FIELD SURVEY OF SELECTED THREATENED, AT RISK, AND OTHER SIGNIFICANT INDIGENOUS PLANTS IN THE OHIWA HARBOUR CATCHMENT

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Field Survey of Selected Threatened, At Risk, and Other Significant Indigenous Plants in the Ohiwa Harbour Catchment

Contract Report No. 2616

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Reviewed and approved for release by:

_____

William Shaw
Principal Ecologist
Director
Wildland Consultants Ltd

1. INTRODUCTION

As part of the Ohiwa Harbour Strategy, the Bay of Plenty Regional Council is undertaking a range of work on the ecology of Ohiwa Harbour and its catchment (see Figure 1). Ohiwa Harbour is located in the eastern Bay of Plenty, and the catchment includes various sites of significant ecological value, including estuarine habitats, streams, freshwater wetlands, and indigenous forest. One of the identified gaps in the knowledge of the harbour catchment ecology is the current distributions and densities of threatened plant species in the catchment, and the Council commissioned Wildland Consultants Ltd to provide expert advice, including a field survey of selected known populations of threatened and regionally uncommon plants, and development of a management strategy to maintain and enhance threatened plant populations in the catchment.

This report provides a description of the work that was undertaken, an overview for each species, and priorities for future field surveys and management. A separate assessment is provided for *Pimelea tomentosa*. Detailed site records are appended for each of the species, along with site maps, and GPS coordinates for site records.

2. METHODS

A table of known populations of significant species in the Ohiwa Harbour catchment, with GPS coordinates, was collated by the Regional Council. These records were mapped onto an aerial photograph using ARCGIS, and additional known populations were then hand-marked on this map.

Using this map, and the current classifications for threatened plants in New Zealand (de Lange *et al*. 2008), priorities were identified for field survey. The highest priorities were species with the highest threat rankings, and included Thornton kanuka, *Pimelea tomentosa*, and king fern.

Other species were included in the survey programme on the following basis:

- they were also present near or at the same sites for the above species (e.g. *Austrostipa stipoides* on Uretara Island); or
- they are species not currently known (or are very uncommon) from other coastal sites in the Bay of Plenty Region (e.g. *Astelia grandis*);
- they are species that were likely to be relatively quick to locate (for an experienced rare plant botanist).

Once populations were identified for field survey, a search of herbarium records was undertaken, to see if there was any additional information on the known populations. The local Department of Conservation botanist was also contacted to discuss the study.

Data Acknowledgment

Topo Map: Crown copyright reserved

Report: 2616
Client: -
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Path: E:\gis\sarah\Ohiwa Harbour significant flora\mxd\Figures\Ohiwa Catchment.mxd
File:

Figure 1. Study Area
Ohiwa Harbour Catchment

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Scale: 1:150,000
Date: 20/04/2011
Cartographer: FM
Format: A4R

A survey plan was then prepared for the populations selected, and landowners were contacted to arrange access permission. A field survey was then undertaken. Information was recorded in the following fields:

- Species Name
- General Location
- Reserve and Administering Authority **or** Private Land Owner **or** Multiple-Owned Māori Land
- Inspection Date
- Inspection Time
- Population Size
- Distribution and Habitat
- GPS Reference
- Photographs
- Threats
- Management Requirements
- Monitoring Requirements
- Priorities for Future Survey

Field surveys were undertaken over the period January-March 2011.

Completed field sheets are provided in Appendix 1, along with a print-out of the information available for each species on the New Zealand Plant Conservation Network (NZPCN) website (including a photograph of the species where a photograph of the species from the current survey has not been included).

3. OVERVIEW OF FINDINGS

Thirteen sites were surveyed for a total of 16[1] species, as listed in Table 1. Several significant species were surveyed and/or found at each site. A total of 25 populations of 10[1] significant species were located, including 13 new populations of significant species[1] (listed in Table 2). The new populations included four populations of two nationally threatened species[1] at several sites. Five species not previously known to be present in the Ohiwa catchment were also found. Sites are mapped in Figure 2 (10 sheets), as presented in Appendix 2. GPS points for all records found during the current field survey are provided in Appendix 3.

Two species records in the Regional Council list of significant species are incorrect and should be deleted - refer to Table 2.

[1] Including *Ficinia spiralis* in Whangakopikopiko Wildlife Refuge Reserve, of which all plants may have been planted.

Table 1: Threatened, At Risk, and other significant indigenous plants in the Ohiwa Harbour Catchment.

Key: (1) = Specified for survey in this contract; (2) = Not a scheduled site for survey; (3) = Not a scheduled species for survey at this site.

Threatened Species

Species	Threat Classification	Location	Surveyed in 2011 ✓	2011 Survey ✓ = Found x = Not Found	New Record in 2011	Reference	Notes
Kunzea 'Thornton'	Threatened-Nationally Vulnerable	Whangakopikopiko Wildlife Refuge Reserve[1]	✓	✓			Record needs to be confirmed.
Pimelea tomentosa	Threatened-Nationally Vulnerable	Hiwarau	✓(2)	x		Beadel 1993	
		Toritori	✓(2)	x		Beadel 1993	One plant recorded in 1993.
		Uretara Island Scenic Reserve (1)	✓	x		Beadel & Shaw 1988	
		Claydon Place (1)	✓	✓		Beadel *et al*. 1999	One plant recorded in 1990. Scramble around from 100 m from *Sicyos* site. Plant under pohutukawa just above beach.
		Waiotane Scenic Reserve[1]	✓	x		Beadel & Shaw 1988	Note: *P. tomentosa* has not been recorded from RAP 17 (Waiotane Scenic Reserve Extension) as indicated in the BOP Regional Council table of significant species in the Ohiwa Harbour.
		Oscar Reeve Scenic Reserve		-		Clarkson & Regnier 1989	
Dianella sp.		Uretara Island Scenic Reserve			✓(3)	Current survey	Possible new record.
Epilobium insulare[3]	At Risk-Declining	Wordsworth Covenant		-		Beadel *et al*. 1999	Note *E. insulare* has not been recorded from RAP 90 - Wordsowth Covenant Extension as indicated in the BOP Regional Council table of significant species in the Ohiwa Harbour catchment.
Poa billardierei	At Risk-Declining	Whangakopikopiko Wildlife Refuge Reserve			✓(3)		
Ptisana salicina	At Risk-Declining	Ford Covenant, Stanley Road (1)	✓	✓			

Species	Threat Classification	Location	Surveyed in 2011 ✓	2011 Survey ✓ = Found x = Not Found	New Record in 2011	Reference	Notes
Ficinia spiralis	At Risk-Relict	Whangakopikopiko Wildlife Refuge Reserve		-	✓(3)	Beadel 1988	
Adelopetalum tuberculatum	At Risk-Naturally Uncommon	Stanley Road"B" (1)	✓	✓		DOC Threatened Species Layer	P. Cashmore pers. comm.
		Waiotane Scenic Reserve			✓(3)		
		Matakerepu Historic Reserve			✓(3)		
		Uretara Island Scenic Reserve			✓(3)		
Peperomia tetraphylla	At Risk-Naturally Uncommon	Matekerepu Historic Reserve (1)	✓	✓		Clarkson and Regnier 1989	
		Waiotane Scenic Reserve	✓	✓(3)			
		Ford Covenant, Stanley Road A			✓(3)		
Sicyos australis	At Risk-Naturally Uncommon	Claydon Place, Port Ohope (1)	✓	x		DOC Threatened Species layer	Not a natural population. Planted at this site in around 1996.
Tetragonia tetragonoides	At Risk-Naturally Uncommon	Whangakopikopiko Wildlife Refuge Reserve	✓	x(3)		Beadel *et al*. 1999	Recorded in 1996.
		Uretara Island Scenic Reserve (1)	✓	x			

Other Significant Species

Species	Significance	Location	Surveyed in 2011 ✓	2011 Survey ✓ = Found x = Not Found	New Record in 2011	Reference	Notes
Austrostipa stipoides	Reaches southern distributional limit on the eastern side of the North Island in Ohiwa harbour.	Otao Domain, Harbour Road	✓	✓(2)		Beadel 1993	
		Motuotu Island (2)				Clarkson & Regnier 1989	
		Pataua Island (2)				Clarkson & Regnier 1989	
		Stipa (2)				Beadel 1993	Largest known population

Species	Significance	Location	Surveyed in 2011 ✓	2011 Survey ✓ = Found x = Not Found	New Record in 2011	Reference	Notes
							in harbour.
		Uretara Island Scenic Reserve	✓	✓(3)		Beadel & Shaw 1988	
		Whangakopikopiko Wildlife Refuge Reserve			✓(3)		
Asplenium terrestre subsp. *maritinum*	Regionally Uncommon.	One site on Ohakana Island.		-		Beadel 1993	This species is likely to occur locally in pohutukawa forest on harbour margins. Only known from one other mainland site on the east coast of North Island, but does occur on Moutuhora Island.
Astelia grandis	Regionally Uncommon. Not known elsewhere in the Taneatua Ecological Region.	Hiwarau Wetland, Nukuhou Estuary(1)	✓	✓		Beadel 1993	
Bolboschoenus caldwellii	Regionally Uncommon.	Hiwarau Wetland, Nukuhou Estuary	✓		✓(3)	Beadel 1993	
Ranunculus acaulis	Regionally Uncommon. Not known from elsewhere in the Taneatua Ecological District.	Near Harbour Road	✓	x(2)		Beadel 1993	Not known elsewhere in Whakatane Ecological Region.
Schoenus apogon	Regionally Uncommon. Not known from elsewhere in the Taneatua District.	Hiwarau	✓	x(3)		Beadel 1993	
Sparganium subglobossum	Regionally Uncommon.	Hiwarau	✓	x(3)		Beadel 1993	
		Ouaki Creek Wetlands		-		Beadel 1993	Only known from two other sites in Ecological District.
Syzygium maire	Regionally Uncommon. Only known from a few other sites in the Taneatua Ecological District.	Te Rereoterangi		-		Beadel *et al*. 1999	
Tetraria capillaris	Regionally Uncommon. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau Wetland, Nukuhou Estuary(1)	✓	✓		Beadel 1993	
Hierochloe redolens	Only known location in the Ecological Region.	Hiwarau		-		Beadel 1993	
Drosera binata	Not known from elsewhere in the Taneatua Ecological District.	Hiwarau Wetland, Nukuhou Estuary	✓	✓(3)		Beadel 1993	

Species	Significance	Location	Surveyed in 2011 ✓	2011 Survey ✓ = Found x = Not Found	New Record in 2011	Reference	Notes
Leptinella squalida subsp. *squalida*	Not known from any other site in the Taneatua Ecological District.	Nukuhou Estuary	✓	x(3)		Beadel 1993	Local distribution.
Austroderia toetoe	Local. Uncommon in Taneatua Ecological District.	Nukuhou Estuary			✓(3)		
Epilobium pallidiflorum	Local. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau Wetland, Nukuhou Estuary			✓(3)		
Hydrocotyle pterocarpa	Local. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau Wetland, Nukuhou Estuary			✓(3)		
Lophomyrtus bullata	Local. Only known from two sites in Taneatua Ecological District	Stanley Road "C"	✓	✓(2)			
Nertera scapanioides	Local. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau Wetland, Nukuhou Estuary			✓(3)		

Table 2: Species incorrectly listed on the 2010 Bay of Plenty Council Regional List of Significant Species in the Ohiwa Catchment.

Species	Feature	Location	GPS Point	Surveyed in 2011 ✓	2011 Survey ✓ = Found x = Not Found	Reference	Action Required
Pimelea tomentosa	Threatened-Nationally Vulnerable	Te Awairoa Stream, off Hiwarau Road	2873000, 6343000		-	DOC Threatened Species Layer	Incorrect record. Delete from Ohiwa Catchment records.
Austrostipa stipoides		Near Ohiwa Road			-	Beadel 2001	Small populations in salt marsh contiguous with freshwater wetlands near Ohiwa Road. New eastern limit. Thirty-one plants found, several browsed by rabbits. This population is in Waiotahi Estuary outside of the Ohiwa Catchment. Delete from Ohiwa Catchment records.

Many new records were located during the 2011 survey and these are listed in Table 3.

Table 3: New records of threatened/significant species found in the Ohiwa Harbour catchment during the current survey.

Species	Status	Location	No. of Populations Found
Poa billardierei	At Risk-Declining	Whangakopikopiko Wildlife Refuge Reserve	1
Ficinia spiralis (pingao)[1]	At Risk-Relict	Whangakopikopiko Wildlife Refuge Reserve	Several small populations.
Adelopetalum tuberculatum	At Risk-Naturally Uncommon	Matekerepu Historic Reserve	2
		Waiotane Scenic Reserve	4
		Uretara Island	1
Peperomia tetraphylla	At Risk-Naturally Uncommon	Ford Covenant Stanley Road "A"	1
Austroderia toetoe	Uncommon in Taneatua Ecological District	Nukuhou	1
Bolboschoenus caldwellii	Regionally Uncommon.	Hiwarau	1
Austrostipa stipoides	Reaches southern distributional limit on the eastern side of the North Island in Ohiwa harbour.	Whangakopikopiko Wildlife Refuge Reserve	3
Epilobium pallidiflorum	Local. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau	1
Hydrocotyle pterocarpa	Local. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau	1
Nertera scapanioides	Local. Not known from elsewhere in the Taneatua Ecological District.	Hiwarau	2
Dianella sp.	Not known.	Uretara Island Scenic Reserve	1

Other features of interest in the Ohiwa Harbour catchment are summarised in Table 4.

Table 4: Other features of interest within the Ohiwa Harbour catchment.

Key: (1) = Not a scheduled site for survey.

Location	**Surveyed in 2011 ✓**	**Reference**	**Notes**
Beech-dominant forest			
Oscar Reeve Scenic Reserve and Extension	×	Beadel *et al*. 1999	Locally rare, not present in any other DOC reserves.
Hebe parviflora			
Wetland communities in Pataua Island Scenic Reserve	×	Clarkson & Regnier 1989	Not a rare or uncommon species, but this species is not known to occur in estuary margin vegetation elsewhere in the Bay of Plenty.
Estuary margin, Tunanui Estuary	✓(1)		

[1] All pingao plants on Whangakopikopiko Wildlife Refuge Reserve may have been planted.

4. *PIMELEA TOMENTOSA*

Five sites were searched for *Pimelea tomentosa* during the current survey, but only three seedlings were located, at the last site surveyed: pohutukawa forest near Claydon Place. Other sites surveyed were: Waiotane Scenic Reserve, Uretara Island Scenic Reserve, Claydon Place, and Hiwarau (see Table 1). *Pimelea tomentosa* was previously known from all sites surveyed, however the exact locations of the original records within these sites was unknown. *Pimelea tomentosa* was also searched for at other sites inspected for other species during the current survey (e.g. Matekerupu Historic Reserve and Stanley Road "A"). The original records for all sites was for a low number of plants (e.g. one or two). The lack of findings could reflect one or more of the following factors:

- *Pimelea tomentosa* is a relatively short-lived species and no or very few plants could be present this year (summer 2010/2011) due to various factors, e.g. unsuitable climate conditions during one or more of the preceding germination seasons.

- It was early in the "season" and recently germinated plants are only small at this time of the year, e.g. three small seedlings were found on the last day of the field survey in March, whereas Waiotane Scenic Reserve was surveyed in January.

- The preferred habitats for *Pimelea tomentosa* are given as "open cliff tops, in scrub, frost flats, track sides and other seral habitats" on the NZPCN website (accessed 7 March 2011), and these habitats are relatively scarce at some of the sites surveyed.

Several of the records that were checked were 25 years or more old, and the secondary vegetation cover at these sites has changed considerably during this time. For example, there were deer present on Uretara Island when *Pimelea tomentosa* was recorded in 1984, whereas there are now no deer present, possum control is being undertaken, and the understorey is generally thicker, with lower light levels than was evident in 1983.

It is recommended that further field survey is undertaken for *Pimelea tomentosa* in the Ohiwa Catchment; for example, at Hiwarau and Oscar Reeve Scenic Reserve. Hiwarau encompasses a large area and only a relatively small part was inspected as part of the 2011 survey. Depending on findings, consideration should be given to the establishment of populations in suitable habitat around the harbour.

5. PRIORITIES FOR FUTURE FIELD SURVEYS AND MANAGEMENT

Specific recommendations are provided, on the site sheets appended for each species, for management, monitoring, and priorities for future survey, as summarised in Table 5 below. The highest priorities are further surveys for *Pimelea tomentosa* and control of grey willow at the Hiwarau Wetland. Hiwarau Wetland is one of the best

wetlands in the Bay of Plenty and, in the largest part of the wetland (i.e. the southern part, where the *Astelia grandis* and the other significant species occur), grey willow is currently at very low infestation levels and it would currently be relatively straight forward to achieve a high level of control.

Table 5: Priorities for further survey and management of significant plant species in the Ohiwa Harbour catchment.

Site	Species	Recommendation	Priority
Hiwarau	*Astelia grandis* *Tetraria capillaris* *Nertera scapanoioides* *Drosera binata* *Epilobium pallidiflorum* *Hydrocotyle pterocarpa* *Sparganium subglobossum*[1]	• Willow control. • Inspect *Astelia grandis* population annually.	High. Very high.
Oscar Reeve Scenic Reserve	*Pimelea tomentosa*[2]	• Search for plants.	Very high.
Hiwarau	*Pimelea tomentosa*	• Search for plants.	High.
Matekerepu	*Pimelea tomentosa*[2]	• Search for plants.	High.
Ford Covenant Stanley Road	*Ptisana salicina* (para, king fern)	• Control wild kiwifruit. • Monitor every two years.	High. High.
Whangakopikopiko Wildlife Refuge Reserve	Thornton kanuka	• Establish permanent monitoring (e.g. photopoints).	Very high.
Pataua Island	*Hebe parviflora*[2]	• Relocate population.	Moderate.
Wordsworth Covenant	*Epilobium insulare*[2]	• Relocate population.	Moderate.
Uretara Island Whangakopikopiko Wildlife Refuge Reserve	*Tetragonia tetragonioides*[1]	• Re-establish species at suitable sites around harbour - could undertake further survey of known previous locations (e.g. Uretara Island) prior to undertaking this work.	Moderate.
Te Rereoterangi	*Syzygium maire* (maire tawake, swamp maire)	• Relocate population. • Collect seed and establish new populations at other suitable locations around the harbour.	Moderate.
Claydon Place	*Pimelea tomentosa*	• Inspect population every 3-6 months. • Collect seed if plants mature. • Plant new populations at other suitable locations around the harbour.	Very high.
Uretara Island	*Austrotipa stipoides*	• Survey other known populations in Ohiwa (Moutotu Island, Pataua Island, “Stipa”) to determine the full extent of the distribution of this species in the harbour and to determine the overall stability of the population.	Moderate.

[1] Not found in 2011.
[2] Not surveyed in 2011.

ACKNOWLEDGMENTS

I would like to thank Annabel Beattie (Bay of Plenty Regional Council) for arranging this project and providing logistical support; Brian Gibbons (Bay of Plenty Regional Council) for providing boat access to Uretara Island and Whangakopikopiko Wildlife Refuge Reserve; Tim Senior (Bay of Plenty Regional Council) for arranging access to Hiwarau, and useful discussion on ramarama; Ruby Nikora for access through her property at Hiwarau; Derek Gosling for useful discussion and for showing me the king fern and ramarama populations; Margaret Sullivan for providing access to the king fern population; Jeremy Hedley for allowing access through his property to Waiotane Scenic Reserve, and for access to the ramarama population; and Paul Cashmore (Department of Conservation) for useful discussion regarding the *Sicyos* planting and spinach on Uretara Island.

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SPECIES RECORD SHEETS

Adelopetalum tuberculatum

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Adelopetalum tuberculatum

Common Name(s):

None Known

Threat Status:

Naturally Uncommon

Status 2004:

Sparse

Authority:

Adelopetalum tuberculatum (Colenso) D.L.Jones, M.A.Clem. et Molloy

Family:

Orchidaceae

Flora Category:

Vascular - Native

Synonyms:

Bulbophyllum tuberculatum Colenso, has also been treated as the allied but distinct Australian B. exiguum F.Muell.

Distribution:

Endemic. North and South islands, from Kaitaia south to Wellington, and in Marlborough and North West Nelson. Probably more widespread than this as easily overlooked.

Habitat:

An epiphytic plant, usually found on trunks and inner branches of trees in lowland or coastal districts. Favoured trees seem to be matai (*Prumnopitys taxifolia* (D.Don) de Laub.), kahikatea (*Dacrycarpus dacrydioides* (A.Rich.) de Laub.), rimu (*Dacrydium cupressinum* Lamb.), totara (*Podocarpus totara*), tawa (*Beilschmiedia tawa* G.Benn.), hinau (*Elaeocarpus dentatus* (J.R.Forst. et G.Forst.) Vahl) and rewarewa (*Knightia excelsa* R.Br.), It is always found with grey lichens of the genus Rimelia Hale et A.Fletcher, Physcia (Schred.) Michx., Heterodermia Trevis., and Ramalina Ach., and often threaded through the climbing fern Pyrrosia eleagnifolia (Bory) Hovenkamp.

Features:

Epiphytic orchid forming tightly clumped masses up to 60 mm diameter on canopy branches and trunks of forest trees. Roots numerous, threaded tightly through encrusting lichens and other epiphytic plants. *Pseudobulbs conpsicuous*, 6-18 x 3-6 mm, green to dark green, ovoid to narrowly ovoid, turgid, smooth surface often spotted with white mealy cells. Apex surmounted by tightly clasping, much reduced scale leaf. Leaf appearing sessile, usually solitary (rarely 2), up to 50 x 5 mm, dark green to purple-green, linear-oblong, acute, glabrous. Flowers racemose, 1-several-flowered, peduncle 10-20 mm long arising from base of pseudobulb; floral bracts triangular, pedicels very short. Ovary minutely tuberculate. Perianth 4 mm long, all aprts except labellum, white to whitish-pink. Dorsal sepal narrow-ovate; lateral similar but broader to triangular-ovate, slightly pouched at base. Petals smaller, ovate, obtuse. Labellum mobile on long slender claw; oblong-obovate to sub-hastate, orange to red, fading toward a yellow base; proximal part with 2 raised ridges, margins recurved at apex. Column short, 2-winged at apex. Capsules ovoid.

Similar Taxa:

None in New Zealand.

Flowering:

(September) - November - April

Fruiting:

November - August

Propagation Technique:

Not well known. Pieces taken from fallen branches have been successfully cultivated in standard orchid mix, or when strapped to a suitable branch, and these plants have frequently flowered. It is probably very easy to grow

Threats:

Probably quite common, but easily overlooked, and current records imply it is naturally sparse. There have been some documented instances where accessible populations have been stripped bare by plant collectors, which is probably the only serious threat to this species. For this reason it is better to use caution when disclosing new findings.

Chromosome No.:

2n = 38

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Photograph by Peter de Lange.

Adelopetalum tuberculatum (At Risk-Naturally Uncommon)
Waiotane Scenic Reserve

Map	Figure 2: Sheet 3		
Inspection Date	27 January 2011	**Inspection Time**	10.30 a.m.
Administered By	DOC	**Population Size**	Seventeen clumps on eight trees at four sites

Populations

010 - About 10 clumps noted, spread over five rewarewa trees in rewarewa-kanuka-(heketara) forest. Half hour spent searching prior to finding this population.

011- Three plants on one rewarewa tree.

Point A - Two clumps epiphytic on one rewarewa.[1]

058 - Two clumps epiphytic on one rewarewa in rewarewa-kanuka forest.

GPS Reference:						
	Waypoint:	010	**Easting:**	E1955798.24	**Northing:**	N5783520.71
	Waypoint:	011	**Easting:**	E1955706.35	**Northing:**	N5783535.05
	Waypoint:	A	**Easting:**	E1955490.22	**Northing:**	N5783443.63
	Waypoint:	058	**Easting:**	E1955903.42	**Northing:**	N5782705.00

[1] Noted by Paul Cashmore on 2 April 2011.

General:

This species was found at several sites during the survey and is likely to be reasonably common at some or all of the sites it is known from, and likely to be present at other sites around the harbour. Whilst it has only been recorded growing on rewarewa on Ohiwa Catchment, this may not represent the only host species in the catchment, but just reflects that it has not been searched for on other hosts, and that suitable habitat (i.e. tree trunks/branches in relatively high light environments) on other host species is not generally visible from the ground.

Relatively little time was spent searching for *Adelopetalum tuberculatum* in the current survey because it was quickly located at all sites where it was searched for, which was often also suitable habitat for *Pimelea tomentosa*, a species with a higher threat classification (Threatened-Nationally Vulnerable). Searching for *Pimelea tomentosa* was considered to be a priority as, although several sites were searched, no plants were found until the last site of the survey when three seedlings >7 cm tall were found.

Threats:

None identified.

Management Requirements:

Nil.

Monitoring Requirements:

Five-yearly site inspections.

Broad Priorities for Future Survey:

This species is likely to be present locally, or possibly reasonably widespread throughout the reserve on rewarewa trunks in high light conditions. Other potential host species in the reserve include tawa (it has been recorded on tawa in Hukutaia Domain (Clarkson and Regnier 1988).

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Waypoint 010 - The rewarewa at this site are *c.*8-10 m tall. Other epiphytes include a variety of lichens, mosses, *Ichthyostomum pygmaeum*, and *Phymatosorus diversifolius*. The understorey comprises silver fern, mamaku, and five finger, whilst the groundcover comprises scattered *Uncinia scabra*, *Uncinia uncinata*, *Coprosma lucida*, *Myrsine australis*, and *Dianella nigra*.

Adelopetalum tuberculatum (At Risk-Naturally Uncommon)
Matakerepu Historic Reserve

Map Reference (Mid-Point)	E1961620; N5779916		
Map	Figure 2: Sheet 3		
Inspection Date	10 March 2011	**Inspection Time**	5.00 p.m.
Administered By	Department of Conservation	**Population Size**	6 clumps on 2 trees at 2 sites

Habitat:

Secondary forest on ridge crest.

Populations

066 - Three clumps epiphytic on rewarewa.

070 - Three clumps epiphytic on rewarewa.

GPS Reference:	**Waypoint:**	066	**Easting:**	E1961663.47	**Northing:**	N5779967.34
	Waypoint:	070	**Easting:**	E1961697.92	**Northing:**	N5780056.96

Threats:

None identified.

Management Requirements:

None.

Monitoring Requirements:

Five-yearly site inspections.

Broad Priorities for Future Survey:

Adelopetalum tuberculatum is likely to occur at other sites in the Ohiwa Harbour catchment in similar habitat (e.g. Kotere Scenic Reserve).

Notes:

This species was not a scheduled species to survey at this site.

This species may be more widespread in the area, however its preferred habitat is trunks/branches with relatively high light intensity, and such habitat is mostly present in the tops of trees and, as the plants are small, they can not be readily seen from the forest floor.

Adelopetalum tuberculatum (At Risk-Naturally Uncommon)
Uretara Island Scenic Reserve

Map	Figure 2: Sheet 3		
Inspection Date	8 March 2011	**Inspection Time**	11.30 a.m.
Administered By	DOC	**Population Size**	One clump

Habitat:

Epiphytic on rewarewa in secondary kanuka-rewarewa forest.

Likely to be more plants of *Adelopetalum tuberculatum* present (see below under 'Notes' for further detail).

GPS Reference: **Waypoint:** 019 **Easting:** E1962126.07 **Northing:** 5785859.15

Threats:

Nil

Management Requirements:

Continue pest animal control work.

Monitoring Requirements:

Five-yearly site inspections.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

There are likely to be other *Adelopetalum tuberculatum* plants on the island. Further survey is likely to find further populations both on the island and elsewhere in the Ohiwa catchment. Very little time was spent searching for this species during the current survey as the focus of the current survey on Uretara Island was on searching for *Pimelea tomentosa.* Searching for these two species is basically mutually exclusive as *Adelopetalum tuberculatum* requires searching tree trunks and branches above eye level (i.e. looking up), and the other requires searching at ground level.

Numerous fernbird were seen and heard in the saltmarsh and associated shrublands during the survey of Uretara Island.

Adelopetalum tuberculatum (At Risk-Naturally Uncommon)
Stanley Road "B"

Map	Figure 2: Sheet 3		
Owner	Marion Van Delden		
Inspection Date	14 March 2011	**Inspection Time**	*c.*1.30 p.m.
Population Size	More than 10 plants observed.		

Habitat:

Numerous plants observed growing on rewarewa trunks in tanekaha-kanuka-rewarewa forest.

GPS Reference: **Waypoint:** 091 **Easting:** E1957413.29 **Northing:** N5781936.07

Threats:

Not known.

Management Requirements:

None identified. Talk with property owner about the species and its significance.

Broad Priorities for Future Survey:

No high priorities. Should be searched for in any areas of secondary forest that are visited as part of other plant species work. Searching with binoculars is very effective.

Notes:

Property has recently changed hands. We called in to see the owners, however they were not home. Plants were seen from vehicle on way down driveway.

Astelia grandis

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Astelia grandis

Common Name(s):

Swamp astelia

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Astelia grandis Hook.f. ex Kirk

Family:

Asteliaceae

Flora Category:

Vascular - Native

Synonyms:

Astelia nervosa var. *grandis* (Kirk) Ckn. et Allan

Chromosome No.:

2n = 140

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Astelia grandis (Regionally Uncommon)
Hiwarau Wetland, Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011	**Inspection Time**	2.00 p.m.
Population Size	Five plants.		

Habitat:

Growing beneath manuka shrubland in association with swamp coprosma and karamu. The ground cover comprises *Baumea juncea*, swamp millet, *Baumea rubiginosa*, and *Baumea tenax*.

GPS Reference: **Waypoint:** 053 **Easting:** E1960653.47 **Northing:** N5783591.77

Individuals:

Five plants seen, ranging in height from 0.8 - 2 m tall (two plants *c.*2 m tall; two plants *c.*1 m tall; one plant *c.*0.8 m tall).

Astelia grandis over 2 m tall in Hiwarau Wetland, growing beneath manuka, *Coprosma propinqua*, and *Coprosma tenuicaulis*.

Threats:

Small population size (only five plants seen).

This is the only population known in the general vicinity. (There is also a population present at five mile gate swamp south of Rotorua.)

Grey willow invasion.

Management Requirements:

Collect seed and propagate.

Establish another population in similar habitat at three to six other sites around the harbour.

Control grey willow, radiata pine, and *Alisma plantago-aquatica*.

Monitoring Requirements:

Inspect every two years.

Broad Priorities for Future Survey:

N/A

Notes:

If found at other sites, it should be recorded, and management requirements identified and reviewed for other sites around the harbour.

Poa anceps was observed growing in this wetland near the *Astelia grandis.*

Hiwarau is one of the best freshwater wetlands in the Bay of Plenty. It has very low levels of exotic species. It is in very good condition and supports a diverse flora, and is contiguous with a high quality large estuarine wetland, as well as being connected to a large area of indigenous terrestrial forest, including pohutukawa forest on the margins of the estuary, tall tawa-puriri-dominant forest and secondary forest.

Austroderia toetoe

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Austroderia toetoe

Common Name(s):

Toetoe

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Austroderia toetoe (Zotov) N.P.Barker et H.P.Linder

Family:

Poaceae

Flora Category:

Vascular - Native

Synonyms:

Cortaderia toetoe Zotov

Distribution:

Endemic. Confined to the North Island where it grows from about Carters Beach (western Waikato) south to Wellington. There are reports of it from the Waitakere Ranges that require further investigation. It has been planted and has sparingly naturalised on Waiheke Island

Habitat:

Common in freshwater swamps and wet plaves from sea level to montane habitats. Often growing in association with flax/harakeke (*Phormium tenax*).

Features:

Stout, tussock-forming grass up to 4 m tall when in flower. Leaf sheath glabrous, ivory with green midrib, copiously covered in white wax. Ligule 4 mm. Collar dark brown, upper surface clothed in short hairs. Leaf blade 2(-3) m x 3 cm, straw-yellow, light-green, rarely dark-green, undersides long hairy toward margins, upper surface with a thick weft of hairs at base, otherwise minutely hairy through, and rather harsh due to numerous prickle-teeth. Culm up to 4 m, inflorescence portion up to 1 m tall, stiff, erect, densely plumose. Spikelets numerous, 25 mm with 2-3 florets per spikelet. Glumes equal, 25 mm, > florets. Lemma 10 mm, 3-nerved, scabrid. Palea 6.5 mm, keels ciliate. Callus hairs 1.5 mm. Rachilla 0.5 mm. Flowers either perfect or female. Anthers of perfect flowers 4.8 mm, in females 2.8 mm. Ovary of perfect flowers 1 mm, stigma -styles 1.8 mm; female flowers with ovary 1.3 mm, stigma-style 3.5 mm. Seed 2.5-3 mm.

Similar Taxa:

Easily identified by the stout, erect, densely plumose inflorescences, and ivory leaf sheaths. Separated from South American Pampas grass species by their spring-flowering, rather than autumn flowering habit, waxy leaf sheaths, and by the dead leaves which fold longitudinally, and disarticulate in their entirety - the South American species curl up toward the leaf base, ultimately decaying to a state resembling wood shavings.

Flowering:

November - February

Fruiting:

October - March

Propagation Technique:

Easily grown from fresh seed (as a revegetation exercise ripe seed heads can be pinned to soil surface, and if kept damp, soon germinate) and division of established plants.

Threats:

Abundant and not threatened. Often naturalising in suitable habitats.

Chromosome No.:

2n = 90

Endemic Taxon:

Yes

Endemic Genus:

Yes

Endemic Family:

No

Austroderia toetoe (Toetoe)[1]
Nukohou Estuary

Map	Figure 2: Sheet 8		
Inspection Date	10 March 2011	**Inspection Time**	1.15 p.m.
Population Size	Two plants.		

Habitat:

Growing on slightly higher ground in association with marsh ribbonwood (*Plagianthus divaricatus*), oioi, and sea couch.

Present on small "island" of slightly higher ground in the midst of saltmarsh (sea rush and oioi). Associated species were marsh ribbonwood, oioi, and sea couch.

GPS Reference: **Waypoint:** 048 **Easting:** E1960263.73 **Northing:** N5783629.89

Two *Austroderia toetoe* plants growing on a small "island" of higher ground in Nukohou saltmarsh.

[1] Uncommon in Taneatua Ecological District.

Threats:

Pampas is present within 100 m of this population. Accidental control of toetoe could be undertaken when pampas control is undertaken.

Management Requirements:

Control of pampas in nearby areas is required by experienced operators. Pampas is growing in habitats that would be suitable for toetoe.

Monitoring Requirements:

N/A. Resurvey in five years, along with other significant species present in this area.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Austrostipa stipoides

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Austrostipa stipoides

Common Name(s):

Coastal immorality grass, Buggar grass

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Austrostipa stipoides (Hook.f.) S.W.L. Jacobs et J. Everett

Family:

Poaceae

Flora Category:

Vascular - Native

Synonyms:

Dichelachne stipoides Hook.f., *Stipa stipoides* (Hook.f.) Veldkamp, *S. teretifolia* Steud.

Distribution:

Indigenous. North Island, From Te Paki to about Taranaki and Ohiwa Harbour, thence absent until the Cook Strait. South Island, Nelson only.

Threats:

Not Threatened

Chromosome No.:

2n = 44

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Austrostipa stipoides[1]
Otao Domain

Map	Figure 2: Sheet 9		
Inspection Date	27 January 2011	**Inspection Time**	*c.*5.00 p.m.
Administered By	Whakatane District Council	**Population Size**	Three plants

Habitat:

Austrostipa stipoides was growing on the edge of the saltmarsh in association with sea couch (*Agropyron pungens*), sea rush (*Juncus kraussii* var. *australiensis*), and glasswort (*Sarcocornia quinqueflora*). This population was first observed by the author in around 1984 when there were about seven plants.

GPS Reference: **Waypoint:** 079 **Easting:** E1959673.72 **Northing:** N5788305.13

Austrostipa stipoides at Otao Domain.

[1] *Austrostipa* reaches its southern limit of distribution on the east coast of the North Island, in Ohiwa Harbour.

Threats:

Erosion.

Sea couch competes with *Austrostipa stipoides* both to colonise unvegetated sites and within established vegetation.

Management Requirements:

Collect seed from Ohiwa populations and replant in suitable locations.

Monitoring Requirements:

Regular inspections.

Broad Priorities for Future Survey:

Survey other known populations in Ohiwa to determine the full extent of the distribution of this species in the Harbour, and to determine the overall stability of the population.

Notes:

This was not a scheduled site for survey.

Fernbird heard at the site.

Austrostipa stipoides[1]
Uretara Island Scenic Reserve

Map	Figure 2: Sheet 9		
Inspection Date	8 March 2011	**Inspection Time**	*c.*10 a.m.
Administered By	DOC	**Population Size**	*c.*19 plants

Habitat:

Growing near edge of estuary, often in association with sea couch and sea rush, and occasionally with oioi and/or *Baumea juncea*.

Populations

Point B[2] - Three plants growing with sea couch, oioi, searush, *Baumea juncea*.

017 - Nine plants growing with sea couch, oioi, searush, *Baumea juncea*.

016 - Seven plants, threatened by erosion, growing with oioi, searush, sea couch.

GPS Reference:						
	Waypoint:	Point B	**Easting:**	E1962164.31	**Northing:**	N5786695.11
	Waypoint:	016	**Easting:**	E1962146.56	**Northing:**	N5786679.02
	Waypoint:	017	**Easting:**	E1962133.75	**Northing:**	N5786666.18

Austrostipa stipoides on Uretara Island.

[1] *Austrostipa* reaches its southern limit of distribution on the east coast of the North Island, in Ohiwa Harbour.
[2] Estimated location.

Threats:

Erosion.

Management Requirements:

None.

Monitoring Requirements:

Inspect at 5-10 yearly intervals.

Broad Priorities for Future Survey:

In 1993 the largest population of this species in the harbour was near Ohiwa Loop Road (Stipa RAP51, a Category 3 RAP in Beadel *et al*. 1999). This latter population should be inspected and the ongoing health of it should be assessed. Other populations can be inspected during monitoring for other species.

Notes:

This species was not a scheduled species to survey at this site.

This is the same site that this species was recorded from the Island in 1984. At that time it was not recorded from elsewhere on the Island. During the current survey it was not searched for in other suitable habitat on the Island, and may be present elsewhere on the Island.

Numerous fernbird were seen and heard during the survey at this site.

Austrostipa stipoides[1]
Whangakopikopiko Wildlife Refuge Reserve

Map	Figure 2: Sheet 9		
Inspection Date	8 March 2011	**Inspection Time**	10.10 a.m.
Administered By	Department of Conservation	**Population Size**	Six plants

Populations:

009 - Six small population growing amongst *Ficinia nodosa*, sea rush, and *Agropyron pungens.*

010 - Ten plants, growing amongst sea rush and *Agropyron pungens.*

012 - Four plants, growing amongst sea rush, *Isolepis nodosa*, *Agropyron pungens.*

GPS Reference:						
	Waypoint:	009	**Easting:**	E1964406.73	**Northing:**	N5786115.76
	Waypoint:	010	**Easting:**	E1964390.49	**Northing:**	N5786097.50
	Waypoint:	012	**Easting:**	E1964298.79	**Northing:**	N5786002.91

Austrostipa stipoides on southern side of Whangakopikopiko Island.

[1] *Austrostipa* reaches its southern limit of distribution on the east coast of the North Island, in Ohiwa Harbour.

Threats:

Erosion.

Management Requirements:

Refer to recommendations under Otao Domain population.

Monitoring Requirements:

Inspect at one-yearly intervals when undertaking monitoring of Thornton kanuka.

Broad Priorities for Future Survey:

Refer to recommendations under Otao Domain population.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Numerous fernbird were seen and heard during the survey at this site.

This species was not recorded from the island in 1999 (see Beadel 1999).

Bolboschoenus caldwellii

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Bolboschoenus caldwellii

Common Name(s):

Purua Grass, Caldwells clubrush

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Bolboschoenus caldwellii (Cook.) Soják

Family:

Cyperaceae

Flora Category:

Vascular - Native

Synonyms:

Scirpus caldwellii Cook.

Distribution:

Indigenous. North Island from the Kaipara Harbour south, and mainly easterly. In the South Island widespread from Nelson to Otago, mainly eastern. Also in Australia.

Habitat:

Coastal to lowland in saltmarshes and other poorly drained saline areas. Sometimes invades pasture abutting tidal streams and estuaries.

Features:

Summer-green, bulbous perennial forming mostly densely clumped patches. Rhizome 3-5 mm diameter, horizontal, long-creeping, brown, apices terminated by globose, ligneous tubers. Culms 1(-3) per tuber, 0.3-1.0 m tall, 2-3 mm diameter, triquetrous; basal sheaths 1-2, mostly membranous, with a short channelled lamina. Leaves numerous, <, equal to, or > culms, 200-320 x 2.5-4.0 mm, double-folded but flattened, grass-like, tapering, coriaceous, margins and midrib scabrid towards apices; sheaths short, closed, coriaceous. Inflorescence a terminal, compact head of 3-6 spikelets; rays if present 1-3, 10-40 mm long, unequal, subtending involucral bracts similar to leaves, > inflorescence, unequal, 40-220 x 1.5-2.5 mm. Spikelets 10-20 mm long, ovoid or cylindric, red-brown. Glumes membranous, pubescent, apices slightly cleft or lacerate, with a scabrid, slightly recurved awn. Hypogynous bristles 6, unequal, about half length of nut, deciduous, red-brown, retrorsely scabrid. Stamens 3. Style-branches 2. Nut 3.5-4.0 x 2.5 mm, biconvex or obovoid, compressed, with a small depression on each side, smooth, apiculate, maturing cream to dull brown and glossy.

Similar Taxa:

Differs from *B. fluviatilis* (Torr.) Soják and *B. medianus* (Cook) Soják by the smaller size, often glaucescent leaves, fewer subsessile to very shortly stalked spikelets, consistently 2 style branches, and circular, biconvex nut with distinctly concave (depressed) sides

Flowering:

October - January

Fruiting:

December - May

Propagation Technique:

Easily grown from fresh seed and rooted pieces. Will grow in almost any soil but prefers a sunny, damp soil. Ideal as a pond plant or for planting along tidal streams.

Threats:

Not Threatened but uncommon in northern part of range.

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Photograph by John Smith-Dodsworth

Bolboschoenus caldwellii (Regionally Uncommon)
Hiwarau Wetland, Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Not known.		
Inspection Date	10 March 2011	**Inspection Time**	*c.*1.15 p.m.
Populations	2 populations		

Habitat:

049 - *Bolboschoenus caldwellii* was growing amongst oioi and *Baumea juncea*, and was surrounded by sea rush and raupo. Dense sward covering an area of about 5 × 4 m.

056 - Small population *c.*10 m^2.

GPS Reference:	**Waypoint:**	049	**Easting:**	E1960181.30	**Northing:**	N5783639.40
	Waypoint:	056	**Easting:**	E1960752.60	**Northing:**	N5783696.64

Bolboschoenus caldwellii (immediate foreground) growing near the mouth of the Nukuhou Stream, adjacent to oioi.

Threats:

Very small population.

Competition from other species; change to microsite conditions may allow other species to out-compete it.

Management Requirements:

None identified.

Monitoring Requirements:

N/A. Resurvey in 2-3 years time, along with other species present in this area.

Broad Priorities for Future Survey:

Undertake field inspection of other known locations in Ohiwa for this species (e.g. it was recorded from a site east of Kutarere in 1993 (see Beadel 1993); this site was later identified as a RAP in Beadel *et al*. 1999 - RAP 75 “State Highway 2”).

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Dianella sp. (possibly *Dianella haematica*)

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Dianella haematica

Common Name(s):

Swamp Blueberry, Swamp Ink berry, Swamp Dianella

Threat Status:

Declining

Status 2004:

Sparse

Authority:

Dianella haematica Heenan et de Lange

Qualifiers:

DP

Family:

Xanthorrhoeaceae

Flora Category:

Vascular - Native

Synonyms:

None (first described 2007)

Distribution:

Endemic. North Island. Te Paki south to at least the Mamaku Plateau and near Te Awamutu.

Habitat:

A coastal to lowland wetland species favouring high moor restiad dominated peat bogs. However, it is also known from lwo moor systems and transitional bogs, the margins of swamps developed within geothermal areas and even from the floating sud communities developed around peat lakes.

Features:

Upright, densely tussock-forming evergreen perennial herb; forming very tight, compact and upright clumps; rhizomes up to 20 mm long. Leaves 1-2 m long, 18-25 mm wide, uniformly olive-green to dull dark green, discolourous, usually upright, slightly curved, sometimes drooping, more or less flat, lamina smooth and more or less glossy; margin and abaxial midrib with obscure to prominent minute teeth; apex subacute to more or less obtuse, cucullate; leaf sheaths equitant, tightly clasping, surface and margin weakly to strongly flushed blood-red, red-maroon or pink, especially near base; apex subacute to more or less obtuse, cucullate. Inflorescence erect, 1-2 m long, usually among the leaves; scape slender, arching base asymmetric up to 8.5 x 5.3 mm diameter; panicle 400-700 mm long, branches spreading, short, regularly spaced; cauline leaves subtending branches, leaf-like at the base but reducing in size and becoming bract-like distally; cymules 3-5-flowered; pedicels 9-20 mm long, slightly recurved, terete; bracteoles 1,0-1.2 x c.0.2 mm, narrow-triangular, subtending pedicels, caducous. Flowers nodding, 10-11 mm diameter, opening mid-morning, collapsing late afternoon, perianth segments patent to slightly recurved; sepals 4.8-5.5 x 1.9-2.0 mm, oblong, undersides olive-green flushed red-brown, upper surface paler, apex obtuse; petals 4.1-4.2 x 2.9-3.0 mm, obovate, white, midvein olive-green, apex obtuse to retuse; filaments 6, 1.2-1.4 mm long, white; struma 0.8-1.3 x 0.6-0.7 mm, short oblong to oblong-obovate, yellow, minutely papillose; ovary 1.3-1.5 x c.1.3 mm, green, more or less globular; style 1.4-1.5 mm long, white. Berry 8-20 x 7-10 mm, ovoid to oblong, grey-white and dull to strong violet-blue and glossy, pericarp spongy. Seeds 1.8-2.5 x 2.3-3.2 mm, ovoid, black, shiny.

Similar Taxa:

Distinguished from *D. latissima* Heenan et de Lange and *D. nigra* Colenso by the densely tussock forming habit, with very tight, compact and upright clumps, ascending rhizomes up to 20 mm long; usually blood red (sometimes pink) leaf sheaths; uniformly olive-green to dull dark green, upright leaves up to 2 m long and 25 mm wide, with prominent, harsh but usual sparse teeth on the leaf margins, subacute to hooded leaf apex; inflorescences hidden among the leaves, shortly oblong to oblong-obovate (0.8-1.3 mm long) struma; and by the styles which are 1.4-1.5 mm long cf 2.0-2.2 mm long in *D. latissima* and 1.7-2.1 mm long in D. nigra. *Dianella haematica* is further distinguished by its preference for acidic wetland habitats.

Flowering:

September - November

Fruiting:

November - April

Propagation Technique:

Easily grown from the division of whole plants and from fresh seed. Despite its natural restriction to wetlands it is easily grown in most situations.

Threats:

Seriously at risk from wetland drainage - especially in the greater Waikato (which appears to be its main centre of distribution). Also vulnerable to competition from wetland weeds such as Royal Fern (*Osmunda regalis* L.) and grey willow (*Salix cinerea* L.). Over large parts of its Waikato range it now survives on the margins of drained peat bogs lining roadside ditches where it is vulnerable to weed spraying. These losses are tempered by the high probability that as a new species its exact range has yet to be determined. Previously regarded (as *Dianella* aff. *nigra* (b) (AK 252911; Kopouatai)) as Sparse in de Lange et al., 2004, Threatened and uncommon plants of New Zealand, New Zealand Journal of Botany 42: 45-76.

Chromosome No.:

2n = 16

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Species:

Dianella nigra

Common Name(s):

Turutu, NZ blueberry, Ink berry

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Dianella nigra Colenso

Family:

Xanthorrhoeaceae

Flora Category:

Vascular - Native

Synonyms:

Dianella intermedia Endl. var *norfolkensis* F.B.H.Brown

Distribution:

Endemic. North and South Islands

Habitat:

coastal to montane (rarely subalpine) (1-1100 m a.s.l.). Colonising a wide variety of habitats from open coastal headlands, gumland scrub and less frequently peat bogs through to dense forest and subalpine scrub.

Features:

Loose tussock forming evergreen perennial herb, forming dense to open, diffuse clumps; rhizomes horizontally 150 mm (or more) long, strong and well developed. Leaves 250-800 x 12-18 mm, uniformly green to dark green, with distinct dark marginal bands 2-4 mm wide, discolorous, upright to strongly curved and distinctly drooping, more or less flat, lamina smooth and more or less glossy; margin and midrib of the leaf undersides smooth to scabrid, teeth often prominent; apex acute, leaf sheaths equitant, tightly clasping, surface light green to dark green with a reddish margin; apex acute to subacute. Inflorescence erect to spreading, up to 1 m long, exserted above the leaves; scape slender, arching, base asymmetric and up to 100 x 75 mm diameter; panicle 300-500 mm long, branches spreading, short, regularly spaced; cauline leaves subtending branches, leaf-like at the base but reducing in size and becoming bract-like distally; cymules 3-7-flowered; pedicels 10-17 mm long, slightly recurved, terete; bracteoles 1.0-1.2 x c.0.2 mm, narrow triangular, subtending pedicels caducous. Flowers nodding, 9-11 mm diameter, opening early morning, collapsing late afternoon, perianth segments strongly recurved at anthesis; sepals 4.4-4.5 x 1.6-1.7 mm, oblong, undersides olive-green flushed red-brown, upper surface paler, apex obtuse; petals 3.5-4.0 x 2.3-3.4 mm, obovate, white, midvein olive-green, apex obtuse to retuse; filaments 6, 1.3-1.4 mm long, white; anthers 1.3-1.4 x c.0.4 mm, yellow-brown, struma 1.2-1.4 x c.0.6 mm, obovate, yellow, minutely papillose; ovary 1.4-1.6 x 1.1-1.3 mm, green, more or less globular; style 1.7-2.1 mm long, white. Berry 8-20 x 7-10 mm, ovoid to oblong, grey-white and dull to strongly violet-blue and glossy, pericarp spongy. Seeds 1.8-2.1 x 2.3-3.0 mm, ovoid, black, shiny.

Similar Taxa:

Distinguished from D. haematica Heenan et de Lange and D. latissima Heenan et de Lange by open, loosely tussock forming habit, with dense to loose clumps, horizontally spreading rhizomes up to 150 mm long (sometimes more); light green to green leaf sheaths with reddish margins; green to dark green with darker marginal bands, curved, distinctly drooping leaves up to 0.8 m long and 18 mm wide with smooth or prominently scabrid leaf margins, acute leaf apex; inflorescences exposed from leaves, obovate (1.2-1.4 mm long) struma; and by the styles which are 1.7-2.1 mm long cf 1.4-1.5 mm long in D. latissima and 2.0-2.2 mm long in *D. nigra*. *Dianella nigra* may grow in wetlands

Flowering:

November - December

Fruiting:

December - May

Propagation Technique:

Easily grown from the division of whole plants and from fresh seed. Often available from garden centres though one populare form sold erroneously as *D. intermedia* is not that species or it would seem *D. nigra* s.s. Its exact status requires further investigation.

Threats:

Not Threatened

Chromosome No.:

2n = 16

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Dianella sp. (possibly *D. haematica*)
Uretara Island Scenic Reserve

Map	Figure 2: Sheet 9		
Inspection Date	8 March 2011	**Inspection Time**	2.30 p.m.
Administered By	Department of Conservation	**Population Size**	*c.*40 plants[1]

Note:

A *Dianella* sp. (possibly *D. haematica*) was recorded from this site. This plant was not able to be assigned to a particular species as it did not fit well with the diagnostic features of currently described species (c.f. Hennan and de Lange 2007). It had several of the diagnostic features of *D. haematica* (which is classed as At Risk-Declining in de Lange *et al*. 2009) (e.g. leaf length, leaf habit, leaf colour, location of inflorescence). Other features could not be determined (e.g. style length and perianth). Further work may be required on the taxonomy of *Dianella* in the Bay of Plenty.

Habitat:

Poorly drained low ridge top, growing with *Baumea juncea*, *Centella uniflora*, *Oplismenus hirtellus* subsp. *imbecillis*. Brush wattle shrubs have been recently cut in this area. Numerous brush wattle seedlings present.

Walking track passes through population.

GPS Reference: **Waypoint:** 029 **Easting:** E1961536.72 **Northing:** N5786086.45

Threats:

None known. Pest animal control currently being undertaken.

Management Requirements:

Continue pest animal control work and pest plant control work currently being undertaken in the reserve.

Monitoring Requirements:

Inspect every 2-3 years.

Confirm species.

Broad Priorities for Future Survey:

None.

[1] The population here is probably larger than this, and may extend *c.*200 m along the ridge.

Dianella sp. growing amongst *Baumea juncea*.

Notes:

This species was not scheduled for survey at this site.

Drosera binata

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Drosera binata

Common Name(s):

Forked sundew, scented sundew

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Drosera binata Labill.

Family:

Droseraceae

Flora Category:

Vascular - Native

Synonyms:

Drosera dichotoma Banks et Sol. ex Smith, *D. intermedia* R.Cunn ex A.Cunn, *D. cunninghamii* Walp., D. flagellifera Colenso

Distribution:

Indigenous. North, South, Stewart and Chatham islands. Present in Australia

Habitat:

Coastal to subalpine in bogs and poorly drained pasture overlying acid soils. More common in coastal to lowland situations. Often abundant following fires

Propagation Technique:

Easily grown in a pot partially submerged in water. Prefers a waterlogged, acidic medium but can also be grown in sphagnum moss. Prefers full sun. Can be cold sensitive but resprouts in warmer weather.

Threats:

Not Threatened

Chromosome No.:

2n = 32

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Drosera binata[1]
Hiwarau Wetland, Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011	**Inspection Time**	*c.*3.30 p.m.
Population Size	Three plants.		

Habitat:

Growing on Sphagnum amongst *Tetraria capillaris* beneath manuka shrubland. *Nertera scapanioides* also present at this site.

GPS Reference: **Waypoint:** 057 **Easting:** E1960917.99 **Northing:** N5783737.12

Drosera binata growing in Sphagnum beside *Tetraria capillaris* in Hiwarau Wetland.

[1] Not known to occur elsewhere in the Taneatua Ecological District.

Threats:

Grey willow invasion.

Management Requirements:

Control grey willow.

Monitoring Requirements:

Site inspection in five years to assess population health and identify any management requirements.

Broad Priorities for Future Survey:

Record if found elsewhere around Ohiwa Harbour Catchment.

Notes:

This species was not a scheduled species for survey.

This species was observed in 1983 by the author growing adjacent to Wainui Road east of McCoy Road/Wainui Road intersection.

Epilobium pallidiflorum

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Epilobium pallidiflorum

Common Name(s):

Tarawera, swamp willowherb

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Epilobium pallidiflorum A.Cunn.

Family:

Onagraceae

Flora Category:

Vascular - Native

Distribution:

Australia, North & South Islands of New Zealand, Chatham Islands.

Habitat:

Swamps & marshes or sandy river banks, often associated with grasses, sedges & rushes or among clumps of Typha; sea level to 600m.

Similar Taxa:

Other *Epilobium* species; *E. ciliatum, E. tetragonum, E. parviflorum, E. montanum, E. obscurum*.

Flowering:

December to April

Threats:

Not Threatened

Chromosome No.:

2n = 36

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Photograph by Jeremy Rolfe.

Epilobium pallidiflorum[1]
Hiwarau Wetland, Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011	**Inspection Time**	*c.*10.30 a.m.
Population Size	Four plants seen.		

Habitat:

Growing amongst *Carex geminata*, blackberry (*Rubus fruticosus* agg.), *Bolboschoenus fluviatilis*), raupo, *Leptospermum scoparium*, *Cordyline australis*, *Dicksonia squarrosa*, and *Calystegia sepium*.

GPS Reference: **Waypoint:** 040 **Easting:** E1961108.05 **Northing:** N5783683.80

Threats:

Continued grey willow invasion.

In 1992 there was virtually no grey willow in this part, however it is now abundant. This site was previously dominated by swamp millet grassland with local manuka (based on a site visit in 1992). *Sparganium subglobosum* was present at that site then. The vegetation cover has changed dramatically over the last 20 years and no *Sparganium* was seen during the current survey. *Epilobium pallidiflorum* does not generally persist beneath a grey willow canopy (I have not seen it growing beneath a grey willow canopy). If grey willow is not controlled in this wetland, then this species is likely to disappear from the wetland.

Management Requirements:

Grey willow control is of high priority. Without control the habitat required by *Epilobium pallidiflorum* will disappear.

Monitoring Requirements:

Site inspection in five years time.

Broad Priorities for Future Survey:

N/A.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Record this species if it is found at other sites that are visited in the future, as part of the Ohiwa Catchment Programme.

There was a wasp nest near this site, so it was not inspected in detail.

This species had not been previously recorded from Taneatua Ecological District (see Beadel *et al*. 1999 and Beadel *et al*. 2009).

[1] Not known to occur elsewhere in the Taneatua Ecological District.

Ficinia spiralis
(pingao)

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Ficinia spiralis

Common Name(s):

pingao, golden sand sedge, pikao

Threat Status:

Relict

Status 2004:

Gradual Decline

Authority:

Ficinia spiralis (A.Rich.) Muasya et de Lange

Qualifiers:

CD, Inc, Sp

Family:

Cyperaceae

Flora Category:

Vascular - Native

Synonyms:

Isolepis spiralis A.Rich., *Desmoschoenus spiralis* (A.Rich.) Hook.f., *Anthophyllum urvillei* Steudel, *Scirpus frondosus* Boeck, *Scirpus spiralis* (A.Rich.) Druce

Distribution:

Endemic. New Zealand: North, South, Stewart and Chatham Islands.

Habitat:

Coastal sand dune systems. It favours sloping and more or less unstable surfaces, growing mostly on the front face of active dunes but also on the rear face and rear dunes, provided that there is wind-blown sand. It can also grow on the top of sand hills. It is effective at trapping sand.

Features:

Stout, yellow-green when fresh, golden when dry, shortly creeping plants with stiff culms and very harsh leaves. Rhizome lignaceous, 10–15 mm diameter, shortly creeping, covered by red-brown to brown, fibrous strands left from decaying leaf-sheaths. Culms numerous, 0.3–1.2 m tall, 2–4 mm diameter, erect, obtusely trigonous, very leafy at the base. Leaves numerous, ± = culms, 2–5 mm. wide, stiffly erect or weakly curved, coriaceous, linear, concavo-convex or ± channelled, margins and keel sharply denticulate, narrowed to a long, trigonous tip; sheaths submembranous, much broader than leaves, with numerous, red-brown veins. Inflorescence, paniculate 70–300 mm long, each panicle composed of c.12 confluent clusters of sessile spikelets, each cluster subtended by a rigid leaf-like bract adnate to the axis and broadening at base to an open sheath, lower bracts much exceeding inflorescence. Spikelets 4–5 mm. long, dark red-brown. Glumes coriaceous, rigid, broadly ovate, obtuse, distinctly nerved, finely mucronulate, the lower ones ± keeled. Nut 2.5–4.0 x 2.0–2.5 mm, broadly obovoid, concavo-convex, compressed, obtuse, dark brown, smooth and shining.

Similar Taxa:

None. Easily recognised by the widely spreading rhizomatous growth habit, distinctive overall orange colouring of the plant, paniculate spiral seed heads, and by the possession of a gynophore (see taxonomic notes).

Flowering:

Spring and early summer

Fruiting:

Late summer

Propagation Technique:

Can be grown from fresh seed and cuttings. Fresh seed germinates easily but plants resent root disturbance, and they should be grown in root trainers. Although it will tolerate most soils and moisture regimes, it obviously does best in coastal situations within active sand dunes.

Threats:

Competition from marram grass (*Ammophila arenaria*), dune stabilisation and compaction, harvesting, trampling, vehicle traffic and browsing animals. Because this species is wind-pollinated, individuals of small, isolated populations may not receive pollen during flowering, and therefore there will be no seed production. Browsing and trampling by sheep and horses; browsing of seedlings by possums; seed destruction by rodents; fire and insensitive harvesting.

Chromosome No.:

2n = 30

Endemic Taxon:

Yes

Endemic Genus:

Yes

Endemic Family:

No

Taxonomic Notes

Desmoschoenus was recently (Muasya & de Lange 2010) submerged into the mainly South African genus *Ficinia* on the basis of sound molecular and morphological reasons. Based on multiple DNA markers *Desmoschoenus* was found to be firmly embedded within *Ficinia*, that, along with its possession of a gynophore (a small cup like structure found at the base of ovary/nut otherwise known only from *Ficinia*) were considered firm reasons for its merger. Furthermore *Desmoschoenus* closely resembles those *Ficinia* which the molecular study placed it with. Read more about this research:

Ficinia spiralis (Pingao; At Risk-Relict)
Whangakopikopiko Wildlife Refuge Reserve

Map	Figure 2: Sheet 10		
Inspection Date	8 March 2011	**Inspection Time**	*c.*9.50 a.m.
Administered By	DOC	**Population Size**	Over 20 plants

Origin:

This species was not present on the island in 1999 (Beadel 1999), and was subsequently planted on the island. Some or all of the populations recorded below have been planted. This species was not identified as a species to be surveyed as part of the current contract. This is not a complete inventory of pingao on the island.

Habitat:

Growing in sandfield. Other species present include spinifex and *Calystegia soldanella*.

Populations

006 - One plant, heavily browsed by rabbit.

007 - Five plants.

013 - Seven clumps. Several plants growing near the *Poa billardierei*.

GPS Reference:						
	Waypoint:	006	**Easting:**	E1964423.11	**Northing:**	N5786128.09
	Waypoint:	007	**Easting:**	E1964488.03	**Northing:**	N5786146.10
	Waypoint:	013	**Easting:**	E1963967.27	**Northing:**	N5786092.33

Heavily browsed pingao (rabbit browse).

Pingao in good health.

Threats:

Saltwater paspalum present near pingao.

Management Requirements:

Continue rabbit control work.

Control of saltwater paspalum should be considered.

Monitoring Requirements:

N/A

Broad Priorities for Future Survey:

N/A

Notes:

This species was not a scheduled species for survey.

Numerous fernbird were seen and heard during the survey at this site.

Hebe parviflora

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Hebe parviflora

Common Name(s):

Hebe

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Hebe parviflora (Vahl) Andersen

Family:

Plantaginaceae

Flora Category:

Vascular - Native

Synonyms:

Veronica parviflora Vahl, Hebe parviflora (Vahl) Cockayne et Allan var. *parviflora* nom. superf., nom. illeg., *Veronica arborea* Buchanan, *Veronica parviflora* var. *arborea* (Buchanan) Kirk, Hebe *parviflora* var. *arborea* (Buchanan) L.B.Moore

Threats:

Not Threatened

Chromosome No.:

2n = 40

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Hebe parviflora
Tunanui Estuary

Map	Figure 2: Sheet 2		
Owner	NA	**Location**	Adjacent to Wainui Road, near Burma Road
Inspection Date	27 January 2011	**Inspection Time**	3.00 p.m.
Population Size	Four trees spread alongside the road over about 30 m.		

Habitat:

This population occurs on a roadside bank beside the estuary, in Tunanui Stream Inlet (RAP 72, Beadel *et al*. 1999), growing amongst karamu (*Coprosma robusta*), mingimingi (*Leucopogon fasciculatus*), gorse (*Ulex europaeus*), mapou (*Myrsine australis*), and silver fern (*Cyathea dealbata*). Koromiko (*Hebe stricta*) and fruit trees (plums) are also present. There is a possibility that this was planted, however that is unlikely. The DBH of the largest tree was *c.*10 cm.

GPS Reference: **Waypoint:** 066 **Easting:** E1956234.29 **Northing:** N5786936.91

Hebe parviflora in flower (white flowers) (January 2011).

Threats:

The plants appear relatively mature and nearing the end of their lifespan. There are no seedlings establishing.

Management Requirements:

Could collect seed and plant in appropriate sites.

Monitoring Requirements:

Nil

Broad Priorities for Future Survey:

There is one other known population in the harbour, on Pataua Island (Clarkson and Regnier 1988 (1984 survey). This population was also seen on the island by SMB in 1985.

Notes:

This site was not scheduled for survey.

Hydrocotyle pterocarpa

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Hydrocotyle pterocarpa

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Hydrocotyle pterocarpa F.Muell.

Family:

Araliaceae

Flora Category:

Vascular - Native

Threats:

Not Threatened

Chromosome No.:

2n = 48

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Photograph by Jeremy Rolfe.

Hydrocotyle pterocarpa[1]
Hiwarau Wetland, Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011	**Inspection Time**	*c.*3.30 p.m.

Habitat:

Growing beneath manuka shrubland, scrambling amongst *Baumea juncea* and swamp Coprosma over an area of *c*.1 m × 2 m.

GPS Reference: **Waypoint:** 050 **Easting:** E1960625.47 **Northing:** N5783546.69

Threats:

Grey willow invasion.

Management Requirements:

Grey willow control at this site is of high priority. This should be undertaken in the next one to two years before it becomes well established.

Monitoring Requirements:

Site inspection in five years to assess population health and identify any management requirements.

Broad Priorities for Future Survey:

None.

Notes:

This species was not a scheduled species for survey at this site.

Record this species if encountered at any other sites around Ohiwa Harbour.

This species had not been previously recorded from Taneatua Ecological District (see Beadel *et al*. 1999 and Beadel *et al*. 2009).

[1] Not known to occur elsewhere in the Taneatua Ecological District.

Kunzea
‘Thornton’

Kunzea 'Thornton' (Threatened-Nationally Vulnerable)
Whangakopikopiko Wildlife Refuge Reserve

Map	Figure 2: Sheet 10		
Map Reference (Mid-Point)	**Easting:** E1964012.23 **Northing:** N5786063.88		
Inspection Date	8 March 2011	**Inspection Time**	9.00 a.m.
Administered By	DOC		

Distribution and Habitat:

Thornton kanuka forms small areas of forest and treeland at this site.

The understory comprises *Baumea juncea*, *Calystegia soldanella*, *Muehlenbeckia complexa*, and *Agropyron pungens*.

One or two shrubs of karo (*Pittosporum crassifolium*) and houpara (*Pseudopanax lessonii*) are present. There are also a few herbaceous weeds, e.g. catsear (*Hypochoeris radicata*), and fleabane.

One hundred and sixty-three Thornton kanuka trees were counted. These comprise several groves (*c.*6 groves with more than 10 trees present, and *c.*7 groves of between 1-6 trees), and several individual trees.

At least three large dead trees were observed, and in addition to these three, the grove closest to the sea had been recently inundated by saltwater, and at least one tree in this grove was dead as a result of this, with a further eight trees suffering major dieback from this event (see photos below) (Point E). Information on some of the groves is provided below:

Waypoint 001 -,large spreading tree *c.*2 m tall.

Waypoint 003 - large spreading tree *c.*4 m tall and *c.*16 m wide.

Regeneration is very healthy at several sites. Numerous (more than 130 counted) small shrubs and saplings *c.*0.1-0.3 m tall were seen (Waypoint 002 five counted, and at Waypoint 004 80 seedlings and saplings 30 cm - 1.5 m tall were counted, at another site, six small shrubs growing amongst *Agropyron pungens*, *Calystegia soldanella*, and *Muehlenbeckia complexa* were counted).

GPS Reference:

Waypoint:	001	**Easting:**	E1963992.42	**Northing:**	N5786055.53
Waypoint:	002	**Easting:**	E1963992.18	**Northing:**	N5786055.51
Waypoint:	003	**Easting:**	E1964012.23	**Northing:**	N5786063.88
Waypoint:	004	**Easting:**	E1964051.40	**Northing:**	N5786073.82
Waypoint:	Point E	**Easting:**	E1964092.25	**Northing:**	N5786142.05

Thornton kanuka stand, Whangakopikopiko Wildlife Refuge Reserve.

Thornton kanuka stand, Whangakopikopiko Wildlife Refuge Reserve.

Multi-leadered Thornton kanuka trunk, Whangakopikopiko Wildlife Refuge Reserve.

Good natural establishment of Thornton kanuka seedlings and samplings, Whangakopikopiko Wildlife Refuge Reserve.

Good natural establishment of Thornton kanuka seedlings and saplings, Whangakopikopiko Wildlife Refuge Reserve.

Some mortality of Thornton kanuka in grassland, Whangakopikopiko Wildlife Refuge Reserve.

Mortality of Thornton kanuka caused by large storm events, resulting in erosion and salt water damage, Whangakopikopiko Wildlife Refuge Reserve.

Threats:

Inundation of salt water. For example, on Thursday 24 February 2011, storm surges, with a maximum peak reaching 4 m, resulted in large-scale mortality in mature Thornton kanuka trees relative to the total size of the population.

Management Requirements:

Brush wattle was growing amongst the Thornton kanuka in one place. Three shrubs were seen, along with numerous seedlings. Control of brush wattle is required around the Thornton kanuka population. Pest animal control is currently undertaken on the island by a community group. This should continue.

Monitoring Requirements:

Monitor on an annual basis for mortality and natural regeneration. Natural regeneration is currently occurring within this population. Establish a series of photopoints (e.g. 5-10) that are retaken on an annual basis. Information on what is visible in the photo should be collected when the photo is taken.

Broad Priorities for Future Survey:

N/A

Notes:

Numerous fernbird were seen and heard during the survey at this site.

Several weeds were noted on the island that should be controlled. Weed infestations noted that should be controlled are as follows:

008: Easting E1964823.82 Northing N5786258.66 - Naked lady (*Amaryllis belladonna*), walnut, pampas (more than ten plants).

009: Easting E1964406.73; Northing N5786115.76 - *Rosa rubiginosa*.

Weed survey was not the focus of the current survey, and this is not a complete inventory of weeds.

Leptinella squalida
subsp*. squalida*

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Leptinella squalida subsp. *squalida*

Common Name(s):

None known

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Leptinella squalida Hook.f. subsp. *squalida*

Family:

Asteraceae

Flora Category:

Vascular - Native

Synonyms:

Cotula squalida (Hook.f.) Hook.f.

Distribution:

Endemic. North, South (North-West Nelson only) and Chatham Islands. In North Island uncommon north of the Waikato.

Habitat:

Mostly coastal or inland (0-300 m a.s.l.), in open turf, on coastal cliffs, in coastal turf, along river beds or in open grassland and open, damp places within shrubland and lowland forest. In some urban areas reported as a lawn weed. Often found growing with *Hydrocotyle heteromeria* A.Rich. and H. *microphylla* A.Cunn. Some forms of L. squalida subsp. squalida have also been gathered from subalpine to alpine habitats in the central North Island.

Features:

Dioecious, widely creeping, fast-growing perennial herb forming dense monospecific turfs or intermingled with other turf species. Rhizomes at or near soil surface, green, dark green to red-green, flexible, pilose hairy; branches usually single at flowering nodes; leaves in two rows, single at apex, 5-30 mm apart. Short shoots alternate on both sides of the rhizomes with distant leaves. Roots slender and weak, up to 0.8 mm diameter. Leaves 1-pinnatifid, 5-10(-20) x 3-20 mm; blade 4-6(-10) mm, bright green or yellow-green with basal 1/3-1/2 brown-pigmented and/or the proximal pinnae, broadly elliptic or obovate, fleshy to membranous, sparsely pilose hairy to moderately pilose hairy or glabrous, midrib raised along majority of ventral surface; pinnae 6-20 pairs, oblong to elliptic, large pinnae suborbicular to obovate, usually equal in length and width, close-set, overlapping; distal pinnae not cut to rhachis, closer together and set at a narrower angle to the rhachis than the middle pinnae, often overlapping; middle and proximal pinnae cut to rhachis, usually distant, but often overlapping; teeth usually present on pinnae with up to 10 per pinna, oblong to acute. Peduncles borne on rhizomes, sparsely pilose hairy, usually longer than leaves, 10-60 mm, ebracteate or with 1 simple bract. Pistillate capitula 3-5 mm elongating to 10 mm diameter in fruit; surface convex; involucre urceolate; involucral bracts 15-

40, subequally 3- or more seriate, green, broadly elliptic, somewhat villous, with a broad brown-tipped scarious margin; inner bracts elongating after anthesis to enclose subglobose fruiting head; florets 15-70, 2.2.5 mm long, yellow-green, curved, corolla slightly longer than wide, dentition unequal. Staminate heads 4-7 mm diameter; involucre hemispherical; involucral bracts 5-10, uni- or biseriate, not extending after anthesis; florets more numerous. Cypsela 1.9 x 0.9 mm, initially pale, chartaceous and wrinkled, maturing brown and smooth.

Similar Taxa:

Differs from *L. squalida* subsp. *mediana* (D.G.Lloyd) D.G.Lloyd et C.J.Webb by its less divided leaves with the distal pinnae not cut to the rhachis, close-set and positioned at a narrower angle to the rhachis than the middle pinnae. It is best distinguished from L. dioica by the sparsely hairy leaves whose basal pinnae are distinctively brown-pigmented.

Flowering:

August - February

Fruiting:

September - June

Propagation Technique:

Easy from rooted pieces and tolerant of a wide range of soil, sun and shade conditions. An excellent lawn cover. Very variable, so could benefit from cultivar selection.

Threats:

Not Threatened but scarce north of Waikato.

Chromosome No.:

2n = 260

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Photograph by Jeremy Rolfe.

Photograph by Peter de Lange.

Leptinella squalida var. *squalida* (Not Threatened)[1]
Nukohou Estuary

Site Inspection:

This species was not re-found during the 2011 field survey of 10 March 2011. The area where it was found in 1992 (approximately Easting E1960181; Northing N5783639) has been colonised by saltwater paspalum (*Paspalum vaginatum*) which forms a dense monoculture in an area 4-6 m wide over 100 m along the edge of the Nukuhou Stream mouth.

Saltwater paspalum is common along much of the margins of the Nukuhou Estuary traversed during the 2011 survey, generally forming a monoculture, to the exclusion of other species.

Broad Priorities for Future Survey:

Leptinella squalid var. *squalida* was not scheduled for inclusion in the 2011 survey and no time was spent searching for it. A dedicated survey for this species could be undertaken in a future survey.

Notes:

This species was not a scheduled species for survey at this site.

[1] Not known from any other site in the Taneatua Ecological District.

Lophomyrtus bullata

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Lophomyrtus bullata

Common Name(s):

Ramarama, bubble leaf

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Lophomyrtus bullata Burret

Family:

Myrtaceae

Flora Category:

Vascular - Native

Synonyms:

Myrtus bullata Sol. ex A.Cunn. non Salis. nom. illegit., *Myrtus aotearoana* (E.C.Nelson) E.C.Nelson nom. illegit., *Lophomyrtus aotearoana* E.C.Nelson nom. illegit.

Distribution:

Endemic. North and South Islands. Scarce in the South Island where it ranges to about North Canterbury and Greymouth.

Habitat:

Coastal to montane forest and shrubland. Often a locally conspicuous component of the understorey of lowland Podocarp riparian forest. *Lophomyrtus bullata* also occasionally grows on in suitable sites in slope forest, and in wetter areas is sometimes a common component of regenerating shrubland in cut over forest. Where it meets with rohutu (*Lophomyrtus obcordata*) the hybrid *L. ×ralphii* is often commonly found. Sometimes *Lophomyrtus xralphii* is locally dominant occurring in places where ramarama is scarce or has seemingly died out.

Features:

Shrub or tree up to 6 m tall or more. Trunk slender, up to 0.2 m diameter. Bark reddish, fibrous, flaking in small irregular shards, underbark pink. Branches numerous, erect, compactly branched, Branchlets initially 4-angled becoming terete with age, rather brittle, finely hairy, hairs ± persistent.Leaves opposite, coriaceous, finely hirsute when young (hairs somewhat stiffly erect to sericeous, appressed, caducous), maturing glabrous, surface minutely glandular-punctate, oil glands colourless, leaf lamina and petiole decurrent with branchlet; petiole 2-5(-10) mm long, rather brittle; leaf lamina 15-30-(50) × 10-15-(40) mm, broadly ovate to suborbicular, bullate, apex obtuse or acute and then often minutely apiculate, adaxially dark green to yellow green, mottled and/or spotted with red, maroon or purple-black circular blemishes, abaixally pink or red-tinged. Flowers 4-merous, 12-14 mm diameter, borne in axillary, solitary monads, on slender, 12-14(-18) mm long, hirsute pedicels. Hypanthium subturbinate, not extending beyond ovary summit, calyx lobes 4, 1.5-2.2 mm long, persistent, spreading, elliptic-oblong, obtuse to

subacute. Petals 8-10 × 6-9 mm, suborbicular, white, margins entire to slightly irregular, ciliate, oil glands colourless. Stamens 80 -100(-200 or more), free, in 4 (or more) weakly defined whorls, filaments 8-12 mm long, anthers cream, dorsifixed, latrorse. Ovary inferior, 2-3-locular, ovules numerous, in a single row on each linear placenta. Style 10-12 mm long, slender, white, stigma capitate, scarcely dilated. Fruit a broadly ovoid, dark red or black 6-8 mm long berry. Seeds numerous, reniform, 2.7-5.5 mm diameter, testa dark brown, glossy ± smooth, very hard. Description by P.J. de Lange (9 February 2011) except for seed description which is modified from Webb & Simpson (2001).

Similar Taxa:

Easily recognised by the suborbicular, bullate (i.e. 'bubbly') usually red-tinged and or mottled leaves.

Flowering:

November - March

Fruiting:

January - June

Propagation Technique:

Easily grown from fresh seed. Can also be grown from semi-hardwood and hardwood cuttings. Ramarama (*Lophomyrtus bullata*) is an attractive and remarkably hard shrub that does well when planted in a semi-shaded site, in a free draining, moist, fertile soil enriched with leaf litter and compost. It is also surprisingly drought tolerant. On account of its bullate ("bubbly") leaves and conspicuous flowers ramarama is a very attractive plant that is well worth growing. Ramarama is, however, rarely available from garden centres - although the hybrid swarm between it and rohutu (*Lophomyrtus obcordata* (*L.* ×*ralphii*)) including a hideous array of variegated horrors are quite commonly available and grown.

Threats:

Not Threatened

Chromosome No.:

2n = 22

Endemic Taxon:

Yes

Endemic Genus:

Yes

Endemic Family:

No

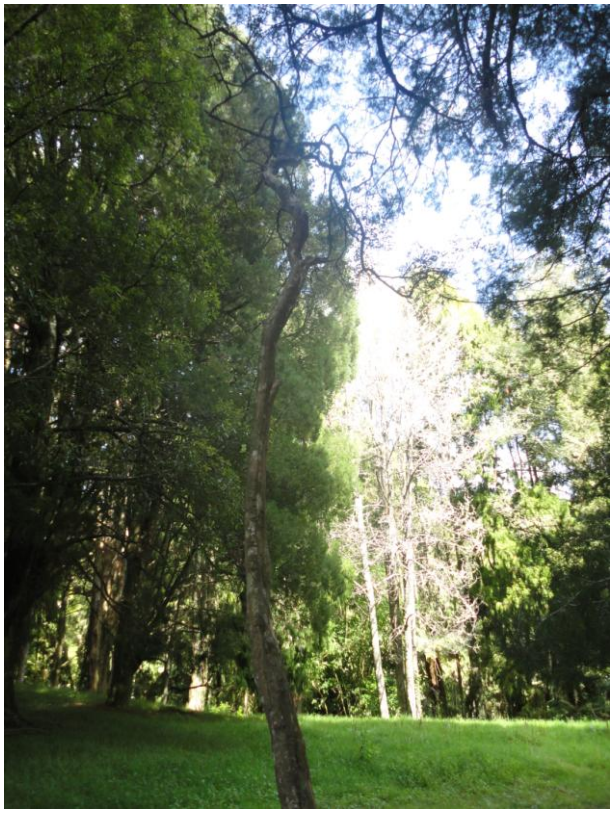
Lophomyrtus bullata (Ramarama; Not Threatened)[1]
Stanley Road "C"

Map	Figure 2: Sheet 6		
Inspection Date	14 March 2011	**Inspection Time**	2.00 p.m.
Owner	Jeremy Hedley	**Population Size**	One plant

Habitat:

One tree 8 m tall, in poor health occurs in tawa-rimu-tanekaha-kahikatea treeland. There is virtually no understorey, apart from grazed pasture. This site was identified as a Category 2 RAP (Asplin Forest) in the Taneatua Ecological District PNAP survey (Beadel *et al*. 1999).

GPS Reference: **Waypoint:** 093 **Easting:** E1957835.34 **Northing:** N5778497.27



Ramarama tree.

Base of ramarama in poor health.

[1] Only known from three sites in the Taneatua Ecological District.

Threats:

Growing in grazed treeland. No understorey or regeneration of canopy species present. The one known tree is not in very good condition. The trunk is damaged.

Management Requirements:

This area was identified as a Category 2 RAP in the 1999 Protected Natural Areas Programme Survey (Beadel *et al*. 1999).

Formal protection of this area should be pursued, along with fencing and exclusion of stock. At the same time, propagation of plant stock from this plant, or the plants recently discovered by the author in Ōhope Scenic Reserve, should be undertaken. Whilst propagation from seed is ideal, cuttings could be collected in the first instance. One cutting was taken during the current field inspection because at that time it was the only plant of this species known in the Taneatua Ecological District, and it is in an unhealthy condition

Monitoring Requirements:

Nil.

Broad Priorities for Future Survey:

A more detailed field survey of the rest of this RAP could find additional plants of this species, or other species that are not currently known from the Ohiwa Catchment or the Taneatua Ecological District.

Notes:

Ramarama is known from only three sites in the Ecological District (near Matekerepu Historic Reserve (one tree; Tim Senior pers. comm.), this site (one tree), and Ohope Scenic Reserves (less than five trees).

This was not a scheduled site for survey.

In a recent survey of a small part of Ōhope Scenic Reserve, the author found three ramarama trees (Beadel In press).

Nertera scapanioides

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Nertera scapanioides

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Nertera scapanioides Lange

Family:

Rubiaceae

Flora Category:

Vascular - Native

Threats:

Not Threatened

Chromosome No.:

2n = 44

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Nertera scapanioides[1]
Hiwarau Wetland, Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011		

Habitat:

10 March 2011

058 - The northern population growing on Sphagnum amongst *Tetraria capillaris*. *Drosera binata* is also present at this site

051 - The southern population was growing beneath Manuka shrubland (with scattered *Coprosma propinqua* × *C. robusta*). Other ground cover components growing in association with the *Nertera scapanioides* include *Oplismenus hirtellus* subsp. *imbecillis*, *Schoenus maschalinus*, lotus, *Centella uniflora*, and *Gonocarpus micranthus*.

GPS Reference:						
	Waypoint:	051	**Easting:**	E1960625.47	**Northing:**	N5783546.71
	Waypoint:	058	**Easting:**	E1960924.69	**Northing:**	N5783715.47

Nertera scapanioides in Hiwarau Wetland.

[1] Not known from elsewhere in the Taneatua Ecological District.

Threats:

Grey willow invasion.

Management Requirements:

Grey willow control at this site is of high priority. This should be undertaken in the next one to two years before grey willow becomes well established.

Monitoring Requirements:

Site inspection in five years to assess population health and identify any management requirements.

Broad Priorities for Future Survey:

This site should be field surveyed for orchids in November.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Record if found elsewhere in Ohiwa Harbour Catchment. This species had not been previously recorded from Taneatua Ecological District (see Beadel *et al*. 1999 and Beadel *et al*. 2009).

Peperomia tetraphylla

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Peperomia tetraphylla

Common Name(s):

None known

Threat Status:

Naturally Uncommon

Status 2004:

Sparse

Authority:

Peperomia tetraphylla (G.Forst.) Hook. et Arn.

Qualifiers:

SO

Family:

Piperaceae

Flora Category:

Vascular - Native

Synonyms:

Piper tetraphyllum G.Forst., *Peperomia novae-zelandiae* Colenso

Distribution:

Indigenous. Recorded from Northland, the Bay of Plenty and East Cape areas. Also known from Australia and some Pacific Islands.

Habitat:

Coastal to lowland, usually epiphytic on tree trunks (particularly near branch junctions) but also found amongst tree roots. Often found on shaded cliff faces and ledges and on boulders within forest. This species is quite tolerant of dry conditions but seems to flourish near streams, water falls and seepages.

Features:

Succulent herb up to 200 x 300 mm. Plants often epiphytic or rupestral. Branches 1-3 mm diameter, dark green, reddish-green to yellow-green, numerous, ascending and spreading; initially finely puberulent, becoming glabrescent with pubescent retained at nodes. Leaves in whorls of (3-4), or opposite, subsessile, 5-15 x 4-12 mm, dark green to yellow-green above paler beneath, rhomboid to suborbicular, thick, fleshy, coriaceous, puberulent when young. Inflorescence a terminal spike 10-40 mm long; axis puberulent; bract orbicular-peltate, subsessile, flowers minute, greenish-yellow. Stamens 2, minute, subsessile. Ovary partially immersed in axis; ovoid, acute; stigma capitellate. Drupe 1.5 mm long, ovoid, red to red-green, very sticky.

Similar Taxa:

Could only be confused with *Peperomia urvilleana* A.Rich., which is much larger in all respects, has alternate rather than whorled, elliptic-oblong to broad-oblong rather than rhomboid to suborbicular leaves and both terminal and axillary rather than only terminal spikes.

Flowering:

September - April

Fruiting:

November - April (-May)

Propagation Technique:

Easy from rooted pieces and fresh seed but can be short-lived. An excellent pot plant. Cold sensitive

Threats:

Not actively threatened but generally uncommon. Some populations are very small, and most of those in Northland occur on private land where they are vulnerable to forest clearance

Chromosome No.:

2n = 44

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Peperomia tetraphylla (At Risk-Naturally Uncommon)
Waiotane Scenic Reserve

Map	Figure 2: Sheet 3
Inspection Date	27 January 2011 - 009, 010 2 April 2011 - 046, Point D
Administered By	Department of Conservation
Population Size	Four populations found.

Populations:

009 - Three clumps. Epiphytic on tawa (trunk) in tall tawa-rewarewa-puriri-kohekohe forest. Located just over side of ridge, near ridge crest. The understorey is nikau, kawakawa (*Macropiper excelsum)*, and silver fern. The groundcover comprised mahoe (*Melicytus ramiflorus)*, *Oplismenus hirtellus* subsp. *imbecillis*, *Blechnum chambersii*, and *Blechnum fluviatile*. Other species epiphytic on the tawa included *Pyrrosia eleagnifolia*, *Ichthyostomum pygmaeum*, *Microsorum pustulatum*, *Drymoanthus adversus*, and *Collospermum hastatum*.

014 - Three plants. Epiphytic on tawa in tawa-dominant forest with kohekohe and nikau in the subcanopy. In the head of a small gully. Three plants observed approximately 15 m above the ground, spotted from upslope looking directly at the trunks of the tawa. Low light conditions despite being a sunny day.

046 - 50+ plants. Over 50 plants recorded from four tawa trees. Tawa-puriri/nikau forest. *Peperomia urvilleana* also present.

Point D - One plant. Epiphytic on nikau in tawa-puriri forest.

GPS Reference:

Waypoint:	009	**Easting:**	E1955902.00	**Northing:**	N5783485.00
Waypoint:	014	**Easting:**	E1955571.71	**Northing:**	N5783601.37
Waypoint:	046	**Easting:**	E1956030.42	**Northing:**	N5783575.63
Waypoint:	Point D	**Easting:**	E1955366.74	**Northing**	N5783667.72

Threats:

None identified. There is a predator animal trap line in the reserve which is regularly serviced. Pest animal control in the reserve should be continued.

Management Requirements:

None identified.

Monitoring Requirements:

None identified.

Broad Priorities for Future Survey:

Further survey of this reserve is likely to identify further populations of this species, and other remnants with mature tawa trees in the vicinity may also support populations of this species.

Notes:

This species was not a scheduled species for survey at this site.

Peperomia tetraphylla (At Risk-Naturally Uncommon)
Matekerepu Historic Reserve

Map	Figure 2: Sheet 7		
Map Reference (Mid-Point)	E1961620; N5779916		
Inspection Date	10 March 2011	**Inspection Time**	5.00 p.m.
Administered By	Department of Conservation	**Population Size**	*c.*33 plants

Habitat:

Tawa-puriri forest. In one place *Peperomia tetraphylla* was growing in association with *Peperomia urvilleana*.

Populations

063 - One plant epiphytic on titoki.

064 - Two plants epiphytic on tawa.

065 - *c.*3 plants epiphytic on puriri.

071 - *c.*4 plants epiphytic on tawa.

072 - *c.*3 plants epiphytic on tawa.

GPS Reference:

Waypoint:	063	**Easting:**	E1961650.12	**Northing:**	N5779781.27
Waypoint:	064	**Easting:**	E1961638.55	**Northing:**	N5779829.09
Waypoint:	065	**Easting:**	E1961635.98	**Northing:**	N5779839.05
Waypoint:	071	**Easting:**	E1961665.92	**Northing:**	N5780024.21
Waypoint:	072	**Easting:**	E1961563.32	**Northing:**	N5779994.55

Peperomia tetraphylla epiphytic on tawa in Matekerepu Historic Reserve.

Peperomia tetraphylla epiphytic on puriri in Matekerepu Historic Reserve.

Threats:

None identified.

Management Requirements:

None.

Monitoring Requirements:

None or minimal.

Broad Priorities for Future Survey:

Survey Kotare Scenic Reserve for this species. Other areas of tall forest in the Ohiwa Catchment may also contain populations of this species.

Notes:

There is likely to be more plants of this species in this reserve.

Peperomia tetraphylla (At Risk-Naturally Uncommon)
Stanley Road "A"

Map	Figure 2: Sheet 5
Owner and Status	Jim and Margaret Sullivan Ford Covenant, Stanley Road (a covenant pursuant to Section 221 of the Resource Management Act 1991)
Inspection Date	14 March 2011
Inspection Time	9.30 a.m.
Population Size	Over 75 plants seen.

Habitat:

Epiphytic on a variety of hosts in tawa-nikau-mamaku-mahoe forest.

Populations

073 - Two plants epiphytic on tawa.

077 - Twenty plants epiphytic on heketara (*Olearia rani*).

078 - Four plants epiphytic on tawa.

079 - Ten plants epiphytic on mahoe.

080 - Fifteen plants epiphytic on dead standing stem, and also growing on dead log on ground.

081 - Twenty plants epiphytic on pigeonwood (*Hedycarya arborea*).

084 - Fifteen plants epiphytic on mamaku (*Cyathea medullaris*).

GPS Reference:

Waypoint:	073	**Easting:**	E1958181.39	**Northing:**	N5781947.11
Waypoint:	077	**Easting:**	E1958166.94	**Northing:**	N5781976.82
Waypoint:	078	**Easting:**	E1958160.48	**Northing:**	N5781977.60
Waypoint:	079	**Easting:**	E1958159.36	**Northing:**	N5781988.91
Waypoint:	080	**Easting:**	E1958167.71	**Northing:**	N5781992.17
Waypoint:	081	**Easting:**	E1958169.26	**Northing:**	N5781980.58
Waypoint:	084	**Easting:**	E1958205.07	**Northing:**	N5782010.49

Threats:

None known.

Management Requirements:

None. Maintain current protection and management of the forest (i.e. it is a district council covenant, not grazed).

Monitoring Requirements:

Five-yearly inspections of this and other sites in the catchment.

Broad Priorities for Future Survey:

None. This species is likely to be present at other sites in the Ohiwa Catchment where it is not currently known from. Sites which are visited in the course of biodiversity work in the catchment should be checked for this species. Further specific surveys for this species are not a priority at this stage.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Peperomia tetraphylla growing on the forest floor in the 'Ford' covenant on Sullivan the property.

Healthy population of *Peperomia tetraphylla* in the 'Ford' covenant.

Pimelea tomentosa

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Pimelea tomentosa

Common Name(s):

None known

Threat Status:

Nationally Vulnerable

Status 2004:

Serious Decline

Authority:

Pimelea tomentosa (J.R.Forst. et G.Forst.) Druce

Qualifiers:

PD

Family:

Thymelaeaceae

Flora Category:

Vascular - Native

Distribution:

Endemic to New Zealand, occurring throughout the North Island and northern South Island.

Habitat:

Open cliff tops, in scrub, frost flats, track sides and other seral habitats.

Features:

An erect, grey-green, leafy shrub up to 1 m tall. Branches are slender and straight, with prominent leaf scars. Bark orange-brown. Young branchlets have whitish hairs. The grey-green, soft lance-shaped leaves are up to 25 mm long, with pale silky hairs on their undersides. The black fleshy fruits are very conspicuous, terminating the branch ends wherever flowers have been present.

Similar Taxa:

Pimelea prostrata is a common component of coastal cliffs and shrubland vegetation. It has several variable forms but the leaves are smaller (3 to 6 by ƒn1 to 3 mm) than of *P. tomentosa*, its habit prostrate to sprawling and it has smaller, less conspicuous white fleshy fruits. Sand daphne (*Pimelea arenaria*) has a similar habit but only occurs in dunes and dune hollows, has shorter, more rounded leaves than *P. tomentosa* and smaller red fruits.

Flowering:

Flowering specimens may be seen throughout the year.

Fruiting:

Fruiting specimens may be seen throughout the year.

Propagation Technique:

Very easy to grow from fresh fruit and semi-hardwood cuttings. This species forms an attractive small shrub and is tolerant of a wide range of soil types and conditions from drought prone sites to frosty situations. It does best in infertile soils.

Threats:

Habitat loss through development, land clearance, succession, track maintenance and competition with weeds.

Chromosome No.:

2n = 36

Endemic Taxon:

Yes

Endemic Genus:

No

Endemic Family:

No

Photograph by Mike Thorsen.

Photograph by Nick Singers.

Photograph by John Barkla.

Pimelea tomentosa (Threatened-Nationally Vulnerable)
Uretara Island Scenic Reserve

Site Inspection:

Four and a half hours was spent searching suitable habitat, without finding any plants, including track margins and dry ridges. All the ridges were searched, as well as the predator control trap line, and also beneath the pohutukawa forest along the coastal margins of the island. Plants may have been present as it was not possible to search everywhere, however it can be said that, if present, *Pimelea tomentosa* was not common on the island in March 2011.

The forest canopy on the island is generally relatively intact, and the groundcover and understorey relatively dense, reflecting the absence or low numbers of browsing animals. From previous observations, *Pimelea tomentosa* seems to prefer relatively high light non-weedy environments, e.g. along track margins, or associated with light wells in the forest canopy, and habitat with these characteristics is scarce on the island.

Threats:

- This species is relatively short-lived, and it may not be present in the reserve this year. It may re-establish in the future.
- Disappearance of optimal habitat.
- Reduction in the extent of appropriate habitat as the indigenous vegetation on the island matures. The vegetation cover is still largely secondary in nature, which is the preferred habitat of *Pimelea tomentosa* in the Bay of Plenty, however there were few sites that provided the relatively high light, non-weedy environments that *Pimelea tomentosa* generally occurs in.

Management Requirements:

- Consideration could be given to planting within existing suitable habitat and/or creating suitable habitat within the catchment for this species.
- Planting should use stock sourced from populations in the Ohiwa Catchment (if any can be located) or nearby (e.g. Kohi Point or Mokoroa Gorge). However, further field survey to locate populations in the Ohiwa Catchment should be undertaken prior to instigating a planting programme.

Monitoring Requirements:

To be assessed.

Broad Priorities for Future Survey:

Survey this site and other historic population sites around the harbour to locate a natural population(s) to obtain eco-sourced seed (only seedlings were found during the current survey). Additional information on the ecology of the species, including habitat requirements, could also be collected during this survey, if populations are relocated.

Notes:

Numerous fernbird were seen and heard during the survey at this site.

Pimelea tomentosa (Threatened-Nationally Vulnerable)
Waiotane Scenic Reserve

Site Inspection:

Approximately six hours (27 January) and three hours (2 April) was spent searching suitable habitat within the reserve, without finding any plants, including track margins and dry ridges. Plants may have been present as it was not possible to search everywhere, however, if present, *Pimelea tomentosa* is not common.

This species is relatively short-lived, and it may not be present in the reserve this year. It may re-establish in the future. From previous observations *Pimelea tomentosa* seems to prefer relatively high light non-weedy environments, e.g. along track margins, or associated with light wells in the forest canopy.

Threats:

- Disappearance of optimal habitat.
- Reduction in appropriate habitat as the indigenous vegetation in the reserve matures. However, secondary vegetation is still common on ridges in the reserve. This is the preferred habitat of *Pimelea tomentosa* in the Bay of Plenty.

Management Requirements:

- Refer to recommendations made above on the Uretara Island site information sheet.

Monitoring Requirements:

N/A

Broad Priorities for Future Survey:

Repeat survey of this reserve, concentrating on areas not traversed in 2011, could be considered.

Refer to recommendations under Uretara Island site sheet.

Pimelea tomentosa (Threatened-Nationally Vulnerable)
Toritori

Site Inspection:

Approximately 15 minutes was spent searching suitable habitat from the harbour edge, without finding any plants. This site was not a scheduled site to survey, and permission had not been obtained from the landowner. A 15 minute visual search was made from below the high tide mark at the end of the day. No plants were found. The property was not entered.

Broad Priorities for Future Survey:

Survey of this site next summer or autumn could be considered.

Notes:

This was not a scheduled site for survey.

Pimelea tomentosa (Threatened-Nationally Vulnerable)
Hiwarau

Site Inspection:

Approximately three hours was spent searching secondary forest ridges and spurs, and along the coastal margin beneath pohutukawa trees. No plants were found.

Threats:

- Refer to notes on Uretara Island above.
- Pig rooting was observed during the survey.

Management Requirements:

- Refer to recommendations made above on the Uretara Island Scenic Reserve site sheet regarding further survey and planting.
- Hiwarau encompasses a large area of which only a small portion was inspected as part of the current survey. Further survey of Hiwarau could be undertaken.

Notes:

- Numerous fernbird were seen and heard during the survey at this site.
- This species was not scheduled for survey at this site.

Pimelea tomentosa (Threatened-Nationally Vulnerable)
Claydon Place

Map	Figure 2: Sheet 1		
Map Reference (Mid-Point)	E1958101; N5788561		
Inspection Date	14 March 2011	**Inspection Time**	5.30 p.m.
Population Size	Three seedlings.		

Habitat:

Growing in a high light site beside a narrow informal walking track on a small spur. Growing amongst *Coprosma rhamnoides*, turutu (*Dianella nigra*), mingimingi (*Coprosma propinqua* var. *propinqua*), bracken (*Pteridium esculentum*), and *Poa anceps*, beneath Pohutukawa-lancewood×houpara forest.

GPS Reference: **Waypoint:** Point C **Easting:** E1958100.82 **Northing:** N5788538.64

Individuals:

098 - Three seedlings (*c.*7 cm tall) present beside a narrow informal walking track.

Pimelea tomentosa seedlings.

Threats:

Track clearance, trampling, shading in the long term as canopy closure occurs.

Management Requirements:

See recommendations in text on *Pimelea tomentosa*, and above under the Uretara Island Scenic Reserve site information sheet.

Monitoring Requirements:

Twice-yearly field inspection of site, or more to improve understanding of the ecology of this species around the harbour.

Broad Priorities for Future Survey:

Field surveys of Oscar Reeve Scenic Reserve, Hiwarau, and possibly Waiotane. (See also recommendations in text on *Pimelea tomentosa*).

Notes:

Euonymus japonicus is present in pohutukawa forest near the boat launching ramp to access Ohakana Island (Easting E1958375.56; Northing N5788423.10). This species should be controlled.

Poa billardierei

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Poa billardierei

Common Name(s):

Sand tussock, hinarepe

Threat Status:

Declining

Status 2004:

Gradual Decline

Authority:

Poa billardierei (Spreng.)St.-Yves

Qualifiers:

SO

Family:

Poaceae

Flora Category:

Vascular - Native

Synonyms:

Festuca littoralis Labill.; *Schedonorus littoralis* (Labill.) P.Beauv.; *Triodia billardierei* Spreng.; *Poa billardierei* (Spreng.)St.-Yves; *Schedonorus billardiereanus* Nees; Arundo triodioides Trin.; *Schedonorus littoralis* var. *alpha* minor Hook.f.; *Austrofestuca littoralis* (Labill.) E.B.Alexev.

Distribution:

North Island, South Island, Chatham Island (apparently absent from Chatham Island now despite being formerly abundant). Also found in temperate Australia.

Habitat:

Coastal dunes; sandy and rocky places near the shore, especially foredunes and dune hollows.

Features:

Yellow-green tussocks up to about 70 cm tall. Leaves fine, rolled, somewhat drooping (coarser than silver tussock), initially green, often fading at tips to silver, and drying to golden-straw colour. Seed heads no longer than leaves; seeds relatively large, barley-like, leaving a characteristic zig-zag look to the remaining head when fallen. Flowers in early summer and the seed are produced in late summer. It could be confused with Poa chathamica which has blue-green or grass-green flat leaves and an open seed head which overtops the foliage. It could also be confused with marram grass which has similar foliage but large cat'stail-like seed heads which overtop the foliage.

Similar Taxa:

Ammophila arenaria (marram grass) is often confused with sand tussock because they grow in the same habitat.

Flowering:

Early summer

Fruiting:

Mid to late summer

Propagation Technique:

Collect seed in mid to late summer-autumn (early January in Wellington). Use fresh seed, sow in

free-draining seed-raising mix (50:50 peat:sand), cover lightly with sieved river sand. It should germinate within 2 months. Grow on in open position where they will not be waterlogged. When growing by division collect matrial in autumn (after flowering has finished) or spring (before new growth appears). Use vigorous pieces from outside of plant and do not make divisions too small. Water regularly until established and new growth appears. Plant out in well-drained soil in open situation.

Threats:

Mammalian grazing and browsing (palatable to sheep, cattle, goats and horses). Competition from marram grass. Coastal development and use of vehicles. The combined impact of browsing and competition from marram grass is believed to have caused the loss of the species from the Chatham Islands.

Chromosome No.:

2n = 28

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Poa billardierei (At Risk-Declining)
Whangakopikopiko Wildlife Refuge Reserve

Map	Figure 2: Sheet 10		
Inspection Date	8 March 2011	**Inspection Time**	*c.*10.10 a.m.
Administered By	DOC	**Population Size**	1 plant

Origin:

No natural records of *Poa billardierei* have previously been made in the Taneatua Ecological District. However, *Poa billardierei* has been planted on the Ohope Spit and also on the Ohiwa Spit to the west of Bryans Beach. There are no records or knowledge of *Poa billardierei* having been planted on Whangakopikopiko Island (M. Collins; P. di Monchy; W. O'Keefe pers. comm., 2011). Therefore, this plant has probably established without human intervention, however the seed source may be from nearby plantings.

Habitat:

Growing in sandfield amongst very scattered plants of *Oxalis rubens*, catsear, *Carex pumila*, fleabane, and *Calystegia soldanella*.

GPS Reference: **Waypoint:** 013 **Easting:** E1963967.27 **Northing:** N5786092.33

Poa billardierei - possibly established naturally on the Island (there are no records of this species having been planted on the Island, although this species has been planted between Bryans Beach and Ohiwa Spit, and along Ohope Beach.

Threats:

Rabbit browse.

Management Requirements:

Continue to control rabbits. Ensure that personnel undertaking weed control on the island are aware of the location of this plant.

Monitoring Requirements:

Inspect every two years.

Broad Priorities for Future Survey:

Nil.

Notes:

This species was not previously known from this site and was not scheduled for survey at this site.

Ptisana salicina

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Ptisana salicina

Common Name(s):

King fern, Para, Tawhiti para, Horseshoe fern

Threat Status:

Declining

Status 2004:

Serious Decline

Authority:

Ptisana salicina (J.E.Sm.) Murdock

Qualifiers:

SO

Family:

Marattiaceae

Flora Category:

Vascular - Native

Synonyms:

Marattia salicina J.E. Sm.; *Marattia fraxinea* Smith, *Marattia fraxinea* sensu J.B.Armstr.

Distribution:

Indigenous to New Zealand and the South Pacific (possibly elsewhere). In New Zealand it is found throughout the north-western half of the North Island from inland Wanganui northwards. The Waikato is probably its stronghold where it is known from many remnants and forested areas in the west.

Habitat:

Favouring lowland, karst habitats (cave entrances and tomo shafts) and dark stream sides, often amongst supplejack (*Ripogonum scandens*) and parataniwha (*Elatostema rugosum*).

Features:

A large, robust fern with fronds to 5 m tall arising from a stout, starchy base that was a traditional food for the Maori. The cane-like leaf stalks are green, 1–3 m long, and have a large basal, ear-like lobe that protects the uncoiling frond. The dark glossy green (or yellow-green in stressed sites) fronds are up to 4 m long by 2 m wide. The frond pinnules are entire, oblong, strap-like, and taper towards the tip. Midribs of the secondary pinnae are swollen at the junction with the main stem. The spores are arranged in distinctive boat-shaped sori. The juvenile fronds are less robust, wilting easily on exposure to sunlight, with the strap-like pinnules often lobed or serrated. An unusual form with crested tips to the adult pinnules is sometimes found in the wild around the Kawhia area.

Similar Taxa:

None

Flowering:

Specimens of suitable age may produce sporangia at any time.

Propagation Technique:

Difficult. Can be grown from spores but very slow.

Threats:

Feral and domestic stock, wild pig and goat browse are serious threats throughout its range. Indeed large specimens are only found where there has been intensive animal control, in inaccessible cave and tomo entrances or in steep-walled limestone gorges. Aside from animals the most serious threat to this species comes from plant collectors who have been responsible for the recent loss of several large, reasonably accessible populations near Kawhia.

Chromosome No.:

2n = 78

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Ptisana salicina (Para, King fern, At Risk-Declining)
Ford Covenant, Stanley Road
(Covenant pursuant to Section 221 of the Resource Management Act 1991)

Map	Figure 2: Sheet 5
Owner	Jim and Margaret Sullivan Ford Covenant, Stanley Road (a covenant pursuant to Section 221 of the Resource Management Act 1991) and Māori land
Inspection Date	14 March 2011
Inspection Time	9.00 a.m. - 1.30 p.m.
Population Size	*c.*10 mature plants; more than 42 small plants 0.1-0.7 m; 50+ small seedlings (less than 0.1 m).

Habitat:

Growing alongside stream beneath tawa-nikau-mamaku-mahoe forest. Other species present include *Cyathea cunninghammii*, pate, kohekohe, and kawakawa.

Populations

075 - 1 plant, 1.2 m tall.

076 - 1 large plant (2-3 m tall) and 2 small plants.

077 - 1 plant (5 fronds), 1.6 m tall; and *c.*10 small plants 0.1-0.5 m tall.

083 - At confluence of streams, 1 plant 1.2 m tall; 1 plant 1 m tall; and 24 small plants (0.1-0.7 m tall).

084 - 4 plants, 1.5-2.0 m tall; and more than 6 small plants.

085 - 1 plant (0.6 m tall).

090 - The landowner transplanted four seedlings from the natural population to this site about two years ago. Three of these have thrived and one is now *c.*0.4 m tall (see photograph below).

GPS Reference:

Waypoint:	075	**Easting:**	E1958166.06	**Northing:**	N5781962.85
Waypoint:	076	**Easting:**	E1958180.11	**Northing:**	N5781985.71
Waypoint:	077	**Easting:**	E1958166.94	**Northing:**	N5781976.82
Waypoint:	083	**Easting:**	E1958187.77	**Northing:**	N5782008.31
Waypoint:	084	**Easting:**	E1958205.07	**Northing:**	N5782010.50
Waypoint:	085	**Easting:**	E1958250.00	**Northing:**	N5782016.43
Waypoint:	090	**Easting:**	E1958181.33	**Northing:**	N5781885.80

Large mature king fern in the Ford covenant.

King fern trunk.

King fern seedlings are common on several banks.

King fern seedlings transplanted below the waterfall are thriving.

Threats:

Deer present. There were previously feral goats in the reserve but the current landowner eradicated them from this site and none have been seen for over ten years.

Management Requirements:

Deer control is required to ensure the deer population does not threaten the king fern populations.

Weed Control :

Two kiwifruit vines were observed near the king fern population (E1958250.00; Northing N5782016.43). These should be cut off and stump swabbed.

Several small pampas and privet (*Ligustrum sinense*) (Easting E1958252.26; Northing N5782018.46) were also present and these should also be controlled.

Monitoring Requirements:

This population should be monitored on an annual basis for 2-3 years. This could then be reviewed.

Broad Priorities for Future Survey:

Other nearby similar stream sites (i.e. similar topography and canopy) could be surveyed for king fern. If no further populations are discovered then consideration could be given to establishment of further populations in the Ohiwa Catchment using material sourced from the Stanley Road population (i.e. plants grown from spores or possibly some harvesting low numbers of seedlings (i.e. less than 5% of total seedlings present) from several of the banks on the site where there are numerous seedlings present).

Suitable sites would include similar gullies in Waiotane Scenic Reserve and potentially Matekerepu Historic Reserve and Kotare Scenic Reserve.

Ranunculus acaulis

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Ranunculus acaulis

Common Name(s):

Sand buttercup, shore buttercup

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Ranunculus acaulis DC.

Family:

Ranunculaceae

Flora Category:

Vascular - Native

Synonyms:

Ranunculus petriei Allan

Distribution:

Indigenous. New Zealand (North, South, Stewart, Chatham and Auckland Islands). Also Australia (Tasmania), South America (Chile) and the Falkland Islands.

Habitat:

Coastal and occasionally inland. Usually in saltmarsh or meadow, muddy ground near tidal creeks, on rock platforms or rock stacks, Occasionally on salt pans, limestone bluffs and along lake margins.

Features:

Perennial, mat-forming; rosettes tufted along pale, spreading, slender rhizomes. Leaves long-petiolate; lamina dark bronze-green to dark green, fleshy, glabrous, trifoliolate or deeply 3-lobed, 5-15(-20) mm diameter; lobes bluntly obovate, entire to shallowly toothed, terminal lobe entire or 3-fid, rounded to obtuse at apex, lateral lobes entire or with 1 basiscopic lobe. Flowers solitary, 5-10 mm diameter; scapes ± sessile, or very short, peduncles glabrous. Sepals spreading, glabrous. Petals 5-8, greenish-yellow, narrowly oblong or spathulate; nectary single, 1.5-2.0 mm from petal base, pocket-like. Receptacle glabrous. Achenes (6-)10-12(-30), not flattened, glabrous; body 2-3 mm long; beak straight, 0.5-1.0 mm long.

Similar Taxa:

Distinguished from other buttercups by the glabrous receptacle, fleshy, obovate, entire, bluntly toothed or shallowly lobed leaves with the apex of the terminal lobe rounded or broadly obtuse, and by the straight achene beak.

Flowering:

August - April

Fruiting:

September - July

Propagation Technique:

Easily grown from rooted pieces and fresh seed. An attractive pot plant.

Threats:

Not Threatened

Chromosome No.:

2n = 48

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Photograph by John Barkla.

Ranunculus acaulis (Regionally Uncommon)
Near Harbour Road

Map	Figure 2: Sheet 1
Inspection Date	10 March 2011

Site Inspection:

Approximately one hour was spent searching for *Ranunculus acaulis* along the harbour margin (E1958759.32 N5788641.42) on 27 January 2011. No plants were found.

Broad Priorities for Future Survey:

Repeat survey next summer could be considered.

Notes:

This was not a scheduled site for survey.

This species is only known from two other sites in the Bay of Plenty Region (see Beadel *et al*. 2009).

Schoenus apogon

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Schoenus apogon

Common Name(s):

None known

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Schoenus apogon Roem. et Schult.

Family:

Cyperaceae

Flora Category:

Vascular - Native

Synonyms:

Chaetospora imberbis R.Br.; *Schoenus imberbis* (R.Br.) Poir; *Schoenus laxiflorus* Steud.; *Schoenus brownii* Hook.f.; *Schoenus vacillans* Kirk; *Schoenus apogon* var. *laxiflorus* (Steud.) C.B.Clarke

Distribution:

Indigenous. North and northern South Islands, also Chatham Island. Also in Australia, New Guinea and Japan.

Habitat:

Coastal to montane (up to 500 m a.s.l.). Preferring open, seasonally damp or poorly drained ground, usually within gumland, tea tree scrub or within pakihi or on the margins of low moor peat bogs. Sometimes an invasive weed of rough or poorly drained pasture. Rarely on ultramafics.

Features:

Densely tufted, caespitose sedge. Culms numerous, 70-600 x 0.5-1.0 mm, densely packed at base, otherwise rather flaccid, unbranched, glabrous, occasionally finely scabrid just below inflorescence. Leaves 40-200(-600) mm long, usually less than, or rarely equal to the culm length; yellow green to green, linear to very narrow-linear, acute, channelled, margins slightly scabrid; sheaths membranous, reddish to red-purple. Panicle of 2-3 distant, or more or less approximate fascicles, the terminal usually with sessile to subsessile, densely clustered spikelets, lower fascicles, stalked, bearing loosely clustered spikelets; bract subtending each fascicle leaf-like, lowest bract overtopping whole inflorescence. Spikelets 4-6 mm long, 2-4-flowered. Glumes dark red, reddish purple to almost black, glossy, rarely pale cream near the slightly scabrid midrib, lower 1-3 glumes usually empty, often mucronate. Hypogynous bristles 6, > nut. Stamens 3. Style-branches 3. Nut slightly less than 1.0 x 0.5 mm, white with the 3 angles green or yellow, elliptic-oblong, almost globose, obtuse, apiculate, surface when viewed with a lens, conspicuously cellular, individual cells large.

Similar Taxa:

Schoenus caespitans is very similar (and is regarded by some as a mere variety).

From *S. caespitans. S. apogon* differs by its taller, more openly flaccid growth habit, culms up to 600 x 1 mm, leaves mostly less than, only rarely equal in length to the culms, 2-4-flowered spikelets that are 4-6 mm long (in S*. caespitans* the spikelets are 1(-2)-flowered and 3-5 mm long) and by the reddish glumes which are only rarely cream near the midrib, rather than distinctly, and centrally blotched cream. The surface of the nuts of *S. apogon* has conspicuous rather than distinctly smaller, minute cells.

Flowering:

August - April

Fruiting:

September - June

Propagation Technique:

Easily grown from rooted pieces and fresh seed. An excellent pot plant. Quite tolerant of dry conditions as well as wet. Requires full sun.

Threats:

Not Threatened

Chromosome No.:

2n = 8

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Photographs by Jeremy Rolfe

Schoenus apogon (Regionally Uncommon)
Hiwarau

Inspection Date	10 March 2011

Notes:

This species was not a scheduled species to survey at this site. *Schoenus apogon* was searched for on roadside banks (approximate location E1961524.39 N5783007.38) during the search for *Pimelea tomentosa*, without success, on 10 March 2011.

Broad Priorities for Future Survey:

Search for this species at Hiwarau if further surveys for *Pimelea tomentosa* are undertaken at Hiwarau.

Sicyos
aff. *australis*

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Sicyos australis sensu lato.

Common Name(s):

Mawhai, Ambush Vine, Nasty

Threat Status:

Naturally Uncommon

Status 2004:

Data Deficient

Authority:

Sicyos australis Endl.

Qualifiers:

CD, TO

Family:

Cucurbitaceae

Flora Category:

Vascular - Native

Synonyms:

Sicyos angulata L. - which is another quite unrelated species.

Distribution:

As currently circumscribed this species is known from Australia, New Zealand, and formerly Norfolk Island.

Habitat:

Coastal forest or lowland forest, often in scrub or amongst bracken fern.

Features:

Rampant vine, producing stems up to 10 m long. Stems, leaves and flower stems covered in sparse, harsh long hairs. Leaves acutely 3-5-lobed, grey-green. Flowers pale cream tinged green. Fruits small, ovoid to ellipsoid, non-fleshy, covered in sharp spines, these detaching readily into clothing and skin.

Similar Taxa:

In NZ could only be confused with an undescribed *Sicyos*, endemic to N. offshore islands. Differs from that by often smaller, grey-green 3-5 acutely-lobed leaves, harsh stem hairs, smaller flowers and spines on the fruits. However, at times plants have been confused with choko (*Sechium edule*), when in a vegetative state this is understandable, though choko has larger, darker green leaves. The fruits of choko are very much larger, pear-shaped, pale green, and unadorned with sharp spines.

Flowering:

In suitable conditions flowers are produced throughout the year.

Fruiting:

In suitable conditions fruits are produced throughout the year.

Propagation Technique:

Easily grown from seed. However seed can take several months to germinate.

Threats:

Threatened by the small population sizes, cucumber and zucchini mosaic virus, and through its weedy habit, causing confusion with other introduced weedy species of cucurbitaceae, e.g. choko (*Sechium edule*).

Chromosome No.:

2n = 26

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Sicyos aff. *australis* (Taxonomically Indeterminate-At Risk-Relict) Claydon Place, Port Ohope

Map	Figure 2: Sheet 1
Map Reference (Approximate Mid-Point of Search Area)	Easting E1958181.06 Northing N5781946.66

Inspection Report:

Date: 27 January 2011 and 14 March 2011

Notes:

Sicyos aff. *australis* was planted at this site by DOC (P. Cashmore and D. Gosling) in about 1996. A verbal description of the location of where the plants were planted was provided by Paul Cashmore (DOC) and Derek Gosling. The site was inspected on two separate dates (27 January 2011 and 14 March 2011) during the current survey, for a duration of about 30-60 minutes each time, and no plants were found.

This is a seasonal ephemeral species, and may reappear at this site in subsequent years, however Paul Cashmore indicated that it had not been seen at this site for a number of years.

The current vegetation is a grassland comprising dense cover of exotic grasses, including kikuyu, sea couch, Mercer grass, and tall fescue. The surrounding tall vegetation comprises a mixture of mahoe, kawakawa, karo, and karamu, with local brush wattle.

GPS Reference: **Waypoint:** 074 **Easting:** E1958064.41 **Northing:** N5788495.88

Near site where *Sicyos* was planted *c.*1996, on the margins of Ohiwa Harbour.
The exotic grasses in the foreground include sea couch, tall fescue, and kikuyu.

Threats:

Weeds (dense exotic grasses, refer to above).

Management Requirements:

Suitable sites around the harbour could be selected where this species could be planted (e.g. on Whangakopikopiko Wildlife Refuge Reserve and Uretara Island).

Monitoring Requirements:

N.A.

Broad Priorities for Future Survey:

Nil.

Tetragonia tetragonioides

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Tetragonia tetragonioides

Common Name(s):

kokihi, New Zealand spinach, tutae-ikamoana

Threat Status:

Naturally Uncommon

Status 2004:

Sparse

Authority:

Tetragonia tetragonioides (Pall.) Kuntze

Qualifiers:

EF, SO

Family:

Aizoaceae

Flora Category:

Vascular - Native

Synonyms:

Demidovia tetragonioides Pall., *Tetragonia cornuta* Gaertn., *Tetragonia expansa* Murray nom. illegit., *Tetragonia halimifolia* G.Forst., *Tetragonia inermis* F.Muell.

Distribution:

Indigenous. Kermadec, Three Kings, North, South, Stewart and Chatham Islands. Also present in Australia, the western Pacific, Malesia, Japan and southern South America.

Habitat:

A species of the coastal strand zone often growing along beaches amongst driftwood, and sea weed but also in sand dunes, on boulder and cobble beaches, on cliff faces and rock ledges and in some areas such as the Kermadec Islands an conspicuous and important associated of the vegetation of many of the outer islands in the archipelago. Partly because it has been cultivated as a vegetable this species often appears in landfills or as a casual weed of urban areas. Indeed some wild occurrences near urban coastal settlements may stem from discarded plants or seed in garden waste.

Features:

Widely trailing perennial herb forming dense patches, circular mats, or rarely mounds of interlacing branches up to 1 m thick. Branches up to 1 m long, bright to dark green or yellow green, subterete, numerous, woody near base, decumbent, trailing not or only rarely rooting at nodes. Petioles firmly fleshy up to 20 mm long. Leaves 15-80 x 10-60 mm, dark green to yellow green, darker above and paler beneath, ovate-rhomboid, rhomoid to triangular, obtuse to subacute, entire or rarely slightly sinuate or shallowly lobed, both surfaces very densely though finely papillose. Flowers solitary or paired, mostly perfect sometimes unisexual, subsessile, 7-8 mm diameter, perianth dark yellow to pale yellow (rarely yellow-green). Calyx-tube broadly turbinate, lobes broad-triangular, obtuse. Stamens variable but between 10-20. Ovary 3-8-celled, styles 3-8. Fruit 8-10(15) mm long, subturbinate, angled, woody

horns 2-4 apical, sharp to blunted-ended, seeds 4-10.

Similar Taxa:

Tetragonia implexicoma (Miq.) Hook.f. is similar but has reddish stems, more usually broadly ovate or deltoid leaves, distinctly pedunculate flowers and globose rather than turbinate, succulent rather than woody, red fruits lacking horns.

Flowering:

October-February

Fruiting:

November - March

Propagation Technique:

Easily grown from seed and once established self-sows freely. A moderately popular vegetable whose seed is sold as New Zealand Spinach. Frost tender but once established usually resprouts from the base when warmer weather returns.

Threats:

It is threatened by disturbance of coastal sands and stony beaches.

Chromosome No.:

2n = 96

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

No

Photographs by Lisa Forester

Tetragonia tetragonioides (At Risk-Naturally Uncommon)
Uretara Island Scenic Reserve

Map	Figure 2: Sheet 9		
Inspection Date	8 March 2011	**Inspection Time**	*c.*11.00 a.m.
Administered By	Department of Conservation		

Site Inspection:

Searched for *Tetragonia tetragonioides* at site (E1962281.21; N5786366.24) where it was present in 1995, but no plants were located.

Threats:

Not known. Possible competition from sea couch.

Management Requirements:

Identify suitable habitat/sites around Ohiwa and plant, however survey site again before introducing plants sourced from other sites to the harbour (see below).

Monitoring Requirements:

N/A

Broad Priorities for Future Survey:

Resurvey site during annual monitoring of Thornton kanuka.

Tetragonia tetragonioides (At Risk-Naturally Uncommon)
Whangakopikopiko Wildlife Refuge Reserve

Map	Figure 2: Sheet 9		
Inspection Date	11 March 2011	**Inspection Time**	9.30 a.m.
Administered By	Department of Conservation		

Notes:

Searched for *Tetragonia tetragonioides* (Easting E1964825.72; Northing N5786275.01) but no plants were relocated.

Management Requirements:

Identify appropriate sites within the harbour to plant, and locate eco-sourced stock. Establish 5-6 populations at key locations.

Habitat can change rapidly, so it may not be that easy to establish.

Monitoring Requirements:

N/A

Broad Priorities for Future Survey:

Undertake species specific survey of Whangakopikopiko Wildlife Refuge Reserve and Uretara Island for this species.

Notes:

This species was not a scheduled species to survey at this site.

Tetraria capillaris

Extract from NZPCN Website (accessed 8 March 2011)

Species:

Tetraria capillaris

Common Name(s):

Tetraria

Threat Status:

Non Threatened

Status 2004:

Non Threatened

Authority:

Tetraria capillaris (F.Muell.) J.M.Black

Family:

Cyperaceae

Flora Category:

Vascular - Native

Synonyms:

Chaetospora capillacea Hook.f.; Chaetospora capillaris F.Muell.; Cladium capillaceum (Hook.f.)C.B.Clarke; Machaerina capillacea (Hook.f.) Koyama

Distribution:

Indigenous. Australia and New Zealand. In New Zealand present in the North Island from Te Paki south to about Taranaki and Hawkes Bay, and in the South Island recorded from the Nelson area and Westland.

Habitat:

Coastal to montane. Usually in seral vegetation within swamps, peat bogs, pakihi, gumland scrub, on sand podzols, in dune slacks or in open ground within regenerating kauri (Agathis australis) forest. Sometimes found fringing burn pools in peat bogs.

Features:

Tufted, tussock forming, rather gracile perennial herb. Rhizome short and lignaceous, up to 1 mm diameter, covered within membranous, red or pale brown, imbricate bracts. Culms 0.15-1.20 m tall, 0.5 mm diameter, glossy bright green to yellow-green, rather slender, wiry. Basal leaves reduced to red, mucronate, sheathing bracts; the uppermost up to 150 mm long, with a very slender mucro-like lamina, up to 5 mm long. Panicle 15-30 mm long, composed of 2-8 usually stalked spikelets; subtending bracts with a long lamina > spikelets. Spikelets c.5 mm long, narrow, dark brown or reddish, (1-)2-flowered. Glumes distichous, lanceolate, acuminate, with white membranous margins, the upper 1-2 pubescent towards the apex, the others glabrous, the lower 3-4 and the upper 1-2 empty. Hypogynous bristles 0. Stamens 3. Style-branches 3. Nut 1.5 x 1-1.2 mm, ellipsoid or oblong-ovoid, light brown with 3 white ribs, surface smooth, crowned by a pubescent, persistent style-base,as long as the nut but much narrower throughout.

Similar Taxa:

Most likely to be confused with *Schoenus carsei* Cheeseman from which it is best distinguished by the absence of hypogynous bristles (usually 3 rarely absent in S. carsei), and smaller (1.5 x 1.2 mm cf. 2 x 1 mm) light brown nut bearing three prominent white ribs otherwise smooth, and crowned by a pubescent, persistent style base of equal length to the nut. In *Schoenus carsei* the nut is uniformly white and smooth, and completely lacking a persistent style-base. *Schoenus carsei* and *Tetraria capillaris* have been found growing together.

Flowering:

October - March

Fruiting:

January - June (but fruits may be present throughout the year)

Propagation Technique:

Easily grown from fresh seed and by the division of whole plants, although as with many cyperaceous plants, specimens resent root disturbance and can take some time to recover from transplanting. Best grown in full sun on a poorly draining clay soil.

Threats:

Not Threatened

Chromosome No.:

2n = 20

Endemic Taxon:

No

Endemic Genus:

No

Endemic Family:

Tetraria capillaris (Regionally Uncommon)
Hiwarau Wetland (southern extent), Nukohou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011	**Inspection Time**	*c.*3.00 p.m.

Habitat:

Tetraria capillaris forms a dense sward in manuka/swamp coprosma/*Tetraria capillaris* shrubland. *Baumea juncea* is also present in the understorey. The population extends over an area *c.*20 m long. This vegetation occurs alongside estuarine saltmarsh in Nukohou Estuary. The wetland is one of the best freshwater wetlands in the Bay of Plenty.

GPS Reference: **Waypoint:** 058 **Easting:** E1960924.70 **Northing:** N5783715.47

Tetraria capillaris growing beneath manuka in Hiwarau Wetland.

Threats:

Grey willow invasion.

Management Requirements:

Grey willow control at this site is of high priority. This should be undertaken in the next 1-2 years, before it becomes well established.

Monitoring Requirements:

Site inspection in five years to assess population health and identify any management requirements.

Notes:

None.

Tetraria capillaris (Regionally Uncommon)
Hiwarau Wetland (northern extent), Nukuhou Estuary

Map	Figure 2: Sheet 8		
Owner	Mihaere	**Tenure**	Māori Land
Inspection Date	10 March 2011	**Inspection Time**	11.00 a.m.
Population Size	*Tetraria capillaris* covers an area of about 5 × 7 m.		

Habitat:

Growing beneath manuka-swamp coprosma-*Coprosma propinqua* × *C. robusta*/raupo/swamp millet shrubland. Other species present include *Baumea juncea*, and swamp kiokio. *Tetraria capillaris* forms the dominant ground cover in places.

GPS Reference: **Waypoint:** 037 **Easting:** E1961241.12 **Northing:** 5783895.08

Dense *Tetraria capillaris* near wetland margin.

Threats:

Grey willow invasion.

Management Requirements:

Grey willow requires control.

Monitoring Requirements:

Site inspection in five years to assess population health and identify any management requirements.

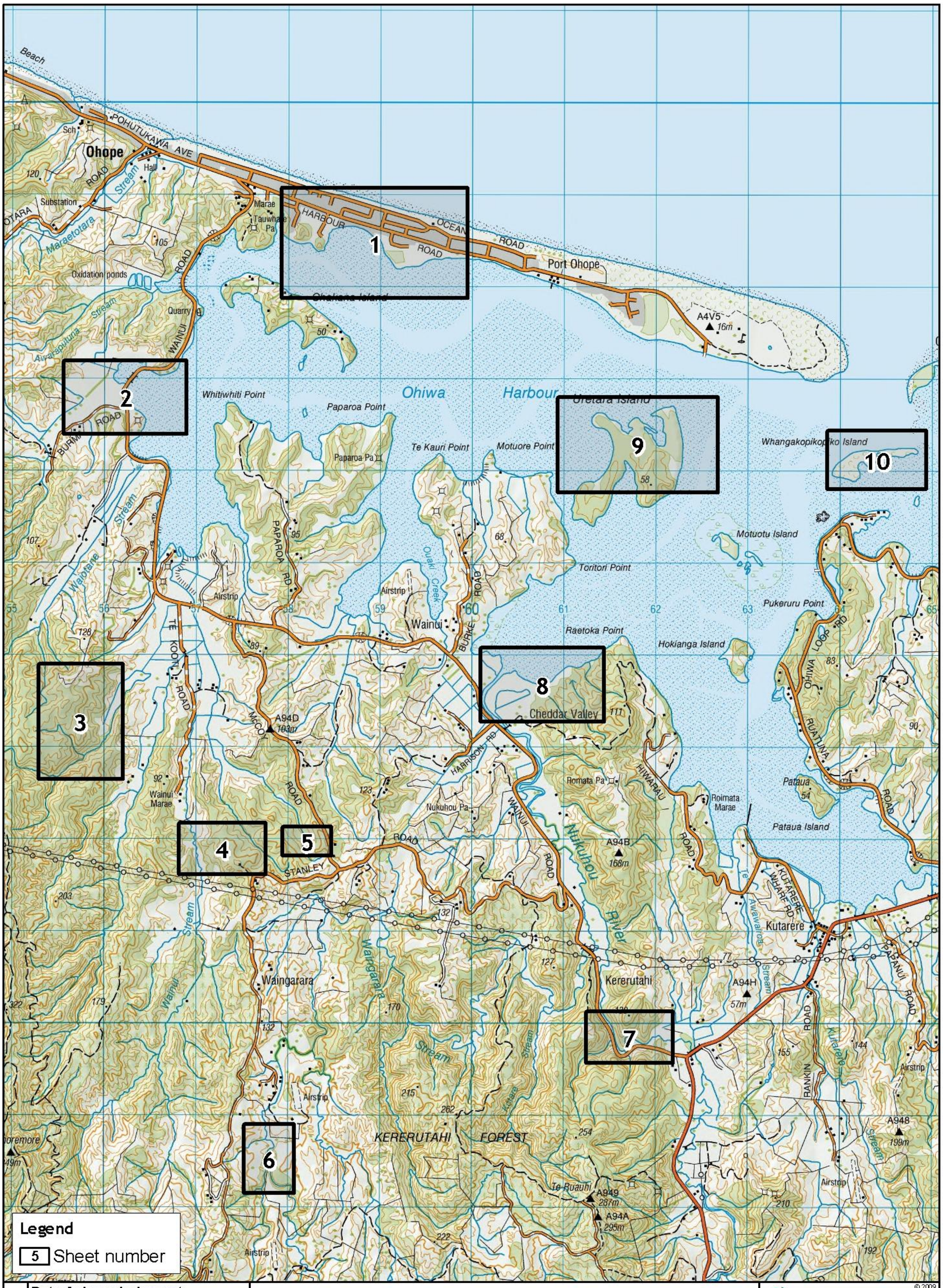
Broad Priorities for Future Survey:

N/A.

Notes:

Record if found elsewhere in Ohiwa Harbour Catchment.

MAPS



Data Acknowledgment

Topo Map: Crown copyright reserved

Report: 2616
Client: -
Ref: 01 1203
Path: E:\gis\sarah\Ohiwa Harbour significant flora\
File: mxd\Figures\Significant pop sheet 03.mxd

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Index Map

0 1,000 2,000 m

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Scale: 1:55,000
Date: 20/04/2011
Cartographer: FM
Format: A4R

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 1 of 10 - Claydon Place, Harbour Road, Otao Domain

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 2 of 10 - Wainui Road

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 3 of 10 - Waiotane Scenic Reserve

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 4 of 10 - Stanley Road B

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 5 of 10 - Stanley Road A

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 6 of 10 - Stanley Road C

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 7 of 10 - Matakerepu Historic Reserve

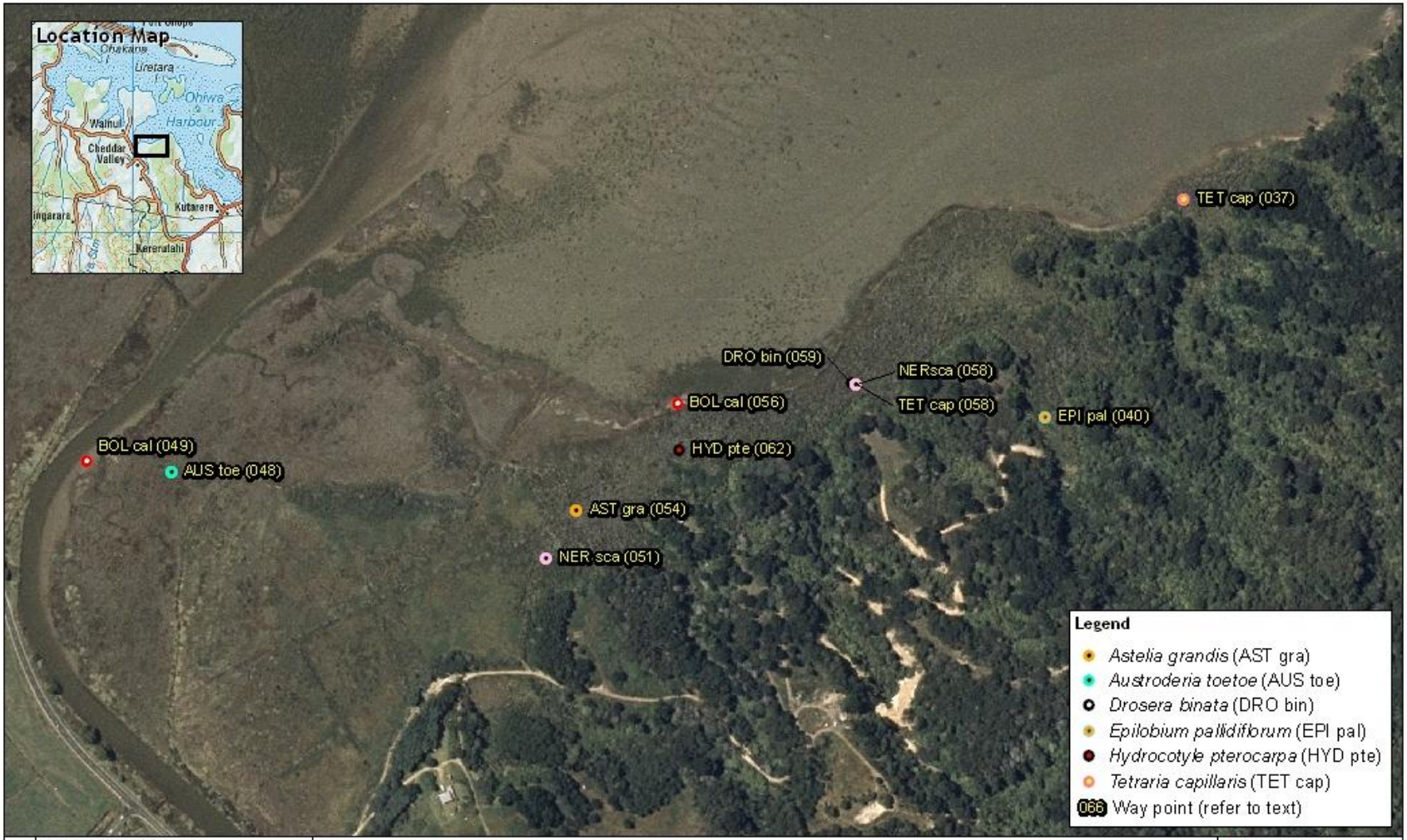

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 8 of 10 - Matakerepu Historic Reserve

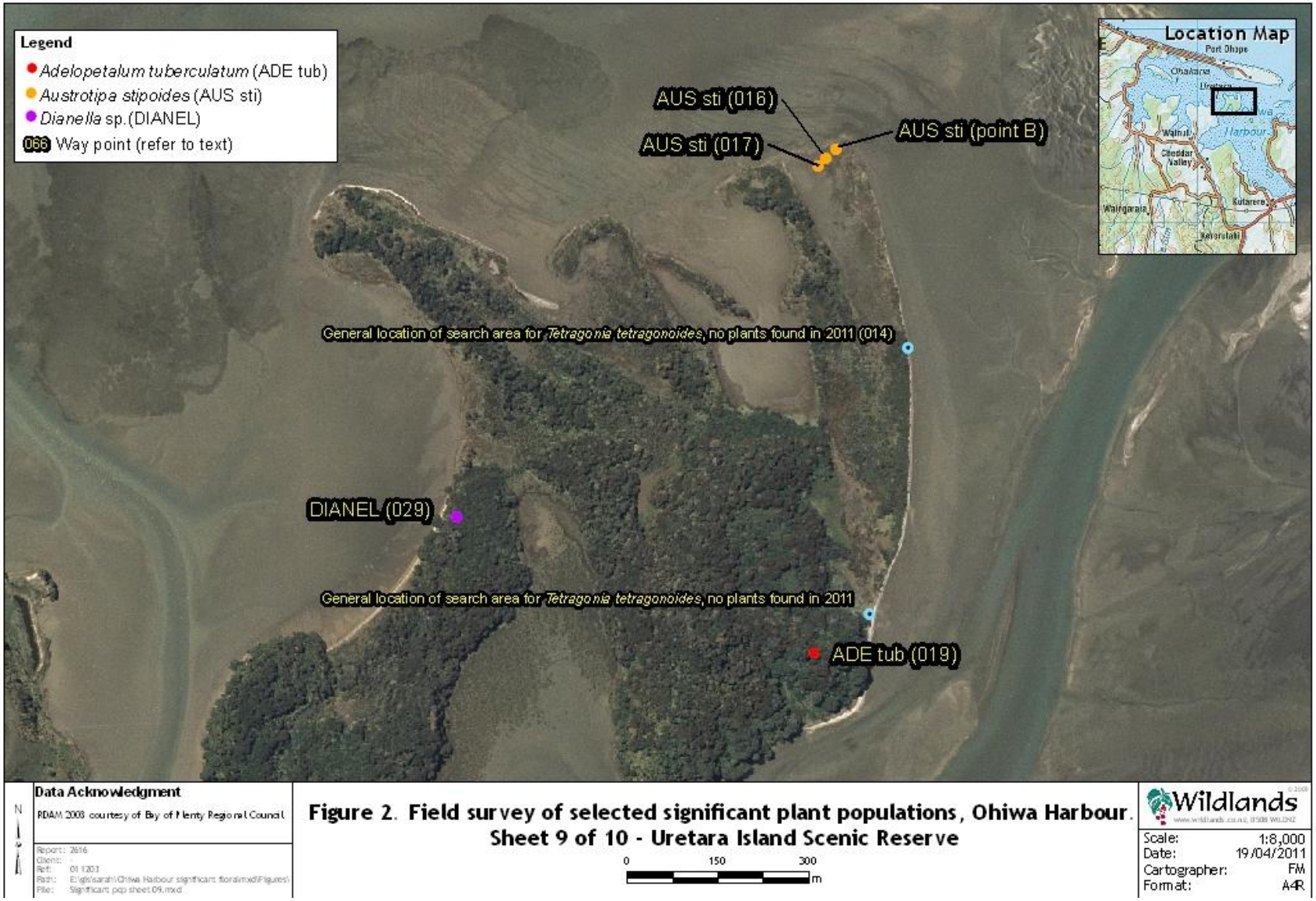

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 9 of 10 - Uretara Island Scenic Reserve

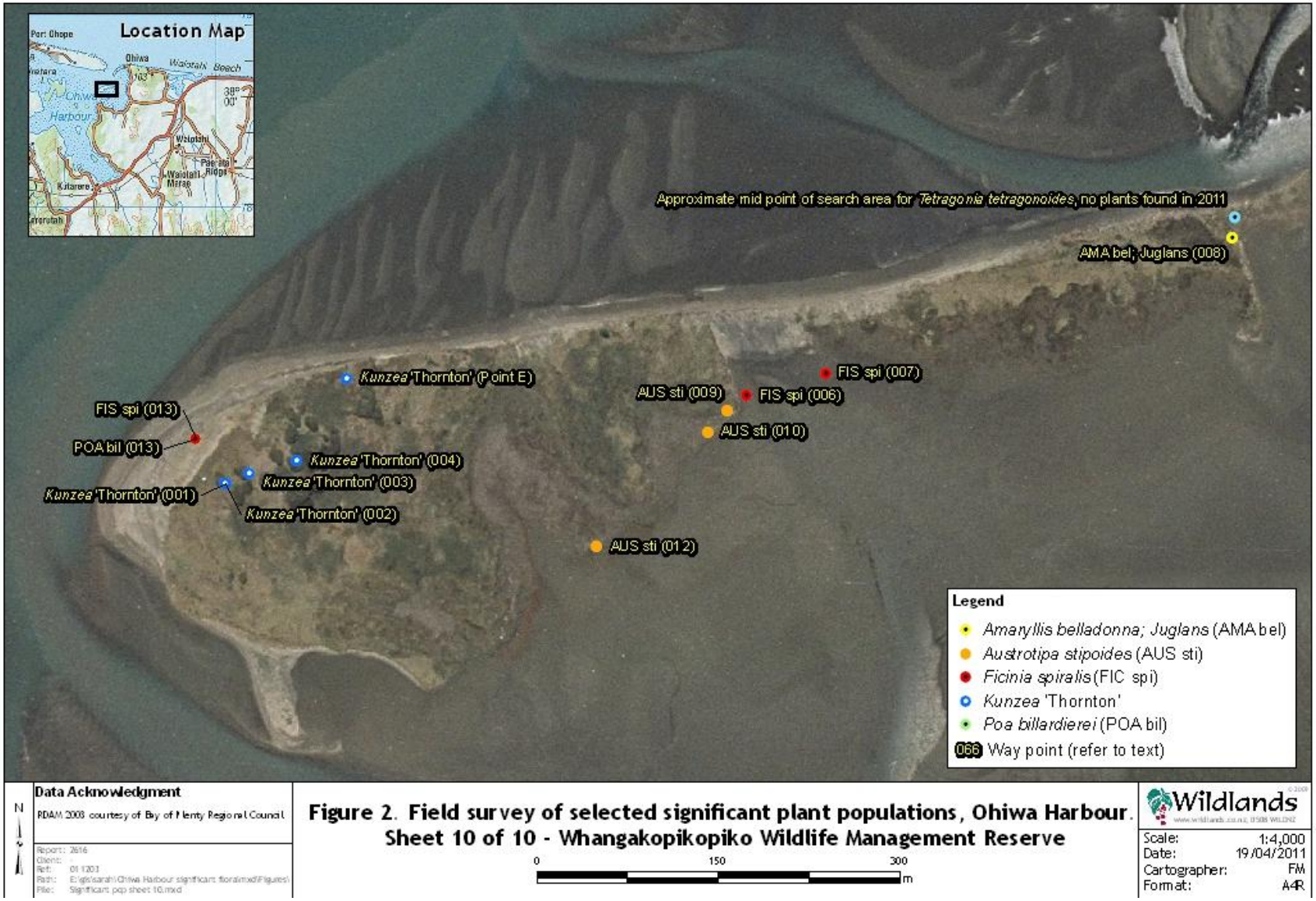

Figure 2. Field survey of selected significant plant populations, Ohiwa Harbour. Sheet 10 of 10 - Whangakopikopiko Wildlife Management Reserve

GPS COORDINATES FOR SPECIES FOUND DURING THE 2011 STUDY

ID Point	Date	Species	NZTM_East	NZTM_North
010	27 January 2011	*Adelopetalum tuberculatum*	1955798.24	5783520.71
011	27 January 2011	*Adelopetalum tuberculatum*	1955706.35	5783535.05
019	8 March 2011	*Adelopetalum tuberculatum*	1962126.07	5785859.15
058	27 January 2011	*Adelopetalum tuberculatum*	1955903.42	5782705.00
066	10 March 2011	*Adelopetalum tuberculatum*	1961663.47	5779967.34
070	10 March 2011	*Adelopetalum tuberculatum*	1961697.92	5780056.96
091	14 March 2011	*Adelopetalum tuberculatum*	1957413.29	5781936.07
Point A	27 January 2011	*Adelopetalum tuberculatum*	1955490.22	5783443.63
053	10 March 2011	*Astelia grandis*	1960653.47	5783591.77
048	10 March 2011	*Austroderia toetoe*	1960263.73	5783629.89
009	8 March 2011	*Austrostipa stipoides*	1964406.73	5786115.76
010	8 March 2011	*Austrostipa stipoides*	1964390.49	5786097.50
012	8 March 2011	*Austrostipa stipoides*	1964298.79	5786002.91
016	8 March 2011	*Austrostipa stipoides*	1962146.56	5786679.02
017	8 March 2011	*Austrostipa stipoides*	1962133.75	5786666.18
079	27 January 2011	*Austrostipa stipoides*	1959673.72	5788305.13
Point B	8 March 2011	*Austrostipa stipoides*	1962164.31	5786695.11
049	10 March 2011	*Bolboschoenus caldwellii*	1960181.30	5783639.40
056	10 March 2011	*Bolboschoenus caldwellii*	1960752.60	5783696.64
031	8 March 2011	*Dianella* sp.	1961477.88	5785862.04
057	10 March 2011	*Drosera binata*	1960917.99	5783737.12
040	10 March 2011	*Epilobium pallidiflorum*	1961108.05	5783683.80
006	8 March 2011	*Ficinia spiralis*	1964423.11	5786128.09
007	8 March 2011	*Ficinia spiralis*	1964488.03	5786146.10
013	8 March 2011	*Ficinia spiralis*	1963967.27	5786092.33
066	27 January 2011	*Hebe parviflora*	1956234.29	5786936.91
050	10 March 2011	*Hydrocotyle pterocarpa*	1960625.47	5783546.69
001	8 March 2011	*Kunzea* 'Thornton'	1963992.42	5786055.53
002	8 March 2011	*Kunzea* 'Thornton'	1963992.18	5786055.51
003	8 March 2011	*Kunzea* 'Thornton'	1964012.23	5786063.88
004	8 March 2011	*Kunzea* 'Thornton'	1964051.40	5786073.82
Point E	8 March 2011	*Kunzea 'Thornton'*	1964092.25	5786142.05
093	14 March 2011	*Lophomyrtus bullata*	1957835.34	5778497.27
051	10 March 2011	*Nertera scapanioides*	1960625.47	5783546.71
058	10 March 2011	*Nertera scapanioides*	1960924.69	5783715.47
009	27 January 2011	*Peperomia tetraphylla*	1955902.00	5783485.00
014	27 January 2011	*Peperomia tetraphylla*	1955571.71	5783601.37
046	2 April 2011	*Peperomia tetraphylla*	1956030.42	5783575.63
063	10 March 2011	*Peperomia tetraphylla*	1961650.12	5779781.27
064	10 March 2011	*Peperomia tetraphylla*	1961638.55	5779829.09
065	10 March 2011	*Peperomia tetraphylla*	1961635.98	5779839.05
071	10 March 2011	*Peperomia tetraphylla*	1961665.92	5780024.21
072	10 March 2011	*Peperomia tetraphylla*	1961563.32	5779994.55
073	14 March 2011	*Peperomia tetraphylla*	1958181.39	5781947.11
077	14 March 2011	*Peperomia tetraphylla*	1958166.94	5781976.82
078	14 March 2011	*Peperomia tetraphylla*	1958160.48	5781977.60
079	14 March 2011	*Peperomia tetraphylla*	1958159.36	5781988.91
080	14 March 2011	*Peperomia tetraphylla*	1958167.71	5781992.17
081	14 March 2011	*Peperomia tetraphylla*	1958169.26	5781980.58
084	14 March 2011	*Peperomia tetraphylla*	1958205.07	5782010.49
Point D	2 April 2011	*Peperomia tetraphylla*	1955366.74	5783667.72

ID Point	Date	Species	NZTM_East	NZTM_North
Point C	14 March 2011	*Pimelea tomentosa*	1958100.82	5788538.64
013	8 March 2011	*Poa billardierei*	1963967.27	5786092.33
075	14 March 2011	*Ptisana salicina*	1958166.06	5781962.85
076	14 March 2011	*Ptisana salicina*	1958180.11	5781985.71
077	14 March 2011	*Ptisana salicina*	1958166.94	5781976.82
083	14 March 2011	*Ptisana salicina*	1958187.77	5782008.31
084	14 March 2011	*Ptisana salicina*	1958205.07	5782010.50
085	14 March 2011	*Ptisana salicina*	1958250.00	5782016.43
090	14 March 2011	*Ptisana salicina*	1958181.33	5781885.80
074	27 January 2011	*Sicyos* aff. *australis*	1958064.41	5788495.88
037	10 March 2011	*Tetraria capillaris*	1961241.12	5783895.08
058	10 March 2011	*Tetraria capillaris*	1960924.70	5783715.47