

# MANAGEMENT & MAINTENANCE PROGRAMME & PLANT SPECIES SCHEDULES

## For Goodland Coastal Farm – 2127 Kaipara Coast Highway, Kakanui 8 July 2023

This document is to be read in conjunction with the Goodland Coastal Farm Plan and Planting Plan dated 8 July 2022



## INTRODUCTION

2127 Kaipara Coast Highway, Kakanui is located on a peninsula of land that extends into the eastern side of the Kaipara Harbour with the lower reaches of the Makarau River extending along its eastern boundary. The property falls within the Rodney Ecological District and is listed in the Auckland Council Geomaps Biodiversity Register (Singers, et al., 2017) as having an ecosystem potential extent as a Kauri, podocarp, broadleaved forest (WF11) which is in keeping with the vegetation at the southern end of the peninsular on which it is located to the immediate south and that along its eastern boundary.

The soils are prone to pugging with evidence of a number of damp spots within the flatter areas where rushes are growing within the pasture (refer Ecological assessment by Wildland Consultants Limited).

The topography ranges from small areas that are gently undulating to very steep. Many of the very steep areas are already covered in native vegetation with the rest in pasture with a few scattered specimen trees. The paddocks are currently being grazed by beef that are roaming freely throughout the paddocks and into the existing mature vegetation areas.

The most elevated parts of the site are very exposed to the prevailing winds. The large area of existing mature vegetation on the south facing slopes is to be fenced off and planted, along with the existing mature trees within the north facing riparian areas and wetlands to be fenced off with supplementary planting around the outside.

The mature trees within the north facing gully systems are predominantly Puriri, Totara, Kahikatea, with patches of Kanuka along with Nikau, Kohekohe and some stray Kauri. Clusters of exotic trees are also present in this area. Immediately adjacent to the site is a large area of existing mature native vegetation on the southern end of the peninsular.

The planting is proposed a wide range of reasons including the protection of the more vulnerable parts of the land, such as in and around the riparian areas and the steeper slopes, the

joining/linkage of large areas of existing native vegetation (including areas covered by Significant Ecological Area Overlays) and infill planting within these existing areas of native vegetation. Planting is also to be used to screen and surround proposed buildings and nestle them into the existing vegetation framework. It is also to be used as a base for septic irrigation fields and as a filter for water leaving the surrounding farmland before entering the Kaipara Harbour environs.

The proposed areas to be planted are illustrated on the Planting Plan (Attachment J) of the Goodland Coastal Farm Landscape and Visual Effects Assessment document.

The following information is to be used in site preparation, controlling weeds and pests, planting and managing the vegetation.

It is recommended that the weed species present within the area to be planted be removed and planted with the species listed (as per the planting schedule below), with a regular maintenance and management programme implemented as outlined below.

The philosophy behind the proposed planting is to fence off the areas to be planted and then let the vegetation regenerate as much as possible, using the existing adjacent established mature bush areas to act as a seed source to create a diversity of planting from natural dispersal that reflects the surrounding species. The proximity of this adjacent established bush a key to this natural dispersal. It is anticipated that once the stock is removed from the areas to be planted the native species will naturally regenerate, particularly in the areas already protected by existing tree canopy. For this reason, the proposed planting is only for the open areas in and around the existing vegetation. The key to this will be in the quality of the site preparation and maintenance of the vegetation areas, to ensure that weed species are kept out and the native species allowed to thrive.

# WEED AND PEST CONTROL PROGRAMME

Weed control is to be undertaken at least 6 – 12 weeks prior to planting using the methods as outlined below. Any regrowth is to be sprayed and repeat sprayed until eradication is achieved.

Any areas of Kikuyu are to be completely sprayed out using a Glyphosate herbicide at the manufacturers recommended rates and repeat sprayed until the entire plant, including roots have been killed.

Do not allow spray to affect the existing native vegetation or to enter into the waterways. I.e. spray on a clear day in no more than 5 knot winds in order to minimise spray drift.

Control of pests such as rabbits, possums, stoats, cats and rats is required to encourage native birdlife. This is to be undertaken as per the measures listed below.

## WEED CONTROL

There are a range of methods available to control pest plants. The following recommendations – which are only a sample of those available – are based on safe-use methods that have proven effective.

- Physical removal of the plant and all fragments to a land fill is the most organic method.

Species	Comments and Control Methods
<b>Acacia longifolia (Sydney Golden Wattle)</b>	<p>Hand pull small plants up to 600mm high.</p> <p>For medium sized plants cut near ground level and treat fresh stumps with a double strength glyphosate gel, ensuring the rim of the stump is painted.</p> <p>For larger trees drill 18mm holes (angled downwards into the centre of the tree) every 100mm around the base of the trunk and saturate each hole with glyphosate at 500ml per litre if safe to do so.</p> <p>Alternatively, ring bark the tree and paint with double strength glyphosate gel.</p>
<b>Alocasia brisbanensis (Elephant Ear)</b>	<p>Hand pull small plants up to 600mm high.</p> <p>For larger plants slash near ground level and treat fresh stumps with metsulfuron – methyl 600g/kg (1g) + glyphosate (100ml) + penetrant per 1L. Leave slashed leaves to rot down.</p> <p>Dig out tubers, bury deeply, or dispose of at a refuse transfer station.</p> <p>Spray with metsulfuron – methyl 600g/kg (3g) + glyphosate (150ml) + penetrant per 10L.</p> <p>Will need to follow up annually to ensure long term control.</p>

- Slashing, mowing or otherwise removing plant material and then treating the stumps or regrowth reduces the amount of chemicals needed.
- When applying herbicides to a cut stump application of the chemical immediately will ensure that the product is absorbed prior to the plant naturally sealing the cut. This should be undertaken within at least 10 minutes of cutting.
- Spray is recommended for large areas. For gun and hose or aerial rates contact the regional council's biosecurity team.
- Penetrant aides the uptake of herbicides – there is a range available, e.g. Pulse, Boost, Freeway, Dewdrop, Kiwi Buddy Update crop oil.

All chemical weed control is to be undertaken by a licenced Grow Safe Operator. Care should be taken not to spray emergent native species. When working near waterways (including wetlands) ensure than an appropriate formulation is used for this sensitive area.

If the above methods have not been successful, for a more selective control method for a particular plant refer to the information below or to the Weedbusters Website [www.weedbusters.org.nz](http://www.weedbusters.org.nz). Or refer to the 'Forest and Bird Weed Guide 2021', which is where this information has been sourced from.

Note that species highlighted below are those that are known to either be present on the property, have been present, or are likely to be present.

Species	Comments and Control Methods
<b>Ipomoea indica</b> <b>(Bindweed / Blue Morning Glory)</b>	<p>Hand pull and dig out including roots, if small enough. Keep stems / roots off the ground so that they do not regrow.</p> <p>Place in sealed black weed bags for 12 months or more to decompose.</p> <p>Leave cut vines in trees to die, don't pull them down (or they will regrow).</p> <p>Cut and paint the base of the plant/stump with a layer of metsulfuron gel, ensuring that the rim of the stump is pasted.</p> <p>Foliage spray with metsulfuron 0.5g per litre, with penetrant 1ml per litre.</p>
<b>Ligustrum lucidum and L. Sinense</b> <b>(Tree Privet &amp; Chinese privet)</b>	<p>Spray with a Metsulfuron-methyl such as Escort.</p> <p>Hand pull small plants up to 600mm high. Otherwise ring bark tree about 15mm above ground and liberally dose cut area with 5gms Escort + 10mls Pulse within 15 minutes of cut. Or, cut at base of stem and apply concentrated dose of Glyphosphate to the stump immediately after cutting.</p>
<b>Paraserianthes lophantha</b> <b>(Brush Wattle)</b>	<p>Cut to a stump and paint with Metsulfuron-methyl such as Escort.</p> <p>Hand pull small plants up to 600mm high. Otherwise ring bark tree about 15mm above ground and liberally dose cut area with neat chemical within 15 minutes of cut. Or, cut the tree at the base of the stem and liberally dose cut area with neat chemical within 15 minutes of cut.</p>
<b>Paspalum distichum</b> <b>(Mercer Grass)</b>	<p>Spray with a glyphosate 300ml per 15L.</p>
<b>Passiflora tripartita</b> <b>(Banana Passionfruit)</b>	<p>Hand pull and dig out including roots, if small enough. Keep stems / roots off the ground so that they do not regrow.</p> <p>Place in sealed black weed bags for 12 months or more to decompose.</p> <p>Leave cut vines in trees to die, don't pull them down (or they will regrow).</p> <p>Cut and paint the base of the plant/stump with a layer of metsulfuron gel, ensuring that the rim of the stump is pasted.</p> <p>Foliage spray with metsulfuron 0.5g per litre, with penetrant 1ml per litre.</p>
<b>Pennisetum clandestinum</b> <b>(Kikuyu)</b>	<p>Spray with a Glyphosate (eg Roundup) as per manufacturers recommendations. Anytime in spring to summer will give best results.</p> <p>Spray as often as necessary. It is likely that complete eradication will require at least three applications of spray.</p>
<b>Rubus fruticosus</b> <b>(Blackberry)</b>	<p>Cut to a stump and paint with Metsulfuron-methyl such as Escort.</p> <p>Spray after flowering – Dec -April &amp; repeat until eradicated.</p> <p>Foliar spray when in full leaf to maximise uptake of herbicide. Spray with 60ml Triclopyr (eg Grazon) /10L water plus organosilicone or 60ml Picloram/Brushkiller/10L water plus organosilicone as a backpack rate.</p>

Species	Comments and Control Methods
<b>Salix fragilis</b> <b>(Crack Willow / Grey Willow)</b>	<p>Hand pull small plants up to 600mm high, including roots.</p> <p>For medium sized plants cut near ground level and treat fresh stumps with a double strength glyphosate gel, ensuring the rim of the stump is painted.</p> <p>Foliage spray with glyphosate 20ml per litre, with penetrant 1ml per litre.</p> <p>For larger trees drill 18mm holes (angled downwards into the centre of the tree) every 100mm around the base of the trunk and saturate each hole with glyphosate at 500ml per litre if safe to do so.</p> <p>Fell the tree. Note that trees are best poisoned a few weeks before felling to prevent regrowth from small branches. Paint both the stump and the cut stem, if the cut stem cannot be kept off the ground.</p>
<b>Syzigium smithii</b> <b>(Acmena/Monkey Apple)</b>	<p>Hand pull small plants up to 600mm high, including roots.</p> <p>For medium sized plants cut near ground level and treat fresh stumps with a layer of metsulfuron gel, ensuring the rim of the stump is painted. .</p> <p>For larger trees ring bark and paint the edges of the ring bark with metsulfuron gel. Or drill 18mm holes (angled downwards into the centre of the tree) every 100mm to 150mm around the base of the trunk and saturate each hole with metsulfuron 10g per litre, if safe to do so.</p>
<b>Solanum mauritianum</b> <b>(Woolly Nightshade /tobacco plant)</b>	<p>Spray with a Glyphosate anytime throughout the year, but spring to summer will give best results.</p> <p>Hand pull small plants up to 600mm high otherwise cut and paint the stump immediately after the cut has been made with Glyphosate 300ml/1L water plus organosilicone. See ARC recommendations for chemical treatment other than Glyphosphate.</p>
<b>Tradescantia fluminensis</b> <b>(Wandering Jew)</b>	<p>This is a high priority plant.</p> <p>Spray with either a Triclopyreg such as Grazon or a Glyphosate in areas adjacent to waterways anytime throughout the year.</p> <p>If in small area remove by hand especially in dry or drought conditions by rake or hand. Dispose of vegetation by burying deeply. Otherwise spray until completely eradicated. Care should be taken not to spread any vegetation to other sites.</p>
<b>Ulex Spp</b> <b>(Gorse)</b>	<p>Cut to a stump and paste immediately with a Metsulfuron-methyl such as Escort anytime throughout the year.</p> <p>Or spray with a Metsulfuron-methyl after flowering – Nov – Feb &amp; repeat until eradicated.</p> <p>Foliar spray when in full leaf to maximise uptake of herbicide. Grazon gives selective control without damaging grass species. Use 1 part Tordon brushkiller to 20 parts water on isolated stumps to prevent regrowth</p>



## RECOMMENDED CONTROL METHODS FOR COMMON PEST SPECIES Refer to attached Predator Control Plan.

Species	Eradication method	Comments
Possums	Pindone Bait in Bait Stations / Kill Traps / Shoot	<p>The recommended control is either the use of Traps (such as Timms Traps or Trapinator) or bait stations.</p> <p><b>Kill traps</b> are to be installed at 100 metre intervals (as per the indicative Predator Control Plan attached).</p> <ul style="list-style-type: none"> <li>The traps should be installed and baited as per the manufacturers / distributors instructions, including ensuring stock, birds and /or pets are unable to access or reach the stations.</li> <li>The traps are to be baited with a ¼ apple, orange, carrot, or other proven food.</li> <li>Traps are to be monitored and maintained regularly.</li> </ul> <p>The kill traps should be baited, set and monitored once every two days for a period of 5 – 7 days every two months during the first year.</p> <p>The most effective Possum traps include the Timms Trap, Flipping Timmy (<a href="http://www.envirottools.co.nz">www.envirottools.co.nz</a>) or Trapinator. These are set approximately 1m above ground level.</p> <p>If using the manually resetting traps, in order to maintain populations at this level a minimum of four trapping sessions must be undertaken annually (i.e. at approximately 3-month intervals) and on an ongoing basis. Checking twice weekly to fortnightly for a period of six weeks. Note that June and October are historically successful trapping months.</p> <p>If using <b>bait</b>, Pindone is the recommended product as it does not pose the same residual and secondary poisoning risks as second generation anticoagulants do.</p> <p>All bait is to be located in bait stations in trees and around margins of bush. Stations to be set in trees showing possum sign or possum 'runs'. The stations are to be placed at 2 metres or higher, out of dogs reach with the station placed 30cm above a branch or other platform such as a branch so that the possums can stand comfortably and feed at the station. Each bait station should be approximately 100m apart.</p> <p>Bait stations to be kept full and checked fortnightly, with any mouldy bait replaced with fresh.</p> <p>Eradication is to be ongoing.</p>
Rats and mice	Pindone Bait / Ditrac in Bait Stations	<p>The recommended control for rats is bait stations and / or kill traps set at 50 metre intervals. Bait stations is the recommended method of control, however kill traps are also effective.</p> <p><b>Kill Traps</b> such as the Victor Professional Rat Trap in a tunnel have been proven to be very effective. Rat traps are to be set under a cover so as to prevent non target kills. Covers can be made from wood, or modified tracking tunnels (e.g. <a href="http://www.gotchatraps.co.nz">www.gotchatraps.co.nz</a>). Note that mounting traps on timber, within a tunnel, or attached to a tree with a length of number 8 wire will ensure that traps are not lost. A possible layout for these is shown on the Indicative Predator Control Plan for the property.</p> <ul style="list-style-type: none"> <li>The traps should be installed and baited as per the manufacturers / distributors instructions.</li> <li>Begin baiting in August and check weekly, or every 10 days for the first month and replenish bait if taken. Stations are to be kept full. After the first month check monthly and replenish as required until April.</li> <li>Eradication is to be maintained for a minimum period of two years and/or until there are no further signs of the predators.</li> </ul> <p>Other rodent control is to include Bait stations to be spread throughout the property as indicated on the Indicative Predator Control Plan.</p> <p><b>Bait stations</b> using Pindone (directions as per possum control) / Ditrac as it does not pose the same residual and secondary poisoning risks as second generation anticoagulants (such as Bromadiolone) do.</p> <p>Ditrac (Supplier Bell Laboratories Limited) is an all weather rodent block which contains Diphacinone. The Traps are 'Protecta Sidekick'. 8 Ditrac blocks are to be wrapped in plastic (sandwich bags can be used here) and threaded onto the metal spikes within the traps.</p> <p>Pulsing the bait in the stations is a good idea with recommended pulsing in August, November, January/February and April for six weekly bursts. This involves filling the bait at the start of the month then refilling every two weeks and removing the bait at the end of the pulse.</p> <p>Gloves should be worn when handling the product and avoid entry into watercourses.</p>

<b>RECOMMENDED CONTROL METHODS FOR COMMON PEST SPECIES</b> Refer to Predator Control Plan.		
Species	Eradication method	Comments
Mustelids such as Stoats, Ferrets, Weasels, Rats and Hedgehogs	DOC 200 predator traps for stoats, rats and hedgehogs, or if Ferrets are known to be present use DOC 250 predator traps	<p>DOC 200 Predator traps are to be spread throughout the site at 1 trap per 6 ha (23 traps) and have the appropriate warning signs placed on them.</p> <ul style="list-style-type: none"> <li>• They are to be checked and reset with an egg as bait (or occasionally some meat or other proven bait). The egg to be replaced, as required.</li> <li>• The traps are to be revisited at least once per month from May to September, and fortnightly from October to April, to check for kills, to reset and / or rebait.</li> <li>• Further information on stoat, weasel and ferret control can be found at <a href="http://www.predatorfreenz.org">www.predatorfreenz.org</a>. or the Auckland Council "Pest animal control guidelines for the Auckland region 2020".</li> <li>• It is also recommended to join the local pest control group on facebook 'Pest Free Kaukapakapa'.</li> </ul> <p>Tracking tunnels can be located at key positions in order to check to see which predators are present and whether the DOC 250 predator trap is required.</p> <p>Eradication is to be maintained for a minimum period of two years and/or until there are no further signs of the predators.</p>
Feral Cats	Timms Traps / Cage Traps	<p>Given the site size, only one trap is needed on Goodland Coastal Farm.</p> <p>If a Timms trap is to be used to catch a cat it is to be set in a location on the southern side of the property in order to ensure that a companion cat is not accidentally caught. Meat can be used as bait, and set as per catching possums.</p> <p>Cage Traps (eg the Havahart Model 1089 cage trap) – Cage traps are generally made of wire mesh and have a trigger device that closes the entrance of the trap once activated by the cats entry. These are baited using meat or cat biscuits in peanut butter.</p> <ul style="list-style-type: none"> <li>• Once set, these traps must be inspected within 12 hours after sunrise on each day that the trap remains set, beginning on the day immediately after it has been set.</li> <li>• Once a live animal is caught within this trap it must be removed and attended to properly, or euthanised humanely.</li> </ul>
Rabbits	Poison	<p>Lay Pindone tablets where signs of rabbit are present. These are to be placed inside tunnels at about 150 metre intervals.</p> <p>Pulsing is the best method of rabbit control with the bait stations filled for about 10 days at a time (ensuring that the bait is present on at least 5 consecutive days), with old bait replenished. Winter is the most effective time for rabbit control.</p> <p>This is to continue until there are no further signs of rabbits.</p>

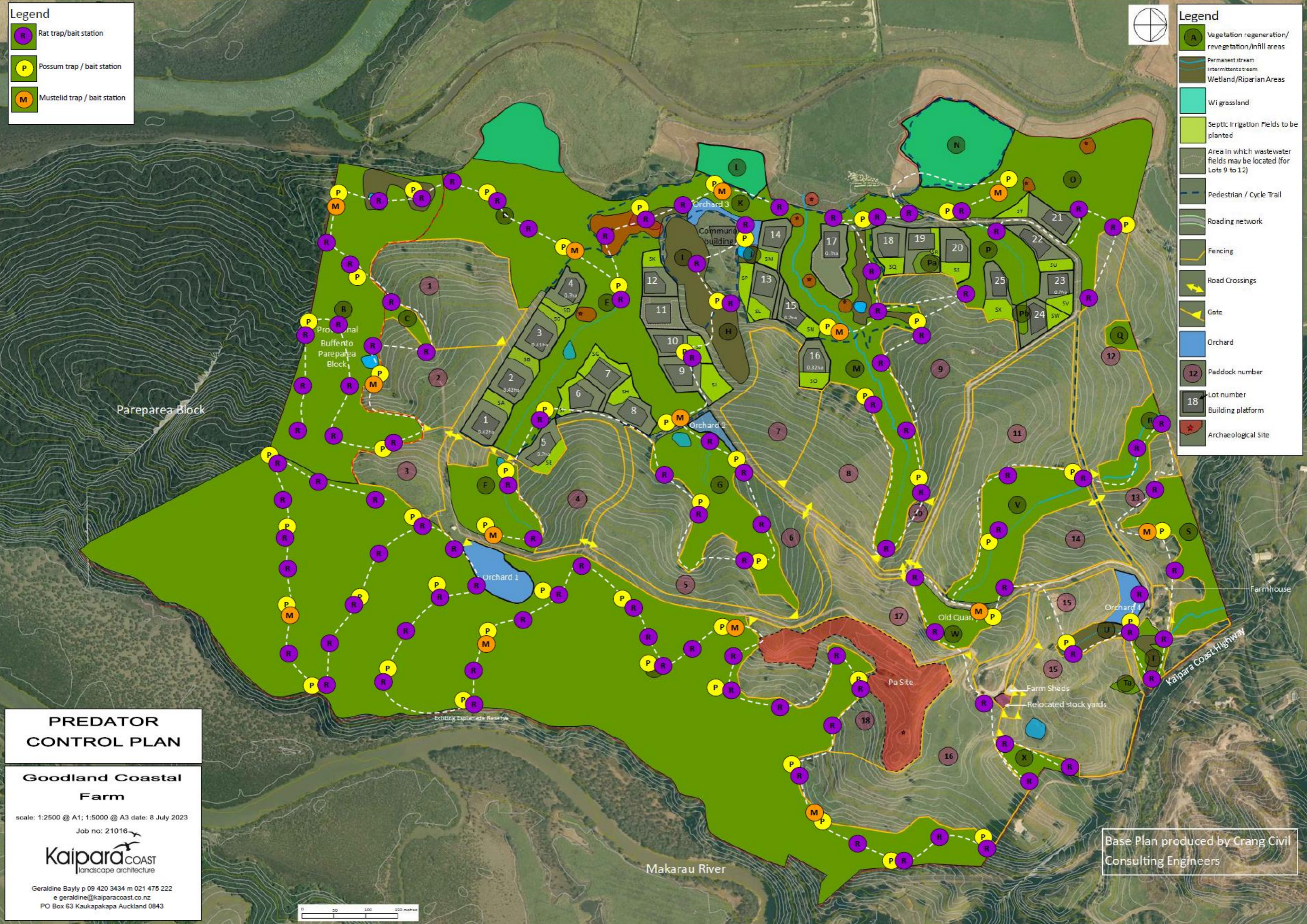
Refer to Predator Control Plan.

**Legend**

- Rat trap/bait station
- Possum trap / bait station
- Mustelid trap / bait station

**Legend**

- Vegetation regeneration/revegetation/infill areas
- Permanent stream
- Intermittent stream
- Wetland/Riparian Areas
- Wi grassland
- Septic Irrigation Fields to be planted
- Area in which wastewater fields may be located (for Lots 9 to 12)
- Pedestrian / Cycle Trail
- Roading network
- Fencing
- Road Crossings
- Gate
- Orchard
- Paddock number
- Lot number
- Building platform
- Archaeological Site



**PREDATOR CONTROL PLAN**

**Goodland Coastal Farm**

scale: 1:2500 @ A1; 1:5000 @ A3 date: 8 July 2023

Job no: 21016

**Kaipara COAST**  
landscape architecture

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PO Box 63 Kaukapakapa Auckland 0843

Base Plan produced by Crang Civil Consulting Engineers

# PLANTING PROGRAMME

Planting on the subject site is to be undertaken to stabilise the steep slopes, revegetate the riparian margins, provide screening and vegetative height around key building platforms as well as enabling connections between existing vegetation corridors. Planting proposed is detailed on the attached Planting Plan.

Given the rich seed source in the immediate surrounding environs, the planting proposed predominantly comprises core nurse crop species such as Manuka, Kanuka and Coprosma. Given the proximity to a rich and diverse seed source in the immediately adjacent established, mature bush it is anticipated that natural seed dispersal will occur through bird life and wind which will result in a more complex mix of plants naturally growing in the area over time.

Natives of at least 0.5L pot size are to be used (as per attached schedule below), with slightly larger pot sizes for some of the canopy species. Locally eco-sourced indigenous plant species are to be used from the Rodney Ecological District. There are some amenity planting areas where other New

## LAYOUT

Vegetation areas have been separated into:

- Regeneration Areas – these are areas with mature vegetation that are to have stock removed and left to regenerate naturally.
- Proposed Restoration/Revegetation Areas – These areas to be planted are generally located adjacent to existing vegetation and are intended to supplement the existing regeneration areas. Some of these areas have been strategically located in order to provide a visual screen to the proposed future development and will visually blend in with the large stands of existing and proposed surrounding native vegetation.
- Wetlands / Riparian Area Margins – These are damp areas / depressions that are to be fenced off and revegetated using species that can tolerate large periods of damp soils.

## PLANTING

All plants shall be in good health, true to botanical name and grade and should be planted in the areas shown on the Subdivision Plan. All plants identified within the areas titled 'Proposed Restoration / Regeneration Areas, Riparian Area Margins, Riparian Areas / Wetlands and Proposed Septic Irrigation Areas' are to be sourced from the **Rodney Ecological District**. Where appropriate, other plants identified within the species schedules are to be sourced from the Rodney Ecological District.

Water well prior to planting and water in, if required.

Avoid leaving plants out of their bags / pots in the sun and wind prior to planting for any more than 5 minutes.

All holes shall be twice the size of the bag.

Zealand native species have been proposed. Controlled release fertiliser is to be added on planting, as well as bamboo stakes with a painted top to mark the position of the young plants.

Planting should be undertaken between the months of April and August when the soil conditions are likely to be moist and suitable. Any planting outside this period must be watered through the drier summer months otherwise root growth will not be sufficient to cope with drought.

All trees larger than a 2 litre pot are to be mulched with 100mm mulch around at least a 500mm radius, preferably a 1 metre radius. This is to be topped up for the first five years after planting, as it biodegrades over time.

Prior to any Myrtaceae species being delivered to the site, a signed Myrtle Rust Nursery Management Declaration (available at <http://nzppi.co.nz>) that certifies that the plant producer has implemented the New Zealand Plant Producers Incorporated Myrtle Rust Nursery Management Protocol must be obtained by the consent holder.

- Proposed septic irrigation areas – These areas are located within each of the proposed lots, and in the communal area. They have been strategically placed so as to blend in with the surrounding native vegetation at the same time as providing visual mitigation, assisting in framing and softening future built form when viewed from the surrounding visual catchment. The layout of these fields is generally organic in shape with the intention that the septic dripper lines are to be woven through this vegetation.
- Proposed Orchard – a wide variety of fruit trees to fruit throughout all of the seasons are to be planted in strategic pockets throughout this proposal where they can be harvested by the common owners.

Incorporate slow release fertiliser at the time of planting.

Firm in the backfill around the plant. The collar of the plant should be located above the soil. ie. At the same level as it was in the bag.

Any mulch available on site is to be used around the larger specimen trees and on the ridges and north facing slopes.

The suppliers of plants within the Myrtaceae family (Kanuka and Manuka) are to sign a Nursery Management Declaration to certify that they have implemented the New Zealand Plant Producers Incorporated Myrtle Rust Nursery Management Protocol.

## MANAGEMENT AND MAINTENANCE PROGRAMME

The planting should be intensively maintained until at least a 75% canopy closure is achieved, and a minimum of 90% of the original density specified.

Maintenance / weed control is to be undertaken over a time frame that enables weed species to be controlled effectively. A number of weed species require a minimum of three follow-up herbicide applications to achieve successful control, along with ongoing vigilance to ensure new infestations are controlled on establishing.

For the purposes of this Weed Management and Maintenance Programme successful control is considered to be achieved if after the initial control work has been completed pest plant infestations have been reduced to a point in which the weed controller is able to complete follow-up control work with 1 backpack full of herbicide solution up to 4 times per annum, and / or the original pest plant infestation has been reduced by at least 95%.

Maintenance shall include:

- Keeping all plants free of weeds and competing grasses. Control of weeds should include spraying a 500mm diameter circle around each plant with a Glyphosate spray or approved equivalent at the manufacturers recommended rates 6 to 8 weeks after planting, then again 3 to 4 months and 6 to 8 months after planting. Plants may require hand releasing through the summer months (note that grasses act as a mulch through the drier summer months and should not be resprayed until March / April). Monocotyledons such as Cabbage trees, Flax and grasses are extremely susceptible to Glyphosate sprays. Either hand clear around these species, or use Gallant where these species are massed.
- The application of 'Agriform', or an equivalent slow release fertiliser as a top dressing, at the manufacturers recommended rate 12 months after planting.
- Trim back by 50% any plants that look as if they might be affected by wind throw.
- Replace any plants that die, or fail to thrive, or are vandalised with the same species. Should a particular species continue to fail to thrive a substitute species may be used (consult with the Landscape Architect). Any replacement planting shall conform to the intention of the Planting Plan. It shall be of the same size as the plant to be replaced and shall be planted between April and September inclusive.
- Topping up mulch and checking stakes and ties, as required, around the larger canopy trees.
- Watering the canopy trees and other plants, as required, during the drier summer months, particularly in the first summer after planting.
- Pest control.

Once plants are at least one metre high and growing vigorously and have at least two thirds of their foliage above surrounding vegetation, maintenance can be reduced to removing invasive weed species and keeping small and replacement plants clear of competing weed and grass species.

On completion of the 5 year performance period the landowner should continue to carry out maintenance control work on any regrowth, and periodically survey for new pest plant species and

/ or infestations. Weed control should be considered as an ongoing process, whereby the areas are revisited and any new species or new populations are controlled on a regular basis.

## SCHEDULE OF VEGETATION IN PLANTING AREAS (as per the Planting Plan 8 July 2023)

Planting Area	Total revegetation /restoration area m <sup>2</sup>	Existing native vegetation to be restored	Area to be Revegetated		Infill areas between existing planting		Wi grassland to regenerate	Planting adjacent to reclaimed land and steep slopes	Grass within reclaimed land to be left	Planting at entry
			Terrestrial	Wetland/damp areas	Terrestrial	Wetland				
<b>Aa</b>	153690	153690								
<b>Ab</b>	122273	52242			70031					
<b>Ac</b>	44237	17213			27024					
<b>B</b>	64676	28870	32236	2970	600					
<b>C</b>	2403		2403							
<b>D</b>	37132	4263	18400		1393		10,115	2961		
<b>E</b>	35763	11638	24125							
<b>F</b>	14155	8824	5331							
<b>G</b>	24321	11520	11419	1382						
<b>H</b>	5374			5374						
<b>I</b>	8208			8208						
<b>J</b>	751			751						
<b>K</b>	35773	9326	9633	5200	6161			5453		
<b>L</b>	1825						1825			
<b>M</b>	25674	1997	6474	1320	15883					
<b>N</b>	18613						18613			
<b>O</b>	39719	4146	3994		6203			7404	17972	
<b>P ,Pa,Pb</b>	12562	5522	5565	1475						
<b>Q</b>	1791		1791							
<b>R</b>	7499	1072	5827	600						
<b>S</b>	14043	8292	5035	716						
<b>T, Ta</b>	4813		3702	1111						
<b>U</b>	3116			3116						
<b>V</b>	20991	8583	11463	945						
<b>W</b>	6366	4337	2029							
<b>X</b>	4215	3200	1015							
<b>Totals</b>	71.2433 71.24ha	33.4735 33.47ha	15.0442 15.04ha	3.3168 3.32ha	12.7295 12.73ha	-	3.4828 3.48ha	1.5818 1.58ha	1.7972 1.80ha	

Planting area	Area in hectares
A	32.02ha
B	6.49
C	.240
D	3.71
E	3.58
F	1.41
G	2.43
H	0.54
I	0.82
J	0.08
K	4.20
L	0.62
M	1.94
N	1.86
O	3.97
P	1.06
Pa	0.12
Pb	0.08
Q	0.18
R	0.75
S	1.40
T	0.40
Ta	0.08
U	0.31
V	2.10
W	0.64
X	0.42
<b>Total</b>	<b>71.46ha</b>



### Legend

- A Vegetation regeneration/revegetation/infill areas
- Permanent stream
- Intermittent stream
- Wetland/Riparian Areas
- Wi grassland
- Septic Irrigation Fields to be planted
- Area in which wastewater fields may be located (for Lots 9 to 12)
- Pedestrian / Cycle Trail
- Roading network
- Fencing
- Road Crossings
- Gate
- Orchard
- 12 Paddock number
- 18 Lot number
- Building platform
- Archaeological Site



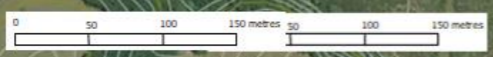
## GOODLAND COASTAL FARM PLANTING PLAN

**2127 KAIPARA COAST  
HIGHWAY, KAKANUI**

scale: 1:2500 @ A1; 1:5000 @ A3 date: 8 July 2023  
Job no: 21016



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Base Plan produced by Crang Civil  
Consulting Engineers

# PLANT SPECIES SCHEDULES (as per the Planting Plan 8 July 2023)

## REVEGETATION AREAS (NOTE: PLANT NUMBERS PROVIDED ONCE FINAL AREAS AND DETAILS HAVE BEEN FINALISED)

Botanical name	Common Name	Spacing	Comment	Size	Number in Area																
					Bb	C	Dd	E	F	G	Kd	Od	P	Q	R	S	T	V	W	X	Total
					32236	2403	18400	24125	5331	11419	9633	3994	5565	1791	5827	5035	3702	11463	2063	1015	
<b>SHRUBS AND GROUNDCOVERS (95%)</b>																					
<i>Coprosma grandifolia</i>	Kanono	1.4m	2.5%	0.5L																	
<i>Coprosma rhamnoides</i>		1.4m	2.5%	0.5L																	
<i>Coprosma robusta</i>	Karamu	1.4m	7.5%	0.5L																	
<i>Dodonea viscosa</i>	Akeake	1.4m	2.5%	0.5L																	
<i>Hoheria populnea</i>	Hoheria	1.4m	7.5%	0.5L																	
<i>Kunzea robusta</i>	Kanuka	1.4m	25%	0.5L																	
<i>Leptospermum scoparium</i>	Manuka	1.4m	25%	0.5L																	
<i>Melicytus ramiflorus</i>	Mahoe	1.4m	10%	0.5L																	
<i>Myoporum laetum</i>	Ngaio	1.4m	5%	0.5L																	
<i>Pseudopanax arboreus</i>	Whauwhaupaku	1.4m	5%	0.5L																	
<i>Pseudopanax crassifolius</i>	Lancewood	1.4m	2.5%	0.5L																	
<b>CANOPY TREES (5% of total vegetation) = 2.5 canopy trees per 100m<sup>2</sup> / 1 canopy tree per 40m<sup>2</sup></b>																					
<i>Alectryon excelsus</i>	Titoki		5%	2L																	
<i>Beilschmiedia taraire</i>	Taraire		5%	2L																	
<i>Corynocarpus laevigatus</i>	Karaka		7.5%	2L																	
<i>Dacrydium cupressinum</i>	Rimu		5%	2L																	
<i>Dacrycarpus dacrydioides</i>	Kahikatea		15%	2L																	
<i>Dysoxylum spectabile</i>	Kohekohe		7.5%	2L																	
<i>Knightia excelsa</i>	Rewarewa		5%	2L																	
<i>Phyllocladus trichomanoides</i>	Tanekaha		12.5%	2L																	
<i>Podocarpus totara</i>	Totara		10%	2L																	
<i>Rhopalostylis sapida</i>	Nikau		7.5%	2L																	
<i>Sophora microphylla</i>	Kowhai		7.5%	2L																	
<i>Vitex lucens</i>	Puriri		12.5%	2L																	
<b>Totals</b>																					

## PLANT SPECIES SCHEDULES (as per the Planting Plan 8 July 2023)

**INFILL AREAS (NOTE: PLANT NUMBERS PROVIDED ONCE FINAL AREAS AND DETAILS HAVE BEEN FINALISED)**

Botanical name	Common Name	Spacing	Comment	Size	Number in Area							
					Ab	Ac	Bc	Dc	Kb	M	Oc	Total
					70031	27024	600	1393	6161	15883	6203	127295
<b>SHRUBS AND GROUNDCOVERS (95%)</b>												
<i>Coprosma grandifolia</i>	Kanono	1.4m	2.5%	0.5L								
<i>Coprosma rhamnoides</i>		1.4m	2.5%	0.5L								
<i>Coprosma robusta</i>	Karamu	1.4m	7.5%	0.5L								
<i>Dodonea viscosa</i>	Akeake	1.4m	2.5%	0.5L								
<i>Hoheria populnea</i>	Hoheria	1.4m	7.5%	0.5L								
<i>Kunzea robusta</i>	Kanuka	1.4m	25%	0.5L								
<i>Leptospermum scoparium</i>	Manuka	1.4m	25%	0.5L								
<i>Melictyus ramiflorus</i>	Mahoe	1.4m	10%	0.5L								
<i>Myoporum laetum</i>	Ngaio	1.4m	5%	0.5L								
<i>Pseudopanax arboreus</i>	Whauwhaupaku	1.4m	5%	0.5L								
<i>Pseudopanax crassifolius</i>	Lancewood	1.4m	2.5%	0.5L								
<b>CANOPY TREES (5% of total vegetation) = 2.5 canopy trees per 100m<sup>2</sup> / 1 canopy tree per 40m<sup>2</sup></b>												
<i>Alectryon excelsus</i>	Titoki		5%	2L								
<i>Beilschmiedia taraire</i>	Taraire		5%	2L								
<i>Corynocarpus laevigatus</i>	Karaka		7.5%	2L								
<i>Dacrydium cupressinum</i>	Rimu		5%	2L								
<i>Dacrycarpus dacrydioides</i>	Kahikatea		15%	2L								
<i>Dysoxylum spectabile</i>	Kohekohe		7.5%	2L								
<i>Knightia excelsa</i>	Rewarewa		5%	2L								
<i>Phyllocladus trichomanoides</i>	Tanekaha		12.5%	2L								
<i>Podocarpus totara</i>	Totara		10%	2L								
<i>Rhopalostylis sapida</i>	Nikau		7.5%	2L								
<i>Sophora microphylla</i>	Kowhai		7.5%	2L								
<i>Vitex lucens</i>	Puriri		12.5%	2L								
<b>Totals</b>												

## PLANT SPECIES SCHEDULES (as per the Planting Plan 8 July 2023)

### COASTAL PLANTING ADJACENT TO RECLAIMED LAND AND STEEP SLOPES

(NOTE: PLANT NUMBERS PROVIDED ONCE FINAL AREAS AND DETAILS HAVE BEEN FINALISED)

Botanical name	Common Name	Spacing	Comment	Size	Number in Area			
					Db	Ka	Ob	Total
					2961	5453	7404	15818
<b>SHRUBS AND GROUNDCOVERS (95%)</b>								
<i>Cordyline australis</i>	Cabbage Tree	1.4m	15%	0.5L				
<i>Phormium tenax</i>	NZ Flax	1.4m	27.5%	0.5L				
<i>Kunzea robusta</i>	Kanuka	1.4m	10%	0.5L				
<i>Leptospermum scoparium</i>	Manuka	1.4m	30%	0.5L				
<i>Meliccytus ramiflorus</i>	Mahoe	1.4m	7.5%	0.5L				
<i>Myoporum laetum</i>	Ngaio	1.4m	5%	0.5L				
<i>Pseudopanax arboreus</i>	Whauwhaupaku	1.4m	5%	0.5L				
<b>CANOPY TREES (5% of total vegetation) = 2.5 canopy trees per 100m<sup>2</sup> / 1 canopy tree per 40m<sup>2</sup></b>								
<i>Corynocarpus laevigatus</i>	Karaka		15%	2L				
<i>Dysoxylum spectabile</i>	Kohekohe		12.5%	2L				
<i>Knightia excelsa</i>	Rewarewa		7.5%	2L				
<i>Metrosideros excelsa</i>	Pohutukawa		30%	2L				
<i>Podocarpus totara</i>	Totara		20%	2L				
<i>Sophora microphylla</i>	Kowhai		15%	2L				
<i>Totals</i>								

RIPARIAN AREAS/WETLANDS (NOTE: PLANT NUMBERS PROVIDED ONCE FINAL AREAS AND DETAILS HAVE BEEN FINALISED)																		
Botanical name	Common Name	Spacing	Comment	Size	Number in Area													
					Bd	G	H	I	J	Kc	M	P	R	S	T	U	V	Total
<b>SHRUBS AND GROUNDCOVERS (95%)</b>																		
<i>Carex lessoniana</i>	Rautahi	0.75m	7.5%	0.5L														
<i>Carex virgata</i>	Purei	0.75m	7.5%	0.5L														
<i>Cyperus ustulatus</i>	Umbrella sedge	0.75m	7.5%	0.5L														
<i>Cordyline australis</i>	Cabbage tree	1.4m	15%	0.5L														
<i>Leptospermum scoparium</i>	Manuka	1.4m	27.5%	0.5L														
<i>Phormium tenax</i>	NZ Flax	1.4m	25%	0.5L														
<b>CANOPY TREES &amp; TALLER VEGETATION (5% of total vegetation) = 2.5 canopy trees per 100m<sup>2</sup> / 1 canopy tree per 40m<sup>2</sup></b>																		
<i>Carpodetus serratus</i>	Putaputaweta		40%	2L														
<i>Dacrycarpus dacrydioides</i>	Kahikatea		35%	2L														
<i>Phyllocladus trichomanoides</i>	Tanekaha		7.5%	2L														
<i>Rhopalostylis sapida</i>	Nikau		7.5%	2L														
<i>Vitex lucens</i>	Puriri		10%	2L														
<i>Total</i>																		

PLANTING AT SITE ENTRY					
Botanical name	Common Name	Spacing	Comment	Size	Number
<b>TREES, SHRUBS AND GROUNDCOVERS (95%)</b>					
<i>Apodasmia simillis</i>	Oioi	0.8m	95%	0.5L	
<i>Alectryon excelsus</i>	Titoki		5%	45L	

## BREAKDOWN OF VEGETATION AREA SCHEDULE

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### Area Ab:

Total area 122273m<sup>2</sup>

Existing planting with almost 100% canopy coverage 44461m<sup>2</sup>

The balance with approximately 10% canopy coverage 77812m<sup>2</sup>.  $77812\text{m}^2 \times 90\% = 70031\text{m}^2$  to be planted

Total vegetation to be restored  $44461 + 7781$  (canopy coverage within infill area) = 52242m<sup>2</sup>

### Area Ac:

Total area 44237m<sup>2</sup>

Existing planting with almost 100% canopy coverage 3588m<sup>2</sup>

Area with approx. 90% vegetation 11,726m<sup>2</sup>.  $11,726\text{m}^2 \times 10\% = 1173\text{m}^2$  to be planted

Balance with approx. 10% vegetation =  $44237 - (3588 + 11726) = 15314$  =  $28923 \times 0.9$  (90%) = 26031m<sup>2</sup> to be planted

Total planting within Area Ac  $1172.6 + 26031 = 27204\text{m}^2$

### Area B:

Infill planting on steep slopes (2 areas) 2000m<sup>2</sup> total area (30% infill) = 600m<sup>2</sup> to be planted.

Species to be planted in and around damp area adjacent to dam 2970m<sup>2</sup>

Revegetation (3 areas) 32236m<sup>2</sup>

### Area C:

Revegetation in and around riparian area 2403m<sup>2</sup>

### Area D:

Wi grassland on reclaimed land to be left to regenerate 10,115m<sup>2</sup>

Revegetation between steep banks and reclaimed land 2961m<sup>2</sup>

Infill planting on steep slopes 4643m<sup>2</sup> total area (30% infill) = 1393m<sup>2</sup> to be planted.

Revegetation in and around lower pasture areas that are marginal with rushes 18400m<sup>2</sup>

### Area E:

Total area E area 35763m<sup>2</sup>.

Planting adjacent to the riparian planting within two gully systems 24125m<sup>2</sup>

Existing riparian planting within two gully systems 11638m<sup>2</sup>. This includes giant umbrella sedge and raupo reedland along with mature Puriri and Totara Trees

### Area F:

Stand of predominantly Kanuka trees along with a raupo reedland just above existing crossing 8824m<sup>2</sup>

Proposed planting around the edges of existing stand of vegetation including planting between stand and proposed access road 5331m<sup>2</sup>

### Area G:

Stand of native vegetation below the apex of two small gully systems with a raupo reedland just above existing crossing in the lower reaches 11520m<sup>2</sup>

Proposed planting around the edges of the riparian planting less planting up centre of gully system 11520m<sup>2</sup>

Gully system planting of a length of 691 lineal metres (two metre width allowance) 1382m<sup>2</sup>

### Area K:

Area Ka Revegetation between steep banks and reclaimed land  $4114 + 1339 = 5453\text{m}^2$

Area Kb Infill planting on steep slopes 8215m<sup>2</sup> total area (75% infill) = 6161m<sup>2</sup> to be planted.

Area Kc Species to be planted in and around wetland and damp areas  $1209 + 2014 + 3291 = 6514\text{m}^2$

Area Kd Revegetation planting in and around the lower reaches of the gully system  $3016\text{m}^2 \times 70\%$  infill = 2111m<sup>2</sup> infill planting

### Area M:

Total area 25674m<sup>2</sup>

660 lineal metres of riparian planting x 2m wide = 1320m<sup>2</sup>

Infill = 15883m<sup>2</sup>

### Area O:

Grass within the flat reclaimed land to be regenerated 17972m<sup>2</sup>

Revegetation along the coastal edge 7404m<sup>2</sup>

Infill planting on the steep slopes 11,279m<sup>2</sup> (55%) = 6203m<sup>2</sup>

100% Revegetation/screen planting 3994m<sup>2</sup>.

### Area P:

Planting in and around an intermittent stream 260m<sup>2</sup>

Revegetation planting 5565m<sup>2</sup>

Vegetated to be left to regenerate 5522m<sup>2</sup>

### Area R:

Riparian Planting in the base of a stream 293m long x 2m wide wetland planting in the base = 600m<sup>2</sup>

### Area S:

Planting in the base a stream and a depression  $186 + 172\text{m}$  long x 2m wide wetland planting in the base = 716m<sup>2</sup>

Riparian /revegetation planting 5035m<sup>2</sup>

Vegetation left to regenerate 8292m<sup>2</sup>