



Final report for Ministry of Primary Industries Billion Tree programme funding from February 2021 to October 2024.

Contract -Awahuri Forest/Kitchener Park Trust – TUR_1BT_2021_112

Cost Code: 365.330

Activity Code: 013590 (Parks Restoration)

Overview

This restoration project has achieved what it set out to do and more. We now have the two original forest strips connected with a continuous linked footprint of plants indigenous to this forest. In time this will facilitate better spread of invertebrates, insects, fungi, lichens etc. and give greater canopy coverage and habitats for birds.

The original planning was ambitious and perhaps should have been spread over a slightly longer period from the beginning. Starting a project in midsummer, halfway through eco-sourced seed gathering period, combined with propagation time, meant we had significantly lower numbers of trees planted in the first two winter seasons compared with the third and fourth (current 2024) planting seasons. Being able to extend this project for eight months from February to October 2024 made all the difference.

We have now exceeded our contracted planted plants requirement of 26,200 by planting 28,749 across the five areas of this project.

Throughout this winter 2024- 7,183 plants were planted under this project of which 6,449 were within the MPI project areas. The other 734 plants were planted in two areas adjacent to the MPI areas. These 734 trees while important to the overall are not included in the grand total.

As well as increasing plant coverage over the five restoration sites under this contract we have increased the diversity of species planted from the historical same 19 species being planted in this forest to 48 species being planted throughout this project. This has given us a greater plant diversity.

This project, while focused on the five areas in our initial proposal, is central to a much wider overall forest restoration activities that include: -

1. **The assessment at application** of for this funding was the overall forest had approximately 60% of the footprint of reasonable coverage with native plants:- As we removed weeds and significant invasive creeper weeds it became apparent overall here was less than 50% of the land covered with native trees. Large holes in the forest were just weeds and invasive species and tree skeletons covered in invasive creepers . Of note when weeds and creepers etc were removed from the footprint three of the five restoration areas under this project it was estimated only 10% of the land had native tree/plant coverage remaining in these areas. It became very apparent how fragile and at risk this forest is. Managing the growth of the plants planted over the next 10 years it imperative. These areas also need to be augmented by additional species as plants grow and new ecosystems start to form.

2. **Restoring the ecosystems** that supported the wetland and lowland forest types of plants that were thriving in this area a hundred years ago: - The Makino Stream was straightened in the 1960s and 1970s cutting many of the wetland areas from the stream. Significant trees and plants died as the ecosystems were abruptly changed. This forest originally had multiple channels through it that flooded naturally each year. The forest was a mosaic of wet forest (WF8: kahikatea, pukatea) and summer-dry forest (WF2: tōtara, mataī, ribbonwood) ecosystem types.
This mosaic of two forest types created a need for very sophisticated plant planning and planting plans. In such a small forest area the two types of plants are literally, in many instances, small pockets of each forest type side by side.

3. **Seed sourcing and propagation** of an increasingly diverse range of plant species combined with detailed planting planning became the key to success.
Historically we could only track 19 plant species that had been reintroduced to the forest over the last 20 years of intermittent restoration activity. We had available a biodiversity plant audit from 1928. This showed 109 plant species were present at that time. This plant audit was repeated in 1945 and 1967 and 2019. There is a clear pattern of species loss over time. Our focus was to work primarily on reintroducing all big tree species, being 27 varieties in this list, and as many shrubs of the original 20 shrub varieties as possible through this project. We employed a specialist seed gatherer to eco source seed from the forest and known original local patches of forest. We have now planted throughout this project 42 different species.
Continued work on reintroducing and balancing the range of plant species will take many more years.

4. **Hydrology management** of the overall forest was another key interrelated activity we worked on in parallel to this project. The stream straightening and cutting off of multiple meandering channels through 1960s and 1970s killed off thousands of native trees and plants as the ecosystems changed very quickly. Some wetland species died off from drying out and some lowland species were drowned as flood water was trapped and couldn't flow out fast enough after floods. Channelling the stream increased the velocity, bringing in river shingle that ground the bases of trees. Copious silt dumps occurred building vastly different soils types. Native plants were replaced with willows, acacia exotic weeds and choking climbers. The significant exotic species were willows, blackberry, old man's beard, great bindweed, German ivy, climbing dock, Japanese honeysuckle, and *Phragmites karka*.

Increased light wells caused many of the native climbers to become an issue, with pōhuehue (*Muehlenbeckia australis*) killing even medium-sized trees and compounding the problem. Linked to the specifics of the stream hydrology was the development of an adjacent purchased paddock into a wetland area that is integrated into the stream management and reestablishment of the original channels in the forest's west side oxbow lagoons. This integrated hydrology management plan came to fruition this winter (2024) with the first two minor flooding events showing the sequence of flooding occurring as planned. The forest's west side oxbows engage in flooding first followed by a sequence of six wetland points engaging and eventually the Makino becomes a lake across the new wetland. This has dropped the velocity significantly and the original channels on the west side are naturally reforming. The increased rate of flood waters receding was equally important. Water remained in the oxbows with other higher areas draining quickly. The Makino Stream rises quickly, but it also drops quickly. Initial planting in the new wetland took place this winter. We have to date planted over 20,000 plants on this site this winter in addition to this restoration project. Planting will continue in some of the bog areas until early November.



Shingle swept in in high velocity flood ring barking tree

5. **Development of infrastructure** in the west side of the forest.
 - a. There was at the beginning of this project a raised combined metal/lime access track and walking track along the straightened stream on the west side of the forest. This narrow straight channel was frequently flooded over. Once over-topped, with high velocity water the access track then became a moat holding water in creating a lake with only one small manmade drain the only outlet. This retained water for days flooding and trees drowning. This track has been allowed to erode and revert to the multiple channels that were always there prior to the stream straightening in the 1970s. The impact is a along the stream bank is now lower with multiple channels that lead into oxbows suitable for wetland forest types and patches of higher areas of lowland forest conditions. The recent two flood this year has shown the detailed planting plan of wet land and lowland plants in this and other forest areas is correct. Walking through the area after the floods receded showed the channels and oxbows holding water and areas of dryer islands. Even though most plants in the area had been planted within the last two months we did not see plant loss or damage. Some of the new trees had to be shaken to remove leaves and debris. By next year the plants will be big enough to not need this.
 - b. To give people access and a more complete experience of a classic wetland and lowland forest we have now installed a loop track through the west side around and over

channels and oxbows. This was completed at the end of September. The walkway is raised and designed for flooding to go over parts of it. This looped boardwalk also allows the whole area from the stream to the board walk to be closed to human access and nature will continue to recreate the original ecosystems.

At times of flooding, we will, for safety reasons, close this boardwalk to the public. Outside of these short periods, people can experience the evolving reforestation of a true wetland forest.



New west side board walk almost completed

6. ***Phragmites karka* management** has been another key issue linked to this restoration project. In late 2019, the increasing invasion of what we found out to be *Phragmites karka* was identified as a risk to the whole forest. The then known areas of infestation were ringfenced outside of this project in Areas One Two and Three. Unfortunately, repeated high velocity floods from September 2021 to October 2022 spread this invasive weed across most of the forest. There are hectares of it along the banks of the Makino Stream, upstream of the forest. Fragments of reeds and rhizomes were swept into the forest establishing wherever they landed.

The Trust initiated a research programme to manage this weed that impacts not just the forest, but over 50 km of waterways across the region and now onto our beaches from floods in infested rivers and waterways. We have developed a potential management technique that can be used in water and wetland. This is currently labour intensive. This R&D project is ongoing and the forest is not yet free of risk. We hope future re-infestation from upstream will be slowed by reducing the velocity of floods, but time will tell if this is the case.

<https://awahuri-forest-kitchener-park.nz/phragmites>.

7. **Finance.** The trust has now claimed from MPI the total amounts of \$81,048. The Trusts has contributed over \$200,000 toward the project. All claims contract and project performance and project finances have been audited each year under our annual audit procedure. The only milestone claims not audited is the milestone from July 2024 to October 2024. As this is in this financial year. Trust audits are available if required.

Forest History;- starting point for this project.

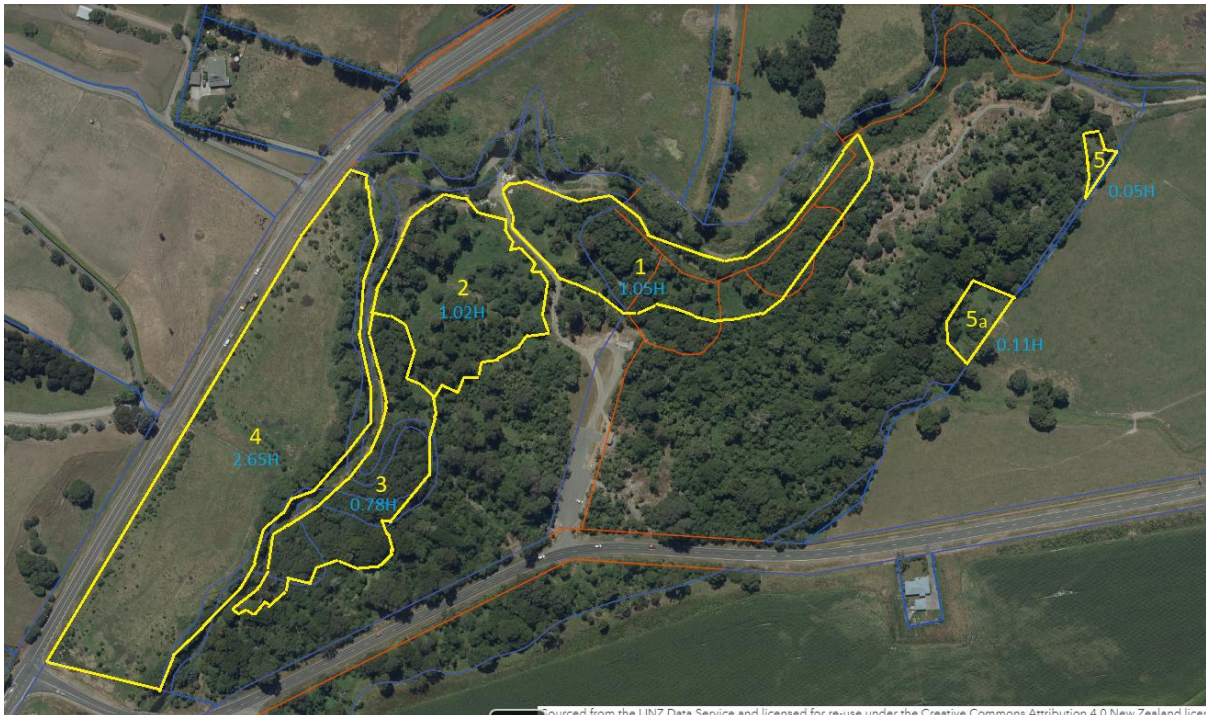
The Awahuri forest Kitchener Park is a registered Scenic A Crown Reserve. The site and surrounding district was originally a dense wetland, lowland mix of forest. In the late 1870s most of this surrounding land was cleared for farming and a road punched through the centre of the existing forest. The remanent of this road are now the entrance and car park and. Across the Makino stream in the recently purchased wetland development block this original corduroy Road is still in evidence. In the early 1900s to about 1940 stock were moved down the what is now the Kawakawa road to the Feilding sale yards. Stock frequently entered the forest and destroyed the understory.

In the 1970s the road bridge was swept away in a flood and a new road was created along the side of the forest. The original stream was straightened and the multiple maze of channels through the forest were cut off from the stream. The forests still flooded as it always did, but now with a single stream channel the velocity built up carrying more river shingle and flooding with force. Because the banks were raised once water got into the forest it did not empty out quickly and lowland trees drowned. The old channels became a series of bog that willow and weeds spread through.

Indigenous plants died out as the terrain eco-systems changed quickly.

To look at the forest in 2019 on the surface the forest looked intact until the actual species and weeds were noted. Sections one two and three of the MPI restoration project had less than 10% native tree and plant coverage. The significant trees were in fact willow. That had spread along all old channels .

The indiginious forest in effect had been reduced to two strips either side of the forest entrance and no indiginious connecting footprint. The east side was in better condition than the northern end and the west side. This project focused on the restoration of these most damaged areas 1,2,3 plus area 4 an adjacent piece of reforesting farmland across the westside of the Makino stream. This piece of land being site 4 was planted in 2016 with poor uptake and struggling to reestablished. The final sites 5a and 5b were large pockets on the edge of the east side of the forest that were just empty grass and weed patches.



Map of restoration areas under this project activity.

1. Area One

Area one has two landscape types. One end is the northern eastern end was a semi open strip of land was primarily grass weeds creepers smothering trees and the odd acacia tree. The soils are almost non existent due flood breaches of the straightened stream banks in 2003 bringing in tons of river shingle. This created a layer of shingle that ranges from 1 meter to four metres thick. Trees and almost all native fauna were smothered by shingle with no build of soils occurring. This is a very difficult area to establish plants into. Several methods of revegetation have been tried. We found partial success with the use of carex to create a cool soil area under them allows us to introduce other plants slowly. In the shallower layers of shingle, we dug deep root holes and filled with soils for canopy and sub canopy trees to establish. Several establishing trees 2-3 metres high suddenly die over the summer periods. We believe this is because the underly shingle warms up killing tree roots. The solution is to plant heavily to create as much shade as quickly as possible. We now have some limited shade coverage in the majority. We just have to replace vegetation quickly if it dies to ensure we keep summer shade. This will over time build soils and forest coverage.



Area one using carex for shade in high shingle damaged area



Area one establishing baseline for plant survival monitoring 2020 and growth 2022 Heavy shingle area

In the northern central and eastern part of this block a few large canopy trees survived but was primarily a mix of willows in the dry channels and black beery old mans beard and other assorted weeds. This site was once where the original stream main channel moved through and was blocked off in the 1970s The deep channels remained clearly visible. In 2020 the area was infested with willow blackberry old mans beard and phragmites. When assessing native plant coverage it was less than 10% of the footprint.



Area one central area cleared of willows and ready to be prepped for planting March 2023



Area one central overplanting with more diverse species in 2024

This area is now cleared of willows and all prime intransient weeds are under control except for the ring fenced Phragmites' karaka areas. The Phragmites patches are reasonably contained now and are being managed under the Phragmites R&D programme. These will need to be planted when we are sure they are under control. The rest of the area has now been planted in a mix of wetland plants in the deeper channels and lowland plants in the higher areas. Weeds are still being managed and will need to be monitored for many years.

Area one was the first to be cleared of willows and planted under this programme. For the last two our specialist seed gathering and propagation programme. winters we have continued to infill with more diversity of species as they became available through

2. Area Two

This area like area one had two distinct areas with different profiles. The northern part was an open area with a few large tree species and major infestations of creeper weeds and ground bind weed. The southern side was undulating terrain with two channels through it. This channel end seemed more intact than the northern end. This area when cleared proved to have minimal native vegetation on the north end and many compromised subcanopy trees in the southern part. We have lost a number of these trees to just being smothered by creeper weeds. The northern part also had a very large phragmites patch that we now believe has been managed. This has to be monitored for 3 years before we plant. There are also other smaller less dense phragmites infestations in this area to still be managed.

The northern area is the open area that was where we focused planting last year. This area is now known as the Kings Coronation planting. The soils is a light rich river silt. Plants have thrived. We are seeing growth rates that are exceeding other restoration areas. The photos are taken two days after planting and again 10 months later.



Two days after planting Aug 2023

Ten months later May 2024

The southern part of area two has been clear of weeds, creepers. We expanded the original project footprint as we found significant empty pockets of land under the creepers and weeds. This area has been planted this winter with a diversity of plants ranging from wetland to lowland species. A intensive weed maintenance programme for the next two years is required to allow plant to reestablish here.



Area Two southern area open in foreground and badly compromised creeper covered trees in background

3. Area Three

This is the most complex area. It had a straightened stream channel cutting of the original multiple channels. This whole area was complexly degraded with a forest of willows and few native species present. By allowing the natural channel's to reformed we now have a mosaic of wetland and lowland features. The eco-system contrasts between wet areas and dry islands is now very obvious. This is where the most infrastructure work, not part of this funding, has taken place. We poisoned all willows in this area at the beginning of the project in 2020 and left most of them standing to slowly degrade in situ. We only removed willows as they started to break down in areas where people moved around. This area was planted in part in 2023 winter and more intensely after a massive weeding and pushing over dead willows this year in 2024.

Issues with multiple floods in 2021 to 2022 caused five canopy trees to drown in strip between area three and the road. We also extended area three footprint to manage this as emergency as we noted the understory plants were now exposed too much sunlight and dying. Weeds and creepers were very quickly filling the space. This strip has also been cleared of weeds and planted more densely than other areas. We are aware some of the plants planted will die through high competition in the next few years. Our hope is we will cover this footprint quickly reforest before to much more damage is incurred



Part of area three where we extended the project footprint



Area Three with dead willows still standing 2023



Area three willows pushed over 2024 and channels flowing again after 60-70 years



View from new board walk 2024 planting in foreground

4. Area Four

This is an area across the Makino stream from area three. It is known as Awahuri paddock. This area was retired farmland and originally planted in 2017. It was thought this would be an easy area to restore. We have found that is not the case.

The reversion of this land to forest has been slow. Many original 2017 plantings had died and most remaining plants have been very slow to grow when compared with the other areas. The soil is primarily a sticky clay type. When looking at this more closely we have found although half of this area is on a slope it is wet all year and seems to be riddled with underground streams and seepage. The seepage is compounded by drainage and run off from the farmland hills across the Awahuri Road. Drain pipes under the road feeding into the area flow at high velocity when we have heavy rains. The water can shoot out several metres knocking plants over and uprooting them. We think there is possibly something wrong with the soils in this area or something is being washed in from the farms across the road. We are now considering do we have to do the unthinkable and add trace elements to balance this area.

Observations now show us the wrong plant types may also have been planted for the conditions in 2017 and again in our first overplanting in 2020. This area looks as if it would be sheltered from wind but the prevailing wind channels around the base of the hill and also the stream length. This area is

also susceptible to frost and we found we cannot plant any frost tender species until a fuller canopy is established.

Over all there is now some improvement in coverage in this area compared to before this project starting, but the results are disappointing when compared to the progress in the other areas. We will be continuing to work on establishing this site more over the next few years.



Area 4 at beginning of Project 2022 gaps and poor uptake from 2017 planting

2024 still gaps and poor plant growth



Planting in area four 2021.

5. Area Five A and B

These two small areas were empty spaces on the edge of the eastern side of the forest. These plantings were just straight forward extensions of the existing forest to the fence line. In comparison to the other four areas, they were easy to clear of weeds and plant. Plants planted in 2020 and 2021 have established and are now two to three metres high and blended into the edge of the forest making it difficult to see what there were ever gaps there.

The future of this project.

This restoration project is not finished. The original planning for this project was based on the Trust purpose recorded in the Trust founding document and will take at least another 10 years before we can. *See insert below*

We have achieved the first wave of clearing and planting of these critical areas to re-create original forest conditions and ecosystems. We now for the first time in over 100 years have a linked-up footprint of potential native forest. The starting point was in effect two strips of forest.

The planning for this initial stage of this project always extended beyond the end of this MPI funded part of the project. It included the plant maintenance stage ending in late 2026. We now need to extend this into the middle of 2027 to consolidate the work. Our focus has to now turn to post planting care and survival of plants already invested in. New planting numbers will drop away to be replaced by intensive plant release and weed management activities. E.G this winter 2024 we are planting nearly 30,000 plants next winter we have ordered 7,500 plants only



To achieve the full reforestation and restoration requires a series of actions to be taken to continue for at least another 20 years and possibly up to 30 years depending on indicators pertaining to the forest being able to sustain itself with self-regeneration.

a. Plant care survival rates.

Overall we have been recording consistently over 90% survival rates for planted trees. Our biggest single loss of trees was from a frost on newly planted trees in area four followed a few weeks later by a significant flood. Te toki and Tawa were the most impacted species. We have had a few plants stolen and once we managed the damage from rabbit and hare infestation by applying the deterrent Plantskydd to susceptible species our survival rates have been consistent.

Much of the success for plant survival can also be attributed to the specialist knowledge of ideal ecosystems for plant species linked to detailed planting planning and layout. This transition now to management of these plants through two and a half years weed release and monitoring of each planting wave.

For the next two years less new planting will take place and time and effort will be based on weed releasing and monitoring of existing plants.

b. Bringing in new species.

As the existing newly planted trees grow and mature they will create new ecosystems. We can start infilling with frost tender, winds sensitive and shade reliant plants species that we have not yet introduced to these five areas. We can also start to bring in subcanopy species, herbs and forest floor plants. While we are doing this, we need to also balance species in this forest. E.G Although we now have all the canopy tree species from the 1928 bio diversity list present in the forest a number of these are not in the numbers that would have been present originally. We will need to continue to plant these species as propagation and conditions allow. It will take years before all these canopy tree species can be considered self-sustainable and in balance.

c. Next five years

Overall the next five years is about maintaining plants and the evolution of eco-systems for additional species to be reintroduced to the forest. The number of plants being planted compared to the years of this project will drop down significantly, but the range of species in the forest will start to expand. Many of the plant's species are scarce and difficult to grow and will cost more per plant. E.G Swamp maire is a scarce and endangered species. We ideally would like to plant 1500 to 2000 of these across parts of the forest and stream sides. We reintroduced the first 20 of these back into the forest in this year. We have a further 50 ordered for 2025. The cost of these plants are currently 2.5 time more extensive than the average canopy tree cost. We have to take what we can when we can.

d. Five to ten years

Much of the work will be like the next five years with even more diversity of species and species being planted as ecosystems form. Frost tender plants and shade loving plants will feature more than they have to date.

e. Beyond ten years

Assessment of the understory, forest floor, ferns, creepers and epiphytes need to take place. It is important to observe what is already naturally establishing these five areas and what will need a helping hand. It will be beyond this time assessments of the forests capability for self-regeneration needs to be monitored. Due to this being a very small footprint of forest it is unlikely it will ever archive a full capacity to self-regenerate.

f. Hydrology and Stream

The Makino stream sides still have a significant number of willows along the banks. These will be removed bit by bit over the next 10 years and the banks will be replanted planted with native wetland trees and grasses. This work has to be done slowly and strategically so ensure we don't just destabilise all of the stream banks. Swamp Maire, Kahikatea, cabbage tree, grasses and sedges are all key species for this work being completed.

Attached supporting files

Planting plan sample

Plant species lists separate attachment

Links to *Phragmites karka* <https://awahuri-forest-kitchener-park.nz/phragmites>.

Constitution extract

Acknowledgements

Throughout this project the Trust has had significant support from many different entities and individuals. There are some who have worked with us right through the project and others who have come in for short periods or specific actions. The key supporters are listed below. Our thanks to them all.

Ministry of Primary Industries- Billion Tree programme. Without the funding, continued support and advise throughout this project the Trust would not have been able to escalate the rate of biodiversity restoration within this forest. Our estimate is without this project support it would have taken at least another six- to seven years to achieve what we did over

this three and a half years. We would not have been able to utilise other capacity in the parallel aligned and integrated hydrology and landscape changes, the wetland project, or the phragmites management project. All these projects combined feed into the biodiversity the total restoration activities. We now have a significant platform to build further restoration from.

We thank the MPI Billion Dollar tree programme and in particular the staff for trusting in us a small local charitable Trust with no history of projects this size. You made it easy for us to report, allowing changes to the programme as we learnt more along the way, understanding we were dealing with the vagaries of nature that did not always fit nicely into plans mapped out two and three years before. Thankyou MPI Biodiversity.

Other supporting entities

Green by Nature (Formally known as Recreational Services) . This entity is our prime contractor carrying out the maintenance and delivery work through this project. This entity employs a range of specialist. Gardeners, builders, facility maintenance, biodiversity specialist etc. The entity supplies a prime person working on regular forest maintenance, weeding, caring for young trees etc. This is augmented by blitz input for planting and for new tree care, intransient weed management etc. Two years ago, GBN employed Aaron Madden the AF/KP Trusts long term biodiversity advisory Trustee. Aaron is an experienced specialist biodiversity person with significant knowledge of indigenous plants and ecosystems. He has taken over the detailed planting plans, weed management plans and overall planning for the biodiversity of the forests. The Green by Nature supervisor Dave Mumby has also worked in other native forests restoration projects. His input in scheduling work made the process easy for the Trust.

Manawatu District Council. The AF/KP Trust is a CCO of the MDC. Their parks team have input into the trust finances via an annual stipend and supporting infrastructure development aspects that compliment this restoration project. This stipend allowed the Trust to apply for funding for this project and makes up a significant portion of

Horizons Regional Council. HRC supported the trust in year one with a small grant and has continued to support this overall project by investing in the Phragmites karaka management R&D project. We have also had significant support advice and input from the HRC river engineers. This team has scalloped stream sides removed stream side willows and advised on hydrology restoration. The Majority of this work was via the adjacent wetland development, but this feeds into the west side development as well. Work on restoring the stream slowly to as original as possible will continue over the next 5-10 years. Sections of the stream will be contoured with remaining streamside willows being removed and replaced with native flora. This must be done slowly and strategically so we don't disrupt the steam totally during flood season.



Diggers. Willows on stream bank removed. Dropping stream banks and inserting low rock wall to enhance channels 20 meters downstream.

MPI Biosecurity. MPI scientists have supported the Trust with advice on the management of *Phragmites karka*. Although not directly part of this project it does impinge on the restoration of this forest. Their scientists have looked at whole environment issues and contributed to supporting the management technologies we have developed for this whole ecosystem.

Trees that Count. TTC has supported the Trust consistently since 2019. The cost of many of the trees and shrubs planted have been covered by TTC.

Source to Sea is a division of the Environmental Manawatu cluster. S2S is a cluster of entities that looks after the Manawatu River. The Makino Stream leads into the Oroua river and then into the Manawatu. This network has shared knowledge interest and been continually encouraging to the Trust

Animal pest control Graham Dixon and Ngāti Kauwhata have managed animal pest control before during and now after this project. We have issues with possums that we eradicate then they invade again from the surrounding areas particularly Feilding township that is experiencing an explosion of possums. Rats stoats mice have also caused issues that they have managed. Rabbits and hares from adjacent farmland have on occasions become a significant problem in relation to small plants. We now spray new plants with plantskydd to keep them at bay until they are big enough to be above their grazing height.

An invasion of wasps across the wider area in the summer of 2022 to 2023 became a significant issue in the forest with forest workers and visitors being attacked. A complex and expansive infestation project had to be commissioned. This has been successful with only two nest sites being found in the previous summer and no signs have been found so far this spring.

Colin Ogle. Is a retired botanist who has provided significant advice information and encouragement throughout this project. Sometimes he is totally unaware of his valuable input.

Viv McGlynn. Was our specialist seed gatherer. Without her knowledge and diligent record keeping we would not have been able to achieve the increased range in species volumes of local eco-sourced seed.

Nurseries. MDC Kawakawa nursery, Manawatu Native Tree nursery and Totara Glen nursery have been key suppliers and propagators of plants planted through this project. Alongside this supply of plants, we have also been supported with advice comments and interest from the nurseries that has helped in so many ways.

There are many others who have visited, shared knowledge, answered questions for us given us insights, support and encouragement throughout this project

Bessie Nicholls
Trustee
AF/KP Trust

Supporting Files

Awahuri Forest / Kitchener Park Trust

The Trust has the following charitable purposes:

- (a) To assist in the ecological restoration, management, and enhancement of the land at Kitchener Park and for this purpose, to maintain a five-year plan which, with an annual budget, will be made available to the Settlor for its approval prior to the commencement of each financial year;
- (b) To steer and co-ordinate the raising of funds to assist the restoration, management, enhancement, promotion, and further development of the land at Kitchener Park;
- (c) To encourage community access to Kitchener Park, and foster knowledge of and interest in the ecological restoration acclivity at Kitchener Park;
- (d) To ensure the continued protection and restoration of Kitchener Park where possible and restore biodiversity values;
- (e) To create a safe haven for native plant and animal species, controlled for plant and animal pests;
- (f) To collaborate with other relevant organisations and individuals to reintroduce locally extinct or threatened plant and animal species, to ensure their long-term survival;
- (g) To develop self-sustaining threatened species populations which will act as source populations for the creation of future community restoration projects in the Manawatu District;
- (h) To care for some special collections, including the podocarp, epiphyte and lichen collections presently established at Kitchener Park;
- (i) To support scientific and historic research of the Kitchener Park eco-system or components thereof;
- (K) To educate the general public, especially school children, about the need to conserve and protect native forest environments in New Zealand.

Planting plan sample

AFKP Planting Plan 2024 MPI areas in West and North.

Each of the planting sites is highlighted on an aerial photo on the following pages and is accompanied by a table with the species and estimated quantity required.

Please note that MDC Nursery is holding some of the listed species until later in the season. These species are in **RED font**. One of those species is *Coprosma robusta* and is a substantial component in some of the sites. We have 650 from Totara Glen Nursery already but once they run out, we may have to collect the MDC specimens (no matter what size they are).

There is a priority ranking for each site. Start by planting the HIGH priority sites. Some are HIGH priority because there are frost-sensitive species involved (they are in **BLUE font**). The sooner these are planted, the sooner they are getting protection from the established plants.

The **pōkākā** and the **black maire** are very valuable species, and we only have low numbers of each. Get Aaron to place these species when planting blocks B and D.

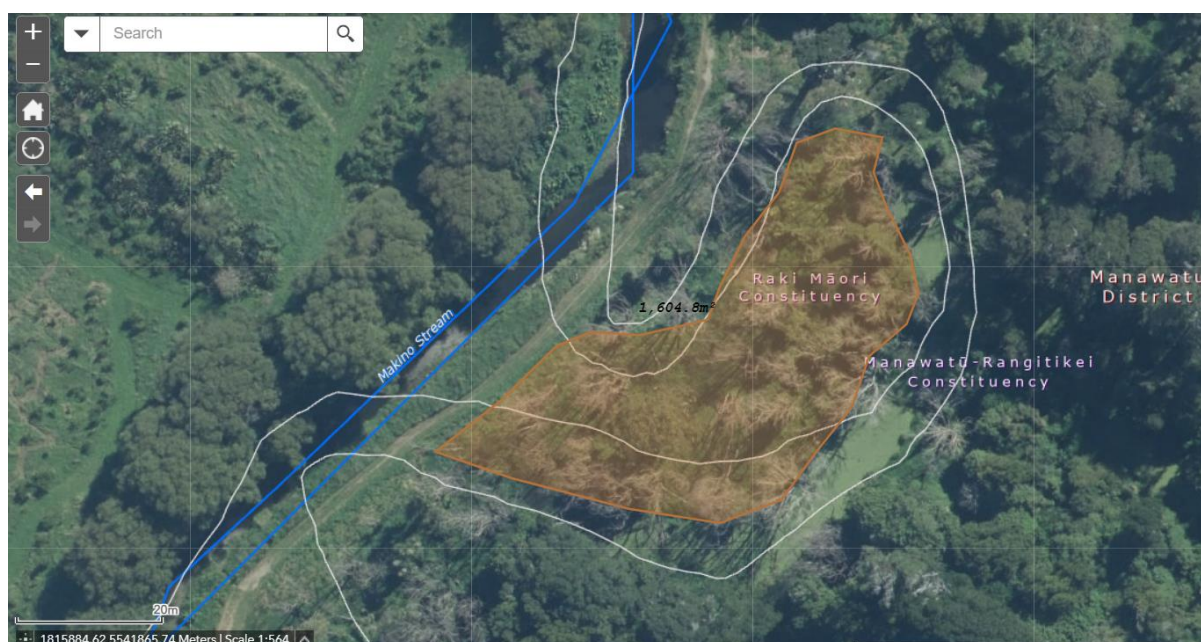
If possible, plant the sites in this order:

C, O, G (frost-sensitive species only), B (frost-sensitive species only), J (frost-sensitive species only), D, A, H, I, E, F, remainder of B, remainder of J, remainder of G, K, L, M, N.

Do **NOT** plant close to the new boardwalk if that section is still being worked on! Someone is bound to trample the new plants.

Block C needs to be planted at **1 metre spacings**. The rest of the blocks can be planted at 1.2 metre spacings. Any sedges should be planted no more than 1 metre apart and the *Carex forsteri* should be 0.7 metres apart.

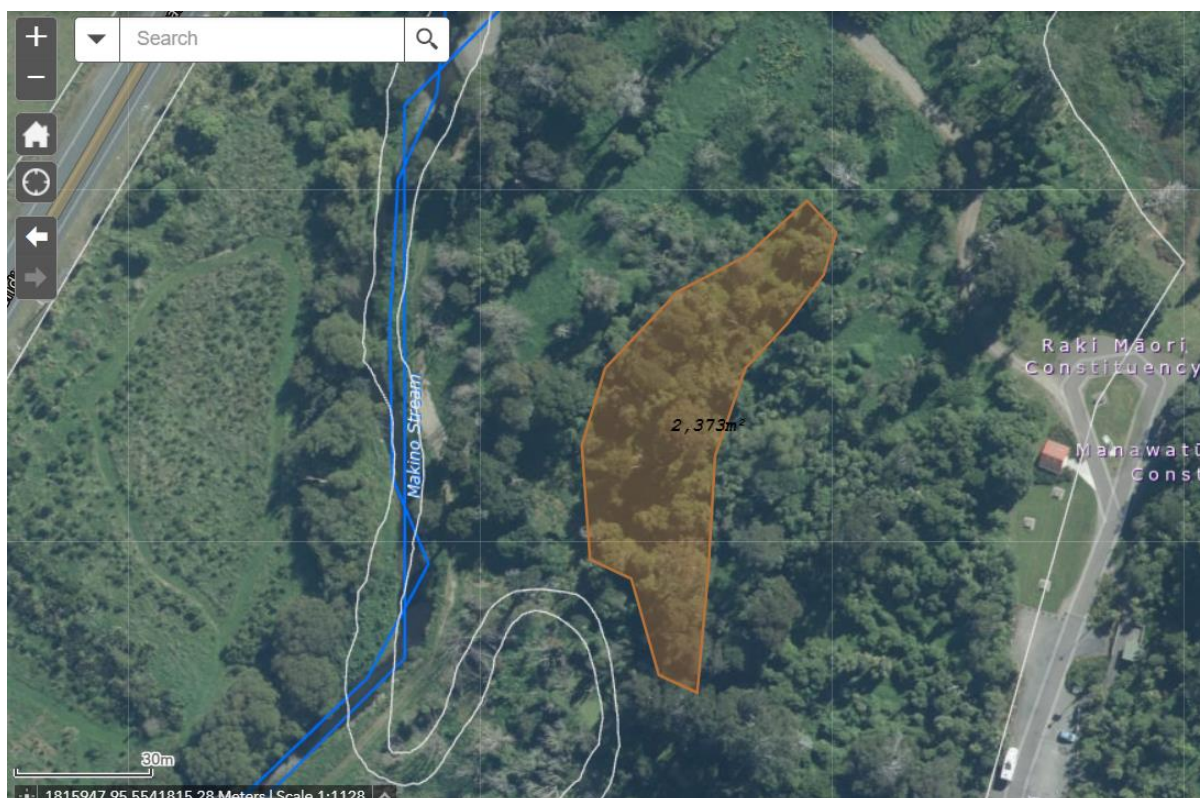
Return any unused plants from a site to a single spot at the depot so they can be used in sites not yet included in this plan.



A: HIGH Priority. Former wasteland and infill of previous planting next to Lagoon 2. 1,600 m². Mostly summer dry forest on the higher plateau. Don't need to go into the lagoons this year.

Common Name	Species	A
Titoki	<i>Alectryon excelsus</i>	25
Karamu	<i>Coprosma robusta</i>	200
swamp coprosma	<i>Coprosma tenuicaulis</i>	20
Cabbage Tree	<i>Cordyline australis</i>	120
Kahikatea	<i>Dacrycarpus dacrydioides</i>	50
Narrow-leaved lacebark	<i>Hoheria angustifolia</i>	20
Houhere	<i>Hoheria sexstylosa</i>	80
Kaikomako	<i>Pennantia corymbosa</i>	20
Kohuhu	<i>Pittosporum tenuifolium</i>	50
Ribbonwood	<i>Plagianthus regius</i>	150
Totara	<i>Podocarpus totara</i>	55
Matai	<i>Prumnopitys taxifolia</i>	10
Kowhai	<i>Sophora microphylla</i>	25
		825

MPI 3



B: LOW/HIGH Priority. Summer dry forest type. 2,400 m². Underplanting existing forest.

Common Name	Species	B
Poataniwha	<i>Melicope simplex</i>	150
Red matipo	<i>Myrsine australis</i>	50
Black maire	<i>Nestegis cunninghamii</i>	25
Kaikomako	<i>Pennantia corymbosa</i>	20
Kawakawa	<i>Piper excelsum</i>	100
Matai	<i>Prumnopitys taxifolia</i>	70
horoeka lancewood	<i>Pseudopanax crassifolius</i>	10
		425

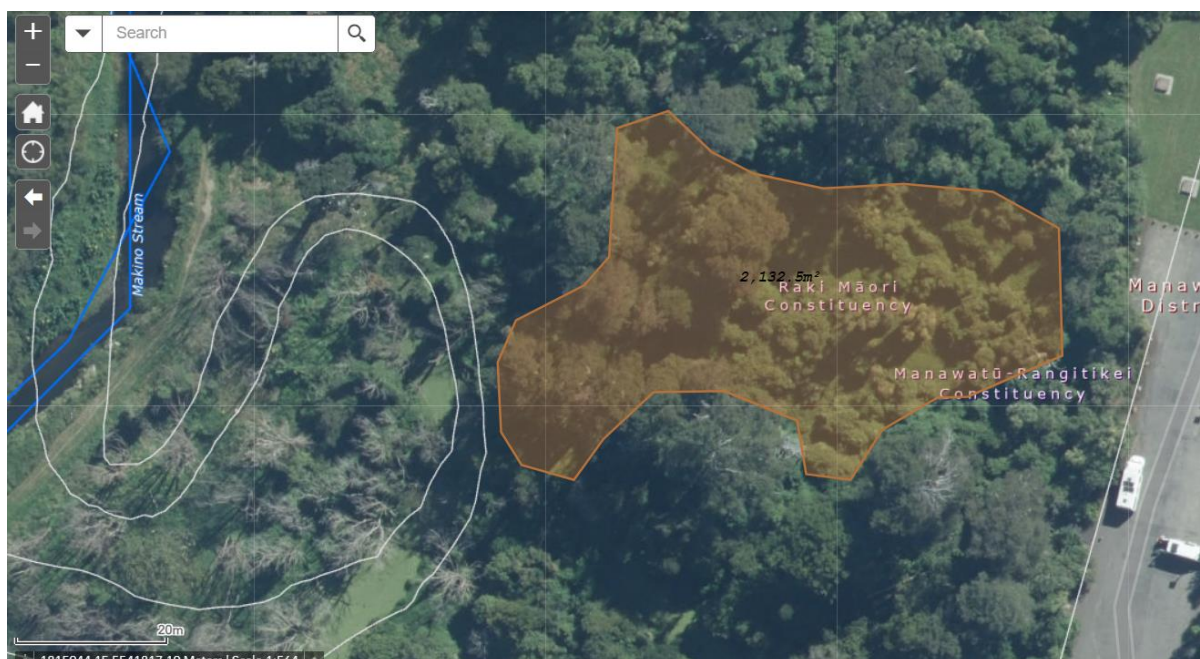
MPI 3



C: HIGHEST Priority. Kawakawa Rd fence to boardwalk. 3,000m². Underplanting and gaps. The two ends are lower priority than the middle. Start at the eastern end of the bigger area and work west until the plants run out.

Common Name	Species	C
Titoki	<i>Alectryon excelsus</i>	20
Tawa	<i>Beilschmiedia tawa</i>	70
thin-leaved coprosma	<i>Coprosma areolata</i>	290
Karamu	<i>Coprosma robusta</i>	100
Cabbage Tree	<i>Cordyline australis</i>	20
Poataniwha	<i>Melicope simplex</i>	300
Mahoe	<i>Melicytus ramiflorus</i>	50
Red matipo	<i>Myrsine australis</i>	330
Kawakawa	<i>Piper excelsum</i>	300
Kohuhu	<i>Pittosporum tenuifolium</i>	50
Matai	<i>Prumnopitys taxifolia</i>	30
horoekea lancewood	<i>Pseudopanax crassifolius</i>	50
Turepo, milk tree	<i>Streblus heterophyllus</i>	100
		1710

MPI 3 Extended



D: HIGH Priority. Mostly wet forest. Carpark to Secret Garden, including new boardwalk. 2,200 m². Best to plant this early before the water table gets too high!!

Common Name	Species	D
Tawa	<i>Beilschmiedia tawa</i>	30
swamp coprosma	<i>Coprosma tenuicaulis</i>	160
Cabbage Tree	<i>Cordyline australis</i>	100
Kahikatea	<i>Dacrycarpus dacrydioides</i>	230
Pokaka	<i>Elaeocarpus hookerianus</i>	16
Narrow-leaved lacebark	<i>Hoheria angustifolia</i>	350
Pukatea	<i>Laurelia novae-zelandiae</i>	200
Swamp mahoe	<i>Melicytus micranthus</i>	250
Pate	<i>Schefflera digitata</i>	40
		1376

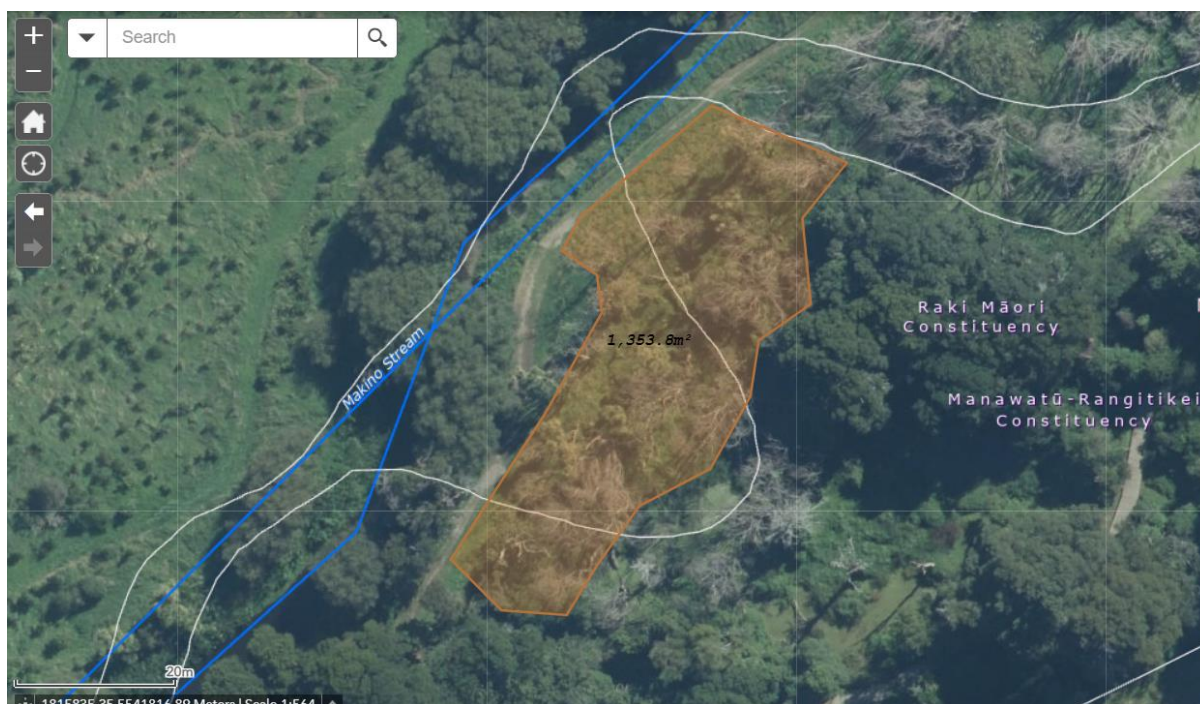
MPI Two and part three extended



E: HIGH Priority. Southside Lagoon 2, including new boardwalk. 1,000m². Some is underplanting.

Common Name	Species	E
Titoki	<i>Alectryon excelsus</i>	25
Karamu	<i>Coprosma robusta</i>	100
Cabbage Tree	<i>Cordyline australis</i>	100
Houhere	<i>Hoheria sexstylosa</i>	40
Poataniwha	<i>Melicope simplex</i>	20
Red matipo	<i>Myrsine australis</i>	30
Kaikomako	<i>Pennantia corymbosa</i>	20
Kohuhu	<i>Pittosporum tenuifolium</i>	25
Ribbonwood	<i>Plagianthus regius</i>	50
Totara	<i>Podocarpus totara</i>	25
Matai	<i>Prumnopitys taxifolia</i>	30
horoeka lancewood	<i>Pseudopanax crassifolius</i>	20
Kowhai	<i>Sophora microphylla</i>	20
		505

MPI 3



F: HIGH Priority. Westside from Lagoon 2 south to Lagoon 1, including new boardwalk. 1,400 m². Exposed, some infilling of previous planting.

Common Name	Species	F
Titoki	<i>Alectryon excelsus</i>	50
Karamu	<i>Coprosma robusta</i>	250
swamp coprosma	<i>Coprosma tenuicaulis</i>	20
Cabbage Tree	<i>Cordyline australis</i>	160
Kahikatea	<i>Dacrycarpus dacrydioides</i>	50
Houhere	<i>Hoheria sexstylosa</i>	80
Kaikomako	<i>Pennantia corymbosa</i>	30
Kohuhu	<i>Pittosporum tenuifolium</i>	100
Ribbonwood	<i>Plagianthus regius</i>	100
Totara	<i>Podocarpus totara</i>	75
Matai	<i>Prumnopitys taxifolia</i>	10
Kowhai	<i>Sophora microphylla</i>	30
		955

MPI 3



G: MEDIUM/HIGH Priority. Southwest carpark. 1,500 m². Underplanting. Frost-sensitive species are high priority – get them in as soon as possible.

Common Name	Species	G
Tawa	<i>Beilschmiedia tawa</i>	30
Cabbage Tree	<i>Cordyline australis</i>	30
Kahikatea	<i>Dacrycarpus dacrydioides</i>	40
Narrow-leaved lacebark	<i>Hoheria angustifolia</i>	20
Kawakawa	<i>Piper excelsum</i>	50
horoeka lancewood	<i>Pseudopanax crassifolius</i>	10
Pate	<i>Schefflera digitata</i>	10
Forster's sedge	<i>Carex forsteri</i>	200
		390

Outside MPI



H: HIGH Priority. King's Walking Track Strip. 450 m2. More *Coprosma robusta* coming later in the season if there are more gaps to fill.

Common Name	Species	H
Karamu	<i>Coprosma robusta</i>	60
Houhere	<i>Hoheria sexstylosa</i>	20
Kanuka	<i>Kunzea ericoides</i>	30
		110

MPI two



I: HIGH Priority. Long Drop Track. West side = gap. 200 m2.

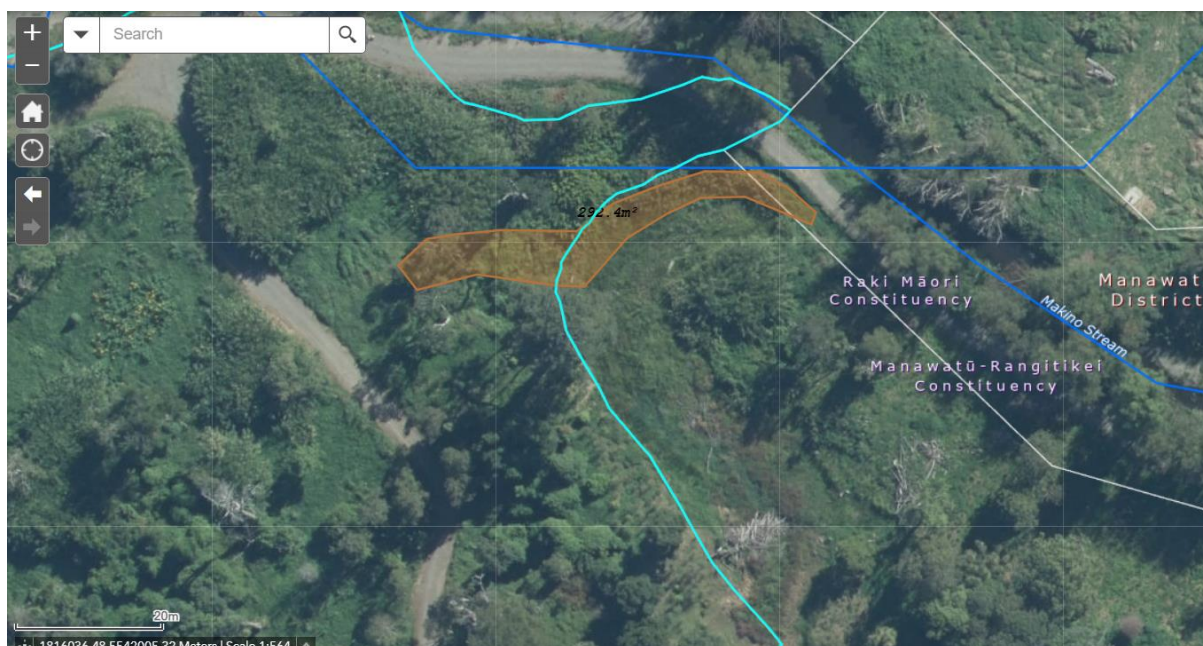
J: MEDIUM Priority. Long Drop Track. East side = gaps and underplanting. 400 m2.

Common Name	Species	I
Karamu	<i>Coprosma robusta</i>	50
Cabbage Tree	<i>Cordyline australis</i>	20
Kahikatea	<i>Dacrycarpus dacrydioides</i>	24
Swamp mahoe	<i>Melicytus micranthus</i>	20
Kohuhu	<i>Pittosporum tenuifolium</i>	25
Kowhai	<i>Sophora microphylla</i>	5
		144

MPI area two

Common Name	Species	J
Karamu	<i>Coprosma robusta</i>	40
Cabbage Tree	<i>Cordyline australis</i>	20
Kahikatea	<i>Dacrycarpus dacrydioides</i>	10
Poataniwha	<i>Melicope simplex</i>	30
Kawakawa	<i>Piper excelsum</i>	28
Totara	<i>Podocarpus totara</i>	10
horoeka lancewood	<i>Pseudopanax crassifolius</i>	10
		148

Mpi Area one



K: MEDIUM Priority. Between Long Drop Track and Stream Track. 290 m².

Common Name	Species	K
Karamu	<i>Coprosma robusta</i>	70
Cabbage Tree	<i>Cordyline australis</i>	30
Kahikatea	<i>Dacrycarpus dacrydioides</i>	20
Narrow-leaved lacebark	<i>Hoheria angustifolia</i>	10
Swamp mahoe	<i>Meliccytus micranthus</i>	30
		160

MPI Area one



L: LOW Priority. Scotty's Island. 70 m². A few gaps – steal a few plants another site.

M: LOW Priority. Dry Hill. 90 m².

N: LOW Priority. Raised with old willow logs. 400 m². Infilling and lagoon margins.

<i>Common Name</i>	<i>Species</i>	<i>M</i>
Karamu	<i>Coprosma robusta</i>	40
Houhere	<i>Hoheria sexstylosa</i>	20
Totara	<i>Podocarpus totara</i>	15
		75

MPI area one

<i>Common Name</i>	<i>Species</i>	<i>N</i>
Karamu	<i>Coprosma robusta</i>	120
Houhere	<i>Hoheria sexstylosa</i>	10
Red matipo	<i>Myrsine australis</i>	20
Kaikomako	<i>Pennantia corymbosa</i>	10
Totara	<i>Podocarpus totara</i>	20
		180

MPI area one



O: HIGH Priority. Rata St End. 700 m2 total. Underplanting – plant early so these plants don’t get frosted sitting at the Depot. **Alternatively, use the poataniwha and kawakawa in the SE corner that Euan has cleared with the weed-eater.** The karamu need higher light levels – plant them in the northern margin of Block O.

<i>Common Name</i>	<i>Species</i>	<i>O</i>
Karamu	<i>Coprosma robusta</i>	70
Poataniwha	<i>Melicope simplex</i>	50
Kawakawa	<i>Piper excelsum</i>	50
		170

MPI Area one

