



Love our Wetlands – Waiheke: Work Programme 2016-2017 & Long Term Vision

16 November 2016

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INTRODUCTION

Background

Waiheke Resources Trust (WRT) and Waiheke Local Board (WLB) have taken responsibility for ecological restoration activities in four areas (Figure 1):

- Matiatia headland (Church Bay esplanade reserve)
- Te Whau esplanade reserve
- Rangihoua wetland
- Te Matuku Bay esplanade reserve

Long Term Aim

The project aims to identify and implement a weed control methodology ** year work programme to protect and enhance the three wetland and one coastal sites.

Goals to support Aims

- Reducing weed abundance and improving riparian and costal habitats over time.
- The project concentrates on develop a herbicide free methodology with a focus on moth plant (and also including asparagus fern, rhamnus and honeysuckle) planting, maintenance and monitoring.
- Defining stages of control to guide implementation and achive desired outcomes over time

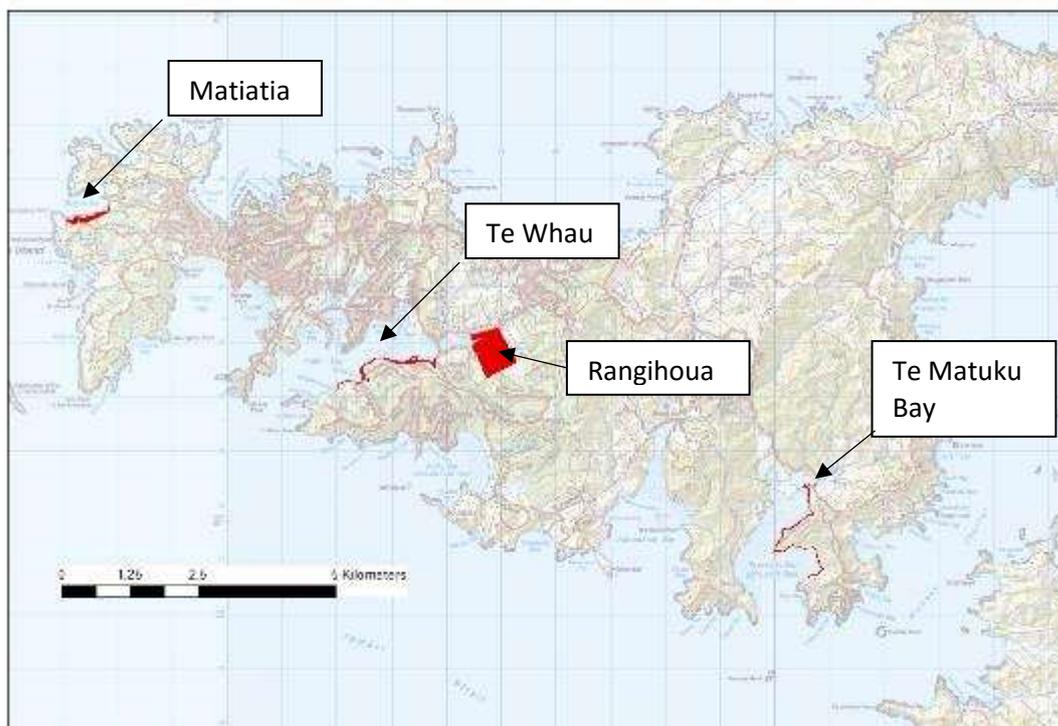


Figure 1: Areas targeted for WRT/WLB ecological restoration

The long term outcomes of ecological restoration activities in these areas are to protect and enhance ecological integrity by:

- Reducing pest plants, thereby creating and sustaining habitat that can support native biota and ecosystems. Such habitat is critical to the survival, diversity and breeding success of our native fauna and flora.
- Revegetating riparian areas with native plants, thereby buffering delicate wetland and estuarine systems from potentially damaging upland runoff that can lead to erosion and pollution. Enhancing streamside shading also helps to reduce stream temperatures and increase dissolved oxygen, minimising algal blooms and improving instream habitats for native fish and reptiles.
- Revegetation of coastal regions will support stabilisation and reduction of erosion. Enhance and increase native coastal forest coverage, providing habitat for flora and fauna.

However, achieving ecological integrity also requires the assessment and possible enhancement of other ecosystem components such as animals, hydrology, soil, microbes and human activities.

This plan focusses on the weeding and planting activities recommended in each area. It does NOT cover other desirable activities that fall outside our remit, such as

- Animal pest management
- Water quality monitoring
- Soil monitoring and management (e.g. for microbial diseases associated with tree diebacks)
- Aquatic pest management
- Fish, bird or reptile surveys/ restoration plans
- Geomorphological surveys and monitoring (eg sedimentation and erosion rates)

It is strongly recommended that processes are put in place to ensure collaboration between the various parties working on these activities on each site and on neighbouring sites (see 'Coordination' section below).

Methodology

Methodology in line with WLB no-spray' policy:

- we seek to minimise the use of herbicides to control weeds (cut and paste or wand application only).
- seek to use manual methods of removal, retaining some weeds as a 'nursery' to shade native plant seedlings and using targeted application of herbicides only as a last resort
- A supplementary project is being planned to investigate the relative efficacy of weed removal by various methods, including consideration of effects on plant composition, soil microbes and effort required.

Planting Methodology:

-
- All seedlings planted are raised from seed sourced from local nurseries from eco sourced stock from the inner Hauraki Gulf District.

Restoration Approach

Labour

The labour required to remove weeds manually is provided largely through the use of volunteers, supplemented by local contractors as required. The use of volunteers encourages community engagement, nurturing partnerships, raising awareness of kaitiakitanga and contributing to community education.

Planting

All seedlings planted are raised from seed sourced from local nurseries from eco sourced stock from the inner Hauraki Gulf District. Plant lists for each site are informed by the species composition found on nearby healthy sites belonging to the same habitat unit.

Management Units

Separate plans have been prepared for each habitat unit within each site. These plans build upon the comprehensive 5-10 year plans for each site that were previously drawn up by Auckland council (AC) Biosecurity team and their contractors, Te Ngahere.

Management Phases

All management units will progress through the five management phases. These phases are defined as:

- **Active control phase 1** – adult and juvenile weed plants control no previous control
- **Active control phase 2** – adult and juvenile weed plants control ongoing control
- **Follow-up weed control phase 3** – control of weed seedlings and seedbank
- **enhancement phases 4** – active planting
- **maintenance phase 5** – releasing of plantings and maintenance weed control. This phase is further defined as **low**, **medium** and **high** maintenance.

Areas progress through the phases as scale and resources dictate.

Habitat Description

A habitat unit is defined as an area of land supporting similar plants and animals within a relatively homogenous physical environment (soils, slope, hydrology, microclimate etc.). At the initial assessment, habitat units were described for each site. Sites were partitioned into management units that reflect the boundaries of habitat types. Non adjacent areas of the same habitat type are described as separate management units.

For each habitat type:

- Plant composition was recorded (qualitative assessment of cover and species composition in canopy, shrub and ground layers).
- Potential threats to ecological integrity were assessed.



- Planting and weeding needs were assessed and prioritised.

For each management unit:

- Photopoints were established, permanently marked with stakes and the GPS position recorded.
- Work undertaken will be recorded, noting volunteers numbers and hours, weed species removed, method of removal and the number and species composition of seedlings planted.

Monitoring and Evaluation

It is proposed that such assessment is conducted annually, to evaluate the work undertaken and to assign new priorities for the coming year. Ideally the plan review should take place in August, covering upcoming weeding periods (Sept-Mar) and propagation needs for planting the following winter.

In order to evaluate the effectiveness of our ecological restoration activities, in terms of the aims and outcomes outlined above, we will monitor and report progression through management phases:

Every 4 months:

- Photopoints in each management unit, together with a qualitative assessment of plant health and weed incidence. Records will include photographs in all directions and a rapid evaluation of vegetation composition and health at each site, paying particular attention to the growth and survival rates of new plantings. This will provide a visual record of seasonal and annual changes in the presence of weed species, demonstrating the success or otherwise of activities undertaken at each site. As weed species are eradicated, ongoing monitoring is needed to check that weeds are not resprouting from the seedbank.
- The assessments also provide opportunities for feedback to the volunteer and contractor teams, allowing fast response to emerging issues.

Every year (as part of the annual plan review):

- % cover and species composition of native plants (canopy, shrub and ground level)
- Establishment and survival of native seedlings (planted and natural regeneration)
- Comparative review of photopoint data

Every 5 years (outside the scope of this project):

- Water quality (Freshwater sites only: Rangihoua, some sites at Te Matuku?)
- Abundance and diversity of freshwater fauna (Freshwater sites only: Rangihoua, some sites at Te Matuku?)
- Abundance and diversity of other fauna (e.g. birds, reptiles, marine). No baseline data currently available.
- Progress towards these long term aims should be reviewed every 5 years, assessing progress against existing baseline data. Such reviews fall outside the scope of this plan, which has a one year focus.

Other Monitoring for Consideration

Water quality and freshwater fauna surveys were undertaken at 7 sites in Rangihoua Sports Park in 2006 and at 4 sites in 2013 by contractors working on behalf of AC. This monitoring is due to be repeated in 2018 (5 yearly). Are water quality monitoring and faunal biodiversity baseline surveys planned elsewhere? Should they be?

Bird, reptile and marine biodiversity has not been assessed at any of the sites, although Forest and Bird (F&B) undertake some such surveys at adjoining sites at Matiatia and Te Matuku Bay.

Following conversations with WRT, a Te Huruhi primary school Citizen Science program is due to start this year at Rangihoua, led by Phil Wainwright. This is intended to be a long-term project using the Auckland Council Waicare program to monitor the water quality at Rangihoua and undertake other educational areas such as growing eco-sourced plants for the site. We hope that our work will continue to stimulate such complementary initiatives.

Coordination with other agencies

It would be desirable to coordinate conservation efforts between the various agencies active at each site and on neighbouring sites, with a view to better understanding and managing interactions between diverse ecosystem components. We recommend site-specific coordination meetings at least annually. A holistic vision for each site would reduce the risk of duplicated efforts, facilitate the sharing of monitored data, enhance coordinated rehabilitation efforts and would also provide a solid platform for ongoing community education and engagement.

At Te Whau and Rangihoua (and elsewhere?): AC is responsible for animal pest control and monitoring (Bridget Velvin/ Daniel Mares).

At the **Rangihoua** site, maintenance responsibilities are shared between WRT, AC, the Golf Club and Sports Park management. Roles and responsibilities need to be clearly defined.

At **Matiatia** and **Te Matuku Bay**, Forest and Bird are actively restoring and monitoring large tracts of neighbouring land.

At **Matiatia**, it would seem sensible to coordinate planting and weeding activities with F&B initiatives in Te Atawhai Whenua reserve. For example, F&B organised a large community planting in part of the esplanade reserve last year, which we plan to extend further towards the headland in coming years. This could maybe become a joint initiative? Furthermore, both planting and weeding in this area need to be aware of the need to protect the little blue penguin colony at the base of the cliffs.

At adjoining properties in **Te Matuku Bay**, conservation projects and various surveys and monitoring activities are being undertaken by F&B, Friends of TM Bay, private land owners, DoC and AC. All these parties should at least know what the others are doing and share any data collected.

Structure of the Plan

For each site, this document provides

1. Map showing the various habitats present in the area, the management units based upon them and the location of photo points established in each management unit.
2. Brief description of each habitat type and initial assessment of current ecological condition and potential threats.
3. Planting and weeding priorities for the next 12 months

These data have been compiled following sites visits by Carola Cullum, Rob Morton, Ivan Kitson and Tony King-Turner between October 2015 and January 2016, together with a review of previous plans produced by Auckland Council Biosecurity team and their contractors (Te Ngahere).

The data are also available in spreadsheet form as Google documents, available for ongoing updating by the project team. They link to records of work planned and undertaken, budgets and monitoring, facilitating project management and reporting (see Work plan.xlsx, shared in Google Docs).



RANGIHOUA

The Rangihoua and Te Whau sites include wetlands and contributing tributaries of Rangihoua Creek that drain into Putiki Bay. This wetland/ estuarine complex is a Site of Ecological Significance (SES 9) and a Site of Special Wildlife Significance (SSWI). The coastal and stream edge vegetation not only protects the streams and wetlands, but also slows erosion and lateral sediment fluxes.

The wetlands and creeks in this area have been subject to several major fluxes of sediment over the last 200 years or so, changing their character from open waterways to mangrove and raupo wetlands and silt-bed streams. These sediment pulses have been associated with human activities such as land clearance, earthworks associated with the construction of roads, the sports park facilities and the nearby Dirt Track as well as the nearby quarry.

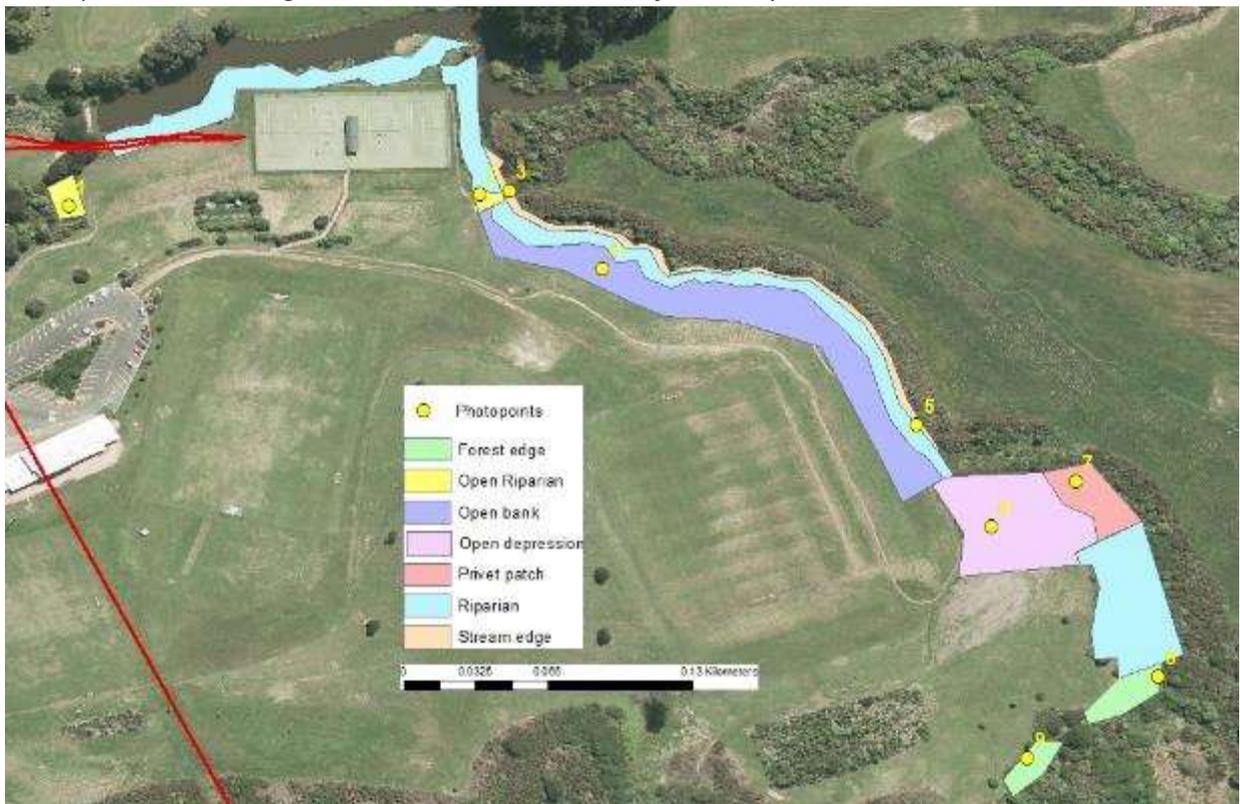
The Rangihoua sites fall within the Rangihoua/Onetangi Sports Park, for which Auckland Council policy and the District Plan requires that the stream banks and wetland margins are plants with ecosourced species and that earthworks and vegetation clearance are controlled in order to limit sediment runoff. The three tributaries of Rangihoua Creek which flow through the park are designated as conservation areas, with the aim of protecting and enhancing the wetlands and their contributing streams.



Rangihoua is covered here in two sections. The first section (assessed November 2015) covers the eastern end of the tributary running behind the tennis courts and playing fields (called Tributary 1 in previous reports). The second section (assessed April 2016) covers the western section of the southern riparian edge of this tributary (i.e. from Sports Park entrance on O'Brien road to western edge of this section). At present, the northern banks of this tributary, the other two tributaries within the Park and the northern edge of the Rangihoua wetland fall outside the scope of this project.

EASTERN SECTION

Photo points and management units: Eastern section of Tributary One



View across Tributary 1 with open bank in foreground and Tributary 2 in background



RIPARIAN FRINGE/STREAM EDGE

Description

Planted in 1990s. Closed canopy – dense trees/shrubs -difficult to see in!

Mahoe, manuka, karo, lacebark, coprosma spp, kohukohu and others

Seems in good condition

Channel varies between small flowing stream and wetland/silted margins with eg bulboschoens

Threats

Weeds encroaching from upland areas and along stream edge.

Weeds

Dock, convolvulus, occasional privet at stream edge.

Recommended actions

Leave privet where shading stream. Plant under elsewhere. Monitor fish and fauna?

Priority 3.5

Photopoints (NB Not all photopoint pictures are shown here)

#3 (on crossing - no pole), #5 (small opening to stream c 10m west of open depression- no pole):

2nd Nov 2015; 31st March 2016

Rang 3a GPSe-151102-095321



Rang 3 GPSe-151102-095326



Rang 5d GPSe-151102-102219



OPEN RIPARIAN EDGE

Description

The riparian fringe is occasionally open, sometimes almost to the stream edge. This generally occurs near crossings. Canopy and shrubs: < 10% cover, Ground: 100% cover with exotic grasses, some honeysuckle and blackberry

Planted to c 10m from stream in July/Aug 2015. Spacing c 1m, includes kanua, manuka plus assorted broadleaf trees.

Threats

Grass and weeds threatening to engulf newly planted seedlings

Weeds

Grass, blackberry, convolvulus, honeysuckle and pasture weeds. Some mothplant and gorse.

Recommended actions

Dig out large blackberry including roots. Leave convolvulus. Remove mothplant and gorse.

Release new plants and stake (so can be seen!)

Do above for all open areas adjacent to path (infilling riparian buffer)

No new planting needed.

Priority 5

Photopoints

#1 & 2: 2nd Nov 2015; 31st March 2016

Rang1a GPSe-151102-093922



Rang1d GPSe-151102-094016



Rang 2b GPSe-151102-095227



Rang 2 honeysuckle GPSe-151102-095259
Honeysuckle strangling new plant



Rang 2c GPSe-151102-095232



OPEN BANKS

Description

Grassy areas south of the path.

Canopy and shrubs: < 10% cover, Ground: 100% cover with exotic grasses, some honeysuckle and blackberry.

Planted Jul/Aug 2015 c 1m apart at eastern end and further apart towards western end. Plants include kanuka, manuka, totara, mahoe ++, with flaxes in wetter gully areas.

Threats

Weeds engulfing recent plants

Cycle track to be moved? Planted near edge!

Weeds

Grass, honeysuckle & convolvulus

Recommendations

Dig up honeysuckle, tracing surface runners to main root. Release trees from grass. And stake them so they can be seen.

Priority 5

Photopoints

#4 2nd Nov 2015; 31st March 2016

Rang 4a GPSe-151102-101015



Rang 4 honeysuckle GPSe-151102-101205
Honeysuckle around new plant



OPEN DEPRESSION:

Description

Wet area, was gorse etc., but has been mechanically removed, with mulch left on surface.
Planted July/Aug 2015 c. 2m spacing - flax, some kanuka, manuka, others Rabbits have eaten many plants including Kohuhu & Mahoe.

Ground: 90% cover exotic grasses, some oioi, wiwi in wetter areas. Shrub: 15% Resprouting gorse
Tree: <5%

Threats

Rabbits damaging some new plants
Gorse regrowth

Weeds

Gorse seedlings re-establishing. Also some honeysuckle, moth plant and woolly nightshade seedlings

Recommendations

Dig out honeysuckle, gorse, moth plant and woolly nightshade seedlings.
Release new trees and stake so they can be seen.
Talk to sports park about rabbit control?
Block up plants to deter rabbits. Need c600 plants Manuka, Kanuka, Totara, flax, Cabbage tree beware frostbite (including adjacent 'privet patch').
Priority 4.5

Photopoints

#6 2nd Nov 2015; 31st March 2016

Rang 6a GPSe-151102-103649



Rang 6b GPSe-151102-103653



PRIVET PATCH

Description

Patch of dead privet. Now replanted c.1-2m spacing with kanuka, manuka and others
Ground: 10-20% exotic grass, rest littler/mulch Shrub: 10% coprosma spp, mahoe Canopy: 30%
dead privet

Threats

Reestablishment of privet and other weeds

Weeds

Mothplant, privet, Woolly nightshade

Recommendations

Remove mothplant, privet, woolly nightshade under privet
Stake and release new plants
Planting as part of recommendations for open depression area.
Priority 4.

Photopoints

#7 2nd Nov 2015; 31st March 2016

Rang 7a GPSe-151102-104025



Rang 7b GPSe-151102-104011



Rang 7 young privet GPSe-151102-103829



FOREST EDGE

Description

Open areas at edge of mature forest, infected with woolly nightshade – has been hacked but not removed. March 2016 grown 2m+ tall, with moth plant underneath.

Canopy: 100% woolly nightshade Shrub: none Ground: 20% moth plant, gorse at edges. No signs of native seedling establishment under nightshade.

Threats

Mothplant and other weeds establishing under woolly nightshade and encroaching elsewhere.

Weeds

Mothplant, woolly nightshade, gorse.

Recommendations

Brushcut and cut n paste woolly nightshade, dig out mothplant.

Liase with sports park – who is doing what?

Replant with c 400 forest edge plants

Priority 5

Photopoints

#8, #9 2nd Nov 2015; 31st March 2016 New point # 10 31st March

Rang8a GPSe-151102-105325



Rang8b GPSe-151102-105257



Rang9a GPSe-151102-110221



Rang9b GPSe-151102-110224



treated woolly GPSe-151102-105616



WESTERN SECTION

The western section runs from the amphitheatre area to the park entrance on o’Brien Road.

This section consists mainly of a riparian strip of regenerating forest, planted in the 1990s and banks planted in 2014(?).



Views over driveway section of Rangihoua



YOUNG KANUKA FOREST

Description

Planted in 1990s?

Tree Canopy: 70-90%: mainly kanuka, Manuka, mahoe, mapou,

Shrub: 20-30% : Mapou.

Ground cover: 50-70% exotic grasses, 30-50% litter / soil

Threats

Weed incursion threatening new established seedlings

Weeds

Occasional asparagus fern, woolly nightshade.

Recommended action

Dig out asparagus, paste woolly nightshade and any moth plant seen. Priority 3.5

No planting needed – further regeneration happening naturally.

Photopoints #11 4th April 2016: ;



P4030056.JPG



P4030057.JPG

CLEARINGS

Description

Gaps within the regenerating kanuka forest offer opportunities for weed invasion.
 In some areas: No canopy or shrubs. Ground cover 100% exotic grasses

Another clearing has more canopy and less ground cover:
 Canopy c. 80% kanuka, Manuka some totara, mapau, karaka
 Shrub: c. 20% mapau
 Ground: <5% cover , mostly asparagus fern– rest litter and soil
 Some clearing show evidence of having been weeded in the past

Healthy edge to wetland, with flax grading to raupo.

Threats

Weed invasion – source of weed seeds for edges/ open areas.

Weeds

Asparagus fern.

Recommended action

Dig out honeysuckle and asparagus fern. plant c 100 manuka kanuka and broadleaves. Priority 4.5

Photopoints #14 4th April 2016



P4030075



P4030079



P4030077



P4030082

PLANTED BANKS

Description

Trees planted in 2014? Are now c. 1.5m high, surrounded by dense grass – but seem to be healthy and not in need of releasing. Trees taller at western end near entrance (#16)

Canopy <5% Shrub: c. 30% kanuka, Manuka, totara, topata, mapau, flax, cabbage trees

Threats

None evident. 90% + of the plants appear to be surviving well. Occasional blight smothering by Muehlenbeckia.

Weeds

Occasional gorse and honeysuckle near points #15 and #16

Recommended action

None.

Photopoints #13,15,16 4th April 2016



#13 P4030067



#16 P4030092



#15 P4030088



#16 P4030094

OPEN RIPARIAN EDGES

Description

Similar to small open areas on the edge of the regenerating forest in the eastern section, these unmown gaps need planting up. At present they are attracting weeds that can then threaten the edges of the establishing forest. No canopy or shrub, Ground cover:100% dense exotic grasses

Threats

Weed invasion – source of weed seeds for edges/ open areas.

Weeds

Honeysuckle, convolvulus and some moth plant, woolly nightshade.

Recommended action

Cut n paste moth plant and nightshade. Priority 4.5

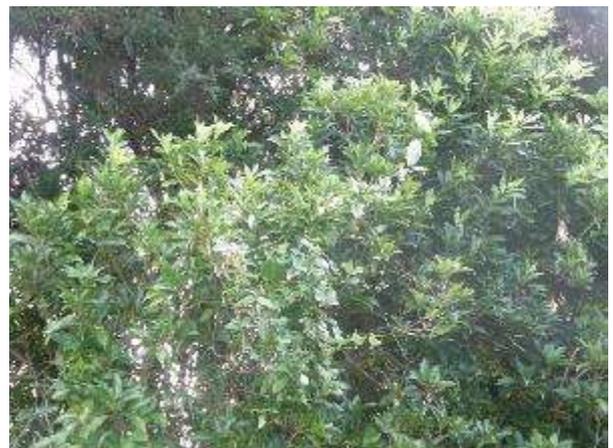
Riparian strip needs thickening. Plant with same trees as adjoining strip. Priority 4

Plant banks where roosters are? Thin riparian strip here.

Photopoints #12 April 4th 2016



P4030060-63

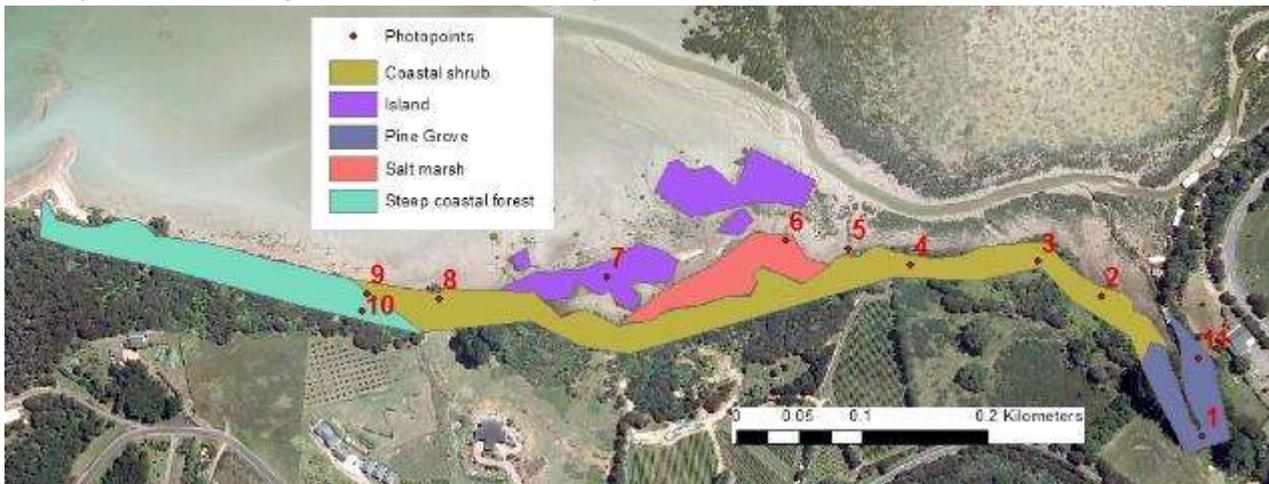


TE WHAU ESPLANADE RESERVE

This site is related to Rangihoua, since it forms the coastal margin to the estuarine component of the Rangihoua wetland complex. Although the esplanade reserve continue right around the point, this assessment (November 2015) only covers the section up to the beginning of the steep coastal forest area.

The islands were assessed both by land (at low tide, Nov 2015) and by kayak (at high tide, March 2016).

Photo points and management units: Te Whau Esplanade Reserve



Views across estuary
view 20151025_172635



A: PINE GROVE

Description

Shaded by mature pines, with regenerating kanuka at edges. Forms riparian fringe to stream flowing into small wetland.

Tree Canopy: 75%: Pinus radiata. Mahoe, Kanuka, Nikau, Tree ferns, Kowhai, Puriri. Kanuka and Mahoe saplings are more established and abundant in open areas away from pine canopy.

Shrub: 40% : Hangehange Karumu.

Ground cover: Needles/ soil 80%, climbing asparagus fern 10%, exotic grasses 10%

Threats

Pine limits understory establishment of native seedlings (acid soil, cover with needles).

Weeds

Asparagus fern re-establishing (looks as though was sprayed Summer 2015). April 2016 around 15-20cm tall, thick carpet in some areas. Also occasional moth plant, woolly nightshade.

Recommended action

Cut n paste moth plant. Shrubcut asparagus fern where starting to climb, then dig out or treat by wand. Priority 5 Riparian strip needs thickening. Possibly plant some kahikatea, tree fuschia and other plants that are likely to have been present in original forest. (How would they survive under/compete against the pines?) Priority 4

Photopoints #1: (No pole: End bridge, 13th Nov 2015 and April 4th 2016);

#11 (April 2016 only)

stream in pine grove: GPSe-151025-153519



April 2016 showing asparagus fern growth



COASTAL SHRUBLAND

Although shown as one unit on the map, the coastal shrubland falls into 4 distinct zones, alternating between open and densely covered areas.

B: DENSE COASTAL SHRUBLAND (WESTERN)

Description

Abrupt transition to dense shrub at land boundary (stile over fence). Distinct transition (ecotone gradient) from waters edge to upland edge of the riparian strip. In good condition - possible reference area?

Canopy: 20% Kanuka, Cabbage tree, Nikau Shrub: 100% Flax, Karamu, Mahoe Kawakawa, Karaka, Ground: 90% + reeds and grasses

Threats

Weed incursion. Source for pampas seed may be upslope patch on private pasture land.

Weeds

Occ. Pampas – has mostly been sprayed, but a few are resprouting.

Recommended action

Chop pampas to ground then cut n paste.
Priority 4.

Photopoints

#2: 13 Nov 2015 and 5th April 2016

whau 2a 20151113_165618



whau 2c 20151113_165624



Possible seed source for pampas? P1030621



C: DENSE COASTAL SHRUBLAND (EASTERN)

Description

Large clump of dense flax, grading to salt marsh on seaward side and raupo inland, where it , extends onto private land.

Threats

Weed incursion.

Weeds

Muehlenbeckia and weeds entwined through flax, so is almost impassable. Also a lot of blackberry, honeysuckle, convolvulus (native?). Previous report also mentions rhamnus, sweet pea and boneseed.

Recommended action

Clear weeds round edge of patch- hand cut then paste. May need landowner permission.

Priority 4.

Photopoints

- None

April 2016 from edge of salt marsh



April 2016 from private land



D: OPEN COASTAL SHRUBLAND (WESTERN - ARUMS)

Description

Open area, with pleasant outlook across estuary. Small house backs onto the esplanade here. Small depression at rear of esplanade strip – likely to be wetter than surrounding area.

Threats

Weed incursion – especially arums.

Weeds

Many arums throughout this area – some already cleared prior to first assessment. Numerous seedlings in lawns above and behind esplanade strip – so may be difficult to control.

Muehlenbeckia engulfing some plants and trees

Recommended action

Finish clearing arums. Priority 4.

Thicken up the riparian strip, following the gradient of plants seen in the more intact areas. Plant and stake about 600 kahikatea, toetoe , olearia solandra (coastal tree daisy) and other plants that are likely to have been present in times past. Maintain viewsheds. Also includes section D below. Priority 3.5

Photopoints

#3 (no pole – back of bench); #4 (no pole – boundary post): 13 Nov 2015 and 4th April 2016

whau 3a 20151113_170032



whau 3d _170130



whau 4d _170143



E: OPEN COASTAL SHRUB (EASTERN))

Description

Open area, with pleasant outlook across estuary. Large house backs onto the esplanade with lawns sweeping to waters edge. Small drainage ditch and boat mooring area.

Canopy and shrubs: None. Ground cover: 100% exotic grasses.

Threats

Reasonably well protected from coastal erosion – sheltered by point.

Weeds

Recommended action

(Part of action for C above) Thicken up the riparian strip, following the gradient of plants seen in the more intact areas. Plant and stake about 600 kahikatea, toetoe , olearia solandra (coastal tree daisy) and other plants that are likely to have been present in times past. Maintain viewsheds. Priority 3.5

Photopoints

#8 (no pole – in front of gum tree); 13 Nov 2015 and 4th April 2016

whau 8c 20151113_172849



whau 8d 20151113_172851



whau 8e 20151113_172854



F: SALT MARSH

Description

Vegetated areas at elevations between islands and mangrove mud flats. Rushes and sedges c.80% cover. Generally in excellent condition.

Threats

Weed incursion from edge

Weeds

No major issues.

Recommended action

Survey annually

Photopoints

#6 and #5 (Edge) 13 Nov 2015 and 4th April 2016

whau 6b 20151113_171309



whau 6d 20151113_171319



whau 6c 20151113_171313



Edge...whau 5a 20151113_170428



G: SHELL BANKS AND ISLANDS

Description

Land is slowly being reclaimed. A peninsula runs W-E with older, more established vegetation on the western end. Distinct transition (ecotone gradient) from high water mark edge to less frequently inundated areas. 100% ground cover and dense shrubland establishing (30-50% cover). A few trees at the older end of the peninsula. Generally in excellent condition. Important feeding and nesting sites for shore birds.

Two partly vegetated islands with Harakeke and Manuka (less well established on smaller island).
Shrub: Muehlenbeckia.

Ground cover: both native and non-native (eg Cyparus ustulatus, Paspalum, Austrostipus, Carex spp, oioi and raupo).

Threats

Weed incursion into valuable and fragile environments

Weeds

Occasional pampas – has mostly been sprayed, but a few are resprouting/ missed. One or two patches of gorse. Scattered boneseed and some asparagus fern and honeysuckle. Largest island also has gorse, Calystegia and herbs such as fat hen and ragwort growing in sprayed areas. Also mothplant, hawthorn and asparagus fern in NE of the largest island.

Recommended action

Survey and remove pampas, boneseed, mothplant and asparagus fern manually.

Photopoints

#7 (Peninsula) 13 Nov 2015 and 4th April 2016... None on islands.

Peninsula margin showing gradation from cushion plants to sedges



Peninsula: whau 7c 20151113_172040



whau 7e 20151113_172050



whau 7d 20151113_172046



Islands Dec 2015



H: STEEP COASTAL FOREST

Description

Regenerating coastal cliff forest. Steep and difficult to access in places. The project area covers only part of the forest, which continues inland and round the peninsula to the west.

Tree Canopy: 90% Kanuka, some Pohutukawa.

Shrub: Sparse - <10% cover overall. Mapou and Coprosma saplings. Ground cover: Twigs/ soil 50 - 70%, climbing asparagus fern 30-50%

Previous reports mention some pines further west.

NB Only assessed first 50m or so of this patch

Threats

Weeds – stifling potential understorey seedling establishment

Weed incursion from inland areas of forest in private properties

Weeds

Lots of climbing asparagus.

Previous reports also mention sweet pea bush, pampas, gorse, honeysuckle, boneseed.

NB Only assessed first 50m or so of this patch

Recommended action

Cut n paste asparagus, shrubcut where starting to climb. liase with Meriel – anti-glysohate

Priority 4...defer?

Photopoints

#9: 13 Nov 2015 and 4th April 2016; #10: 4th April 2016

GPSe-151026-121600



GPSe-151026-121641

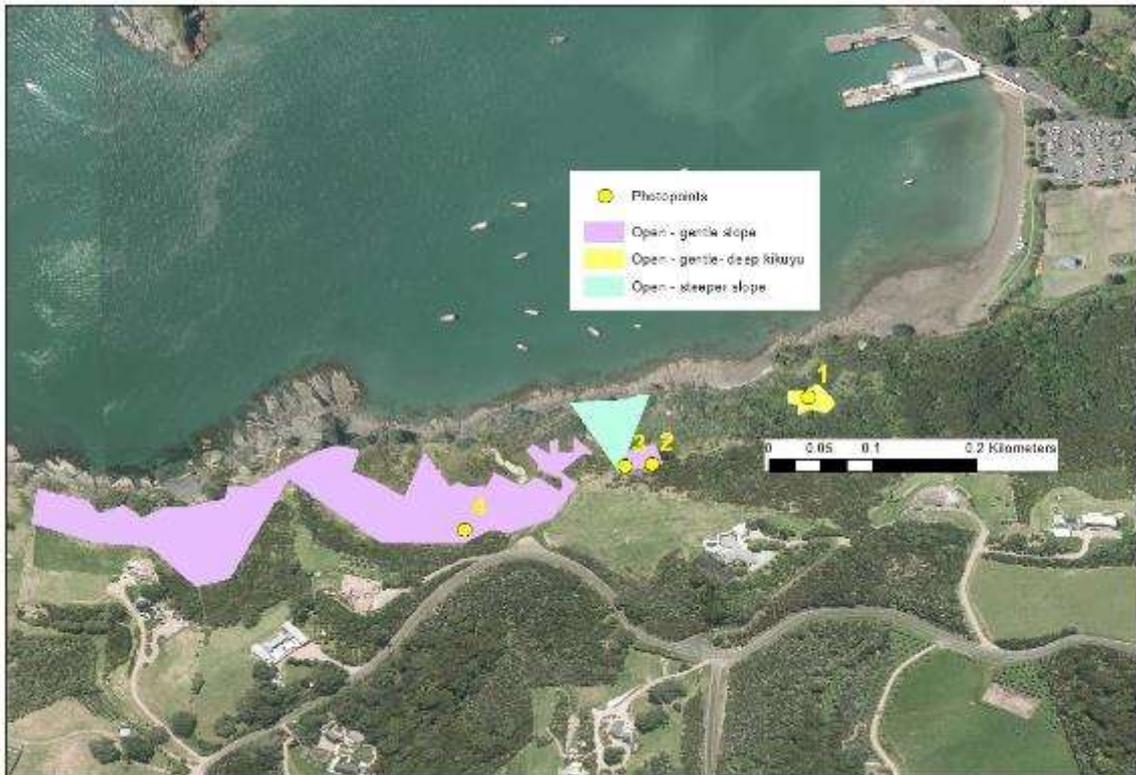


April 2016 slight new point #10 slightly upslope from #9



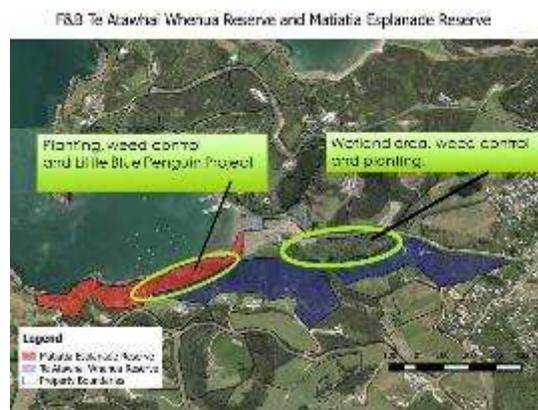
MATIATIA (CHURCH BAY ESPLANADE RESERVE)

Management units were assessed from the headland path. Note that Forest and Bird are active in this area, with extensive planting at the eastern end of Area 4 in winter 2015, in commemoration of Don Chapple. We strongly recommend close cooperation with Forest and Bird (joint projects?).



Forest & Bird projects in the area

Matiatia overview 20151109_105631



TE ATAWHAI-WHENUA

The most easterly part of the esplanade reserve forms part of Forest and Bird’s Te Atawhai-Whenua reserve, planted by Don Chapple from 1993 onwards. This area is outside the scope of this project.

Open areas to the west of this reserve are divided into three management units: Open areas with relatively gentle slopes, some with deep kikuyu and others with other pasture grasses) and steeper open areas. The wooded parts of the cliffs have not been assessed.

OPEN AREAS WITH GENTLE SLOPES AND DEEP KIKUYU

Description

Kikuyu up to about 1m deep presents a challenge to planting in this area.

No trees or shrubs, 100% ground cover with kikuyu.

Threats

Kikuyu smothering young seedlings and preventing the natural establishment of native seedlings.

Weeds

Kikuyu, occasional moth plant

Recommendations

Cut holes in kikuyu prior to planting – lay carpet or similar to prevent regrowth?

Plant - Titoki, toupata, flax

Photopoints

#1 No pole – look down from path.

Mat 1a 20151109_095809



mat 1b 20151109_095830



OPEN AREAS WITH GENTLE SLOPES AND PASTURE GRASSES

Description

Open areas: Ground cover: 100% exotic grasses shrub: 10% muehlenbeckia, ?? trees: <5% occasional Manuka and others

Threats

Delicate balance between retaining plants to preserve cliffs/ prevent landslips and removing weeds
Preserve viewsheds – plant prostrate plants near path

Weeds

Occasional moth plant, woolly nightshade and gorse

Recommendations

Remove moth plant. Remove gorse in prominent positions near path edge? Plant underneath?
Young plants need releasing from grass
Extensive planting -600+ Titoki, toupata, flax. Joint project with F&B?

Priority 4

Photopoints

,#2 (by yellow topped pole), #4 (wide area, looking across 9TH November 2015

Mat 2a 20151109_101102



Mat 2d 20151109_101938

Mat 2b 20151109_101108



open areas 20151109_102817

Mat 2c 20151109_101808



plantable 20151109_104318



open planting 20151109_103113



plantable 20151109_104549



gully 20151109_105132



STEEPER OPEN AREAS

Description

Open areas on steep cliffs. Has been treated in past – several dead rhamnus.

Soil near several dead pohutukawa near cliff base has been diagnosed with Phytophthora multivora (22/3/2016 via Deryn Dromgoole).

Threats

Delicate balance between retaining plants to preserve cliffs/ prevent landslips and removing weeds Phytophthora multivora?

Weeds

Some gorse, woolly nightshade, boneseed, rhamnus

Recommendations

Remove woolly nightshade
Abseiling contractor needed to weed many of these areas.

Priority 3.5

Photopoints

#3 9TH November 2015

mat cliffs 20151109_105725



Mat 3g 20151109_102530



Mat 3a 20151109_102235



pohut 20151109_105738

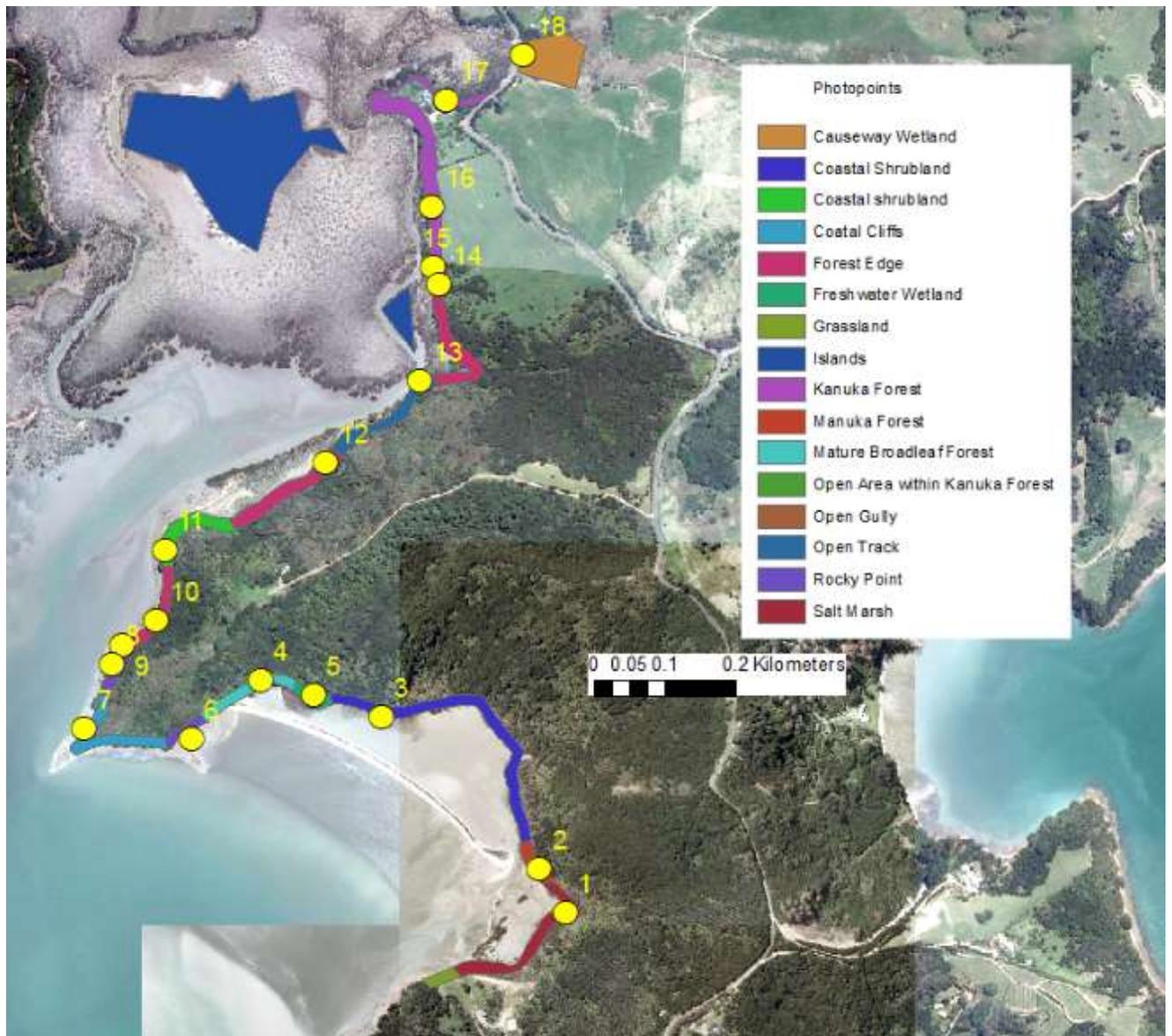


TE MATUKU BAY ESPLANADE RESERVE

Te Matuku Bay is a nationally important site of ecological significance (SES 1). It is also a ‘high’ ranking Site of Special Wildlife Interest (SSWI). The bay itself is a marine reserve. The esplanade strip abuts several conservation areas, including TMB Scenic reserve (F&B), AC reserves (Stockyard Reserve), DoC land (Pioneer cemetery reserve) and private land that is the focus of major conservation efforts (e.g. <http://tematukupoint.com>). Close liaison between all these parties is therefore strongly recommended.

Te Matuku Bay was assessed on two dates: The northern section (points 12-18) was assessed on 7th Dec 2015, whilst the southern section was assessed on 18th December 2015. The islands were assessed in January 2016. Photopoints were revisited on 19th and 22nd April 2016.

Photopoints and Management Units



TM view_2 20151207_104723



Behind sandspit 19th April 2016



From TM Point, showing northern esplanade curving round the right hand side of the bay



KANUKA WOODLAND EDGE ADJOINING PASTURE

Description

Old growth kanuka separates mangroves from pasture/grassland.

Canopy 80% kanuka with some kowhai. Shrub layer 40% cover with Mingimingi, mahoe and others. 100% ground cover by grasses.

Generally in v good condition, particularly at southern end where many broadleaf seedlings/ saplings are establishing under the kanuka (incl. totara). Fewer seedlings established at northern end – crowded out by dense grass?

Small kauri grove and white heron nest.

From previous report "The shrubland had a dry gumland species vegetation character, which suggests that there was historically kauri present at this site. Kanuka, mapou, tanekaha, kowhai and lancewood were present in the canopy. Prickly mingimingi, koromiko, akepiro, hangehange, shining karamu, bracken and gahnia sp. were frequent in the understorey. Cordyline banksii, rangiora and tauhinu (Pomaderris amoena) were rare. There were a good range of ferns including: kidney fern (Cardiomanes reniforme), hanging spleenwort (Asplenium flaccidum), sickle spleenwort (Asplenium polyodon), Hounds tongue (Microsorium pustulatum subsp. pustulatum) and kiokio (Blechnum novae-zelandiae)."

The next two management units describe gaps in this woodland.

Threats

Weed incursion from private land upslope. Particularly as kanuka fall.

Track planned: Kauri will need protection

Weeds

Phoenix palm on entering path. Occasional gorse, pampas and agapanthus

22nd April Recommendations

Dig out pampas and agapanthus. Priority 2.

Underplant kanuka canopy with broadleaf trees. C 250 plants (eg Taupata, Karamu, Kawakawa, Olearia furfuracea, Hebe macrocarpa, Kauri, Mahoe, Hangehange, Houpara, Nikau, Puriri, Totara). Also ferns and Nikau. Also includes Open areas described below. Priority 3.

Photopoints

#17 Dec 7th 2015

#1 20151207_095426



#1c 20151207_095428



OPEN AREAS WITHIN KANUKA WOODLAND

Description

Some open areas are associated with gullies. The first photopoint is at a landslip area. In some places there is little riparian protection to the estuarine wetland.

Canopy <60% kanuka, some pohutukawa. Shrub 30% at edges, 100% ground cover with native grasses (Macrolena). Muelhenbeckia in gullies.

Threats

Weed incursion from private land upslope. Especially in landslip areas or in gaps as kanuka falls. Bank erosion/ slips where less vegetation cover.

Weeds

Agave and agapanthus invading from adjoining property. Occasional nightshade.

Recommendations

Ask neighbour to help us remove plants invading from his property. (via Rob Moreton?) Some plum saplings nearby. Remove tall eucalypt? Priority 5

Plant occasional open areas with c 250 incl mahoe, manuka/kanuka shade providing trees, preserving viewsheds and providing habitat for birds. Cabbage trees/Flax in gullies. (Includes all open areas.) Priority 3.

Photopoints

#16 Dec 7th 2015

2g 20151207_104129



2f 20151207_104138



another open area 20151207_103345



landslip_1 20151207_101855



fallen kanuka 20151207_104438



landslip 2 20151207_102026



In some places there is little riparian protection to the estuarine wetland. (PP17 April 2016)



PP18 April 2016

OPEN GULLY

Description

Some open areas are associated with gullies. One landslip. Canopy 60% kanuka, some pohutukawa. Shrub 30%, 100% ground cover with native grasses (Macrolena). Muelhenbeckia in gullies.

Threats

Weed source for surrounding areas.

Weeds

Himalayan honeysuckle, gorse can stay

Recommendations

Shrubcut then paste honeysuckle and other weeds.

Make holes in grass to plant 50-75 Karaka, broadleaf. Priority 3.

Photopoints

#15 Dec 7th 2015

3a 20151207_104933



3b 20151207_104943



3c 20151207_105123



FOREST EDGE (EASTERN)

Description

Mature kanuka canopy 90%, 40% heathy shrub understorey to 5m high, including ponga, hangehange, mapou, nikau.

Threats

Spread of asparagus fern.

Weeds

Occasional asparagus fern

Recommendations

Occasional asparagus fern needs to be dug out before spreads further. Priority 5.

Photopoints

#14 Dec 7th 2015

4a 20151207_10561204933



4c 20151207_105536



PP14 April 2016



4b 20151207_105545



4d 20151207_105533



OPEN TRACK

Description

Grassed and mown track divides edge to water (ribbonwood, harakeke, kowhai, pohutukawa) from upslope area on forest edge (mahoe, kanuka, haupara). Nice spot for a picnic table at the end!

Threats

Weed incursion.

Weeds

Young gorse on upper bank, occasional moth plant. Moth plant increases going southwest (PP12)

Recommendations

Cut n paste gorse and mothplant. Priority 4.

Infill open areas, particularly on waters edge side. About 100m. C 300 plants. Priority 4.

Photopoints

#13 7th Dec 2015

5a 20151207_111313



5b 20151207_111307



5c 20151207_111303

PP13 April 2016



Pp12



FOREST EDGE (WESTERN)

Description

Similar to Eastern edge, but more flaxes and more weeds. Occasional open patches. Grades to *Carex* spp and *Juncus* spp, then mangroves at waters edge. Small stream.

Threats

Weed incursion.

Weeds

Occasional mothplant, increases northward.

Recommendations

Remove mothplant. Priority 5.

Plant up edges where needed - c 50 plants haraheke and other costal edge plants. Priority 4.

Photopoints

#12 7th Dec 2015, #10 18th Dec 2016

6a 20151207_113609



6c 20151207_112112



PP10 April 2016 gorse? sprayed



6b 20151207_113621



#10 bit further south



Stream April 2016



COASTAL SHRUBLAND (Western)

Description

Shrubby banks 80%+ cover, patches of bare rock Manuka, houpara, gharnia, mapou, some gorse

Threats

Cliff erosion.

Weeds

LOTS of mothplant

Recommendations

Remove mothplant -probably need to spray

Harakeke and coastal edge plants eg Pohutukawa, houpara, kowhai - c. 200 plants in total.

Priority 3.

Photopoints #11 Dec 18th 2015



COASTAL CLIFFS

Description

Shrub 80% Houpara, Pohutukawa, gharnia, mapai, bracken, some gorse areas.

From previous "pohutukawa, mapou, houpara, kawakawa, lancewood, bracken and manuka. Gorse and woolly nightshade become more frequent, with some moth plant. The coastal environment changes to rocky shore. There is a particularly large mangeao tree (Litsea calicaris) at the end of the peninsula along the coastal edge "

Threats

Erosion if insufficient plant cover

Weeds

Gorse

Recommendations

Leave gorse to stabilise cliff.

Photopoints #7 Dec 18th 2015



ROCKY POINTS

Description

Shrubby - 70% cover - mapou, mahoe, olearia, manuka. Been sprayed so likely to thicken somewhat naturally over time. Forest reaches straight to rocky platform – no marsh or mangroves. Severe erosion in places.

Threats

Mothplant has previously been sprayed, but now regenerating. Erosion – especially if weeds removed (eg gorse)

Weeds

Mothplant 5cm high carpet in patches c. 10m sq. patches of woolly nightshade (esp #9)

Recommendations

Remove mothplant - grub out roots. Priority 5.

Thicken edge with Harakeke 100 plants. Priority ?

Photopoints

#6 & 8&9 Dec 18th 2015



April 2016 PP6 and PP8 and #9– gorse removal?



FRESHWATER WETLAND

Description

Wetland. 100% raupo, *Bolboschoenus*, *Muehlenbeckia*

From previous report " Bolboschoenus sp. dominated wetland (wetland 1) with frequent giant umbrella sedge (Cyperus ustulatus), Carex lessoniana, Carex secta and bindweed sp. There was occasional NZ jasmine (Parsonsia heterophylla), Schoenoplectus tabernaemontani and bird's-foot-trefoil (Lotus pedunculatus). Infrequent tree species within the wetland included manuka, mapou and mahoe. This is a potentially interesting wetland (wetland 1), yet unfortunately it has serious weed invasion issues, namely moth plant and mist flower, (Ageratina riparia). Moth plant was scrambling over native vegetation and had mature pods, whilst mist flower was frequent throughout. At the bush edges to the north and east there is woolly nightshade present.

Threats

Weed invasion

Weeds

LOTS of mothplant, bulberschoenus (native), calystegius

Recommendations

Remove mothplant. Priority 5.

Photopoints

#5 Dec 18th 2015

IMG 8210-8215



April 2016



MATURE BROADLEAF FOREST

Description

Mature forest to waters edge Canopy 90%: Taraire, kohekohe, nikau, pohutukawa, puriri, totara
Shrub: 30% lush understory <10% groundcover - soil and litter

From previous report "The canopy consists of mature kohekohe, taraire, puriri, kowhai and ponga. At the edge there is tawa, totara, pohutukawa and lancewood. The understory contains nikau, tanekaha, karaka, mahoe, kawakawa, mapou and supplejack. The groundcover was relatively sparse and there were limited weeds, with only small amounts of moth plant and climbing asparagus noted at the edge."

Threats

Weeds

Occasional small patches of asparagus fern (20cm x 20 cms)

Recommendations

Remove asparagus fern. Priority 4.5.

No planting needed.

Photopoints

#4 Dec 18th 2015

IMG 8206-8208



COASTAL SHRUBLAND AND FOREST

Description

100% canopy cover: Manuka, kanuka.

Shrub: Mapai, Hangehange, emerging broadleaf eg kohekohe

Threats

Erosion.

Weeds

No major problems evident.

Recommendations

No weeding or planting needed.

Photopoints

#3 Dec 18th 2015

IMG 8201-8203



April 2016



MANUKA FOREST

Description

70-80% canopy: Manuka

30% Shrub: Muehlenbeckia, Mapai

100% ground cover: Juncus spp c 1m high.

Planted c 1990s.

Threats

Weeds

Scattered Calystegus, pampas, asparagus fern

Recommendations

Manual weeding - dig out, maybe occas spray of large pampas

Photopoints

#2 Dec 18th 2015

IMG 8196-8199



April 2016



SALTMARSH

Description

Back of sandspit. Ground: Salt marsh 100% cover with dense *Juncus* spp. and oi oi c 1m high.. 2% shrub cover including Manuka, *Plagianthus*, *Muehlenbeckia* and ribbonwood.

Threats

Weed incursion into fragile ecosystem. Some dead Manuka round edge of marsh? Young mangroves establishing

Weeds

Scattered pampas, mothplant, asparagus fern

Recommendations

Manually dig out pampas

Photopoints

#1 Dec 18th 2015

IMG 8190-8193



PP1 April 2016



ISLANDS

Description

Low lying islands (Largest approx 0.5 ha), surrounded by *Apodasmia similis* (Oioi) and various other rushes. Some areas had some *Leptospermum scoparium* (Manuka) under which the ground was fairly open and contained some small annual herbs. Also *Plagianthus divaricatis* (salt marsh ribbon wood) and *Muehlenbeckia complexa*. The wider area was surrounded by mangroves. There was no sign of any native birds

Threats

Weed incursion.

Weeds

Occasional pampas. Some new and young plants, others were shoots from older plants which had been previously sprayed

Recommendations

Survey biannually by kayak to check for weeds and deal to them Tilde Sorenson surveyed and removed c 20 pampas manually in Jan 2016

Photopoints

None



SANDSPIT

Description

70% ground cover as described below. 0% canopy and shrub. Flax planted? At c 3m intervals. One pohutukawa sapling.

From previous report Coastal needle tussock was abundant with occasional knobby clubrush, flax, small-leaved pohuehue, shore bindweed (Calystegia soldanella) and the exotic coastal orache (Atriplex prostrata). Weeds observed on or near the spit included moth plant, some kikuyu, climbing asparagus and small clumps of controlled pampas. There is a smaller shell bank complex at the end of the spit, which starts from the eastern end of the bay. Vegetation consisted of saltmarsh ribbonwood, manuka, coastal needle tussock, sea rush and flax.

Threats

Weed invasion – important dotterel breeding area – do not disturb in breeding season.

Weeds

Pasture weeds and occasional kikuyu. Removed 3 moth plant seedlings.

Recommendations

Survey annually for weeds

Photopoints

None

April 2016



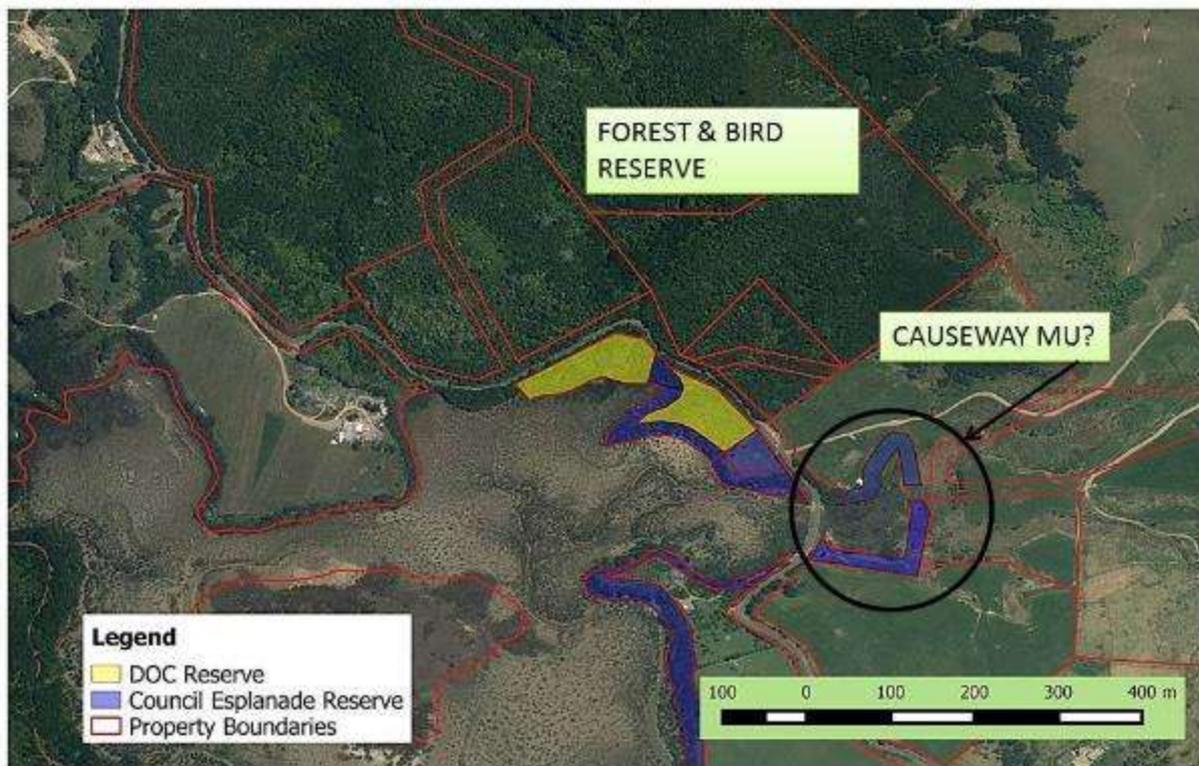
CAUSEWAY WETLAND

Causeway management unit currently falls outside the scope of our project - but falls between stools and needs a guardian (see map below).

Salt marsh, with raupo and mangroves at edge. Kanuka on higher ground.

Threats from invasive willows. Pasture edge could be planted. Possible encroachment issue with local farmer?

**TE MATUKU BAY
CLOSE UP OF CEMETERY/STOCKYARD MU**



View over causeway wetland 20151207_094310



causeway_4 1207_094758



causeway_3



causeway view 2 20151207_094614

