Te Ngahere
Native Forest Management

Ōtāhuhu
Planting Plan 2018

Ecological Restoration and Consultancy

Ōtāhuhu
Planting Plan 2018

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Prepared on Behalf of:

Tūpuna Maunga Authority

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Te Ngahere

Ōtāhuhu

1.1 Context

Maunga within Tāmaki Makaurau (Auckland) currently support a mix of native and exotic vegetation, ranging from small isolated patches of SEA (significant ecological area) ngahere (forest), to native and exotic specimen trees and significant environmental pest plants.

Historically vegetation in these areas was WF7 - Pūriri Ngahere, an ecosystem type present in highly fertile areas associated with volcanic and alluvial deposits, which is now classified as Critically Endangered in the Regional IUCN Threat Status (Singers et al., 2017). Three distinct variations of this ecosystem type occur, dependent on characteristics associated with differences in alluvial components and volcanic composition of the soil (Singers et al., 2017).

In all cases however pūriri (*Vitex lucens*) is present as a significant component within the mixed broadleaf canopy. Other prominent species include kohekohe (*Dysoxylum spectabile*), karaka (*Corynocarpus laevigatus*), and taraire (*Beilschmedia taraire*), with additional species composition varying dependent on soil and site characteristics. Podocarps including kaihikatea (*Dacrycarpus dacrydioides*) and tōtara (*Podocarpus totara*) are present as secondary successional species along with a mix of smaller broadleaf species (Singers et al., 2017).

Tūpuna Maunga of Tāmaki Makaurau have significant cultural, spiritual and archaeological values. These distinctive cultural landscapes were historically supported by and connected to indigenous ecosystems. The planting plan for Ōtahuhu therefore involves restoration of indigenous vegetation on the maunga and the development of suitable habitat to protect and preserve native fauna present at the site

1.2 Restoration aims

Revegetation planting brings a number of positive outcomes for biodiversity, ecosystem function and amenity.

The aims of revegetation / restoration are outlined below:

- Use methods and species appropriate for archaeologically sensitive areas.
- Enhance the quality of habitat used by native fauna including skinks, ngā manu (birds), and native invertebrates.
- Prevent the re-establishment of weed species.
- Protect sites by reducing foot traffic through some areas.
- Promote species of appropriate heights to maintain historic defence sightlines where needed.
- Assist and promote natural ecological processes.

1.3 Revegetation principles

Revegetation should follow best practice ecological restoration planting principles, including:

- Ensure plants and/ or methodologies are appropriate for the site and location considering substrate, sightlines, archaeology and slope.
- Ensure all planting material is eco-sourced from naturally occurring indigenous stock growing within the Tamaki Ecological District or culturally appropriate.
- Plant size should be appropriate to location. 1.5 L and 2L (PB3 equivalent) are recommended wherever possible. These allow for quick establishment minimising need for ongoing follow up. Smaller sizes such as 0.5L/ root trainer grade are appropriate for very rocky slopes or sensitive areas where approved.
- Plant spacing of 1m for tree species is ideal for achieving rapid establishment of native vegetation cover, which in turn reduces competition from weed species. For lower growing species 0.5 to 0.75m spacing should be used. Larger tree species such as pūriri should be at 5m spacing.
- Planting should ideally take place during the months of May to August as long as soil conditions are suitable.
- Living mulch such as rye clover seed can be use around plantings if required to suppress weeds and cover the ground.
- Planting maintenance is an important task to ensure successful establishment of plantings. This should be carried out for at least five years, ideally longer, with 2-3 visits a year. Regular visits are required to prevent annual plants and weeds suppressing the establishment and growth of plantings. Maintenance should be undertaken until canopy closure occurs (or once bare ground is covered for low growing plantings).

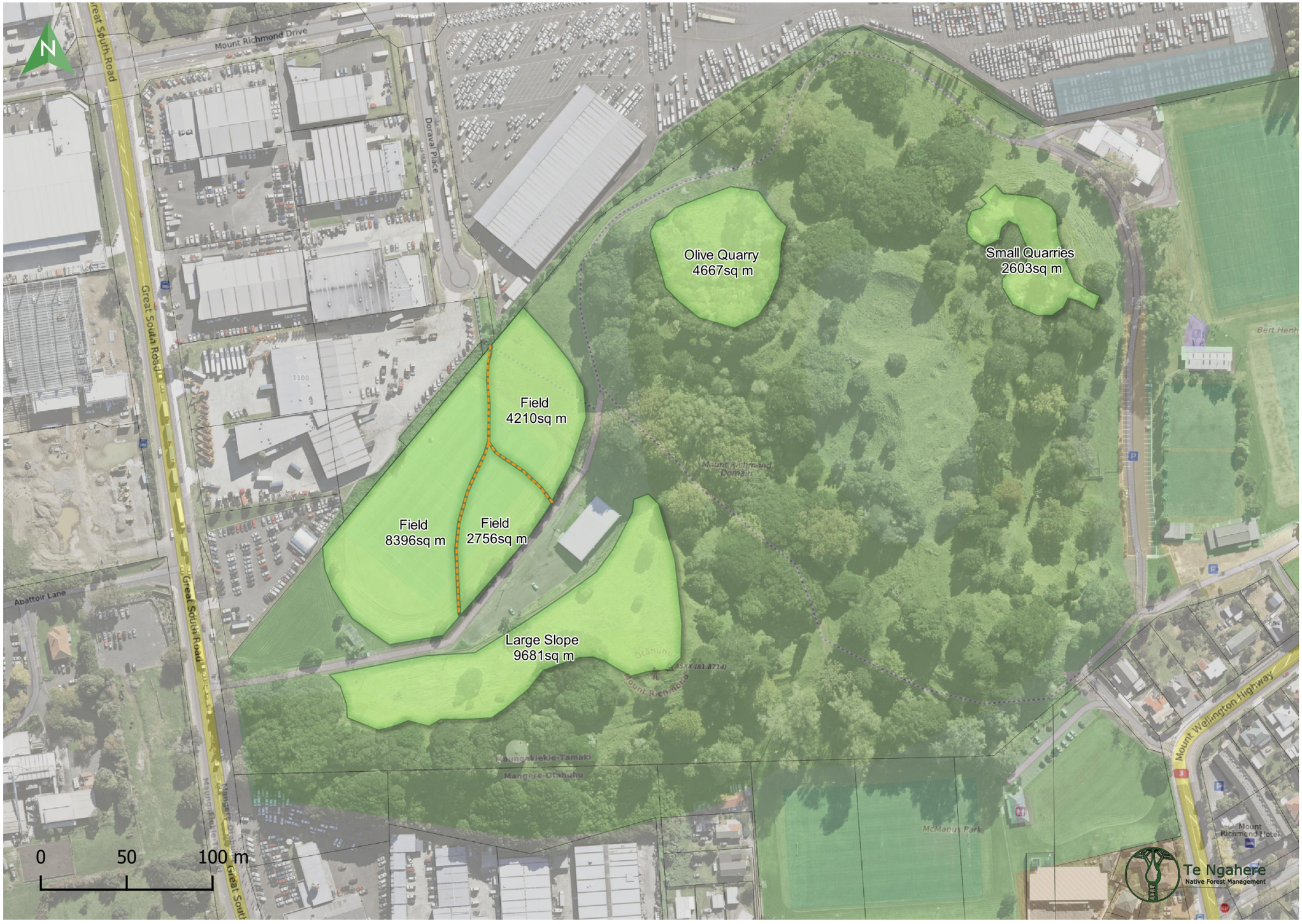


Figure 1: *Map indicating estimated areas of proposed restoration planting on Ōtāhuhu. (See section 1.6 and Appendix A for more details).*

1.4 Potential Skink and Invertebrate Habitat

Areas to establish native skink and invertebrate habitat include rocky areas that will provide basking habitat similar to that illustrated in Figure 2 below. At least two of the planting areas on Ōtāhuhu should create ideal skink habitat including the Small Quarries area, and the rocky slope of the Olive Quarry (Figure 1). Proposed plants include low growing species such as pōhuehue (*Muehlenbeckia complexa* var. *complexa*) and native ferns that would provide shelter and food if native skinks are present. The plants selected are also low growing which is an appropriate option as there will be no resulting impact on historic defensive. Depending on the site skink habitat restoration may consist of;

- Weed management only for sensitive sites to promote establishment of existing low growing native species.
- Planting some 1.5 to 2L plants where the site is not considered sensitive to promote faster establishment.
- Preventing the site naturally regenerating into larger native tree species.

These plantings areas will also include an additional follow-up infill planting aiming to replace losses and infill gaps that may appear. Species selected for this infill can be adapted based on observations of initial plantings.

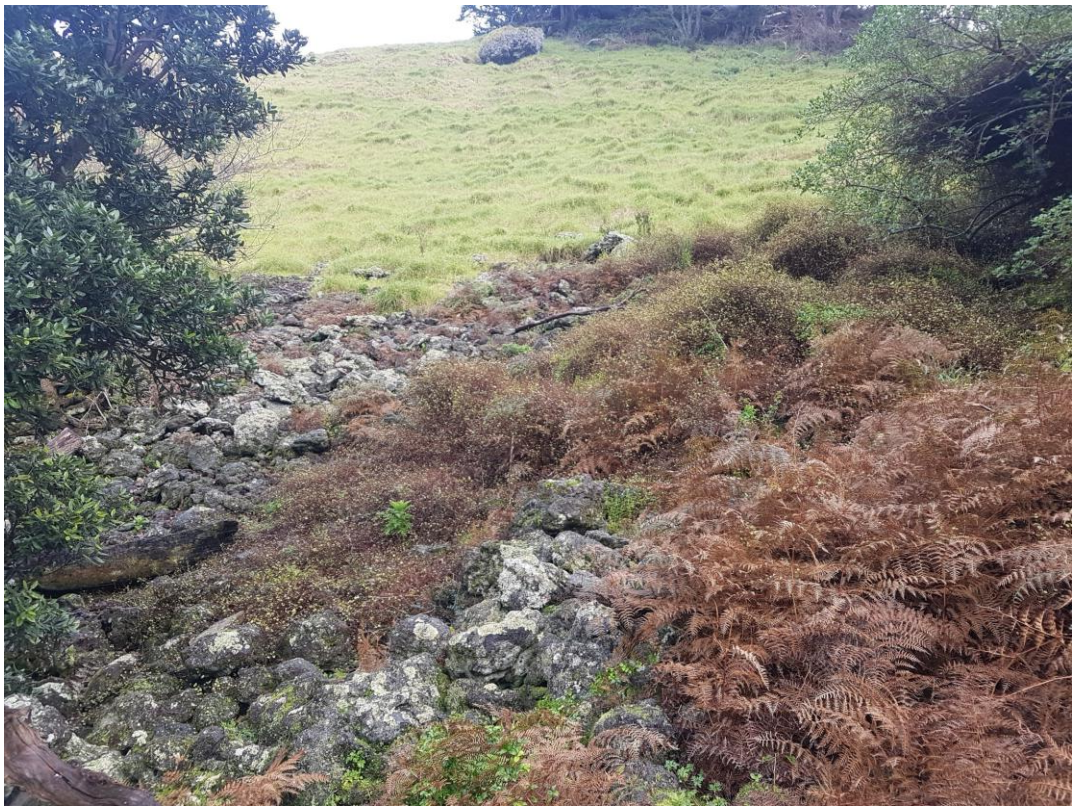


Figure 2: *Example of skink habitat including pōhuehue, some low growing native ferns and some larger self established native tree species such as pōhutukawa, Māngere Mountain, 2018.*

1.5 Potential WF7 Pūriri Ngahere (forest)

WF7/ Pūriri Ngahere (Auckland Council, 2017) is likely to have been present across much of this site historically. This ecosystem type will be re-introduced in the base of the Olive Quarry, across the Field, and at the base of the Large Slope where it will not inhibit historic defensive sightlines from the tihi (Figure 1). An example of established WF7 understory can be seen in Figure 3 below. Initial plantings will include a range of species, listed in Tables 1-3. These plantings areas will also include an additional follow-up infill planting aiming to replace losses and infill gaps that may appear. Species selected for this infill can be adapted based on survival observations of initial plantings.

Figure 3: *Example of a WF7 understorey, Withiel Thomas Reserve.*

1.6 Planting Areas and Plant Lists

LARGE SLOPE PLANTING AREA

This planting area covers the slope from the tihi down to the north west as far as the fence at the base, north east as far as the track down the ridge, and south west as far as the existing canopy allows. The area is currently predominantly covered by grass, including kikuyu, with isolated pōhutukawa and olive trees on the slope. There is a steep gradient across most of the slope with some very sheer sections. Volunteer involvement should be possible over most of the site, though some of the steepest areas should only be planted by experienced contractors.
The plant list developed for this area is divided into a number of sub-sections (Table 1). This will allow preservation of historic defensive site-lines from the tihi by creating a canopy height gradient from larger WF7 forest species at the base of the slope progressing to low ground covering species toward the summit.
The actual extent of this restoration area will require further definition by an archaeologist to ensure no damage to significant features including archaeology occurs.

Table 1: *Proposed species list for large slope north of tihi.*

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Lower Slope				
Emergent/Diversity species				
Alectryon excelsus	Tītoki	10	5m+ spacing	
Corynocarpus leavigatus	Karaka	15	5m+ spacing	
Dacrycarpus dacrydioides	Kahikatea	10	Damp areas. 5m+ spacing	
Dysoxylum specibile	Kohekohe	15	5m+ spacing	
Litsea calicaris	Mangeao	10	5m+ spacing	
Podocarpus totora	Tōtora	15	5m+ spacing	
Sophora chatamica	Coastal kōwhai	15	5m+ spacing	
Vitex lucens	Pūriri	10	5m+ spacing	
Canopy/Understory				
Coprosma robusta	Karamū	300		
Dodonaea viscosa	Akeake	100		
Geniostoma ligustrifolium	Hangehange	50		
Hedycarya arborea	Porokaiwhiri	50		
Kunzea robusta	Kānuka	200		Yes
Melicytus ramiflorus	Māhoe	200		
Myrsine australis	Māpou	200		
Pseudopanax lessonii	Houpara	100		
	Total	**1300**		

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Lower too Mid Slope				
Carex dissita	Flat leaved Sedge	500	Plant in small clusters.	
Cordyline australis	Tī kouka	300		
Entelea arborescens	Whau	350		
Leptospermum scoparium	Mānuka	270		Yes
Piper excelsum subsp. *excelsum*	Kawakawa	450	Skink food source.	Yes
Phormium tenax	Harakeke	480	Plant in small clusters.	
Solanum laciniatum	Poroporo, bullibulli	350		Yes
Veronica stricta var. *stricta*	Koromiko	800		Yes
	Total	**3500**		
Mid Slope too Upper				
Astelia banksii	Shore kowharawhara	300	Partial shade, under existing pōhutukawa and pūriri present. Skink food source.	
Austroderia fulvida	Toetoe	1600	Plant in small clusters.	Yes
Coprosma rhamnoides	Mingimingi	700	Skink food source.	
Haloragis erecta subsp. *erecta*	Shrubby toatoa	1200		Yes
Muehlenbekia complexa	Pōhuehue	1600	Copper butterfly breeding habitat. Skink food source.	Yes
Parablechnum novae-zealandiae	Kiokio	350	Plant in small clusters.	
Phormium cookianum subsp. *hookeri*	Whaririki, coastal flax	1300	Plant in small clusters.	Yes
Rubus cissoides	Tātarāmoa, bush lawyer	450	May be difficult to source. Keep away from edges. Skink food source.	Yes
	Total	**7500**		

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Upper Slope				
Arthropodium cirratum	Rengarenga	1400	Spring flowering. Plant in small clusters.	Yes
Carex testacea	Speckled sedge	1300	May be spaced more closely in small clusters (~0.5m)	Yes
	Total	**2700**		
			15000	**plants**

FIELD PLANTING AREA

This planting area covers the playing field on the western side of the reserve northwest as far as the fence, south west as far as the top of the slope, and north east over the fence into the current rank kikuyu area as far as the top of the shallow slope. The area is currently predominantly mown grass with rank kikuyu north east of the fence. The area is largely flat and likely remains waterlogged throughout winter. Volunteer involvement should be possible over the entire site.
The plant list developed for this area is representative of WF7 with a number of damp tolerant species dominating. Sub-sections in the table propose species for development of forest canopy and a number of species that may be used to create more open pockets within the area including along the sides of the proposed track and around edges (Table 2).
The actual extent of this restoration area will require further definition by an archaeologist to ensure no damage to significant features including archaeology occurs.

Table 2: *Field planting list.*

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
WF 7 Canopy				
Emergent				
Alectryon excelsus	Tītoki	90	5m+ spacing	
Corynocarpus leavigatus	Karaka	90	5m+ spacing	
Dacrycarpus dacrydioides	Kahikatea	210	Damp areas. 5m+ spacing	
Dysoxylum specibile	Kohekohe	90	5m+ spacing	
Litsea calicaris	Mangeao	30	5m+ spacing	
Podocarpus totora	Tōtora	90	5m+ spacing	
Sophora chatamica	Coastal kōwhai	90	5m+ spacing	
Vitex lucens	Pūriri	90	5m+ spacing	
Canopy				
Carpodetus serratus	Putaputwētā	90	Damps areas.	
Coprosma robusta	Karamū	2700		
Cordyline australis	Tī kouka	990		
Geniostoma ligustrifolium	Hangehange	510		
Hedycarya arborea	Porokaiwhiri	510		
Hoheria populnea	Houhere	240		
Kunzea robusta	Kānuka	690		Yes
Leptospermum scoparium	Mānuka	900		Yes
Melicytus ramiflorus	Māhoe	1710		
Myrsine australis	Māpou	990		
Piper excelsum subsp. *excelsum*	Kawakawa	810	Skink food source.	Yes
	Total	**10920**		

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Open pockets/edge/path sides				
Austroderia fulvida	Toetoe	690	Plant in small clusters.	Yes
Carex dissita	Flat leaved sedge	690	Plant in small clusters.	
Carex lambertiana	Forest sedge	690	Plant in small clusters.	
Parablechnum novae-zealandiae	Kiokio	210	Plant in small clusters.	
Phormium tenax	Harakeke	990	Plant in small clusters.	
Solanum laciniatum	Poroporo	270		Yes
Veronica stricta var. *stricta*	Koromiko	540		Yes
	Total	**4080**		
			15000	**plants**

OLIVE QUARRY PLANTING AREA

This planting area covers the old quarry basin near the north western side of the reserve. The area includes the flat base and the surrounding rocky slope within the quarry. The base section is mown grass which likely remains waterlogged throughout winter, while the slope is rocky with some grass and other herbaceous plants covering in areas. Volunteer involvement should be possible on the flat base area though the steep slope planting should be undertaken by experienced contractors.
The plant list is split into sub-sections with taller, damp tolerant WF7 forest species in the flat base and low growing, hardy drought tolerant plants on the rocky slope. The slope species were also selected to provide shelter and food for native skink species that may inhabit the area (Table 3). The actual extent of this restoration area will require further definition by an archaeologist to ensure no damage to significant features including archaeology occurs.

Threatened *Pellaea* spp. were observed as present on the rocky slope of this planting area. Extreme care needs to be taken by any contractor undertaking planting preparation, weed control, planting or any other work on this slope to ensure preservation and support of existing plants.

Table 3: *Olive Quarry planting list.*

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Base				
Emergent				
Alectryon excelsus	Tītoki	5	5m+ spacing	
Corynocarpus leavigatus	Karaka	5	5m+ spacing	
Dacrycarpus dacrydioides	Kahikatea	10	Damp areas. 5m+ spacing	
Dysoxylum specibile	Kohekohe	5	5m+ spacing	
Litsea calicaris	Mangeao	5	5m+ spacing	
Podocarpus totora	Tōtora	5	5m+ spacing	
Sophora chatamica	Coastal kōwhai	5	5m+ spacing	
Vitex lucens	Pūriri	10	5m+ spacing	
Canopy				
Coprosma robusta	Karamū	350		
Cordyline australis	Tī kouka	200		
Dodonaea viscosa	Akeake	100		
Geniostoma ligustrifolium	Hangehange	100		
Hedycarya arborea	Porokaiwhiri	100		
Kunzea robusta	Kānuka	250		Yes
Leptospermum scoparium	Mānuka	250		Yes
Melicytus ramiflorus	Māhoe	250		
Myrsine australis	Māpou	150		
Piper excelsum subsp. *excelsum*	Kawakawa	200	Skink food source.	Yes
	Total	**2000**		

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Slope				
Arthropodium cirratum	Rengarenga	300	Spring flowering. Plant in small clusters.	Yes
Astelia banksii	Shore kowharawhara	150	Plant under partial shade where possible. Skink food source.	
Austroderia fulvida	Toetoe	300	Plant in small clusters.	Yes
Carex testacea	Speckled sedge	150		Yes
Coprosma rhamnoides	Mingimingi	100		
Botanical Name	**Other Names**	**Number**	**Notes**	**Approved for archaeological sites based on Jones (2007)**
Doodia australis	Pukupuku, rasp fern	100		
Haloragis erecta subsp. erecta	Shrubby toatoa	200		Yes
Muehlenbekia complexa	Pōhuehue	300	Copper butterfly breeding habitat. Skink food source.	Yes
Parablechnum novae-zealandiae	Kiokio	50		
Phormium cookianum subsp. *hookeri*	Whaririki, coastal flax	250	Plant in small clusters.	Yes
Rubus cissoides	Tataramoa, bush lawyer	100	May be difficult to source. Keep away from edges. Skink food source.	Yes
	Total	**2000**		
			4000	**plants**

SMALL QUARRIES PLANTING AREA

This planting area extends though a handful of small adjoined quarry pockets at the top of the slope in the north eastern area of the reserve. This site is currently rocky with a number of steep slopes around the edges. Grass and other herbaceous species are growing under a patchy canopy mostly comprised of olive trees. Due to the sensitive archaeological nature and difficult rocky ground the planting should only be undertaken by experienced contractors.
The plant list developed for this area is designed to remain low growing and provide a sheltered habitat including food sources for native skinks which may be present in the area on the rocky basking habitat available (Table 4).
The actual extent of this restoration area and placement of specific plant species will require further definition by an archaeologist to ensure no damage to significant features including archaeology occurs.

Threatened *Pellaea* spp. were observed as present in this rocky planting area. Extreme care needs to be taken by any contractor undertaking planting preparation, weed control, planting or any other work in this area to ensure preservation and support of existing plants.

Table 4: *Small Quarries planting list.*

Botanical Name	Other Names	Number	Notes	Approved for archaeological sites based on Jones (2007)
Arthropodium cirratum	Rengarenga	300	Spring flowering. Plant in small clusters.	Yes
Astelia banksii	Shore kowharawhara	150	Plant under partial shade where possible. Skink food source.	
Austroderia fulvida	Toetoe	250	Plant in small clusters.	Yes
Carex testacea	Speckled sedge	300	Plant in small clusters.	Yes
Coprosma rhamnoides	Mingmingi	100		
Doodia australis	Pukupuku, rasp fern	200		
Muehlenbekia complexa	Pōhuehue	300	Copper butterfly breeding habitat. Skink food source.	Yes
Phormium cookianum subsp. *hookeri*	Whararikī, coastal flax	100	Plant in small clusters.	Yes
Piper excelsum subsp. *excelsum*	Kawakawa	100	Skink food source.	Yes
Rubus cissoides	Tataramoa, bush lawyer	200	May be difficult to source. Keep away from edges. Skink food source.	Yes
			2000	**plants**

2 References

Jones, K. L. (2007). *Caring for archaeological sites: Practical guidelines for protecting and managing archaeological sites in New Zealand.* Wellington: New Zealand Department of Conservation.

Singers N., Osborne B., Lovegrove T., Jamieson A., Boow J., Sawyer J., Hill K., Andrews J., Webb C. (2017). *Indigenous terrestrial and wetland ecosystems of Auckland.* Auckland: Auckland Council.

3 Appendix A

The table below lays out a proposed six year schedule for undertaking the proposed plantings on Ōtāhuhu. This provides opportunities for volunteer involvement each year of the first 5 years of initial plantings. The sixth year will be reserved for undertaking infill planting to replace losses and fill gaps that may have appeared. The numbers for infill plantings have been based on a standard 10% rate of loss, however this may not be the actual rate apparent. The species selected for infill are also a 10% representation of all species used in the initial plantings. This infill rate is therefore an indication only and adjustments to numbers and species should be made based on the outcome of initial plantings.

Planting site preparation for all planting areas should include a minimum of two green glyphosate sprays to control invasive grass species such as kikuyu. Native ground covers such as *Microlaena stipoides* should be preserved wherever possible, and particular care must be taken to avoid other native plants such as *Pallaea* spp. which may also be present.

Planting should include the spread of rye clover grass seed to act as both a living mulch and weed suppressant following plantings.

Table A1: Proposed plant lists and six year planting schedule for Ōtāhuhu.

				Year 1 (2019)		Year 2 (2020)		Year 3 (2021)		Year 4 (2022)	Year 5 (2023)	Year 6 (2024)
Botanical Name	Other Names	*Recommended Container Size	Total Plants	Field (1 of 3) Northern	Olive Quarry (1 of 2) Slope	Field (2 of 3) Central	Olive Quarry (2 of 2) Base	Field (3 of 3) Eastern	Small Quarries (1 of 1)	Large Slope (1 of 2) Upper	Large Slope (2 of 2) Lower	Infill - All Areas
Alectryon excelsus	Tītoki	2 Litre	115	30		30	5	30			10	10
Arthropodium cirratum	Rengarenga	1 Litre	2200		300				300	1100	300	200
Astelia banksii	Shore kowharawhara	1 Litre	660		150				150	200	100	60
Austroderia fulvida	Toetoe	1 Litre	3120	230	300	230		230	250	800	800	280
Carex dissita	Flat leaved sedge	1 Litre	1310	230		230		230		200	300	120

				Year 1 (2019)		Year 2 (2020)		Year 3 (2021)		Year 4 (2022)	Year 5 (2023)	Year 6 (2024)
Botanical Name	Other Names	*Recommended Container Size	Total Plants	Field (1 of 3) Northern	Olive Quarry (1 of 2) Slope	Field (2 of 3) Central	Olive Quarry (2 of 2) Base	Field (3 of 3) Eastern	Small Quarries (1 of 1)	Large Slope (1 of 2) Upper	Large Slope (2 of 2) Lower	Infill - All Areas
Carex lambertiana	Forest sedge	1 Litre	760	230		230		230				70
Carex testacea	Speckled sedge	1 Litre	1930		150				300	1300		180
Carpodetus serratus	Putaputaweta	1 Litre	100	30		30		30				10
Coprosma rhamnoides	Mingimingi	1 Litre	990		100				100	500	200	90
Coprosma robusta	Karamū or Coastal karamū	1 Litre	3690	900		900	350	900			300	340
Cordyline australis	Tī kouka	1 Litre	1640	330		330	200	330			300	150
Corynocarpus leavigatus	Karaka	2 Litre	120	30		30	5	30			15	10
Dacrycarpus dacrydioides	Kahikatea	2 Litre	250	70		70	10	70			10	20
Dodonaea viscosa	Akeake	1 Litre	220				100				100	20
Doodia australis	Pukupuku, rasp fern	1 Litre	330		100				200			30
Dysoxylum specibile	Kohekohe	2 Litre	120	30		30	5	30			15	10
Entelea arborescens	Whau	1 Litre	390								350	40
Geniostoma ligustrifolium	Hangehange	1 Litre	730	170		170	100	170			50	70
Haloragis erecta subsp. *Erecta*	Toatoa	1 Litre	1540		200					1000	200	140
Hedycarya arborea	Porokaiwhiri	1 Litre	720	170		170	100	170			50	60
Hoheria populnea	Houhere	1 Litre	260	80		80		80				20

				Year 1 (2019)		Year 2 (2020)		Year 3 (2021)		Year 4 (2022)	Year 5 (2023)	Year 6 (2024)
Botanical Name	Other Names	*Recommended Container Size	Total Plants	Field (1 of 3) Northern	Olive Quarry (1 of 2) Slope	Field (2 of 3) Central	Olive Quarry (2 of 2) Base	Field (3 of 3) Eastern	Small Quarries (1 of 1)	Large Slope (1 of 2) Upper	Large Slope (2 of 2) Lower	Infill - All Areas
Kunzea robusta	Kānuka	1 Litre	1250	230		230	250	230			200	110
Leptospermum scoparium	Mānuka	1 Litre	1560	300		300	250	300			270	140
Litsea calicaris	Mangeao	2 Litre	55	10		10	5	10			10	10
Melicytus ramiflorus	Māhoe	1 Litre	2370	570		570	250	570			200	210
Muehlenbeckia complexa	Pōhuehue	1 Litre	2420		300				300	1100	500	220
Myrsine australis	Māpou	1 Litre	1470	330		330	150	330			200	130
Parablechnum novae-zealandiae	Kiokio	1 Litre	670	70	50	70		70		200	150	60
Phormium cookianum subsp. *hookeri*	Whararikī	1 Litre	1820		250				100	1000	300	170
Phormium tenax	Harakeke	1 Litre	1620	330		330		330			480	150
Piper excelsum subsp. *excelsum*	Kawakawa	1 Litre	1720	270		270	200	270	100		450	160
Podocarpus totora	Totora	2 Litre	120	30		30	5	30			15	10
Pseudopanax lessonii	Houpara	1 Litre	110								100	10
Rubus cissoides	Tataramoa, bush lawyer	1 Litre	820		100				200	100	350	70
Solanum laciniatum	Poroporo, bullibulli	1 Litre	680	90		90		90			350	60
Sophora chatamica	Coastal kōwhai	2 Litre	120	30		30	5	30			15	10

				Year 1 (2019)		Year 2 (2020)		Year 3 (2021)		Year 4 (2022)	Year 5 (2023)	Year 6 (2024)
Botanical Name	Other Names	*Recommended Container Size	Total Plants	Field (1 of 3) Northern	Olive Quarry (1 of 2) Slope	Field (2 of 3) Central	Olive Quarry (2 of 2) Base	Field (3 of 3) Eastern	Small Quarries (1 of 1)	Large Slope (1 of 2) Upper	Large Slope (2 of 2) Lower	Infill - All Areas
Veronica stricta var. *Stricta*	Koromiko	1 Litre	1480	180		180		180			800	140
Vitex lucens	Pūriri	2 Litre	120	30		30	10	30			10	10
			39600	**7000**		**7000**		**7000**		**7500**	**7500**	**3600**

* Olive Quarry (1 of 2) Slope 2019 should be 0.5 Litre size due to the rocky substrate present. Container size for other planting areas may also differ depending on specific site conditions and plant availability which will be determined closer to the time.

Planting

Reference:

4222 - Otahuhu - 2019: Field (1 of 3) Northern

Te Ngahere

flat leaved sedge *(Carex dissita)*

Damp - Wet

Full Sun - Shade

Enrichment riparian

Should be used sparingly and only in flood plains and depressions near streams

230

1 Litre

forest sedge *(Carex lambertiana)*

Dry - Damp

Semi Shade - Shade

Enrichment riparian/wetland

Does not like wet feet

230

1 Litre

hangehange *(Geniostoma ligustrifolium var. ligustrifolium)*

Dry

Full Sun - Semi Shade

Coloniser riparian/forest edge

prefers forest edge where it can get lots of light, yet is sheltered from exposure to strong winds. Grows best in soils rich and moist, but not too wet.

170

1 Litre

harakeke *(Phormium tenax)*

Dry - Wet

Full Sun

Coloniser wetland/boundary edges

Plant in groups. Used in wetlands and for 'fencing' along boundaries. In stream backswamps or floodplains plant away from the normal stream flood zone as flax does not lie flat during flooding.

330

1 Litre

houhere *(Hoheria populnea)*

Dry - Damp

Full Sun - Semi Shade

Enrichment forest

Coastal to montane usually in Kauri (Agathis australis) forest but also in successional forest associated with kauri. Also common in pohutukawa (Metrosideros excelsa) dominated coastal forest.

80

1 Litre

kahikatea *(Dacrycarpus dacrydioides)*

Damp

Full Sun - Semi Shade

Enrichment forest

Lowland forest, formerly dominant on frequently flooded, and/or poorly drained alluvial soils

70

2 Litre

kānuka (Auckland) *(Kunzea robusta)*

Dry

Full Sun

Coloniser forest

soft to touch. Hardy tree prefers drier sunny sites.

230

1 Litre

karaka *(Corynocarpus laevigatus)*

Dry - Damp

Full Sun - Shade

Enrichment forest/coastal

Suitable for sheltered and exposed situations, common naturally regenerating under shade so should be planted in places where this is unlikey to occur.

30

2 Litre

karamū *(Coprosma robusta)*

Dry - Wet

Full Sun - Shade

Coloniser forest

900

1 Litre

kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp

Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

270

1 Litre

kiokio *(Parablechnum novae-zelandiae)*

Dry - Damp

Full Sun - Shade

Coloniser riparian/coastal/forest edge

70

1 Litre

kohekohe *(Dysoxylum spectabile)*

Dry - Damp

Semi Shade - Shade

Enrichment forest

sometimes dominant or co-dominant tree of coastal to lowland forest

30

2 Litre

koromiko *(Veronica stricta var. stricta)*

Dry

Full Sun

Coloniser riparian/coastal/forest edge

Common in successional habitats from coastal areas to lower montane habitats

180

1 Litre

kōwhai (coastal) *(Sophora chathamica)*

Dry

Full Sun - Semi Shade

Enrichment coastal

30

2 Litre

māhoe *(Melicytus ramiflorus)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest

good at stabilising banks

570

1 Litre

Mangeao *(Litsea calicaris)*

Damp

Semi Shade - Shade

Enrichment forest

plant sparingly, can be difficult to establish

10

2 Litre

mānuka *(Leptospermum scoparium var. scoparium)*

Dry - Damp

Full Sun

Coloniser forest

prickly to touch. Very hardy. Sunny position, dry to moist soils

300

1 Litre

māpou *(Myrsine australis)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest/coastal

330

1 Litre

pigeonwood / porokaiwhiri
(Hedycarya arborea)

Dry - Damp | Semi Shade

Enrichment forest

170
1 Litre

Poroporo, bullibulli *(Solanum laciniatum)*

Dry - Damp | Full Sun

Coloniser coastal/forest edge

90
1 Litre

pūriri *(Vitex lucens)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

prefers rich fertile soils. frost tender when young.

30
2 Litre

putaputawētā / marbleleaf
(Carpodetus serratus)

Damp - Wet | Full Sun - Shade

Enrichment riparian/forest

Moist broadleaf forest. Streamsides and forest margins. Needs shelter and prefers damp soil.

30
2 Litre

tī kōuka / cabbage tree *(Cordyline australis)*

Dry - Wet | Full Sun

Coloniser riparian/coastal/forest/wetland

Most commonly encountered on alluvial terraces within riparian forest. Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought

330
1 Litre

tītoki *(Alectryon excelsus)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

Needs some shade to establish, prefers fertile volcanic or alluvial sites

30
2 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp | Full Sun

Coloniser riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

230
1 Litre

tōtara *(Podocarpus totara)*

Dry

Full Sun - Shade

Enrichment

lowland forest

30

2 Litre

Totals by Container

4710	1 Litre
290	2 Litre

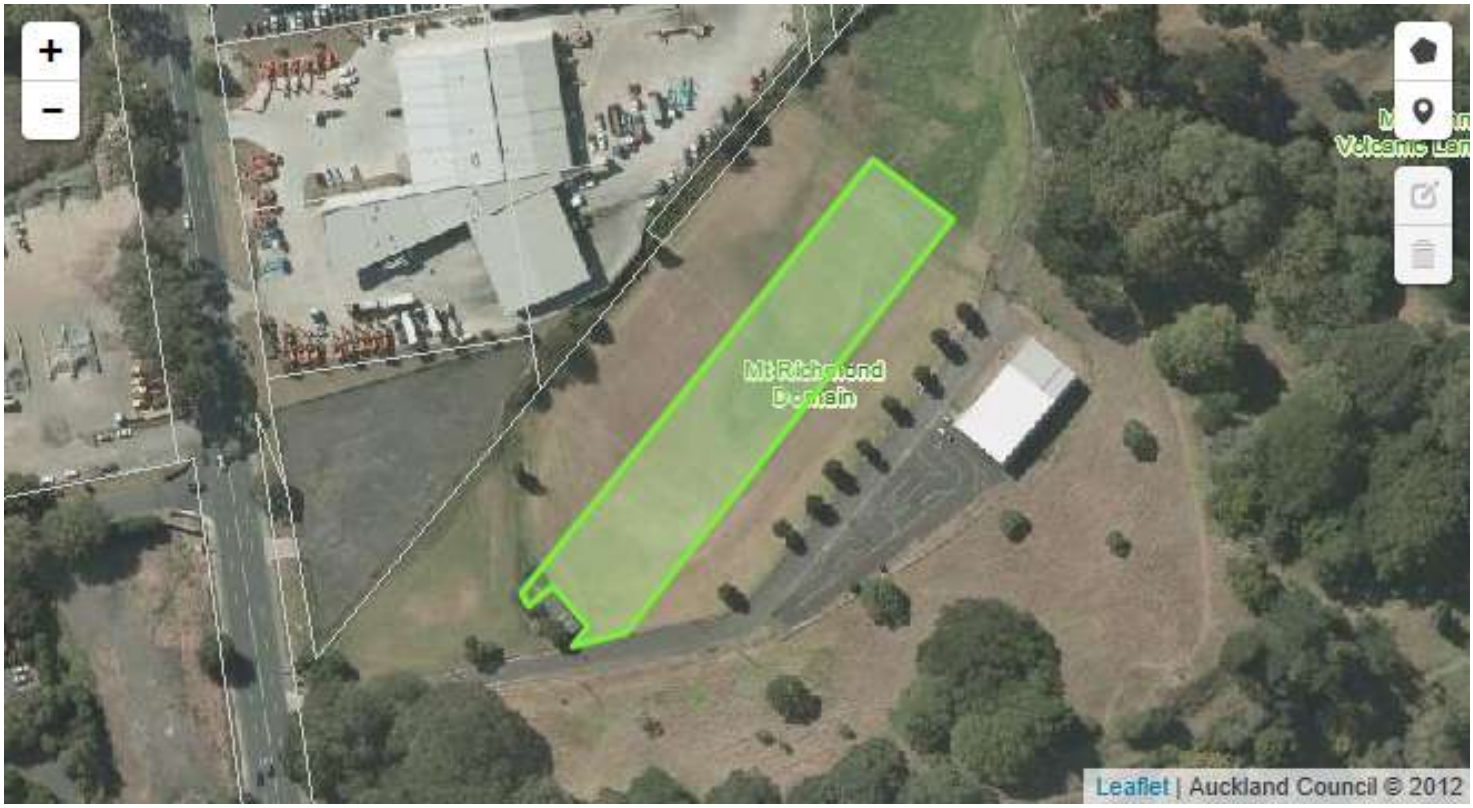
Total Plant **5000**

Planting

Reference:

4222 - Otahuhu - 2020: Field (2 of 3) Central

Te Ngahere



flat leaved sedge *(Carex dissita)*

Damp - Wet

Full Sun - Shade

Enrichment riparian

Should be used sparingly and only in flood plains and depressions near streams

230

1 Litre

forest sedge *(Carex lambertiana)*

Dry - Damp

Semi Shade - Shade

Enrichment riparian/wetland

Does not like wet feet

230

1 Litre

hangehange *(Geniostoma ligustrifolium var. ligustrifolium)*

Dry

Full Sun - Semi Shade

Coloniser riparian/forest edge

prefers forest edge where it can get lots of light, yet is sheltered from exposure to strong winds. Grows best in soils rich and moist, but not too wet.

170

1 Litre

harakeke *(Phormium tenax)*

Dry - Wet

Full Sun

Coloniser wetland/boundary edges

Plant in groups. Used in wetlands and for 'fencing' along boundaries. In stream backswamps or floodplains plant away from the normal stream flood zone as flax does not lie flat during flooding.

330

1 Litre

houhere *(Hoheria populnea)*

Dry - Damp

Full Sun - Semi Shade

Enrichment forest

Coastal to montane usually in Kauri (Agathis australis) forest but also in successional forest associated with kauri. Also common in pohutukawa (Metrosideros excelsa) dominated coastal forest.

80

1 Litre

kahikatea *(Dacrycarpus dacrydioides)*

Damp

Full Sun - Semi Shade

Enrichment forest

Lowland forest, formerly dominant on frequently flooded, and/or poorly drained alluvial soils

70

2 Litre

kānuka (Auckland) *(Kunzea robusta)*

Dry

Full Sun

Coloniser forest

soft to touch. Hardy tree prefers drier sunny sites.

230

1 Litre

karaka *(Corynocarpus laevigatus)*

Dry - Damp

Full Sun - Shade

Enrichment forest/coastal

Suitable for sheltered and exposed situations, common naturally regenerating under shade so should be planted in places where this is unlikey to occur.

30

2 Litre

karamū *(Coprosma robusta)*

Dry - Wet

Full Sun - Shade

Coloniser forest

900

1 Litre

kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp

Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

270

1 Litre

kiokio *(Parablechnum novae-zelandiae)*

Dry - Damp

Full Sun - Shade

Coloniser riparian/coastal/forest edge

70

1 Litre

kohekohe *(Dysoxylum spectabile)*

Dry - Damp

Semi Shade - Shade

Enrichment forest

sometimes dominant or co-dominant tree of coastal to lowland forest

30

2 Litre

koromiko *(Veronica stricta var. stricta)*

Dry

Full Sun

Coloniser riparian/coastal/forest edge

Common in successional habitats from coastal areas to lower montane habitats

180

1 Litre

kōwhai (coastal) *(Sophora chathamica)*

Dry

Full Sun - Semi Shade

Enrichment coastal

30

2 Litre

māhoe *(Melicytus ramiflorus)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest

good at stabilising banks

570

1 Litre

Mangeao *(Litsea calicaris)*

Damp

Semi Shade - Shade

Enrichment forest

plant sparingly, can be difficult to establish

10

2 Litre

mānuka *(Leptospermum scoparium var. scoparium)*

Dry - Damp

Full Sun

Coloniser forest

prickly to touch. Very hardy. Sunny position, dry to moist soils

300

1 Litre

māpou *(Myrsine australis)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest/coastal

330

1 Litre

pigeonwood / porokaiwhiri
(Hedycarya arborea)

Dry - Damp | Semi Shade

Enrichment forest

170
1 Litre

Poroporo, bullibulli *(Solanum laciniatum)*

Dry - Damp | Full Sun

Coloniser coastal/forest edge

90
1 Litre

pūriri *(Vitex lucens)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

prefers rich fertile soils. frost tender when young.

30
2 Litre

putaputawētā / marbleleaf
(Carpodetus serratus)

Damp - Wet | Full Sun - Shade

Enrichment riparian/forest

Moist broadleaf forest. Streamsides and forest margins. Needs shelter and prefers damp soil.

30
2 Litre

tī kōuka / cabbage tree *(Cordyline australis)*

Dry - Wet | Full Sun

Coloniser riparian/coastal/forest/wetland

Most commonly encountered on alluvial terraces within riparian forest. Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought

330
1 Litre

tītoki *(Alectryon excelsus)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

Needs some shade to establish, prefers fertile volcanic or alluvial sites

30
2 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp | Full Sun

Coloniser riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

230
1 Litre

tōtara *(Podocarpus totara)*

Dry

Full Sun - Shade

Enrichment

lowland forest

30

2 Litre

Totals by Container

4710	1 Litre
290	2 Litre

Total Plant **5000**

Planting

Reference:

4222 - Otahuhu - 2021: Field (3 of 3) Southern and Eastern

Te Ngahere

flat leaved sedge *(Carex dissita)*

Damp - Wet

Full Sun - Shade

Enrichment riparian

Should be used sparingly and only in flood plains and depressions near streams

230

1 Litre

forest sedge *(Carex lambertiana)*

Dry - Damp

Semi Shade - Shade

Enrichment riparian/wetland

Does not like wet feet

230

1 Litre

hangehange *(Geniostoma ligustrifolium var. ligustrifolium)*

Dry

Full Sun - Semi Shade

Coloniser riparian/forest edge

prefers forest edge where it can get lots of light, yet is sheltered from exposure to strong winds. Grows best in soils rich and moist, but not too wet.

170

1 Litre

harakeke *(Phormium tenax)*

Dry - Wet

Full Sun

Coloniser wetland/boundary edges

Plant in groups. Used in wetlands and for 'fencing' along boundaries. In stream backswamps or floodplains plant away from the normal stream flood zone as flax does not lie flat during flooding.

330

1 Litre

houhere *(Hoheria populnea)*

Dry - Damp

Full Sun - Semi Shade

Enrichment forest

Coastal to montane usually in Kauri (Agathis australis) forest but also in successional forest associated with kauri. Also common in pohutukawa (Metrosideros excelsa) dominated coastal forest.

80

1 Litre

kahikatea *(Dacrycarpus dacrydioides)*

Damp

Full Sun - Semi Shade

Enrichment forest

Lowland forest, formerly dominant on frequently flooded, and/or poorly drained alluvial soils

70

2 Litre

kānuka (Auckland) *(Kunzea robusta)*

Dry

Full Sun

Coloniser forest

soft to touch. Hardy tree prefers drier sunny sites.

230

1 Litre

karaka *(Corynocarpus laevigatus)*

Dry - Damp

Full Sun - Shade

Enrichment forest/coastal

Suitable for sheltered and exposed situations, common naturally regenerating under shade so should be planted in places where this is unlikey to occur.

30

2 Litre

karamū *(Coprosma robusta)*

Dry - Wet

Full Sun - Shade

Coloniser forest

900

1 Litre

kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp

Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

270

1 Litre

kiokio *(Parablechnum novae-zelandiae)*

Dry - Damp

Full Sun - Shade

Coloniser riparian/coastal/forest edge

70

1 Litre

kohekohe *(Dysoxylum spectabile)*

Dry - Damp

Semi Shade - Shade

Enrichment forest

sometimes dominant or co-dominant tree of coastal to lowland forest

30

2 Litre

koromiko *(Veronica stricta var. stricta)*

Dry

Full Sun

Coloniser riparian/coastal/forest edge

Common in successional habitats from coastal areas to lower montane habitats

180

1 Litre

kōwhai (coastal) *(Sophora chathamica)*

Dry

Full Sun - Semi Shade

Enrichment coastal

30

2 Litre

māhoe *(Melicytus ramiflorus)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest

good at stabilising banks

570

1 Litre

Mangeao *(Litsea calicaris)*

Damp

Semi Shade - Shade

Enrichment forest

plant sparingly, can be difficult to establish

10

2 Litre

mānuka *(Leptospermum scoparium var. scoparium)*

Dry - Damp

Full Sun

Coloniser forest

prickly to touch. Very hardy. Sunny position, dry to moist soils

300

1 Litre

māpou *(Myrsine australis)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest/coastal

330

1 Litre

pigeonwood / porokaiwhiri
(Hedycarya arborea)

Dry - Damp | Semi Shade

Enrichment forest

170
1 Litre

Poroporo, bullibulli *(Solanum laciniatum)*

Dry - Damp | Full Sun

Coloniser coastal/forest edge

90
1 Litre

pūriri *(Vitex lucens)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

prefers rich fertile soils. frost tender when young.

30
2 Litre

putaputawētā / marbleleaf
(Carpodetus serratus)

Damp - Wet | Full Sun - Shade

Enrichment riparian/forest

Moist broadleaf forest. Streamsides and forest margins. Needs shelter and prefers damp soil.

30
2 Litre

tī kōuka / cabbage tree *(Cordyline australis)*

Dry - Wet | Full Sun

Coloniser riparian/coastal/forest/wetland

Most commonly encountered on alluvial terraces within riparian forest. Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought

330
1 Litre

tītoki *(Alectryon excelsus)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

Needs some shade to establish, prefers fertile volcanic or alluvial sites

30
2 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp | Full Sun

Coloniser riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

230
1 Litre

tōtara *(Podocarpus totara)*

Dry

Full Sun - Shade

Enrichment

lowland forest

30

2 Litre

Totals by Container

4710	1 Litre
290	2 Litre

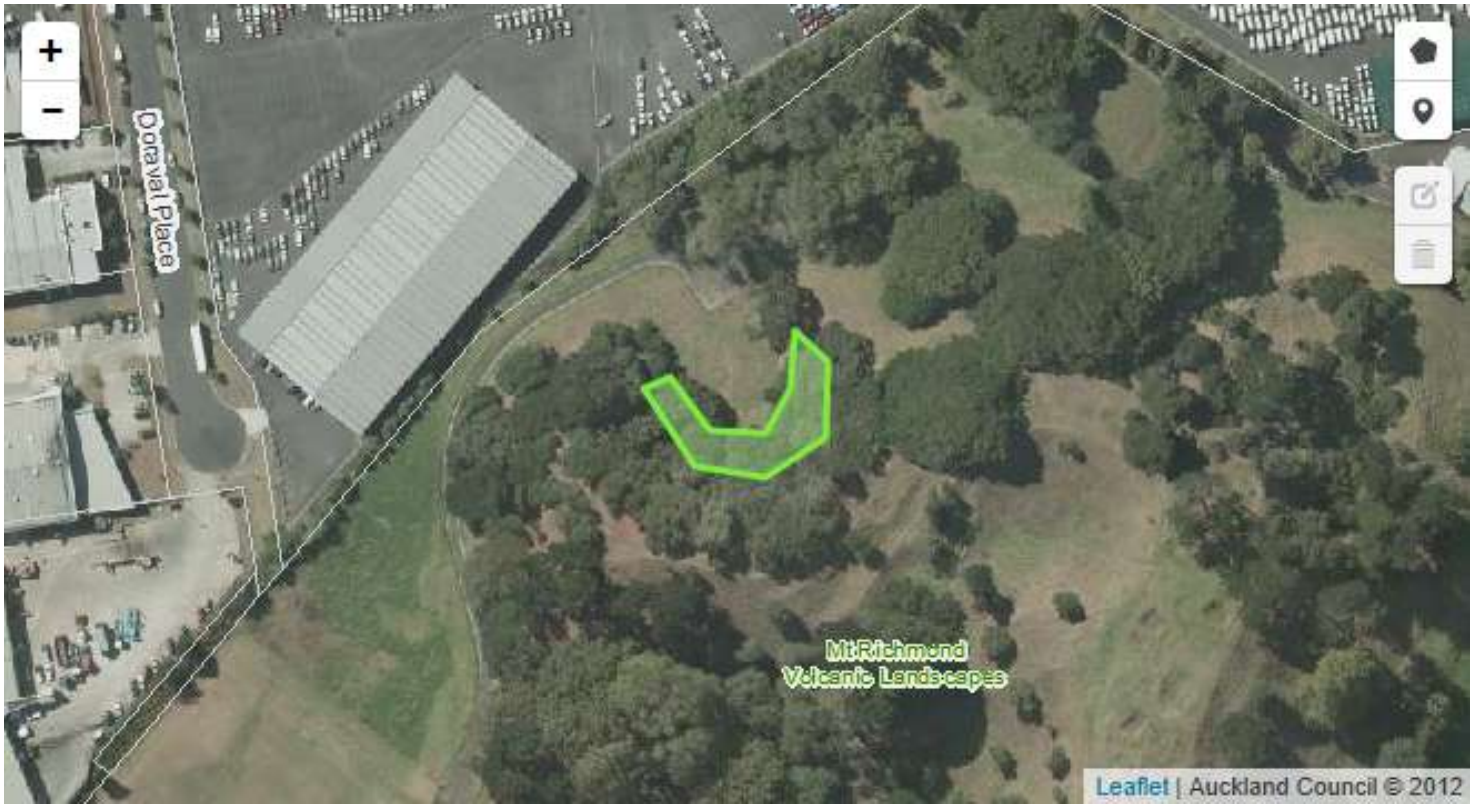
Total Plant **5000**

Planting

Reference:

4222 - Otahuhu - 2019: Olive Quarry (1 of 2) Slope

Te Ngahere



kiokio *(Parablechnum novae-zelandiae)*

Dry - Wet

Full Sun - Shade

Enrichment

Plant in groups

riparian/forest

50

0.5 Litre

mingimingi *(Coprosma rhamnoides)*

Dry - Damp

Full Sun - Shade

Coloniser

forest/coastal

100

0.5 Litre

põhuehue *(Muehlenbeckia complexa)*

Dry - Damp

Full Sun - Semi Shade

Coloniser

forest/coastal

300

0.5 Litre

rasp fern / pukupuku *(Doodia australis (syn. Blechnum parrisiae))*

Dry - Damp | Full Sun - Semi Shade

Enrichment | forest/coastal

100
0.5 Litre

rengarenga *(Arthropodium cirratum)*

Dry | Full Sun

Amenity | coastal/forest edge

300
0.5 Litre

speckled sedge *(Carex testacea)*

Dry | Full Sun

Coloniser | Open/coastal

150
0.5 Litre

Tataramoa *(Rubus cissoides)*

Full Sun

Enrichment | forest

100
0.5 Litre

Toatoa, fireweed, shrubby Haloragis *(Haloragis erecta subsp. Erecta)*

Dry - Wet | Full Sun - Semi Shade

Coloniser | forest edge

200
0.5 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp | Full Sun

Coloniser | riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

300
0.5 Litre

whaririki (mountain flax) *(Phormium cookianum)*

Dry - Damp | Full Sun

Coloniser | coastal/forest edge

Very hardy, tolerant of salt exposure. Grows in a range of conditions. Suitable for planting up to the cliff edge

250
0.5 Litre

wharawhara *(Astelia banksii)*

Dry

Semi Shade - Shade

Enrichment coastal/forest edge

150

0.5 Litre

Totals by Container **Total Plant** **2000**

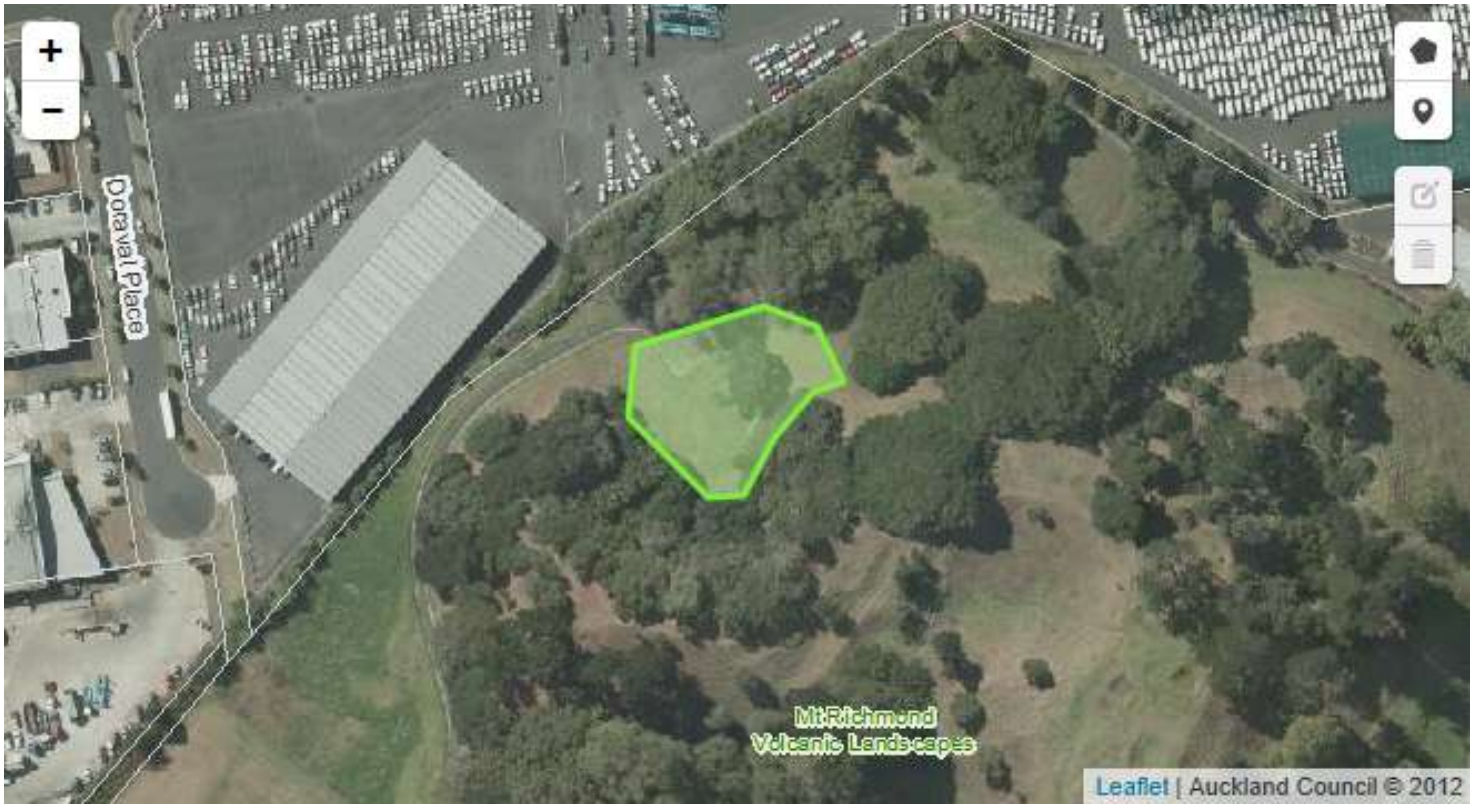
2000 0.5 Litre

Planting

Reference:

4222 - Otahuhu - 2020: Olive Quarry (2 of 2) Base

Te Ngahere



akeake *(Dodonaea viscosa)*

Dry - Damp

Full Sun

Coloniser coastal

100

1 Litre

hangehange *(Geniostoma ligustrifolium var. ligustrifolium)*

Dry

Full Sun - Semi Shade

Coloniser riparian/forest edge

prefers forest edge where it can get lots of light, yet is sheltered from exposure to strong winds. Grows best in soils rich and moist, but not too wet.

100

1 Litre

kahikatea *(Dacrycarpus dacrydioides)*

Damp

Full Sun - Semi Shade

Enrichment forest

Lowland forest, formerly dominant on frequently flooded, and/or poorly drained alluvial soils

10

2 Litre

kānuka (Auckland) *(Kunzea robusta)*

Dry — Full Sun

Coloniser forest

soft to touch. Hardy tree prefers drier sunny sites.

250

1 Litre

karaka *(Corynocarpus laevigatus)*

Dry - Damp — Full Sun - Shade

Enrichment forest/coastal

Suitable for sheltered and exposed situations, common naturally regenerating under shade so should be planted in places where this is unlikey to occur.

5

2 Litre

karamū *(Coprosma robusta)*

Dry - Wet — Full Sun - Shade

Coloniser forest

350

1 Litre

kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp — Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

200

1 Litre

kohekohe *(Dysoxylum spectabile)*

Dry - Damp — Semi Shade - Shade

Enrichment forest

sometimes dominant or co-dominant tree of coastal to lowland forest

5

2 Litre

kōwhai (coastal) *(Sophora chathamica)*

Dry — Full Sun - Semi Shade

Enrichment coastal

5

2 Litre

māhoe *(Melicytus ramiflorus)*

Dry - Damp — Full Sun - Semi Shade

Coloniser forest

good at stabilising banks

250

1 Litre

Mangeao *(Litsea calicaris)*

If not able to be sorced replace with Vitex lucens or similar. Will require possum control

Damp

Semi Shade - Shade

Enrichment forest

plant sparingly, can be difficult to establish

5

2 Litre

mānuka *(Leptospermum scoparium var. scoparium)*

Dry - Damp

Full Sun

Coloniser forest

prickly to touch. Very hardy. Sunny position, dry to moist soils

250

1 Litre

māpou *(Myrsine australis)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest/coastal

150

1 Litre

pigeonwood / porokaiwhiri *(Hedycarya arborea)*

Dry - Damp

Semi Shade

Enrichment forest

100

1 Litre

pūriri *(Vitex lucens)*

Dry - Damp

Full Sun - Semi Shade

Enrichment forest

prefers rich fertile soils. frost tender when young.

10

2 Litre

tī kōuka / cabbage tree *(Cordyline australis)*

Dry - Wet

Full Sun

Coloniser riparian/coastal/forest/wetland

Most commonly encountered on alluvial terraces within riparian forest. Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought

200

1 Litre

tītoki *(Alectryon excelsus)*

Dry - Damp

Full Sun - Semi Shade

Enrichment forest

Needs some shade to establish, prefers fertile volcanic or alluvial sites

5

2 Litre

tōtara *(Podocarpus totara)*

Dry

Full Sun - Shade

Enrichment

lowland forest

5

2 Litre

Totals by Container

1950	1 Litre
50	2 Litre

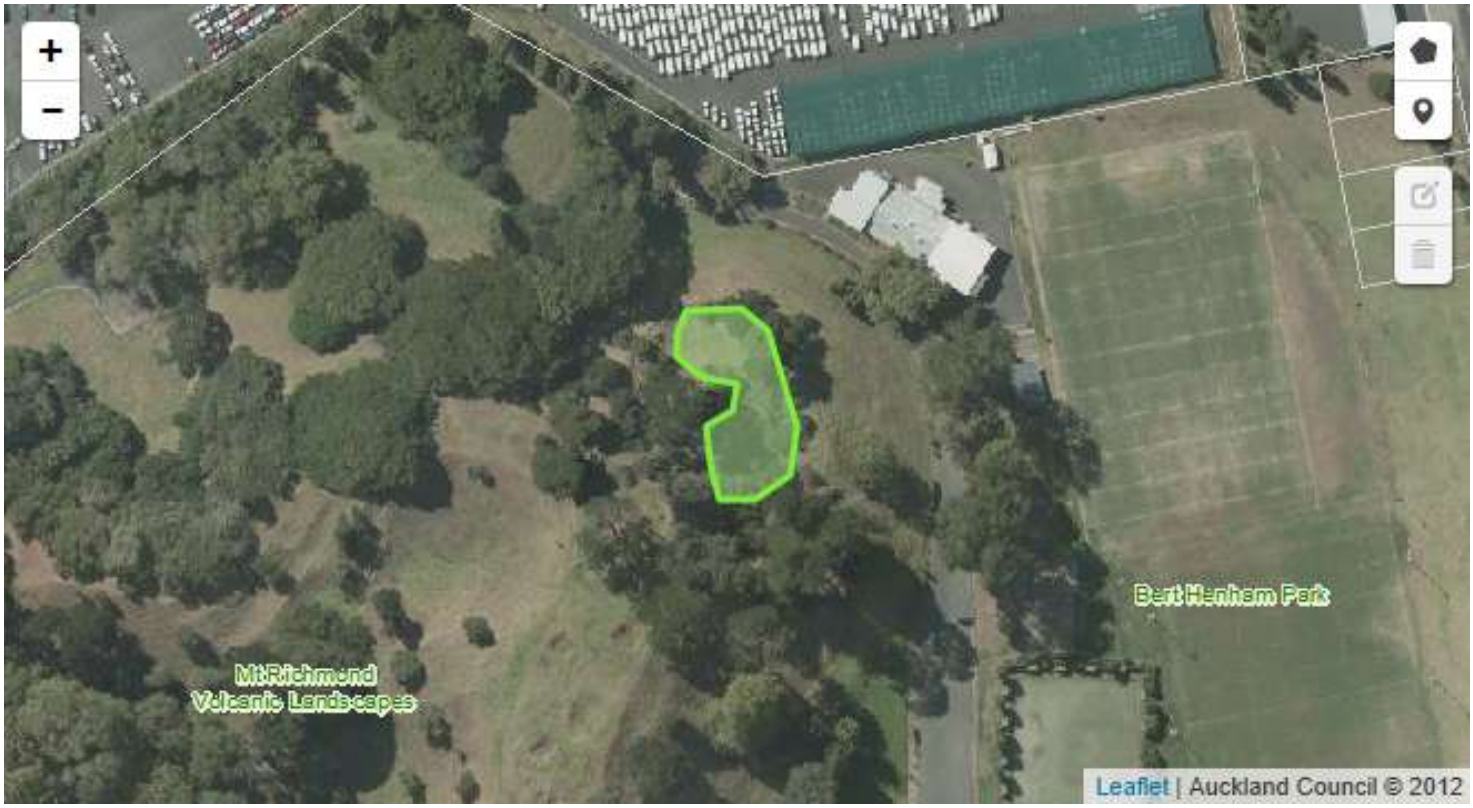
Total Plant **2000**

Planting

Reference:

4222 - Otahuhu - 2021: Small Quarries (1 of 1)

Te Ngahere



kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp

Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

100

1 Litre

mingimingi *(Coprosma rhamnoides)*

Dry - Damp

Full Sun - Shade

Coloniser forest/coastal

100

1 Litre

põhuehue *(Muehlenbeckia complexa)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest/coastal

300

1 Litre

rasp fern / pukupuku *(Doodia australis (syn. Blechnum parrisiae))*

Dry - Damp | Full Sun - Semi Shade

Enrichment | forest/coastal

200
1 Litre

rengarenga *(Arthropodium cirratum)*

Dry | Full Sun

Amenity | coastal/forest edge

300
1 Litre

speckled sedge *(Carex testacea)*

Dry | Full Sun

Coloniser | Open/coastal

300
1 Litre

Tataramoa *(Rubus cissoides)*

Full Sun

Enrichment | forest

200
1 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp | Full Sun

Coloniser | riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

250
1 Litre

whaririki (mountain flax) *(Phormium cookianum)*

Dry - Damp | Full Sun

Coloniser | coastal/forest edge

Very hardy, tolerant of salt exposure. Grows in a range of conditions. Suitable for planting up to the cliff edge

100
1 Litre

wharawhara *(Astelia banksii)*

Dry | Semi Shade - Shade

Enrichment | coastal/forest edge

150
1 Litre

Totals by Container **Total Plant** **2000**

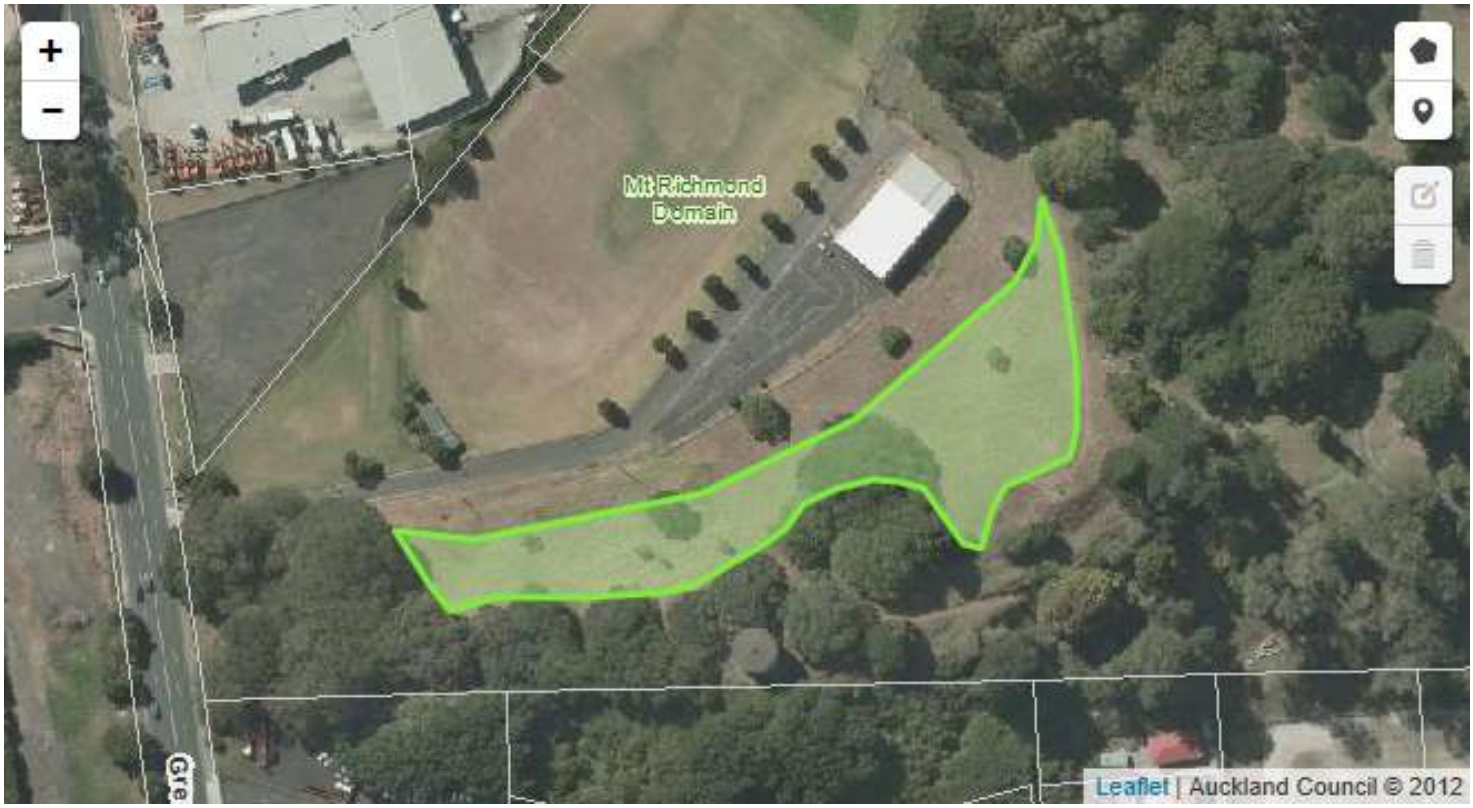
2000 1 Litre

Planting

Reference:

4222 - Otahuhu - 2022: Large Slope (1 of 2) Upper

Te Ngahere



flat leaved sedge *(Carex dissita)*

Damp - Wet

Full Sun - Shade

Enrichment riparian

Should be used sparingly and only in flood plains and depressions near streams

200

1 Litre

kiokio *(Parablechnum novae-zelandiae)*

Dry - Damp

Full Sun - Shade

Coloniser riparian/coastal/forest edge

200

1 Litre

mingimingi *(Coprosma rhamnoides)*

Dry - Damp

Full Sun - Shade

Coloniser forest/coastal

500

1 Litre

pōhuehue *(Muehlenbeckia complexa)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest/coastal

1100

1 Litre

rengarenga *(Arthropodium cirratum)*

Dry

Full Sun

Amenity coastal/forest edge

1100

1 Litre

speckled sedge *(Carex testacea)*

Dry

Full Sun

Coloniser Open/coastal

1300

1 Litre

Tataramoa *(Rubus cissoides)*

Full Sun

Enrichment forest

100

1 Litre

Toatoa, fireweed, shrubby Haloragis *(Haloragis erecta subsp. Erecta)*

Dry - Wet

Full Sun - Semi Shade

Coloniser forest edge

1000

1 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp

Full Sun

Coloniser riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

800

1 Litre

whaririki (mountain flax) *(Phormium cookianum)*

Dry - Damp

Full Sun

Coloniser coastal/forest edge

Very hardy, tolerant of salt exposure. Grows in a range of conditions. Suitable for planting up to the cliff edge

1000

1 Litre

wharawhara *(Astelia banksii)*

Dry

Semi Shade - Shade

Enrichment coastal/forest edge

200

1 Litre

Totals by Container **Total Plant** **7500**

7500 1 Litre

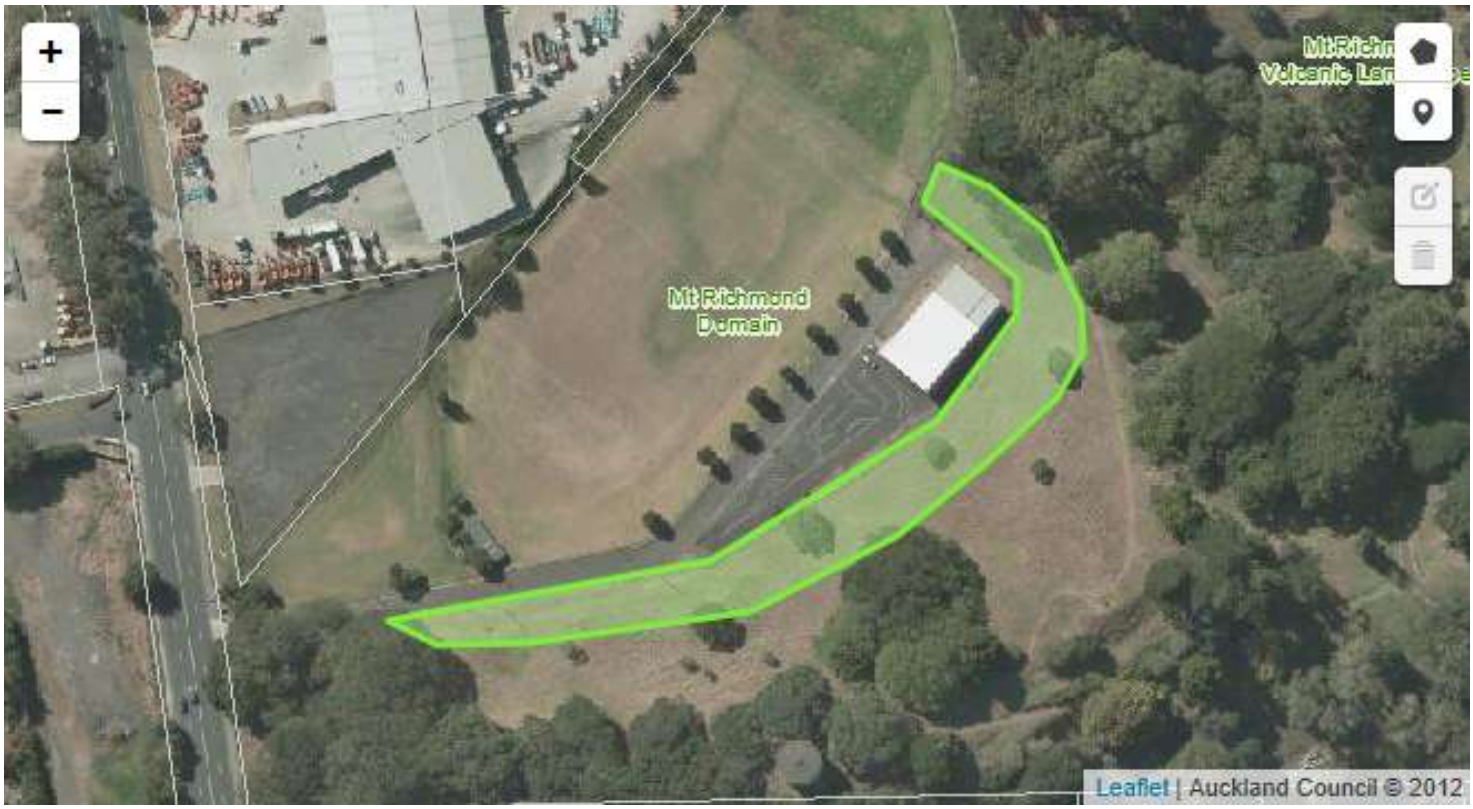
Planting

Reference:

4222 - Otahuhu - 2023: Slope (2 of 2) Lower

Te Ngahere

North west of tihi, gradient from strip of more typical forest to lower edge species into low growing plants up most of the slope so sightlines are not inhibited.



akeake *(Dodonaea viscosa)*

Dry - Damp

Full Sun

Coloniser coastal

100

1 Litre

flat leaved sedge *(Carex dissita)*

Damp - Wet

Full Sun - Shade

Enrichment riparian

Should be used sparingly and only in flood plains and depressions near streams

300

1 Litre

hangehange *(Geniostoma ligustrifolium var. ligustrifolium)*

Dry

Full Sun - Semi Shade

Coloniser riparian/forest edge

prefers forest edge where it can get lots of light, yet is sheltered from exposure to strong winds. Grows best in soils rich and moist, but not too wet.

50

1 Litre

harakeke *(Phormium tenax)*

Dry - Wet | Full Sun

Coloniser wetland/boundary edges

Plant in groups. Used in wetlands and for 'fencing' along boundaries. In stream backswamps or floodplains plant away from the normal stream flood zone as flax does not lie flat during flooding.

480

1 Litre

houpara *(Pseudopanax lessonii)*

Dry | Full Sun - Semi Shade

Coloniser coastal

100

1 Litre

kahikatea *(Dacrycarpus dacrydioides)*

Damp | Full Sun - Semi Shade

Enrichment forest

Lowland forest, formerly dominant on frequently flooded, and/or poorly drained alluvial soils

10

1 Litre

kānuka (Auckland) *(Kunzea robusta)*

Dry | Full Sun

Coloniser forest

soft to touch. Hardy tree prefers drier sunny sites.

200

1 Litre

karaka *(Corynocarpus laevigatus)*

Dry - Damp | Full Sun - Shade

Enrichment forest/coastal

Suitable for sheltered and exposed situations, common naturally regenerating under shade so should be planted in places where this is unlikey to occur.

15

1 Litre

karamū *(Coprosma robusta)*

Dry - Wet | Full Sun - Shade

Coloniser forest

300

1 Litre

kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp | Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

450

1 Litre

kiokio *(Parablechnum novae-zelandiae)*

Dry - Damp

Full Sun - Shade

Coloniser riparian/coastal/forest edge

150

1 Litre

kohekohe *(Dysoxylum spectabile)*

Dry - Damp

Semi Shade - Shade

Enrichment forest

sometimes dominant or co-dominant tree of coastal to lowland forest

15

1 Litre

koromiko *(Veronica stricta var. stricta)*

Dry

Full Sun

Coloniser riparian/coastal/forest edge

Common in successional habitats from coastal areas to lower montane habitats

800

1 Litre

kōwhai (coastal) *(Sophora chathamica)*

Dry

Full Sun - Semi Shade

Enrichment coastal

15

1 Litre

māhoe *(Melicytus ramiflorus)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest

good at stabilising banks

200

1 Litre

Mangeao *(Litsea calicaris)*

If not able to be sourced; replace with Vitex lucens (Puriri).

Damp

Semi Shade - Shade

Enrichment forest

plant sparingly, can be difficult to establish

10

1 Litre

mānuka *(Leptospermum scoparium var. scoparium)*

Dry - Damp

Full Sun

Coloniser forest

prickly to touch. Very hardy. Sunny position, dry to moist soils

270

1 Litre

māpou *(Myrsine australis)*

Dry - Damp | Full Sun - Semi Shade | Coloniser | forest/coastal

200

1 Litre

mingimingi *(Coprosma rhamnoides)*

Dry - Damp | Full Sun - Shade | Coloniser | forest/coastal

200

1 Litre

pigeonwood / porokaiwhiri *(Hedycarya arborea)*

Dry - Damp | Semi Shade | Enrichment | forest

50

1 Litre

pōhuehue *(Muehlenbeckia complexa)*

Dry - Damp | Full Sun - Semi Shade | Coloniser | forest/coastal

500

1 Litre

Poroporo, bullibulli *(Solanum laciniatum)*

Dry - Damp | Full Sun | Coloniser | coastal/forest edge

350

1 Litre

pūriri *(Vitex lucens)*

Dry - Damp | Full Sun - Semi Shade | Enrichment | forest

prefers rich fertile soils. frost tender when young.

10

1 Litre

rengarenga *(Arthropodium cirratum)*

Dry | Full Sun | Amenity | coastal/forest edge

300

1 Litre

Tataramoa *(Rubus cissoides)*

Full Sun

Enrichment forest

350

1 Litre

tī kōuka / cabbage tree *(Cordyline australis)*

Dry - Wet

Full Sun

Coloniser riparian/coastal/forest/wetland

Most commonly encountered on alluvial terraces within riparian forest. Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought

300

1 Litre

tītoki *(Alectryon excelsus)*

Dry - Damp

Full Sun - Semi Shade

Enrichment forest

Needs some shade to establish, prefers fertile volcanic or alluvial sites

10

1 Litre

Toatoa, fireweed, shrubby Haloragis *(Haloragis erecta subsp. Erecta)*

Dry - Wet

Full Sun - Semi Shade

Coloniser forest edge

200

1 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp

Full Sun

Coloniser riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

800

1 Litre

tōtara *(Podocarpus totara)*

Dry

Full Sun - Shade

Enrichment lowland forest

15

1 Litre

whararikī (mountain flax) *(Phormium cookianum)*

Dry - Damp

Full Sun

Coloniser coastal/forest edge

Very hardy, tolerant of salt exposure. Grows in a range of conditions. Suitable for planting up to the cliff edge

300

1 Litre

wharawhara *(Astelia banksii)*

Dry

Semi Shade - Shade

Enrichment coastal/forest edge

100

1 Litre

whau *(Entelea arborescens)*

Dry

Full Sun

Coloniser coastal/forest edge

Coastal to lowland forest or shrubland. Usually in open sites such as around recent slips, tree falls, cliff faces, boulder slopes, sand dunes or on the margins of streams, rivers, lagoons and lakes.

350

1 Litre

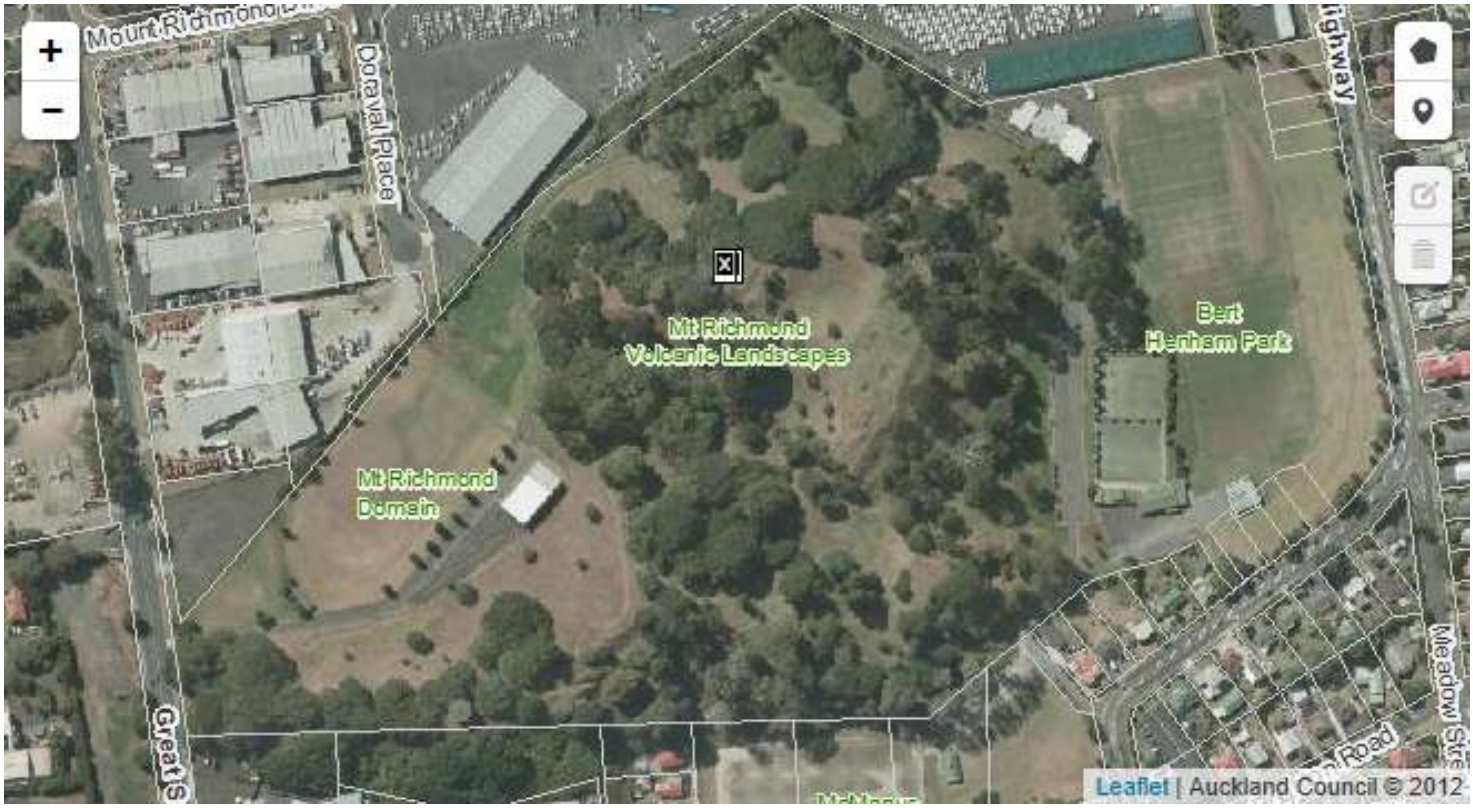
Totals by Container **Total Plant** **7500**

7500 1 Litre

Planting
4222 - Otahuhu - 2024: Infill - All areas

Reference:

Te Ngahere



akeake *(Dodonaea viscosa)*

Dry - Damp | Full Sun

Coloniser | coastal

20
1 Litre

flat leaved sedge *(Carex dissita)*

Damp - Wet | Full Sun - Shade

Enrichment | riparian

Should be used sparingly and only in flood plains and depressions near streams

120
1 Litre

forest sedge *(Carex lambertiana)*

Dry - Damp | Semi Shade - Shade

Enrichment | riparian/wetland

Does not like wet feet

70
1 Litre

hangehange *(Geniostoma ligustrifolium var. ligustrifolium)*

Dry | Full Sun - Semi Shade

Coloniser | riparian/forest edge

prefers forest edge where it can get lots of light, yet is sheltered from exposure to strong winds. Grows best in soils rich and moist, but not too wet.

70
1 Litre

harakeke *(Phormium tenax)*

Dry - Wet | Full Sun

Coloniser wetland/boundary edges

Plant in groups. Used in wetlands and for 'fencing' along boundaries. In stream backswamps or floodplains plant away from the normal stream flood zone as flax does not lie flat during flooding.

150

1 Litre

houhere *(Hoheria populnea)*

Dry - Damp | Full Sun - Semi Shade

Enrichment forest

Coastal to montane usually in Kauri (Agathis australis) forest but also in successional forest associated with kauri. Also common in pohutukawa (Metrosideros excelsa) dominated coastal forest.

20

1 Litre

houpara *(Pseudopanax lessonii)*

Dry | Full Sun - Semi Shade

Coloniser coastal

10

1 Litre

kahikatea *(Dacrycarpus dacrydioides)*

Damp | Full Sun - Semi Shade

Enrichment forest

Lowland forest, formerly dominant on frequently flooded, and/or poorly drained alluvial soils

20

1 Litre

kānuka (Auckland) *(Kunzea robusta)*

Dry | Full Sun

Coloniser forest

soft to touch. Hardy tree prefers drier sunny sites.

110

1 Litre

karaka *(Corynocarpus laevigatus)*

Dry - Damp | Full Sun - Shade

Enrichment forest/coastal

Suitable for sheltered and exposed situations, common naturally regenerating under shade so should be planted in places where this is unlikey to occur.

10

1 Litre

karamū *(Coprosma robusta)* OR C. macrocarpa subsp. minor - need to look at what is dominante in this area

Dry - Wet | Full Sun - Shade

Coloniser forest

340

1 Litre

kawakawa *(Piper excelsum subsp. excelsum)*

Dry - Damp

Full Sun - Shade

Coloniser forest

Usually an important understorey species in coastal forest

160

1 Litre

kiokio *(Parablechnum novae-zelandiae)*

Dry - Damp

Full Sun - Shade

Coloniser riparian/coastal/forest edge

60

1 Litre

kohekohe *(Dysoxylum spectabile)*

Dry - Damp

Semi Shade - Shade

Enrichment forest

sometimes dominant or co-dominant tree of coastal to lowland forest

10

1 Litre

koromiko *(Veronica stricta var. stricta)*

Dry

Full Sun

Coloniser riparian/coastal/forest edge

Common in successional habitats from coastal areas to lower montane habitats

140

1 Litre

kōwhai (coastal) *(Sophora chathamica)*

Dry

Full Sun - Semi Shade

Enrichment coastal

10

1 Litre

māhoe *(Melicytus ramiflorus)*

Dry - Damp

Full Sun - Semi Shade

Coloniser forest

good at stabilising banks

210

1 Litre

Mangeao *(Litsea calicaris)*

Damp

Semi Shade - Shade

Enrichment forest

plant sparingly, can be difficult to establish

10

1 Litre

mānuka *(Leptospermum scoparium var. scoparium)*

Dry - Damp | Full Sun

Coloniser | forest

prickly to touch. Very hardy. Sunny position, dry to moist soils

140

1 Litre

māpou *(Myrsine australis)*

Dry - Damp | Full Sun - Semi Shade

Coloniser | forest/coastal

130

1 Litre

pigeonwood / porokaiwhiri *(Hedycarya arborea)*

Dry - Damp | Semi Shade

Enrichment | forest

60

1 Litre

pōhuehue *(Muehlenbeckia complexa)*

Dry - Damp | Full Sun - Semi Shade

Coloniser | forest/coastal

220

1 Litre

Poroporo, bullibulli *(Solanum laciniatum)*

Dry - Damp | Full Sun

Coloniser | coastal/forest edge

60

1 Litre

pūriri *(Vitex lucens)*

Dry - Damp | Full Sun - Semi Shade

Enrichment | forest

prefers rich fertile soils. frost tender when young.

10

1 Litre

putaputawētā / marbleleaf *(Carpodetus serratus)*

Damp - Wet | Full Sun - Shade

Enrichment | riparian/forest

Moist broadleaf forest. Streamsides and forest margins. Needs shelter and prefers damp soil.

10

1 Litre

rasp fern / pukupuku *(Doodia australis (syn. Blechnum parrisiae))*

Dry - Damp | Full Sun - Semi Shade

Enrichment | forest/coastal

30

1 Litre

rengarenga *(Arthropodium cirratum)*

Dry | Full Sun

Amenity | coastal/forest edge

200

1 Litre

speckled sedge *(Carex testacea)*

Dry | Full Sun

Coloniser | Open/coastal

180

1 Litre

Tataramoa *(Rubus cissoides)*

Full Sun

Enrichment | forest

60

1 Litre

tī kōuka / cabbage tree *(Cordyline australis)*

Dry - Wet | Full Sun

Coloniser | riparian/coastal/forest/wetland

Most commonly encountered on alluvial terraces within riparian forest. Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought

150

1 Litre

tītoki *(Alectryon excelsus)*

Dry - Damp | Full Sun - Semi Shade

Enrichment | forest

Needs some shade to establish, prefers fertile volcanic or alluvial sites

10

1 Litre

Toatoa, fireweed, shrubby Haloragis *(Haloragis erecta subsp. Erecta)*

Dry - Wet | Full Sun - Semi Shade

Coloniser | forest edge

140

1 Litre

toetoe *(Austroderia fulvida)*

Dry - Damp

Full Sun

Coloniser riparian/forest edge

Plant in groups. Coastal to inland. Wet places, stream, lake and forest margins, and disturbed hillsides.

280

1 Litre

tōtara *(Podocarpus totara)*

Dry

Full Sun - Shade

Enrichment lowland forest

10

1 Litre

whararikі (mountain flax)
(Phormium cookianum)

Dry - Damp

Full Sun

Coloniser coastal/forest edge

Very hardy, tolerant of salt exposure. Grows in a range of conditions. Suitable for planting up to the cliff edge

170

1 Litre

wharawhara *(Astelia banksii)*

Dry

Semi Shade - Shade

Enrichment coastal/forest edge

160

1 Litre

whau *(Entelea arborescens)*

Dry

Full Sun

Coloniser coastal/forest edge

Coastal to lowland forest or shrubland. Usually in open sites such as around recent slips, tree falls, cliff faces, boulder slopes, sand dunes or on the margins of streams, rivers, lagoons and lakes.

40

1 Litre

Totals by Container

3600 1 Litre

Total Plant **3600**