



# **Whangamata Marina Society (Inc)**

## **Mitigation and Enhancement Plan.**

**FEBRUARY 2007**

**FOR: WHANGAMATA MARINA SOCIETY (INC)**  
**BY: BIORESEARCHES GROUP LIMITED**

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## 1 INTRODUCTION

This Plan describes the enhancement and mitigation measures that would be undertaken as part of the marina development.

There are three main elements to the Plan as follows:

- (i) fauna management
- (ii) Moanaanuanu enhancement area
- (iii) additional enhancement areas

The details of (ii) and (iii) have mostly been established by the Environment Court (EC) decision and endorsed by the subsequent decision of the Minister for the Environment (MfE). The only task to be completed is the identification of potential additional enhancement areas [(iii) above] by the Waikato Regional Council as directed by both the Court and Minister.

For completeness, however, the details of the landscape management plan of (ii) above in particular are included in this Plan.

## 2 FAUNA MANAGEMENT

[Reference : MfE Coastal Permit No. 953761 – paragraph 7]

.....detail a fauna management plan to be put in place that details how the potential and actual effects on the fauna in and around the site during construction of the marina (including associated facilities and structures) will be minimised. The plan shall address fauna to be protected and the consent holder's or its agents' responsibilities and procedures to ensure compliance with the plan.

### 2.1 Reclamation area birds

The species of potential concern is banded rail (*Gallirallus philippensis assimilis*; mohopereru), which is considered to be “sparse” (at risk) but does not meet the criteria for a threatened species. Although not located by lure tape surveys in either the site habitat or enhancement area, the protocol below would also apply to any fernbird (*Bowdleria punctata vealeae*) that could conceivably have colonised the site in the interim, especially following disturbance to maritime habitats above the causeway. Fernbird has the same conservation rating as banded rail (i.e. is considered “at risk” – sparse – but not “threatened”).

- [(i) Hitchmough, R; Bull, L and Cromarty, P (compilers) 2005  
New Zealand Threat Classification System Lists. 194 pp (*publ.* Jan. 2007). Dept. of Conservation].
- [(ii) Molloy, J *et al* 2001  
Classifying species according to threat of extinction. 24 pp. Dept. of Conservation].

#### 2.1.1 **Breeding season**

The removal and relocation of the rush marsh habitat will be part of the initial stage of the development and may occur within either the main breeding season (September to December) or known extended breeding season (September to April) [Heather, B.D. & Robertson, H.A. 2005. The Field Guide to the Birds of New Zealand. 440 pp. Viking].

If works occur between August (to accommodate any early nesting) and April inclusive, the following monitoring is proposed :

- the rush marsh and perimeter habitats will be systematically searched using a grid pattern for the presence of indicative banded rail footprints, banded rail nests, fernbirds and their nests.
- searches will be undertaken at intervals of two weeks, one week and 48 hours prior to the commencement of rush marsh removal and relocation.
- if any nests containing eggs or unfledged juveniles are located, the Conservator, Waikato Conservancy, Department of Conservation would be notified with a view to their removal to an offsite incubation and rearing facility to be nominated by the Conservator.

### **2.1.2 Non-breeding period**

Between May and July inclusive, there would be no breeding activity likely, but use of the site rush marsh may occur. No specific management is proposed because the presence of personnel and machinery would result in any birds vacating the area.

### **2.2 Reclamation area reptiles**

Reptiles in the Harbour edge habitat between the footbridge and the Reserve at the end of Beach Road would be surveyed using artificial cover objects (ACOs), captured and relocated in consultation with the Department of Conservation.

### **2.3 Animal pest control**

There are likely to be animal pests, especially rats, within the rush marsh area and its perimeter, particularly within the pampas-infested portion. Once the rush marsh removal and relocation phase commences, those pests will disperse to both surrounding residential areas and probably into the Moanaanuanu Enhancement Area habitat, which would place additional predation pressure on the banded rail population, any fernbirds, and reptiles in that area especially if that phase occurs during the bird breeding season.

To minimise the potential effect of pests dispersing from the site saltmarsh, rat bait stations will be placed around and within the site saltmarsh and on the immediate upstream side of the causeway four weeks prior to works occurring in or adjacent to the site rush marsh area. That program will be established and managed by experienced animal pest control contractors.

#### 2.4 Associated facilities and structures

“Associated facilities and structures” has been assumed to relate to the marina basin and general works and preparatory areas associated with the development.

The two key species are New Zealand dotterel (*Charadrius obscurus aquilonius*; tuturiwhatu pukanui), which is a threatened species with a rating of nationally vulnerable (acutely threatened) and variable oystercatcher (*Haematopus unicolor*; toreapango) which is *not* considered either threatened or at risk (Hitchmough *et al*, 2005) but is also a characteristic species of the Coromandel-Bay of Plenty coastline.

Monitoring of adjacent intertidal feeding and resting habitats is included in the Environmental Management Plan document together with controls on and monitoring of the discharges that would occur during the construction phase.

Secondly, management of the specific area on the eastern side of the Harbour, well removed from this site, that is utilised for breeding by NZ dotterel will be provided by the Whangamata Marina Society under an agreement with the Department of Conservation.

Management of the remainder of the site would include the following, which are aimed at minimising disturbance during the construction period to NZ dotterel and variable oystercatcher in particular, but Harbour birds in general, in areas immediately adjacent.

- no vehicles or machinery will operate in the intertidal habitats beyond the immediate works areas of the marina footprint.
- dogs introduced to the site by construction personnel will remain tethered at all times.

### 3 MOANAANUANU ENHANCEMENT AREA

#### 3.1 Condition

[Reference : MfE Coastal Permit No. 953761 – paragraph 8]

*.....enhancement and restoration works to be undertaken on the land described as the "enhancement area" on Figure 1 attached to Environment Court decision A173/2005 dated 26 October 2005 and in general accordance with the Moanaanuanu Estuary Enhancement Proposed Management Plan, being Appendix 6 to Mr Don's evidence to the September 2005 hearing. The enhancement and restoration works encompassed by this condition (excluding the initial 2 year maintenance program) shall be completed before the marina commences operation.*

#### 3.2 Enhancement works

##### 3.2.1 Vegetation enhancement

Figure 1 and Appendix 6 referred to above and reproduced from the Environment Court's decision are attached as follows:



FIGURE 1



FIGURE 1 ENHANCEMENT AREA

## APPENDIX 6

### Moanaanuanu Estuary Enhancement Proposed Landscape Management Plan



**WHANGAMATA MARINA  
MITIGATION PROPOSAL**

**PROPOSED LANDSCAPE  
MANAGEMENT PLAN**



Prepared by Bernard Brown Associates Ltd  
ANZILA  
July 2005



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- 1.0 Introduction
- 2.0 Terms of Reference and Work Brief
- 3.0 Existing Environment
- 4.0 Proposed Landscape Management Plan
- 5.0 Cost Estimates
- 6.0 Site Works and Planting Specifications
- 7.0 Maintenance Requirements

**APPENDICES**

- Appendix 1 Whangamata Marina - Mitigation Proposal - Proposed Landscape Management Plan. Drawing No. 64/2005
- Appendix 2 Proposed Plant Schedule



## 1.0 INTRODUCTION

- 1.1 My full name is Bernard Duncan Brown and I hold the following qualifications gained from Lincoln University (1967 – 1973 ) Dip Hort (Distinction), Cert LD and ANZILA (Associate Member of the NZ Institute of Landscape Architecture). I have had 32 years work experience with central government (NZED and MWD) and 16 years as a private consultant Landscape Architect based in Hamilton and Raglan.
- 1.2 I have worked throughout the Coromandel Peninsula for the last 25 years having been involved with various roading developments, consent applications and assisted the Department of Conservation with management plans
- I am familiar with the coastal ecological values associated with most harbour environments throughout the Coromandel Peninsula

## 2.0 TERMS OF REFERENCE AND WORK BRIEF

- 2.1 The terms of reference for this mitigation proposal are contained in a letter to Bernard Brown Associates (BBA) from the Whangamata Marina Society (WMS) dated 2 July 2005
- 2.2 The specific work brief tasks required are outlined in the above correspondence and were confirmed following a site visit by Bernard Brown and Mr Mick Kelly of (WMS) on 12 July 2005. These tasks include the following.
- Prepare a Proposed Landscape Management Plan (LMP) that is consistent with the recommendations made by Mr Graham Don of BioResearches Ltd in the report titled Whangamata Marina Society, Moanaauanu Estuary, Esplanade Strip, Enhancement Proposal dated June 2005
  - Describe the existing environment of the subject site and advise on key site preparation works required prior to planting
  - Advise on appropriate mix of species and planting densities for areas below and above mean high water and collectively incorporate these into a Proposed Landscape Management Plan.
  - Supply a Proposed Planting Schedule with associated Estimated Costs covering Site Preparation and Site Works, Plant Supply and Planting with follow up maintenance over 2 years.



### 3.0 EXISTING ENVIRONMENT

- 3.1 The subject site is illustrated in Figure 1 below and comprises an area of approximately 1.5 ha of land adjoining the eastern margins of Moanaauanu Estuary being part of the greater Whangamata Harbour.

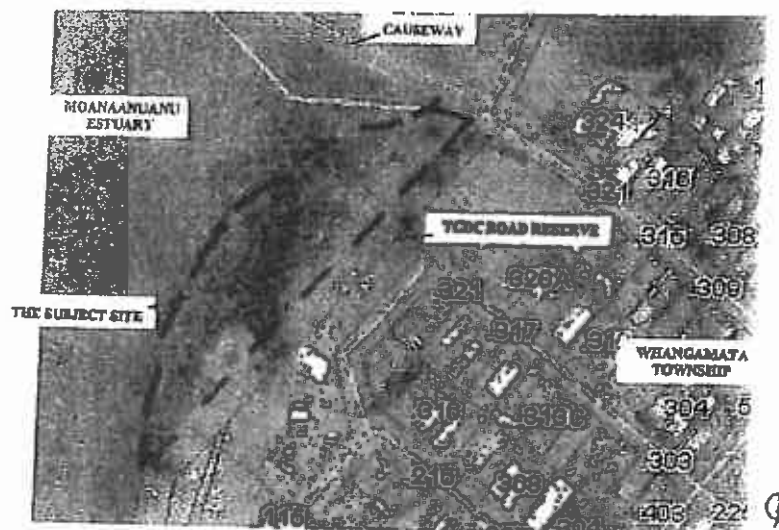


Figure 1 - The subject site proposed for enhancement

- 3.2 Originally included within the site is the Thames Coromandel District Council 20m wide road reserve which is planned to provide future pedestrian access along the Moanaauanu Estuary. This leaves an approximate total area of 6800m<sup>2</sup> available for enhancement plantings.
- 3.3 Research on historical aerial photographs of the area indicate that up to 1950 the site was occupied by Manuka Scrubland with adjoining pasture and exotic forestry. Prior to clearing for these land uses all dryland margins of the Moanaauanu Estuary were probably covered with extensive Pohutukawa-Haupara climax forest.
- 3.4 Recent incremental filling over the greater area has occurred permitting residential and light industrial land uses. In the subject site, clean fill has been placed to depths of 1.0m at the northern end and extending to estimated depths of 2.5m - 3.0m in the south portion of the proposed enhancement area. The site has a general unkempt appearance with scattered industrial debris common in the southern areas. Extensive Kikuyu ground cover exists with large patches of Pampas and Wattle.



- 3.5 Two open stormwater drains currently dissect the mid sections of the site. Should TCDC require integrated development of a walkway in conjunction with this enhancement proposal, the two open drains will need piping at least over the 20m width of the legal road reserve.
- 3.6 The historical ad hoc placement of clean fill over the entire site has resulted in mostly poorly drained soils with characteristics resembling andesitic clays laid on sands and estuarine muds. In my opinion, in order to achieve the objectives of the Bioresearches Ltd enhancement planting proposal involving Rushmarsh Habitat, Batter to Rushmarsh & Esplanade (Drier Ground) Associations, local earthworks are required to better define the estuarine margin and higher drier land/soils.
- 3.7 The above can be achieved by excavating the existing fill batters along the estuarine margin thus forming a 5 – 10m wide "littoral bench" where transplanted Rushes are proposed. All excavated material can be placed parallel to the TCDC walkway forming a series of earthmounds strategically placed between the existing open drains. These areas would effectively form the Esplanade Strip comprising dry ground with the secondary/olimax species proposed in the Bioresearches Ltd report.
- 3.8 In my opinion, the clean fill used is suitable as a "soil" capable of supporting the proposed native revegetation species. It is recommended that immediate grassing with DAP fertiliser be undertaken following site works. It is also recommended that all plantings undertaken have 1 / 20 Agriform Fertiliser tablet and 30 gms wet Rainsaver applied sub surface at planting time. All plantings require to be staked and tied immediately following planting.



- 4.0 **PROPOSED LANDSCAPE MANAGEMENT PLAN** (refer attached Appendix 1)
- 4.1 The attached Appendix 1, Proposed Landscape Management Plan, presents a Plan with two sections incorporating the site works concept previously described in Sections 3.6 and 3.7 above
- 4.2 The three native planting associations proposed by Biosearches Ltd are illustrated in each of the Sections A-A and B-B. In summary, each of these areas comprise:
- Rushmarsh Habitat - 1600m<sup>2</sup>  
Transplanted Rushes from the Marina Site
  - Formed Batter to Rushmarsh - 3200m<sup>2</sup>  
Planted species comprising Marsh Ribbonwood, Flax, Coprosma propinqua, Marsh Daisy and Sedges  
Total Plants required @ 1.5m spacing - 1400
  - Esplanade Strip (On Mounds) - 4000m<sup>2</sup>  
Planted species comprising, Manuka, Karo, Karuna, Five Finger, Ake Ake, Koromiko, Cabbage Tree, Kahikatea, Pohutukawa, Rimu and Sedges  
Total Plants required @ 1.5m spacing - 1700
- 4.3 In compliance with Biosearches Ltd recommendations a continuous 300m long wire mesh fence is proposed to be located on the western TCDC Road Reserve boundary (refer attached Appendix 1)
- 5.0 **COST ESTIMATE** (based on current contract rates)
- 5.1 Task 1 – Survey & Tidy Up (Spring / Summer)
- Survey and establish all boundaries
  - Remove all debris from site
- \$2,500
- 5.2 Task 2 – Site Preparation (Spring Summer)
- Spray all Kikuyu ground cover
  - Remove Pampas and Wattle and all woody weeds
  - Use 12 tonne Excavator Truck off site  
Estimate 2 days @ \$800/day
- \$2,000  
\$1,600
- 5.3 Task 3 – Site Works (Summer)
- Excavate littoral bench
  - Form earth mounds
  - Shape batters and grass
  - Use 12 tonne Excavator @ \$800/day  
Estimate total 4 days
  - Grass all areas using Soil Conservation Mix – Browntop, Yorkshire Fog, Clover with DAP fertiliser @ 250kg/ha
- \$2,000  
\$3,200  
\$800





5.4	<b>Task 4 – Plant Supply and Planting ( Winter – May – September )</b>	
	• Transplanting of Rushes Use Hoff Loader @ \$800/day (Estimate 2 days)	\$1,600
	• Plant Batter to Rush Marsh Use minimum Pb2 grade @ \$3.50 ex nursery 1400 Pb2 plants @ \$7.00 planted	\$9,800
	• Plant Esplanade Strip (on mounds) Use minimum Pb2 grade @ \$3.50 ex nursery 1700 Pb2 plants @ \$7.00 planted	\$11,900
	• Ancillary Materials Supply 3100 14cm Bamboo Stakes & Tree Lok Ties @ 20¢ each Supply 7 Boxes Agriform Fert Tablets @ \$80/box Supply 10kg Rainsaver @ \$30/kg	\$620 \$560 \$300
5.5	<b>Task 5 – Install Wire Mesh Fence</b>	
	• 300m long / 900mm high wire mesh fence @ \$12/m installed	\$3,500
	<b>Total Project Estimated Capital Costs (net)</b>	<b>\$38,380</b>

## 6.0 SITE WORKS AND PLANTING SPECIFICATIONS

### 6.1 Weed Control

- (a) The key site works objective is to control/remove all existing Kikuyu ground cover and woody weeds including Pampas and Wattle
- (b) Under no circumstances should earthworks (site works) be undertaken until all of the above weeds are deemed effectively controlled or removed from site.

### 6.2 Planting

- (a) All plants supplied shall be minimum Pb2 grade.
- (b) All plantings shall have the following supplied at planting time:
  - 1/20gm Agriform Fertiliser Tablet
  - 30gms wet Rainsaver
  - 1/14mm x 1200mm Bamboo Stake each plant tied with Tree Lok ties
- (c) Prior to planting spot spray with Roundup at 1.5m spacings.



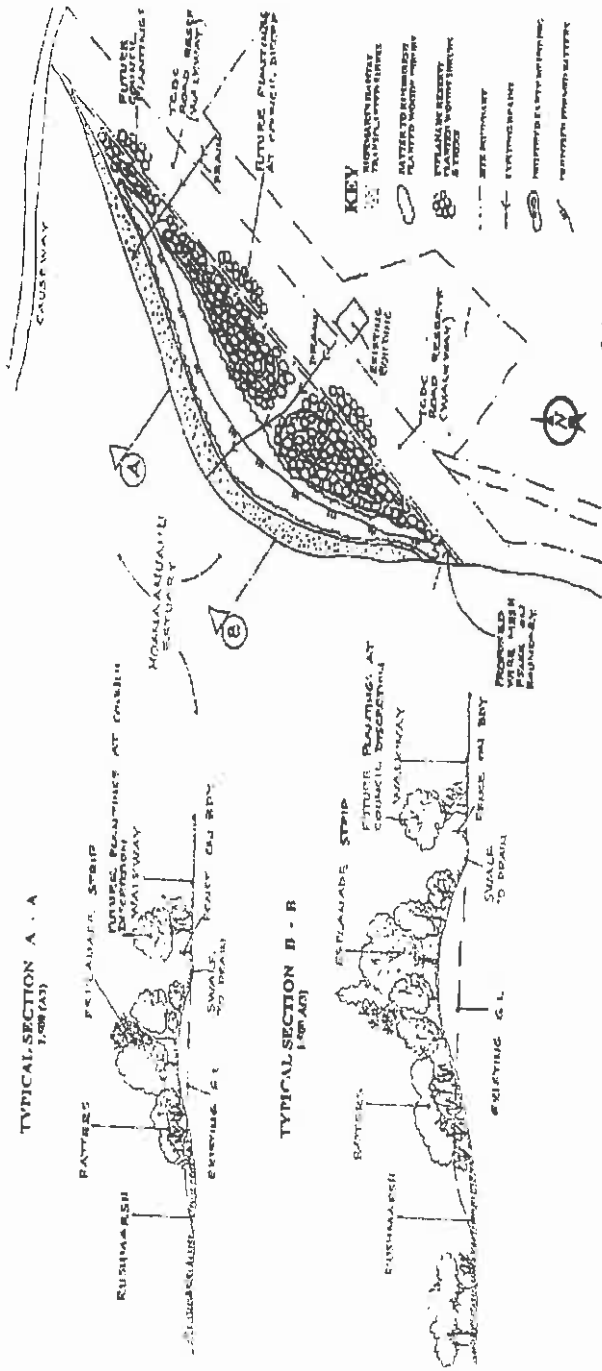
7.0 **MAINTENANCE REQUIREMENTS**

- 7.1 It is recommended that a minimum 2 year maintenance programme be undertaken following plantings
- 7.2 Each year a total of 3 site visits shall be undertaken to "release" plantings from encroaching grass cover. The task is best performed by hand. No herbicides shall be used
- 7.3 Current contract rates for releasing are 0.30¢ per unit net. Given the total 3100 planted species required the estimated contract maintenance costs over 2 years with 6 site visits are:

$$3100 \text{ plants} \times 0.30¢ \times 6 = \$5,580 \text{ (net)}$$

Bernard Brown ANZILA  
July 2005





**WHANGAMATA MARINA SOCIETY - MITIGATION PROPOSAL  
PROPOSED LANDSCAPE MANAGEMENT PLAN**

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 Environmental Planning and Design Consultants  
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**WHANGAMATA MARINA - PROPOSED MITIGATION  
PROPOSED PLANTING SCHEDULE**

COMMON NAME	BOTANICAL NAME	MIN GRADE	NO REQ
Rushmarsh Habitat			
Sea Rush	<i>Juncus kraussii</i>		
Oi Oi	<i>Apodasmia similis</i>		
	<i>Baumea juncea</i>		

All species to be transplanted using Hoff Loader. Place bucket minimum 300mm beneath root systems and keep intact.

<b>Formed Batters to Rush Marsh - 1400 plants</b>			
Marsh Ribbonwood	<i>Plagianthus divaricatus</i>	Pb2	200
Swamp Flax	<i>Phormium tenax</i>	Pb2	300
	<i>Coprosma propinqua</i>	Pb2	100
Marsh Dairy	<i>Olearia solandri</i>	Pb2	100
Sedge	<i>Cyperus ustulatus</i>	RTH	200
	<i>Carex flagellifera</i>	Pb2	300
Manuka	<i>Leptospermum scoparium</i>	Pb2	300
• Manuka to be Eco sourced - Use local seed			

<b>Esplanade Strip - 1700 plants</b>			
Manuka (as above)	<i>Leptospermum scoparium</i>	Pb2	300
Karo	<i>Pittosporum crassifolium</i>	Pb2	200
Houpara	<i>Pseudopanax lessonae</i>	Pb2	100
Ake Ake	<i>Dodonaea viscosa</i>	Pb2	200
Koromiko	<i>Hebe stricta</i>	Pb2	200
Cabbage Tree	<i>Cordyline australis</i>	Pb2	100
Kahikatea	<i>Dacrydium dacrydioides</i>	Pb2	100
Pohutukawa	<i>Metrosideros excelsa</i>	Pb2	100
Sedge	<i>Cyperus ustulatus</i>	RTH	200
Sedge	<i>Carex flagellifera</i>	Pb2	200
• RTH grades are Roottrainer Hilsons			

**APPENDIX 2**



### 3.2.2 Animal pest control

In addition, an ongoing animal pest control program will be established that will target rats, possums and stoats throughout the enhancement area primarily to minimise the predation pressure on the banded rail population utilising that area. That will involve the following trapping effort:

- 12 rat bait stations
- 2 possum bait stations
- 2 mustelid traps and covers

The program will be established and managed by experienced animal pest control contractors.

## 4 ADDITIONAL ENHANCEMENT AREAS

### 4.1 Condition

[Reference : MfE Coastal Permit No. 953761 – paragraph 10]

*To the extent practicable, and to the extent of the areas that are made available to the consent holder for enhancement prior to the date on which marina construction is programmed to commence, and following consultation with Thames Coromandel District Council, Waikato Regional Council, iwi representatives and the Department of Conservation, native rush plants from the marina site saltmarsh that are not transplanted in accordance with condition 8 of this consent shall be used to enhance other estuarine sites in the District. That enhancement process, will as a priority, remedy sites from which pampas has been removed, to the extent that the total area of enhancement (including areas provided for under condition 8 of this consent) is equal to or exceeds the area of saltmarsh removed for development of the marina, provided that sufficient areas have been made available prior to the date on which marina construction is programmed to commence, and shall be carried out under the guidance of an appropriately experienced and suitably qualified ecologist acceptable to the Waikato Regional Council.*

*The Waikato Regional Council will advise the consent holder of areas available for enhancement at least two weeks in advance of the programmed date of commencement of construction.*

### 4.2 Enhancement Works

Pampas would be removed and replaced with rush plants from the marina site.

The site(s) would be selected by the Waikato Regional Council.