is a haven for juvenile flounder, snapper and yellow-eyed mullet. Eels and whitebait pass through the area (Ref 1, 9).
10. STABILITY OF WETLAND Little change in area of the wetland. The estuary had a weir built across it close to State Highway 16, with subsequent ponding upstream of the weir.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Auckland Harbour Board. Waitemata Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.

Territorial local authority	Waitemata City Council, Rodney County Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Not known.

14. WETLAND MODIFICATIONS PROPOSED Not known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: No.

Waste disposal: Cow shed effluent. Eel factory effluent.
Oxidation pond effluent.

Refuse land fill: No, but dumping area for clay near mouth of estuary.

Recreation: Canoeing and other water sports.

Fishing: Flounder.

Sand extraction: No.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland:

The water area here is vulnerable to pollution as a result of slow flushing. Low summer dissolved oxygen and high sediment load. History of cowshed effluent discharges. Influenced by sewage treatment plant discharge at Whenuapai.

Any further addition of organic or nutrient rich wastes may be detrimental.

High nitrogen and phosphorus concentrations approaching values likely to cause nuisance algal blooms (Ref 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment: 1120 ha.

(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	1%	residential	1%	bare earth
	pasture	85%	industrial	-	

(Ref 5),

Other land use likely to affect wetland: Eel processing factory.
Intensive horticulture.

Reserves present: Waitemata City Council proposed foreshore
reserve throughout most of inlet (Ref 17).

Land use changes anticipated up to year 2000: Large increase in
horticulture with subsequent runoff of sediment and pesticides to
the estuary.

District scheme - zoning provisions: Predominantly rural zoning
(ref 17).

Controls other than District scheme likely to influence future land
use: Waitemata Maritime Planning Scheme (1987) habitat zoning in
Brigham's Sub-Estuary (ref 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently rolling, clay soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: This estuary should be conserved in
its present state as a fish habitat.

19. RELEVANT REFERENCES:

Refer R10/29.

1. NAME Rangitopuni
2. AREA CODE R10/29D Map 16
3. MAP REFERENCE NZMS 260 R10 534 915
4. LOCATION DESCRIPTION Extreme north western sub-estuary of the Upper Waitemata Harbour.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha)
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The Rangitopuni sub-estuary has relatively steep intertidal areas with a 100 metre wide band of healthy mangroves throughout.

The most extensive area of mangrove is to the eastern margin in the lower reaches of the creek where mangroves reach 3-4 m tall. More than 50% of the area is occupied by 2-3 m tall trees.

Mangroves in the Rangitopuni are generally of high density.

Total biomass of mangrove in Rangitopuni calculated to be 662 tonnes (1981).

The Rangitopuni accounts for 10% of the leaf litter production in the Upper Waitemata Harbour (Ref. 9).

Patches of salt marsh plants may occur - Samolus repens, Leptocarpus simplex, Juncus maritimus var australiensis (Ref. 1).

8. WILDLIFE VALUES The value of this sub-estuary for feeding of wading birds is limited by the narrowness of the intertidal zone.

Dominant species Pied stilt, white-faced heron, kingfisher, red-billed gull, black-backed gull, turnstone, South Island pied oystercatcher, white-fronted shag, little black shag, duck (Refs 1, 2).

Rare species/endangered species Red-necked stint, wrybill (Ref. 2).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This upper estuary is a haven for juvenile flounder, snapper and yellow-eye mullet (Refs 1, 3).
10. STABILITY OF WETLAND Little change in the recent past.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board - Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Refer 15.

14. WETLAND MODIFICATIONS PROPOSED None known

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Agricultural stormwater and dilute cowshed effluent. Riverhead septic tank seepage.

Refuse land fill: No

Recreation: Canoeing, small boats.

Fishing: Recreational

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: This subestuary is very vulnerable to pollution as a result of its upstream location and morphology. Pollutants accumulate here. Low summer dissolved oxygen saturation (Ref. 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 85 km²

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 20% residential - bare earth -
 pasture - 75% industrial -
 (Ref. 5)

Other land use likely to affect wetland: Timber mill with history of illegal toxic discharges to stream. Intensive horticulture.

Reserves present: None

Land use changes anticipated up to year 2000:

Felling of exotic forest (Ref. 4).

Increase in area in horticulture.

Possible bulk draw off of water for urban supply would result in a considerable reduction in freshwater inputs to Rangitopuni estuary and sub-sequently an upstream movement of high salinity water and and a reduction in sediment input to the estuary.

District scheme - zoning provisions: Rural (Ref. 6).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987): "Headwaters of Rangitopuni sub-estuary in conservation zone. Downstream half of Rangitopuni sub-estuary in habitat zone."

(Ref. 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Gently rolling, little erosion.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Improve and maintain water quality. Avoid further major point inputs of organic wastes. Minimise sediment losses from catchment.

19. RELEVANT REFERENCES:

Refer R10/29.

1. NAME Paremoremo
 2. AREA CODE R10/29E Map 16
 3. MAP REFERENCE NZMS 260 R10 563 913
 4. LOCATION DESCRIPTION Central estuary on northern shore of Upper Waitemata Harbour.
 5. TYPE OF WETLAND Mangrove Saltmarsh
 6. AREA OCCUPIED BY WETLAND (ha) Not known
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION The mangrove forests which fringe Paremoremo Stream are generally of greater width than in other Upper Waitemata Harbour creeks. In general the trees are taller, 50% of the mangroves are 2-3 m tall, however the single most extensive height-density class is 3-4 m/>90% cover, i.e. many are high density and tall.
- Total biomass of mangrove in Paremoremo calculated to be 1318 tonnes in 1981. The Paremoremo accounts for 14% of the leaf litter production in the Upper Waitemata Harbour (Ref. 9).
- Salt marsh species present: Samolus repens, Selliera radicans, Leptocarpus simplex, Juncus maritimus var australiensis, Stipa teretifolia (Ref. 1).
8. WILDLIFE VALUES: Birdlife is similar to that found in Lucas sub-estuary, refer R10/29F.
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Paremoremo Creek has the tallest, probably least modified mangrove ecosystem of the Upper Waitemata Harbour.
 10. STABILITY OF WETLAND Little change in recent past.
 11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board - Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Takapuna City, Rodney County
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authorities

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Sewage effluent waste disposal.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

- (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Major sewage effluent discharge to saline water.
Dairy shed effluent to catchment stream.

Refuse land fill: No

Recreation: Water skiing, canoeing, swimming.

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment -- likely to affect wetland: The sewage effluent has little impact on wetlands. Estuary is well flushed each tide (Ref. 4).

Bacterial concentrations and biochemical oxygen demand are generally high immediately downstream of the treatment plant, but water quality improves towards estuary mouth (Ref. 8).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 9 km²

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 24% residential - 2% bare earth -
 pasture - 73% industrial - horticulture - 1%

Other land use likely to affect wetland:

Reserves present: Not known

Land use changes anticipated up to year 2000: Slight increase in horticulture possible.

District scheme - zoning provisions: Rural and special community purposes zones (Ref. 6, R10/29D).

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme 1987.
 Conservation zone throughout the entire Paremoremo sub-estuary (Ref. 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating pasteral hill country.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:
18. FUTURE MANAGEMENT RECOMMENDATIONS: Maintain estuary in present state.
19. RELEVANT REFERENCES:

Refer R10/29.

1. NAME Lucas Creek
2. AREA CODE R10/29F Map 16
3. MAP REFERENCE NZMS 260 R10 590 912
4. LOCATION DESCRIPTION North-eastern subestuary of Upper Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Extensive mangrove - 45 ha. Small salt marsh area.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Over half the mangroves in Lucas subestuary form very high density beds. Lucas mangroves are generally the tallest in the Upper Waitemata Harbour Catchment with the exception of those in Paremoremo Creek. Mangrove trees increase in height and density from sub-estuary headwaters to mouth. Many seedlings in headwaters.

Total biomass of mangrove in Lucas calculated in 1981 to be 2549 tonnes. The Lucas accounts for 34% of leaf litter production in the Upper Waitemata Harbour. This is the highest productivity value for any of the subestuaries (Ref. 9).

Salt marsh plants at the high tidal fringe: Leptocarpus simplex, Selleira radicans, Stipa teretifolia, Samolus repens, Juncus maritimus var australiensis (Ref. 1)(R10/29D).

8. WILDLIFE VALUES

Dominant species Turnstone, asiatic whimbrel, kingfisher, pied stilt, white-faced heron, eastern knot, godwit, oystercatcher, red-billed gull, black-backed gull, sharptail sandpiper, terek sandpiper, pied shag, little pied shag, little black shag, curlew sandpiper, gannet, white-fronted tern (Refs 1, 2).

Rare species/endangered species Caspian tern, red-necked stint, wrybill.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This is a valuable feeding and nursery area for juvenile fish especially snapper, flounder and yellow eyed mullet. For other species refer R11 29A/B (Refs 3, 9).
10. STABILITY OF WETLAND Small reclamation at creek mouth for boat building yard.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Auckland Harbour Board - Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Rodney County, Takapuna City
Crown	Department of Conservation
Other	Waitemata Harbour Maritime Planning Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Boat building industry, recreation.

14. WETLAND MODIFICATIONS PROPOSED One of the alternative routes for the Huntly-Marsden gas pipeline (Ref. 10).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Boat moorings in estuary mouth

Waste disposal: Albany Village stormwater

Refuse land fill: Rosedale refuse tip in catchment. Well managed

Recreation: Canoeing, swimming, boating.

Fishing: Recreational

Sand extraction: No

Other: Sediment loss from ongoing urban development in Albany Basin.

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Turbidity is naturally high and this is likely to be aggravated by urban earthworks in the catchment. A tidal pool in the headwaters of this sub-estuary is vulnerable to accumulation of pollutants. Some improvement in water quality has resulted from removal of sewage and meat industry waste inputs from Albany. A radical change in water quality as a result of urban use is not expected (Ref. 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Approximately 40 km²

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 25% residential - bare earth - 5%
 pasture - 60% industrial -

Much of the is still in bush or pasture, but is becoming urbanised.

Other land use likely to affect wetland: Rosedale refuse landfill.
 Horticulture

Land use changes anticipated up to year 2000: Northern Transfer Station (for refuse disposal) considerable expansion of urban use to eventually dominate catchment. By year 2000 up to 25% of catchment may be urban.

District scheme - zoning provisions: Predominantly rural-future residential, rural-future industrial or rural/residential zoning (Ref. 6).

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987) conservation zoning for the entire sub-estuary except the sub-estuary entrance as far north as Oscar Road, where a Recreation C zone provides for boat mooring (Ref. 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Gently rolling clay.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Adequate supervision of urban development to minimise sediment losses to the estuary is essential. Refer Ref. 11 for further recommendations.

19. RELEVANT REFERENCES:

See R10/29D.

1. NAME Hellyers Creek.
 2. AREA CODE R11/29G Map 16.
 3. MAP REFERENCE NZMS 260 R10685 892
 4. LOCATION DESCRIPTION
 5. TYPE OF WETLAND Mangrove Saltmarsh
 6. AREA OCCUPIED BY WETLAND (ha) 40 ha
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION
 Mangrove Avicennia marina var resinifera.
 Salt marsh Stipa teretifolia.
Sarcocornia quinqueflora.
Leptocarpus simplex.
Juncus maritimus var. australiensis (Ref 1).
 8. WILDLIFE VALUES Hellyer's Creek has similar wildlife to Lucas Sub-Estuary refer R10/29F.

Rare species/endangered species Banded rails.
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.
 10. STABILITY OF WETLAND No information.
 11. CONTROL OF WETLAND AND CATCHMENT

 Ownership status of wetland: Crown.
 Management agencies: Auckland Harbour Board: Waitemata Harbour Maritime Planning Authority.
- | | Name |
|-----------------------------|--|
| Catchment authority | Auckland Regional Water Board. |
| Regional planning authority | Auckland Regional Authority. |
| Harbour board | Auckland Harbour Board. |
| Territorial local authority | This catchment is covered by both Takapuna city and Birkenhead city. |
| Crown | Department of Conservation |
| Other | Waitemata Maritime Planning Authority. |
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.
 13. USE OF WETLAND BY MAN Rubbish dumping near where a pipeline crosses an intertidal creek (ref 1 R10/29D).
 14. WETLAND MODIFICATIONS PROPOSED Minor foreshore works proposal.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Swing moorings in entrance.

Waste disposal: Residential stormwater.

Refuse land fill: No.

Recreation: Yes.

Fishing: Flounder, shellfish occasionally taken.

Sand extraction: No.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland:

Sediment load)

Nutrient status) Some of the best water quality in the Upper
Waitemata

Oxygen depletion) Harbour, good flushing (Ref 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha): 350 ha.(b) Land use of catchment: Approximate percentage of total catchment

in: forest	50%	residential	50%	bare earth
pasture		industrial		

Northern face of catchment is in bush.

Other land use likely to affect wetland:

Land use changes anticipated up to year 2000: Slight increase in residential still possible.

District scheme - zoning provisions: Takapuna District Scheme:
Rural - residential zoning of bush-covered northern slope.
Residential zone at head of Hellyer's Creek.

Birkenhead District Scheme: '...to control and reduce soil and water pollution' (no discharges of potentially harmful substances into ground or stormwater system, or natural watercourse).
Preservation of existing bush and restricted development at foreshore would reduce the degree of erosion particularly on cliff faces.

Recreation zones and reserves dominate foreshore areas - to preserve foreshore for recreation and passive use.

'That, in general, development is to be controlled along the coastline in such a manner that it is subordinate to the natural landscape'. 'Physical features such as cliffs, promontories, tidal

mudflats, mangrove marshes, inlets, estuaries, rivers and creeks will generally be retained in their natural state'.

Controls other than District scheme likely to influence future land use: Waitemata Maritime Planning Scheme (1987) habitat zoning in headwaters and along northern coast of Hellyer's Sub-Estuary. Recreation C zone in mouth of Hellyer's Sub-Estuary (ref 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Steep northern bush clad face.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Retain bush on northern catchment face. Develop residential areas with care to prevent sediment loss to estuary.

19. RELEVANT REFERENCES:

See R10/29.

1. NAME Kauri Point - Little Shoal Bay.
2. AREA CODE R11/30 Map 13
3. MAP REFERENCE NZMS 260 R11 603888 to R11 664846
4. LOCATION DESCRIPTION Central northern coast of Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
Other - Little Shoal Bay has two predominantly freshwater wetlands with peripheral saline influence (Ref 1).
6. AREA OCCUPIED BY WETLAND (ha) Marine wetland probably only one or two hectares in size.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Mangroves scarce but reported to be in Soldier's Bay (Ref 4, 8).

A relic area of salt marsh before 1958 near the gas works had:
Juncus maritimus, Salicornia australis, (now Sarcocornia quinqueflora),
Aster subulatus, Festuca elatior, F. arundinacea, Cotula coronopifolia,
Scirpus cernuus, Triglochin striata and Samolus repens (Ref 3).

At Soldier's Bay shell banks shelter salt marsh and flax swamp (Ref 8).

Little Shoal Bay:

<u>Avicennia resinifera</u>	a few trees.
<u>Leptocarpus similis</u>	)
<u>Plagianthus divaricatus</u>	)
<u>Atriplex hastata</u>	) Sparse at Little Shoal Bay as a result of
<u>Triglochin striata</u>	) extensive reclamation.
<u>Cotula coronopifolia</u>	)
<u>Juncus maritimus</u>	)
<u>Cyperus ustulatus</u>	) (Ref 1)

Any special features? The predominantly freshwater wetlands of Little Shoal Bay were once mangrove/saltmarsh areas but downstream bunding and reclamation resulted in retention of freshwater runoff and subsequent transition from a marine to freshwater habitat.

8. WILDLIFE VALUES

Dominant species Little Shoal Bay: pukekos, ducks, white faced heron (Ref 1).

Soldier's Bay has sand flats, mangroves, shellbank, saltmarsh and flax swamp which provide wildlife habitat for pied stilt, white-faced heron, kingfisher, gull, white-fronted tern and occasionally gannet (Refs 4, 8).

Rare species/endangered species

(Unconfirmed) marsh crake: Little Shoal Bay (Ref 1).
 caspian tern: Soldier's Bay (Ref 4).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Parore and snapper feeding (Ref 8).

10. STABILITY OF WETLAND Little Shoal Bay - substantial areas of maritime marsh/mangrove reclaimed in piecemeal fashion in early 20th century up to 1970. Bay cut in half by road, further shrinkage resulting from sediment accretion and increased freshwater runoff (Ref 1). Sediment discharge from Little Shoal Bay is accelerating the drying out of remaining wetlands.

Recent reclamations? The head of Chelsea Bay was dammed in the process of which saltmarsh was destroyed (Ref 8). The Birkenhead/Northcote area has been modified considerably by man's activities (Ref 3).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.
Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Northcote Borough Council (Little Shoal Bay). Birkenhead City Council.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Little Shoal Bay - in Waitemata Harbour Maritime Planning Scheme, the western part of the foreshore and the tidal area beyond it extending to Northcote Point and Birkenhead Wharf are zoned Recreation C. The eastern portion of the intertidal area is unzoned (Ref 5).

13. USE OF WETLAND BY MAN Little Shoal Bay wetlands a valuable educational resource.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: Kauri Point defence wharf.

Marinas/moorings: Some moorings.

Waste disposal: Residential stormwater.

Refuse land fill: No.

Recreation: Boating, line fishing, swimming.

Fishing: Shellfishing for pipis, cockles, oysters, line fishing.

Sand extraction: No.

Other: Deep water off Kauri Point.

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: This deep well-flushed part of the Waitemata has satisfactory water quality. Slightly anaerobic conditions reported near Chelsea Sugar Works outfall in 1973 (Ref 8).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 500 ha.

- (b) Land use of catchment: Little Shoal Bay.
Approximate percentage of total catchment in:
- | | | | | |
|-------------|-----|------------|------------|-----|
| residential | 50% | bare earth | forest | 40% |
| pasture | | industrial | commercial | 10% |
| | | 0% | | |

Other land use likely to affect wetland: Chelsea Sugar Works.

Reserves present: Little Shoal Bay Scenic Reserve (Le Roy's Bush) administered by North Shore Scenic Board.

Land use changes anticipated up to year 2000: Little Shoal Bay - further potential for urban development. Expansion of Highbury Commercial Centre. Conversion of bush and scrub areas into residential. Potential for change in land use if ammunition stores at Kauri Point are relocated.

District scheme - zoning provisions: Little Shoal Bay recreation zones and reserves predominate near foreshore. Birkenhead District Scheme (1986): 'To control and reduce soil and water pollution (no discharges of potentially harmful substances into ground or stormwater system, or natural water course). Preservation of existing bush and restricted development at foreshore would reduce the degree of erosion particularly on cliff faces'. 'That, in general, development is to be controlled along the coastline in such a manner that it is subordinate to the natural landscape'. 'Physical features such as cliffs, promontories, tidal mudflats, mangrove marshes, inlets, estuaries, rivers and creeks will generally be retained in their natural state'.

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme:
Conservation zone, Soldier's Bay.
Habitat zone. Kauri Point east to Chelsea wharves.
Port zone Chelsea wharves.
Recreation C zone over most of Little Shoal Bay.

Extract from Buckland (1988) - As well as exercising control over recreational and navigational uses of Little Shoal Bay, the maritime planning scheme requires that direct discharges to be constructed to the harbour shall be processed as 'exceptions' to that scheme. All discharges are therefore to be evaluated by the Maritime Planning Authority against the objectives and policies in the maritime scheme, a comprehensive framework which protects all valued attributes of the harbour.

This is of particular relevance to Little Shoal Bay, as it thus becomes necessary to comprehensively consider all potential impacts of any proposed stormwater outfall from the catchment of which the reserve forms part, with regard to their effects on the harbour environment and other uses of the harbour.

The provisions of the foregoing district and maritime schemes are generally congruent with the reserve status of Little Shoal Bay, and make appropriate provision for the future development and use of the reserve. Both district schemes contain conservation provisions to safeguard bush, trees and landforms in their respective recreation zones and to limit buildings so that their design and siting is appropriate to the local environment.

The Birkenhead city scheme however does not extend protection for bush and trees outside the Reserve. This has important implications visually and for reasons of catchment management, as removal of vegetation would result in erosion, increased stormwater runoff and worsen the flooding that occurs in the reserve.

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Much of this coastline has steep cliffs. To the east and west extremes of the area the cliffs are lower and small bays may support saltmarsh.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

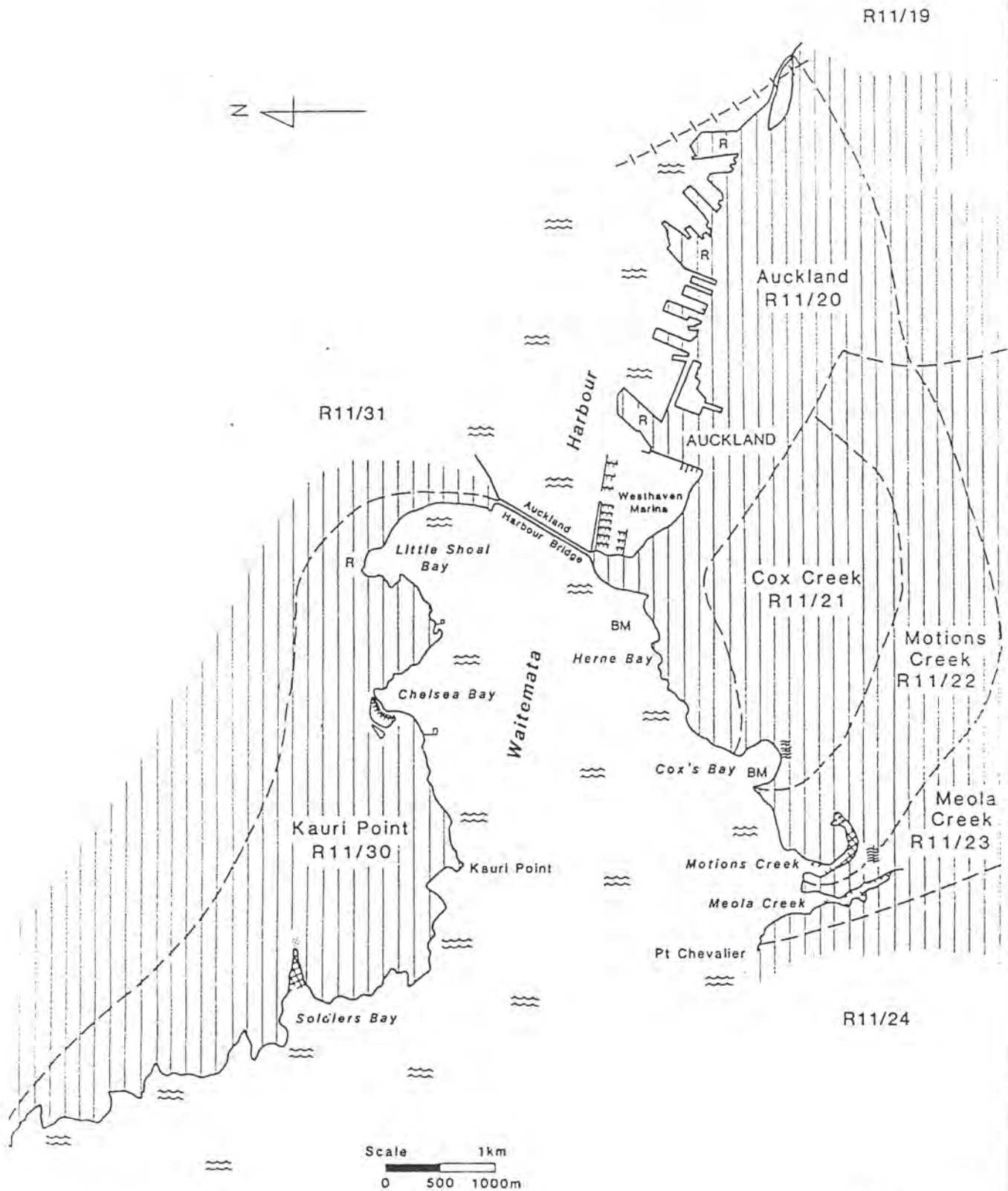
18. FUTURE MANAGEMENT RECOMMENDATIONS: Maintain remaining wetlands at Little Shoal Bay and Soldier's Bay. If Kauri Point coastline is ever developed extreme care will be necessary to prevent erosion and subsequent foreshore sediment deposition.

19. RELEVANT REFERENCES:

- (1) Bioresearches Limited (1988). Little Shoal Bay Wetlands Natural Environment Values and Management Alternatives Report prepared for Northcote Borough Council, February 1988.
- (2) Buckland, M. (1988). Management Plan for Little Shoal Bay. Report prepared for Northcote Borough Council.
- (3) Chapman, V. J. and J. W. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus, New Zealand DSIR Bulletin No 125.
- (4) Auckland Regional Planning Draft Scheme maps (1979).
- (5) Waitemata Harbour Maritime Planning Authority (1987) Maritime Scheme.
- (6) Birkenhead City Council District Scheme (1986).
- (7) Northcote Borough District Scheme (1986).
- (8) Larcombe, M. (1973) Ecology Report, Waitemata Harbour Study. Auckland Regional Authority/Auckland Harbour Board.

MAP 13

AUCKLAND R11/20
 COX CREEK R11/21
 MOTIONS CREEK R11/22
 MEOLA CREEK R11/23
 KAURI POINT R11/30



1. NAME Shoal Bay.
2. AREA CODE R11/31 Map 17
3. MAP REFERENCE NZMS 260 R11 680 865
4. LOCATION DESCRIPTION Shoal Bay.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Approximately 200 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION For a comprehensive description of the ecology of the Bay, the reader is referred to the Waitemata Harbour Study (Ref 12).

Onepoto Basin and Tank Farm are former freshwater crater lakes which have been breached by the sea and now provide sheltered inter-tidal mangrove and salt marsh communities (ref 7).

The mangrove community in Shoal Bay itself reaches its greatest development on the north shore of the Waitemata.

Extensive shell banks occur in Shoal Bay. There are two zones of vegetation in these shell banks. The uppermost comprises Suaeda australia var. nova zelandica and Samolus repens.

In the NE corner, Juncus with Leptocarpus and Cladium junceum occupy two extensive areas, but otherwise Juncus normally represents the frontal fringe of the salt-marsh community behind the mangrove. The next higher zone is occupied by Leptocarpus simplex with Sarcocornia, Samolus and Selliera as associated species. The highest zone is dominated by Stipa teretifolia with Plagianthus and Muehlenbeckia (Ref 6). The Jutland Road succession as described by Chapman and Ronaldson is shown below:

Bare mud

<u>Avicennia resinifera</u>	Shell and shingle
<u>Juncus</u>	<u>Samolus repens</u> and
<u>maritimus</u>	<u>Apium prostratum</u>

Salicornia australis

Lotus hispidus

(fire)

Leptocarpus simplex and

Stipa teretifolia (on banks)

Aster subulatus

Cladium junceum

Aster subulatus, Cotula coronopifolia,
Samolus repens

Ulex europaus

Festuca arundinacea

Mariscus-Scirpus)

Phormium tenax) Theoretical

Forest)

Scheme put forward by CHAPMAN (1958) for the vegetation of Shoal Bay salt marshes and shell banks.

In 1967 Ward produced a simplified scheme of the succession on the Jutland Road shell beach as follows.

- | | | |
|------------------------------|---|--|
| | Stable shell | |
| | <u>Salicornia, australis</u> | |
| | <u>Suaeda, novae-zelandiae</u> | |
| Loose shell | <u>Salicornia, australis,</u> | |
| | <u>Suaeda novae-zelandiae,</u> and | |
| | <u>Stipa teretifolia</u> | |
| | <u>Samolus repens</u> | |
| <u>Atriplex hastata</u> | | |
| <u>s.sp. novae-zelandiae</u> | <u>Stipa teretifolia</u> and | |
| | <u>Plantago coronopus</u> | |
| <u>Pholiurus incurvus,</u> | <u>Stipa teretifolia</u> and | |
| <u>Plantago coronopus,</u> | <u>Festuca arundinacea,</u> | |
| <u>Cotula coronopifolia,</u> | <u>Plantago coronopus,</u> | |
| <u>Sonchus oleraceus</u> | <u>Scirpus nodosus</u> | |
| | <u>Stipa teretifolia</u> and | |
| | <u>Plagianthus divaricatus,</u> | |
| | <u>Aster subulatus</u> var <u>euroaster</u> | |
| | <u>Phormium tenax</u> | |
| | (Ref 8) | |
- NOTE Salicornia australis is now Sarcocornia quinqueflora. Species other than those in this succession which were recorded by Ward include: Avicennia marina var. resinifera, Leptocarpus simplex, Scirpus nodosus, Rumex crispus, Sophora microphylla.
- The shell banks migrate landward smothering mangroves in their path. New shell banks may form seaward of old banks and then mangroves re-establish between successive shellbanks. The cycle is repeated.
- Any special features? Shoal Bay is a very valuable ecological area equalled in the Waitemata only by Pollen Island wetlands.
8. **WILDLIFE VALUES** Onepoto Basin and Tank Farm have provided important fish and bird habitats (Ref 7).
- Shoal Bay has extensive shellbanks which are important feeding and roosting areas for birds.
- Dominant species** Kingfisher, pied stilt, white-faced heron, pukeko and gulls (Ref 7).
- Rare species/endangered species** Caspian tern)
New Zealand dotterel) breeding
9. **OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES** Feeding area for parore, snapper, flounder (Ref 12).
10. **STABILITY OF WETLAND** Shell banks have migrated from seaward to landward through mangroves (Ref 4). During 1940's Shoal Bay had Zostera beds. Zostera would be washed up on the tide line (Ref 9).
- Onepoto Basin has been filled in and drained (Ref 7). Large refuse

landfill in mangroves in 1970's in Barry's Point Road. Reclamations for harbour bridge approach and motorway (late 1950's). Small reclamations at the rear of industrial properties on Barry's Point.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.

Management agencies: Auckland Harbour Board, Waitemata Harbour Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Northcote Borough.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
The entire embayment is Auckland Harbour endowment land.

13. USE OF WETLAND BY MAN Walking, fossicking, visual open space.

14. WETLAND MODIFICATIONS PROPOSED

- Proposed crossing by gas pipeline for Huntly-Marsden gas pipeline (Ref 10).
- Several proposals in past to place road causeways across Shoal Bay from Harbour Bridge causeway to Devonport.
- Proposed reclamation of entire embayment, by Auckland Harbour Board in 1959 (Ref 1B).
- Proposed marina at Bayswater.
- Proposed under harbour tunnel to Auckland city dissecting Shoal Bay.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Proposed marina at Bayswater. Swing moorings in bay.

Waste disposal: Urban stormwater.

Refuse land fill: A large urban refuse tip closed in 1970's in Barry's Point Road area.

Recreation: Walking, windsurfing, fossicking - a valuable open space.

Fishing: Commercial flounder fishing, recreational fishing.

Sand extraction: No.

Other: Education.

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Polluted anaerobic sediments and dissolved oxygen depletion noted in early 1970's when leachate from Barry's Point refuse landfill was entering the Bay (Ref 12). An article in the AUCKLAND STAR, 14 August 1987, referred to water quality monitorings which indicated that leachates from this site were still hazardous.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 600 ha.
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | |
|---------|-------------|-----|------------|
| forest | residential | 70% | bare earth |
| pasture | industrial | 30% | |

Other land use likely to affect wetland: Large industrial area in Barry's Point Road with stormwater drainage to Bay.

Reserves present:

Land use changes anticipated up to year 2000: Little change.

District scheme - zoning provisions: Residential and industrial.

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987):

- Shoal Bay, Tuff Crater, Waioroko Creek, Waiwiwi Creek conservation zoned.
- Onepoto Stream habitat zoned.
- Bay entrance is a mixture of recreation A and C zones and unzoned in channels.

- (c) Description of topography (soil type, slope, erosion susceptibility): Low lying.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: The crossing of this bay by roads or pipelines should be strongly resisted in the interests of conserving this valuable ecosystem and public open space.

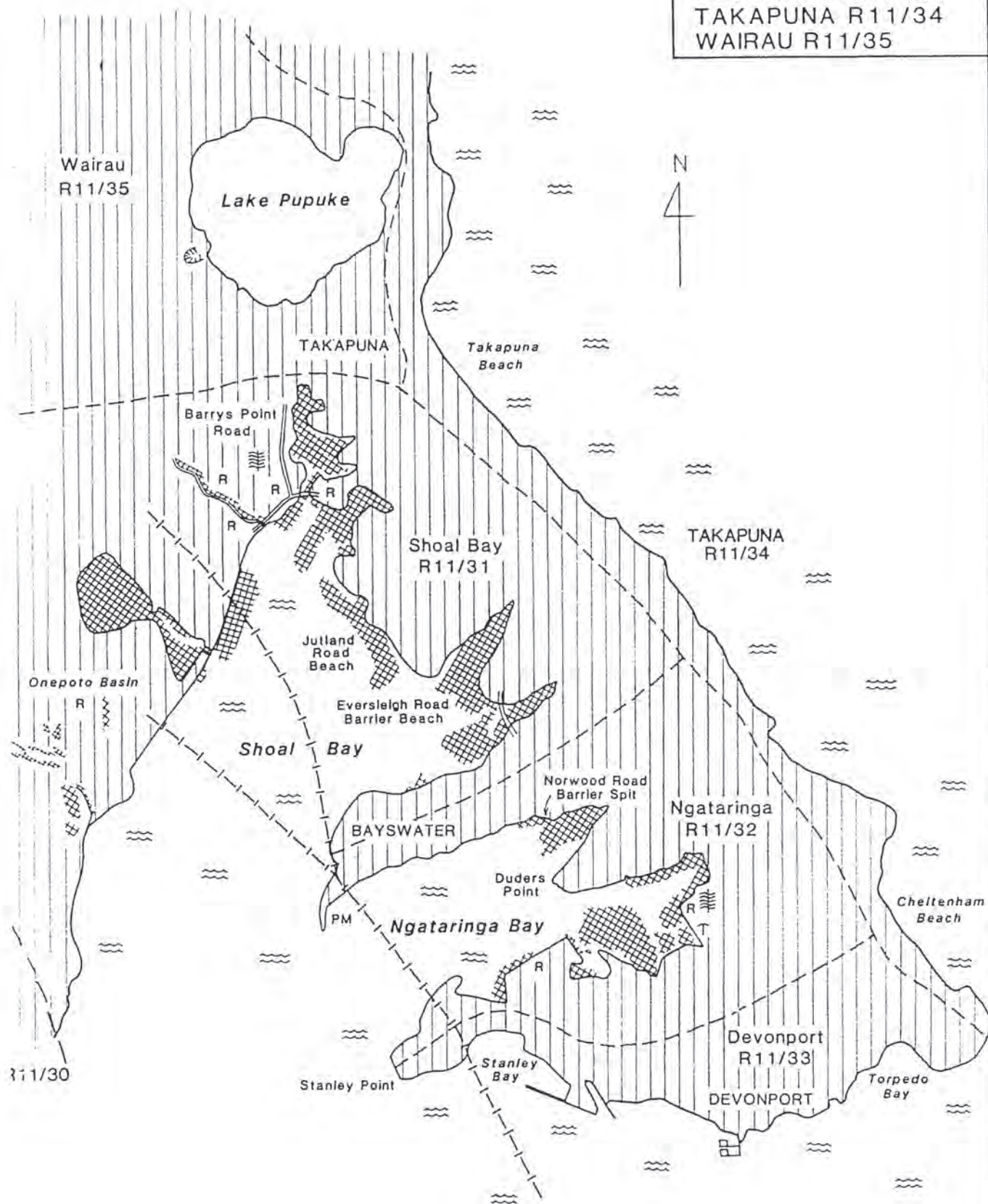
19. RELEVANT REFERENCES:

- (1) Bioresearches Limited (1988) Little Shoal Bay Wetlands, Natural Environment Values and Management Alternatives. Prepared for Northcote Borough Council.
- (2) Buckland, Mary (1988) Management Plan for Little Shoal Bay. Prepared for Northcote Borough Council.
- (3) Buckland, Mary (under prep. 1988). Management Plan for Onepoto Basin. Northcote Borough Council.
- (4) Woodruffe, C. (1983). Mangrove Swamps Productive Estuarine Wetlands, New Zealand Environment 37, pp 12-17.
- (5) Morton, J. E. (1981). Contributions to a Handbook on Devonport Walks.

- (6) Chapman, J., Ronaldson, J. W. (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus, New Zealand DSIR Bulletin No 125.
- (7) Auckland Regional Planning Scheme Maps (1979).
- (8) Ward, J.M. (1967). Studies in Ecology of a Shell Barrier Beach. Section 1: Physiography and vegetation of shell barrier beaches. Vegetation 14 241-96.
- (9) Challis, D. and A. Haughey (1988) pers. comm. Scientists Mangere Sewage Purification Works.
- (10) Bioresearches Limited (1986). Assessment of Natural Environment Implications of Locating a Proposed Gas Pipeline in Shoal Bay, Waitemata Harbour.
- (11) Reports on proposed motorway links.
- (12) Larcombe, M. (1973) ecology. Waitemata Harbour Study, Auckland Regional Authority/Auckland Harbour Board.
- (13) Swales, A. (1987). Reclamation in the Waitemata Harbour - A Review 20.441 Research Report.

MAP 17

SHOAL BAY R11/31
 NGATARINGA R11/32
 DEVONPORT R11/33
 TAKAPUNA R11/34
 WAIRAU R11/35



Scale 1km
 0 500m 1000m

Information from NZMS 260 (1987)
 NZMS 270 (1977)
 Aerial photographs (1988)
 M.O.W.D. (1986)

1. NAME Ngataringa
2. AREA CODE R11/32 Map 17
3. MAP REFERENCE NZMS 260 R11 690850
4. LOCATION DESCRIPTION Bay inside northern headland of Waitemata Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Mangrove marsh occupies approximately 25 ha (Ref 7).
Approx 50 m² of rush marsh.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
Clumps of Stipa, Salicornia and Suaeda australis var nova zelandica (Ref 4). A small patch of Zostera occurs in one place (Ref 3). Mangroves are relatively small being mainly 0.5 to 1.0 m high. At lower intertidal levels the trees grow substantially higher. Species present, Norwood Road shell barrier Ngataringa Bay: Juncus maritimus, Avicennia, resinifera, Atriplex hastata s.sp. novae-zelandiae, Festuca arundinacea (Ref 5).
8. WILDLIFE VALUES S.Sp. Ngataringa Bay is a valuable feeding area for a wide range of harbour species including yellow-eyed mullet, juvenile flat fishes and parore (Ref 10). Feeding range for several common harbour bird species.

Dominant species Pukeko, white-faced heron, black-backed gull, red-billed gull, pied stilt, pied shag, little black shag (Ref 10), mallard duck, pukeko. (Ref 10).

Rare species/endangered species Caspian tern (Ref 10), banded rail.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The salt marshes and mangroves in this area have developed behind shell banks (Ref 4).
10. STABILITY OF WETLAND Reclamations: Devonport refuse tip at Narrow Neck, naval sports fields near Stanley Bay, naval base foreshore and north yard.

Mangroves are spreading slowly in many areas around the fringes of existing marshes.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.
Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Takapuna City Council, Devonport Borough.

Crown

Department of Conservation

Other

Waitemata Harbour Maritime Planning
Authority.12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

- 13.
- USE OF WETLAND BY MAN
- Rubbish tipping, reclamation, walking, fossicking, open space value, wildlife habitat.

- 14.
- WETLAND MODIFICATIONS PROPOSED
- Proposed reclamation for road - building and construction in south-east of bay. (This will involve removal of a sequence of habitats from raupo to salt marsh to mangrove) (Refs 1, 2, 7, 8). There is also a proposed platform and ramp (WHMPA).

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Proposed marina (Bayswater) off Dunders Point.

Waste disposal: Stormwater from residential areas and naval base.

Refuse land fill: Devonport Tip (Ngataranga Bay land fill).

Recreation: Walking, fossicking, open space value.

Fishing: Recreational.

Sand extraction: No.

Other:

- (b)
- Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland:
- Presently satisfactory water quality. In early 1970's Larcombe reported oil deposits in the sediments next to defence areas as well as the interaction of metals with seawater in the inorganic refuse at the head of the bay (Ref 12).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a)
- Approximate total area of catchment:
- 200 ha.

- (b)
- Land use of catchment:
- Approximate percentage of total catchment
-
- in: forest residential 70% bare earth
-
- pasture industrial
-
- naval base 20%

Other land use likely to affect wetland: Rubbish tip and reclamation.
Naval base.Reserves present: Mount Victoria.
North Head.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Predominantly residential and defence purposes.

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987). Habitat zoned (ref 9).

Waitemata Harbour Maritime Planning Scheme acknowledges the fact that the Crown is not bound by the maritime planning provisions of the Town and Country Planning Act 1977. A number of specific policies to guide the Crown in planning within the maritime planning area have been put forward -

- Only defence establishments having an operational need for a harbour location should take up harbour space.
- Where the Crown requires space for defence activities or facilities they should be accommodated as far as possible by the redevelopment or modification of areas already occupied for defence purposes.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Soils of volcanic origin in catchment. Generally gently undulating land.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Ngataringa Bay wetlands and associated habitats make a valuable contribution to the productivity and diversity of the Waitemata Harbour. For this reason they should be protected from further reclamation and rubbish dumping.

19. RELEVANT REFERENCES:

- (1) Ministry of Works and Development (1986). Proposed Ngataringa Bay Access Road Devonport Naval Base Environmental Impact Assessment.
- (2) Market Research and Town Planning (1986). Review of Environmental Impact Assessment for Proposed Ngataringa Bay Access Road Devonport Naval Base, prepared for Ministry of Works and Development.
- (3) Armiger, L. C. (1965). A Contribution to the Autecology of Zostera MSc thesis, Department of Botany, Auckland University.
- (4) Chapman, V. J. and J. W. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus, DSIR Bulletin No 125.
- (5) Ward, J. M. (1967). Studies in Ecology of a Shell Barrier Beach Section 1: Vegetation 14 241-96.
- (6) Ngataringa Bay Protection Society. Literature resulting from 1970's proposal for residential marina.
- (7) Bioresearches Limited (1986). Assessment of Natural Environment Implications of Proposed Roding Reclamation at Ngataringa Bay.
- (8) Bioresearches Limited (1986). Implications of Proposed Gas Pipeline Crossing of Shoal and Ngataringa Bays.
- (9) Waitemata Harbour Maritime Planning Authority (1987). Maritime Scheme.
- (10) Larcombe, M. 1973. Ecology Report, Waitemata Harbour Study. Auckland Regional Authority/Auckland Harbour Board.

1. NAME Devonport
2. AREA CODE R11/33 Map 17
3. MAP REFERENCE NZMS 260 R11 685843 to R11 722844
4. LOCATION DESCRIPTION Northern headland of Waitemata Harbour.
5. TYPE OF WETLAND None.
6. AREA OCCUPIED BY WETLAND (ha) None
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Within the last 30 years there has been a *Zostera* bed in Torpedo Bay (Ref 2).
8. WILDLIFE VALUES The narrow intertidal zone on this foreshore provides little feeding area for birds. Many of the species named below feed in nearby waters (Ref 6).

Dominant species Red-billed gull, black-backed gull, white-faced heron, pied stilts, pied shags, white-fronted tern, gannet.

Rare species/endangered species Caspian tern.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND The complete disappearance of *Zostera* from Stanley Bay is probably due to the undermining of the formation by the tidal stream following construction of tide deflectors in the Waitemata (Ref 3).

At the naval base there is an extensive reclaimed area - the destruction of a large zone of mangrove. Reclamation has been effected here by building a wall and filling in the enclosed area. Near the gasworks another small area has been reclaimed by excluding the tide and in 1958 was a prosperous market garden (Ref 1).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board
 Management agencies: Auckland Harbour Board, Waitemata Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland.
Territorial local authority	Devonport Borough.
Crown	Department of Conservation.
Other	Waitemata Harbour Maritime Planning Authority.

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 No.

13. USE OF WETLAND BY MAN No wetland.
14. WETLAND MODIFICATIONS PROPOSED Proposed redevelopment of Devonport Wharf.
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: Devonport Naval Base. Devonport Ferry Terminal.

Marinas moorings: A lot of swing moorings.

Waste disposal: Urban stormwater - residential, commercial and naval base.

Refuse land fill: No.

Recreation: Swimming, picnicking.

Fishing: Line, recreational.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Satisfactory. The principle source of pollution appears to be oil, paint and tar from naval dockyards. In early 1970's sewage pollution was having an adverse effect on intertidal ecology near the outfall on the south-eastern side of North Head (Ref 6).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 125 ha

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|------------|-------------|-----|------------|
| in: | forest | residential | 35% | bare earth |
| | pasture | industrial | 40% | naval base |
| | commercial | 25% | | |

Other land use likely to affect wetland: Erosion, particularly at Stanley Point.

Reserves present: Hauraki Gulf Maritime Park North Head. Foreshore reserves.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions:

Controls other than District scheme likely to influence future land use: Waitemata Harbour Maritime Planning Scheme (1987). Shallow habitat zone at North Head. Otherwise Recreation C and port zonings.

- (c) Description of topography (soil type, slope, erosion susceptibility): Mostly gently slope apart from volcanic cones.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

- 18.
- FUTURE MANAGEMENT RECOMMENDATIONS:
- Tighten controls over pollutants from dockyard.

19. RELEVANT REFERENCES:

- (1) Chapman, V.J. and J.W. Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus, DSIR Bulletin 125.
- (2) Challis, D. and A. Haughey (1988) pers. comm. Scientists at Mangere Purification Works.
- (3) Armiger, L. C (1965). A Contribution to the Autecology of Zostera. MSc thesis, Auckland University.
- (4) Auckland Regional Authority/Auckland Harbour Board (1975) Waitemata Harbour Study.
- (5) Devonport Borough District Scheme (1986).
- (6) Larcombe, M. (1973), Ecology. Report, Waitemata Harbour Study. Auckland Regional Authority/Auckland Harbour Board.

1. NAME Takapuna
2. AREA CODE R11/34 Map 17
3. MAP REFERENCE NZMS 260 R11 722844 to R10 685910.
4. LOCATION DESCRIPTION Foreshore North Head to Milford.
5. TYPE OF WETLAND Saltmarsh
6. AREA OCCUPIED BY WETLAND Little
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
 Thorne Bay small saltmarsh areas on rocks.
Selliera, radicans.
Samolus, repens.
Salicornia.
Cotula sp.
Triglochin striatum.
Suaeda novaezealandiae (Ref 1).

 Used to be a Zostera bed at Cheltenham but its disappearance can be largely attributed to a disease by the Labyrinthula slime mould; also it is possible that pathogenic susceptibility is enhanced by unfavourable conditions for growth such as increased sediment load, reduced salinity, or pollution (Ref 2).
8. WILDLIFE VALUES

Dominant species Red-billed gull, black-backed gull (Ref 4).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Feeding area for snapper (Ref 4).
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

 Ownership status of wetland: Crown.
 Management agencies: Takapuna City Council.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Takapuna City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Grant of control over part of coast by Takapuna City Council.
13. USE OF WETLAND BY MAN

14. WETLAND MODIFICATIONS PROPOSED15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: No.

Waste disposal: Stormwater/residential/industrial/commercial.

Refuse land fill: No.

Recreation: Highest intensity of aquatic recreation in Auckland.

Fishing: Recreational.

Sand extraction: No.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Satisfactory.16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha): 1500(b) Land use of catchment:

Approximate percentage of total catchment		
in: forest	residential 90%	bare earth
pasture	industrial	

Other land use likely to affect wetland:

Reserves present: Foreshore/local authority. Hauraki Gulf Maritime Park at North Head.

Land use changes anticipated up to year 2000: Little.

District scheme - zoning provisions:

Controls other than District scheme likely to influence future land use: The Council has introduced a Conservation of Natural Features Ordinance (Ordinance 14) to regulate modifications to landforms, bush, streams and other physical features which enhance the character and amenities of the city.

No removal of bush or trees is permitted without the prior consent of the Council (Ref 3).

(c) Description of topography (soil type, slope, erosion susceptibility):
Coastal residential. Erosion prone cliffs between beaches.17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:18. FUTURE MANAGEMENT RECOMMENDATIONS:

RELEVANT REFERENCES:

- (1) Morton, J.E. (1988) per. comm. Professor of Zoology, Auckland University.
- (2) Dromgoole, F. and B. Foster (1983) Changes to the Marine Biota of the Auckland Harbour, Tane 29.
- (3) Takapuna City Council District Scheme (1982).
- (4) Larcombe, M. (1973) Ecology. Waitemata Harbour Study, Auckland Regional Authority/Auckland Harbour Board.

1. NAME Wairau
2. AREA CODE R11/35 Maps 17 and 18
3. MAP REFERENCE NZMS 260 R10 682915
4. LOCATION DESCRIPTION Small inlet at mouth of Wairau Stream, Milford.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
Avicennia marina var. resinifera.
 Upstream of Milford Marina there remains a mangrove swamp in reasonable health.
8. WILDLIFE VALUES An area highly impacted by human activity.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Part of the Wairau Inlet mangrove area was dredged to build the Milford Marina. A further mangrove swamp on the northwest side of the inlet was filled to accommodate dredge spoil (Ref 2). Dumping of spoil on foreshore at Inga Road (Ref 5).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Takapuna City Council

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Takapuna City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Takapuna City Council grant of control.
13. USE OF WETLAND BY MAN Site of marina development.
14. WETLAND MODIFICATIONS PROPOSED
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: Milford Marina (Wairau Estuary Marina).

Waste disposal: Stormwater from Wairau industrial area.
Considerable sediment loss from urban earthworks in catchment.

Refuse land fill: No.

Recreation: Boating.

Fishing: Recreational.

Sand extraction: Maintenance dredging for marina.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Van Roon (1983) found heavy metal concentrations in Wairau Inlet sediments were many times those in the upper Waitemata Harbour (Ref 3). Water quality influenced both by Milford Marina (antifoulants, etc) and by Wairau industrial area.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 1550
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|------------|-------------|-----|------------|
| in: forest | residential | 50% | bare earth |
| pasture | industrial | 50% | |

Other land use likely to affect wetland: Catchment prone to flooding. Wairau Creek now consists of a concrete canal.

Reserves present: Milford Reserve (northern end of Milford Beach includes the Wairau Estuary), (Ref 1).

Land use changes anticipated up to year 2000:
Intensification/infilling of industrial areas. Some urban earthworks ongoing 1988.

District scheme - zoning provisions: Industrial and residential zonings predominate on land. Wairau Inlet has a recreational zoning (Ref 4).

Controls other than District scheme likely to influence future land use: None.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Urban development covers entire catchment.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Tighten controls over unauthorised discharges of toxic substances.

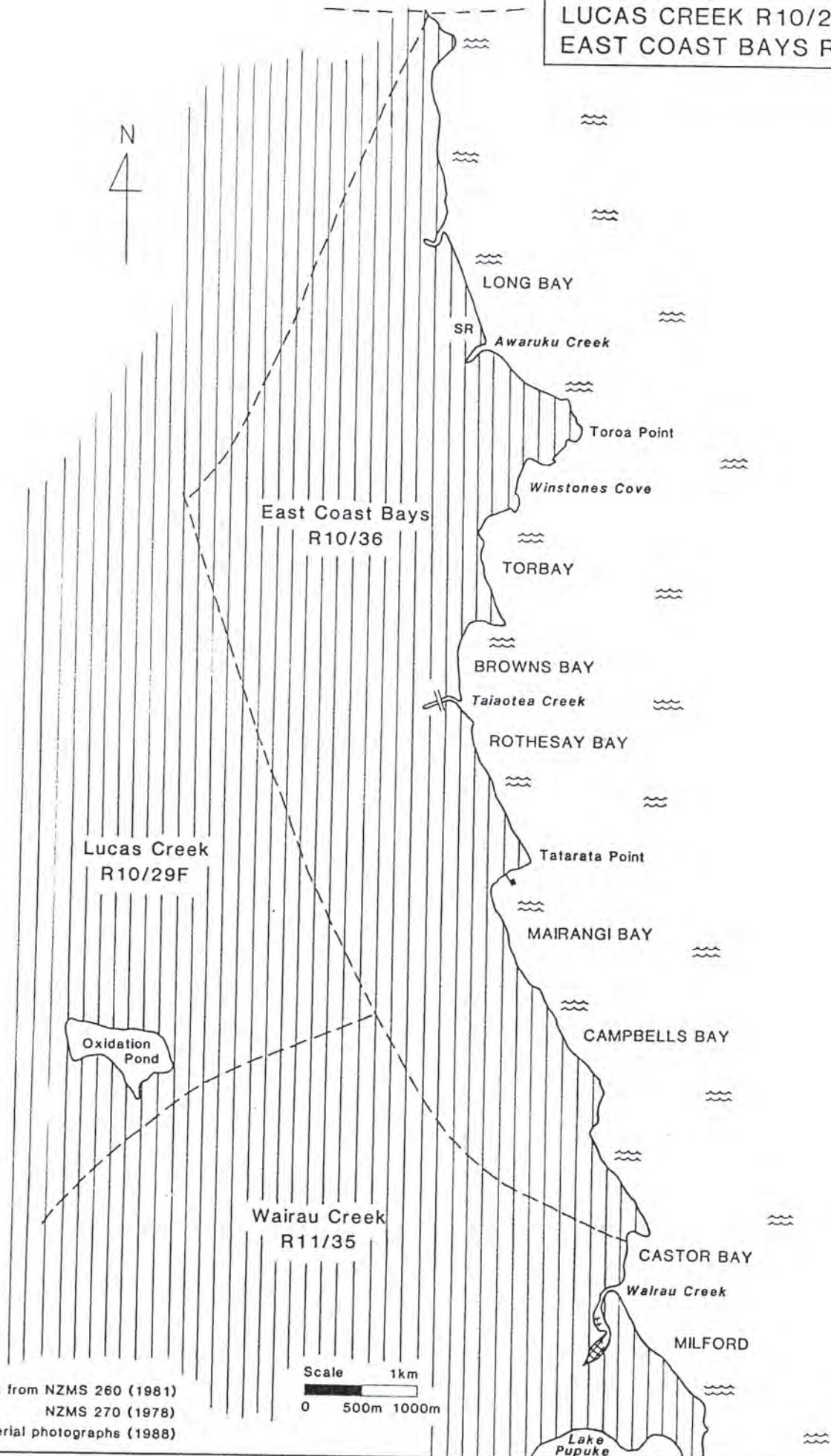
19. RELEVANT REFERENCES:

- (1) Takapuna City Council (1985) Management Plan for Milford Reserve.
- (2) Grace, R.V. (1988) pers. comm. Marine Biological Consultant, Auckland.
- (3) Van Roon, M.F. (1983) Water Quality of the Upper Waitemata Harbour and Streams. Specialist report, UWHC study, Auckland Regional Water Board.

- (4) Takapuna City Council (1982) District Scheme.
- (5) Department of Conservation (1988) internal file 411/3/I12.

R10/37 MAP 18

WAIRAU CREEK R11/35
 LUCAS CREEK R10/29F
 EAST COAST BAYS R10/36



1. NAME East Coast Bays
2. AREA CODE R10/36 Map 18
3. MAP REFERENCE NZMS 260 R10 685 920 to 665 030
4. LOCATION DESCRIPTION East Coast Bays
5. TYPE OF WETLAND Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Small
7. DOMINANT WETLAND VEGETATION/ASSOCIATION A small area of saltmarsh lines the stream mouth at the entrance to Long Bay Regional Reserve (Ref. 1).
8. WILDLIFE VALUES Common seashore species. Wildlife has been influenced by the proximity of vast urban development.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
 Management agencies: East Coast Bays City Council

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	
Territorial local authority	East Coast Bays City
Crown	Department of Conservation
Other	Regional Parks Department, Auckland Regional Authority

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Recreation
14. WETLAND MODIFICATIONS PROPOSED None known
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Point sources of pollution: North Shore Drainage Board's sewer outfall, local stormwater outfalls, sewage pumping station emergency overflows.

Possible that effluent from North Shore Drainage Board's sewage outfall could drift to other bays. In order to cope with the sewage generated on the North Shore, a sewage treatment plant was built near Rosedale Road and oxidation pond water piped to an outfall located ~ 500 m offshore between Red Bluff and Caster Bay (Ref. 2).

Refuse land fill:

Recreation: Intensive water based recreational use.

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No water quality problems likely to affect wetlands. High coliform concentrations at Mairangi and Milford Beaches (Ref. 2).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 1750 ha
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-----|-------------|-----|------------|
| forest | 5% | residential | 85% | bare earth |
| pasture | 10% | industrial | | |

Other land use likely to affect wetland:

Reserves present: Milford Reserve. Long Bay Regional Park.

Land use changes anticipated up to year 2000: Infilling of residential development at northern end of catchment.

District scheme - zoning provisions: Predominantly residential.

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme (1987) regarding limits of Metropolitan area.

- (c) Description of topography (soil type, slope, erosion susceptibility): Gently rolling. Urbanised.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Nil.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Auckland Regional Authority Park Department staff, pers comm 1988.
2. Auckland Regional Water Board (1978) Twelve localities subject to Environmental pressure - a preliminary study.
3. City of Takapuna (1985) Management Plan for Milford Reserve.

1. NAME: Okura
2. AREA CODE: R10/37 Map 19
3. MAP REFERENCE: NZMS 260 R10 650 025
4. LOCATION DESCRIPTION Estuary immediately south of Whangaparaoa Peninsula.
5. TYPE OF WETLAND: Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha): Whole estuary - 133.65 ha (Ref.1)
Wetland approximately 20 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The estuary is 600 metres wide at mouth - no obvious wetland here. Reduces to 30 metres wide in headwaters where it branches into shallow mangrove fringed northern and southern channels (Ref. 1).

Challis established five surveyed permanent biological transects (map). Mangroves at transects 3 to 5 fringe the southern shores. Upstream in the northern arm pneumatophores extend right to the low water channel (Ref. 1).

The Rodney Protected Natural Area survey reports two hectares of saltmarsh in scenic reserve, Leptocarpus similis, Juncus maritimus sedgeland on stabilised sand; described as the best in the Rodney Ecological District (Ref. 2). The presence of this saltmarsh and its transition to adjacent forest was confirmed also by Mitchell (Ref. 3) and WERI (Ref. 4).

8. WILDLIFE VALUES PNA rated wildlife habitat as of moderate to high value. Good wader feeding areas (Ref. 2).

Okura River area has a diversity of tidal inlet, estuarine, and coastal habitats which are rich in bird life. A large colony of white-faced herons is to be found in one of the arms of the river, and the numbers of pied stilts are increasing. White herons also frequent the area. Kingfishers and pukeko nest on the river margins, as do rosellas, shags, blue reef herons and oystercatchers (Ref. 5).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES According to the PNA survey Rodney, this is a Priority Natural Area.

10. STABILITY OF WETLAND

Extensive mangrove mortality in early 1980s in headwaters probably resulted from spraying of adjacent area with Tordon 520 (Ref. 1).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Rodney County Council.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Rodney County - Grant of Control over water.

13. USE OF WETLAND BY MAN? Bird watching, shellfishing.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Moorings only

Waste disposal: Okura septic tank seepage

Refuse land fill: Proposed

Recreation: Low key - boating

Fishing: Recreational

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland Challis found water quality in 1984 to be good (Ref. 1)

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 2,500 ha

(b) Land use of catchment:

Approximate percentage of total catchment in:

Forest	- 40%	Pasture	- 58% (mostly south side)
Industrial	-	Residential	- 2% (Okura township)
Bare earth	-		

Estuary shoreline mostly bush fringed.

Other land use likely to affect wetland: To the northwest in the major headwater catchment the large Weiti Station, once pastoral, is being planted in exotic forest.

A large tip for clean fill rubble at Lonely Track Road is feared by locals to contribute large amounts of silt to the Okura River. Regional Water Board and Rodney County Council gave permission and set conditions.

Reserves present: Scenic reserve down to estuary - 147 ha. R10. 635020 (ref. 2). Southern headland is part of Long Bay Regional Park. Bush on northern shore forms a 'native forest reserve' (Ref. 6).

Land use changes anticipated up to year 2000? ARA proposed major refuse tip in this catchment. Pine forest expansion and eventual harvest.

District scheme - zoning provisions: Landscape - (bush protection) zoning on the northern foreshore. Small proportion of catchment in rural-residential and farmlet zonings. Large area to north of estuary forms Weiti Forest Park zone. Balance of catchment in rural zoning.

The following is an extract from the Auckland Regional Proposed Planning Scheme: Long Bay - Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential. The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other land uses:

- i) Waiwera to Mullet Point.
- ii) The bush clad slopes on the north side of the Okura River.
- iii) The bush clad escarpment of the Waiti River valley along its eastern banks (this area may be used for low density residential as long as the bush cover is protected" (Ref. 6).

Controls other than district scheme likely to influence future land use?

- (c) Description of topography (soil type, slope, erosion susceptibility)
Catchment rises to steep erosion prone Albany Heights.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: There are five permanent biological transects in the Okura Estuary established by surveyors pegs. These could be used to monitor future change (Ref. 1).

Sediment particle size distribution at these sites could be monitored in order to monitor siltation changes (possibly caused by landfill or by forest harvesting).

18. FUTURE MANAGEMENT RECOMMENDATIONS: The Protected Natural Areas survey recommends: "Investigate formal protection for adjacent saline wetlands, especially behind sandbar. Investigate ownership/protected status of bar, initiate weed and pest eradication along shore." "Coastal fringe vegetation and intertidal habitat likely to be degraded through any significant improvement in access to Karepiro Bay Beach." (Ref. 2).

Any land use change involving vegetation removal and soil disturbance in this erosion prone catchment needs to be undertaken with all possible precautions to prevent sediment deposition in the estuary.

19. RELEVANT REFERENCES:

1. Challis, D.A. (1984). An Environmental Baseline Survey of the Okura Estuary. Refuse Department, Auckland Regional Authority.
2. Ayres, B. et al (1983). Protected Natural Areas Survey, Rodney Ecological District. Auckland Regional Authority/Department of Conservation/University of Auckland.
3. Mitchell, N. pers. comm. (1988). Botany Department, Auckland University.
4. Department of Conservation (1982). WERI - computerised wetland inventory, Wellington.
5. Moore, A. Smith, M. Lewis, D. and Lane, J (1982). Planned Developments of the Okura River, Zoology Department, University of Auckland, unpublished.
6. Auckland Regional Authority (1987) Proposed Regional Scheme.

MAP 19

OKURA RIVER
R10/37

R10/38

WEITI RIVER

Karepiro Bay

SR

Okura River

Okura
R10/37

R10/36

Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
NZMS 270 (1978)
Aerial Photographs (1988)

1. NAME Weiti
 2. AREA CODE R10/38 Map 20
 3. MAP REFERENCE NZMS 260 R10 650 050
 4. LOCATION DESCRIPTION Estuary at base of Whangaparaoa Peninsula.
 5. TYPE OF WETLAND Mangrove Saltmarsh
 6. AREA OCCUPIED BY WETLAND (ha) ~ 108 ha
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION *Avicennia marina* var. *resinifera*, *Leptocarpus*, *Juncus maritimus* (Ref. 1).

Zostera found in the drainage streams of mangrove swamps, e.g. at Stillwater (Ref. 2).
 8. WILDLIFE VALUES Feeding area for waders.

Dominant species Common species are present (Ref. 3).
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Weiti River estuary has immobile shell spits mostly covered in the 1960s with terrestrial vegetation (Ref. 4).

It has marker beds for global sea level change monitoring.
 10. STABILITY OF WETLAND Reclamation and jetty application (1987)(Ref. 5). Proposal to construct a bridge over the Weiti estuary for access to marina on Whangaparaoa Peninsula (Ref. 6).
 11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
Management agencies: Rodney County Council
- | | Name |
|-----------------------------|-------------------------------|
| Catchment authority | Auckland Regional Water Board |
| Regional planning authority | Auckland Regional Authority |
| Harbour board | Nil |
| Territorial local authority | Rodney County |
| Crown | Department of Conservation |
| Other | |
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Grant of Control of water areas by Rodney County Council.
 13. USE OF WETLAND BY MAN See 10.

14. WETLAND MODIFICATIONS PROPOSED Reclamation possible for Silverdale industrial area (Ref. 7).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No

Marinas/moorings: No.

Waste disposal: Dumping of building material on the northern foreshore at the mouth of Weiti River (Ref. 8).

Refuse land fill: No.

Recreation: Camping ground/swimming at Stillwater.

Fishing: Recreational

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Some pollution noted during PNA survey (Ref. 3).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 3200 ha

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|-----|---------|-----|-------------|----|------------|
| in: | forest | 10% | residential | 5% | bare earth |
| | pasture | 80% | industrial | 5% | |

Other land use likely to affect wetland: Silverdale industrial area stormwater including that from timber treatment yard drains to Weiti (Ref. 9).

Reserves present: No information

Land use changes anticipated up to year 2000: Exotic forest planting/late harvesting on Weiti Station south west shore of estuary.

Infilling of low density urban uses on north eastern shoreline expanding industrial area at Silverdale.

District scheme - zoning provisions:

Southern esplanade area. Nature Conservation and Coastal Landscape protection zones.

Weiti Forest Park zone south of Stillwater.

Extensive urban zone around estuary headwaters at Silverdale and along full length of north eastern foreshore.

Rural residential zone west of Stillwater.

Urban zone at Stillwater.

Balance of catchment zoned rural (Ref. 12).

Controls other than District scheme likely to influence future land use: Extract from Auckland Regional Proposed Planning Scheme (1987):

Long Bay - Cape Rodney : "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential. The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other land uses."

- (a) Waiwera to Mullet Pt including Mahurangi Harbour.
- (b) The bush-clad slopes on the north side of the Okura River.
- (c) The bush clad escarpment of the Weiti River Valley along its eastern bank (this area may be used for low-density residential as long as the bush cover is protected).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating

- 17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Recommend a university student project to extend the existing scant knowledge of this wetland.

- 18. FUTURE MANAGEMENT RECOMMENDATIONS:

- 19. RELEVANT REFERENCES:

1. Department of Conservation, Wellington (1980-1988) WERI Wetland Inventory.
2. Armiger, L.C. (1965) A contribution to the Autecology of Zostera MSc thesis, unpublished. Auckland University.
3. Ayres, B, et al. (1983) Protected Natural Area Survey - Rodney Ecological District. Department of Conservation/Auckland Regional Authority/University of Auckland.
4. Ward, J (1967) Studies in the Ecology of a Shell Barrier Beach. Section 1, Vegetation 14.
5. Department of Conservation, Auckland. Internal files.
6. Department of Conservation, pers. comms. Coastal and Marine, Auckland.
7. Mitchell, N., pers. comm. 1988. Botany Department, Auckland University.
8. Department of Conservation, Auckland, file 411/3/110 and photos.
9. Henderson, K, pers. comm. 1988 Auckland Regional Water Board.
10. Auckland Regional Authority (1987) proposed Regional Scheme.
11. Dromgoole, F.I. and B.A. Foster (1983) Changes to the Marine Biota of the Auckland Harbour : Tane 29.
12. Rodney County Council (1987) District Scheme.

Hobbs Bay

MAP 20

WEITI RIVER R10/38

WHANGAPARAOA R10/39



Big Manly Beach

Arkles Bay

Whangaparaoa
R10/39

Stanmore Bay

Red Beach

BM

STILLWATER

Weiti
RiverWeiti River
R10/38

R10/37

R10/40

Scale 1km
0 500 1000m

Information from NZMS 260 (1987)

NZMS 270 (1976)

Aerial photographs (1987-1988)

1. NAME Whangaparaoa
2. AREA CODE R10/39 Map 20
3. MAP REFERENCE NZMS 260 R10 660 046 to R10 630 098
4. LOCATION DESCRIPTION The whole peninsula
5. TYPE OF WETLAND Saltmarsh
6. AREA OCCUPIED BY WETLAND Minimal
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Okoramai Bay - saltmarsh/salt meadow (Ref. 1) Triglochin striatum, Cotula sp.
8. WILDLIFE VALUES Some secondary wading bird feeding areas in most tidal bays.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND In the period around 1945 six of seven freshwater wetlands were drained (Ref. 2). The construction of Gulf Harbour Marina meant reclamation.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Department of Conservation.

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

Rodney County - Grant of Control over adjacent waters.

13. USE OF WETLAND BY MAN Recreation.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Marinas/moorings: Gulf Harbour

Waste disposal: Sewage effluent discharges to saline waters at Orewa and Whangaparaoa Head. Whangaparaoa residential stormwater.

Refuse land fill: No

Recreation: Intensive use of coastline for swimming, boating.

Fishing: Mainly recreational line fishing.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 2,400 ha

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | |
|---------------|-------------------|------------|
| forest - 10% | residential - 55% | bare earth |
| pasture - 35% | industrial | |

Other land use likely to affect wetland:

Reserves present: Rodney County Local Reserves. Shakespeare Regional Reserve

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: The whole peninsula is zoned urban, except the areas east of Okoromai Bay, which is zoned for coastal landscape protection (Ref. 3).

Controls other than District scheme likely to influence future land use: Extract from Auckland Regional Proposed Planning Scheme (1987). Long Bay-Cape Rodney: Urban development should not be permitted outside metropolitan limits and areas currently zoned residential (Ref. 4).

- (c) Description of topography (soil type, slope, erosion susceptibility): Rolling hill country, largely urbanised.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Nil

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- (1) Morton J E pers. comm. 1988 Zoology Professor, Auckland University.
- (2) Ayres B, et al (1983). Protected Natural Area Survey. Rodney Ecological District. Auckland Regional Authority/Department of Conservation/ University of Auckland.
- (3) Rodney County Council (1987) District Scheme.
- (4) Auckland Regional Authority (1987) Proposed Regional Scheme.

1. NAME Orewa
2. AREA CODE R10/40 Map 21
3. MAP REFERENCE NZMS 260
4. LOCATION DESCRIPTION Estuary immediately north of Whangaparaoa Peninsula
5. TYPE OF WETLAND Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Approximately 20
7. DOMINANT WETLAND VEGETATION/ASSOCIATION In the Orewa River a *Avicennia/Juncus/Leptocarpus/Typha* type zonation is found (2).

Most of the swamp is mangrove, bordering the creek with *Juncus maritimus* over the remainder. Around the edges of the swamp there is a narrow belt of *Leptocarpus* or *Cladium junceum* and *Typha* (Refs 1,2).

8. WILDLIFE VALUES Good diversity and abundance of birds (Ref. 3). Large population of little black shag. Oxidation ponds - paradise shelduck moulting site.

Rare species/endangered species NZ dabchick, australasian bittern (Ref. 2)

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Very strong currents at river mouth (Ref. 4). Probably little or no fresh water during droughts (Ref. 2).

10. STABILITY OF WETLAND Several illegal works and reclamations, including: Orewa estuary - reclamation or encroachment by 'Maygrove' subdivision 1987 (Ref. 5)

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown - not protected.

Management agencies: Rodney County Council. Department of Conservation.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Rodney County Council - Grant of Control over water areas.

13. USE OF WETLAND BY MAN Accommodation of sewage oxidation ponds.
Walking, fossicking, bird watching.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

- (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: All the sewage is reticulated to an oxidation pond treatment system (located on the south bank of the Orewa River Estuary) (Ref. 4). The effluent from the oxidation ponds is discharged via a marine outfall some 600 metres from Orewa Beach. Intak and discharge pipes - Orewa River (Ref 6). Point sources of pollution: Emergency storm sewer overflows into the estuary, stormwater (Ref. 4).

Refuse land fill: No

Recreation: Extensive - boating, bathing, water sports.

Fishing: Extensive shellfishing (Ref. 4).

Sand extraction: From estuary for beach replenishment (move sand from dredging site in estuary to beach) (many references, including DOC files).

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Land drainage affects the estuary water quality.

The streams flowing into the Orewa Estuary are small and slow flowing. They contain either a high plant or organic load (correlates with the low dissolved oxygen concentrations and high biochemical oxygen demands). Once in the estuary, further dilution with tidal water increases water quality. There does not appear to be any seepage from the oxidation ponds into the estuary (Ref. 4).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 1750

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | |
|---------|-----|-------------|-----|------------|
| forest | 10% | residential | 10% | bare earth |
| pasture | 80% | industrial | | |

Other land use likely to affect wetland:

Reserves present: No information.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Urban zoning on both headlands from river mouth to R10 613 096 on south shore and to R10/605 108 on north shore. Balance of catchment zoned rural (Ref. 7).

Controls other than District scheme likely to influence future land use: Extract from Auckland Regional Proposed Planning Scheme. Long Bay-Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned 'residential'..." (Ref. 8).

(c) Description of topography (soil type, slope, erosion susceptibility):
Headwaters of catchment fairly steep and erosion prone.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

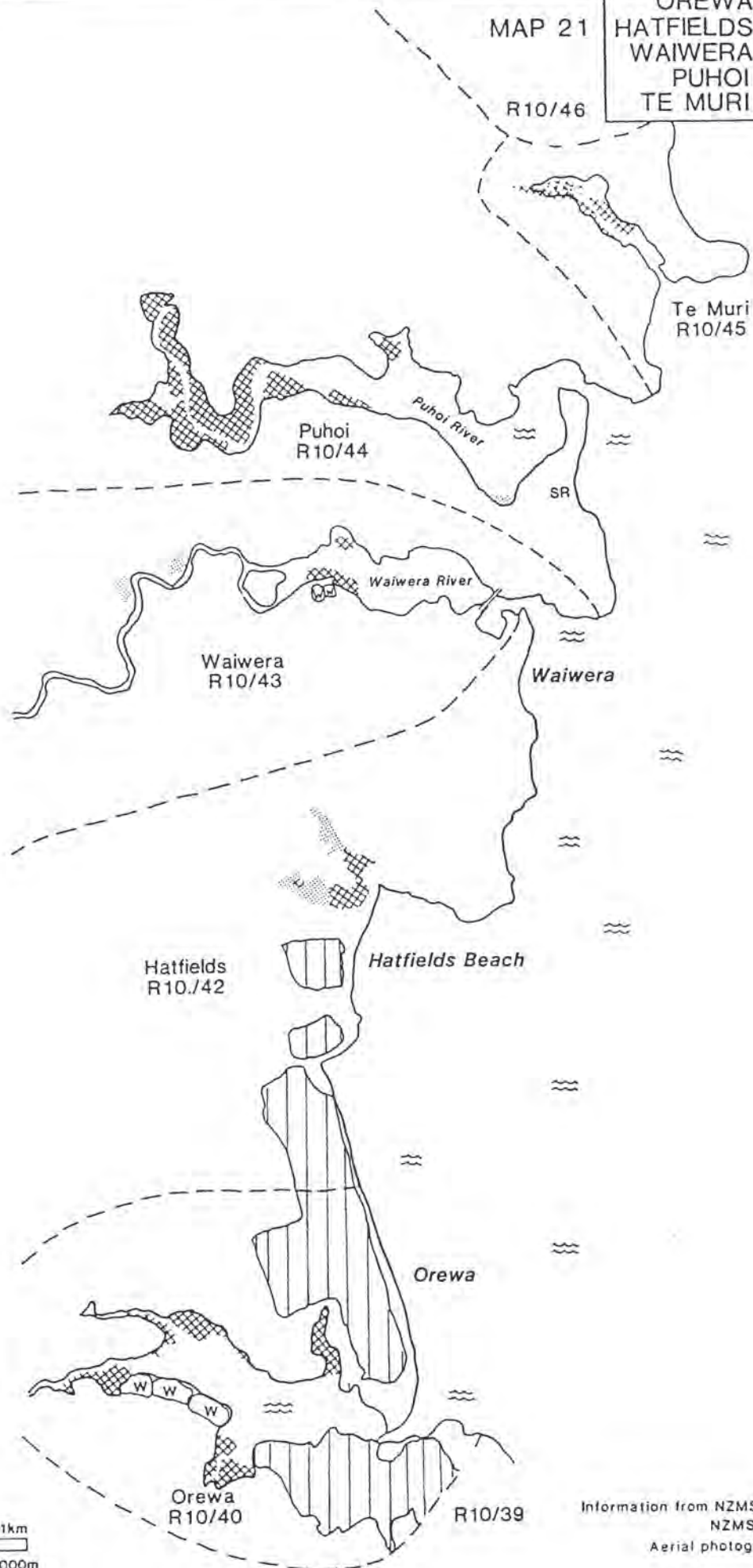
18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Chapman J V and J W Ronaldson (1958). The Mangrove and Salt Marsh Flats of the Auckland Isthmus.
- 2) Department of Conservation, Wellington (1980-1988) WERI Computerised Wetland Inventory.
- 3) Ayres B et al (1983) Protected Natural Area Survey. Rodney Ecological District. Department of Conservation/ Auckland University/Auckland Regional Authority.
- 4) Auckland Regional Water Board (1978). Twelve localities subject to environmental pressure.
- 5) Department of Conservation, Auckland internal files.
- 6) Rodney County Council (1987) District Scheme.
- 7) Auckland Regional Authority (1987) Proposed Regional Scheme.

MAP 21

OREWA R10/40
 HATFIELDS R10/42
 WAIWERA R10/43
 PUHOI R10/44
 TE MURI R10/45



Scale 1km
 0 500m 1000m

Information from NZMS 260 (1981)
 NZMS 270 (1978)
 Aerial photographs (1988)

1. NAME Inner Hauraki Gulf Islands, including:

Rangitoto: NZMS 260 R10 770 900
 Tititiri-Matangi: NZMS 260 R10 790 100
 Motutapu: NZMS 260 R10 820 910
 Rakino: NZMS 260 R10 845 960
 Motuine: NZMS 260 R11 840 860
 Motukorea: NZMS 260 R11 795 840

2. AREA CODE R10/41 No map

3. MAP REFERENCE NZMS 260 R10 and R11

4. LOCATION DESCRIPTION Hauraki Gulf

5. TYPE OF WETLAND Mangrove, Saltmarsh

6. AREA OCCUPIED BY WETLAND (ha) Small bays on Rangitoto

7. DOMINANT WETLAND VEGETATION/ASSOCIATION No known wetlands on any islands except Rangitoto. Rangitoto Island - at a sheltered bay east of the wharf on the southern side - a small saltmarsh, and some mangroves in bay at south of island.

Salt-marsh

Sarcocornia quinqueflora

Stipa teretifolia

Mimulus repens

Juncus maritimus

Samolus repens

Avicennia marina var resinifera

(Ref. 1. See also Refs 4 and 5)

8. WILDLIFE VALUES Common sea-shore bird species in these bays (Ref. 4).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Rangitoto presents maturing botanical associations.

10. STABILITY OF WETLAND Not known, but mangroves have likely colonised and spread since 1945.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Department of Conservation. Hauraki Gulf Maritime Park Board.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Waiheke County Council
Crown	Department of Conservation
Other	Hauraki Gulf Maritime Park, Department of Conservation

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Education/recreation

14. WETLAND MODIFICATIONS PROPOSED Rangitoto marsh - nil. (Part of Maritime Park).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: Wharf nearby to Rangitoto saltmarsh

Marinas/moorings: No

Waste disposal: Seepage of wastes from baches

Refuse land fill: No

Recreation: Yes - water related recreation, (e.g. boating, bathing, etc.) predominates around all of the islands.

Fishing: Yes

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Area of Rangitoto Island:

(b) Land use of catchment: (for Rangitoto)

Approximate percentage of total catchment in:

forest - 99%	residential	bare earth
pasture	industrial	

Other land use likely to affect wetland: Baches remain on the island.

Reserves present:

- Hauraki Gulf Maritime Park.
- Proposed marine park or reserves in waters around Tiritiri Matangi Island

Land use changes anticipated up to year 2000: Rangitoto nil, except bach removal.

District scheme - zoning provisions:

Controls other than district scheme likely to influence future land use: Hauraki Gulf Maritime Park policies.

(c) Description of topography (soil type, slope, erosion susceptibility):
Rangitoto - volcanic soils, and steep island terrain.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Further information on the ecology of wetlands on Rangitoto Island.
18. FUTURE MANAGEMENT RECOMMENDATIONS: Preserve the salt-marsh at Rangitoto as part of park. Valuable for its scarcity as a different ecosystem on Rangitoto.
19. RELEVANT REFERENCES:
 - 1) Morton J E and R Cometti (1985) Margins of the Sea - Exploring New Zealand's Coastline. Published by Hodder & Staughton.
 - 2) Meekan M (1984) An Inter-tidal survey of Tiritiri-Matangi Island.
 - 3) Ministry of Agriculture & Fisheries, Auckland (1982). Auckland Region Marine Reserves Plan.
 - 4) Segedin A (1985) Rangitoto Island biological report - Biological Assessment and Natural History - prepared by Department of Lands & Survey for the Hauraki Gulf Maritime Park Board.
 - 5) Mitchell N D and J E Braggins (1982) A provisional vegetation map of Rangitoto, Botany Department, University of Auckland.

1. NAME: Hatfields
2. AREA CODE: R10/42 Map 21
3. MAP REFERENCE: NZMS 260 R10 623141
4. LOCATION DESCRIPTION: Between Orewa and Waiwera estuaries
5. TYPE OF WETLAND Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha): Approximately five hectares
7. DOMINANT WETLAND VEGETATION/ASSOCIATION

Nice saltmarsh behind road/spit. In good condition and with educational/
recreational potential (Refs 1, 2).

Mangrove *Avicennia marina* var. *resinifera* (Ref. 3). *Juncus maritimus*
8. WILDLIFE VALUES

Some feeding by wading birds - habitat potential (Ref. 6)
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

None.
10. STABILITY OF WETLAND

State Highway 1 crosses entrance to inlet.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown land - not protected.

Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Ni.
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

Rodney County Council - Grant of Control over water areas.

13. USE OF WETLAND BY MAN?

Main threat from possible land fill, from grazing, and from residential pollution.

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Residential stormwater

Refuse land fill: No

Recreation: Popular swimming and picnicking beach

Fishing: Recreational line fishing

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland

Good quality water.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 500

(b) Land use of catchment:

Approximate percentage of total catchment in:

Forest - 20% Pasture - 75%

Residential - 5% Industrial Bare earth

Other land use likely to affect wetland:

Cattle damage (Ref. 6). Rubbish from road.

Reserves present: Foreshore, Rodney County Council reserve.

Land use changes anticipated up to year 2000? None known.

District scheme - zoning provisions:

Urban zoning southern headland. Rural-residential/coastal landscape protection zoning northern headland. Rural zoning inland (Ref. 4).

Controls other than District scheme likely to influence future land use?

Extract from Auckland Regional Proposed Planning Scheme (1987) (Ref. 5). Long Bay-Cape Rodney: Urban development should not be permitted outside metropolitan limits and areas currently zoned residential.

(c) Description of topography (soil type, slope, erosion susceptibility)

Rolling hill country, urbanisation on western side of bay.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

A fuller description of this saltmarsh is required.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

This wetland is of sufficient quality that it should, be protected as an educational resource close to this popular picnic area. Rodney County Council should be encouraged to facilitate access.

19. RELEVANT REFERENCES:

- 1) Morton, J E pers. comm. 1988. Professor Zoology, Auckland University.
- 2) Grace, R U pers. comm. 1988. Consultant Marine Biologist.
- 3) Department of Conservation (1980-1988). WERI computerised wetland inventory.
- 4) Rodney County Council (1987) District Scheme.
- 5) Auckland Regional Authority (1987) Proposed Regional Scheme.
- 6) Department of Conservation faunal survey.

1. NAME: Waiwera
2. AREA CODE: R10/43 Map 21
3. MAP REFERENCE: NZMZ 260 R10 165625
4. LOCATION DESCRIPTION: East Coast, north of Whangaparaoa Peninsula
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha): 10
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
Avicennia marina var resinifera Juncus maritimus
8. WILDLIFE VALUES Good diversity of bird species feed here (Ref. 1).
Abundant wader feeding areas.

Banded rail (Ref. 1)
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

A clean sandy estuary at the estuary mouth.
10. STABILITY OF WETLAND

Sewage oxidation ponds built on southern shore in 1970s. Causeway and bridge for State Highway 1 across mouth. Threats from urban and industrial pollution, and also from grazing.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Swamp next to oxidation pond privately owned (Ref.2). Crown.

Management agencies: Department of Conservation. Rodney County Council.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

Rodney County - Grant of Control over water areas.

13. USE OF WETLAND BY MAN?

Oxidation ponds.

14. WETLAND MODIFICATIONS PROPOSED None known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Swing moorings

Waste disposal: Sewage effluent discharge Oxidation ponds in upper catchment.

Refuse land fill: No

Recreation: Swimming, picnicking, probably shellfishing .

Fishing: Yes

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland

No information

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 2500

(b) Land use of catchment:

Approximate percentage of total catchment in:

Forest - 40% Residential - <5% Bare earth

Pasture - 55% Industrial

Other land use likely to affect wetland: Tourist development with thermal pools, hotels and camping ground on southern headland.

Reserves present: Wenderholm Regional Reserve on northern headland. Scenic reserve south headland. Oxidation ponds.

Land use changes anticipated up to year 2000? Little

District scheme - zoning provisions: Urban zoning south shore extends from estuary mouth west to R10. 624163. Coastal landscape protection zoning on northern shore west to R10. 605165.

Extract from Auckland Regional Proposed Planning Scheme (1987):
 Long Bay-Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential. The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other land uses:
 i) Waiwera to Mullet Point."

Controls other than District scheme likely to influence future land use?

(c) Description of topography (soil type, slope, erosion susceptibility)

Catchment relatively steep and erosion prone.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Department of Conservation (1981). WERI - Computerised Wetland Inventory.
- 2) Department of Conservation Faunal Survey, unpublished.

1. NAME Puhoi
2. AREA CODE R10/44 Map 21
3. MAP REFERENCE NZMS 260 R10 177 630
4. LOCATION DESCRIPTION Estuary north of Whangaparaoa Peninsula.
5. TYPE OF WETLAND Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Approximately 18
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Mangroves, *A. marina* var. *resinifera* gives way on the upper shore to *Juncus maritimus* and *Triglochin striata*. Small patches of herbaceous salt marsh occur with *Selliera*, *Samolus*, and *Cotula*. *Sarcocornia* does not play a major part in the succession (Refs 1,2)

Any special features: PNA area recommended for protecting rated as Moderate-High habitat value (Ref. 3).

8. WILDLIFE VALUES

Dominant species Spotless crane, shoveller and paradise duck (Ref. 4).
A large population of little black shag (Ref. 5).

Rare species/endangered species Australasian bittern, fernbird, dabchick (Ref. 5).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.

10. STABILITY OF WETLAND

DOC files indicate that there has been illegal reclamation - dumping of surplus fill material - in the Puhoi River. Ministry of Works & Development was requested to restore the area to original state as much as practicable (1984) (Ref.6).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Department of Conservation. Rodney County Council.

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour Board	Nil
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

Rodney County - Grant of Control over water areas.

13. USE OF WETLAND BY MAN Educational at Wenderholm Regional Park.

14. WETLAND MODIFICATIONS PROPOSED Extensive wetlands in upper estuary may be vulnerable to unauthorised reclamations for farming.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Has in past had an oyster farming depot upstream near State Highway 1.

Ports: No

Marinas/moorings: No

Waste disposal: Agricultural pollution.

Refuse land fill: No

Recreation: Extensive - part of popular regional park used by thousands every weekend in summer.

Fishing: Recreational.

Sand extraction: No.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha):

(b) Land use of catchment:

Approximate percentage of total catchment in:

forest - 50%	residential	bare earth
pasture - 50%	industrial	

Other land use likely to affect wetland: Grazing on foreshore (Ref. 5)

Reserves present: Okahu Creek Scenic Reserve. Wildlife refuge. Wenderholm Regional Park at mouth of mobile spit (Ref. 5).

Land use changes anticipated up to year 2000: Little change.

District scheme - zoning provisions: Coastal landscape protection zones extend from estuary mouth on both shores to approximately R10 613 176 (Ref. 9). Rural zoning in balance of catchment.

Controls other than District scheme likely to influence future land use: Extract from Auckland Regional Proposed Planning Scheme (1987): Long Bay-Cape Rodney, "Urban development should not be permitted outside metropolitan limits and areas currently zoned Residential. The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other land uses:

- Waiwera to Mullet Point, including Mahurangi Harbour."

(c) Description of topography (soil type, slope, erosion susceptibility):

Catchment is steep and erosion prone.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

PNA survey recommends "Investigate protection of mangrove area adjacent to regional park." (Ref. 3). All reasonable steps will be taken by ARA Parks Department to provide and protect wildlife habitats. In particular, the mangroves and other marine resources of the Puhoi River estuary (Ref. 1).

Ensure that cattle are excluded from foreshore.

19. Relevant references

- 1) Auckland Regional Authority (1982) Wenderholm Regional Park Management Plan.
- 2) Chapman, V J and J W Ronaldson. The Mangrove and Soft Marsh Flats of the Auckland Isthmus.
- 3) Ayres, B et al (1983) Protected Natural Areas Survey, Rodney Ecological District.
- 4) Morton, J E pers. comm. (1988), Professor, Zoology Department, University of Auckland.
- 5) Department of Conservation (1981), WERI computerised wetland inventory.
- 6) Department of Conservation, Auckland. Internal files, unpublished.
- 7) van Roon, M and R V Grace (1973). Ecology of Wenderholm Regional Park. A pamphlet prepared for ARA Parks Division.
- 8) Morton, J E and D Thom (1973), Seacoasts in the seventies.
- 9) Rodney County Council (1987) District Scheme and Change 75.
- 10) Osborne (1988) Study of hydrodynamics of Puhoi Estuary, in preparation, Department of Geography, University of Auckland.

1. NAME Te Muri
2. AREA CODE R10/45 Map 21
3. MAP REFERENCE NZMS 260 R10 645192
4. LOCATION DESCRIPTION Immediately south of Mahurangi Harbour.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Mangrove.
8. WILDLIFE VALUES Moderately high habitat value. There are nationally rare bird species present (Ref 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.
10. STABILITY OF WETLAND Highly stable.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Department of Conservation. Rodney County Council.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	ARA
Harbour board	Rodney County
Territorial local authority	Auckland Regional Authority
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

Rodney County - Grant of Control over water areas.

13. USE OF WETLAND BY MAN
14. WETLAND MODIFICATIONS PROPOSED None.
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Various water sports in gulf

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 550 ha

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 20% residential bare earth
 pasture - 80% industrial

Other land use likely to affect wetland:

Reserves present: Mahurangi West (Te Muri) Regional Reserve.
 Southern and northern headlands.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Headlands in coastal
 landscape protection zone. Rural zoning in catchment (Ref. 1).

Controls other than District scheme likely to influence future land use: Extract from Auckland Regional Proposed Planning Scheme (1987). Long Bay-Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned Residential. Flora and fauna of the Mahurangi and Whangateau Harbours should be protected. The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other land uses: Waiwera to Mullet Point, including Mahurangi Harbour."

- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- a) Rodney County Council (1987) District Scheme Change No. 75.
 b) Department of Conservation Faunal Survey - unpublished notes.

1. NAME Mahurangi Harbour
2. AREA CODE R09/46 Map 22
3. MAP REFERENCE NZMS 260 R09 650 250
4. LOCATION DESCRIPTION 50 km north of Auckland on east coast
5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass Spartina
6. AREA OCCUPIED BY WETLAND (ha) 45% of harbour in mangrove (Ref. 5).
Little saltmarsh.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Most of the harbour's edge is in dense mangrove growth in good condition. A lot of well established seedlings (Ref. 2).

Spartina present at;
 (a) northern headland of Dawsons Creek
 (b) opposite (a) on western side of main harbour channel
 (c) Pukapuka Inlet.
 (Ref. 2).

 Saltmarsh noted in Huawai Bay and on eastern coast of main channel.
Leptocarpus similis predominant.

Any special features? Valuable zonation in Cowans Creek from mangrove to kowhai-pohutukawa to podocarp/kauri.

 Protected Natural Areas survey Rodney: "Mangrove/saline wetland one of three best in Rodney District" (Ref. 5).

 Areas recommended for protections include: Dyers Creek, Cowans Creek and 24 Te Kapa Inlet (Ref. 15).
8. WILDLIFE VALUES Protected Natural Areas rating: Moderately-high habitat value. One of best wading bird habitats in Rodney District. More than 14 species (Ref. 5).

Dominant Species Pied stilt, white-faced heron, red-billed gull, godwit (Ref. 1).

Rare Species/Endangered Species Nationally rare species in low numbers (Ref. 1). Banded rail, caspian tern, spotless crane, bittern, kaka.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Outstanding source of oyster spat for the New Zealand Marine Farming Industry. Good oyster growing area as well.

 Tidal oscillations favour the retention of larvae in the harbour and plankton is abundant. Bio enrichment of the harbour is assumed to have increased flounder catches nearby. Tidal exchange with the open coast is slow.
10. STABILITY OF WETLAND Sewage oxidation pond built in Dawsons Creek 1950s for Snell/Algies area.

 Reclamations at Warkworth next to sewage treatment plant. 0.35 ha and 9.84 ha (Ref. 6)

The mangrove area fringing the main harbour channel has been eroded by boat works (Ref. 2).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Department of Conservation, Rodney County Council

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	NIL
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	Ministry of Agriculture and Fisheries - control over oyster farms

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Rodney County - grant of Control over water.

13. USE OF WETLAND BY MAN?

14. WETLAND MODIFICATIONS PROPOSED

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: New Zealand's foremost harbour for oyster farming - 45 leases in 1985 in Huawai, Pukapuka, Dyers, Te Kapa Inlets, (Ref. 4).

Ports: No

Marinas/moorings: Marina under construction in old cement works basin near Warkworth. Lock connecting basin to estuary.

Waste disposal: Sewage effluent from Warkworth, some septic tank seepage, emergency sewage overflows from Dawsons Creek oxidation ponds (main discharge to Martins Bay A long history of poorly - monitored cowshed effluent discharge into the Mahurangi Harbour.

Refuse land fill: Yes. Dawson Creek catchment.

Recreation: Yes, bathing, fishing swimming.

Fishing: Recreational; commercial floundering.

Sand extraction: Sand extractions at Mullet Point and Saddle Island.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland Some pollution from animal wastes and rural runoff in the catchment. Demand for high water quality for oyster farming creates demand for care with all discharges. Emergency or maintenance overflows from the Snells/Algies oxidation ponds are directed to small holding ponds for ultimate release to small tributaries of the harbour (Ref. 13).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): 170 km² (75 km coastline)
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | |
|----------------|---------------|------------|
| in forest - | industrial - | bare earth |
| pasture - ~70% | residential - | <5% |

Other land use likely to affect wetland: Satellite station. Boat building yard Warkworth (Ref. 9).

Reserves present: Seven scenic reserves - all rated as moderately-high forest habitat value by PNA (Ref. 5).

Regional Park (3 blocks) R09 650 228
644 204
666 218

Scenic Reserve R09 652 229

Land use changes anticipated up to year 2000? Little

District scheme - zoning provisions:

- Most land zoned for various rural uses.
- All land readily visible from Mahurangi main channel is in Coastal Landscape protection zone.
- Large areas in reserves or private open space (Ref. 3).

Rodney District Scheme policy: "No dredging, reclamation, dumping, construction, or other activity which would remove or damage mangroves or other saline wetland vegetation will be permitted in the Mahurangi without full prior scrutiny by all relevant controlling bodies."

Controls other than District scheme likely to influence future land use? Extract from Auckland Regional proposed planning scheme (1987): Long Bay - Cape Rodney: "Urban development should not be permitted outside metropliton limits and areas currently zoned residential. Flora & fauna of the Mahurangi and Whangateau Harbours should be protected."

"The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other landuses.

- (a) Waiwera to Mullet Pt including Mahurangi Harbour."

The 1982 proposed Regional Planning Scheme stated "Estuaries shall not be used for public works including refuse and sewage disposal".

- (c) Description of topography (soil type, slope, erosion susceptibility)
The catchment rises from lowland to steep hills. Clay soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS Contain and pump away from catchment, stormwater/washings from boat haulout area at Warkworth Marina.

Minimise sediment loss to harbour during exotic forest felling inland of Pukapuka Inlet.

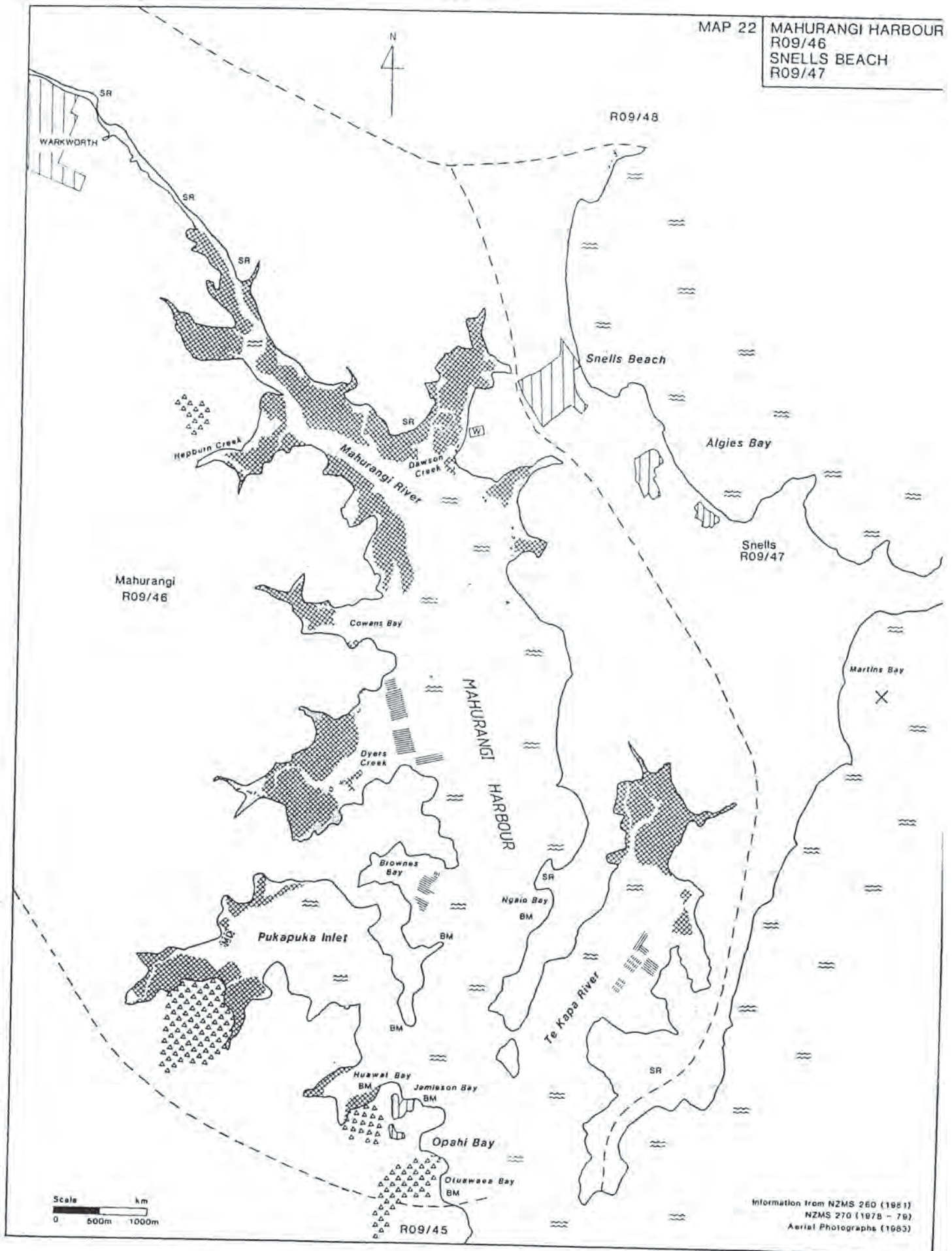
Follow up protection for areas identified by PNA.

Recommend that the Regional Authority, in collaboration with Rodney County should undertake an agreed programme to determine the type of management needed to prevent conflict with conservation aims in this highly valuable yet vulnerable scientific area (Ref. 10).

19. RELEVANT REFERENCES

1. Department of Conservation, Auckland (1980-1988). Faunal Survey unpublished notes.
2. Challis, D.A., pers comm 1988. Field Studies Scientist
3. Rodney County Council (1987) District Scheme and Scheme Change 75.
4. NZ Rock Oyster Farmers Associate (1985) Directory of Oyster farms.
5. Ayres, B. et al (1983) Protected Natural Areas Survey
Rodney Ecological District Field card notes Auckland University,
Botany Department.
6. Department of Conservation, Auckland Internal file 8/6/10/1.
7. Murray North and Partners (1975) Sewage treatment and Disposal for Coastal Townships adjacent to the Whangateau and Mahurangi Harbours. Prepared for Rodney County Council.
8. Henderson, K., pers. comm. (1988) Water Quality Inspector, Auckland Regional Water Board.
9. Auckland Regional Authority (1987). Proposed Planning Scheme.
10. Harrison & Grierson & Partners (1974) Mahurangi Harbour Marine Studies - A report prepared for ARA.
11. Augustin, J.E. The Ecology of the Mahurangi Harbour. (Date not known).
12. Auckland Regional Water Board (1984). Water & Soil Management Issues in the Mahurangi Catchment, Estuary, and Harbour. Technical Publication No. 29.
13. Auckland Regional Water Board (1978). Twelve localities subject to environmental pressure - Technical Publication No. 5.
14. Department of Conservation/NZ Biological Resources Centre (1987). Publication No. 6 A Guidebook for the Rapid Ecological Survey of Natural Areas - NZ Protected Natural Areas Programme guidelines compiled for the Technical Advisory Group PNA Programme.

MAP 22 MAHURANGI HARBOUR
R09/46
SNELLS BEACH
R09/47



1. NAME Snells Beach
2. AREA CODE R09/47 Map 22
3. MAP REFERENCE NZMS 260 R09 660 205 to 663 318
4. LOCATION DESCRIPTION Coastal fringe between Mahurangi and Matakana estuaries.
5. TYPE OF WETLAND None
6. AREA OCCUPIED BY WETLAND (ha) None
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
8. WILDLIFE VALUES Limited
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No known threats.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
 Management agencies: Department of Conservation

	<u>Name</u>
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Rodney County Grant of Control over waters.
13. USE OF WETLAND BY MAN Recreational
14. WETLAND MODIFICATIONS PROPOSED None
5. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas:
 - Marine farming: No
 - Ports: No

Marinas/moorings: No

Waste disposal: Snells/Algies sewage effluent at Martins Bay.

Refuse land fill: No

Recreation: Very popular for swimming, boating, picnicking

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland Good water quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment in
- | | | |
|--------------|---------------|-------------------|
| forest - 40% | pasture - 40% | residential - 20% |
| industrial | bare earth | |

Other land use likely to affect wetland:

Reserves present: Mahurangi Regional park R09 667 217

Land use changes anticipated up to year 2000? Little

District scheme - zoning provisions: Urban zoning throughout Snells, Algies and central part of Martins Bays. As well as Sandspit - southern headland of Matakana Harbour. Balance of catchment in Coastal Landscape protection zone or underlying zoning for Regional Reserve (Ref. 1).

Controls other than District scheme likely to influence future land use? Extract from Auckland Regional proposed planning scheme (1987): Long Bay - Cape Rodney : "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential. Flora and fauna of the Mahurangi and Whangateau Harbours should be protected. The following coastal land areas of relevance to wetlands should be protected from any extension of existing residential subdivision or harmful effects of other land uses: (a) Waiwera to Mullet Pt including Mahurangi Harbour" (Ref. 2).

- (c) Description of topography (soil type, slope, erosion susceptibility)
Rolling hill country.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Rodney County Council (1987) District Scheme and Change 75.
2. Auckland Regional Authority (1987) proposed Regional Planning Scheme.

1. NAME Matakana Harbour
2. AREA CODE R09/48 Map 23
3. MAP REFERENCE NZMS 260 R09 660 330
4. LOCATION DESCRIPTION Mainland East Coast near Kawau Island
5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Approximately 50 ha
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Marine vegetation is dominated by mangroves (*A. marina* var *resinifera*). Small patches of eel grass (*Zostera* spp.). Mangroves are scattered throughout the intertidal to about 30 m offshore. Mangrove heights juveniles to 4 metres. Trees are healthy (Ref. 1).
8. WILDLIFE VALUES

Dominant Species Pied stilt, red-billed gull, black-backed gull, white-faced heron, South Island pied oystercatcher (Ref. 1). Far-eastern curlew (Ref. 2).

Rare Species/Endangered Species Pectoral sandpiper (Ref. 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Absence of edible shellfish, maritime marshes, and bird roosts (Ref. 2).
10. STABILITY OF WETLAND Mangrove marsh is spreading slowly (Ref. 1).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Department of Conservation, Rodney County Council

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Rodney County Grant of Control over water.
13. USE OF WETLAND BY MAN Recreation, waste disposal.
14. WETLAND MODIFICATIONS PROPOSED Proposed Sandspit marina-dredging and reclamation.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: Proposed (1988) Gracilaria sordida farm

Ports: Wharf at Sandspit-Departure point for Kawau Island. Wharf at Matakana Township.

Marinas/moorings: Proposed marina at Sandspit.

Waste disposal: From future marina. Sewage leaks from septic tanks in Matakana village, proposed sewage treatment plant under construction. Discharge to be through artificial wetland at head of harbour. Cowshed discharges in catchment (Ref. 3).

Refuse land fill: No

Recreation: Campground, boating, swimming - Sandspit, Matakana.

Fishing: Recreational.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland The water quality of the upper Matakana Harbour has been severely degraded by sewage and abattoir wastes from Matakana Township as well as cowshed wastes from the catchment. Recent water rights have been granted for a sewage treatment plant and spray irrigation of abattoir wastes (Ref. 3).

16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment in
- | | | |
|--------------|------------------|---------------------|
| forest - 30% | pasture - 65% | bare earth |
| industrial | residential - 5% | Matakana & Sandspit |

Other land use likely to affect wetland: Abattoir in Matakana township - spray irrigation of wastes to pasture anticipated soon.

Reserves present: Small esplanade reserve at Matakana township.

Land use changes anticipated up to year 2000? Little.

District scheme - zoning provisions: Small areas of urban zoning at Matakana township and Sandspit Coastal Landscape protection zoning on Harbour headlands. Balance of catchment zoned rural (Ref. 4).

Controls other than District scheme likely to influence future land use? Extract from Auckland Regional proposed planning scheme (1987): Long Bay - Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential" (Ref. 5).

- (c) Description of topography (soil type, slope, erosion susceptibility)
Undulating hills.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Recommend student project to better describe wetlands.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

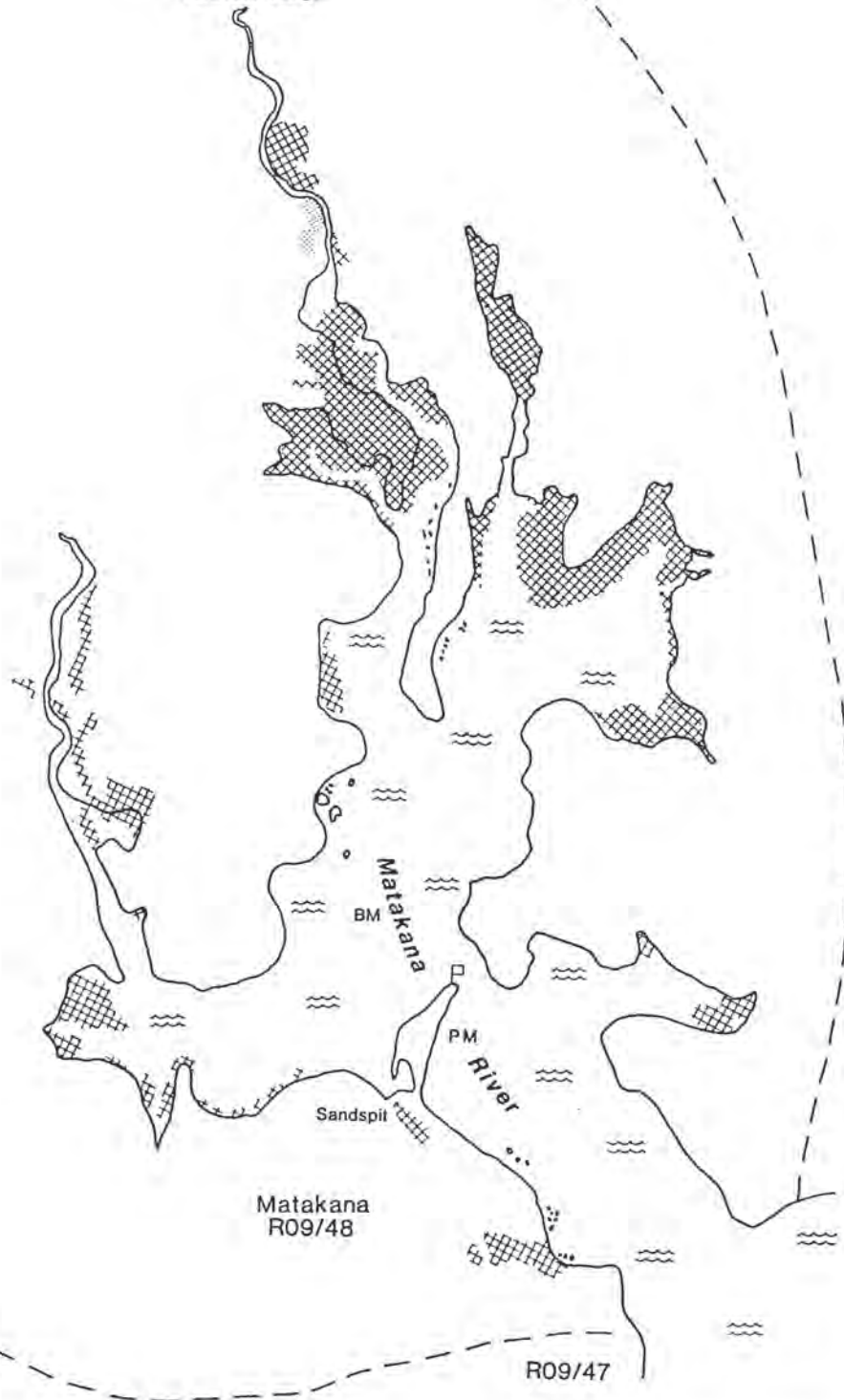
19. RELEVANT REFERENCES:

1. Bioresearches Ltd (1988) Review of Proposed Sandspit Marina National Environmental Implications. A report for Wilkins and Davies Marinas Ltd (part of Sandspit EIA).
2. Ogle, C.C., (1982) Wildlife and Wildlife Habitats of Northland. NZ Wildlife Service Report No. 30.
3. Beekes K. pers. comm. (1988) Water Quality Scientist.
Henderson K. pers. comm. Water Quality Inspector,. Auckland Regional Water Board staff.
4. Rodney County Council (1987) District Scheme and Change 75.
5. Auckland Regional Authority (1987) proposed Regional Planning Scheme.
6. Bioresearches Ltd (1987) A report prepared on the Ecological Impacts of sewage effluent discharge from Matakana Township. Report prepared for Rodney County Council.



R09/49

Matakana Village

Matakana
R09/48

R09/47

Scale 1km
0 500 1000m

Information from NZMS 260 (1981)
NZMS 270 (1978-79)
Aerial photographs (1983)

1. NAME: Tawharanui
2. AREA CODE: RO9/49 Map 24
3. MAP REFERENCE: NZMS 260 RO9 670 324 to RO9 703 407
4. LOCATION DESCRIPTION The whole Tawharanui Peninsula and ocean side of Omaha Sandspit.
5. TYPE OF WETLAND: Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) No information.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Small mangrove area in Millon Bay (Ref. 1). Two areas of saltmarsh near the lagoon in Jones Bay (Refs 1, 2).
8. WILDLIFE VALUES

Omaha Spit attracts large numbers of migrant waders.

Rare Species/Endangered Species The Omaha Spit attracts a wintering flock of NZ dotterel. Caspian tern in Jone's lagoon.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

a) The Tawharanui Peninsula is home to an outstanding array of rocky reef marine life protected by the Tawharanui Marine Park (Fisheries Act 1986 and Harbours Act 1950).

b) Sand extraction and dune drainage at Omaha have resulted in accretion and erosion in previously stable areas.
10. STABILITY OF WETLAND Drainage to Jones Bay saltmarshes during regional park development (Ref. 1).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.
Management agencies: Department of Conservation. Rodney County Council.

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Grants of Control over water areas:

a) Auckland Regional Authority Order in Council 1979. Foreshore adjacent to Tawharanui Regional Park.

b) Rodney County Council: Balance of foreshore in area RO9/49.

13. USE OF WETLAND BY MAN14. WETLAND MODIFICATIONS PROPOSED Reversion of wetland to saline.15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Proposed scheme for Karamuroa Point. Discharge from inland sewage treatment plant to sea (Ref. 3).

Refuse land fill: No

Recreation: Popular swimming, surfing, picnicking, diving area.

Fishing: Line fishing outside marine park.

Sand extraction: Sand extraction at Christians Bay, Omaha Bay and Hughes Beach.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland Good water quality.16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha):(b) Land use of catchment:

Approximate percentage of total catchment in:

forest	- 30%	pasture	- 70%	Bare earth
residential	-	industrial	-	

Other land use likely to affect wetland:

Reserves present: Tawharanui Regional Park occupies eastern 60% of Tawhanui Peninsula.

Land use changes anticipated up to year 2000? Infilling of residential area at Omaha Sandspit.

District scheme - zoning provisions: Northern half of Omaha Sandspit zoned urban. Coastal Landscape Protection Zone covers all rural land between Omaha urban area and Tawharanui Regional Park.

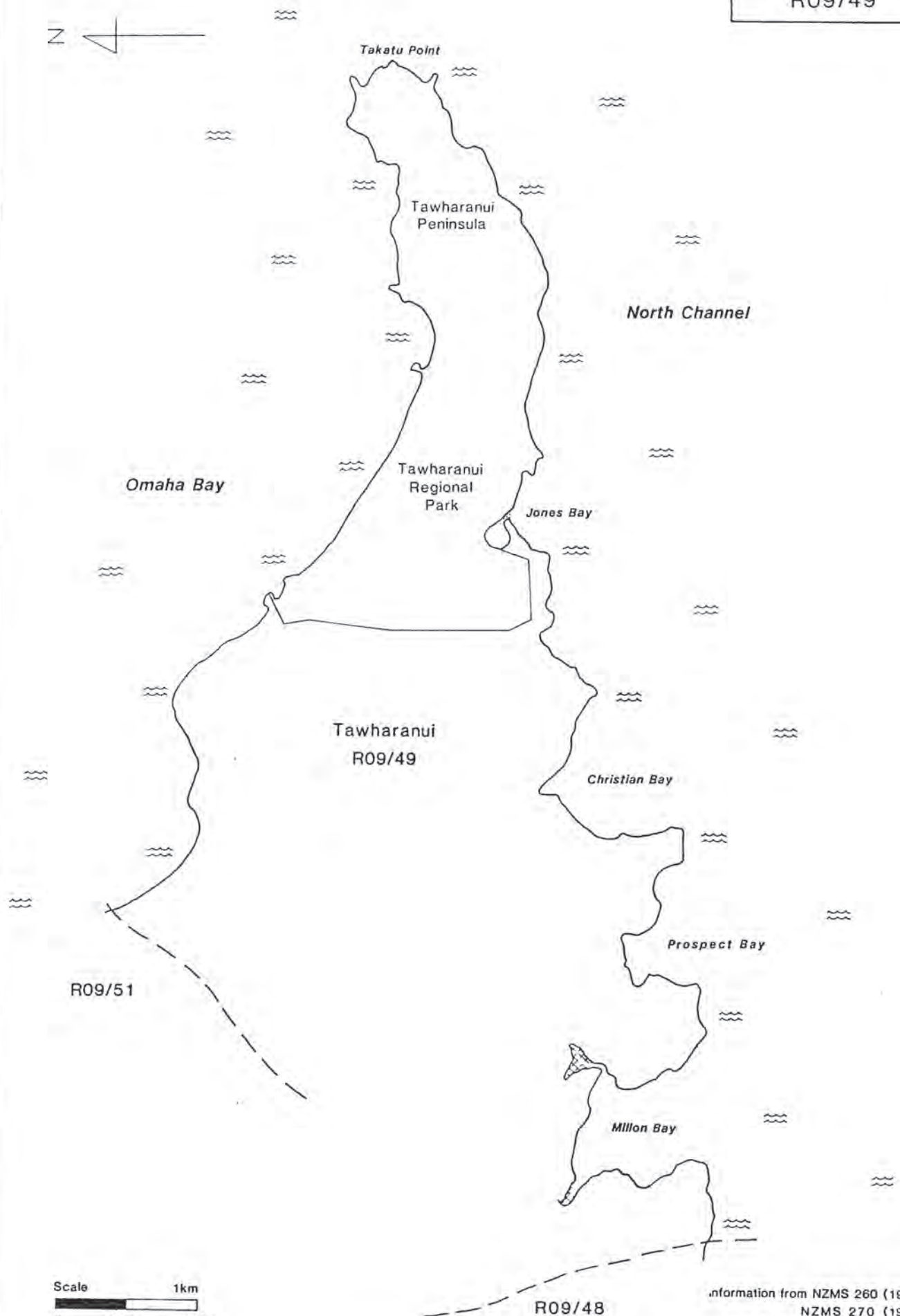
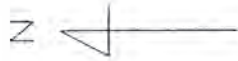
Controls other than District scheme likely to influence future land use? Extract from Auckland Regional Proposed Planning Scheme:

Long Bay-Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential" (Ref. 6).

(c) Description of topography (soil type, slope, erosion susceptibility)
Gently rolling hills behind sand-dune.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Would need botanical advice on whether the tidal arms behind the lagoon would develop into worthwhile saltmarsh if left (Ref. 2).
18. FUTURE MANAGEMENT RECOMMENDATIONS:
19. RELEVANT REFERENCES:
 1. Grace, R.V., pers. comm. (1988). Consultant Marine Biologist, Auckland.
 2. ARA Parks Department 1981. Tawharanui Regional Park Management Plan.
 3. Murray North Partners (1975) Sewage Treatment and Disposal for Coastal Townships Adjacent to the Whangateau and Mahurangi Harbours Report. Prepared for Rodney County Council.
 4. Auckland Regional Planning Scheme.
 5. Rodney County Council (1987) District Scheme and change 75.
 6. Auckland Regional Authority (1987) proposed Regional Planning Scheme.

MAP 24

TAWHARANUI
R09/49

1. NAME Kawau
2. AREA CODE R09/50 Map 25
3. MAP REFERENCE NZMS 260 R09. 690 400
4. LOCATION DESCRIPTION Kawau Island
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Unknown
7. DOMINANT WETLAND VEGETATION/ASSOCIATION *Avicennia marina* var *resinifera* in Bon Accord Harbour, North Cove. Salt-marsh in Bon Accord Harbour, South Cove, and Bosanquet Bay (Ref. 1).
8. WILDLIFE VALUES Unknown. Common species.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.
10. STABILITY OF WETLAND No threats.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown.

Management agencies: Department of Conservation. Rodney County.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Rodney County Council have a grant of control over the water areas.
13. USE OF WETLAND BY MAN Jetties, recreation.
14. WETLAND MODIFICATIONS PROPOSED None.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No

Ports: Wharves, both private and public.

Marinas moorings: Swing moorings.

Waste disposal: Septic tank effluent.

Refuse land fill: No.

Recreation: Boating, swimming.

Fishing: Yes.

Sand extraction: No.

Other: Bon Accord experiences considerable pressure from the boating fraternity, especially over the Christmas period.

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good, but Bon Accord Harbour adversely affected by marine toilet discharges in peak periods.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): 200

(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	90%	residential	bare earth
	pasture	10%	industrial	

Other land use likely to affect wetland:

Reserves present: Hauraki Gulf Maritime Park. Esplanade reserves.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Rodney district scheme, proposed second review (1985). Kawau Island Rural Conservation 4. "To protect the unique character of the natural environment of the island from more intensive development."

Rural Settlement 4. "To allow the development of the island for low intensity residential and tourism purposes in a way which will ensure the special character of the area is retained." (Ref. 2).

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme (1988). Policy 314: "The metropolitan limits on the Hibiscus Coast shall be a line linking the western boundaries of the Orewa and Silverdale townships as defined in the Urban and (Future Urban) Zoning in the Rodney District Scheme....."

Policy 7.25: "The special values of the region's remaining distinctive indigenous wetland habitats shall be recognised and measures taken to ensure their biological and physical functions are not diminished." (Ref. 3).

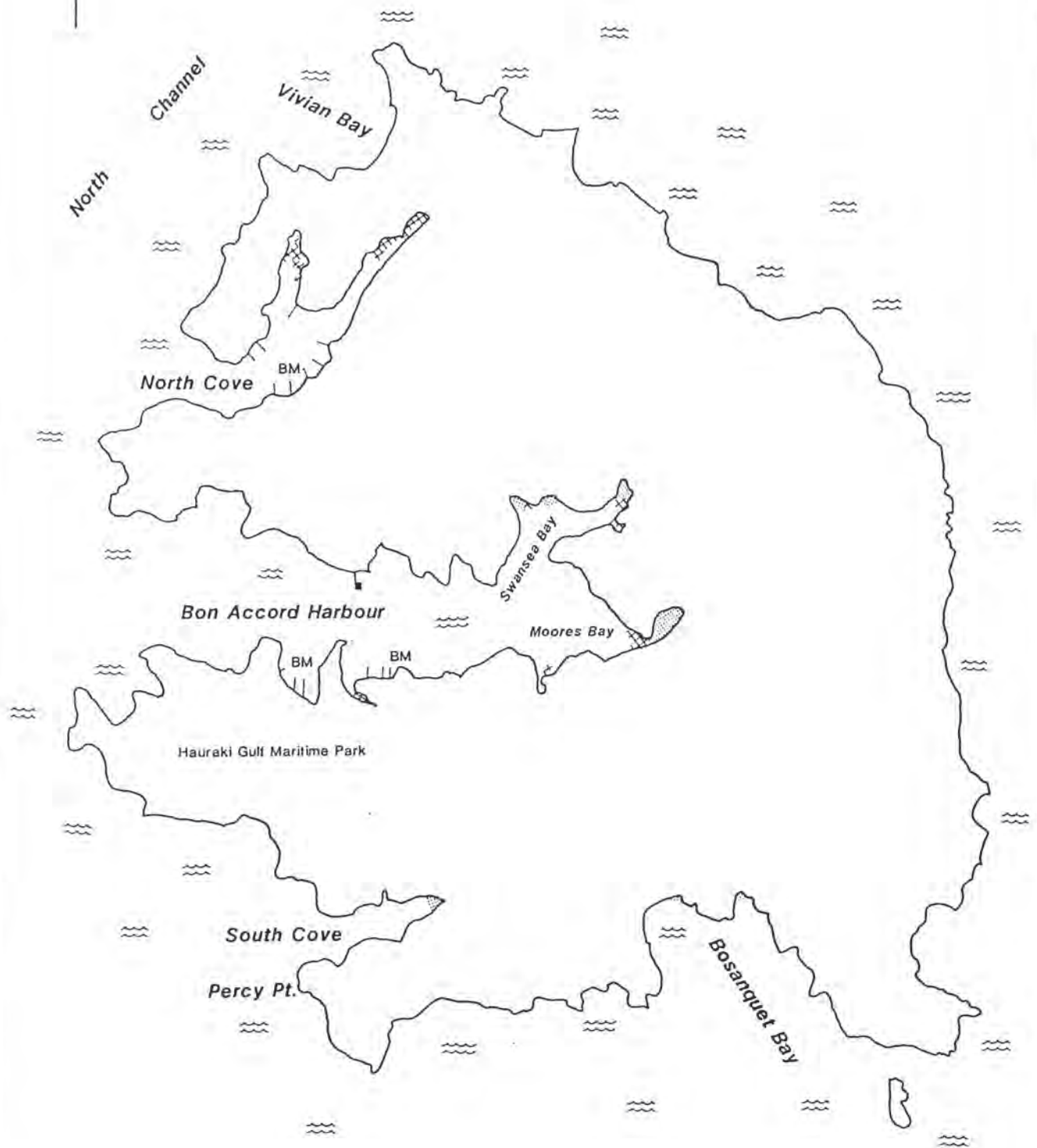
(c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Department of Conservation (1982) WERI computerised wetland inventory.
2. Rodney County District Scheme (1988) Proposed Second Review.
3. Auckland Regional Planning Scheme (1988).



Scale 1km
0 500m 1000m

Information from NZMS 269 (1981)
NZMS 270 (1977 - 78)
Aerial photographs (1983)

1. NAME Whangateau Harbour
2. AREA CODE R09/51 Map 26
3. MAP REFERENCE NZMS 260 R09 690 400
4. LOCATION DESCRIPTION Harbour north of Tawharanui Peninsula.
5. TYPE OF WETLAND Mangrove Saltmarsh Spartina
6. AREA OCCUPIED BY WETLAND (ha)
Whangateau Harbour (from aerial photographs)
 1953 - 28.7 ha mangrove)
 1966 - 36.4) 52% increase in 20 years
 1973 - 43.5)
7. DOMINANT WETLAND VEGETATION/ASSOCIATION A. marina var. resinifera - The harbour contains extensive areas of dense mangrove with the tallest trees at channel edges. The trees are generally healthy (Ref. 1).

Spartina alterniflora (Ref.s 2, 3). Spartina is spreading in the southwest corner immediately behind a causeway next to Kauri Forest (Ref. 3).

 In parts of the upper harbour on broad sand flats an association dominated by the eelgrass Zostera is found (Ref. 4).

 There is a unique transition of flora in the southern arm (R09 697377) from Kahikatea forest through to saline wetland (Refs 3, 7).

 Any special features? Priority Natural Area for protection. Whangateau Harbour rated as moderate-high habitat value with no existing protection (Ref. 9a).
8. WILDLIFE VALUES Moderate-high habitat value for migratory wading birds (Ref. 9b).

Dominant species White-faced heron, black swan, gulls (Ref. 9b).

Rare species/endangered species NZ dotterel wintering flock, little egrets near Omaha Causeway (Ref. 10). Banded rail, Caspian tern, fernbirds (Ref. 9b).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Wangateau is a fish breeding/feeding/sheltering area (Ref. 4). Species included yellow-eyed mullet, spotty, flounder, kahawai, parore, piper. There are extensive beds of molluscs for these fish to feed on (Ref. 11). Many juvenile fish have been observed in the mangroves (Ref. 12).

Forest on Halocene sandspit (Ref. 6).

An outstanding example of an intact sequence of ecological classes from Whangateau Harbour to Mangatawhiri Spit (Ref. 9).

Tidal flow is a dominant feature of the Whangateau Harbour. 98% of the water is replaced at each tidal cycle (Ref. 1).

10. STABILITY OF WETLAND Many road causeways along northern coast of the harbour. Refuse tip at R09 685417 - 0.6 ha filled in 1976.

Broadlands Drive Causeway built late 1960s impedes tidal flow, accelerating sedimentation of inlet to the south (van Roon pers. obs.).

Serious modification by bulldozer of beach north of Panetiki Island (Ref. 13).

In the southwest part of the harbour there was a 15.6% increase from 1942-1973 - an average of 5% per annum (Ref. 8).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown

Management agencies: Department of Conservation, Rodney County Council

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	
Territorial local authority	Rodney County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Rodney County Council - Grant of control over harbour.

13. USE OF WETLAND BY MAN Varied, see 15.

14. WETLAND MODIFICATIONS PROPOSED None known

15. CHARACTERISTICS OF ADJOINING WATER AREAS

- (a) Use of adjoining water areas:

Marine farming: No

Ports: Wharf

Marinas/moorings: Swing moorings

Waste disposal: Some problems with cowshed wastes (Ref. 14).
Sewage effluent from septic tanks at Pt Wells, Whangateau, Omaha.
Sewage treatment plant for Omaha under construction.

Refuse land fill: Refuse tip northern arm now closed. *leachate present.*

Recreation: Boating, diving, swimming, walking,

Fishing: Shellfishing, linefishing, spearfishing.

Sand extraction: No. Not in harbour, but sand extraction in Omaha Bay has been blamed for sand accretion in Whangateau Harbour.

Other: Sewage treatment plants have been proposed for other areas including Pt Wells, Ti Point and Whangateau Village (Ref. 15). As yet no water rights have been applied for.

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Satisfactory.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment:

Approximate percentage of total catchment in:

forest - 15%	residential - 5%	bare earth
pasture - 80%	industrial	

Other land use likely to affect wetland: Quarry in the Tamahunga stream headwaters. Omaha state forest. Pressure for irrigation in catchment (Ref. 6).

A sewage treatment plant for Omaha Spit is under construction at R09 680380. Oxidation pond effluent is to be trickle irrigated onto new pine forest more than 0.5 km inland from southern inlet.

Reserves present: Small local authority and scenic reserves.

Land use changes anticipated up to year 2000: Infilling of residential areas.

District scheme - zoning provisions: Urban zoning, northern half of Omaha Sandspit, around existing residential area at Pt Wells and Whangateau.

Nature Conservation zone covers harbour foreshore of Omaha Sandspit south of causeway, i.e. covers kahikatea forest.

Northern half of harbour catchment totally covered by Coastal Landscape Protection Zone.

Rural zone in balance of catchment to west (Ref. 16).

Controls other than District scheme likely to influence future land use: Extract from Auckland Regional proposed Regional Planning Scheme (1987): Long Bay - Cape Rodney: "Urban development should not be permitted outside metropolitan limits and areas currently zoned residential. Flora and fauna of the Mahurangi and Whangateau Harbours should be protected" (Ref. 17).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Very steep in headwaters of catchment. Clay soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: The Whangateau is an area of high scientific value possessing habitats vulnerable to damage from existing or anticipated future uses. This damage could arise from within the area itself or from its immediate surroundings. This area warrants top priority for protection. Recommended that the regional authority (after consultation with Rodney local authority) undertakes an agreed programme to determine a management plan (Ref. 17).

19. RELEVANT REFERENCES:

1. May, J.D., (1979) Fish utilisation of a NZ mangrove with particular reference to Aldrichetta forsteri. M.Sc Thesis, Auckland University.
2. Partridge, T.R., (1987) Spartina in New Zealand. NZ J. of Botany 25, 267-575.
3. Parnell, K. pers. comm. 1988 Staff. Geography Department, Auckland University.
4. Davenport, M.W., (1979) Zooplankton and fish of a mangrove area of the Whangateau Harbour, Northland, New Zealand. Ph.D Thesis, Auckland University.
5. Grace, R.V., (1972) The Benthic Ecology of the Entrance to the Whangateau Harbour, Northland, New Zealand. PhD Thesis, Auckland University.
6. Department of Conservation (1982) WERI computerised wetland inventory.
7. Mitchell, N. pers. comm. 1988. Botanist, Auckland University.
8. Taylor, F.J., (1976) pers. comm. to Nature Conservation Council Symposium on "Why are Mangroves Important", Whangarei 1976.
9. Auckland Regional Authority/University of Auckland/Department of Conservation (1983)
 - (a) Ayres, B., et al Protected Natural Area, Rodney Ecological District
 - (b) Priority Protected Places field card notes held by N. Mitchell, Botany Department, University of Auckland.
10. Department of Conservation, Auckland (1980-1988) Faunal Survey. Unpublished notes.
11. Larcombe, M., (1971) The Ecology, Population Dynamics and Energetics of Soft Shore Molluscs PhD Thesis, Auckland University.
12. Park, S.G., (1984) Biology of O-group flatfish on Auckland Sandflats. M.Sc. Thesis, Auckland University.
13. Department of Conservation, Auckland. Internal files. Unpublished.
14. Henderson, K. pers. comm. 1988. Water Quality Inspector, Auckland Regional Water Board.
15. Murray North and Partners (1975) Sewage Treatment and Disposal for Coastal Townships adjacent to Whangateau and Mahurangi Harbours. Prepared for Rodney County Council.
16. Rodney County Council (1987) District Scheme and change 75.
17. Auckland Regional Authority (1987) proposed Regional Planning Scheme.

MAP 26

WHANGTEAU HARBOUR
R09/51
PT. CAPE RODNEY
R09/52



R09/52

BM
Omaha
Cove

LEIGH

Whangateau
Village

Horseshoe
Island

R09/51

SR

Ti Point

Little Omaha Bay

OMAHA

R09/49

Broadlands
Driveway

W

Waikokopu
R09/50A

Whangateau Harbour

1. NAME Cape Rodney
2. AREA CODE R09/52 Map 26
3. MAP REFERENCE NZMS 260 R09 715 405 to R09 660 492
4. LOCATION DESCRIPTION Coastal margin between Whangateau Harbour and Pakiri River.
5. TYPE OF WETLAND None
6. AREA OCCUPIED BY WETLAND (ha) No wetland
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
8. WILDLIFE VALUES Common species.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Outstanding rocky reef ecology.
10. STABILITY OF WETLAND No wetland.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
 Management agencies: Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Nil
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Cape Rodney to Okakari Point Marine Reserve Management Committee.
13. USE OF WETLAND BY MAN No wetland.
14. WETLAND MODIFICATIONS PROPOSED No wetland.
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: Leigh Wharf

Marinas/moorings: Moorings in Omaha Cove

Waste disposal: Septic tanks

Refuse land fill: No

Recreation: Diving, swimming, picnicking, boating

Fishing: Yes, mainly line fishing outside marine reserve

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No wetland.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment:

Approximate percentage of total catchment in:

forest	- 20%	residential	- <5%	bare earth
pasture	- 75%	industrial		

Other land use likely to affect wetland: Fish processing, Leigh. Auckland University Marine Research Laboratory, Goat Island Bay.

Reserves present: Cape Rodney-Okakari Point Marine Reserve. Ti Point Scenic Reserve.

Land use changes anticipated up to year 2000: Little.

District scheme - zoning provisions: Predominantly Coastal Landscape Zone. Urban zone extends from Mathesons Bay to Omaha Cove inclusive.

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme (Ref. 2).

- (c) Description of topography (soil type, slope, erosion susceptibility): Steep to rolling pastureland.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Nil

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Rodney County Council (1987) District Scheme and Change 75.
2. Auckland Regional Authority (1987) proposed Regional Scheme.

NAME Tasman Coast of Kaipara North

AREA CODE P08/103 No map

MAP REFERENCE NZMS 260 P07

LOCATION DESCRIPTION Tasman Coast of Kaipara North and North Head of Kaipara Harbour.

TYPE OF WETLAND Freshwater lakes/lagoons. No saline wetlands

AREA OCCUPIED BY WETLAND (ha) None

DOMINANT WETLAND VEGETATION/ASSOCIATION

WILDLIFE VALUES Proposed 117 ha Wildlife Management reserve at Omamari Swamp.

OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

STABILITY OF WETLAND Not applicable

CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
Management agencies:

	Name
Catchment authority	Northland Regional Council
Regional planning authority	Northland Regional Council
Harbour board	Kaipara Harbour Limits include southern part of Poutu Peninsula
Territorial local authority	Hobson County
Crown	Department of Conservation
Other	

2. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

3. USE OF WETLAND BY MAN Not applicable

WETLAND MODIFICATIONS PROPOSED Not applicable

5. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Low scale

Fishing: Recreational

Sand extraction: Part of the West Coast Sand Production Group; includes Omamari, Bayley's Beach, Dargaville Coast, Glinks Gully.

Sand extraction at North Head of Kaipara Harbour (Ref. 3).

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Probably excellent oceanic water quality,

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 50% residential - bare earth -
 pasture - 40% industrial -

Other land use likely to affect wetland:

Reserves present: Taharoa Domain (Kai Iwi Lakes) Hobson County

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: (Ref. 2) rural.

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Consolidated sand dunes.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Department of Lands and Survey (1979) North Auckland Land District Coastal Reserves Investigation. Report on Hobson County.
2. Hobson County Council (1986) District Scheme.
3. Fahy, F. pers. comm. 1988. Department of Conservation, Auckland.

1. NAME Wairoa River
2. AREA CODE P08/104 maps 27 and 28.
3. MAP REFERENCE NZMS 260 Q09 165 390 to 140 468 and NZMS 260 P07 (not printed).
4. LOCATION DESCRIPTION Wairoa River Catchment.
5. TYPE OF WETLAND Mangrove Saltmarsh Manchurian rice grass.
6. AREA OCCUPIED BY WETLAND (ha)
7. DOMINANT WETLAND VEGETATION/ASSOCIATION There is an extensive area of mangrove surrounded by a fringe of Juncus marsh at Punahaere Creek.

Another extensive area of good mangrove with areas of fresh water swamp lying behind is at Tangitiki Bay. The fresh water swamp drains into the mangrove. A poor attempt has been made to reclaim the western swamp south of Pouto Road, killing some mangrove.

Waimamaku Creek contains good mangrove. At Sail Point to Te Kopuru there is mangrove fringe at intervals with an extended fringe between Taingaete and Gordon Roads. Such fringe is a good riverside protection belt. There has been a poor attempt at reclamation on the west of the road. Mangroves become more evident between Kelly's Bay and Tangaehe.

From Takatuka to Mapau Village there is mangrove fringe at intervals, often in front of a sea wall. Such fringe is a good protection belt. From Burgess Island to Kohakutahi Point is a very fine broad fringe of mangrove in front of the sea wall. At the rear, tall isolated trees form a saline savannah with grass covering the ground (Ref 6).

Extensive beds of Zizania (Manchurian wild rice) occur in the mouth of the Wairoa River, thought to be upstream of Dargaville bridge (Refs 7, 8).

It is unlikely that Zostera will be present in the Wairoa as there is too much fine sediment deposition (Ref 8).

8. WILDLIFE VALUES The principal wildlife habitats in Hobson County have been identified by the New Zealand Wildlife Service. Five categories of habitat and identified value and potential habitats. Forest habitats range from outstanding value to potential forest habitats.

The dune lakes of the lower Pouto Peninsula including the Pouto State Forest Wildlife Refuge, make up one of the most important wetland systems in the region. The value of this area lies in the abundance and diversity of bird species present in large and relatively unmodified habitats (Ref 1), and the presence of an endemic galaxid species of limited distribution.

Wetlands provide habitats for a variety of resident and migratory bird species and are an important component of the outdoor recreational scheme. Over the years the wetland area has been reduced by land drainage and farm development programmes and those that remain are remnants of a much larger resource.

Rare species/endangered species Spotless crane habitat north of the entrance to Arapaoa River (Ref 10).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

10. STABILITY OF WETLAND Many swamps have been drained along the side of the North Wairoa River to create farmland(ref 5).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Many wetland habitats in private ownership.
Management agencies:

	Name
Catchment authority	Northland Regional Council.
Regional planning authority	Part Whangarei County. Northland Regional Council.
Harbour board	Kaipara Harbour Authority.
Territorial local authority	Mostly: Hobson County and Otamatea County.
Crown	Department of Conservation.
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN

14. WETLAND MODIFICATIONS PROPOSED Development at Kelly's Bay.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming:

Ports: Yes - commercial port at Dargaville (Ref 4).

Marinas/moorings: Jetties.

Waste disposal: Te Kopuru township is the only area in the Hobson County with the reticulated sewage disposal system. The beach settlements at Maunganui Bluff, Omamari, Balys Beach, Glink's Gully, Kelly's Bay and Pouto Point rely on septic tanks and associated soakage systems for effluent disposal (Ref 2).

Refuse land fill: No.

Recreation: Boating in Wairoa River.

Fishing: Fishing popular in Wairoa River. Shark fishing takes place at the harbour entrance, as a long narrow band on the northern shoreline.

Sand extraction: From Millar's Bank.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information as to water quality within the Kaipara Harbour system.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|----|-------------|------------|
| in: | forest | 15 | residential | bare earth |
| | pasture | 70 | industrial | |

Other land use likely to affect wetland: Cattle grazing - Tokatoka to Mapau Village (ref 6).

Quarrying, coal reserves at Hikurangi.

The six indigenous state forests in the county have important forest protection, water conservation and wildlife management roles. The forests are - Mataraua, Waipoua, Marlborough, Kaihu, Houto, Tangihua.

Western shoreline - Ruawai Flats. Comprise a total area of 8,500 ha. Area is very flat, broken occasionally by hills and shelter belts.

The eastern riverbank of the Wairoa River is generally muddy. Hinterland is predominantly agricultural, flood plains.

Reserves present: Hobson County has over 50 reserves which protect areas of historic, recreational, scenic, wildlife significance. Most notable are Taharoa Domain (Kai Iwi Lakes), Trounson Kauri Park Scenic Reserve, Kaipara North Head Lighthouse Historic Reserve, recreation reserves, scenic reserves and local purpose reserves.

Hobson Acclimatisation Society has a programme to attempt to preserve some of the remaining wetlands (Ref 1).

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions:

Controls other than District scheme likely to influence future land use: Section 77 of the Reserves Act 1977 - provides for conservation covenants to preserve the natural environment, landscape amenity, wildlife, fresh water or marine life without acquiring land ownership.

The Minister of Lands, Hobson County, or any other approved body can negotiate with the landowner for a conservation covenant to be applied to an area.

The covenant, which may be in perpetuity or for a specific term is registered against the title to the land and is binding on future owners (Ref 2).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Soils - sedimentary. Limestone/loam.
The west coast beaches are backed by sandstone cliffs or sand dunes supporting marram and spinifex grasses, lupin and toitoi.

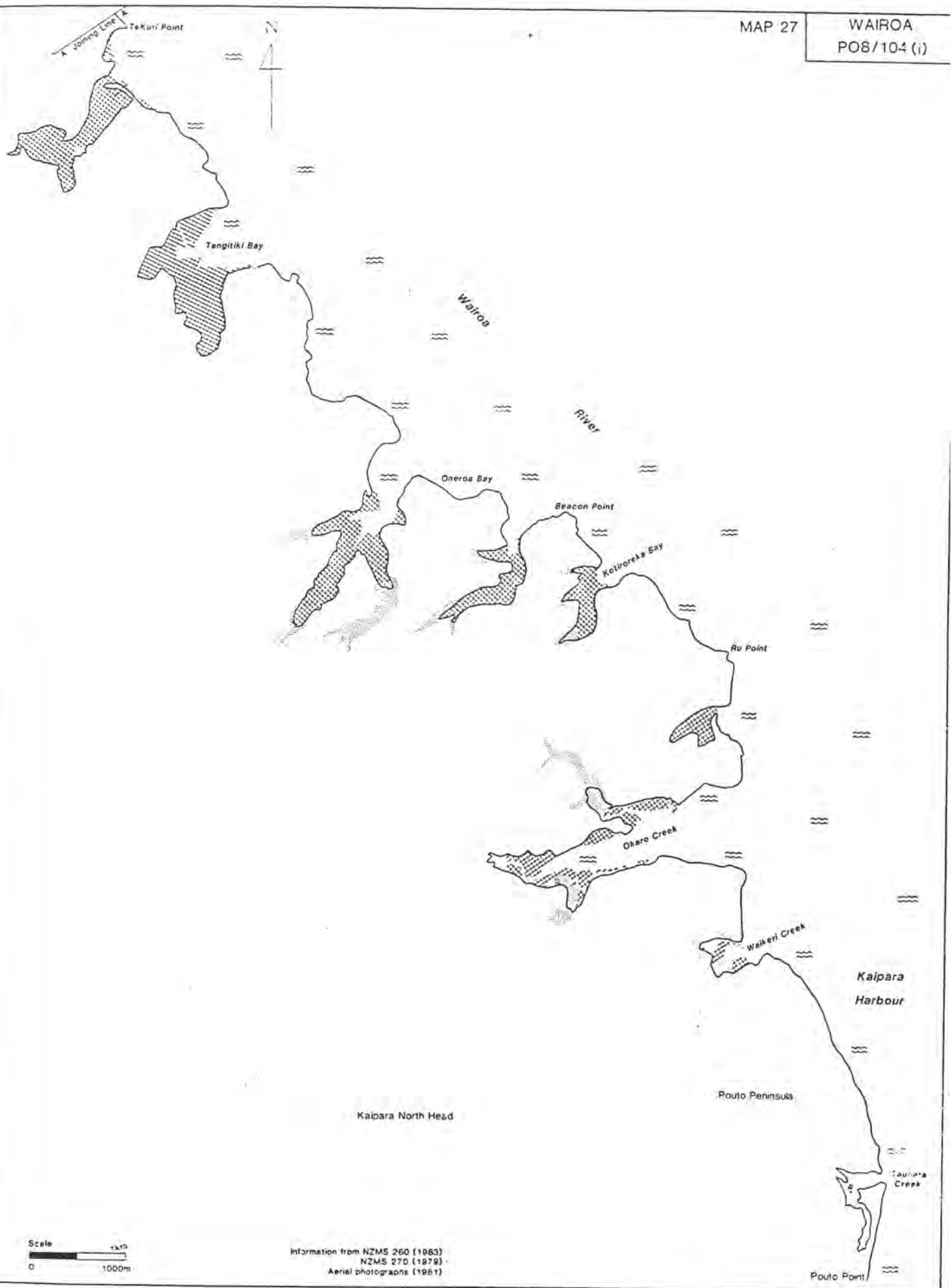
FUTURE RESEARCH/INFORMATION REQUIREMENTS:

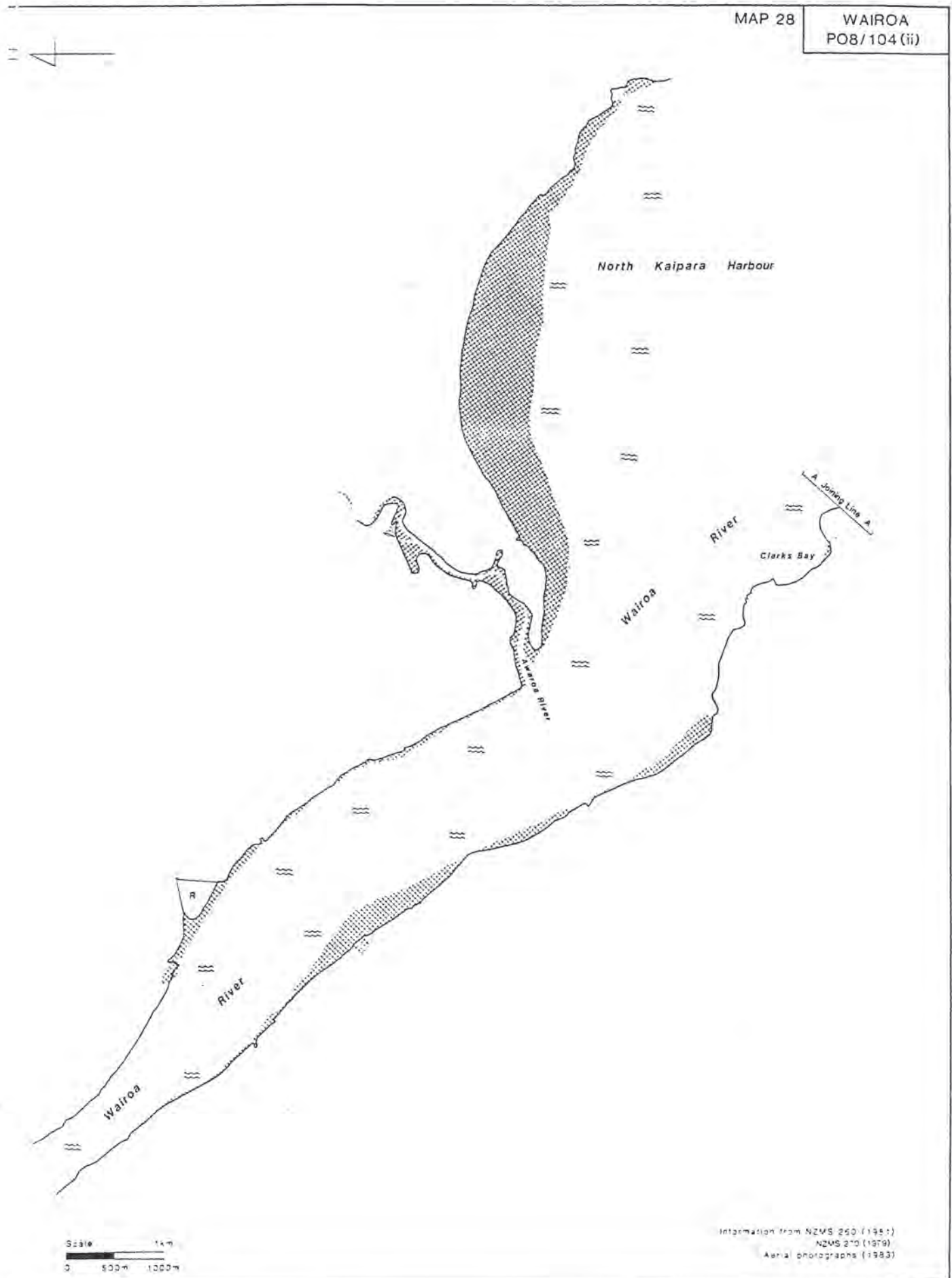
FUTURE MANAGEMENT RECOMMENDATIONS:

RELEVANT REFERENCES:

- (1) Ogle, C. C. (1982). Wildlife and Wildlife Values of Northland - New Zealand Wildlife Service Fauna Survey Report No 30.
- (2) Hobson County Council (1986) District Scheme.
- (3) Hobson County (1982) Historical Places Inventory.
- (4) Tortell, P. (1981) Coastal Resources Atlas.
- (5) Esler, A. E. 1975. Botanical features of Punahaere Creek, Kaipara, DISR, Auckland.
- (6) Chapman, V. J. (1976). Kaipara Harbour Mangrove and Salt Marsh Study. Report prepared for the Department of Lands and Survey.
- (7) Holdoway, J. pers. comm. 1988. Chair Technical Advisory Committee on mangroves. Nature Conservation Council.
- (8) Haughey, A. pers. comm. 1988. Chief chemist Manukau Sewage Purification Works, Auckland.
- (9) Young, D. pers. comm. 1988. MAFFish Whangarei.
- (10) Department of Conservation, Northern Region (1980-88) faunal survey. Unpublished notes.

MAP 27

WAIROA
PO8/104 (i)



1. NAME Kaipara Harbour
2. AREA CODE Q09/104A No map
3. MAP REFERENCE NZMS 260 Q09, 170 320
4. LOCATION DESCRIPTION Overview of the Kaipara Harbour
5. TYPE OF WETLAND Mangrove, Saltmarsh, Spartina.
6. AREA OCCUPIED BY WETLAND (ha) 500 kilometres of coastline: 3640 hectares of mangrove (Ref. 4).
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Kaipara wetlands are characterised by the extent of mangrove cover, numerous plantings of spartina and no zostera. Spartina species identified include S. alterniflora, S. anglica, S. townsendii (Ref. 7). For further details refer to subcatchment areas.
8. WILDLIFE VALUES The Kaipara Harbour is one of the three areas in the Auckland region which are of national and international ornithological significance, attracting tens of thousands of birds each year from the South Island and from the Arctic and sub-Arctic regions. Regular large-scale movement of birds occurs between the Kaipara and Manukau Harbours and the Firth of Thames. With its extensive tidal flats, mangroves and salt-marshes, it is an important feeding area for waders. Due to reclamation there are few remaining roosting areas in the Kaipara Harbour. The Topora Coast is one of the major roosts; Jordons Farm and Oyster Point are the only major ones in the southern part of the harbour, where up to 10,000 birds roost during the summer. For details of distribution of the 40 species present in the harbour refer to subcatchment areas, (Refs 6 and 7).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Extensive estuarine mudflats and mangrove areas comprise a richly productive primary source in the marine food chain supporting fish and bird life, both inside and outside the harbour. The Kaipara Harbour is recognised as being worthy of the highest value for protection because of its national significance as a wildlife harbour.
10. STABILITY OF WETLAND Numerous large, illegal reclamations. Seventeen out of a total of 42 mangrove areas in the Kaipara Harbour have been partially or totally reclaimed (Ref. 16). Most of the reclaimed land has been drained for agriculture. Kaipara Harbour's southern shores could be the subject of New Zealand's first court action against a farmer for illegally claiming land (Ref. 15).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Many of the coastal wetlands are included on private titles. However, as they are inundated by tidal movements, they are under the control of the Kaipara Harbour Authority and Department of Conservation, i.e. are treated as Crown land.

Management agencies: Department of Conservation. Kaipara Harbour Authority

	Name
Catchment authority	Northern half - Northland Regional Council. Southern half - Auckland Regional Water Board.
Regional planning authority	Northern half - Northland Regional Council. Southern half - ARA.
Harbour board	Kaipara Harbour Authority (Harbours Act grant of control over the whole harbour).
Territorial local authority	Hobson County, Otamatea County, Rodney County. Jurisdiction above mean high water mark.
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN See 15.

14. WETLAND MODIFICATIONS PROPOSED None.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Oyster farming (refer individual areas). Prawn farm closed in 1985.

Ports: Kaipara was a major port until 1947. Useable wharves still exist at Ruawai and Whakapirau.

Marinas/moorings: Yes - scattered in various sheltered areas.

Waste disposal: The catchment is predominantly rural; therefore farm run-off predominates. Some urban pollution from Helensville and small coastal holiday centres. Previous pollution from dairy factories at Helensville and Maungatoroto.

Refuse land fill: Helensville, adjacent to mangroves. HZS Smells 1988 (pers. obs.).

Recreation:

Fishing: Shellfishing: mussels, pipi, tuatua. A valuable regional fishery, especially mussel dredging and flounder set-netting. The Kaipara mussel fishery is the most productive in New Zealand (Ref. 11), the flounder fishery ranks second in New Zealand. Kaipara Harbour fish catch 1974/75 (Ref. 9): grey mullet, 20 tonnes; trevally, six tonnes; snapper, six tonnes; kahawai, four tonnes; flounder, 192 tonnes; school shark, 500 tonnes; mussels, 497 tonnes; eels, 35 tonnes.

Sand extraction: (Ref. 10). At harbour entrance and other areas. Refer subcatchment areas.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Sands in entrance and inside northern arm of harbour conform to those necessary for making cement, so extraction is a possibility. Fine sands suitable for asphalt, suitable for fibreglass, and ironsands at the harbour mouth.

Nutrient status: Little is known about water quality in the Kaipara. In the past there were very low dissolved oxygen values in the Kaipara River. This resulted from the Kaipara Dairy factory (Ref. 12).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | |
|------------|-------------|------------|
| in: forest | residential | bare earth |
| pasture | industrial | |

Other land use likely to affect wetland: For details refer subcatchment areas. Mostly surrounded by grass-clad rolling hills. Kaipara Harbour wetlands are detrimentally affected by heavy grazing associated with recent land development. Such development is financed by low interest Rural Bank/Finance Corporation loans, without consideration of wildlife or other biological values that will be sacrificed with the development (soil and water). Ref. 13).

Reserves present: Refer subcatchment areas. In the northern part of the harbour, south of Ruawai, there are protected estuarine flats.

Land use changes anticipated up to year 2000: Little.

District scheme - zoning provisions: Refer subcatchment areas. The Otamatea district scheme recognises the importance of farming to the district. As part of its district scheme, council introduced a coastal zone with special requirements for beach areas. Several of the beaches along the shore of the Kaipara Harbour and at Mangawhai have for many years been the sites of cottage settlements (Ref. 2).

Controls other than District scheme likely to influence future land use: Kaipara Harbour authority controls.

- (c) Description of topography (soil type, slope, erosion susceptibility): Mostly surrounded by gently undulating land at northern end; land mainly flat at southern end. Sandy soils, especially at the southern head of the harbour (this area is erosion prone).

FUTURE RESEARCH/INFORMATION REQUIREMENTS:

FUTURE MANAGEMENT RECOMMENDATIONS: The Otamatea Council recognises that it has a special duty of care to ensure that development on the harbour shores does not impinge on wildlife values or habitats. This extract comes from the ARA proposed planning scheme - "Further development in the area should be provided for only in existing settlements, or in selected localities particularly suitable for the establishment of aquatic recreation or to service the fishing industry....." (Ref. 6).

RELEVANT REFERENCES:

- 1) Chapman V J (1976) Mangroves and Salt Marshes of the Kaipara Harbour.
- 2) Otamatea County Council (1987) District Scheme.
- 3) Hobson County Council (1986) District Scheme.
- 4) Fuge D N (1964) The Mangrove Swamps of North Auckland. Unpublished MA theses, University of Otago.
- 5) Dent D (1986) Acid Sulphate Soils: a baseline for research and development. Institute for land reclamation and improvement ILRI, Netherlands, publication 39.
- 6) Auckland Regional Authority (1987) Proposed Regional Planning Schemes.
- 7) Ogle C C (1982) Wildlife and wildlife values of Northland in NZ Wildlife Report No. 30.
- 8) Department of Conservation, Northern Region (1988) internal files.
- 9) Ritchie L D (1976) Why are Mangroves Important to Fisheries. From the Proceedings of Symposium, Nature Conservation Council, Whangarei.
- 10) Applied Geology Associates Ltd (1982) Coastal Sand and Shingle Resources of Auckland and Northland.
- 11) Northland Regional Resources Study.
- 12) Challis D A pers. comm. (1988) Scientist, Manukau Sewage Purification Works, Auckland Regional Authority.
- 13) Stephenson G K (1983) Wetlands: a diminishing resource (a report to be Environmental Council) National Water and Soil Conservation Organisation, Misc. publication #58.
- 14) Patridge T R (1987) Spartina in NZ. NZ J. of Bot. 25, 567-575.
- 15) Susan Botting, Illegal Reclamations Destroy Kaipara Shoreline (1987) in Soil and Water, Autumn 1987, page 32.
- 16) Biddle M R (1984) Report on Unauthorised Agricultural Reclamations Kaipara Harbour. Unpublished.

1. NAME Coates Bay
2. AREA CODE Q09/105A Map 29
3. MAP REFERENCE NZMS 260 Q09 217 479 to Q08 265 515
4. LOCATION DESCRIPTION North headland of the entrance to Arapaoa River,
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Small
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
8. WILDLIFE VALUES There is a major wading bird roost at Tinopai (Ref. 1).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown - refer 104A

Management agencies: Kaipara Harbour Authority, Department of Conservation

	Name
Catchment authority	Northland Regional Council
Regional planning authority	Northland Regional Council
Harbour board	Kaipara Harbour Authority
Territorial local authority	Otamatea County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Kaipara Harbour Authority has control over foreshore and waters.
13. USE OF WETLAND BY MAN Boat jetties amongst mangroves.
14. WETLAND MODIFICATIONS PROPOSED None known
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Oyster farm Q09 217 479 (Ref. 16)

Ports: No

Marinas/moorings: Boats moored in sheltered inlets

Waste disposal: Septic tank area - overtaking of system: discharge of effluent (Ref. 2).

Refuse land fill: No

Recreation: Limited water contact sports.

Fishing: Maori oyster fishery eastern headland (Ref. 15).

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland:

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|-------|-------------|------|------------|---|
| forest | - 60% | residential | - 5% | bare earth | - |
| pasture | - 30% | industrial | - | | |

Other land use likely to affect wetland: Camping ground Tinopai forestry.

Reserves present: Two Otamatea County Reserves on Southern Coast (Ref. 13).

Land use changes anticipated up to year 2000: Forest felling.

District scheme - zoning provisions: None

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):
Hilly. Scrub and forest-covered mainly.

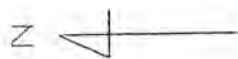
17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Until sewage treatment is introduced it is important to place a density limit on residential subdivision to ensure that septic tank drainage conditions are not overtaken.

19. RELEVANT REFERENCES:

1. Bioresearches Ltd, (1976) "The Ecological Impact of the Proposed Development of Auckland Thermal No. 1 at Waiau Pa".
2. Otamatea County Council (1987) District Scheme.
3. Department of Conservation, Northern Region (1980-88) Faunal Survey, unpublished notes.
4. Chapman, V.J. (1976) "Mangroves and Salt Marshes of the Kaipara Harbour". A report prepared for the Department of Lands and Survey.

5. Department of Conservation, Northern Region (1988) Internal files (5a)411/9/6. Photos available (5b)54/4/366.
6. Northland Regional Council (1988) Water Right Application/file 4204. Unpublished.
7. Mortimer, G. pers. comm. 1988. Scientist, Northland Regional Council.
8. Clarke, C. pers. comm. 1988. Department of Conservation, Hauraki District.
9. Ritchie, L.D. (1979) Fish and Fisheries Aspects of Mangrove Wetlands. Environment 77; proceedings 7, Coastal Zone Workshop.
10. Haughey, A. pers. comm. 1988. Chief Chemist, Manukau Sewage Purification Works. Auckland Regional Authority.
11. Partridge, T.R. (1987) Spartina in New Zealand. New Zealand Journal of Botany, No. 25. 564-575.
12. Department of Lands and Survey (1981) New Zealand Lands Inventory of Northland.
13. Department of Lands and Survey (1983) Coastal Reserves Investigation. North Auckland Land District - Otamatea County.
14. Ritchie, L.D. (1976) Why are Mangroves Important - Fisheries Paper in Proceedings of Symposium, Whangarei. Natural Conservation Council.
15. Young, D. (1986) Maori Oyster Fisheries, MAFFish, Whangarei.
16. Oyster Growers Association (1985) Directory of Oyster farms.
17. Rodney County Council (1987) District Scheme change 75.



Q09/105B

Pakaurangi Point

Puketū Point

Komiti Bay

Tinopai

Coates Bay
Q09/105A

Q09/104

Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
Aerial photographs (1983 & 1988)

1. NAME Raepere Creek
2. AREA CODE Q08/105B Map 30
3. MAP REFERENCE NZMS 260 Q08 165 515 to Q08 221 566
4. LOCATION DESCRIPTION Inside north headland of entrance to Arapaoa River.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION There are good stands of mangrove between Tahupo Creek and Raepere Creek (Ref. 4).
8. WILDLIFE VALUES Tahupo Creek: Very high habitat value (Ref. 3).
Dominant species Common species associated with coastal wetlands.
Rare species/endangered species Tahupo Creek: Extremely good habitat. Spotless crane, rails, bittern. Not fernbird.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND In 1976 there was only fringe mangrove between Te Kopua Point and Puriri Point (Ref. 4).
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/105A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Limited
14. WETLAND MODIFICATIONS PROPOSED None known
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 (a) Use of adjoining water areas:
 Marine farming: Oyster farm (Ref. 16).
 Ports: No
 Marinas/moorings: No
 Waste disposal: No sewage treatment - on-site effluent disposal in non-reticulated areas (Ref. 2).
 Refuse land fill: No
 Recreation: Limited boating, swimming.
 Fishing: Maori Oyster fishery Tahupo Creek, Te Mira Creek, Raepere Creek (Ref. 15).
 Sand extraction: No
 Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Little information available about water quality in the Kaipara Harbour.

CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | |
|------------|------------------|-------------|
| forest | 40% (20% exotic) | residential |
| pasture | 60% | industrial |
| bare earth | | |

Other land use likely to affect wetland:

Reserves present:

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: A limit on density of residential development to ensure that septic tank drainage conditions are not over taxed (Ref. 2).

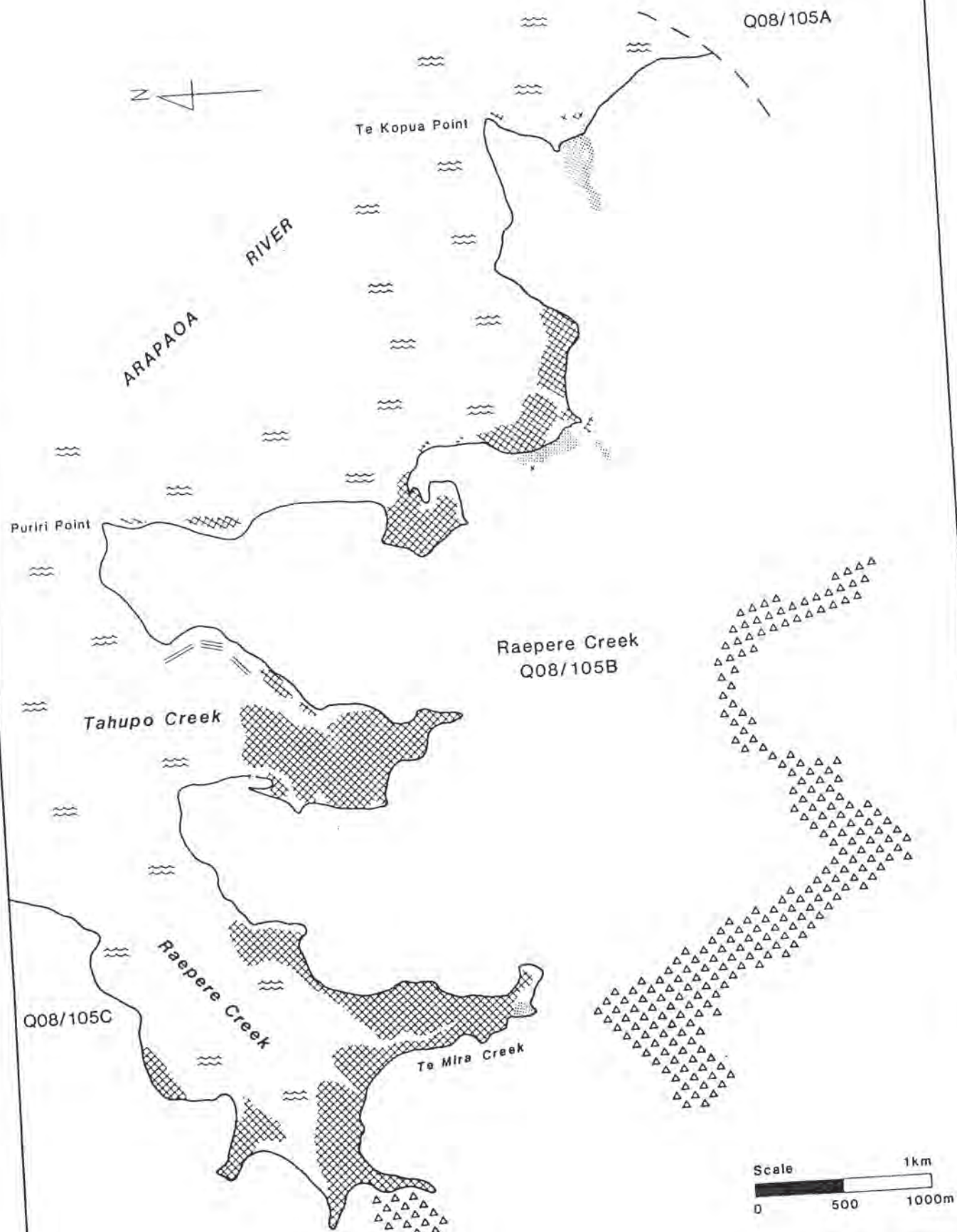
Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):
Undulating farmland.

FUTURE RESEARCH/INFORMATION REQUIREMENTS:

FUTURE MANAGEMENT RECOMMENDATIONS: Care is needed in felling of exotic forests in headwaters, to prevent siltation of wetlands.

RELEVANT REFERENCES: Refer area Q09/105A



1. NAME Kirikiri
 2. AREA CODE Q08/105C Map 31
 3. MAP REFERENCE NZMS 260 North of a line from Q08. 221566 to Q08. 226573
 4. LOCATION DESCRIPTION Northernmost estuary arm of Arapaoa River
 5. TYPE OF WETLAND Mangrove, Saltmarsh
 6. AREA OCCUPIED BY WETLAND (ha) Not known.
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION There is scattered mangrove in Kirikiri Inlet. From Karakanui Road to Matakoho River there are fringe mangroves to the creeks, becoming more abundant near the heads. A very good area of mangrove exists at Paparoa Creek. There is good mangrove in isolated bays at the head of Pahi Estuary (Ref. 4). Kirikiri Inlet: 10% mangrove, narrow area of saltmarsh behind mangrove (Ref. 3)
 8. WILDLIFE VALUES The large estuarine area of the Arapaoa River supports large numbers of waders and other feeding birds. Kirikiri Inlet: High habitat value, valuable feeding area for a large number of common birds (Ref. 3). Major wading bird roost at Arapaoa River in the Pahi area (Ref. 1).
- Dominant species White-faced heron, variable oystercatcher, pied stilt, godwit.
- Rare species/endangered species Kirikiri Inlet: Good crane habitat (Ref. 3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Arapaoa River fisheries (Ref. 14) 1976. Annual commercial fish catch - flounder 55 tonnes (supports eight fishermen) and worth \$50,000.00 plus per year in 1976. Arapaoa in 1976 also supported seven oyster farms as well as catches of kahawai, parore, mullet, shark, snapper.
 10. STABILITY OF WETLAND Know information.
 11. CONTROL OF WETLAND AND CATCHMENT: Refer Q09/105A
 12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 13. USE OF WETLAND BY MAN Limited.
 14. WETLAND MODIFICATIONS PROPOSED None known.
 15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Mussel farm set up in Kirikiri Inlet; eight oyster farms around Pahi River in 1985 (Ref. 16)

Ports: No

Marinas/moorings: No

Waste disposal: Non-reticulated sewage system - on-site effluent disposal.

Refuse land fill: No

Recreation: Limited

Fishing: Maori oyster fishing - Kirikiri Inlet (Ref. 5)

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information on water quality in the Kairapa Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known.

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|-----|-------------|----|---|------------|
| forest | 15% | residential | 5% | - | bare earth |
| pasture | 80% | industrial | | | |

Other land use likely to affect wetland: Quarries: i) West of Okorako Creek. ii) North-east of Matatakohe Creek.
Sawmill at Te Mateotetawa Creek

Reserves present: Hukatere Scenic Reserve. Otamatea County reserves close to foreshore: Two in Pahi River near mouth on west shore, one in headwaters of Motatakohe Creek. Crown reserve at Rabbit Island and Goat Island in Pahi River.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Limits on density of subdivision so as not to overtax the drainage system, such as at Matakoho and Paparoa. Majority of land adjacent to Paparoa Creek is zoned rural or public open space. District scheme recognises the importance of farming.

Controls other than District scheme likely to influence future land use: No

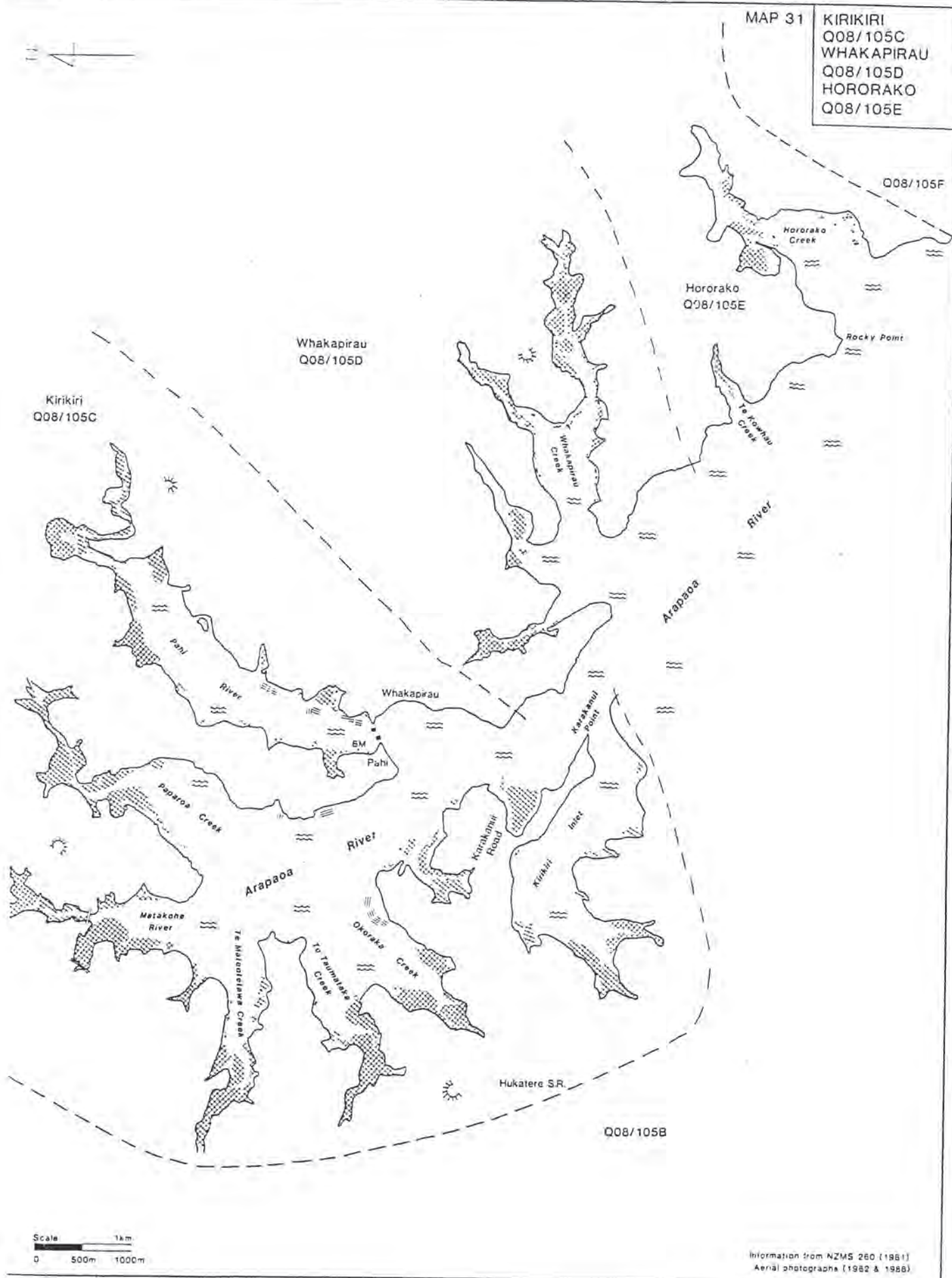
- (c) Description of topography (soil type, slope, erosion susceptibility):
Undulating hill country.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

Refer Q09/105A



1. NAME Whakapirau
2. AREA CODE Q08/105D Map 31
3. MAP REFERENCE NZMS 260 Q08 250 573
4. LOCATION DESCRIPTION An eastern subestuary of Arapaoa River
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
In Whakapirau Creek there is fringe mangrove in the various inlets (Ref. 4).
8. WILDLIFE VALUES Good wader habitat (Ref 3)
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT
Ownership status of wetland: (refer Q09/105A)
Management agencies:
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Limited
14. WETLAND MODIFICATIONS PROPOSED None known
15. CHARACTERISTICS OF ADJOINING WATER AREAS
(a) Use of adjoining water areas:
Marine farming: 4 oyster leases in 1985 (Ref, 16)
Ports: No
Marinas/moorings: No
Waste disposal: Non-reticulated sewage system on-site effluent disposal (Ref. 2)
Refuse land fill: No
Recreation: Limited
Fishing: Yes, commercial and recreational
Sand extraction: No
Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment – likely to affect wetland:

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 15% residential bare earth
 pasture- 85% industrial

Other land use likely to affect wetland: Quarry

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Limits on density of
 subdivision - so as not to overtax the drainage system (Ref. 2)

Controls other than District scheme likely to influence future land
 use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Undulating hill country

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

refer Q09/105A

1. NAME Hokoraka
2. AREA CODE Q08/105E Map 31
3. MAP REFERENCE NZMS 260 Q08 285 540
4. LOCATION DESCRIPTION eastern subestuary of Arapaoa River
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Mangrove
8. WILDLIFE VALUES Common coastal species. Good wader habitat.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT refer Q09/105A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Limited
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas:Yes/No

Marine farming: Oyster farm south headland (Ref. 16)

Ports: No

Marinas/moorings: No

Waste disposal: Non-reticulated sewage system. On-site effluent disposal (Ref.2).

Refuse land fill: No

Recreation: Minimal

Fishing: Commercial and recreational

Sand extraction: No

Other:
 - (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No information
16. CHARACTERISTICS OF WETLAND CATCHMENT
 - (a) Approximate total area of catchment (ha): small

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 15% residential - 85% bare earth
 pasture industrial

Other land use likely to affect wetland: None

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Limits on density of
 subdivision so as not to overtax sewage drainage (Ref. 2).

Controls other than District scheme likely to influence future land
 use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

Refer Q09/105A

1. NAME Otamatea
2. AREA CODE Q08/105F Map 32
3. MAP REFERENCE NZMS 260 Q08 280510
4. LOCATION DESCRIPTION Middle estuary arm of upper Kaipara.
5. TYPE OF WETLAND Mangrove, Saltmarsh, Spartina
6. AREA OCCUPIED BY WETLAND (ha) 4750 ha mangroves.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The Wairau River is tidal and flanked by good quality mangrove and salt-marsh in the side tributaries (Ref. 5). In 1976 there were "areas of mangrove/wetland vegetation all through this river" (Ref. 4).

"At Maungaturoto - the riverbanks comprise mud with mangroves lining the tributaries and bays."

"Fringe mangrove occurs at the head of most of the creeks draining into the river. The best mature mangrove is in the Otairi and Owhei Creeks near the river mouth." (Ref. 4).

In 1973 there were patches of Spartina in Otamatea River (Ref.11)

8. WILDLIFE VALUES Otamatea River is very important in that it provides many wading bird roosts (Ref. 1). Although not a true natural habitat, this area has been recorded as having exceptional water fowl loafing and breeding areas. The upper part of the river has been dammed by a railway causeway. Consequently a near-freshwater area approximately 1 km long and 150-200 m wide now provides an excellent water fowl area. Large numbers of mallards, some greys, and paradise ducks, plus black swans, have been noted. There are no rails other than pukekos (Ref.3). Towards the seaward half of the Otamatea Estuary there are good wader habitats; birds feed and roost on the mudflats (Ref. 3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Otamatea River in general has an exceptional diversity of water fowl. The wildlife values of Wairau River are severely compromised by an existing leaky pipe which discharges effluent to the estuary (Ref. 6).
10. STABILITY OF WETLAND Reclamations in Otari and Owhei Creeks (Ref. 4). The Maungaturoto dairy factory outfall has had an influence on mangrove extent (Ref. 7).
11. CONTROL OF WETLAND AND CATCHMENT: Refer Q05/105A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Limited.
14. WETLAND MODIFICATIONS PROPOSED None.
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No

Marinas moorings: No

Waste disposal:

- 1) Discharge of waste products from dairy factory at Maungataroto into Wairau River; at present the pipeline follows the river, but it is being redirected along the side of the river (no more leakages of waste into mangrove areas).
- 2) Non-reticulated sewage system (Refs 5, 6, 7).

Refuse land fill: No legal fills known of

Recreation: Limited

Fishing: Recreational and commercial

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Maungataroto - Otamatea River dairy factory discharge results in low dissolved oxygen. No obvious impact as yet on mangroves. Dissolved oxygen concentrations down 2 mg. High nutrient concentrations at the point of discharge of dairy wastes. Dissolved oxygen levels increase along the length of the estuary with distance away from the discharge (Ref. 6).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|-------------|------------|------------|
| in: | forest | residential | 3% | bare earth |
| | pasture | 80% | industrial | 2% |

Other land use likely to affect wetland: Dairy processing industry at Maungataroto (Ref. 2). Quarry near Kaiwaka. Railway line running through catchment. Various airstrips (to service farming community).

Reserves present: Pukekaroro Scenic Reserve. Numerous county and Crown reserves in east of catchment.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Limits on subdivision density so as not to overtax sewage system (Ref. 2).

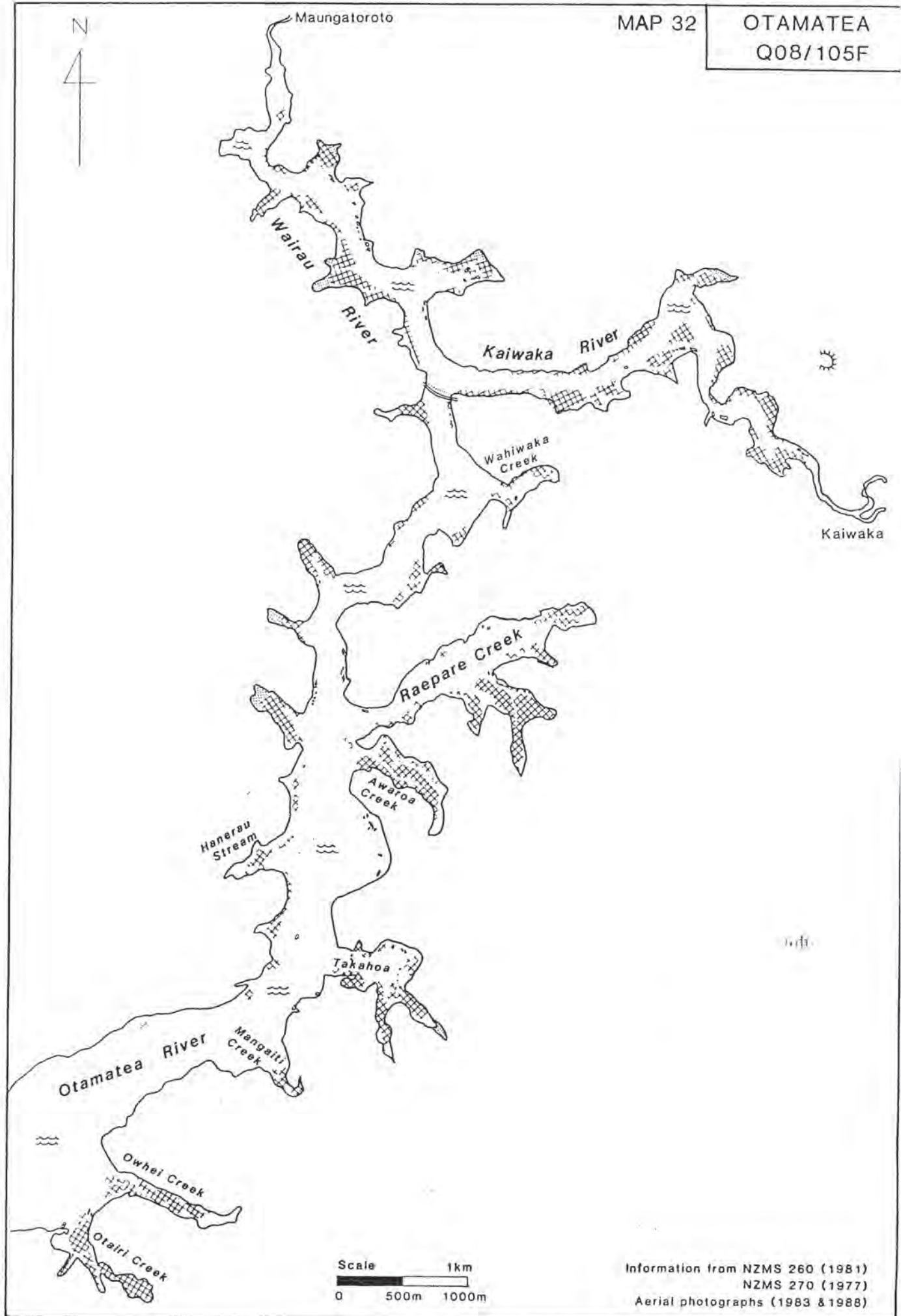
Controls other than District scheme likely to influence future land use: None.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Land is unstable and prone to slumping.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Close watch is needed on industrial discharges and their effects on the nearby wetlands (especially dairy factory discharge at Maungataroto) (Refs 7,8).

19. RELEVANT REFERENCES: Refer Q09/105A



1. NAME Whakaki
 2. AREA CODE Q09/105G Map 33
 3. MAP REFERENCE NZMS 260 Q09 295 490
 4. LOCATION DESCRIPTION Southern margin of northern arm of Kaipara. Part of Puketotara Peninsula. The peninsula formed between Otamatea and Oruawharo Rivers.
 5. TYPE OF WETLAND Mangrove.
 6. AREA OCCUPIED BY WETLAND (ha) Not known.
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION "Mangroves grow in some of the bays around the peninsula. There is a good patch of mangrove in the bay opposite Ngamotu Island, but it is very inaccessible. The mangrove in Stony Creek is very good. Patches near the road have been killed. There is fringe mangrove in the bay opposite Ngamotu Island. At the head of the river at Oneriri there is a substantial mangrove area" (Ref. 4).
- The Whakaki Estuary has been described as one of the Kaipara's least modified areas with quality mangroves (Ref. 10).
8. WILDLIFE VALUES Although little is known of the wildlife value of this estuary, it is likely to be highly similar to other Kaipara estuaries.
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This estuary has undergone minimal human impact.
 10. STABILITY OF WETLAND No information.
 11. CONTROL OF WETLAND AND CATCHMENT: Refer Q09/105A
 12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 13. USE OF WETLAND BY MAN Limited.
 14. WETLAND MODIFICATIONS PROPOSED None.
 15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Two oyster leases (Ref. 16)

Ports: No

Marinas moorings: No

Waste disposal: Non-reticulated sewage system. On-site effluent disposal (Ref 2)

Refuse land fill: No

Recreation: Minimal

Fishing: Minimal

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information is available on water quality in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known.
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | |
|---------|-----|-------------|------------|
| forest | 10% | residential | bare earth |
| pasture | 90% | industrial | |

Other land use likely to affect wetland: Catchment is mainly in one private ownership and well managed pasture. This has benefitted the estuary (Ref. 10).

Reserves present: None.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: (Ref. 17). Limits on subdivision density so as not to overtax the sewage system

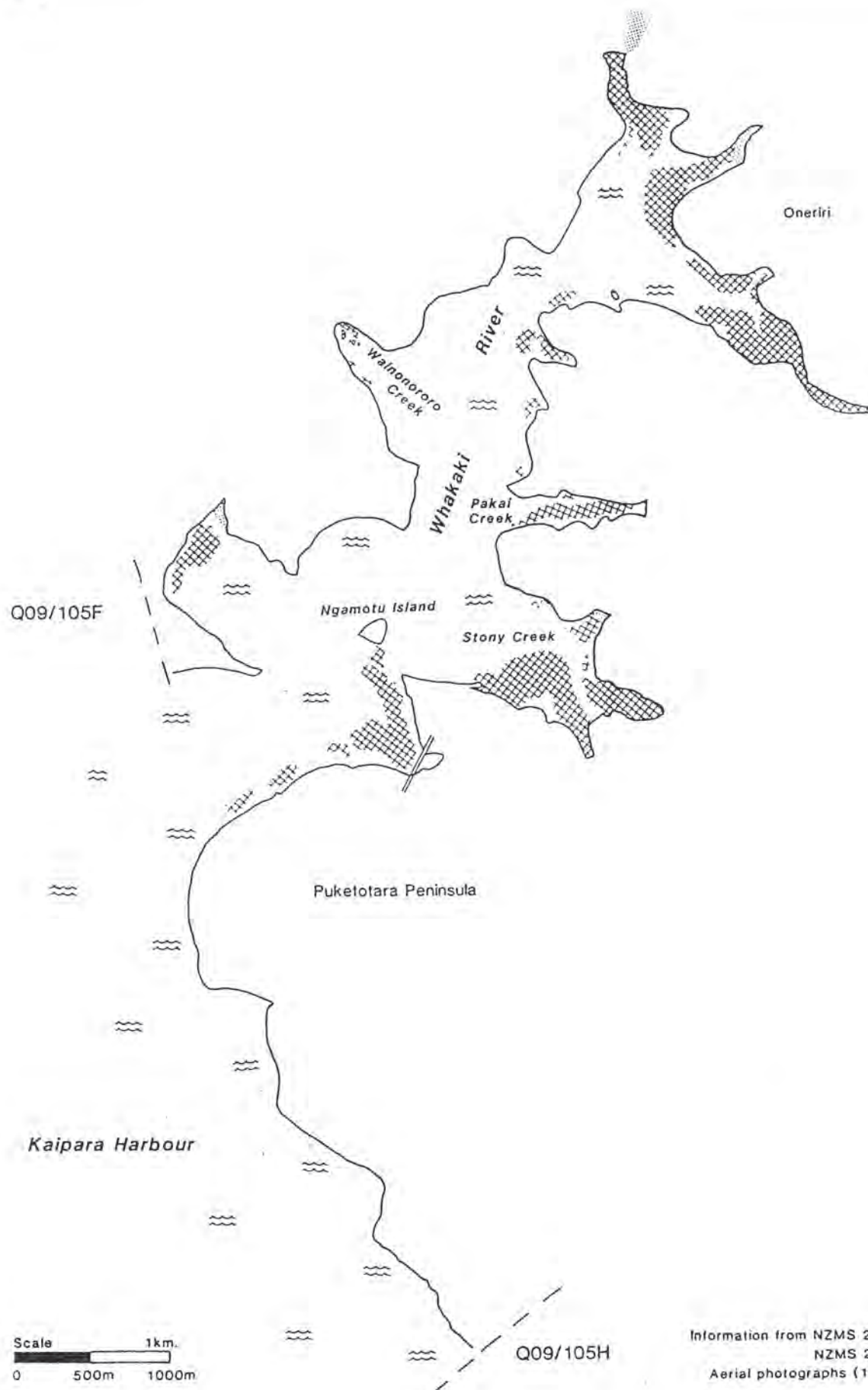
Controls other than District scheme likely to influence future land use: None.

- (c) Description of topography (soil type, slope, erosion susceptibility): Unstable land prone to slipping.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: More information about the ecological systems in this area.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES: Refer Q09/105A



1. NAME Oruawharo
2. AREA CODE Q09/105H Map 34
3. MAP REFERENCE NZMS 260 Q09 265 440
4. LOCATION DESCRIPTION Southern estuary arm of Kaipara Harbour North.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION

"Opposite Schnapper Point a small area of mangrove is present in this bay.

Oturapa Creek, Mullet Creek and Atiu Creek - fringe mangrove present in these creeks.

Takahe Creek - this contains a good area of mangrove (forming a major productivity area for the Oruawharo River).

Takapou Creek - there is fringe mangrove and Salicornia present in this creek.

Wharehanu Creek - an area of good mangrove between these rivers."

Tapuni River - mangroves grow in abundance both sides of the river (Ref. 4).

8. WILDLIFE VALUES

Mullet Creek: locally low habitat value as a result of stock damage.

Takahe Creek and Takapou Creek: moderately valued habitat - shellbanks suitable for roosting. Valuable mangrove/mudflat feeding area for waders.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES

10. STABILITY OF WETLAND There have been quite substantial reclamations for farmland in the past, e.g. a massive reclamation on the northern shore directly opposite Mullet Creek. Other examples include the western shore of Wharehanu Creek, and at the creeks along from Schnapper Point (Ref. 5 & 6).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland:

Crown refer 104A

Management agencies:

Kaipara Harbour Authority

	Name
Catchment authority	Northland Regional Council to north-west of catchment.
Regional planning authority	Northland Regional Council north-west side of catchment. Auckland Regional Authority south-east side of catchment.
Harbour board	Kaipara Harbour Authority
Territorial local authority	partly Otamatea County & Rodney County Boundary through centre of estuary
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

13. USE OF WETLAND BY MAN Illegal dumping of rubbish

14. WETLAND MODIFICATIONS PROPOSED None known

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Oyster farming

Ports: No

Marinas/moorings: No

Waste disposal: Non-reticulated sewage system. On-site effluent disposal. Dairy factory at Te Hana - run-off to Meaneene Creek.

Refuse land fill: No illegal dumping of rubbish in mangroves and saltmarshes.

Recreation: Limited

Fishing: Maori oyster fishery, north coast from Raekau Wharf west and into Kaira River as far inland as Waingapai Creek (Ref. 15).

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information is available on water quality in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known

(b) Land use of catchment: Approximate percentage of total catchment
in: forest residential bare earth
pasture 80% industrial

Other land use likely to affect wetland: Grazing damage to mangroves especially in Mullet Creek. Large block of production forestry in north of catchment.

Reserves present: None

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Otamatea District Scheme limits on subdivision density so as not to overtax the sewage system (Ref. 2).

Southern shore zoned rural; small urban zone at Port Albert (Ref. 17).

Controls other than District scheme likely to influence future land use: None

(c) Description of topography (soil type, slope, erosion susceptibility):
Strongly rolling hill country.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

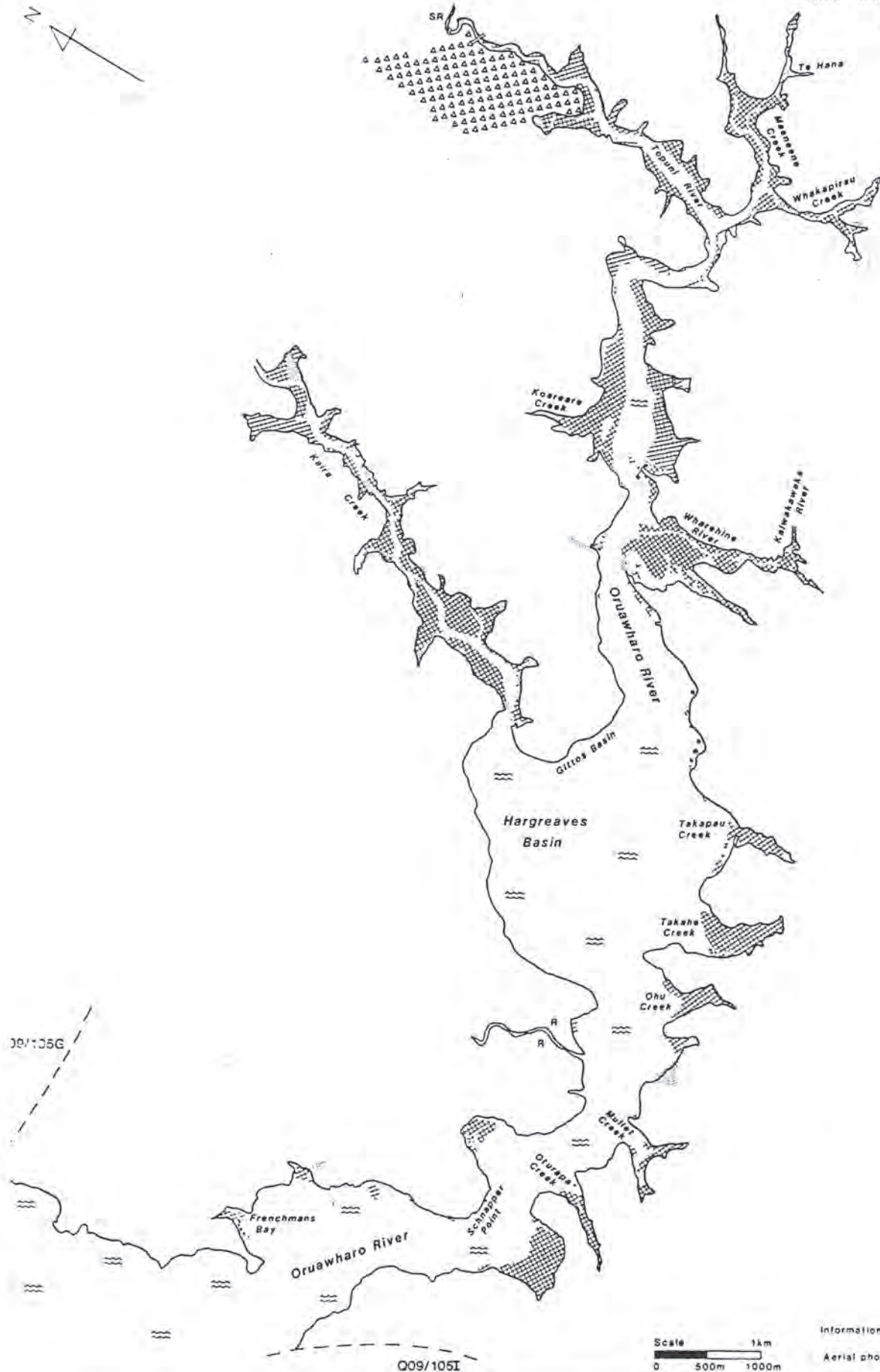
18. FUTURE MANAGEMENT RECOMMENDATIONS:

Care needed in felling of forests. Catchment to prevent siltation of mangrove areas. Fencing of mangrove margins necessary to prevent further stock damage.

19. RELEVANT REFERENCES:

Refer Q09/105A

MAP 34

ORUAWHARO
Q09/105H

1. NAME Otekawa
2. AREA CODE Q09/105I Map 35
3. MAP REFERENCE NZMS 260 Q09 250 425
4. LOCATION DESCRIPTION Southern mouth of southernmost estuary arm of Kaipara Harbour North.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Otekawa Creek has an extensive amount of mangrove and salt marsh in the head of the Creek.
8. WILDLIFE VALUES Good wader habitat.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND In 1976 Otekawa Creek had a small amount of fringe mangrove (Ref. 4).
11. CONTROL OF WETLAND AND CATCHMENT
 Ownership status of wetland: Crown - refer 104A
 Management agencies: Kaipara Harbour Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Kaipara Harbour Authority
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Limited
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 (a) Use of adjoining water areas:
 Marine farming: No
 Ports: No

Marinas/moorings: No

Waste disposal: Residential septic tank. Farm run-off.

Refuse land fill: No

Recreation: Bird watching.

Fishing: No

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality information of the Kaipara Harbour is very limited.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | | |
|-----|---------|--------|-------------|---|------------|---|
| in: | forest | - | residential | - | bare earth | - |
| | pasture | - ~80% | industrial | - | | |

Other land use likely to affect wetland: Reservoir inland.

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Rural (Ref. 17).

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):
Flat land.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

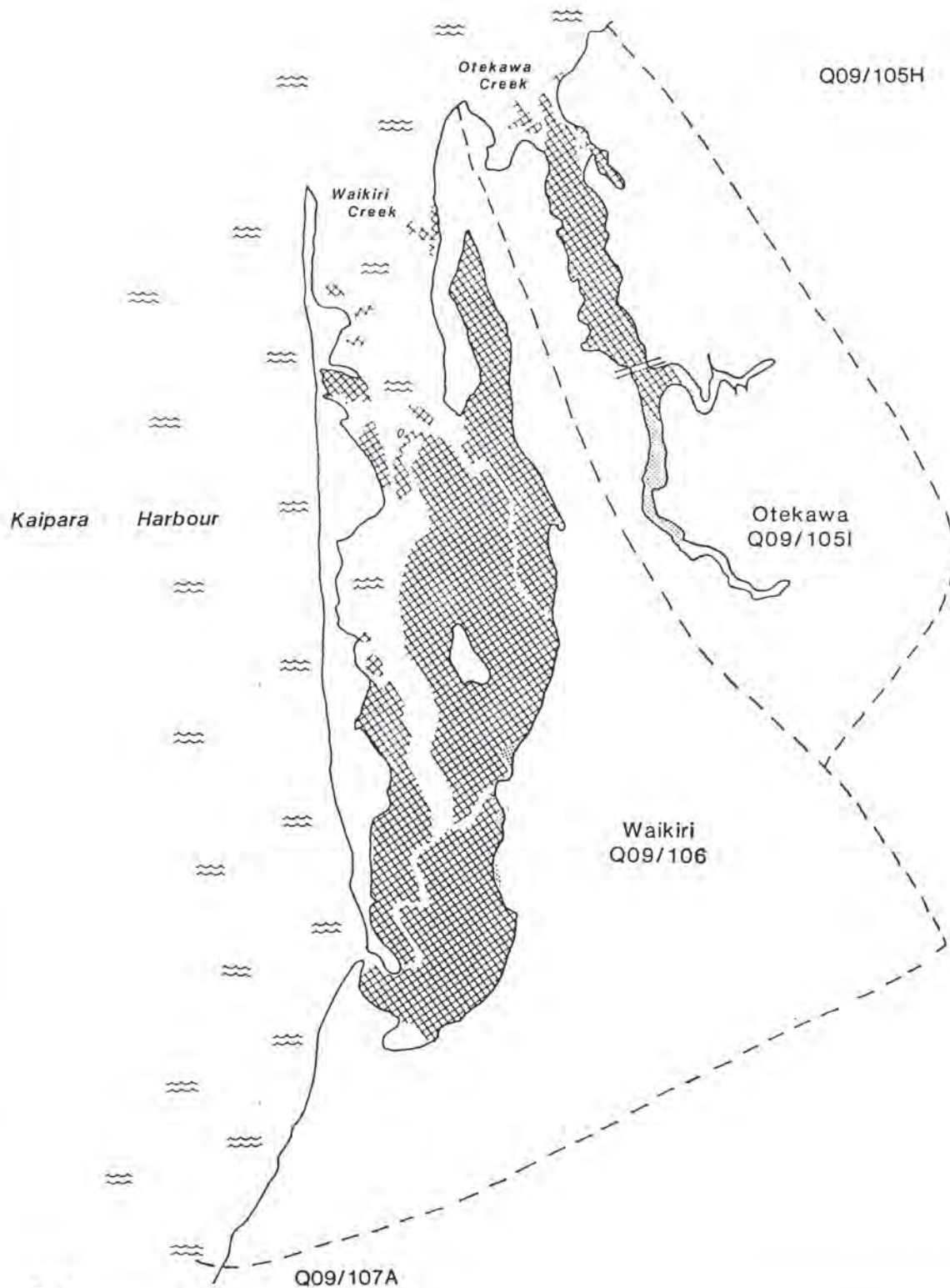
18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

Refer Q09/105A.

MAP 35

OTEKAWA
Q09/105I
WAIKIRI
Q09/106



Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
Aerial photographs (1983 & 1988)

1. NAME Waikiri
2. AREA CODE Q09/106 Map 35
3. MAP REFERENCE NZMS 260 Q09 240 420
4. LOCATION DESCRIPTION Headland in Kaipara Harbour opposite harbour entrance.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION In 1976 this creek contained two areas of good mangrove. At least one substantial area of mangrove needs preserving. The northern area of mangrove includes some islands (Ref. 1).

Salt rush and reed swamp, estuarine shrub swamp (Ref. 2).
8. WILDLIFE VALUES Large shrub-clad sand dune spits which serve as important roosts for large numbers of waders (Ref. 5). Valuable wader feeding areas around spits.

Dominant species Godwit, knot, South Island pied oystercatcher, white-faced heron.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Tapora area has an unusually rich variety of habitats, making this an area of regional significance for birdlife (Ref. 3).

It is also an outstanding wilderness area. (C42)
10. STABILITY OF WETLAND Proposed reclamation at Waikiri Creek, Okahukura: the area is barely tidal and the border of mangroves will remain outside the proposed stopbank (Ref. 4).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown - refer 104A
Management agencies: Kaipara Harbour Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Kaipara Harbour Authority
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN None

14. WETLAND MODIFICATIONS PROPOSED None known

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Cow shed run-off

Refuse land fill: No

Recreation: Minimal

Fishing: No

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: No information

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): No information

(b) Land use of catchment: Approximate percentage of total catchment
in: forest - residential - bare earth -
pasture - 90% industrial -

Other land use likely to affect wetland: Forestry on sand dunes

Reserves present: Coastal recreation reserve on spit of Parapara Creek Q09 243 417 (Ref. 17).

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Nature conservation zoning covers. Waikiri Creek Sandspit and southern fringe of estuary Islands within Waikiri Creek are zoned for coastal landscape protection as is the spit of Parapara Creek (Ref. 17).

Controls other than District scheme likely to influence future land use: None

(c) Description of topography (soil type, slope, erosion susceptibility):
Flat.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: The wetland of Waikiri estuary requires fuller description.
18. FUTURE MANAGEMENT RECOMMENDATIONS: The Taporā headland and Waikiri Creek make up a unique diverse habitat of Regional value as a wilderness and wildlife habitat. The area should be managed as a unit and protected from unnatural changes.
19. RELEVANT REFERENCES:
 1. Chapman, V.J (1976) Mangroves and Salt Marshes of the Kaipara Harbour. Report prepared for the Department of Lands and Survey.
 2. Department of Conservation, Wellington (1978) WERI - computerised wetland inventory.
 3. Department of Conservation; University of Auckland; Auckland Regional Authority (1979) Priority Natural Areas. Rodney Ecological District. Unpublished notes, Auckland Regional Authority.
 4. Department of Conservation, Northern Region (1988) Internal file 54/4/361.
 5. Department of Conservation, Northern Region (1980-88) Faunal Survey. Unpublished notes.

1. NAME Tapura
 2. AREA CODE Q09/107A Map 36
 3. MAP REFERENCE NZMS 260 Q09 235 370 to Q09 280 339
 4. LOCATION DESCRIPTION Headland directly opposite Kaipara Harbour entrance
 5. TYPE OF WETLAND Mangrove, Saltmarsh
 5. AREA OCCUPIED BY WETLAND (ha) Not known.
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION Te Ngaio Point wetland: This habitat is inundated only by extreme high tide. Scirpus lacustrus predominates. There are mangrove trees here.
 8. WILDLIFE VALUES Te Ngaio wetland: High quality habitat, no public use, good roost (Ref. 2). The Tapura coast has an unusually rich variety of habitats, making this an area of significance for bird life: freshwater wetlands, salt-marshes, mangroves and islands of hard sand. With its hard sand areas and coastal margins it is a major roosting area in the Kaipara Harbour for waders. Many of the roosting areas in the Kaipara have been destroyed by reclamation. The Tapura coast, together with Jordans and Oyster Point, are the major roosts remaining on the eastern side of the harbour. Sand Island is a wildlife management reserve; similar status was being sought by the Wildlife Service, Internal Affairs Department, for the area between Waikiri Creek and Te Ngaio Point (Ref. 1).
- Dominant species South Island pied oystercatcher, godwit, turnstone, knot, pied stilt, eight species of water birds (Ref. 3).
- Rare species/endangered species Wrybill, NZ dotterel, banded dotterel, grey plover, eastern golden plover (Ref. 3). Te Ngaio Wetland: Fernbird, bittern (Ref. 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Tapura headland and sand islands make up an outstanding wilderness area of regional value (Ref. 4).
 10. STABILITY OF WETLAND Reclamation of intertidal areas.
 11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown refer 104A
 Management agencies: Kaipara Harbour Authority

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board,	Kaipara Harbour Authority
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN: Fossicking, bird watching. Extension of grazing land.

14. WETLAND MODIFICATIONS PROPOSED None known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Dairy shed effluent (Ref. 5)

Refuse land fill: No

Recreation: Bird watching

Fishing: No

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information is available on the water quality of any area in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not available.

(b) Land use of catchment: Approximate percentage of total catchment
in: forest 5% residential bare earth 15%
pasture 80% industrial

Other land use likely to affect wetland: None.

Reserves present: Sand Island is a wildlife management reserve

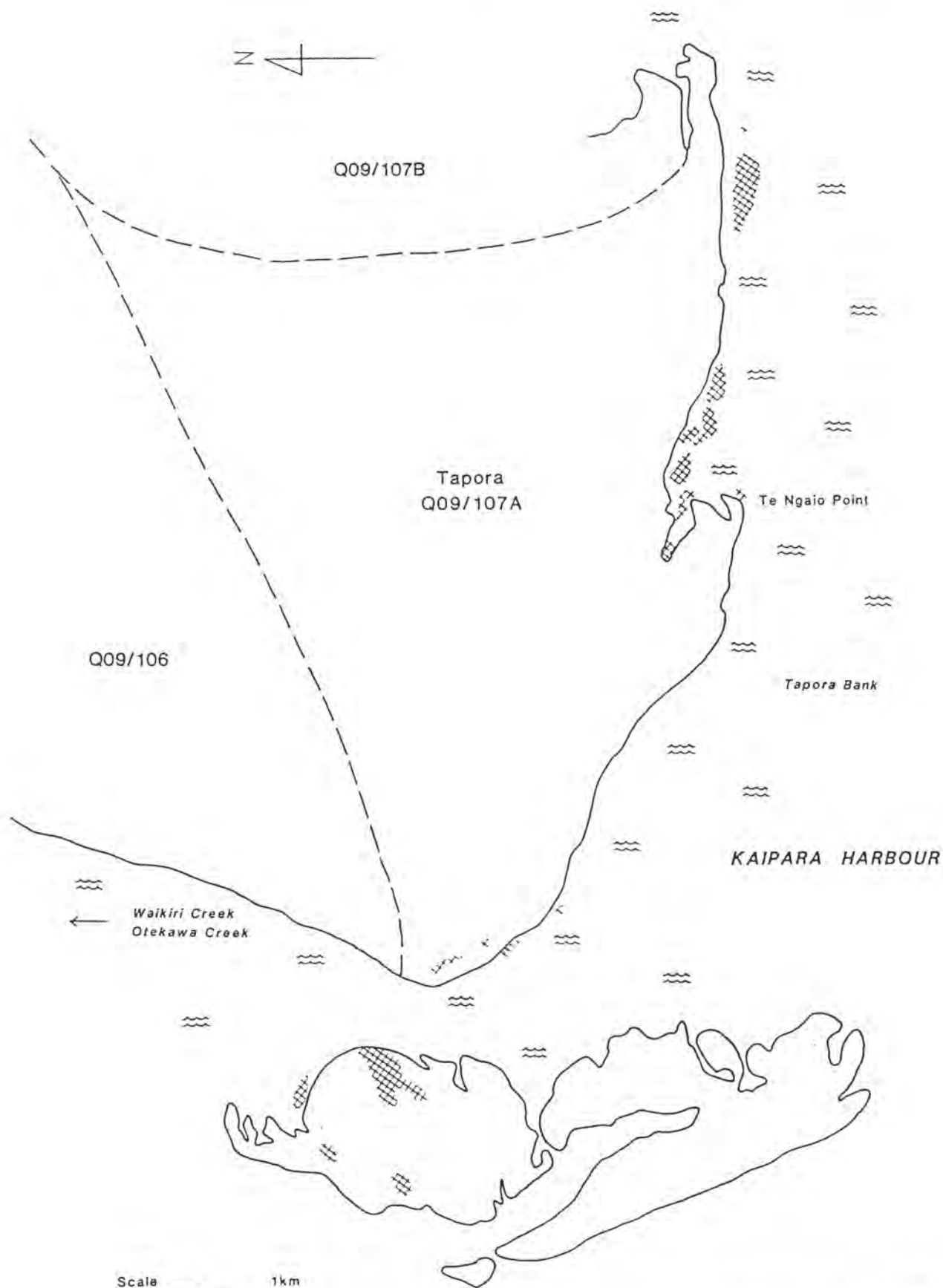
Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: "Nature conservation zoning covers the near shore area of the mainland and some islands"(Ref. 17).

Controls other than District scheme likely to influence future land use: None.

(c) Description of topography (soil type, slope, erosion susceptibility):
Flat lands; sandy soils.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:
18. FUTURE MANAGEMENT RECOMMENDATIONS: The whole coastline from Otekawa Creek to Te Ngaio Point is worthy of national reserve status.
19. RELEVANT REFERENCES:
 - 1) Auckland Regional Authority (1987) Proposed Regional Planning Scheme.
 - 2) Department of Conservation, Northern Region (1980-88) Faunal Survey. Unpublished notes.
 - 3) Ornithological Society of New Zealand (1978) Survey of birds in the Taporā area, Kaipara Harbour. Quoted in ARA (1987).
 - 4) Van Roon M R (1977) pers. obs.
 - 5) Henderson K (1988) pers. comm. 1988. Water Quality Inspector, Auckland Regional Water Board.



1. NAME Gum Store Creek
2. AREA CODE Q09/107 B Map 37
3. MAP REFERENCE NZMS 260 Q09 280 350
4. LOCATION DESCRIPTION Inside southern headland of Taporā Peninsula, Kaipara Harbour.
5. TYPE OF WETLAND Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha)
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Gum Store Creek contains some mangrove, mudflat and Juncus marsh (Ref. 1)
8. WILDLIFE VALUES

Dominant species Gum Store Creek is an important shag roosting area (Ref. 2).

Rare species/endangered species
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Gum Store Creek has a rich assemblage of habitats, i.e. mangroves, mudflats, sandbanks, scrub and freshwater wetlands (Ref. 1)
10. STABILITY OF WETLAND Reclamations noted in 1978 (Ref. 1)
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/107 A.
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Reclamations.
14. WETLAND MODIFICATIONS PROPOSED None known.
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Probably septic tanks at Taporā

Refuse land fill: No

Recreation: Limited

Fishing: Recreational, Commercial flounder.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The amount of information available on water quality in the Kaipara Harbour is limited.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known.
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|-------|-------------|------------|
| in: | forest | < 15% | residential | bare earth |
| | pasture | 80% | industrial | |

Other land use likely to affect wetland: Most land is very flat and extensively drained.

Reserves present: Part of the shore extending westwards from Orange Point is reserved. A recreation reserve exists at the headwater of Gum Store Creek.

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Most of catchment has rural zoning. Urban zone over Tapora township at head of estuary (Ref. 17).

Controls other than District scheme likely to influence future land use: None.

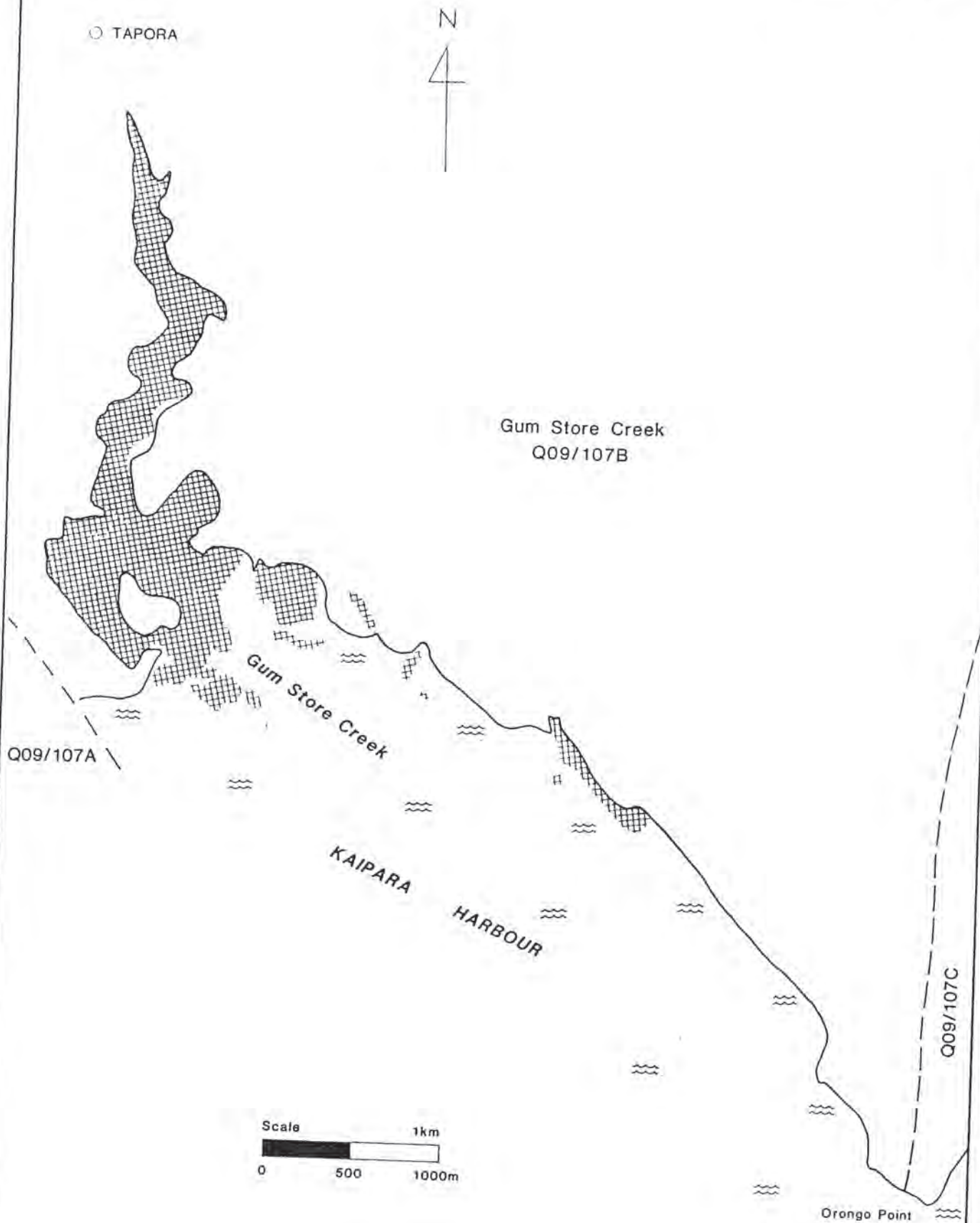
- (c) Description of topography (soil type, slope, erosion susceptibility): Mostly flat. Catchment rises to east.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: A more in-depth description of Gum Store Creek wetland is desirable.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Chapman V J (1976) Mangroves and salt marshes of the Kaipara Harbour. A report prepared for the Department of Lands & Survey.
- 2) Auckland Regional Authority (1987) Proposed Regional Planning Scheme.

MAP 37 GUM STORE CREEK
Q09/107B

1. NAME Tauhoa/Hoteo
2. AREA CODE Q09/107C Map 38
3. MAP REFERENCE NZMS 260 Q09 360 310
4. LOCATION DESCRIPTION South-east of Kaipara Harbour
5. TYPE OF WETLAND Mangrove, Saltmarsh, Spartina
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The mangrove trees at Glorit have in the past been distinctly taller than those around Auckland (Ref. 9). Mataia Creek to Breach Point (1976) - This is all good fringe protection mangrove (Ref. 1). Papakanui River to Tauhoa, plus Tauhoa River estuary. All this is excellent mangrove and salt-marsh and it must provide a great deal of primary production for the Kaipara. The very finest mangrove are the two patches at the head of Tauhoa River (1982) (Ref. 5). Te Karaka Creek (Glorit), large Spartina planting in distinctive pattern (Refs 1, 4).
8. WILDLIFE VALUES Major wading bird roosts at Tauhora River and at Glorit - Hoteo River (Ref. 3).

Dominant species - Eleven species of coastal birds, including black swan, eastern bar-tailed godwit, knot, at Karaka (Ref. 6).

- Shag breeding colony (pied, black, little), good area for waterfowl, white-faced heron. Upper Tauhoa not good for waders (Ref. 8).

Rare species/endangered species Fernbirds are abundant at Karako Wetland (Ref. 6). Upper Tauhoa estuary: Good for banded rail (Ref 8).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Massive reclamations of intertidal areas causing concern to Department of Conservation, as well as Royal Forest & Bird Protection Society. Illegal reclamations at headwaters of Tauhoa estuary, and legal reclamations near Tauhoa (Ref. 7). Large-scale reclamation at Te Karaka Creek. Te Ikatauhou tidal flats: Former pasture reclaimed by tide (Ref 4).
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/107A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)? No.
13. USE OF WETLAND BY MAN Reclamation and grazing (Ref. 7).
14. WETLAND MODIFICATIONS PROPOSED None known.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: Two oyster leases in Tauhoa River.

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Bird-watching

Fishing: No

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information available on water quality in Kaipara Harbour.16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha): Very large catchment.(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	10%	residential	bare earth
	pasture	90%	industrial	

Other land use likely to affect wetland: Grazing damage to wetlands. Bush areas in upper Tauhoa estuary have their undergrowth stripped by stock grazing (Ref. 8).

Reserves present: (Ref. 1) Native flora reserve Breach Point to Papakanui River. Tauhoa Scientific Reserve comprises 291 hectares; 75-80% of which is dense mangrove forest. It is one of only two such significant reserves in New Zealand. It was vested in the University of Auckland in 1949 and classified as a flora and fauna reserve. Under the Reserves Act 1977 it is being reclassified as a scientific reserve. The Department of Conservation administers the reserve and intends to fence the area to keep cattle out. It is open to the public (Ref. 2).

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Predominantly rural zoning - Nature Conservation zoning over native flora reserve between mouth of Papakanui River and mouth of Hoteo River (Ref. 17).

Controls other than District scheme likely to influence future land use: None.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Hilly catchment. Mostly in pasture.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Information on water quality in this area.

18. FUTURE MANAGEMENT RECOMMENDATIONS: Halt illegal reclamations. Prevent damage to wetlands by grazing cattle. Check on the spread of spartina at Glorit.

19. RELEVANT REFERENCES:

- 1) Chapman V J (1976). Mangroves & Salt Marshes of the Kaipara Harbour. Report prepared for Department of Lands & Survey.
- 2) Auckland Regional Authority (1987). Proposed Regional Planning Scheme.
- 3) Bioresearchers Ltd (1976). 'The Ecological Impact of the Proposed Development of Auckland Thermal No. 1 at Waiau Pa'.
- 4) Department of Conservation, Wellington (1978). WERI - Computerised wetland inventory.
- 5) Haughey A pers. comm. (1988). Chief Chemist, Manukau Sewage Purification Works, Auckland Regional Authority.
- 6) Royal Forest & Bird Protection Society file notes.
- 7) Department of Conservation, Northern Region, files - especially 54/4/300; 54/4/503. File: Manaia Properties Ltd. Unauthorised Works, Mataia Creek.
- 8) Department of Conservation, Northern Region, (1980-88) Faunal Survey - unpublished notes.
- 9) Chapman V J and J W Ronaldson (1958). Mangrove and Salt Marsh Flats of the Auckland Isthmus.
- 10) Kindley M (1984). Assessment of a South Kaipara Wetland. Unpublished BSc. notes, University of Auckland.

MAP 38

TAUHOA /HOTEQ
Q09/107C

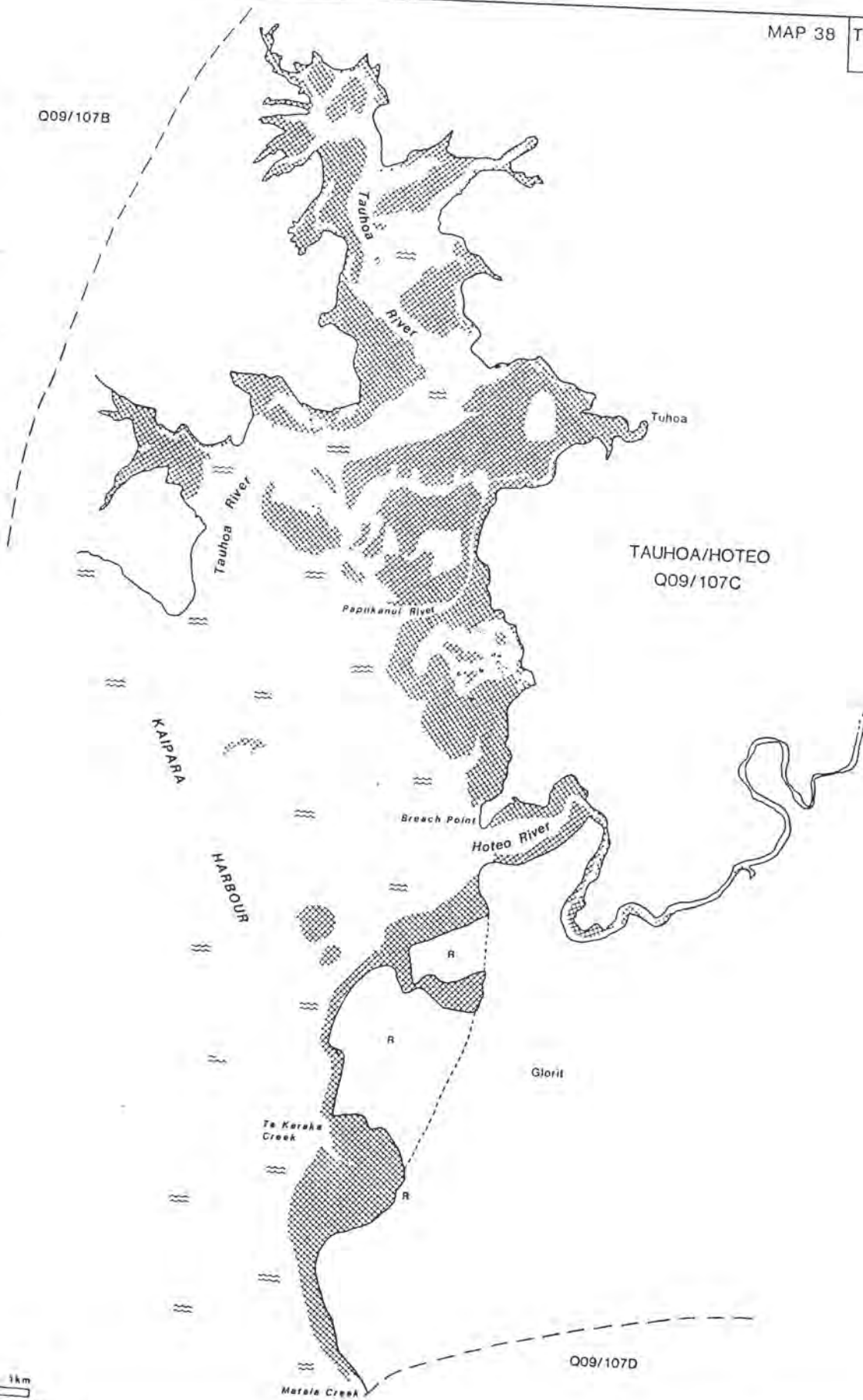
Q09/107B

TAUHOA/HOTEQ
Q09/107C

Q09/107D

1km
100m 1000m

Information from NZMS 260 (1981)
Aerial photographs (1952-53 & 1988)



1. NAME Araparera
2. AREA CODE Q09/107D Map 39
3. MAP REFERENCE NZMS 260 Q09 390 215
4. LOCATION DESCRIPTION Southeastern margin of Kaipara Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh Spartina
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION

The mangrove in the Araparera River is of high quality and is fronting reclamation (Ref. 1).

In the Kakanui Point to Araparera River area:

Spartina townsendii, Spartina alterniflora

Maritime Marsh Zone - large, healthy.

Plagianthus divaricatus, Sarcocornia quinqueflora

Stipa teretifolia

Leptocarpus simulus

Juncus maritimus (Ref. 4)

Mangroves: A. marina var resinifera rarely inundated by the tide and small in stature (Ref. 3).

Araparera Swamp: Raupo swamp with scattered shrubs. Juncus, Phoridium; area extensively drained (Ref. 6).

Spartina has been planted in order to help accelerate shock grazing of wetland. With its aggressive growth, Spartina could be a threat to the largely exotic wetland (Ref. 3).

8. WILDLIFE VALUES Araparera Swamp: Extremely high value habitat (Ref. 6). The continuing reclamation will threaten birdlife (Ref. 3).

Dominant species Mataia Creek: Pied stilts (breeding), oystercatchers (Ref. 5).

Rare species/endangered species Fernbird - small but dense population (Refs 3, 5, 6), bittern (Ref. 6).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND Royal Forest and Bird Protection Society and Department of Conservation have voiced concern over reclamation in this area. Reclamations noted by Chapman 1976.

1982 Mataia Creek: Shopbanks and drainage ditches were constructed to reclaim mud flats within the owner's title to make them into productive farmland. Manaia properties reclaimed 15 ha at Mataia Creek (Ref. 7).

Problem of acid sulphate soils: Impediment to agricultural development of potentially fertile sediments deposited in saline waters (Refs 2, 8).
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/107A

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Reclamation for pasture.
14. WETLAND MODIFICATIONS PROPOSED Further reclamation by farmers /
reversion to wetlands encouraged by opposing "environmentalists".
15. CHARACTERISTICS OF ADJOINING WATER AREAS
- (a) Use of adjoining water areas:
- Marine farming: No
- Ports: No
- Marinas/moorings: No
- Waste disposal: Farm run-off
- Refuse land fill: No
- Recreation: Bird-watching
- Fishing: No
- Sand extraction: No
- Other:
- (b) Water quality characteristics of adjoining harbour/coast/catchment -
likely to affect wetland: Minimal information is available on
water quality in the Kaipara Harbour.
16. CHARACTERISTICS OF WETLAND CATCHMENT
- (a) Approximate total area of catchment (ha): Not known
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|-------|-------------|------------|
| in: | forest | - 25% | residential | bare earth |
| | pasture | - 75% | industrial | |
- Other land use likely to affect wetland: Stock grazing damage
likely to increase. Small area of exotic production forestry in
headwaters of catchment.
- Reserves present: None
- Land use changes anticipated up to year 2000: None
- District scheme - zoning provisions: Predominantly rural; coastal
landscape protection zone on north headland of Araparera River (Ref.
9).
- Controls other than District scheme likely to influence future land
use: None
- (c) Description of topography (soil type, slope, erosion susceptibility):
Mostly hilly.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Department of Conservation negotiating with nearby owners to prevent further degradation of Araparera Swamps (Ref. 6). Reduce amount of stock grazing. Revert reclamations back to wetland.

19. RELEVANT REFERENCES:

1. Chapman, V.J. (1976) Mangroves and Salt Marshes fo the Kaipara Harbour, Department of Lands and Survey.
2. Metson, A.J., E.J. Gibson, J.E. Cox, D.B. Gibbs (1977) NZ Journal of Science Vol 20 p 371-394.
3. Kindley, M (1984) Assessment of a South Kaipara Wetland. Unpublished BSc. thesis, Auckland University.
4. Bascand, L.D. (1968) Spartina Investigations in New Zealand. A paper prepared for the Ministry of Agriculture and Fisheries, NZ.
5. Ornithological Society of New Zealand 1965 and 1979. Member surveys.
6. Department of Conservation, Northern Region (1980-88) Faunal Survey, unpublished notes.
7. Department of Conservation, Northern Region (1988) Internal file 54/4/503. Photographs available.
8. Dent, D. (1986) Acid sulphate soils: A baseline for research and development. Institute for land reclamation and improvement. ILRI Wageningen, the Netherlands. Publication 39.
9. Rodney County Council (1987) District Scheme change 27.



1. NAME Makarau River
2. AREA CODE Q10/107E Map 40
3. MAP REFERENCE NZMS 260 Q10 400 155
4. LOCATION DESCRIPTION Southeastern margin of Kaipara
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Makarau River to Kakanui Point. Good mangrove and salt marsh 1976 (Ref. 1).
8. WILDLIFE VALUES A major wading bird roost at Jordan's (Ref. 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None
10. STABILITY OF WETLAND Farmer wanting to reclaim mangroves enquiries to Auckland Regional Water Board (Ref. 3). Major reclamations in this area (Refs 4, 5).
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/107A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Reclamations for farmland.
14. WETLAND MODIFICATIONS PROPOSED Reclamation proposals.
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Agricultural effluent

Refuse land fill: No

Recreation: Limited

Fishing: Yes

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Limited information available on water quality in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | | |
|-----|---------|-------|-------------|---|------------|---|
| in: | forest | - 40% | residential | - | bare earth | - |
| | pasture | - 60% | industrial | - | | |

Other land use likely to affect wetland: None

Reserves present: Omeru Scenic reserve.

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Nature Conservation zoning covers Makara River and Kakanui Creek from Q09 400 153 to Q09 420 154 (Ref. 6).

Controls other than District scheme likely to influence future land use: None

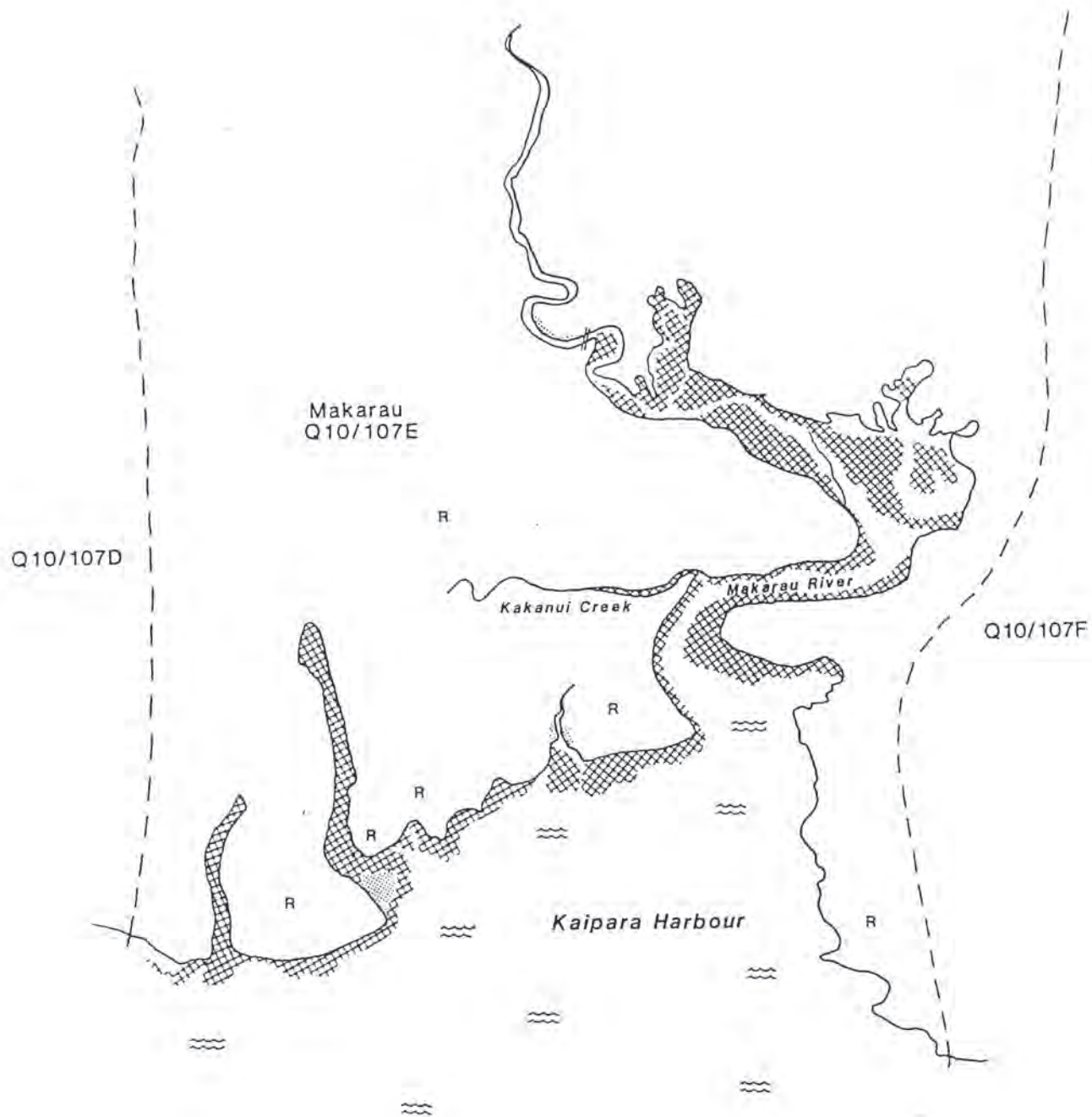
- (c) Description of topography (soil type, slope, erosion susceptibility):
Rolling to steep.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Halt illegal reclamations.

19. RELEVANT REFERENCES:

1. Chapman, V.J. (1976) Mangroves and salt marshes of the Kaipara Harbour, Department of Lands and Survey.
2. Bioresearches Ltd (1976) "The Ecological Impact of the Proposed Development of Auckland Thermal No. 1 at Waiau Pa".
3. Rix-Trot, T. pers. comm. 1988. Auckland Regional Water Board.
4. Department of Conservation, Northern Reion (1988) Internal files.
5. Royal Forest and Bird Protection Society (1988) Files.
6. Rodney County Council (1987) District Scheme Change 27.



Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
Aerial photographs (1962-3 & 1988)

1. NAME Matawhero.
2. AREA CODE Q10/107F Map 41.
3. MAP REFERENCE NZMS 260 Q10 385140 to Q10 390090.
4. LOCATION DESCRIPTION South eastern margin of Kaipara Harbour south. Oyster Point - south-east shore of Kaipara Harbour.
5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass Spartina
6. AREA OCCUPIED BY WETLAND (ha) Oyster Point Swamp is 12.75 ha.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Matawhero Stream - mangrove has been developing here.
Oyster Point - there is a mangrove fringe on the western and northern slopes.
Ngapuke Creek - a good development of mangrove in this creek and in the surrounding bay (Ref 2).
8. WILDLIFE VALUES Extensive tidal mangrove marshes are present in Ngapuke Creek, at Oyster Point and in the Makarau River. Trees up to 6 m tall (Ref 2).

Spartina alterniflora has been planted in a band around the shore from Ngapuke Creek to the mouth of the Makarau River in an attempt to reduce erosion of bunds which protect the low-lying farmland. Plantings commenced in 1968. Spartina now forms a dense bed, averaging 200 m wide from Ngapuke Creek to the Makarau River and in 1978, was spreading.

Ngapuke Creek - following species present:
Spartina townsend, Juncus maritimus, Leptocarpus simplex (Ref 3).

Dominant species Pied stilt, South Island pied oystercatcher, black swan, grey duck, mallard duck, white-faced-heron, black shag, little tern, red-billed gull, southern black-backed gull, little shag, pied shag, white-fronted tern.

Rare species/endangered species Fernbird common in low scrub. Banded rail in marsh. Banded dotterel, red-breasted New Zealand dotterel, wrybill, white heron and caspian tern.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND There have been large areas reclaimed in this area of the harbour. From Oyster Point to Kakanui Point has all been reclaimed. Most reclamation, if not all, has been for farmland. The probable reason for the rapid colonisation of previously open areas by mangroves is the rapid accumulation of fine sediment in intertidal areas as a result of input from the catchment.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown - refer 104 A.
Management agencies:

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Kaipara Harbour Authority.
Territorial local authority	Rodney County Council.
Crown	Department of Conservation.
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Kaipara Harbour Authority.

13. USE OF WETLAND BY MAN The shallow intertidal areas of Ngapuke Creek and adjacent intertidal flats were in 1978 considered as an alternative cooling pond site for a proposed power station at Oyster Point (Ref 2).

14. WETLAND MODIFICATIONS PROPOSED Further reclamations a possibility (Ref 2).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas moorings: No.

Waste disposal: Minimal farm run-off.

Refuse land fill: No.

Recreation: Little.

Fishing: Yes.

Sand extraction: Part of East Kaipara Sand Production Group - Jordan's Sand Pit.

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: There is little information about water quality in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha):

(b) Land use of catchment: Approximate percentage of total catchment
in: forest residential bare earth
pasture 70% industrial

Other land use likely to affect wetland: Land which is periodically inundated. Sand pit.

Reserves present: None.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Rural zoning throughout the catchment.

Controls other than District scheme likely to influence future land use: None.

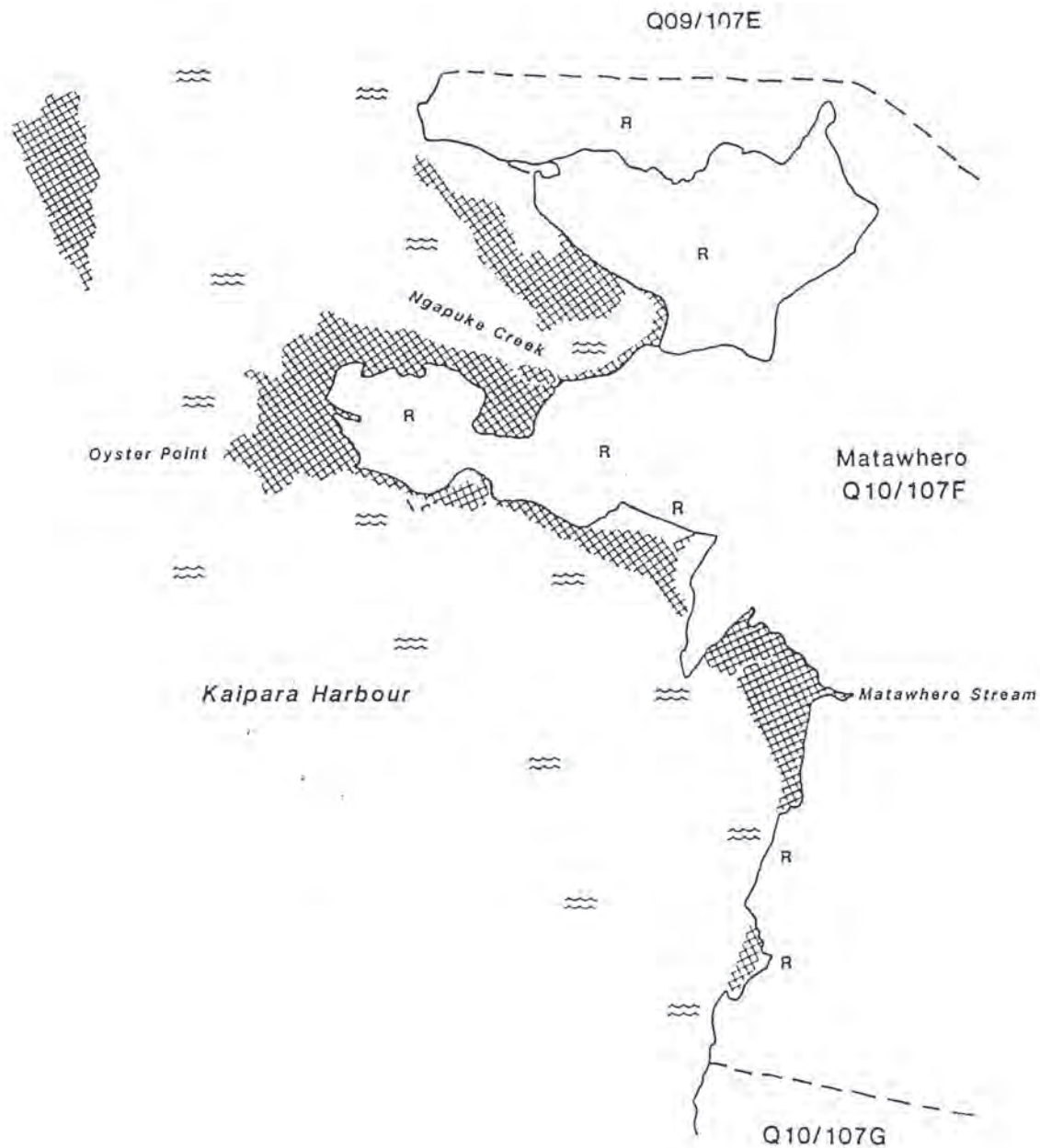
- (c) Description of topography (soil type, slope, erosion susceptibility):
Near shore land is very flat and dissected by drains. Rolling upper catchment.

FUTURE RESEARCH/INFORMATION REQUIREMENTS:

FUTURE MANAGEMENT RECOMMENDATIONS:

RELEVANT REFERENCES:

- (1) Cox, G. J. (1977). Utilisation of Mangrove Swamps by Birds M.Sc. thesis, University of Auckland.
- (2) Chapman, V. J. (1976). Mangroves and Salt Marshes of the Kaipara Harbour.
- (3) Bioresarches Limited (1978). Report on the Ecology of Oyster Point in the South Kaipara Harbour: A Possible Future Power Station Site (for N.Z.E.D.).
- (4) Dent, D. (1986). Acid Sulphate Soils: A Baseline for Research and Development. Institute for Land Reclamation and Improvement. I.L.R.K. Wageningen. Publication 39.
- (5) Rodney County Council (1987) District Scheme Change 75.



Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
Aerial photographs (1988)

1. NAME Kaipara River
2. AREA CODE Q10/107G Map 42
3. MAP REFERENCE NZMS 260 Q10 390060
4. LOCATION DESCRIPTION Southern margin of South Kaipara Harbour.
5. TYPE OF WETLAND Mangrove, Saltmarsh,
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The mouth of the Kaipara River is estuarine - it is subject to saline inundation (Ref. 1). There are extensive areas of wetland in this area. The southern end of the Kaipara Harbour has a mosaic of mangroves/salt-marsh/mudflats and open water, with numerous estuarine arms. There are mature mangroves fringing Upokonui Creek (Ref. 3). In the southern portion of the Kaipara Harbour, bordering the lower part of the Helensville River, there are extensive mangrove swamps, together with Salicornietum. Higher up the river this is replaced by the introduced grass Zizania aquatica (Ref. 3.)
8. WILDLIFE VALUES This is an outstanding habitat for birdlife. A huge number of waders (25,000 have been recorded at any one time). Kaukapakapa Estuary is an important habitat for wildlife, with shags and other birds nesting.

Rare species/endangered species Brown teal in some creeks.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND This area has been subjected to a lot of reclamation to create further farmland. This is continuing (Ref. 2). A proposed reclamation around Opahekehe Island (Ref. 2). A large legal reclamation just south of Parekawa Creek and another small illegal one just north of this creek. Illegal reclamation at Coopers, and another at the mouth of Kaukapakapa Stream. Much of the land around Upokonui Creek has been reclaimed (Ref. 3).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown refer 104A
Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Kaipara Harbour Authority
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Kaipara Harbour Authority.
13. USE OF WETLAND BY MAN Reclamation for further farmland. Areas to drain waste and run-off to. Rubbish disposal.
14. WETLAND MODIFICATIONS PROPOSED There is much controversy surrounding the drainage of wetland at the Te Karaka site (Ref.2).
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: A great deal of farm waste run-off and effluent sewage from dairy company sewage outfalls from residential areas - particularly Helensville and Kaukapakapa (Helensville sewage oxidation ponds discharge to river opposite Parakai).

Refuse land fill: Rubbish tip near Helensville.

Recreation: Limited

Fishing: Limited. Commercial eel fishing (Ref. 4).

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality is fair but improving (Ref. 1). Some water quality deterioration in the late 1970s resulted from dairy factory discharge and farm run-off.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|-----|---------|-----|-------------|----|------------|
| in: | forest | 10% | residential | 5% | bare earth |
| | pasture | 80% | industrial | | |

Other land use likely to affect wetland: Land use capabilities are highly variable throughout the catchment (Ref.1). Main railway runs adjacent to many estuarine areas.

Reserves present: A 20 metre strip designated as public reserve extends along the eastern bank of the Upokonui Creek and the western bank of the Kaipara River (Ref. 3). Kaukapakapa Estuary Scientific Reserve.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: A 20 metre strip designated as public reserve extends along the eastern bank of Upokonui Creek and the west bank of the Kaipara River. Most of the catchment is zoned rural. Areas of urban zoning are at Helensville, Parakai, Waimauku, Huapai-Kumeu (Ref. 5).

Controls other than District scheme likely to influence future land use: None.

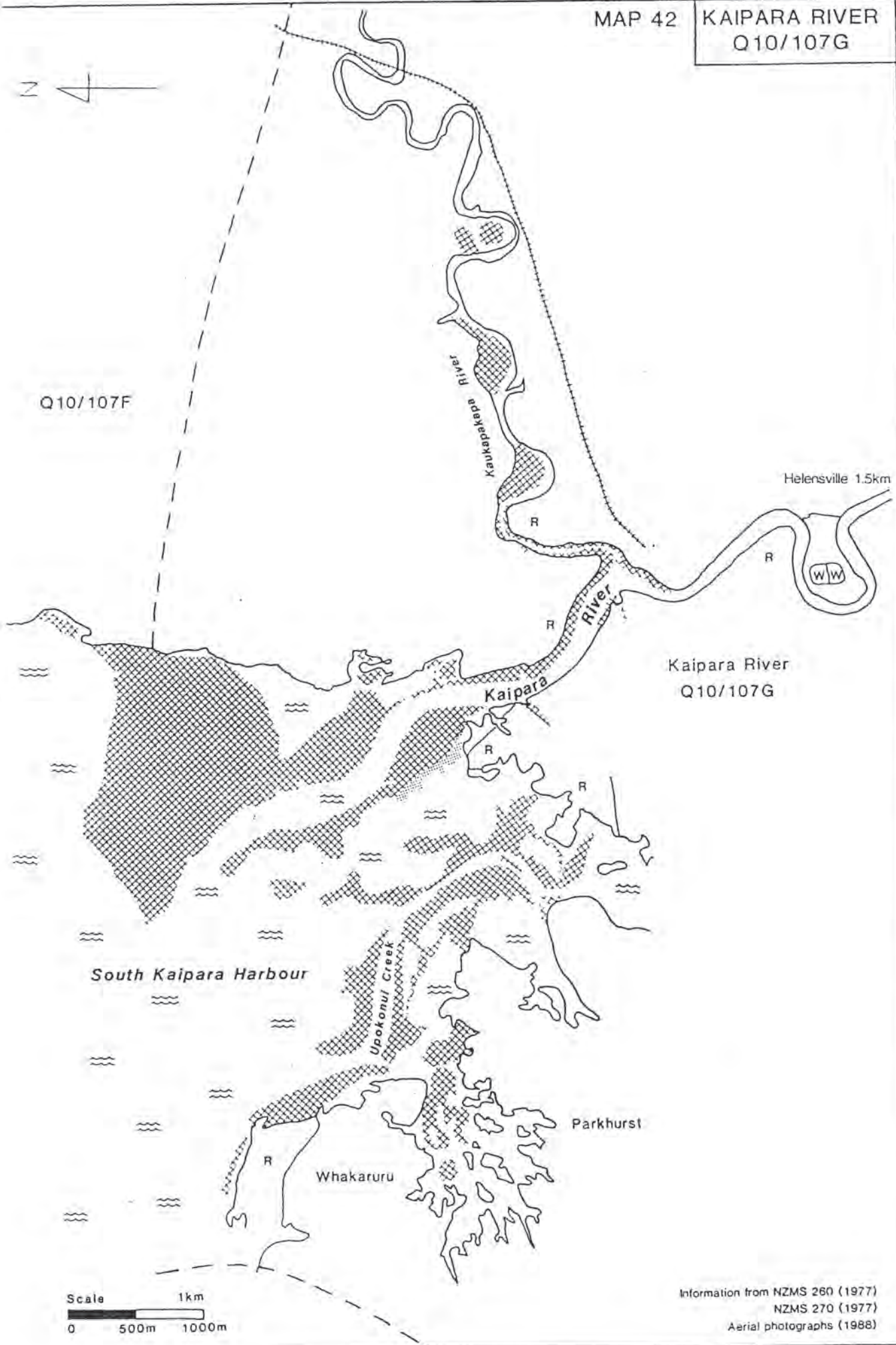
- (c) Description of topography (soil type, slope, erosion susceptibility): Soil type is highly variable throughout the catchment (Ref. 1), but is generally flat, so reducing risk of erosion.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Prevent any further reclamation and perhaps revert back to wetland those areas already reclaimed, if possible.

19. RELEVANT REFERENCES:

- 1) Auckland Regional Authority/Auckland Regional Water Board (1984) Kaipara River Freshwater Resource Report and Interim Management Plan Technical Report No. 27.
- 2) Department of Conservation (1988) unpublished file information.
- 3) Chapman V J (1976) Mangroves and Salt Marshes of the Kaipara Harbour. A report for the Department of Lands & Survey.
- 4) Bacon M R (1977) Ecology of the Auckland Region: Auckland Regional Planning Scheme Review. A report prepared for the Auckland Regional Authority Planning Division.
- 5) Rodney County District Scheme (1987).



1. NAME Waioneke
2. AREA CODE Q10/107H Map 43
3. MAP REFERENCE NZMS 260 Q10 356 075 to Q10 338 136
4. LOCATION DESCRIPTION South/western margins of south Kaipara Harbour
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Extensive wetland areas dominated by the mangrove *Avicennia marina* var *resinifera* in this area.
Parekawa to Upokohui Creek: "This is a fine area of mangrove and saltmarsh and should be preserved" (Ref. 1).
8. WILDLIFE VALUES This area is a very important bird (particularly wader) feeding and roosting area.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND A great deal of reclamation in this area. Quite extensive reclamation has occurred at Puharekeke Creek.
A substantial portion of the inland area at Parekawa Creek has been reclaimed (Ref. 1).
11. CONTROL OF WETLAND AND CATCHMENT
Ownership status of wetland: Crown refer 104A
Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Kaipara Harbour Authority
Territorial local authority	Rodney County Council
Crown	Department of Conservation
Other	
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Kaipara Harbour Authority
13. USE OF WETLAND BY MAN Fossicking, dumping rubbish, waste disposal, reclamation for farmland
14. WETLAND MODIFICATIONS PROPOSED
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas:
Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Farm run-off

Refuse land fill: No

Recreation: Limited

Fishing: Recreational and commercial

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment – likely to affect wetland: Little information is available on water quality in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 10% residential - < 5%
 bare earth pasture - 85% industrial

Other land use likely to affect wetland: None

Reserves present: Recreation reserve at Shelly Beach

Land use changes anticipated up to year 2000: None

District scheme – zoning provisions: Predominantly rural zoning.
 Small area of Nature Conservation zoning on foreshore of Parekawa Creek. Recreation reserve and urban zone at Shelly Beach.

Controls other than District scheme likely to influence future land use: None

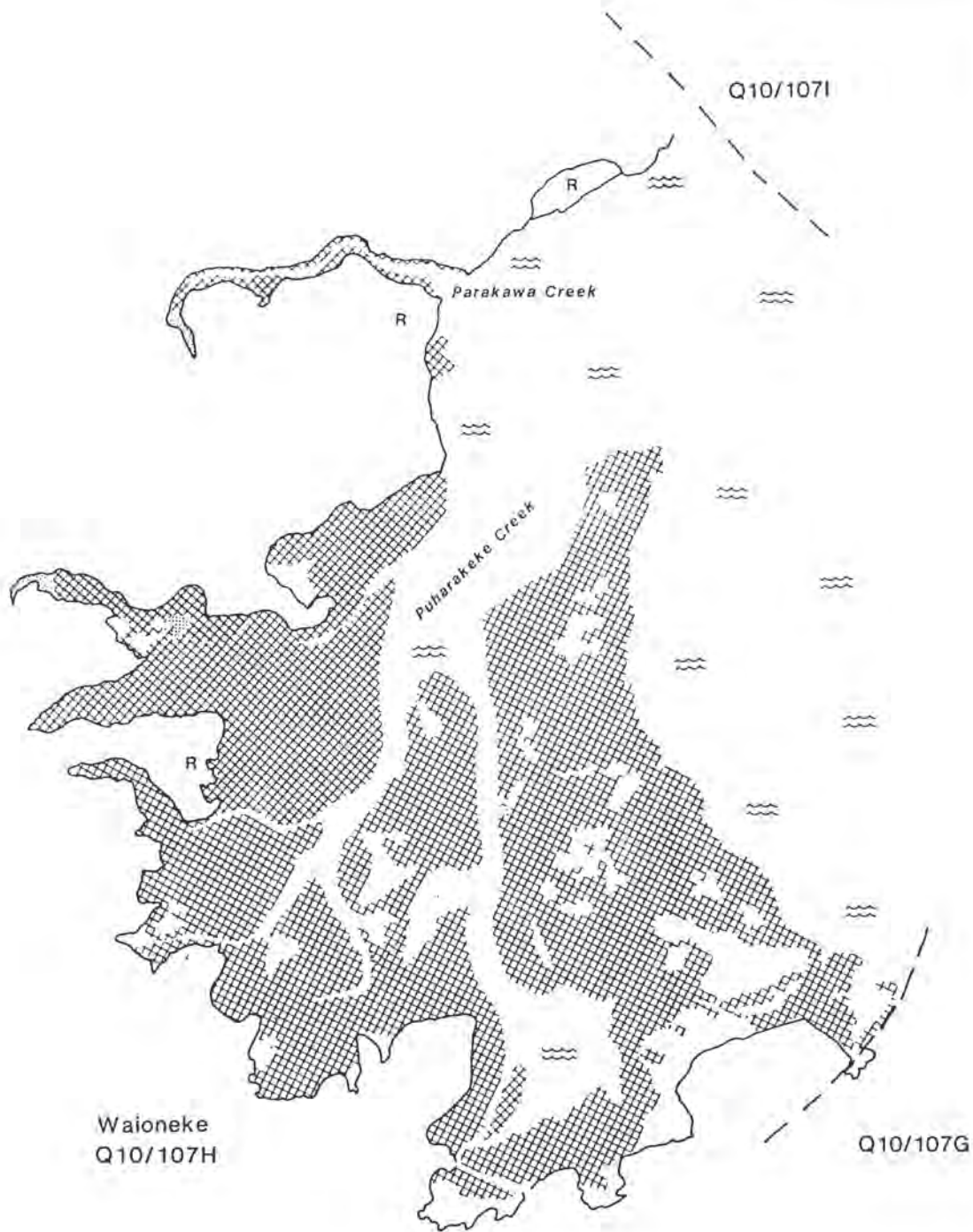
- (c) Description of topography (soil type, slope, erosion susceptibility):
 Undulating landscape

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Chapman, V J (1976) Mangroves and salt marshes of the Kaipara Harbour.
2. Royal Forest & Bird (1986) unpublished notes on illegal reclamations in the Kaipara Harbour.



Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
NZMS 270 (1976)
Aerial photographs (1983 & 1988)

1. NAME Mairetahi
2. AREA CODE Q10/107I Map 44
3. MAP REFERENCE NZMS 260 Q10 338 136 to 318 163
4. LOCATION DESCRIPTION South western Kaipara Harbour
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The Mairetahi Creek area has two minor areas of mangrove which have been reclaimed and are farmed.
8. WILDLIFE VALUES A number of wader species visit this area, especially for feeding.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Two minor reclaimed areas now in farmland (Ref. 1)

A large illegal reclamation at the head of Mairetahi Creek, and a drain constructed through the mangroves (Ref. 6). Reclamation here, own title, erection of stopbank and floodgate DOC decision to remove these structures and fill in drainage system (Ref. 6).
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09 107A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Reclamations for farm land
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas: Yes/No
 - Marine farming: No
 - Ports: No
 - Marinas/moorings: No
 - Waste disposal: Houses at Shelly Beach probably have septic tanks.
 - Refuse land fill: No
 - Recreation: Water activities
 - Fishing: Yes
 - Sand extraction: No
 - Other:
 - (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Minimal information on the quality of water in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha):

(b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 10% residential bare earth
 pasture - 90% industrial

Other land use likely to affect wetland: None

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Zoned Rural A land (Ref. 5)

Controls other than District scheme likely to influence future land
 use: Kaipara Harbour Authority Controls

(c) Description of topography (soil type, slope, erosion susceptibility):
 Gentle hills backing coastal land

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: More information on the
 contributions of such wetlands to the ecology of the Kaipara Harbour.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

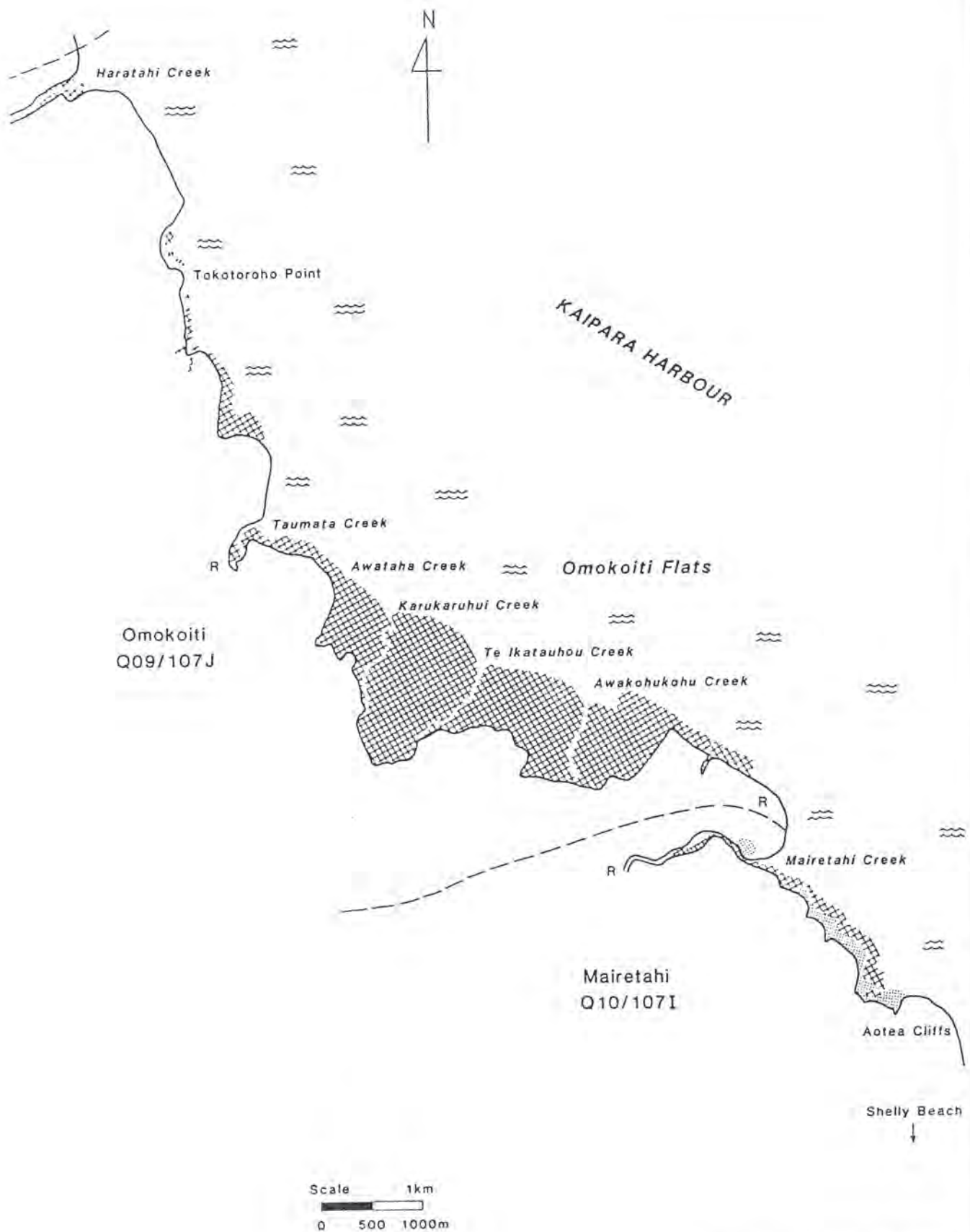
19. RELEVANT REFERENCES:

1. Refer Q10 107G

MAP 44

MAIRETAHI Q10/107I

OMOKOITI Q10/107J



Information from NZMS 260 (1980)

NZMS 270 (1979)

Aerial photographs (1982) (1988)

1. NAME Omokoiti
2. AREA CODE Q10/107J Map 44
3. MAP REFERENCE NZMS 260 Q09 250 223 to Q10 318 161
4. LOCATION DESCRIPTION South eastern margin of Kaipara Harbour
5. TYPE OF WETLAND Mangrove Saltmarsh Spartina
6. AREA OCCUPIED BY WETLAND Approximately 4 km²
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The northern bank of the Taumata Creek has a belt of mangrove and salt marsh. Spartina alterniflora is present and probably was planted originally as an enclosed patch in the centre.

The Karukaruhui Creek/Omokoiti Flats/Mairetahi Headland is an extensive area of mangrove and salt marsh and as such is an important part of the Kaipara ecosystem (Ref. 1)

Te Ikatauhou Tidal Flats : dominant plants Schoenus species rush and A. marina var resinifera (Ref. 4).
8. WILDLIFE VALUES Te Ikatauhou Flats: Roosting sites at most tidal levels (Ref. 4).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Reclamations of previous mangrove/wetland areas shown in Ref. 3.

Chapman 1976 reported poor reclamation over the whole area between Taumata Creek and the Awataha Creek to the south (Ref. 1).

Massive illegal reclamations at Omokoiti Flats (Ref. 5a).

Legal reclamations at Taumata Creek and just north of this creek (Ref. 5b).
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/107K
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)? Kaipara Harbour Authority
13. USE OF WETLAND BY MAN Recreation, scientific research
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas:
 - Marine farming: No
 - Ports: No
 - Marinas/moorings: No

Waste disposal: Omokoiti Flats: One of the proposed sites for disposal of Auckland's sewage effluent from MSPW (in revision of effluent treatment and disposal) (Ref. 3).

Refuse land fill: No

Recreation: Little - Access difficult except by boat.

Fishing: Shellfishing - scallops, cockles.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Little information about water quality in the Kaipara Harbour.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): ~ 20 km²

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | | | |
|---------|-------|-------------|---|------------|---|
| forest | - 5% | residential | - | bare earth | - |
| pasture | - 90% | industrial | - | | |

Other land use likely to affect wetland: None

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: The land adjoining the Omokoiti Flats is zoned Rural A with a 20 m strip on the northern bank of Taumata Creek designated as proposed public reserve (Ref. 6).

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility): Pure sand/increase in topsoil to east. Undulating/hilly landscape.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Chapman V J (1978) The Mangroves and Salt Marshes of the Kaipara Harbour.
2. Bacon M.R. (1976) Coastal Resource Area. Kaipara South Peninsula. A report prepared for the Auckland Regional Authority.
3. Auckland Regional Authority (1987) Auckland Area Sewerage Study : Issues and Options Report. Drainage Division.

4. Department of Conservation, Wellington (1978) WERI - Computerised wetland inventory.
5. Department of Conservation, Northern Region (1988). Internal files (5a) 54/16/239, (5b) 54/4/5.
6. Rodney County Council (1984) District Scheme.

1. NAME Okaka
2. AREA CODE Q09/107K Map 45
3. MAP REFERENCE NZMS 260 Q10 267 194 to Q09 213 297
4. LOCATION DESCRIPTION Northern end of harbour coast of South Kaipara Peninsula
5. TYPE OF WETLAND No wetlands
6. AREA OCCUPIED BY WETLAND (ha) No significant wetlands
7. DOMINANT WETLAND VEGETATION/ASSOCIATION No wetland
8. WILDLIFE VALUES
Dominant species Waders in low numbers (Ref. 2).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND Not applicable
11. CONTROL OF WETLAND AND CATCHMENT Refer Q09/105A
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Not applicable
14. WETLAND MODIFICATIONS PROPOSED Not applicable
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: Prawn farm closed in 1988.

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Little, access difficult

Fishing: Shellfishing: scallops, cockles

Fishing: refer Q09/107.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Not applicable

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known
- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|------------|-------|-------------|---|------------|---|
| in: forest | - 40% | residential | - | bare earth | - |
| pasture | - 60% | industrial | - | | |

Other land use likely to affect wetland: Exotic production forestry in north-west of catchment.

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Coastal landscape protection zone north of area. Rural zone over balance (Ref. 3).

Controls other than District scheme likely to influence future land use: None

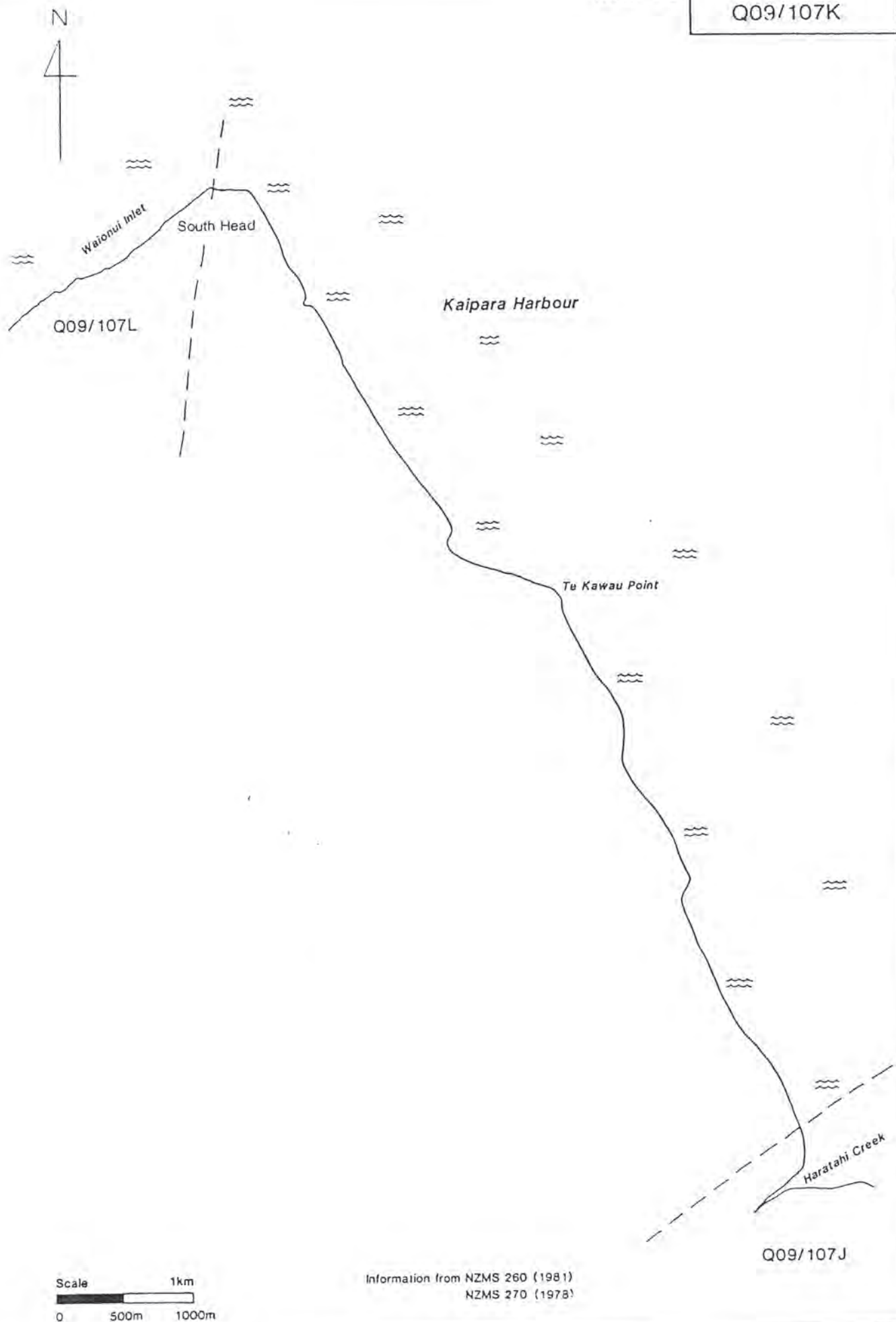
- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Care required in felling of exotic forest to prevent coastal siltation.

19. RELEVANT REFERENCES:

1. Bacon-van Roon, M.R. (1976) Coastal Resource Area, South Kaipara Peninsula. Planning Division, Auckland Regional Authority.
2. Department of Conservation (1980-88) Faunal Survey. Unpublished notes.
3. Rodney County Council (1987) District Scheme Change 75.



1. NAME Waionui Inlet
2. AREA CODE Q09/107L Map 46
3. MAP REFERENCE NZMS 260 Q09 190 290
4. LOCATION DESCRIPTION Head of South Kaipara Peninsula. Papakanui Spit is a mobile sandspit enclosing Waionui Inlet.
5. TYPE OF WETLAND Mangrove, Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The estuarine regions are notable for the succession of plant communities between tidal flats and dune areas. Manuka -- Baumea -- Mazus

Species in upper margin of Waionui Inlet: (Refs 2, 3). * Species with very localised New Zealand distribution:

<u>Thelymitra pauciflora</u>	<u>Juncus articulatus</u>
<u>Gastrodea sesamoides</u>	<u>Juncus caespiticius</u>
<u>Muehlenbeckia complexa</u>	<u>Juncus planifolius</u>
* <u>Mazus pumilio</u> (declined since 1986)	<u>Centalla uniflora</u>
<u>Baumea juncea</u>	<u>Lobelia anceps</u>
* <u>Cyclosorus interruptus</u>	<u>Leptocarpus similis</u>
<u>Isachne glabosa</u> (swamp millet)	* <u>Thelypteris confluens</u>
8. WILDLIFE VALUES (Refs 6, 1, 4, 7)

This is an outstanding habitat of national importance. The wildlife refuge at the tip of the spit has the largest colony of caspian tern in New Zealand.

Dominant species White-fronted tern (breeding and roosting)

Rare species/endangered species Caspian tern (breeding), New Zealand dotterel (breeding and roosting), fernbird, white heron.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES None.
10. STABILITY OF WETLAND High.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
 Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Kaipara Harbour Authority
Territorial local authority	Rodney County Council
Crown	NZ Forestry Corporation. Department of Conservation
Other	New Zealand Air Force

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Bombing range for NZ Air Force

14. WETLAND MODIFICATIONS PROPOSED None.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas moorings: No

Waste disposal: One of proposed sites for alternative disposal of treated effluent from MSPW to the Kaipara (rather than Manukau) is in this area (Ref. 5).

Refuse land fill: No

Recreation: Deer shooting, birdwatching (Ref. 4).

Fishing: Yes - popular

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|------------|-----|-------------|----------------------|
| in: forest | 50% | residential | bare earth |
| pasture | 20% | industrial | wetland and sand 30% |

Other land use likely to affect wetland and wetland habitat:
Papakanui Spit and surrounding harbour areas are affected by the use of the RNZAF bombing range on the sand-dunes of Kaipara South Head immediately to the south of the spit.

Reserves present: A small area at the tip of the spit is a wildlife refuge - Papakanui Spit Wildlife Refuge.

Land use changes anticipated up to year 2000: The whole land area is within Woodhill State Forest but there are no known plans for further afforestation than already exist. Logging of forest adjacent to wetland a possibility.

District scheme - zoning provisions: Most of catchment is in coastal landscape protection zone. Nature Conservation Zoning over Papakanui Spit.

Controls other than District scheme likely to influence future land use:

- (c) Description of topography (soil type, slope, erosion susceptibility):
A lot of the catchment area is made up of undulating sandy soils.

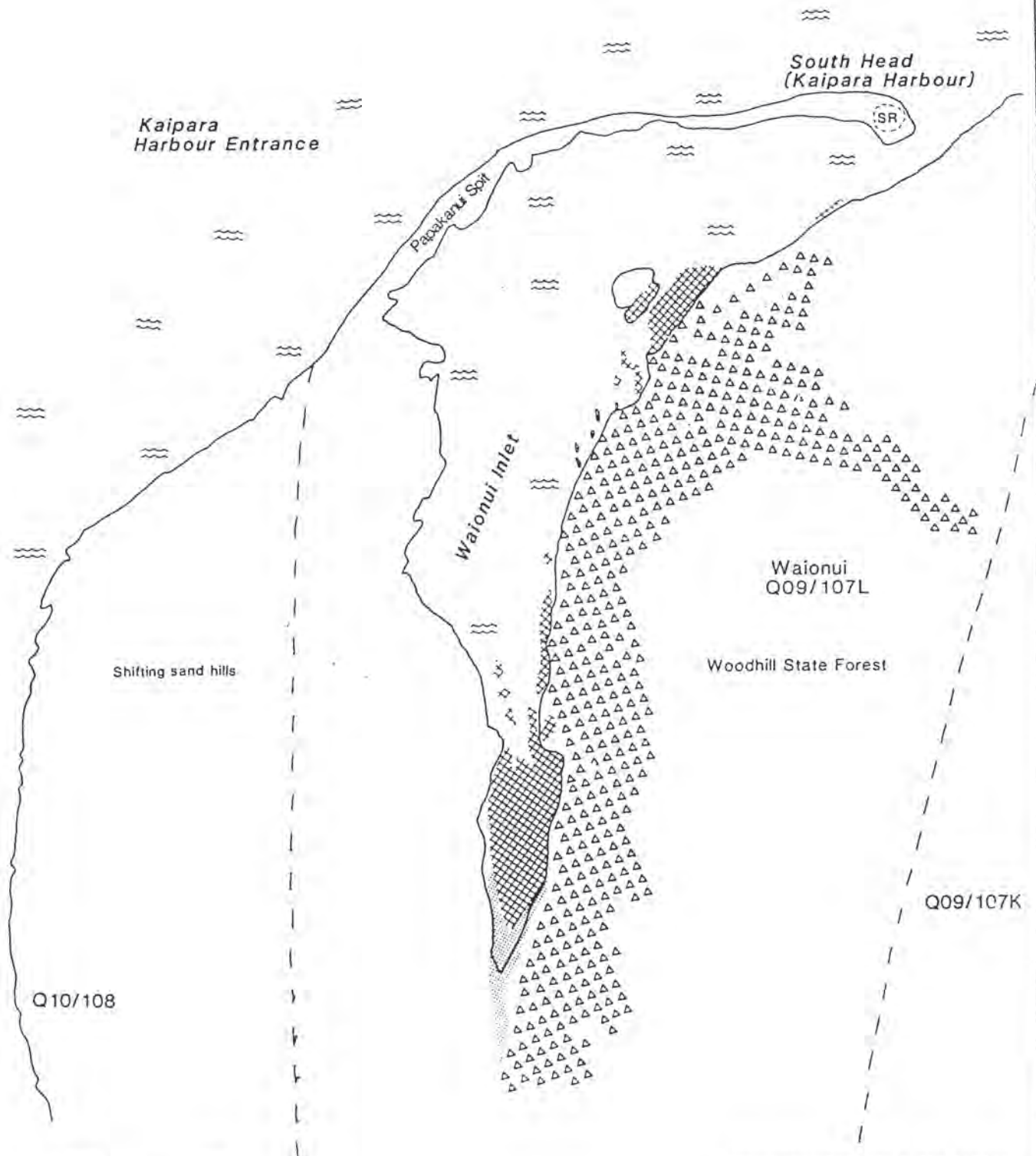
17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Ensure that four-wheel-drive vehicles are excluded from the wetland and Papakanui Spit. Prevent dogs entering the area during the bird breeding season - August to February. Prevent damage to wetlands during any future afforestation or forest harvesting.

19. RELEVANT REFERENCES:

- 1) Ogle C C (1982) Wildlife & Wildlife Values of Northland. NZ Wildlife Service report No. 30.
- 2) Cameron E K and P J Bellingham (1986) Northern Woodhill State Forest - Notes on Several Areas. Auckland Botanical Society newsletter, Vol. 4(2) 46-52.
- 3) Cameron E K (1988) Northern Woodhill. Auckland Botanical Society newsletter 43(a).
- 4) Bacon M R (1976) Coastal Resource Area. South Kaipara Peninsula. Planning Division, ARA.
- 5) ARA (1987). Auckland Area Sewerage Study: Issues & Options Report.
- 6) Bioresearches Ltd (1976). 'The Ecological Impact of the Proposed Development of Auckland Thermal No. 1 at Waiau Pa'.
- 7) Department of Conservation (1980-88) Faunal Survey - unpublished notes.

MAP 46

WAIONUI
Q09/107L

Scale 1km
0 500m 1000m

Information from NZMS 260 (1981)
Aerial photographs (1983 & 1988)

1. NAME Auckland West Coast - Northern Manukau Head
2. AREA CODE Q10/108 No map
3. MAP REFERENCE NZMS 260 Q10 and R11
4. LOCATION DESCRIPTION Part of South Kaipara Head - West Coast - North Manukau Head.
5. TYPE OF WETLAND Saltmarsh
Most of the lagoons (Te Henga, Muriwai, Piha, etc) are freshwater for most of the year, but are inundated by the sea during storms.
6. AREA OCCUPIED BY WETLAND (ha) Te Henga Swamp 18 ha
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Muriwai Lagoon - the dominant plant species is salt rush (Ref. 4).

The dominant salt marsh species at "Whatipu Sands" include Corex pumila, Scirpus cernuus and Triglochin striatum (Ref. 3).

There is salt marsh at Te Henga (Ref. 2). At the seaward edge of the swamp there is Leptocarpus similus, Carex pumila, Scirpus cernuus, and Juncus articulatus (Ref. 2).

For a further summary of the Te Henga Swamp (Ref. 7).
8. WILDLIFE VALUES Abundant birds at Murawai Lagoon (Ref. 4).

Dominant species At Te Henga: White-faced heron, black swan, little black shag, pied shag (Ref. 2).

At Whatipu Sands: Variable oystercatcher, pied oystercatcher, pied stilt (Ref. 2).

Rare species/endangered species At Te Henga: Fernbird, bittern, banded rail, marsh crake (Ref. 3).

At Whatipu Sands: Godwit, wrybill, New Zealand dotterel, banded dotterel, Australasian bittern (Ref. 3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES For further information on the Te Henga Swamp ecology, see (Ref. 7).
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT A lot of land adjacent to this area is Harbour Endowment leased to Auckland Regional Authority as reserve.

Ownership status of wetland: Crown/Waitemata City Council
Management agencies: Waitemata City Council, Department of Conservation

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City Council and Rodney County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No

13. USE OF WETLAND BY MAN Recreation - walking, fossicking, etc.

14. WETLAND MODIFICATIONS PROPOSED None

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Rural and residential run-off into wetland areas along coast. Occasional litter into all west coast wetland areas having public access.

Refuse land fill: Waitakere Refuse Tip (Ref. 7).

Recreation: Fishing, swimming, walking (Ref. 3).

Fishing: Yes subject to fishing claim by the Tainui people

Sand extraction: The Woodhill Sand Production Group comprising Steels Sand Pit, Lyons Sand Pit, McCraes Sand Pit. (Ref. 1).

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The wetlands in this area have high water quality. There is some seepage/run-off of sewage into the wetland at Piha.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 60% residential - 5%
 pasture - industrial - bare earth -

Other land use likely to affect wetland: Forestry behind Murawai.
 Various archaeological sites around the coastal wetlands (Ref. 2).

Reserves present: Most of the land in the region is proposed as
 either Waitakere Environmental Protection Zone (Rodney County) or
 Landscape. Protection Zone (Waitemata City). There are proposals
 to extend Centennial Memorial Park (Ref. 3).

Land use changes anticipated up to year 2000:

District scheme - zoning provisions: Rural A to Landscape
 Protection Zone (Ref. 5). Rural A to Waitakere Environmental
 Protection Zone (ref. 6). Most of the land in this region is zoned
 or is proposed as Environmental Protection Zone (By either Rodney
 County or Waitemata City).

Controls other than District scheme likely to influence future land
 use: Centennial Memorial Park Board.

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Undulating, sandy, coastal land.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Te Henga Swamp is one of the few
 places near to Auckland where brown teal may be encouraged to spread.
 Prevent further sedimentation, (by run-off and dam construction) and
 thus prevent reclamation, which will lead to the swamp level rising above
 the water table, and thus drying out.

19. RELEVANT REFERENCES:

1. Applied Geology Associates (1982) Coastal Sand and Shingle Resources
 of Auckland and Northland.
2. Waitakere Ranges Protection Society (1978) Wainamu - Te Henga, A
 study.
3. Cameron, E. (1988) pers. comm. Botany Department, University of
 Auckland.
4. Department of Conservation. National Wetlands Inventory, "Wetlands
 of Ecological and Representative Importance" (WERI). Compiled by
 Biological Resources, and now held by the Science Directorate,
 Department of Conservation.
5. Waitemata City District Scheme (1984).
6. Rodney County District Scheme (1980).
7. Bacon, M.R. (1977) Ecology of the Auckland Region - A Report
 produced for the Auckland Regional Scheme Review.
8. Cameron, E.K. and P.J. Bellingham (1986) Woodhill State Forest -
 notes on several natural areas in Auckland Botanical Society
 newsletter, 41 (2); 46-52.

1. NAME Huia Creek
2. AREA CODE R11/109 Map 47
3. MAP REFERENCE NZMS 260 R11 500 650
4. LOCATION DESCRIPTION Huia Creek 500 650
5. TYPE OF WETLAND Saltmarsh, Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Minimal
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Salt-marsh northeast of the bridge at western end of the bay (Ref. 1). Zostera bed at Little Huia (Ref. 2) and at Wellesley Spragg Memorial Park.
8. WILDLIFE VALUES Many migrant waders visit Huia
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Huia salt-marsh is home to a small weevil, Peristoreus australis, previously found only in the South Island (Ref.1)
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.

Management agencies: Auckland Harbour Board. Manukau Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.
13. USE OF WETLAND BY MAN No information
14. WETLAND MODIFICATIONS PROPOSED No information

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Some sewage overflow into harbour

Refuse land fill: No

Recreation: Yes

Fishing: Yes, subject to fisheries claim of Tainui people

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment: 1500 ha

(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	80%	residential	10%	bare earth
	pasture		industrial		

Other land use likely to affect wetland: Water catchment and reservoir

Reserves present: Most of land is reserved either for water supply purposes or as park: Kaitarakihi Park, Cornwallis Park, Auckland Centennial Memorial Park, Wellesley Spragg Memorial Park

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Most land is reserved as recreational or for water supply. Some land zoned non-urban residential. Some land zoned for landscape protection.

Controls other than District scheme likely to influence future land use: None.

(c) Description of topography (soil type, slope, erosion susceptibility): Billy, potential for erosion, given changes to vegetation cover.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: More information on wetland vegetation in this area.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

- 1) Bioresearches (1987) Manukau Harbour Maritime Plan proposed habitat zones. Prepared for Manukau Maritime Planning Authority.
- 2) Armiger, LC (1965) A contribution to the autecology of Zostera. MSc thesis, Auckland University.

MAP 47

AUCKLAND WEST
COAST Q10/108
HUIA CREEK
R11/109
CORNWALLIS
R11/110
SOUTH MANUKAU
HEAD R11/125

R12/124

South Manukau Head

R12/125

Waiuku Channel

Grahams Beach

Big Bay

Mako Point

Cornwallis

R11/110

Lawry Point

Puponga Point

Cornwallis

Kukumatua Inlet

Kaitarakihi Point

Huia

Huia Bay

Little Huia

Huia Creek

R11/109

Lower Huia Reservoir

Auckland Centennial Park

Auckland West Coast/North Manukau Head

Q10/108

Sawyers Point

Beacon Point

Manukau Harbour Entrance

Paretutae Island

R12/126

Scale 1km
0 500m 1000m

Information from NZMS 260 (1966)
NZMS 270 (1977)
Aerial photography (1967)

1. NAME Cornwallis
2. AREA CODE R11/110 Map 47
3. MAP REFERENCE NZMS 260 R11 535 650
4. LOCATION DESCRIPTION Cornwallis
5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass
6. AREA OCCUPIED BY WETLAND Minimal
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Zostera at Cornwallis Beach and at Mill Bay (Ref. 1).

The smallest plants of Zostera seen by Armiger (1965) were at Cornwallis, these were in very coarse black and red sands (Ref. 1). At Mill Bay close by, a certain kind of 'plastic' soft mould containing small amounts of sand supports Zostera with long narrow leaves. These two kinds of substratum represent the extremes of the sand-mud range, and neither produces particularly robust plants.

8. WILDLIFE VALUES Good wader habitat
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND The amount of Zostera has changed with time.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland:	Crown/Auckland Harbour Board
Management agencies:	Auckland Harbour Board: Manukau Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
13. USE OF WETLAND BY MAN Recreation
14. WETLAND MODIFICATIONS PROPOSED None

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas: Yes/No

Marine farming: No

Ports: No, but a wharf is present

Marinas moorings: No

Waste disposal: Occasional seepage of sewage to the harbour

Refuse land fill: No

Recreation: Bathing, boating, etc.

Fishing: Fin fish and shell-fish

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland Water quality improves with increasing distance from the Manukau Sewage Treatment Plant at Mangere.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known

(b) Land use of catchment: Approximate percentage of total catchment

in: forest	residential	bare earth
pasture	industrial	

Other land use likely to affect wetland:

Reserves present: Most of the land is reserved as being recreational land

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Recreational (a bit of non-urban residential)

Controls other than District scheme likely to influence future land use: None

(c) Description of topography (soil type, slope, erosion susceptibility):
Not susceptible to erosion

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Armiger, L C (1965). A Contribution to the Autecology of Zostera
M.Sc. Thesis Auckland University

1. NAME Manukau Harbour
2. AREA CODE R11/110A No map
3. MAP REFERENCE NZMS 260 R11

4. LOCATION DESCRIPTION Overview of the Manukau Harbour - greater details are available in individual area descriptions (R11/109 to R11/118 and R12/119 to R12/121).

It is desirable to consider the Manukau Harbour as one ecosystem with the flora and fauna of different parts of the harbour being able to interact through the common medium of tidal water. The surrounding land and watershed of the harbour, and particularly the foreshore, are also part of the Manukau Harbour ecosystem because changes within these areas so often cause changes within the tidal and subtidal regions (Ref. 6).

5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass
 Spartina Gracilaria

6. AREA OCCUPIED BY WETLAND (ha) 1977 : 871 ha
 Mangrove 447 ha (3.1% of intertidal)
 Saltmarsh 91 ha (0.6% of intertidal)
 Eelgrass 171 ha (1.2% of intertidal)
 Spartina 10 ha (0.1% of intertidal)
 Gracilaria 152 ha (1.0% of intertidal) (Ref. 2).

7. DOMINANT WETLAND VEGETATION/ASSOCIATION Although mangroves are the dominant vegetation of the Manukau (Ref. 5), they and salt marsh, are not greatly developed in this harbour, being absent in many areas due to the sandy nature of the substrate, or because it is too exposed. Mangrove vegetation is therefore restricted to the numerous creeks and streams which run into the harbour (areas R11/109 to R11/118 and R12/119 to R12/121) (Ref. 10). Eelgrass flats occur in the open sand flats of the harbour, but diminished tremendously between 1964 and 1975, attributed in the past to a fungal disease (Ref. 5). Salt marsh vegetation is common throughout the harbour around high tide mark, but occurs infrequently in vast stands, (Ref. 5). The following extracts are taken from the Manukau Harbour Plan (1985):

→ Salt Marsh Zone:

Important species in the Manukau are Leptocarpus simplex, Juncus maritimus var australiensis, Scirpus nodosus and Salicornia australis. Salt marsh areas in the Manukau have been greatly reduced in European times by reclamation, however, salt marsh fringes the land from Clarks Beach to Pahurehure. It is present in many sheltered inlets and localised in inlets along the eastern coast of the Awhitu Peninsula and in the Waiuku Estuary itself.

↘ Important feeding/nesting habitat for pukeko, banded rail, pied stilt, Australian brown bittern, kingfisher, white faced heron, fernbird.
 Breeding of whitebait species.

Zostera:

Localised beds occur on several of the major banks in the harbour, as well as the mouth of Big Muddy Creek and several small areas along the eastern shore of the Waiuku Peninsula. The largest bed in the Manukau occurs between Clarks Beach and Seagrove.

Zostera beds in the Manukau Harbour once occupied much greater intertidal areas than they do at present (1978) and have undergone a major reduction in extent since 1964. The probable reason for their reduction is infection by the fungus Labyrinthula. In areas overseas where similar infection has occurred, Zostera beds have recovered over a period of approximately 30 years.

The productivity of Zostera beds of the Manukau is below maximum because remaining beds are present in suboptimal habitats.

Zostera zone is used as a feeding area for fishes and birds. Shallow pools in the zone provide refuge for small fish especially juvenile flounder when the tide is out. Some herbivorous fish also feed on Zostera.

Gracilaria secundata:

Proliferate near sewage works. It performs a valuable function of nutrient stripping and traps fine particles preventing them from spreading to other parts of the harbour.

Spartina alterniflora and S. townsendii

In 1978 small stands present on the southern shore of Pahurehure Inlet, in Blackbridge Creek (tributary of Pahurehure) between Clarks Beach and Seagrove, in Waipipi Creek (tributary of Waiuku Creek). The Waiuku Estuary from the "needles" to the Waiuku township holds significant stands also.

Although the principle of increased productivity as a result of the spread of Spartina in the harbour may appear to give the beds a high value, in practice large-scale spread of Spartina in the Manukau would be ecologically undesirable.

8. **WILDLIFE VALUES** A great deal of work has been done on the ecology of the Manukau Harbour to which the reader is referred. This extract is from the Auckland Regional Planning Scheme:

"THE MANUKAU HARBOUR is the second largest estuarine area on the west coast of the North Island has a great expanse of intertidal areas, providing one of the most important habitats in New Zealand for wading birds including migratory species. It is special in New Zealand in that it is located adjacent to an urban area and yet supports a great number and variety of bird species. Because of the large number of both individuals (up to 50,000 birds at one time) and species which traditionally use the Harbour, it can be considered to be of national and even international significance. There is some evidence to suggest that the Manukau Harbour may be a major gathering place of migrants in the Auckland area prior to departure to the Northern Hemisphere. Regular large-scale movement occurs within the Region between the Manukau and Kaipara Harbours and the Firth of Thames.

Waders of the Manukau include the godwit, knot, South Island pied oystercatcher, banded dotterel, New Zealand dotterel, wrybill, stilt, variable oystercatcher, golden plover and turnstone. The black stilt (now considered rare) and the black oystercatcher are occasional visitors to the Harbour. In addition to the large population of wading birds the Manukau Harbour also supports high densities of red-billed gulls, southern black-backed gulls, mallard and grey ducks and black swans. Shags, gannets, white herons, white-faced herons, blue reef herons, kingfishers, royal spoonbills and terns also use the Harbour.

Less common foreign migrants include the american whimbrel, asiatic black-tailed godwit, asiatic wimbrel, broad-billed sandpiper, curlew sandpiper, greenshank, grey-tailed tattler, grey plover, hudsonian godwit, large sand dotterel, little egret, little whimbrel, long-billed curlew, marsh sandpiper, mongolian dotterel, pectoral sandpiper, red-capped dotterels, red-necked stint, sharp-tailed sandpiper, terek sandpiper."

This extract from the preliminary draft of the Manukau Maritime Planning Scheme:

"The Manukau Harbour is home to many of the common bird species found around the northern coasts of New Zealand but it does have some significant bird roosts which are of a national and international standard. The bird species may be broadly divided into four groups - shore feeders, including godwits, oystercatchers, NZ dotterel and herons; open water feeders, including terns, shags and gannets; water fowl, including duck and swans; and marsh feeders such as pukiko, New Zealand fern bird and banded rail. Some of these birds reside in the harbour permanently, while others are seasonal migrants from other parts of New Zealand and from overseas."

"The harbour supports a wide variety of fish including valued commercial and recreational species such as mullet and flounder. It is important for fish populations not only as a feeding area and place of refuge, but also as a breeding and nursery area for juvenile fish. In performing this role the harbour in turn helps maintain the larger scale commercial fisheries of the West Coast."

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Manukau Harbour is possibly the best wader harbour in New Zealand. It is an outstanding habitat of very high value.

It is an outstanding shellfish habitat because of its variations in depth and sediment composition, i.e. extensive scallop and mussel beds in the channels, amphibola, cockle and pipi beds in intertidal areas.

10. STABILITY OF WETLAND There has been extensive reclamation in the Manukau Harbour. By 1978, 700 ha had been reclaimed, leaving a mangrove area of 447 ha (Ref. 1).

The overall massive decrease in area of wetland is due primarily to the release of pollutants into the harbour, plus the reclamation of intertidal areas. "Hot spots", areas where pollution and/or reclamation are intense, include the "northern" coastline of the harbour, near to residential development, the Mangere Inlet due to pressures from especially industry, the area of the harbour which receives the outfall from the Manukau Sewage Purification Works, the Pahurehure Inlet because of particularly residential and industrial pressures, and the Waiuku River which receives industrial outfall from New Zealand steel and poorly retained reclamations in the Waiuku Estuary.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown/Auckland Harbour Board
(intertidal) subject to a Waitangi Tribunal
land claim.

Management agencies: Auckland Harbour Board, Manukau Harbour Maritime
Planning Authority. Small areas in local bodies.
Ministry of Transport.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	various
Crown	Department of Conservation
Other	Manukau Maritime Planning Authority New Zealand Railways

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Apart from small areas at Westfield, Mangere Bridge, and Pahurehure Inlet, which are vested in local authorities, the intertidal areas of the Manukau Harbour are vested in the Auckland Harbour Board/Manukau Harbour Maritime Planning Authority.

13. USE OF WETLAND BY MAN Rubbish and waste disposal sites. Some recreation, e.g. fossicking. It has been recognised that: "The major development of the zone occurs in the sheltered inlets in the southern and eastern parts of the harbour with small pockets on the northern coast and inlets of Awhitu Peninsula" (Ref. 7).
Shellfish collection.

14. WETLAND MODIFICATIONS PROPOSED Local authorities are the greatest threat to wetlands which they regard as available for development. They are inclined to line the foreshore with old telephone poles, etc "to protect it from erosion" (Ref. 16).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: Onehunga

Marinas/moorings: No

Waste disposal: There are numerous examples of waste disposal sites in the intertidal areas of the harbour; many point sources of disposal from both residential and industrial origins. Most residential waste comes from urban areas to the north and north east of the harbour. The most intensive industrial waste comes from areas adjacent to the Mangere Inlet (Ref. 13). There are existing water rights for the discharge of waste water directly to the Inlet, but these are for only small volumes of low-strength wastes (Ref. 13). Outfalls directly into the harbour originate from the Manukau Sewage Purification Works which discharges approximately 300,000 m³/day of treated waste into the harbour (Ref. 5).

Investigations have been initiated to study alternatives to the present sea discharge (Ref. 14).

Refuse land fill: A number of land fills have previously existed, but have since been closed (especially so in the Mangere Inlet). However, even tips which are closed still leach to the harbour. There are a number of sites of illegal land fill.

"50 farmers along southern Awhitu and Ihumotoa shores are guilty of using creeks as rubbish dumps - resulting in creeping reclamations" (Ref. 16).

Recreation: Yes, extensive, e.g. bathing, boating.

Fishing: Yes, both recreational and commercial (although this is becoming increasingly limited by pollution of the harbour waters).

Sand extraction: No

Other: Proposed gas pipeline across harbour (Ref. 11). Quarrying of basalt and scoria. Possibility of a sewage pipeline to Awhitu Peninsula.

- (b) Water quality characteristics of adjoining harbour/coast - likely to affect wetland: The Manukau Harbour is grossly polluted, moreso towards the Mangere Inlet and to a lesser extent towards the harbour entrance. Also in the Waiuku Estuary.

Potential pollution sources include industry, urban stormwater, diffuse and point source rural wastes, sewage pumping station overflows and silt from urban and rural land development (Ref. 8).

Nutrient status in particular is directly related to the degree of recent rainfall - stormwater run-off and sewage treatment plant overflows have a marked effect on water quality (Ref. 13).

16. CHARACTERISTICS OF WETLAND CATCHMENT:

- (a) Approximate total area of catchment (ha): Extensive - the harbour collects water from a huge catchment.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | | |
|-----------|-------|-------------|-------|------------|---|
| in forest | - | residential | - 75% | bare earth | - |
| pasture | - 10% | industrial | - 15% | | |

Other land use likely to affect wetland: Specific industries, such as the NZ Steel Mill at Glenbrook. Sanitary land fills, both in use and "closed". Intensive horticulture.

Reserves present: Five areas have been identified as being suitable as proposed reserves:

- (i) Pollock Spit-Rangiriri Creek (from Kelly's landing to Tokaroa Point).
- (ii) Seagrove-Clarks (one mile offshore).
- (iii) Puhinui Creek (0.5 mile offshore from the east side of the Auckland International Airport prohibited fishing zone extending 1.7 miles towards Weymouth and including Puhinui Creek).
- (iv) Ihumatao Peninsula (0.5 miles offshore along the Ihumatao Peninsula to the Auckland International Airport prohibited fishing zone).
- (v) Mangere Bridge-Ambury Park (half a mile offshore).

These all contain important wildlife habitats (Ref. 17) and are areas which MAF recommended as proposed marine habitat reserves (Ref. 15).

Land use changes anticipated up to year 2000 Changes to waste disposal sites (a proposal to look at new ways of collecting, treating, and disposing of waste is intended - Ref. 14). Further industrial and/or residential development.

District scheme - zoning provisions: There are a number of schemes for various districts abutting the harbour - refer individual areas. The Manukau Harbour stretches through eleven district planning areas. Different district schemes have particular ordinances which regulate land uses in significant habitat areas.

Controls other than District Scheme likely to influenced future land use: Manukau Harbour Action Plan, Manukau Maritime Planning Scheme, Auckland Regional Authority Drainage Plan, Water and Soil Legislation, Health Act, Treaty of Waitangi Act, Environmental and Conservation Acts, Local Government Act.

The Auckland Regional Water Board is leading a three year action plan aimed at reducing pollution in the Manukau Harbour and putting into place a management plan to ensure that the quality of the harbour waters is maintained for a wide variety of uses.

This extract from the Auckland Regional Planning Scheme exemplifies the steps to be taken in managing land use around the harbour:

The predominantly rural character of the coastline should be preserved in the following areas:

- (a) From Parau to North Head (Whatipu).
- (b) In the vicinity of the wildlife reserve at the mouth of Puhinui Creek.
- (c) From Pahurehure Inlet to South Head.

Recreational uses and potential of these coastlines should be provided for.

"In addition to the need to restore the health of the harbour ecosystem and to balance development with the maritime planning area against possible detrimental effects on the natural environment and ecology, there are ecological reasons for requiring stronger protection for some areas. These have been zoned as either Conservation Zones or Habitat Zones."

Conservation Zones

Kakamatua-Puponga Point
Big Muddy Creek
Little Muddy Creek
South-east Mangere Inlet
Ihumatao
Puhinui
Drury Creek
Karaka
Seagrove
Tahiki
Pollock
Awhitu
(Ref. 6).

Habitat Zones

Paratutai Island - Kaiteke Point
South Head to Tipitai Point
Orua Bay to Mako Point
Te Tau Bank

(c) Description of topography (soil type, slope, erosion susceptibility):

Land catchment to the north of the harbour is gently undulating and is intensively developed in residential suburbs. The southeast part is flat to hilly with residential land near the harbour, interspersed with industrial, horticultural and agricultural land. Further south east, the land is gently rolling pastoral farmland. The Western catchment area is rolling to hill, and as such is more prone to erosion.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Alternative methods of collection, treating, and/or disposing of waste from Auckland. Monitoring present and possible land use changes in the catchment around the harbour. Monitoring of the natural processes operating within the harbour and potential influences on them. The Regional Authority will, where appropriate "Encourage research of harbour ecology and co-operate in research programmes ... in harbour ecology" (Ref. 6).
18. FUTURE MANAGEMENT RECOMMENDATIONS:
- Inhibit further waste disposal into the harbour, and stop further reclamations.
 - Enhance environmental impact reporting for any proposed schemes using the harbour.
 - The Auckland Regional Authority recommends that the following influence all future management plans to do with the harbour.: "Protection, conservation and management of the resources of the area. The maintenance or attainment of water quality appropriate to the circumstances" (Ref. 6).
 - The decision to seek a new water right in discharging treated effluent from the MSPW into the harbour "implements a recommendation of the 1985 Waitangi Tribunal finding on the Manukau claim that existing use discharges from the MSPW should be reviewed" (Ref 14).

"Wetlands (mangroves, salt marshes, and eelgrass flats) at present cover less than 5% of the intertidal area of the Manukau Harbour. Areas of particular importance include Pahurehure Inlet which contains 25% of the mangroves in the Harbour, and its upper reaches. Drury Creek has the largest slat marsh. Further west, extensive beds of Zostera (eelgrass) are found on the South Manukau intertidal flats between Clarks Beach and Seagrove. (Henriques, 1978). Marine wetlands are particularly vulnerable ecosystems because the water discharge within them is only partial during each tidal cycle and wastes readily accumulate. The remaining wetlands of the Manukau Harbour need and warrant complete protection since they are indispensable to the estuarine biota and foreshore protection."

"In order to maintain the wader population it is believed that preservation of major roosting areas is one of the most important factors (food supply appears to be adequate). Important wader roosting areas on the South Manukau Harbour include the shell banks and adjoining pasture at Karaka (Kidd's farm), Seagrove, and Pollok Spit. The Department of Internal Affairs has proposed that the coast around Seagrove and Kidd's farm be designated an area of scientific and wildlife interest. Such a designation would give some protection to the roosts but it is not sufficient to save these from disturbance and incompatible uses. More protection would be assured if the shell banks were given Nature or Scientific Reserve status and the pasture lands Wildlife Conservation Zone status. It has been suggested that Pollock Spit with its marshes should be bought by the ARA because of its regional significance. It is the only major roost on the west side of the Harbour. Public access to these areas should be planned so as to least disturb the features that provide the special interest" (Ref 6).

Consideration should be given to the establishment and planting of a 'buffer zone' along the foreshore areas.

19. RELEVANT REFERENCES:

1. Nature Conservation Council (1984) Strategies for the Management of Mangrove Forests in New Zealand.
2. Henriques, P.R. (1977) Select ecological aspects of the Manukau Harbour. PhD thesis, University of Auckland.
3. Auckland Harbour Board (1978) Manukau Harbour Plan and Auckland Regional Authority.
4. Bioresearches Ltd (1976) The Ecological Impact of the Proposed development of Auckland Thermal #1 at Waiaua Pa - supplementary report. Prepared for the NZ Electricity Department.
5. Henriques, P.R. (1976) Manukau Harbour Ecology Preliminary Investigations. Works Division, Auckland Regional Authority.
6. Auckland Regional Authority (1987) Manukau Maritime Planning Scheme (especially Sections I & II).
7. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan proposed conservation zones. Prepared for Manukau Maritime Planning Authority.
8. Auckland Regional Water Board (1987) Manukau Harbour Action Plan.
9. Armiger, L.C. (1965) A Contribution to the Autecology of *Zostera*. MSc thesis, University of Auckland.
10. Chapman, V.J. and J.W., Ronaldson (1958) The Mangrove and Salt Marsh Flats of the Auckland Isthmus.
11. Bioresearches Ltd (1987) Proposed Natural Gas Pipeline Sector 2, for Huntly-Marsden Power Station.
12. Bioresearches Ltd (1976) The Ecological Impact of the Proposed Development of Auckland Thermal #1 at Waiaua Pa, Supplementary Report.
13. Bioresearches Ltd (1987) The Effects of Effluent Discharged from the Manukau Sewage Purification Works on the Water Quality and Natural Environment of the Manukau Harbour.
14. Auckland Regional Authority (1987) Auckland Area Sewerage Study; issues and options report.
15. Ministry of Agriculture and Fisheries (Management Division) (1985) Auckland Region Marine Reserves Plan - a discussion paper.
16. Haines, D. 1988 (pers comm) Auckland Harbour Board.

1. NAME Big Muddy Creek *Ngati*
2. AREA CODE R11/111 Map 48
3. MAP REFERENCE NZMS 260 R11 550 650
4. LOCATION DESCRIPTION Big Muddy Creek
5. TYPE OF WETLAND Mangrove, Saltmarsh, Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Extensive mangrove marsh in upper intertidal area is spreading rapidly in the eastern part of the bay. Species diversity, biomass and productivity are high. Beds of *Gracilaria secundata* in mid-tidal zone (Ref 2). There is also *Zostera muelleri* at the entrance to the creek (Ref. 6). The average height of the mangrove trees is about three metres. Vegetation is dense over much of the swamp (Ref. 3).
- Special features: Native forest nearby.
8. WILDLIFE VALUES Wader feeding area: White-faced heron, grey warbler, silver-eye, chaffinch, kingfisher, sparrow, fantail (Ref. 7). A variety of habitats. High species diversity, biomass and productivity indicate a high environment ranking (Ref. 4).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Potential habitat value; especially as feeding area for fish. Good habitat quality. Mudflats probably subjected to many outside influences due to the close proximity of the city. High public use (Ref. 7). Presence of beds of *Gracilaria* indicates that there could well be increased ammoniacal nitrogen available in this area (Ref 5).
10. STABILITY OF WETLAND The wetland was adversely affected by construction of the Auckland Regional Authority water supply dam upstream. There has been some evidence of mangrove stress from hypersalinity (Ref. 1).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.
 Management agencies: Auckland Harbour Board. Manukau Harbour
 Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Manukau Harbour Plan.

13. USE OF WETLAND BY MAN Recreation, e.g. fossicking.

14. OTHER USES/PROJECTIONS PROPOSED No information.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Septic tank seepage from Laingholm (Ref. 8). In the Titirangi/Laingholm area several of the small streams are contaminated by septic tank effluent seepage (Ref. 5).

Refuse land fill: No

Recreation: Small-boating and exploring.

Fishing: Shellfishing - subject to Tainui fishing claim

Sand extraction: No

Other: -

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Pollution quite high in this area of the harbour - mostly organic pollution direct from the residential areas.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known.

(b) Land use of catchment: Approximate percentage of total catchment

in:	forest	75%	residential	15%	bare earth
	pasture		industrial		

Other land use likely to affect wetland: Auckland water supply dam built in catchment (refer ARA for further information).

Reserves present: Large tracts of land are reserved either for water supply purposes or for landscape protection.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions: Water supply purposes. Non-urban residential. Big Muddy Creek - Conservation Zone (4).

Controls other than District scheme likely to influence future land use: Water supply purposes. Manukau Harbour Plan noted that Big Muddy Creek wetlands were worthy of preservation.

(c) Description of topography (soil type, slope, erosion susceptibility): Catchment hilly, but most is covered by forest, or drains into a water supply dam, so that erosion to the coast is reduced.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Manukau Harbour Plan recommends protection for Big Muddy Creek wetlands.

19. RELEVANT REFERENCES:

- 1) Moore A (1986). Lower Epidermal Leaf Gall in Auckland Mangrove Polulations. University Bursary Maths With Statistics Project, Kelston Boys High School.
- 2) Bioresearches Ltd (1985). Manukau Harbour Maritime Plan. Proposed Conservation Zones. Prepared for the Manukau Maritime Planning Authority.
- 3) Cox G J (1977). Utilisation of Mangrove Swamps by Birds. MSc thesis, Auckland University.
- 4) Huntly/Marsden Power Station. Proposed Natural Gas Pipeline, Sector 2. Bioresearches Ltd 1987.
- 5) Bioresearches Ltd (1987). The Effects of Effluent Discharged From the Manukau Sewage Purification Works on the Water Quality and Natural Environment of the Manukau Harbour.
- 6) Auckland Regional Authority (1978). Manukau Harbour Plan.
- 7) Department of Conservation (1988). Floral and Faunal Survey - unpublished.
- 8) Henderson (1988) pers. comm., Auckland Regional Water Board.

MAP 48

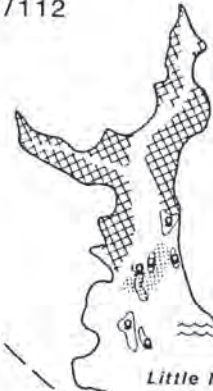
BIG MUDDY CREEK
R11/111
LITTLE MUDDY CREEK
R11/112



Big Muddy Creek
R11/111



Little Muddy Creek
R11/112



Little Muddy Creek

R11/110

Big Muddy Creek

Wairoa Channel

MANUKAU HARBOUR



Information from NZMS 260 (1987)
Aerial photographs (1987)
Henriques (1978)

1. NAME Little Muddy Creek
2. AREA CODE R11/112 Map 48
3. MAP REFERENCE NZMS 260 R11 570 770
4. LOCATION DESCRIPTION Little Muddy Creek
5. TYPE OF WETLAND Mangrove Saltmarsh Gracilaria
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The upper reaches contain an extensive mangrove marsh that in 1985 was in excellent condition and spreading (Ref. 1).
8. WILDLIFE VALUES Wader feeding area
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES A habitat of high natural value in terms of species diversity, biomass, productivity, fish use and for the fact that it adjoins good stands of bush with kowhai and puriri (Ref. 1).
10. STABILITY OF WETLAND Changes to the areas of mangroves and of Gracilaria. The mangrove areas are spreading (Ref. 1).
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board

Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Waitemata City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau Harbour Plan
13. USE OF WETLAND BY MAN Recreation
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Local contamination of inflows by septic tank effluent from the Titirangi area. A package treatment plant discharges into the Waikomiti Stream (entering the head of Little Muddy Creek), (Ref. 2).

Refuse land fill: No

Recreation: Yes - swimming bathing, fossicking, etc.

Fishing: shellfish, some fin fish

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The presence of beds of *Gracilaria* indicates that there could well be increased ammoniacal nitrogen available in this area (Ref. 2).

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | |
|--------------|------------------|------------|
| forest - 25% | residential- 70% | bare earth |
| pasture | industrial | |

Other land use likely to affect wetland: Water supply catchment and reservoir upstream from inlet.

Reserves present: All foreshore land reserved. A large area reserved for landscape protection.

Land use changes anticipated up to year 2000: None

District scheme - Waioneke provisions: Most of catchment zoned non-urban residential and reserved.

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility): Hilly terrain, susceptible to erosion.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: The Manukau Harbour Plan recommends that the Little Muddy Creek wetlands are worthy of protection.

19. RELEVANT REFERENCES:

1. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan proposed conservation zones . Prepared for the Manukau Maritime Planning Authority.
2. Bioresearches Ltd (1987) The Effects of Effluent Discharged from the Manukau Sewage Purification Works on the Water Quality and Natural Environment of the Manukau Harbour.
3. Henriques, P R (1978) The Vegetated Tidelands of Manukau Harbour.

1. NAME Northern Coast of Manukau Harbour
 2. AREA CODE R11/113 Map 49
 3. MAP REFERENCE NZMS 260 R11 590 710
 4. LOCATION DESCRIPTION North Manukau Coast
 5. TYPE OF WETLAND None
 6. AREA OCCUPIED BY WETLAND (ha) Nil
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION No vegetation of much significance in this area between Little Muddy Creek and Mangere Inlet.
 8. WILDLIFE VALUES There is a low tide bird feeding area at Motukaraka Bank, Green Bay.

In Hillsborough Bay there is a bird feeding area.
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This area of the harbour is shallow. About 50% of it is exposed as mudflat at low tide (Ref. 2).
 10. STABILITY OF WETLAND No information.
 11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown/Auckland Harbour Board (intertidal)

Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority various local bodies.
- | | Name |
|-----------------------------|---|
| Catchment authority | Auckland Regional Water Board |
| Regional planning authority | Auckland Regional Authority |
| Harbour board | Auckland Harbour Board |
| Territorial local authority | partly Waitemata City and partly Mount Roskill Borough, Auckland City Council |
| Crown | Department of Conservation |
| Other | |
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
 13. USE OF WETLAND BY MAN Recreation, e.g. fossicking.
 14. WETLAND MODIFICATIONS PROPOSED No information.
 15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: Some moorings.

Waste disposal: Point sources of pollution include several stormwater outfalls, and emergency sewage pump station overflows. At Blockhouse Bay there is frequent seepage from sewers near to the foreshore, and there are regular sewage overflows.

Refuse land fill: No

Recreation: Bathing, fossicking, etc.

Fishing: Not extensive; subject to Tainui Fishery Claim.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The quality of the water increases with distance from the Manukau Sewage Treatment Plant towards the Harbour entrance.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | |
|---------|-------------|-----|------------|
| forest | residential | 95% | bare earth |
| pasture | industrial | | |

Other land use likely to affect wetland: None

Reserves present: All foreshores and some parts.

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Residential and non-urban residential, bounded by reserved foreshore land.

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility): Hilly, susceptible to erosion depending on land cover.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Further information as to the ecology of this entire coastal area.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Bioresearches Ltd (1987). The Effects of Effluent Discharge from the Manukau Sewage Purification Works on the Water Quality and Natural Environment of the Manukau Harbour.
2. Henriques, P R (1978). The Vegetated Tidelands of the Manukau Harbour.

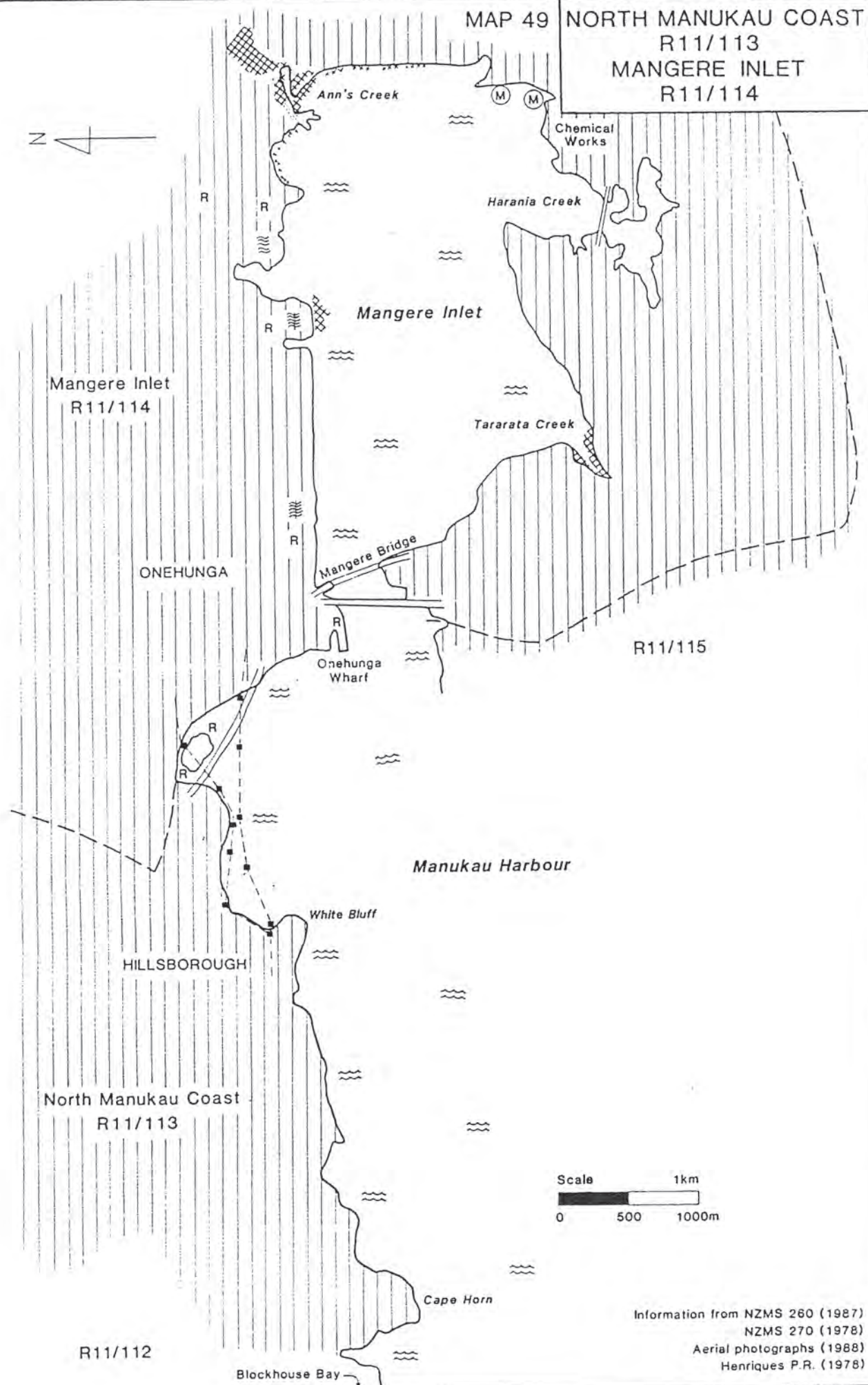
MAP 49

NORTH MANUKAU COAST

R11/113

MANGERE INLET

R11/114



1. NAME Mangere Inlet
2. AREA CODE R11/114 Map 49
3. MAP REFERENCE NZMS 260 R11 700 725
4. LOCATION DESCRIPTION Mangere Inlet
5. TYPE OF WETLAND Mangrove Saltmarsh Spartina
6. AREA OCCUPIED BY WETLAND Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION At Anne's Creek (north east Mangere Inlet) there is a big salt marsh between Great South Road and the railway. There is a small salt marsh behind the freezing works at Southdown (Ref. 12).

Gracilaria bed at Blockhouse Bay. Probably as a consequence of sewer overflows (Ref. 13).

There is Spartina at Cape Horn (Ref. 5).

A general salt marsh community is found fringing all of the pastures bordering the harbour - Sailicornia, Plantago coronopus and Juncus maritimus, Samolus, Selliera (Ref. 8).

In the south east Mangere Inlet there is a high diversity of native maritime and marine vegetation. This includes a meadow of Cortula coronopifolia, to the seaward of which there is a diverse maritime marsh of native species. To the north of this is an extensive maritime marsh dominated by Spartina townsendii up to 40 cm tall, covering 300 m x 100 m area. There is some colonisation of the Spartina area by mangroves (Ref. 4).

8. WILDLIFE VALUES Feeding area for waders.

Large numbers of birds utilise the intertidal area in the Onehunga Bay region; including red-billed gull, black-backed gull, pied stilt, pied oystercatcher, white-faced heron, reef heron, kingfisher, little shag.

There are no important breeding or roosting areas in Onehunga Bay (Ref. 6).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES With the diversion of industrial discharge to the Mangere Sewerage Purification Works in 1961 there was a rapid improvement of water quality. The improvement of the quality of the natural environment of the inlet continued over a number of years and at present there are extensive areas of healthy productive habitat within the central, eastern, and southern areas of the Inlet (Ref. 11).

10. STABILITY OF WETLAND This area has a history of reclamations. There have been massive reclamations all along the foreshore - even to fulfil the 20 m foreshore amenity area reserve.

Reclamation of tidal mudflats and mangroves has reduced the water volume in the estuary, leading to a reduction in the ability of the estuary to flush itself clear of silt. Development of land adjoining the harbour has tended to be for heavy and noxious activities (Ref. 1).

There have been reclamations for motorway construction across the inlet, and for industry.

A large area of mangrove in the extreme northeastern corner is to be reclaimed for industry (Ref. 14).

Slow ecological changes are occurring as a result of the deposition of fine sediment, changing the nature of the surface substrates. Where surface sediments are becoming softer, there is a reduction in the diversity and abundance of several common invertebrates.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board/local bodies

Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Mt Roskill, Onehunga, One Tree Hill, Mt Wellington and Otahuhu Borough Council, and Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
In the area at the northern end of the Mangere Bridge, around Onehunga Port, the port has higher priority for the use of harbour areas than any other uses (Ref. 15).

13. USE OF WETLAND BY MAN Dumping, waste disposal, reclamation (building sites).

14. WETLAND MODIFICATIONS PROPOSED The proposed redevelopment of the Otahuhu Fertiliser Industry if it goes ahead will mean reclamation of wetland (Ref. 3).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: Yes - Onehunga

Marinas/moorings: No

Waste disposal: There are waste disposal outfalls from each borough/city. The Manukau Sewage Purification Works is in this area and discharges treated waste in this part of the harbour.

The foreshore of the Manukau Harbour in Onehunga has been subject to extensive reclamation for refuse disposal purposes. These tips have leachate seepage problems, and the reclamations they are on are unstable.

Refuse land fill: Pikes Point. Several in the past - now officially closed, but still leaking leachate.

"The views and policies of the Auckland Regional Authority, in its role as the regional refuse disposal authority, have changed in line with the general change in public and official attitudes to coastal land-fills. In 1972 the Authority, at the request of local authorities, agreed to take over from the Onehunga Borough Council the authorised reclamation of 25 hectares at Pikes Point, in the Manukau Harbour, to provide a regional disposal facility to serve the Auckland Isthmus. In order to prevent harbour pollution the Authority enclosed the reclamation with an impervious bund and drained the area before refuse was deposited. Subsequently a leachate collection and pumping system was added to pump leachate into the system draining to the Manukau Sewerage Purification Works. Although this landfill was originally intended to be an interim measure for only five years, it became obvious towards the end of that period that alternative facilities would not be available by the time it was full and it was necessary for the Authority to obtain approval for the use of a further 32 hectares of adjoining tidal flats. Filling in this area, using similar pollution prevention measures, commenced in 1977 and was completed in 1981.

The Authority has adopted firm plans for the disposal of metropolitan refuse which avoid the establishment of any further foreshore land-fills. It has established inland land-fills at Rosedale Road on the North Shore and Greenmount in South Auckland and has built a transfer station on the land reclaimed by refuse at Pikes Point West for reception of refuse and partial separation of usable materials from raw refuse before its final transport and deposit at the Greenmount land-fill." (Ref. 15).

Recreation: Sport fishing, water sports.

Fishing: Yes - Recreational and commercial. Subject to Tainui fishing claim.

Sand extraction: No

Other: Possible crossing for proposed liquid fuels pipeline between Marsden Point and Wiri. Pylons in harbour, south of Hillsborough (Ref. 7).

- (b) Water quality characteristics of adjoining harbour/coast - likely to affect wetland: This area is grossly polluted.

The fine sediment environment of the mid-tidal region of Onehunga Bay should be regarded as pollution sensitive, and care should be taken with the locating of any discharges in this region, to prevent further enrichment, and deterioration of the fine sediment habitat. No obvious evidence of pollution in the area at present (Ref. 6).

16. CHARACTERISTICS OF WETLAND CATCHMENT:

(a) Approximate total area of catchment: Approximately 4000 ha

(b) Land use of catchment: Approximate percentage of total catchment

in forest -	residential - 70%	bare earth -
pasture -	industrial - 30%	

Other land use likely to affect wetland: Previously, rubbish tips along the northern shore of the Inlet. Quarrying, e.g. Three Kings. Water catchment.

Reserves present: Various foreshore reserves (20 m esplanade reserve fronting harbour - Local Government Act).

Land use changes anticipated up to year 2000: Rapidly changing nature of industrial technology may lead to changes in industry. Possible accidental release of hazardous substances. Future development - limited by extent of reclamation.

District scheme - zoning provisions: Water protection area follows borough boundary. Any precautions against damage should allow for both large scale accidents and the more common incidence of minor pollution, often cause by poor housekeeping.

Controls other than District Scheme likely to influence future land use: Treaty of Waitangi Act - Waitangi Tribunal findings. Control of hazardous activities is given to a number of central and local government agencies and administered under a wide range of legislation, including: Public Works Act 1981, Water and Soil Conservation Act 1967, Clean Air Act 1973, Petroleum Act 1937, Mining Act 1971, Coal Mines Act 1979, Explosives Act 1957, Dangerous Goods Act 1974, Toxic Substances Act 1974, Pesticides Act 1947. (At present no single authority has overall responsibility for the assessment and control of hazardous activities.)

Advice of Health Department and Fire Service will be sought to assist in appraisal of possible hazards.

(c) Description of topography (soil type, slope, erosion susceptibility)
Gently undulating landscape, highly modified by human activity. The area south of Hillsborough Road is erosion prone due to its gradient.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Owing to the extent of reclamation already carried out, any further reclamation should be restricted to the minimum area necessary and a public need for the work must be displayed.

Ensure, by the enforcement of environmental standards, that potentially - polluting materials do not contaminate the soil, enter the drainage system, or pollute the freshwater aquifers.

Restrict the area of allowed industrial development. To provide for a wide range of industrial and related activities.

19. RELEVANT REFERENCES:

1. Onehunga Borough District Scheme, Third Revision, 1987.

2. Mt Roskill Borough District Scheme, Second Review, 1983.
3. NZ Farmers - Fertiliser Co. Ltd (1987) Environmental Impact Report on Ruciman Fertiliser Works.
4. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan, proposed conservation zones, prepared for the Manukau Maritime Planning Authority.
5. Bioresearches Ltd (1987) Manukau Harbour Maritime Plan, proposed habitat zones, prepared for the Manukau Maritime Planning Authority.
6. Ministry of Works and Development (1975) Mt Roskill to Wiri Motorway - Onehunga Bay Section - Environmental Impact Report.
7. Rowe, D. (1975) Phytoplankton Populations and Physico-chemical variables in a Sewage treatment plan. MSc. thesis, University of Auckland.
8. Chapman, V.J. and J.W. Ronaldson (1958) The Mangrove and Salt Marsh Flats of the Auckland Isthmus.
9. NZ Refining Company Ltd. Proposed Products Pipeline, Marsden Point to Auckland, Environmental Report 1981.
10. Auckland Harbour Board (1978) Manukau Harbour Study. Rubbish - a discussion paper.
11. Bioresearches Ltd (1987). The Effects of Effluent Discharged from the Manukau Sewage Purification Works on the Water Quality and Natural Environment of the Manukau Harbour.
12. Henderson (1988) pers comm.
13. Challis and Haughey (1988) pers comm, Auckland Regional Water Board.
14. Department of Conservation, Coastal and Marine Division, Auckland Regional Office (1988) pers comm.
15. Auckland Regional Authority (1987), Auckland Regional Planning Scheme proposal.

1. NAME Airport. *Wor4*
2. AREA CODE R11/115 Map 50.
3. MAP REFERENCE NZMS 260 R11 695 720 to 713 644.
4. LOCATION DESCRIPTION Auckland International Airport environs, Mangere Sewerage purification works.
5. TYPE OF WETLAND Saltmarsh Eelgrass Gracilaria secundata.
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Small areas of maritime marsh on the north-eastern side of Wiroa Island. Low density patches of Zostera in upper intertidal near Wiroa Island. This is the most extensive remaining Zostera bed in the Manukau Harbour (Ref 3).

→ Gracilaria beds off Mangere Sewage Purification Works area are very mobile - possibly following movement of sand banks. There has been no discernible expansion in area of Gracilaria over the past few years (Ref 4).
8. WILDLIFE VALUES A roost was created at Wiroa Island to attract birds away from the airport. It is now the major wrybill roost in the harbour. The following is an extract from the Auckland Regional Planning Scheme:

'BIRDS OF PUKETUTU ISLAND. This is a favourite roosting area for wading birds, including the N Z dotterel, a species whose numbers are declining. The white heron and blue reef heron also roost in this area. Following construction of the Manukau Sewage Purification Works the number of wrybills feeding and roosting in the area declined. However, recently there has been an increase in numbers'.

Another from Bioresarches Limited from the Manukau Maritime Planning Scheme:

'IHUMATO A

This conservation zone includes on the Karore Bank the most extensive area of Zostera remaining in the harbour. There are several small areas of maritime marsh near high tide level and one area about 300 m south of Ihumatoa Road where mangrove marsh and a variety of maritime marsh habitats grade into freshwater marsh habitats.

'The high natural environment ranking of this zone results from the rarity of Zostera in the Manukau, for its value as a feeding area for birds and for fish especially mullet and flounder. High densities of some common waders feed in and around Zostera beds. Black swans and duck feed on the Zostera itself'.
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Buried forest - well preserved ancient forest vege (29,000 BP) buried by volcanic eruption. Exhumed by the sea - tree trunks visible (Ref 5).
10. STABILITY OF WETLAND This area of wetlands has been very unstable from 1960-1988 with the disappearance of vast areas of Zostera and the growth of Gracilaria beds.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.
 Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Manurewa City Council.
Crown	Department of Conservation.
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
 Subject to a Waitangi Tribunal land claim.

13. USE OF WETLAND BY MAN Limited.

14. WETLAND MODIFICATIONS PROPOSED Some threat from extension of airport runways.

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:

Marine farming: No.

Ports: Onehunga Port nearby.

Marinas moorings: No.

Waste disposal: Manukau Sewage Purification Works - largest outfall of treated sewage to harbour. Disposal of run-off from catchment to harbour e.g. at Oruarauki Creek (ref 6).

Major outfalls at:

- (i) Southern end of the western boundary of northernmost pond (nearest Mangere Inlet).
- (ii) The western side of the southernmost pond. In about 1970 it was clear that existing discharge procedures resulted in concentrated fields of discharge procedures resulted in concentrated fields of discharged effluent.

Refuse land fill: No.

Recreation: Limited e.g. birdwatching, some watersports.

Fishing: Some, recreational. Subject to Tainui fishing claim.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Sewage effluent has enriched the area in nutrient status and resulted in the spread of Gracilaria.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha):

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | | |
|-----|---------|-------------|------------|------------|
| in: | forest | residential | 70 | bare earth |
| | pasture | 10 | industrial | 5 |

Other land use likely to affect wetland: Airport protection zone.
Large sewage treatment plant.

Reserves present: Ambury Park. Various foreshore reserves.

Land use changes anticipated up to year 2000: Proposed airport extensions.

District scheme - zoning provisions: Most coastal areas are reserved zones 2 or 3 - recreational.

Controls other than District scheme likely to influence future land use: Regional scheme provisions for airport protection and extension. Ihumatoa conservation zone.

- (c) Description of topography (soil type, slope, erosion susceptibility):

Low lying, gently undulating land of volcanic origin. Volcanic cones within catchment. Scoria and basalt worthy of quarrying.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Research into nutrient status of water around the sewage treatment plant and how it effects localised ecology.

18. FUTURE MANAGEMENT RECOMMENDATIONS: The Auckland Regional Authority Planning Scheme states that;

'While claiming exceptional use status for the Manukau Sewage Purification Works, to use harbour areas already authorised for that purpose, the regional authority will take all practicable steps to minimise adverse effects of the works on the harbour's water quality and marine ecology and will, as far as possible, limit the spread or intensification of such effects when meeting the increasing demands for metropolitan sewage disposal.' (Ref 7).

'The construction and operation of the Auckland International Airport has had a major impact on an important part of the Region's marine environment. It has already absorbed 100 ha of the Manukau Harbour and 11.2 km of its coastline by reclamation. Safety restrictions on marine activities affect another 950 ha of marine areas near the airport. These effects will be considerably increased by future airport expansion which are expected to be necessary to meet the needs of increasing air traffic.'

'While the use of marine areas for the development, expansion and operation of the International Airport is justified by its national importance, its effects on the marine environment and other uses and values of the Manukau Harbour can be minimised by carefully design of development and control of airport operations and services.'

Investigations have been initiated to study alternatives to the present sea discharge for the Mangere Sewerage Purification Works (Ref 8).

19. RELEVANT REFERENCES:

- (1) Manukau City (1954) District Scheme.
- (2) Bioresearches Limited (1985) Manukau Harbour Maritime Plan Proposed Conservation Zones. Manukau Maritime Planning Authority.
- (3) Bioresearches Limited (1987) Manukau Harbour Maritime Plan Proposed Habitat Zones. Prepared for Manukau Maritime Planning Authority.
- (4) Haughy and Challis (1988) pers. comm. Auckland Regional Water Board.
- (5) Department of Conservation (1979) WERI. Computerised wetland inventory.
- (6) Becker (1988) pers. comm. Auckland Regional Water Board.
- (7) Auckland Regional Authority (1987) Regional Planning Scheme.
- (8) Auckland Regional Authority (1987). Auckland Area Sewerage Study; issues and options report.

MAP 50

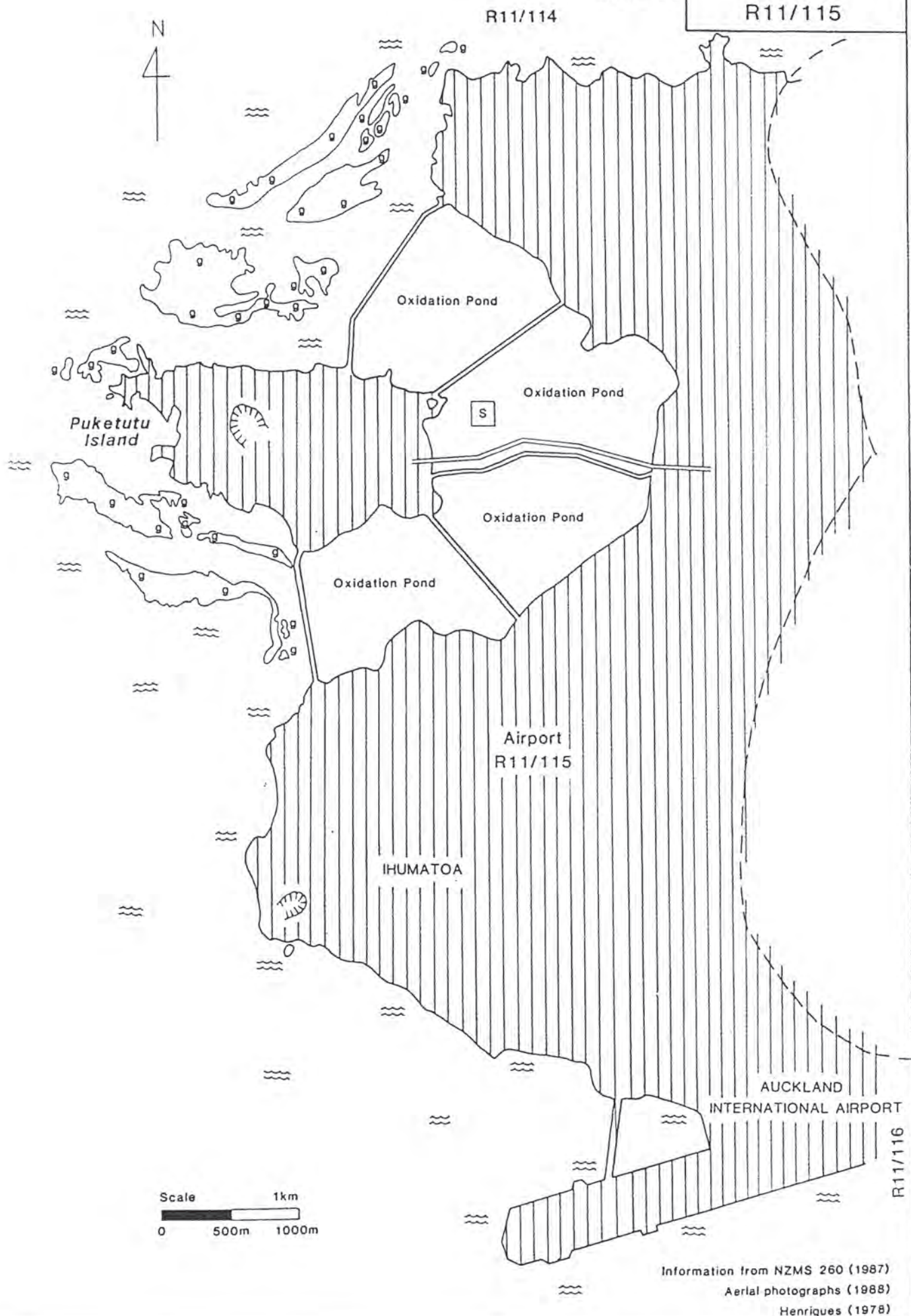
AIRPORT
R11/115

Information from NZMS 260 (1987)
Aerial photographs (1988)
Henriques (1978)

19. RELEVANT REFERENCES:

- (1) Manukau City (1954) District Scheme.
- (2) Bioresearches Limited (1985) Manukau Harbour Maritime Plan Proposed Conservation Zones. Manukau Maritime Planning Authority.
- (3) Bioresearches Limited (1987) Manukau Harbour Maritime Plan Proposed Habitat Zones. Prepared for Manukau Maritime Planning Authority.
- (4) Haughey and Challis (1988) pers. comm. Auckland Regional Water Board.
- (5) Department of Conservation (1979) WERI. Computerised wetland inventory.
- (6) Becker (1988) pers. comm. Auckland Regional Water Board.
- (7) Auckland Regional Authority (1987) Regional Planning Scheme.
- (8) Auckland Regional Authority (1987). Auckland Area Sewerage Study; issues and options report.

MAP 50

AIRPORT
R11/115

1. NAME Pukaki/Waokauri.
2. AREA CODE R11/116 Map 51.
3. MAP REFERENCE NZMS 260 R11 713 644 to 745 620.
4. LOCATION DESCRIPTION Pukaki/Waokauri.
5. TYPE OF WETLAND Mangrove
6. AREA OCCUPIED BY WETLAND (ha) Not known.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The Pukaki Creek and its tributaries are very shallow areas, with extensive intertidal zones and mangrove marsh (Ref 4).

The mangroves in this area are healthy - dense and mature (Ref 3).

8. WILDLIFE VALUES Over the last 30 years, 86 species have been sighted in the area, many of which are overseas migrants. Species which breed here include the white-faced heron, banded rail, shoveler duck, pied stilt and welcome swallow. The feeding grounds are also used by waders such as the South Island pied oystercatcher, wrybill, banded dotterel, godwit, knot, turnstone and golden plover. Dabchicks, paradise ducks, white herons, little egrets, royal spoonbills, black-fronted and New Zealand dotterels are seen occasionally.

Dominant species Ducks, pukeko (ref 3).

Rare species/endangered species Banded rail, spotless crane (ref 3).

Brown bittern, fernbird, marsh crane (ref 5). Rare visitors include the black-fronted tern, black stilt and black-billed gull.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Two small islands just off shore in the oxidation ponds and in the Manukau Harbour are being kept clear of vegetation to provide more roosting space in an attempt to keep the birds away from the airport. (Ref 2).
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.

Management agencies: Auckland Harbour Board. Manukau Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.
Territorial local authority	Manurewa.
Crown	Department of Conservation.
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Some land is vested in the International Airport specifically for airport alterations. Area subject to 1984 Manukau Harbour claim to Waitangi Tribunal.

13. USE OF WETLAND BY MAN Grazing by cattle with damage to wetlands.

14. WETLAND MODIFICATIONS PROPOSED Further changes in land use (e.g. more residential development) would lead to further discharges of contaminated stormwater or emergency sewage to the harbour. Proposed eastern access to the airport bridges the Pukakai Estuary.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: No.

Waste disposal: Sewage overflows. Stormwater run-off (Ref 4).

Refuse land fill: No. Some illegal tipping occurs.

Recreation: Duckshooting, valued shellfishing area (ref 6).

Fishing: Commercial and recreational, subject to Tainui fishing claim.

Sand extraction: No.

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: High faecal coliform counts (Ref 6). Maintenance of the water quality of Puhinui Stream and the appropriate use of adjacent land are essential to the preservation of the value of this area.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known.

- (b) Land use of catchment: Approximate percentage of total catchment
- | | | | |
|-----|---------|-------------|------------|
| in: | forest | residential | bare earth |
| | pasture | industrial | |

Other land use likely to affect wetland: Airport - the run-off may contain high levels of hydrocarbons etc.

Reserves present: None.

Land use changes anticipated up to year 2000: Probable extensions to airport.

District scheme - zoning provisions: A major coastal reserve of approximately 24 ha will be located along the full length of the harbour coast for esplanade, open space, recreation and coastal protection purposes. Natural features including landforms, water features, shoreline, bush and trees which enhance the amenity of

*Should be under area 111
District scheme
ed. 3.3.2.4.*

the area are to be conserved. Landform, existing contours and substantial areas of vegetation are to be disturbed as little as possible. (Special emphasis shall be given to the retention, conservation and utilisation of existing natural and environmental features when considering the location and provision of drainage, sewerage, roads and building platforms (ref 7)).

Controls other than District scheme likely to influence future land use: None.

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating, but susceptible to increased erosion with denudation through, for example, further residential development.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Ongoing study into the effects of land based activity on the ecology of the area.

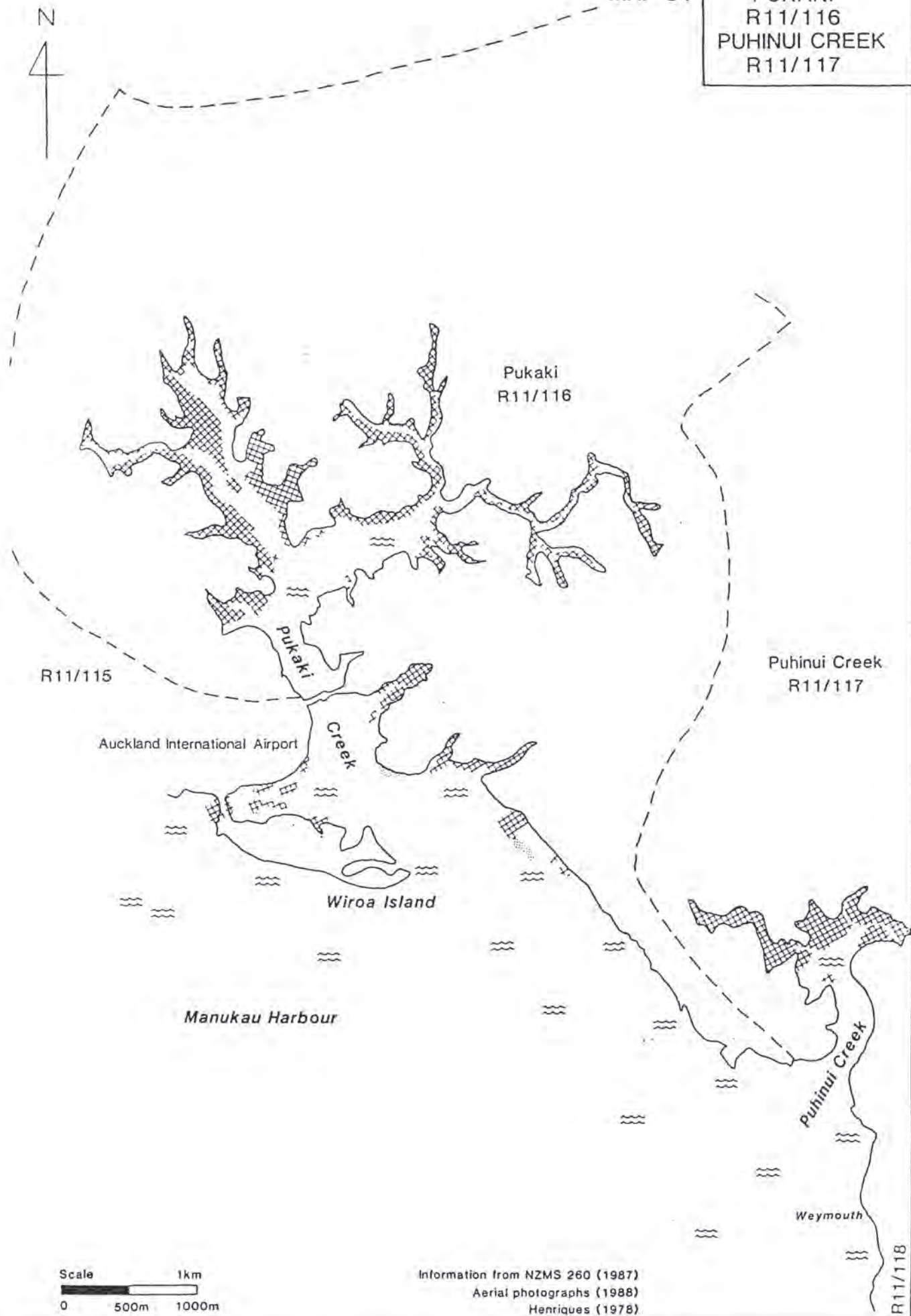
18. FUTURE MANAGEMENT RECOMMENDATIONS: The Manukau Harbour Plan (1978) recommended that Pukaki and Waokauri wetlands are to be given protection. Fence out stock.

19. RELEVANT REFERENCES:

- (1) Auckland Harbour Board/Auckland Regional Authority (1976) Manukau Harbour Plan.
- (2) Auckland Regional Authority (1987) Regional Planning Scheme.
- (3) Bioreserches Limited (1987) Manukau Harbour Maritime Plan proposed habitat zones. Prepared for Manukau Harbour Maritime Planning Authority.
- (4) Bioreserches Limited (1987). The Effect of Effluent Discharged from the Manukau Sewage Purification Works on the Water Quality and Natural Environment of the Manukau Harbour.
- (5) Auckland Regional Authority (1987) Manukau Harbour Maritime Planning Scheme.
- (6) Henderson (1988) pers. comm. Auckland Regional Water Board.
- (7) Manukau City (1984) District Scheme.

MAP 51

PUKAKI
R11/116
PUHINUI CREEK
R11/117



1. NAME Puhinui Creek. *East*
2. AREA CODE R11/117 Map 51.
3. MAP REFERENCE NZMS 260 R11 745 620 to 760 594.
4. LOCATION DESCRIPTION Puhinui Creek.
5. TYPE OF WETLAND Mangrove Saltmarsh
6. AREA OCCUPIED BY WETLAND (ha) The Puhinui zone contains the most extensive maritime marsh habitat in the Manukau Harbour. The maritime marsh occurs as a band of variable width at high tide protected on the seaward side by shell bars which are colonised by a variety of plants. Two areas of mangrove marsh are present in the south eastern corner of the zone near the mouth of Puhinui Creek (Ref 2).
7. DOMINANT WETLAND VEGETATION/ASSOCIATION The Puhinui Creek Inlet is relatively small, with extensive intertidal areas and upper intertidal level mangrove marsh (Ref 2). There are Cotula meadows in the upper reaches (Ref 3).
8. WILDLIFE VALUES Within the Weymouth/Puhinui Inlet is a shell bank which is an important bird roost especially for a vast oystercatcher population. A wildlife refuge was established because of this, in 1964 - it is the only reserve of its kind in Auckland city set aside especially for waders. Birds here include godwit, knot, oystercatcher, turnstone, N Z dotterel, white-faced heron, caspian tern (Ref 1).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Bioresearches ranked this area very highly for natural environment values. It adjoins pockets of manuka and small native trees. Cabbage trees which may be a habitat to the fern bird Bowdleria punctata (Ref 2).

Because of the shallow nature of the tidal creek a high degree of exchange of creek waters with harbour waters is to be expected (Ref 2).

The extensive mangrove marshes within the creek are particularly important for trapping the sediments brought down from the catchments by run-off (Ref 2).

The Manukau Harbour Plan recommended that the Puhinui mangroves are worthy of protection.

10. STABILITY OF WETLAND The mangroves in the Puhinui Inlet are spreading.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board.
 Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority.

Name	
Catchment authority	Auckland Regional Water Board.
Regional planning authority	Auckland Regional Authority.
Harbour board	Auckland Harbour Board.

Territorial local authority

Manukau City Council.

Crown

Department of Conservation.

Other

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No.

13. USE OF WETLAND BY MAN Maritime marsh threatened by cattle grazing.

14. WETLAND MODIFICATIONS PROPOSED Reclamation, etc proposed. Development of racetrack (cars).

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No.

Ports: No.

Marinas/moorings: No.

Waste disposal: Stormwater drains proposed.

Refuse land fill: No.

Recreation: Little except bird watching, duck shooting (ref 3).

Fishing: Limited. Subject to Tainui fishing claim.

Sand extraction: No.

Other: Waahi tapu on the banks of estuary for the Tainui.

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Potential threat from development of catchment. Some nutrient enrichment from Manukau Sewage Works. The water quality is affected by run-off from the catchment (there are 54 existing water rights for discharging stormwater into the Puhinui Creek or its tributaries).

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known.

(b) Land use of catchment: Approximate percentage of total catchment
in: forest residential 10 bare earth
pasture 70 industrial 5

Other land use likely to affect wetland: The land around the lower reaches of the creek is largely used for farming purposes, while a large proportion of the middle catchment is intensively developed for industrial, commercial and residential use. The eastern catchment is again used for pastoral farming. Expanding industrial development. Imminent development of motorsports complex 1988.

Reserves present: The Puhinui Creek area is a wildlife refuge comprising a variety of habitats including extensive shell banks, intertidal mudflats and extensive shoreline salt marsh.

Land use changes anticipated up to year 2000: Development of the catchment; including industry, motorsports complex and destruction of freshwater marsh in mid-catchment area resulting in loss of hydrological buffering of estuarine system. Use of Puhinui for emergency overflows from sewerage reticulation.

District scheme - zoning provisions: Mostly residential or rural.

Controls other than District scheme likely to influence future land use: None.

(c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating. Soil good for agricultural land.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Ongoing effects of land based activities on the ecology of the area.

18. FUTURE MANAGEMENT RECOMMENDATIONS: Protection should be sought for the land fringe which includes native scrub and trees. This would complete the natural succession from shore to land - a succession which is rare within the Manukau.

19. RELEVANT REFERENCES:

- (1) Morton, J. E. and Cometti, R. (1985) Margins of the Sea.
- (2) Bioresearches Limited (1985). Manukau Harbour Maritime Plan Proposed Conservation Zone. Prepared for Manukau Maritime Planning Authority.
- (3) Bioresearches Limited (1987) Manukau Harbour Maritime Plan - proposed habitat zones. Prepared for Manukau Maritime Planning Authority.

- Eash*
1. NAME Waimahia Creek
 2. AREA CODE R11/118 Map 52
 3. MAP REFERENCE NZMS 260 R11 760 594 to 800 605
 4. LOCATION DESCRIPTION Waimahia Creek
 5. TYPE OF WETLAND Mangrove Saltmarsh
 6. AREA OCCUPIED BY WETLAND (ha)
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION West of Weymouth are mangroves and a strip of saltmarsh in good condition (Ref. 1).

A lot of Leptocarpus supported in this area (Ref. 1).
 8. WILDLIFE VALUES There is a high tide bird roost in the mouth of this creek.

Weymouth has flats which provide a rich refuge for many wading birds: pied stilt, oystercatcher, white faced heron, Caspian tern.
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
 10. STABILITY OF WETLAND No information
 11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board

Management agencies: Auckland Harbour Board. Manukau Harbour Maritime Planning Authority

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Manukau City Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Educational observation
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS
 - (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Stormwater run-off to the harbour

Refuse land fill: No

Recreation: Little

Fishing: Recreational, Tangatawhenua; subject to Tainui Fishing Claim

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The Manukau Harbour has a reputation for having polluted water

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | |
|---------------|-------------------|------------|
| forest | residential - 10% | bare earth |
| pasture - 70% | industrial | |

Other land use likely to affect wetland: None

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Most of immediate coastal area is zoned Reserved. Quarry zone at end of Pahurehure Inlet.

Controls other than District scheme likely to influence future land use: None

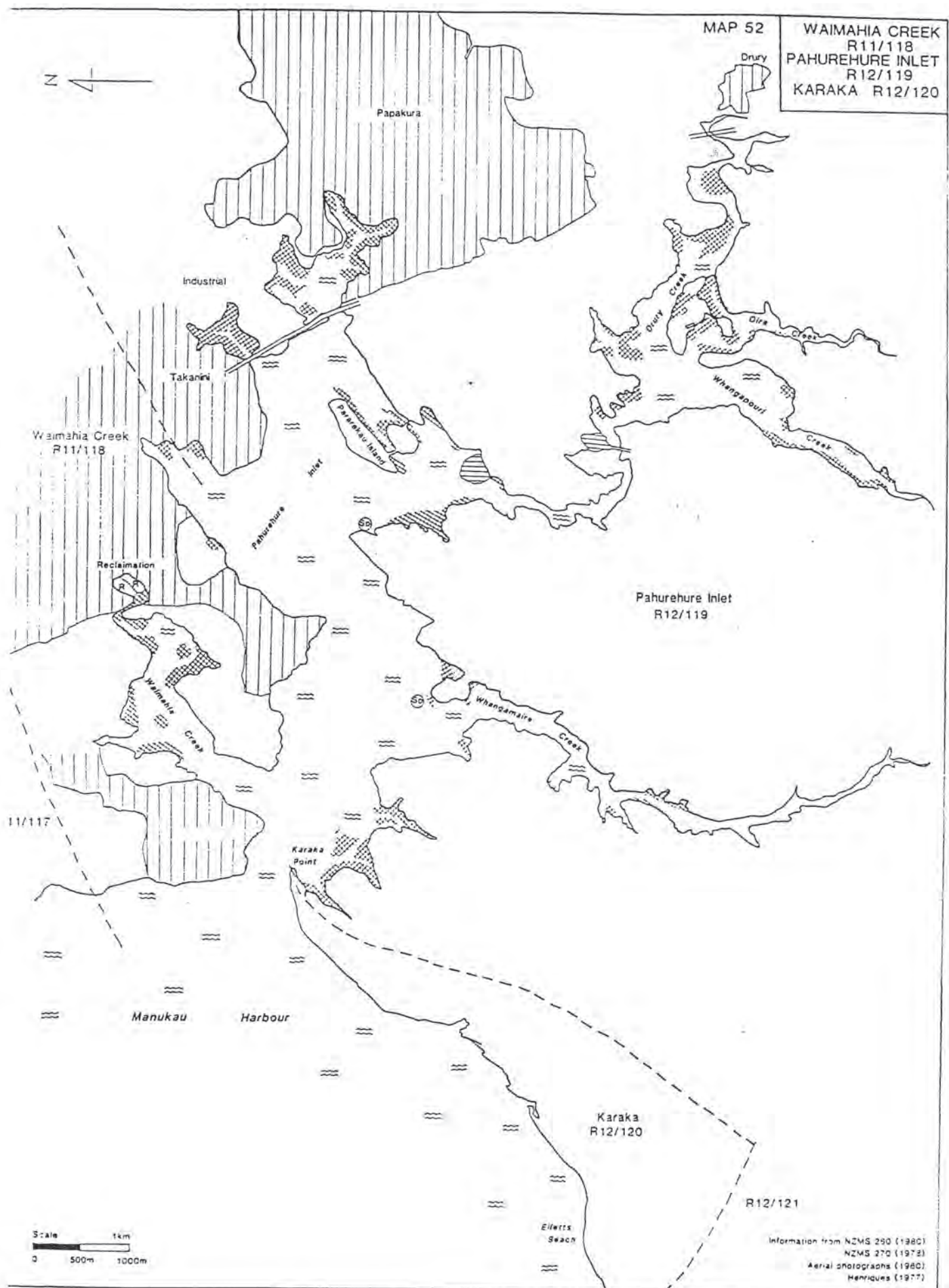
- (c) Description of topography (soil type, slope, erosion susceptibility):
- Gently undulating
 - Soft, peaty soil

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: More information as to ecology of this area, and the effects of land based activities.

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Bioresearches Ltd (1987) Manukau Harbour Maritime Plan proposed Habitat Zones. Prepared for Manukau Harbour Maritime Planning Authority.
2. Morton J E and R Cometti (1985). Margins of the Sea.



1. NAME Pahurehure Inlet
2. AREA CODE R12/119 Map 52
3. MAP REFERENCE NZMS 260 R12 800 605 to 755 590
4. LOCATION DESCRIPTION Extreme eastern arm of Manukau
5. TYPE OF WETLAND Mangrove Saltmarsh Eelgrass Spartina
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION This area is shallow with extensive intertidal zones. (Ref. 2).

There are healthy mangroves in the Whangamaire-Karaka area. The saltmarsh here is dominated by Juncus maritimus and sedge Scirpus pungens. There are small patches of saltmarsh plants Cotula coronopifolia and Triglochin striatum. Saltmarsh plants such as Sarcocornia quinquefolia and Samolus repens (Ref. 8).

The Leptocarpus stands in Drury Creek are the nicest examples of such in the Manukau Harbour. The stand is dense with no mangrove intermixed (Ref. 9).

Small stands of Spartina were present in 1977, on the southern shore of Pahurehure and in Blackbridge Creek. There is Spartina scattered in small beds throughout the Pahurehure Inlet (10) also occurring in beds near the mouth of Whangapouri Creek, along edges of a causeway between two islands in the Oira Creek. Small areas of maritime marsh in the upper reaches of creeks but there are no extensive areas (Ref. 5).

Several healthy beds of Zostera are in the southern half of Whangapouri Creek (Ref. 5).

There are extensive marsh habitats present in Drury Creek, with a good succession from mangrove to maritime marsh (dominated by Leptocarpus similis) to freshwater marsh (dominated by Scirpus lacustris), (Ref. 4).

8. WILDLIFE VALUES There is a low diversity of species in the mangrove areas in most of Pahurehure (Ref. 1).

Pied shag breeding colonies at narrows south of Bottletop Bay. The Drury Creek is valuable as a migration pathway for eels, common bully, and white bait (Ref. 4).

There are important bird roosting and feeding areas on all coastlines in this area.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This area exhibits estuarine characteristics to a greater degree than other areas of the harbour because of the relatively large watershed (Ref. 2).

The ecological value of the mangrove marsh lies in the contribution of the mangroves to the overall primary productivity of the inlet (Ref. 1).

10. STABILITY OF WETLAND Some areas of mangroves have been killed (by industrial effluent?).

Other areas of mangroves however are spreading (Ref. 1). Quite massive increases in mangrove area especially in Puhunui Creek, Bottle Top Bay, and Drury Creek (Ref. 1).

Severe illegal reclamations occur in this creek. Entire inlets have been reclaimed. There have been several private illegal reclamations in the head of Pahurehure Inlet near Conifer Grove.

Evidence of dumping of fill in Pahurehure Inlet (fill is being placed on the recreation reserve abutting the inlet and extending into the harbour waters). A removal notice was filed in 1984 (Ref. 10).
Stock grazing damage in Whangamaire (Ref. 5).

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board (intertidal)
rest crown

Management agencies: Auckland Harbour Board, Manukau Harbour Maritime
Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau Harbour Plan (1978) recommends protection for Pahurehure wetlands.

13. USE OF WETLAND BY MAN In Drury Creek two inorganic rubbish dumps are encroaching into the intertidal zone and stock have access to maritime marshes.

14. WETLAND MODIFICATIONS PROPOSED Proposed LPG wharf at Papakura Inlet

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No. Proposed bulk LPG wharf at Papakura Inlet (Ref. 6).

Marinas/moorings: No

Waste disposal: Various prosecutions for placing of wastes into tidal waters. Existing discharge of treated effluent from Drury township (Ref. 11).

Livestock wastes and stable washings discharged into mangrove marsh (Ref. 1).

The saltmarsh habitat has inorganic rubbish thrown on it.

There are discharges of process washing water (possible input of cement washings).

Sewage pump station overflows and some industrial stormwater inputs on northern Papakura coast.

St Stephens School sewage effluent discharge.

Refuse land fill: Manukau City Council landfill predominantly inorganic in head of Pahurehure - east of Conifer Grove.

Recreation: Various, e.g. duckshooting.

Fishing: Limited

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland:

Because of the large volume of tidal water within the Pahurehure Inlet-Drury Creek areas, and the strong tidal currents, any contaminants entering the system with freshwater inflow would be rapidly diluted and dispersed within the system (Ref. 7).

There is much sediment runoff from the catchment (Ref. 4).

Severe fish kill near Bottle Top Bay in 1987.

High concentrations of heavy metals 1988.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known

(b) Land use of catchment: Approximate percentage of total catchment
 in: forest residential bare earth
 pasture - 80% industrial

Other land use likely to affect wetland: Intensive market gardening in Pukekohe area. Quarry near Drury. Old Papakura refuse tip near Drury in the intertidal zone.

Reserves present: Esplanade reserves (three small reserves in Whangapouri Estuary). In 1984 a council recreation reserve was established at the end of the Pahurehure Inlet (Ref. 10).

Land use changes anticipated up to year 2000: Existing Drury sewage treatment system to be replaced in the near future by oxidation ponds and discharge is to go into an artificial wetland.

Proposed bulk LPG depot and pipeline across harbour (Ref. 6).
 Proposed site for fertiliser works at Runciman (Ref. 3).

District scheme - zoning provisions: South of catchment is predominantly rural 1 with pockets of rural 6 to allow for quarrying. Rural 1 zone encourages the use of land for food production.

Controls other than District scheme likely to influence future land use: Auckland Regional Planning Scheme restricts the spread of urban development to the southern boundary of Papakura City. No urbanisation will be permitted in the Drury triangle and Hingaia area.

The Auckland Regional Water Board is in the process of examining waste discharges in the catchment (Ref. 7).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating landscape. Soils sufficient for intensive horticulture.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

To limit urban development to the southern boundary of Papakura City.

To encourage the wise use of agricultural land.

To preserve the coastal environment of the Manukau Harbour in its present state.

To contain the development of Drury township to the present area.

The foreshore of Drury Creek needs fencing to prevent stock access to wetlands. Dumping of rubbish needs to cease.

19. RELEVANT REFERENCES:

1. Fraser, Thomas Partners (1982). Proposed Reclamation for Ross Concrete Ltd, The Furlong, Takapuna.
2. Bioresearchers Ltd (1981) - Pahurehure Inlet - water quality and plankton data, Tech. Bull. # 0011 52 pp.
3. NZ Farmer's Fertiliser Company Ltd (1978) Environmental Impact Report - Runciman Fertiliser works.
4. Bioresearchers Ltd (1985) Manukau Harbour Maritime Plan proposed conservation zones. Prepared for Manukau Maritime Planning Authority.
5. Bioresearchers Ltd (1987) Manukau Harbour Maritime Plan proposed habitat zone proposal for Manukau Maritime Planning Authority.
6. Manukau Marine Terminal Planning Application (1987).
7. Bioresearchers Ltd (1987) The Effects of Effluent Discharged from the Manukau Sewage Purification Works in the Water Quality and Nat. Env. of the Manukau Harbour.
8. Department of Conservation (1982-1986) Floral and Faunal Survey unpublished survey results.
9. Haughey & Challis (2988) pers comm, ARWB.
10. Department of Conservation (1988) pers comm unpublished DOC files.
11. Franklin County Council District Scheme (1985).

1. NAME Karaka
2. AREA CODE R12/120 Map 52
3. MAP REFERENCE NZMS 260 R12 755 590 to 705 550
4. LOCATION DESCRIPTION Southeastern margin of Manukau.
5. TYPE OF WETLAND Saltmarsh Spartina
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION At Hikihiki Bank Spartina townsendii has been planted both near to the shoreline, and on two lines extending offshore. It is very slow growing.

There is an extensive bed of Gracilaria secundata along the east-west drainage channel 500 m offshore on the eastern bank (Ref. 3).

A salt marsh consisting of: Leptocarpus simplex)
Juncus maritimus)beach
Scirpus nodosus)
Salicornia australis)

fringes the whole beach from Clark's Creek to Pahurehure.

Given high ranking for maritime vegetation by Bioreserches Ltd (1985).

8. WILDLIFE VALUES Excellent bird roosts and feeding areas. A spring roost is located on the coast.

This area is a wading bird habitat of international significance.

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Very dense beds of cockles/cockle shells forming mounds on top of one another.
10. STABILITY OF WETLAND Stable wetland. Spartina is spreading.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board
 Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority

Name	
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?

13. USE OF WETLAND BY MAN No information.

14. WETLAND MODIFICATIONS PROPOSED No information.

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Limited

Fishing: Commercial and recreational. Tainui fishery claim.

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known

(b) Land use of catchment: Approximate percentage of total catchment
in: forest - residential - bare earth -
pasture - 80% industrial

Other land use likely to affect wetland: None

Reserves present: Proposed foreshore reserve.

Land use changes anticipated up to year 2000: None.

District scheme - zoning provisions:

Rural 1 - To encourage food production.

Rural 2 - To encourage food production and conservation.

Goals described by the Franklin District Scheme include:

(a) Limit urban development to southern boundary of Papakura City.

(b) Encourage the wise use of agricultural land.

(c) Preserve the coastal environment of the Manukau Harbour in its present state.

(d) Improve public access to the coast for recreation.

Controls other than District scheme likely to influence future land use: None

(c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating. Little erosion.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: The Manukau Harbour Maritime Planning Scheme recommends that the wetlands in this area be protected. Franklin District Scheme recognises the wildlife value of this area of coast and aims to protect it.

19. RELEVANT REFERENCES:

1. Auckland Regional Authority/Auckland Harbour Board (1978) Manukau Harbour Plan.
2. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan Proposed Conservation Zones. Prepared for Manukau Maritime Planning Authority.
3. Bioresearches Ltd (1987) Manukau Harbour Maritime Plan Proposed Habitat Zones. Prepared for Manukau Maritime Planning Authority.

East

1. NAME Clark's Creek/Seagrove
2. AREA CODE R12/121 Map 53
3. MAP REFERENCE NZMS 260 R11 705 550 to 603 500
4. LOCATION DESCRIPTION Southern margin of Manukau Harbour.
5. TYPE OF WETLAND Saltmarsh Eelgrass Spartina
6. AREA OCCUPIED BY WETLAND (ha)
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Clark's Creek is a relatively short, shallow mangrove-lined creek (Ref. 7). There is a Zostera bed in Clark's Bay, and maritime marsh on most of the foreshore (Ref. 2). Along the northern shore of Seagrove Peninsula the maritime marsh is 800 metres long and 20-30 metres wide. This habitat contains a high density of maritime vegetation and despite the small extent, is in excellent condition (Ref. 4). Healthy mangroves line the creek form near the entrance to several kilometres upstream (Ref. 2).

There are patches of Spartina reported in this area. Spartina has been planted along the shore of Clark's Bay in several areas and in two patches away from the shore. It is spreading aggressively in one offshore patch where it has resulted in considerable sediment accumulation and habitat modification (Ref. 4).

8. WILDLIFE VALUES Up to 12,500 birds use the Clark's Bay region for feeding and roosting, including eight species which are rare in New Zealand. One small zone at Awhitu Point (at the north eastern extremity of the beach) is a nesting area for New Zealand dotterel.

There are important spring tide roosts at Seagrove and further east; during neap tides birds roost right along the foreshore between Weymouth and Clarks Beach (Ref. 3).

Extremely high density feeding and roosting sites for waders at Seagrove (Ref. 2).

Lists of bird species found in this area are given in (Ref. 2).

9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Dense beds of cockles with cockle shells forming mounds in the intertidal area. These shell banks are sites of intensive bird roosts. There is a wading bird roost and feeding ground of international significance at Seagrove.
10. STABILITY OF WETLAND The mangroves lining Clark's creek are expanding in area rapidly (Ref. 5). Over the past 30 years an extensive bed of Zostera has disappeared from Poutara Bank. (Zostera has been extensively reduced in area since 1960)(Ref. 2).

There have been massive reclamations right along the Clark's Beach foreshore.

11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board

Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau Harbour Planning Scheme.

13. USE OF WETLAND BY MAN Cattle grazing/stock damage (Ref. 5). Spartina
is grazed by cattle.

14. WETLAND MODIFICATIONS PROPOSED None

15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: There are existing discharges of domestic wastes at Clark's Beach and from Kingseat Hospital (Refs 1, 6). There is a single-stage pond at Clark's Beach which is underloaded and so probably only discharges effluent intermittently.

Refuse land fill: No

Recreation: Bird watching, duck shooting (Ref. 5).

Fishing: Yes

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The Manukau Harbour is polluted by nutrients.

16. CHARACTERISTICS OF WETLAND CATCHMENT

(a) Approximate total area of catchment (ha): Not known

(b) Land use of catchment: Approximate percentage of total catchment
in: forest - residential - bare earth -
pasture - 95% industrial -

Other land use likely to affect wetland: Kingseat Hospital (sewage effluent discharge). Proposed Thermal #1 power station at Waiau Pa (Refs 2, 3).

Reserves present: Reserve at Clark's Beach (Ref. 5).

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Franklin District Scheme objectives are to maintain the present natural coastal environment, prevent the spread of urban Auckland to the south, and encourage wise use of agricultural land. Also to restrict urban expansion to existing small towns, and to improve public access to the coastline for recreation. Rural 1 zoning to encourage food production.

Controls other than District scheme likely to influence future land use: Water right to discharge effluent into Clark's Creek; it is restricted to a period commencing three hours before the time of local high tide (Ref. 6).

- (c) Description of topography (soil type, slope, erosion susceptibility):
Gently undulating.

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS: Fencing to prevent stock damage to wetlands. Eliminate Spartina.

19. RELEVANT REFERENCES:

1. Franklin County District Scheme (1985).
2. Bioresearches Ltd (1976) The Ecological Impact of the Proposed Development of Auckland Thermal No. 1 at Waiau Pa - a supplementary report.
3. Auckland Regional Authority (1976) Environmental Impact Report for Auckland Thermal No. 1 Power Station at Waiau Pa.
4. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan Proposed Conservation Zones - prepared for the Manukau Maritime Planning Authority.
5. Franklin County Council Management Plan for Clark's Beach Reserve (no date given).
6. Bioresearches Ltd (1987) The Effects of Effluent Discharged from the Manukau Sewage Purification Works on the Water Quality and Natural Environment of Manukau Harbour.

MAP 53

Clarks Creek/
Seagrove
R11/121

N

R11/120

Kingseat

Clarks

Creek

Seagrove

Clarks Beach/Seagrove

R11/121

Waiau Pa

Sp

Sp

Sp

(2)

(2)

(2)

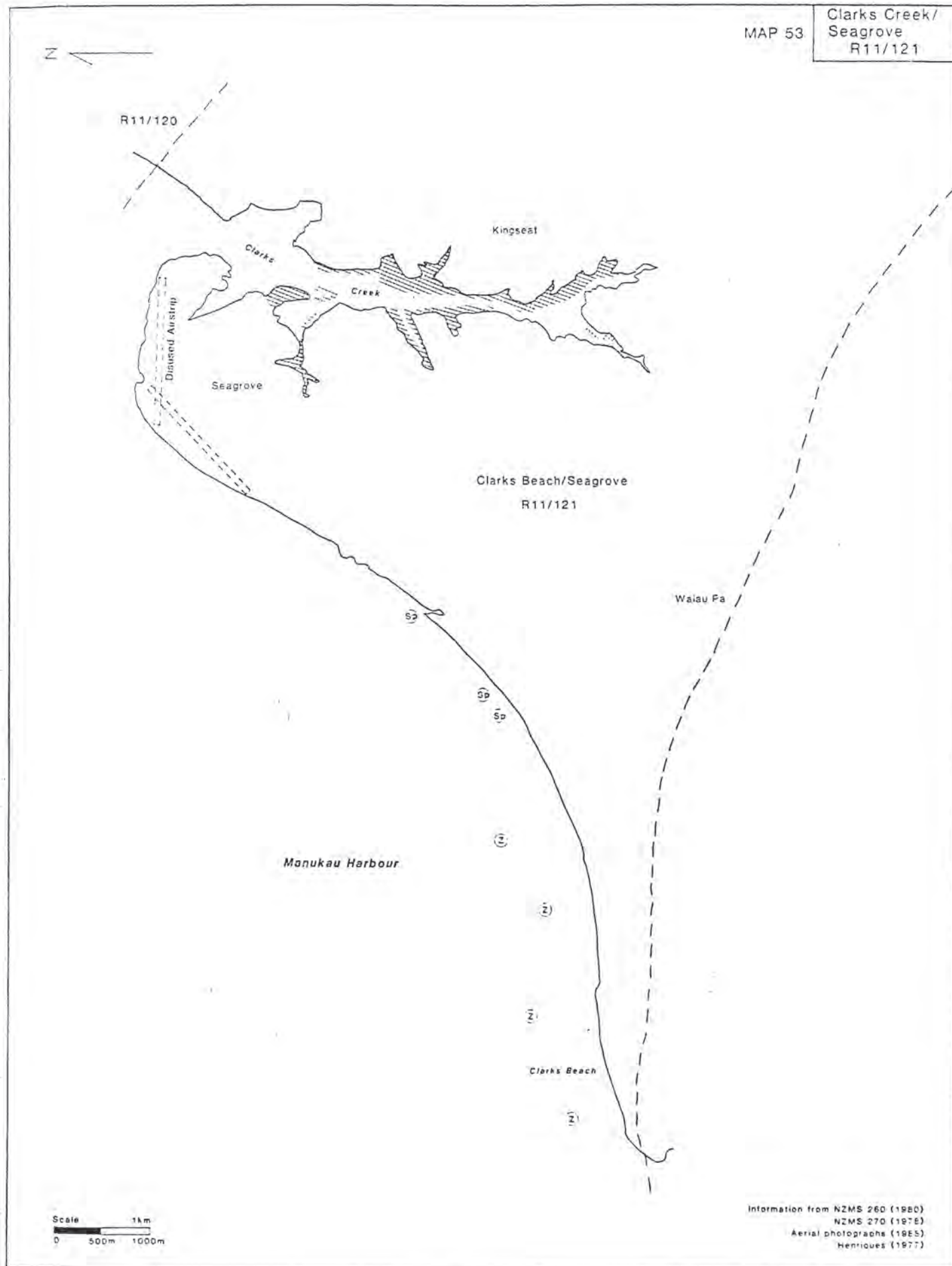
Clarks Beach

(2)

Manukau Harbour

Scale 1km
0 500m 1000m

Information from NZMS 260 (1980)
NZMS 270 (1976)
Aerial photographs (1965)
Henriques (1977)



1. NAME Taihiki River *East*
2. AREA CODE R12/122 Map 54
3. MAP REFERENCE NZMS 260 R12 603 550 to 616 478
4. LOCATION DESCRIPTION Taihiki River
5. TYPE OF WETLAND Mangrove Saltmarsh
Spartina - Approx. 2 km down harbour from mouth of Mauku Stream (Ref. 1).
6. AREA OCCUPIED BY WETLAND (ha) Not known
7. DOMINANT WETLAND VEGETATION/ASSOCIATION This river contains extensive mangroves and many small pockets of maritime marsh.
 Mangroves in western half of Taihiki River are spartan.
 Entrance channel to Taihiki estuary drains very rapidly. The scour is probably unhospitable to mangroves which are subsequently spartan near the mouth.
8. WILDLIFE VALUES Important wader feeding area
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES This area is thought to be particularly important as a nursery area for flounder and grey mullet. It is a feeding area for kahawai and kingfish (Ref. 1).
10. STABILITY OF WETLAND The wetland area appears to have remained stable over the recent past.
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board (intertidal area)

Management agencies: Auckland Harbour Board: Manukau Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)? Manukau Harbour Plan
13. USE OF WETLAND BY MAN No information
14. WETLAND MODIFICATIONS PROPOSED The wetlands are under little threat provided that there are no major sediment inputs from the catchment (Ref. 1).

15. CHARACTERISTICS OF ADJOINING WATER AREAS(a) Use of adjoining water areas:No

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: No treated effluent. Likely run-off from surrounding farmland.

Refuse land fill: No

Recreation: Limited

Fishing: Shellfishing (oyster/mussel) in lower 3-4 km cockles, Amphibola. Subject to Tainui fishery claim.

Sand extraction: No

Other:

(b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: good water quality16. CHARACTERISTICS OF WETLAND CATCHMENT(a) Approximate total area of catchment (ha): Not known(b) Land use of catchment: Approximate percentage of total catchment

in: forest	residential	bare earth
pasture - 85%	industrial	

Other land use likely to affect wetland: None

Reserves present: Esplanade Reserves 1) head of Taihiki estuary.
Proposed Wildlife Reserve - Seagrove and Karaka coastal fringes.

Land use changes anticipated up to year 2000: None

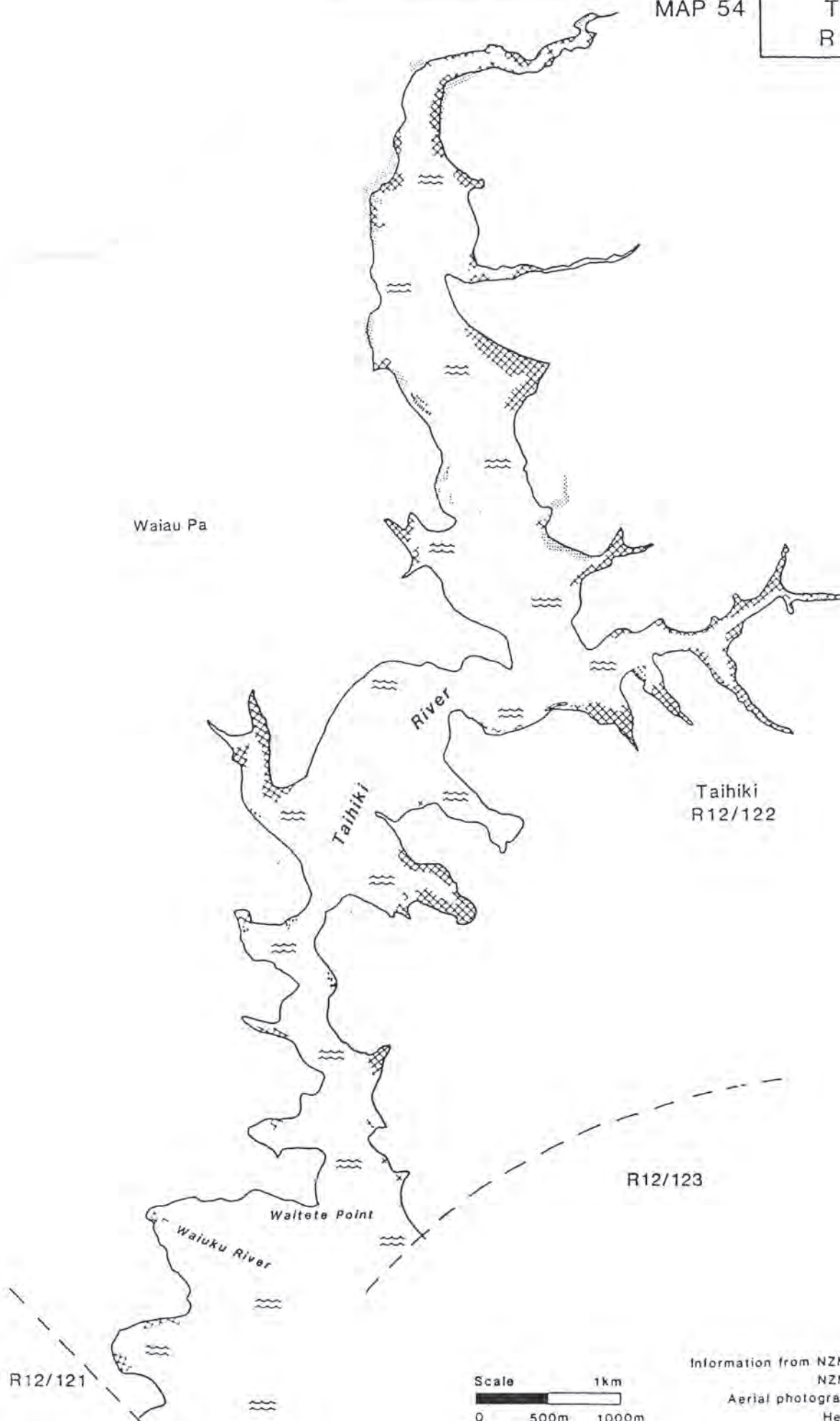
District scheme - zoning provisions: Refer R12/121 for description of District Scheme. Rural 1 zoning to encourage food production.

Controls other than District scheme likely to influence future land use: None

(c) Description of topography (soil type, slope, erosion susceptibility):
Undulating farmland surrounding estuary.17. FUTURE RESEARCH/INFORMATION REQUIREMENTS18. FUTURE MANAGEMENT RECOMMENDATIONS: Protect native vegetation on steep banks (Ref. 1). Manukau Harbour Plan recommended that the wetlands in this area be protected.19. RELEVANT REFERENCES:

1. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan proposed Conservation Zones. Prepared for Manukau Harbour Maritime Planning Authority.

MAP 54

TAIHIKI
R12/122

Information from NZMS 260 (1987)
 NZMS 270 (1978)
 Aerial photographs (1987-88)
 Henriques (1978)

1. NAME Waiuku *West*
2. AREA CODE R12/123 Map 55
3. MAP REFERENCE NZMS 260 R11 616 478 to 596 to 495
4. LOCATION DESCRIPTION Southernmost estuary arm of Manukau Harbour.
5. TYPE OF WETLAND Mangrove, Saltmarsh, Eelgrass, Spartina
6. AREA OCCUPIED BY WETLAND (ha) Approximately 50.
7. DOMINANT WETLAND VEGETATION/ASSOCIATION Mangroves occur only far into the headwaters of western shoreline inlets. There are no mangroves on the western side of the main Waiuku channel. There are several small patches of *Zostera* along the eastern shore of Waiuku Peninsula (Ref. 5). There are patches of *Spartina* in Waipipi Creek. There is a mangrove marsh at the head of Okohaka embayment, another at Parakau Creek, and fringing all the Te Hakono, Kohonui and Pukenhau Creeks (Ref. 3).
8. WILDLIFE VALUES Pollock Spit is one of the Manukau Harbour's outstanding wading bird roosts. Birds move out over the estuary to feed at low tide. There are important neap tide roosts at the eastern end of the headland between Parakau and Mokorau Creeks, and at the eastern end of the headland which is south of Mokorau Creek. Valuable roosting and feeding areas at Te Toro (Ref.3).
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES The Waiuku River estuary is one of the three largest estuaries of the Manukau Harbour. It is situated in the southwest part of the harbour, in an area that is predominantly rural. The town of Waiuku is at the southernmost end of the estuary (Ref. 1). The estuary is a long, narrow, predominantly shallow waterway.
10. STABILITY OF WETLAND No information.
11. CONTROL OF WETLAND AND CATCHMENT
- Ownership status of wetland: Auckland Harbour Board (intertidal areas only)/Crown.
- Management agencies: Auckland Harbour Board, Manukau Harbour Maritime Planning Authority.

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
Manukau Harbour Maritime Plan.
13. USE OF WETLAND BY MAN Waipipi Creek - much of the upper or western area is well fenced and stock access to the intertidal zone is restricted (Ref. 3)
14. WETLAND MODIFICATIONS PROPOSED Possible expansions to NZ Steel mill (Ref. 1)
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No, but there is an area from which local Maori people can get shellfish (at The Needles).

Ports: No - Waiuku Wharf

Marinas/moorings: No

Waste disposal: Waiuku oxidation ponds sewage effluent - discharge of treated waste (predominantly domestic load, with some commercial and light industrial) (Ref. 4). Point sources of pollution - NZ Steel has both process water and treated sewage effluent discharges (Ref. 1). The waste water from NZ Steel is a significant source of pollution in the Waiuku River estuary. This waste contributes more enriching and polluting material to the estuary than do local streams under flood conditions (Ref. 1). The Waiuku oxidation pond does not often discharge, but it does have an outfall in the Waiuku River. In addition, there is a pig farm and a number of dairy farms that discharge into streams which flow into the estuary.

Refuse land fill: No

Recreation: Significant high tide/half tide boating, yachting, canoeing off Waiuku sandspit

Fishing: Waiuku estuary is an important fishing ground

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: The Waiuku River environment and water quality have been under considerable scrutiny as a result of NZ Steel Ltd discharges, and a discharge from the Waiuku Borough sewage treatment oxidation ponds (Ref. 4). During storms there is a high input of suspended solids discharged into the estuary from the steel mill.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment: 5000 ha
- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | | |
|---------|-------------|------------|------------|
| forest | residential | 5% | bare earth |
| pasture | 85% | industrial | 10% |

Other land use likely to affect wetland: NZ Steel mill. Waiuku timber treatment plant.

Reserves present: Esplanade Reserve on:

- 1) Eastern foreshore either side of Glenbrook Steel mill.
- 2) Western foreshore north and south of Waipipi Creek.
- 3) Creek south of Mayhead Road.
- 4) Rangiwheia Creek.

Land use changes anticipated up to year 2000: Mining possible. Possible expansion of steel mill - this will include the possibility of local mining (to supply raw materials) and changes in water use.

District scheme - zoning provisions: Refer to R12/121 for description of district scheme zones. Mostly Rural 1 zoning - to encourage food production. Zoning for industry - zoned for iron and steel making.

Controls other than District scheme likely to influence future land use: Water rights to take water from the Waikato River and to discharge it into the Waiuku Estuary.

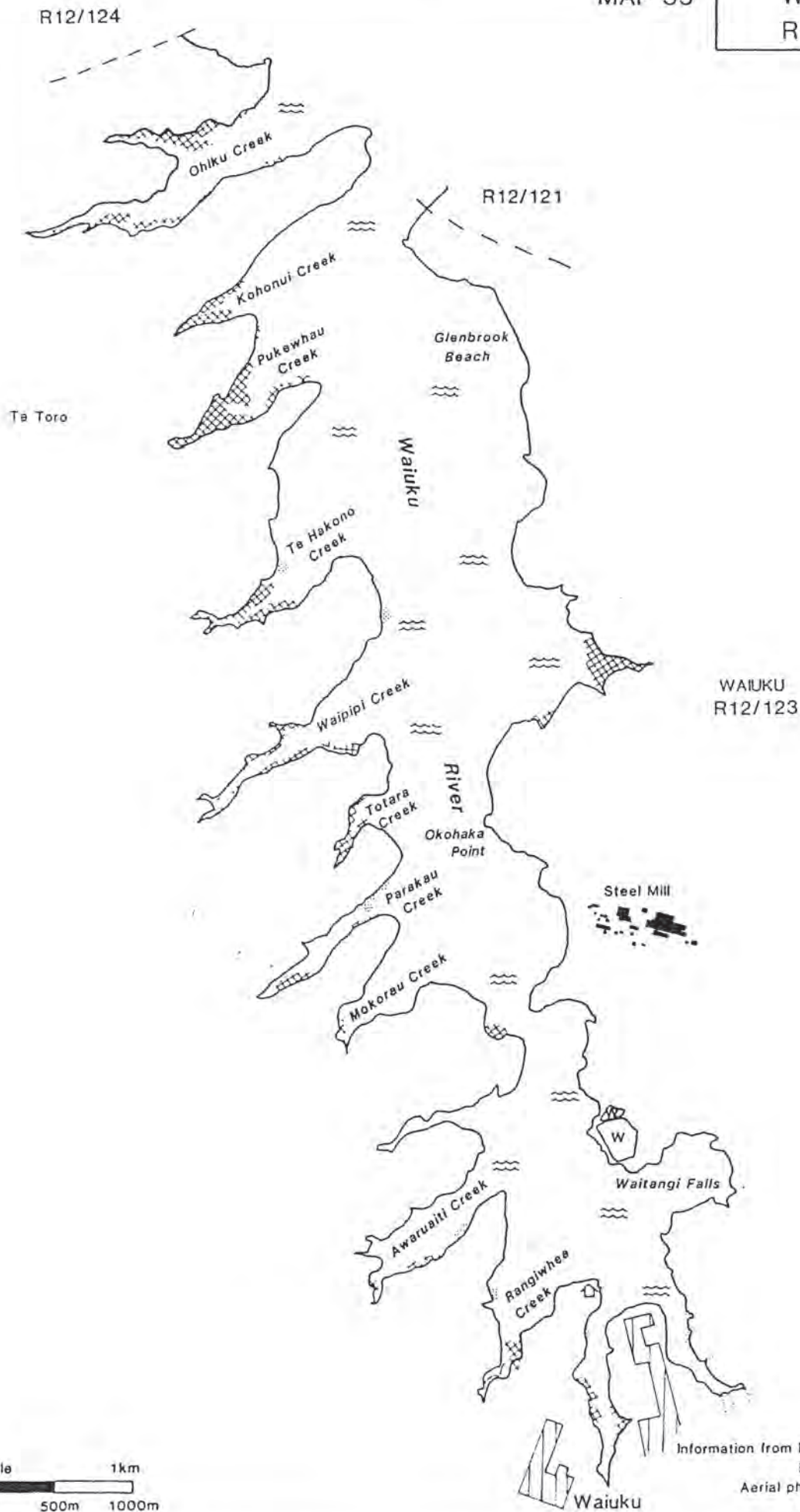
- (c) Description of topography (soil type, slope, erosion susceptibility): Gently undulating at river head, hilly to west of catchment (south Manukau Peninsula).

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS: Research into identifying the bird species which frequent the area.

18. FUTURE MANAGEMENT RECOMMENDATIONS: Eradicate Spartina. Closely scrutinise any further industrial development proposals, especially with regard to their waste discharges.

19. RELEVANT REFERENCES:

- 1) New Zealand Steel Ltd (1980) Proposed Expansion - environmental impact audit - for Commissioner for the Environment.
- 2) Auckland Regional Authority/Auckland Harbour Board (1978) Manukau Harbour Plan.
- 3) Bioresearches Ltd (1985) Manukau Harbour Maritime Plan proposed conservation zone prepared for Manukau Maritime Planning Authority.
- 4) Bioresearches Ltd (1987) The Effects of Effluent Discharged from the Manukau Sewage Purification Works on the water quality and natural environment of the Manukau Harbour - review of existing data.
- 5) Bioresearches Ltd (1978) report for Manukau Harbour Plan.



Scale 1km
0 500m 1000m

Information from NZMS 260 (1987)
NZMS 270 (1978)
Aerial photographs (1988)
Henriques (1978)

West

1. NAME Awhitu
 2. AREA CODE R12/124 Map 56
 3. MAP REFERENCE NZMS 260 R11 590 560
 4. LOCATION DESCRIPTION Harbour coast of southern peninsula of Manukau Harbour.
 5. TYPE OF WETLAND Mangrove Saltmarsh
 6. AREA OCCUPIED BY WETLAND (ha) Not known
 7. DOMINANT WETLAND VEGETATION/ASSOCIATION There is maritime marsh and mangroves in Matakawau Creek in Rangiriri Creek (Ref. 1), and in the Kawitutahi Creek, (Jock Whitley pers comm).
 8. WILDLIFE VALUES Important wading-bird roost at Pollock Spit. In Kauritutahi Creek there is also a bird roost.
Rare species/endangered species Fernbird (Ref. 2)
 9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES Flounder breed in these small inlets
 10. STABILITY OF WETLAND Stable wetland.
 11. CONTROL OF WETLAND AND CATCHMENT
Ownership status of wetland: Auckland Harbour Board
Management agencies: Auckland Harbour Board; Manukau Harbour Maritime Planning Authority
-
- | | Name |
|-----------------------------|-------------------------------|
| Catchment authority | Auckland Regional Water Board |
| Regional planning authority | Auckland Regional Authority |
| Harbour board | Auckland Harbour Board |
| Territorial local authority | Franklin County Council |
| Crown | Department of Conservation |
| Other | |
-
12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
No
 13. USE OF WETLAND BY MAN Stock grazing causing damage to wetlands. Education camps at Awhitu Regional Park.
 14. WETLAND MODIFICATIONS PROPOSED None
 15. CHARACTERISTICS OF ADJOINING WATER AREAS
(a) Use of adjoining water areas: Yes/No
Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: Cowshed waste run-off

Refuse land fill: No

Recreation: Bird-watching, fossicking and educational field trips.

Fishing/Shellfish: Oyster bed near Kauritutahi Island and Matakawau Point, scalloping and fin fishing common.

Sand extraction: No

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment in:
- | | | |
|--------------|-------------|------------|
| forest - 10% | residential | bare earth |
| pasture- 85% | industrial | |

Other land use likely to affect wetland: Regional Park management for Kauritutahi Creek.

Reserves present: Awhitu Regional Park provides good protection to Kauritutahi Creek.

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Refer to 12/121 for description of District Scheme goals. Predominantly Rural 1 - to encourage food production.

Controls other than District scheme likely to influence future land use: None

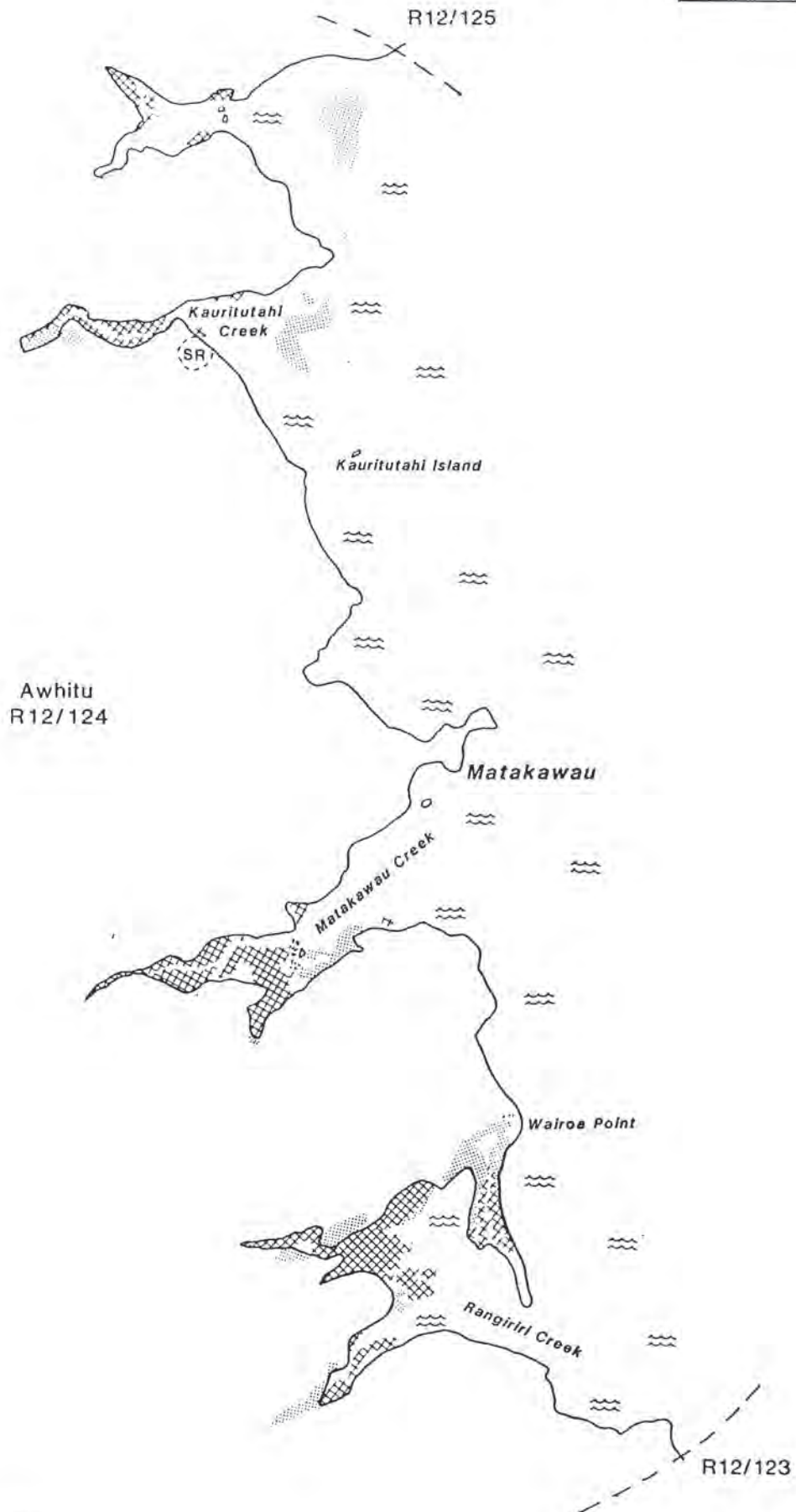
- (c) Description of topography (soil type, slope, erosion susceptibility): Hilly

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Bioresearches Ltd (1985) Manukau Harbour Maritime Plan - proposed conservation zones. Prepared for Manukau Maritime Planning Authority.
2. Bacon -van Roon, M R (1977). Ecology of the Auckland Regional Scheme Review. A report prepared for the Planning Division, Auckland Regional Authority.



Scale 1km
0 500m 1000m

Information from NZMS 260 1987
Aerial photographs 1988
Henriques 1978

West

1. NAME South Manukau Head
2. AREA CODE R12/125 Map 47
3. MAP REFERENCE NZMS 260 R11 and R12 584 580 to 472 600
4. LOCATION DESCRIPTION South Manukau Head
5. TYPE OF WETLAND Eelgrass
6. AREA OCCUPIED BY WETLAND (ha) Negligable
7. DOMINANT WETLAND VEGETATION/ASSOCIATION A small patch of Zostera at Big Bay (Ref. 1).
8. WILDLIFE VALUES
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No information
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Auckland Harbour Board

Management agencies: Auckland Harbour Board: Manukau
Harbour Maritime Planning Authority

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland Harbour Board
Territorial local authority	Franklin County Council
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN None
14. WETLAND MODIFICATIONS PROPOSED None
15. CHARACTERISTICS OF ADJOINING WATER AREAS Yes/No
 - (a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Limited

Fishing: Yes, shellfish and fin fishing common

Sand extraction: Historical sand mining at Big Bay, Potential sand extraction at 'Awhitu Prospect', (Ref. 2).

Other:

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Water quality goal

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - 10% residential bare earth
 pasture- 85% industrial

Other land use likely to affect wetland: None

Reserves present: Orua Bay Scenic Reserve

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Rural 1 Franklin D. Sch - to encourage food production

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):
 Steep hill country

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

1. Henriques, P R (1978). The Vegetated Tidelands of the Manukau Harbour
2. Applied Geology Associates (1982). Coastal and sand shingle resources of Auckland and Northland.

MAP 47

AUCKLAND WEST
COAST Q10/108
HUIA CREEK
R11/109
CORNWALLIS
R11/110
SOUTH MANUKAU
HEAD R11/125

R12/124

R12/125

Graham's Beach

Waiuku Channel

South Manukau Head

Big Bay

Mako Point

Tongaroawhata

Cornwallis

Cornwallis

R11/110

Kakamatua Inlet

Kaitarakihi

Point

Huia Bay

Huia

Lower Huia
Reservoir

Huia Creek

R11/109

Little Huia

Sawyers Point

Beacon Point

R12/126

Manukau Harbour Entrance

Pareitua Island

Auckland West Coast/North Manukau Head

Q10/108

Auckland Centennial Park

Scale 1km
0 500m 1000m

Information from NZMS 260 (1986)
NZMS 270 (1977)
Aerial photography (1987)

1. NAME Tasman Coast of South Manukau Head northern Waikato River.
2. AREA CODE R12/126 No map
3. MAP REFERENCE NZMS 260 R12
4. LOCATION DESCRIPTION Tasman Coast of South Manukau Peninsula
5. TYPE OF WETLAND None
6. AREA OCCUPIED BY WETLAND (ha) No wetlands
7. DOMINANT WETLAND VEGETATION/ASSOCIATION
8. WILDLIFE VALUES
9. OTHER OUTSTANDING BIOLOGICAL/PHYSICAL FEATURES
10. STABILITY OF WETLAND No wetlands
11. CONTROL OF WETLAND AND CATCHMENT

Ownership status of wetland: Crown
 Management agencies:

	Name
Catchment authority	Auckland Regional Water Board
Regional planning authority	Auckland Regional Authority
Harbour board	Auckland
Territorial local authority	Franklin County
Crown	Department of Conservation
Other	

12. CONTROL OF WATER AREAS ADJACENT TO WETLANDS. DOES THIS VARY FROM (11)?
13. USE OF WETLAND BY MAN Not applicable
14. WETLAND MODIFICATIONS PROPOSED Not applicable
15. CHARACTERISTICS OF ADJOINING WATER AREAS

(a) Use of adjoining water areas:

Marine farming: No

Ports: No

Marinas/moorings: No

Waste disposal: No

Refuse land fill: No

Recreation: Limited

Fishing: Yes

Sand extraction: At Tuakau

Other: High energy coast

- (b) Water quality characteristics of adjoining harbour/coast/catchment - likely to affect wetland: Good water quality.

16. CHARACTERISTICS OF WETLAND CATCHMENT

- (a) Approximate total area of catchment (ha): Not known

- (b) Land use of catchment: Approximate percentage of total catchment
 in: forest - residential - bare earth -
 pasture - industrial -

Other land use likely to affect wetland: iron sand mining

Reserves present: None

Land use changes anticipated up to year 2000: None

District scheme - zoning provisions: Rural 1, Franklin

Controls other than District scheme likely to influence future land use: None

- (c) Description of topography (soil type, slope, erosion susceptibility):

17. FUTURE RESEARCH/INFORMATION REQUIREMENTS:

18. FUTURE MANAGEMENT RECOMMENDATIONS:

19. RELEVANT REFERENCES:

KEY

	Catchment boundary boundary of area under study
	Mangrove
	Unspecified wetland
	Salt marsh
	Gracilera
	Zostera
	Spartina
	Eelgrass
	Current marine farming lease
MD	Marine farm product depot
	Urban area
	Oxidation pond
	Sewage treatment plant
	Sewage discharge (marine)
R	Reclamation
PR	Proposed reclamation
	Completed refuse disposal reclamation leachate still present
	Refuse disposal site in current use
	Camping ground



Marina

PM

Proposed marina



Permanent boat moorings and jetties



Wharf



Commercial port

PP

Proposed port



Dam



Road across estuary



Railway



Special "wetland clearance" covenant



Reserved area scenic, wildlife, recreational, conservation



Miranda Naturalist Trust lease



D.O.C. Reserve for wildlife management



Wildlife reserve approx. boundary

SE

Sand extraction



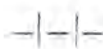
Exotic forest



Quarry



Mining site



Approx proposed natural gas pipeline



Approx. line of pylons

INDEX OF WETLAND AREAS

WETLAND AREA	PAGE	
Airport	364	358
Araparera	302	305
Auckland Central Business District	104	107
Auckland West Coast	333	-
Awaawaroa Bay	42	45
Awhitu	397	399
Big Muddy Creek	350	353
Brighams Creek	153	146
Cape Rodney	247	246
Clark's Creek/Seagrove	386	389
Coates Bay	261	264
Cornwallis	340	339
Cox Creek	113	107
Curlew Bay	81	72
Devonport	182	178
East Coast Bays	192	191
East Tamaki	93	72
Eastern Beaches	65	68
Gum Store Creek	295	297
Hatfields	212	208
Hellyers Creek	165	146
Henderson Creek	135	134
Hobson Bay	99	98
Hokoraka	273	270
Huia Creek	336	339
Inner Hauraki Gulf Islands	209	-
Kaiaua	8	14
Kaipara Harbour	257	-
Kaipara River	313	316
Karaka	383	378
Kauri Point - Little Shoal Bay	168	172
Kawau	238	241
Kirikiri	268	270
Limeburners	138	134
Little Muddy Creek	354	353
Lucas Creek	162	146
Mahurangi Harbour	223	227

Mairetahi	320	322	
Makarau River	306	308	
Mangere Inlet	359	358	
Manukau Harbour	342	-	
Maraetai	27	31	
Matakana Harbour	230	233	
Matawhero	309	312	
Maungamaungaroa Creek	62	61	
Meola Creek	118	107	
Miranda	8		
Motions Creek	116	107	
Ngataringa	179	178	
Northern Coast Manukau Harbour	356	358	
Northern Manukau Head			
Oakley Creek	121	126	
Okaka	326	328	
Okura	194	198	
Omaru Creek	90	72	
Omokoiti	323	322	
Orere	18	21	
Orewa	205	208	
Oruawharo	281	284	
Otahuhu Creek	84	72	
Otamatea	275	277	
Otara Creek	79	72	
Otekawa	285	287	
Pahurehure Inlet	379	378	
Pakuranga Creek	76	72	
Panmure Basin	87	72	
Paremoremo	159	146	
Pollen Island	121		
Ponui Island	36	-	
Puhinui Creek	373	372	
Puhoi	218	208	
Pukaki/Waokauri	369	372	
Putiki Bay	46	49	
Raepere Creek	265	267	
Rangitopuni	156	146	
Shoal Bay	173	178	
Snells Beach	228	227	

South Manukau Head		400	402
Taihiki River		390	392
Takapuna		185	178
Tamaki Drive		95	98
Tamaki Estuary		69	72
Tapora		291	294
Tasman Coast Kaipara North		249	-
Tasman Coast to Waikato River		403	-
Tauhoa/Hoteo		298	301
Tawharanui		234	237
Tē Atatu Peninsula		131	134
Te Matuku Bay		38	41
Tē Muri		221	208
Traherne Island		121	126
Turanga Creek		58	61
Upper Waitemata Harbour		141	146
Waiarohia Inlet		147	146
Waiheke East		55	57
Waiheke North		52	54
Waiheke West		50	49
Waikiri		288	287
Waikopua Creek Estuary		32	35
Waimahia Creek		376	378
Waioneke		317	319
Waionui Inlet		329	332
Wairau		188	178, 191
Wairoa River		22	26
Wairoa River		251	255, 256
Waitemata Harbour		108	-
Waiuku		393	396
Waiwera		215	208
Wakaaranga Creek		73	72
Weiti		199	202
Whakaki		278	280
Whakapirau		271	270
Whangaparaoa		203	202
Whangateau Harbour		242	246
Wharekawa		15	14
Whau River		127	126
Whenuapai		150	146