



WINSTONE
AGGREGATES

Boffa Miskell



Part
B

Appendix B12.8.10

Ecological Management Plan

Hunua Quarry Development

Ecological Management Plan
Prepared for Winstone Aggregates Limited

28 March 2026





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Cover *photograph*: View from Symonds Hill Pit, looking in a north-westerly direction, © BML, 2025.

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1.0 Introduction

1.1 Background

Winstone Aggregates (“Winstone”), a division of Fletcher Concrete and Infrastructure Limited, owns and operates the Hunua Quarry in South Auckland, approximately 5 kilometres (km) southeast of Papakura and 35 km southeast of the Auckland Central Business District (“CBD”) (**Figure 1**).

Hunua Quarry has been operating on the site since the 1920s and is recognised as one of Auckland’s three most strategically important sources of aggregate, as it supplies a significant part of the Auckland region’s greywacke rock aggregate requirements.

Ecological management activities in the Hunua Quarry landholding outside of the operational quarry area are currently undertaken as in accordance with existing resource consents issued in 2009 for the previous expansion of Symonds Hill Pit. These activities include maintenance of 39.9 hectares of native revegetation plantings and 1.2 ha of riparian plantings established as a requirement of the consent; and weed and pest management throughout the Hunua Quarry landholding.

Winstone is seeking approval to expand the existing Symonds Hill Pit quarry to enable the continued extraction of aggregate for a further 80 years (“**the Project**”). Through this approval process, Winstone propose to update the consent conditions and quarry management plans applying to the site to incorporate the changes and enable greater operational efficiency.

The proposed quarry expansion will involve forest clearance, stream diversion, and the loss of stream and wetland features.

The National Policy Statement for Indigenous Biodiversity 2023 Amended 2025 (NPS IB) directs the use of an effects management hierarchy (EMH) approach to the consideration of adverse effects on ecological values. The National Policy Statement for Freshwater Management 2020 Amended 2025 (NPS-FM) provides specific direction in relation to the protection and restoration of wetlands.

The EMH approach is defined in the NPS IB and NPS-FM as:

effects management hierarchy means an approach to managing the adverse effects of an activity on indigenous biodiversity that requires that:

- (a) adverse effects are avoided where practicable; then
- (b) where adverse effects cannot be avoided, they are minimised where practicable; then
- (c) where adverse effects cannot be minimised, they are remedied where practicable; then
- (d) where more than minor residual adverse effects cannot be avoided, minimised, or remedied, biodiversity offsetting is provided where possible; then
- (e) where biodiversity offsetting of more than minor residual adverse effects is not possible, biodiversity compensation is provided; then
- (f) if biodiversity compensation is not appropriate, the activity itself is avoided.

Details of ecological values, effects and proposed management measures in accordance with the EMH are set out in the Assessment of Ecological Effects report (AEcE)¹. A key component of the effects management response is a package of biodiversity offset and compensation measures in three Focus Areas (refer **Figure 1**).

1.2 EMP Scope and Purpose

The purpose of the Ecological Management Plan (EMP) is to address the impact of quarrying and associated activities on ecological values. This EMP directs the implementation of effects management measures identified in the AEcE and secured through consent conditions in relation to ecological matters for the Project. The EMP also provides a framework to integrate existing consent requirements with respect to ecological management within the Hunua Quarry site. This EMP seeks to ensure long term ecological management is consistently applied but can adapt over time to incorporate improvements in practice.

The EMP provides a plan for the minimisation, remedy, offsetting and compensation of the modification and loss of stream, wetland, vegetation and habitat values, and to enhance where practicable the ecological values of the Site and surrounding area.

Several ecological effects management measures are outside the scope of the EMP, and are addressed in the following management plans:

- Rehabilitation of the Symonds Hill Quarry pit following decommissioning is addressed in the **Landscape Rehabilitation Strategy and Management Plan** (Boffa Miskell, March 2026).
- The diversion, reconstruction and enhancement of the Mangapū Stream Tributary is addressed in the Stream Realignment Management Plan (Boffa Miskell, March 2026).
- Site-wide, long-term management of weeds and vertebrate pests across the Hunua Quarry Site and Focus Areas 1 & 2 are addressed in the Pest Management Plan (Boffa Miskell, March 2026).
- Lizard management protocols specified in the wildlife authority application for lizard salvage and relocation are addressed in the Lizard Management Plan (Boffa Miskell, March 2026).
- Salvage and relocation of aquatic fauna from impacted streams is addressed in the Aquatic Fauna **Salvage and Rehabilitation Plan** (Boffa Miskell, March 2026).

1.3 Objective of the EMP

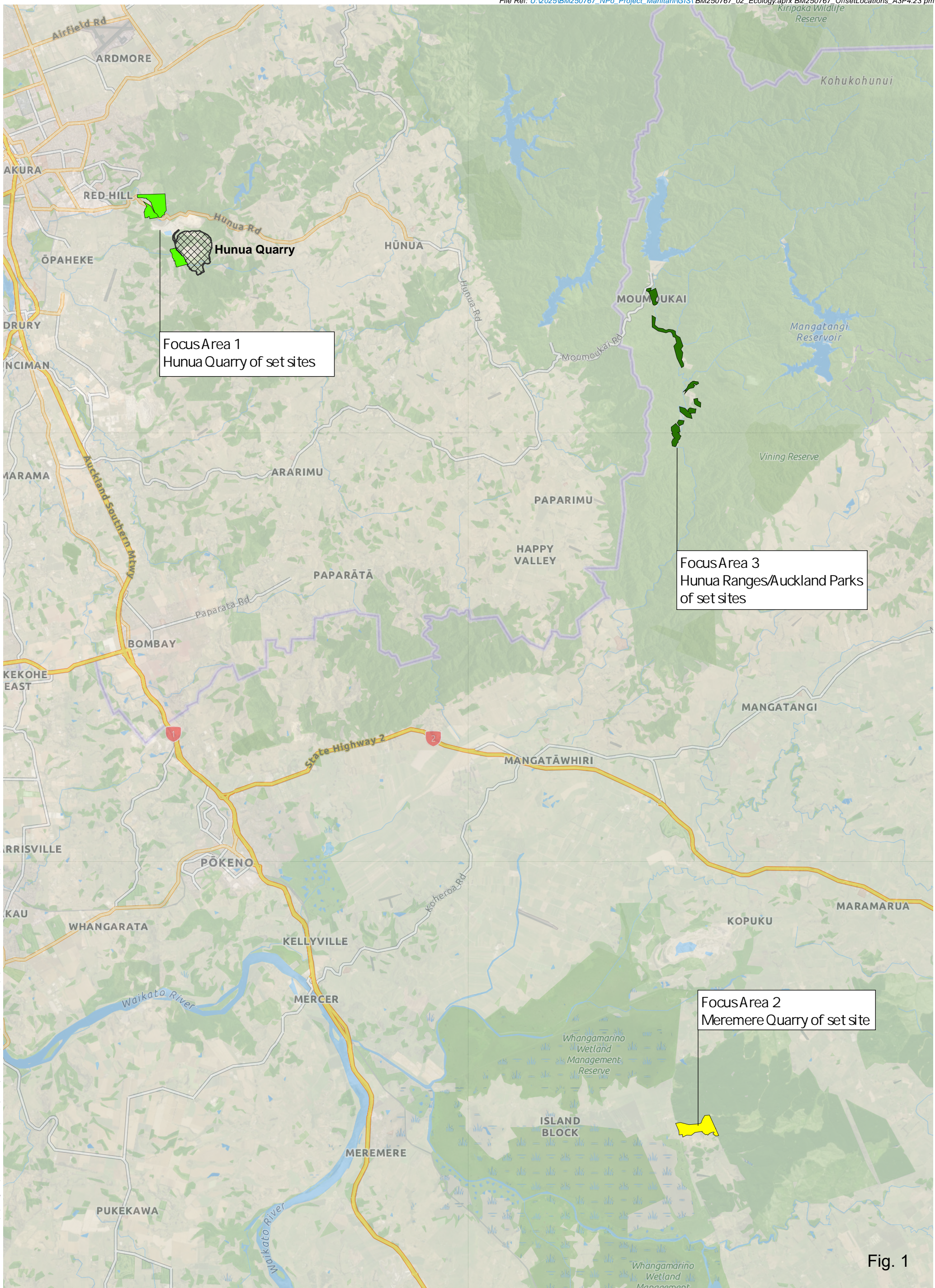
The objective of the EMP is to enhance ecosystem structure, function, and resilience across terrestrial, wetland and aquatic habitats in multiple Focus Areas, through the implementation of an integrated, longterm ecological management programme that contributes to landscape scale ecosystem connectivity.

All offset/ compensation areas shall be subject to legal protection to ensure that the ecological enhancements remain in perpetuity.

Mechanisms to achieve this objective include:

- **Revegetation:** establish native plant communities that have a composition and structure that promotes successional development to an ecosystem that is representative of the surrounding Ecological District and local environs.

- **Weed suppression:** targeted control of invasive exotic plants in identified management areas, to create space for infill planting with secondary forest species and reduce competitive displacement to protect planted and naturally regenerating native vegetation.



Focus Area 1
Hunua Quarry of set sites

Focus Area 3
Hunua Ranges/Auckland Parks
of set sites

Focus Area 2
Meremere Quarry of set site

Fig. 1

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- **Wetland creation, rehabilitation and enhancement:** create new wetlands and reinstate or enhance existing wetlands areas. This includes reinstating flowpath connections in decommissioned stock ponds; excluding domestic and feral browsers and revegetating degraded wetland features with an assemblage of native plants to promote the development of wetland ecosystem features that are representative of the surrounding Ecological District and local environs and creating new areas of wetland.
- **Riparian enhancement:** rehabilitation and establishment of plant communities within the riparian zone to increase biodiversity and ecological function, suppress invasive species, shade the waterway and increase available habitat for fauna.
- **Monitoring and maintenance:** establish a standardised monitoring framework to quantitatively assess revegetation (establishment, survivorship and growth of specimens) and condition of managed forest remnants, to assess progress towards the restoration objective and identify requirements for specific management interventions (e.g., infill planting, suppression of browsing pests, etc).

2.0 Ecological Enhancement Locations

2.5 Integrated Approach

The AECE report identified specific offset or compensation mechanisms for each of the residual effects of the Project (i.e., loss of terrestrial vegetation and habitat, loss of stream length, and loss of wetland extent and values). These components have been integrated across three key “focus areas”, selected for the potential to expand and improve the condition of existing ecological features, including indigenous forest, streams and wetlands, through revegetation and management.

Focus Areas all contain existing patches of natural forest and scrub, while Focus Areas 1 and 3 adjoin or are close to extensive tracts of forested SEA. Revegetation (including removal of woody weeds and infill planting) will surround and encompass these remnants, reducing fragmentation and edge effects, and enhancing connectivity across the surrounding SEAs. The planting will introduce a more varied mix of secondary forest species into areas of low-complexity scrubland, facilitating the development of a more diverse secondary forest community over the medium to long term.

The total area of ecological enhancement for the three Focus Areas amounts to:

- 85.62 ha of new plantings and 16.33 ha of mature and regenerating indigenous vegetation, to a total of 101.95 ha of combined indigenous vegetation areas.
- Enhancements to 3,580 m of stream length (including removal of 2.5 km of riparian weed infestations).
- Restoration of fish passage leading to improved access to and connectivity with over 2,500 m of stream extent that is currently fully or partially impeded.
- Re-establishing and/ or enhancing 2.51 ha of wetlands in Focus Areas (including decommissioned farm ponds and associated flowpaths in Focus Area 1; degraded seep

and swamp wetlands in Focus Area 2; and low-lying, flood prone alluvial terraces with dense blackberry infestations in Focus Area 3.

- Integrated and comprehensive landscape-scale pest management strategy (as detailed in the Pest Management Plan).
- Improved water quality in headwater catchments through stock exclusion and revegetation.

2.6 Focus Area 1: Hunua Quarry and Surrounds

Focus Area 1 includes large portions of five separate properties, including 4 rural residential properties (484, 397 and 411 Hunua Road and 118 Judge Richardson Drive), along with the Hunua Quarry Pit within the landholding that contains the proposed quarry expansion (**Figure 1**).

Hunua Quarry is situated in dissected hill country near the eastern boundary of the Manukau Ecological District within the wider Auckland Ecological Region. The quarry lies within the foothills of the Hunua Ranges east of Papakura, which contain the most extensive areas of native vegetation in the Manukau Ecological District (most of the Manukau ED is pastoral farmland). Further eastward, the forested Hunua Ranges are encompassed within the Hunua Ecological District.

Hunua Quarry is surrounded by established large tracts of indigenous vegetation including several areas identified as Significant Ecological Areas on steep hill and valley systems. Manukau Harbour is situated to the west and the Hunua Ranges to the east. Surrounding land uses include the suburb of Papakura to the northwest, the settlement of Drury to the southwest, New Zealand Defence Force land to the north, and a mix of rural and rural residential properties in the immediate vicinity.

Hunua Quarry Pit revegetation

The Hunua Quarry Pit to the north of the proposed quarry expansion boundary is included as part of Focus Area 1 (**Figure 2**). The pit has been decommissioned for extraction and now receives overburden from the Symonds Hill Pit operation. The Hunua Quarry Pit is adjacent to SEA_T_5289, though separated from it by Hunua Road. Eastward of the pit, naturally regenerating indigenous scrub and forest and revegetation plantings extend to the property boundary.

- Once filled (an estimated 30 years' timeframe), the 25.8 ha overburden disposal area will be revegetated with native forest species, forming an extension to forest within the adjacent SEA_T_5289 and maturing bush to the east.

Hunua Road & Judge Richardson Drive properties

The four rural residential properties that form part of Focus Area 1 contain areas of remnant and regenerating indigenous forest and scrub, and areas of pastoral grassland that is to be revegetated, along with riparian and wetland features that will be restored and enhanced (**Figure 3**).

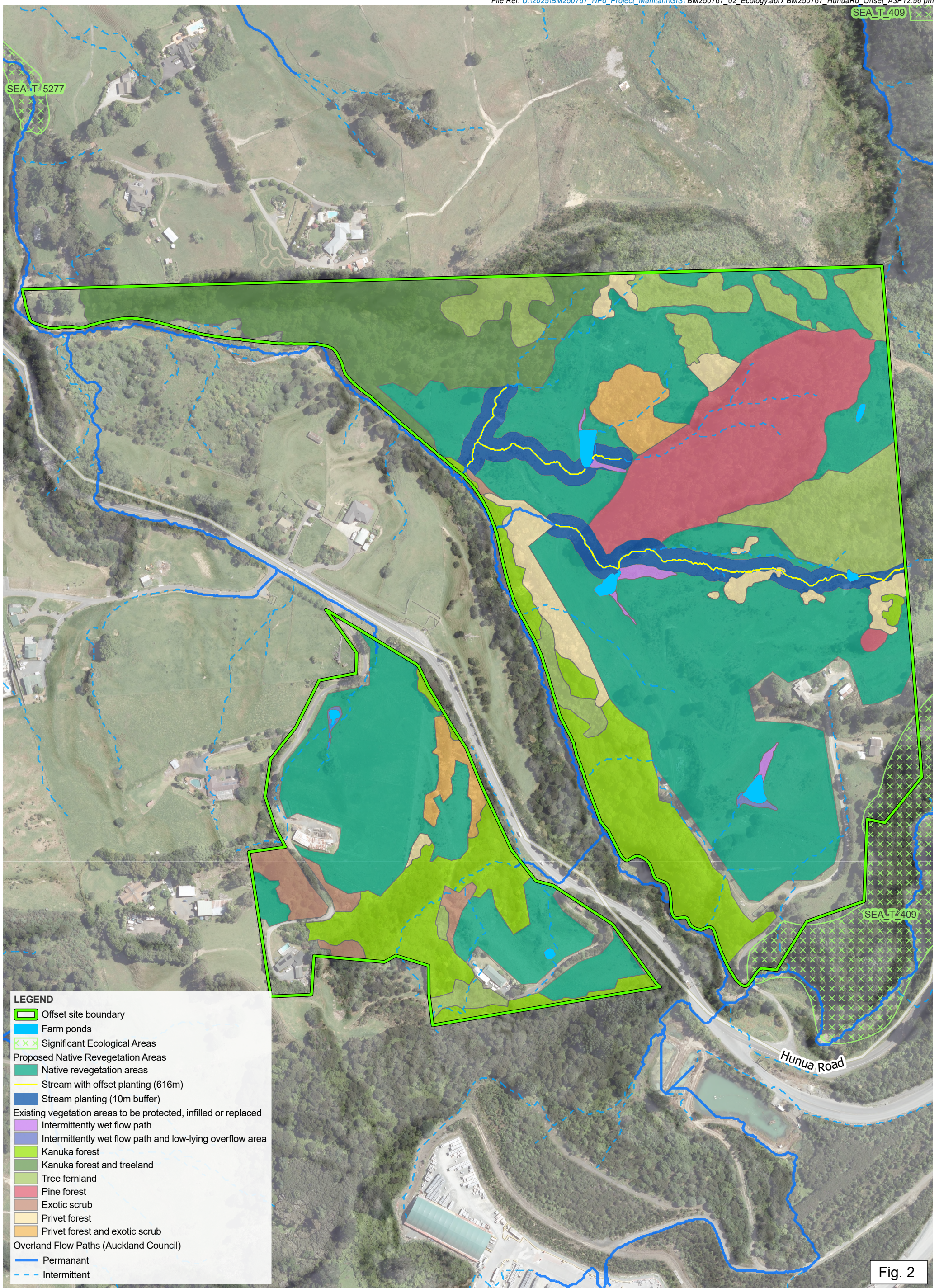
Vegetation communities present within the Judge Richardson Drive and Hunua Road properties contain a mix of well-maintained and rough grazed pasture used for stock grazing, exotic scrub dominated by gorse and woolly nightshade, exotic tree privet forest, treefern – dominated scrub interspersed with woody weeds, regenerating kanuka scrub, and mature secondary kanuka

forest. The area proposed for restoration in the Judge Richardson Drive property adjoins mature secondary kauri, podocarp forest within SEA_T_5323 where hard beech (a regionally at risk species) was found.

- Native revegetation planting will encompass a total of 15 ha across the 4 rural residential properties. Most of the area to be planted is currently in grazed pasture, while 2.5 ha is in plantation pines and approximately 0.5 ha is in privet forest and exotic scrub. A further 7.5 ha of indigenous forest and scrub within these properties will be retired from grazing and managed to remove extensive infestations of tree privet and other woody weeds. Secondary forest species will be planted in canopy gaps where weed infestations are likely to impede regeneration of indigenous forest species.
- A total 0.33 ha of indigenous wetland will be created through rehabilitation of stock ponds, and 0.03 ha (surrounding areas of low relief) enhanced with indigenous vegetation, all of which will be surrounded and buffered by revegetated native forest.
- Stock ponds (7 in total) have been formed within natural watercourses in all four of the rural residential properties. These features will be retired from use for stock watering and rehabilitated to form indigenous wetlands. Connecting flowpaths and surrounding areas of low relief that are intermittently wet will be incorporated into the wetland features with planting of appropriate wet-tolerant vegetation. Stream connectivity will be restored where suitable native fish habitat is available upstream of the features.
- 10 m riparian buffers either side of 600 m of permanent and intermittent stream length within the Hunua Road properties is set aside to offset loss of stream length (a total of 1 ha).

The proposed terrestrial revegetation surrounds all wetland and riparian areas to be restored, and appropriate ecotonal gradients will be incorporated into the planting design and specifications.

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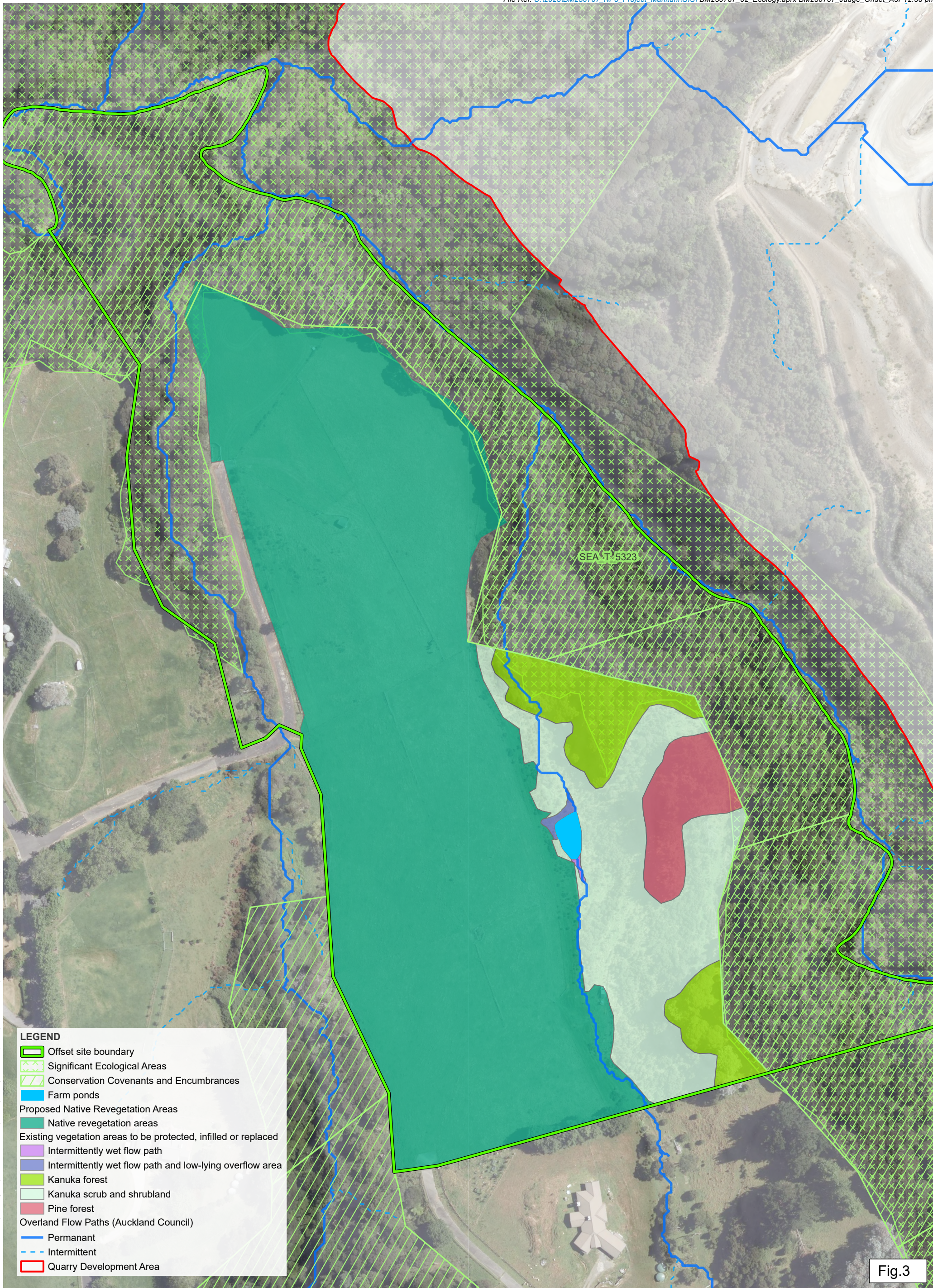


LEGEND

- Offset site boundary
- Farm ponds
- Significant Ecological Areas
- Proposed Native Revegetation Areas**
- Native revegetation areas
- Stream with offset planting (616m)
- Stream planting (10m buffer)
- Existing vegetation areas to be protected, infilled or replaced**
- Intermittently wet flow path
- Intermittently wet flow path and low-lying overflow area
- Kanuka forest
- Kanuka forest and treeland
- Tree fernland
- Pine forest
- Exotic scrub
- Privet forest
- Privet forest and exotic scrub
- Overland Flow Paths (Auckland Council)**
- Permanent
- Intermittent

Fig. 2

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LEGEND

- Offset site boundary
- Significant Ecological Areas
- Conservation Covenants and Encumbrances
- Farm ponds
- Proposed Native Revegetation Areas**
- Native revegetation areas
- Existing vegetation areas to be protected, infilled or replaced**
- Intermittently wet flow path
- Intermittently wet flow path and low-lying overflow area
- Kanuka forest
- Kanuka scrub and shrubland
- Pine forest
- Overland Flow Paths (Auckland Council)**
- Permanent
- Intermittent
- Quarry Development Area

Fig.3

2.7 Focus Area 2: Meremere Quarry

The Meremere Quarry site is 29.4 ha of pastoral land with scattered forest and scrub remnants on the northern edge of Meremere Quarry (**Figure 4**). Pine forest adjoins the proposed revegetation site to the north and east, while 7.5 ha of secondary podocarp forest remnant (kahikatea, rimu, totara, miro and rewarewa) and patches of dense kanuka scrub in a gully head are located within the north-eastern corner of the Meremere Quarry property. Several similar indigenous forest patches of varying size are present on surrounding properties. A stream and wetland (approximately 0.15 ha) containing a mixed assemblage of native and exotic species is present on the valley floor to the south of the forest remnant.

Scattered totara trees (approximately 4 – 6 m tall) have naturally regenerated on the hillslopes, and patches of secondary kanuka – broadleaved scrub are present in gullies, along with a planted woodlot (to be felled and revegetated). A few remnant kahikatea are present around the stream where it flows along the edge of the quarry. Feral pigs were seen and evidence of pig rooting was noted in the forest remnant and wetland.

- 21.12 ha of pastoral farmland on steep hillslopes has been identified for replanting, incorporating and buffering 7.53 ha of existing mature and regenerating indigenous forest.
- Stream enhancements include riparian planting of 10 m buffers along 400 m of stream, and removal of fish passage impediments to create access to greater than 1,900 m extent of stream length for climbing fish.
- Wetland enhancement comprises weed removal and planting over 0.15 ha of degraded wetland.

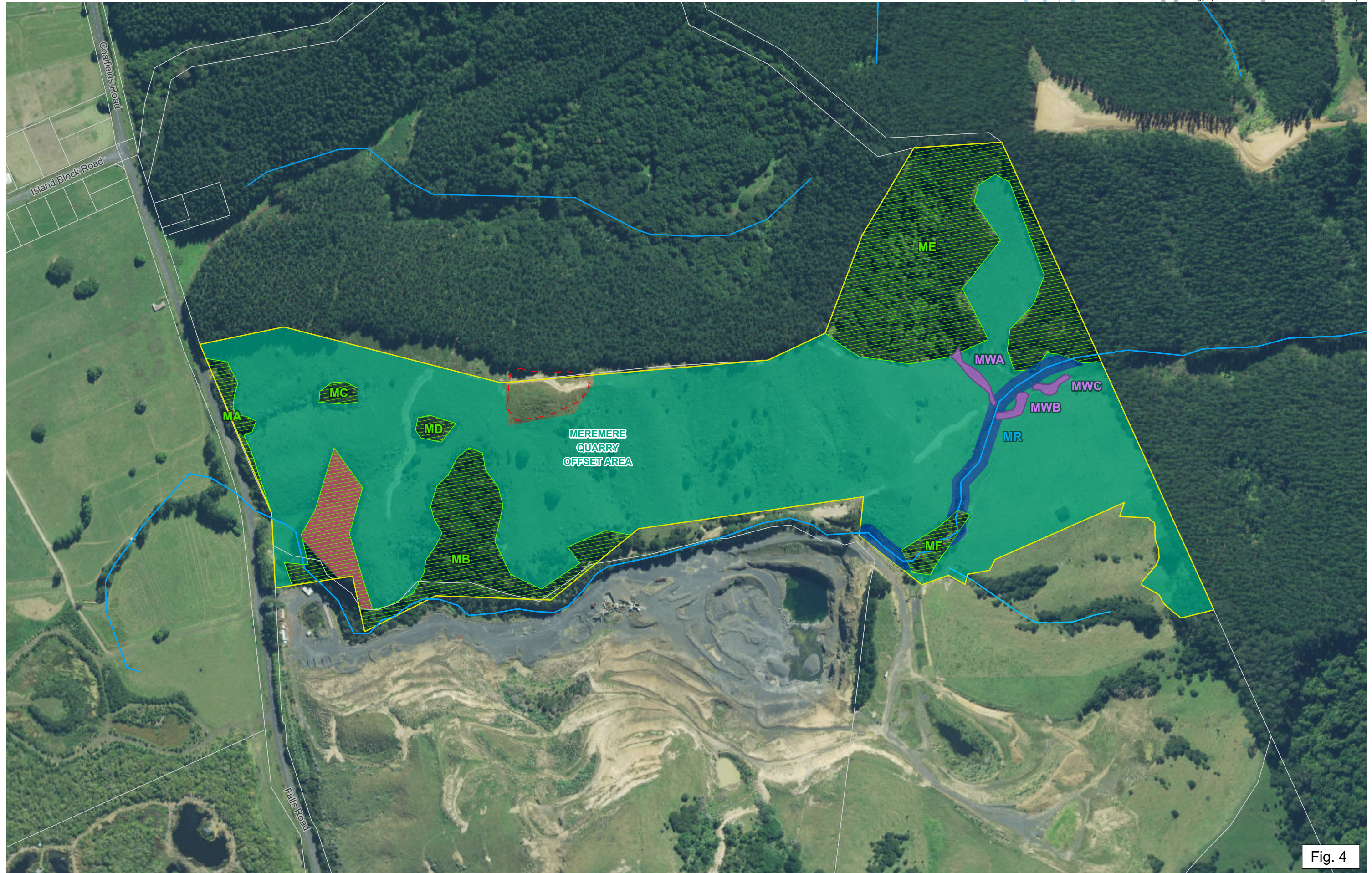


Fig. 4

2.8 Focus Area 3: Hunua Regional Parkland

Winstone Aggregates have a formal confirmation of landowner support to undertake planting and associated ecological management measures in indicatively identified areas in Hunua Regional Park, on alluvial terraces of the Mangatawhiri River below the Upper Mangatawhiri Reservoir (**Figure 1**).

Auckland Council's Parks team indicatively identified areas (at least 30.6 ha) where revegetation and management will be of ecological benefit. The identified areas are canopy gaps ranging between 0.3 ha and 12 ha in size, surrounded by extensive tracts of indigenous forest and scrub. The largest patch surrounds a 2.6 km section of Mangatawhiri River.

Dense swards of blackberry form the dominant vegetation cover across a large portion of the features (refer **Figure 5** and **Figure 6**), particularly on low-lying, wide terraces that are evidently subject to periodic flooding.

Some of the identified patches are intersected with recreation trails, and three of the areas include patches of rough grassland. Stands of kanuka forest (and some stands of podocarp-broadleaved forest), manuka-kanuka scrub, and naturally regenerating kanuka, treefern and broadleaved scrub dominate the surrounding hillslopes, and are interspersed throughout the areas identified for revegetation and management. While the areas identified for planting and management focus on gaps in riparian and forest vegetation cover, areas of blackberry and woody weed invasion extend well beyond the mapped areas.

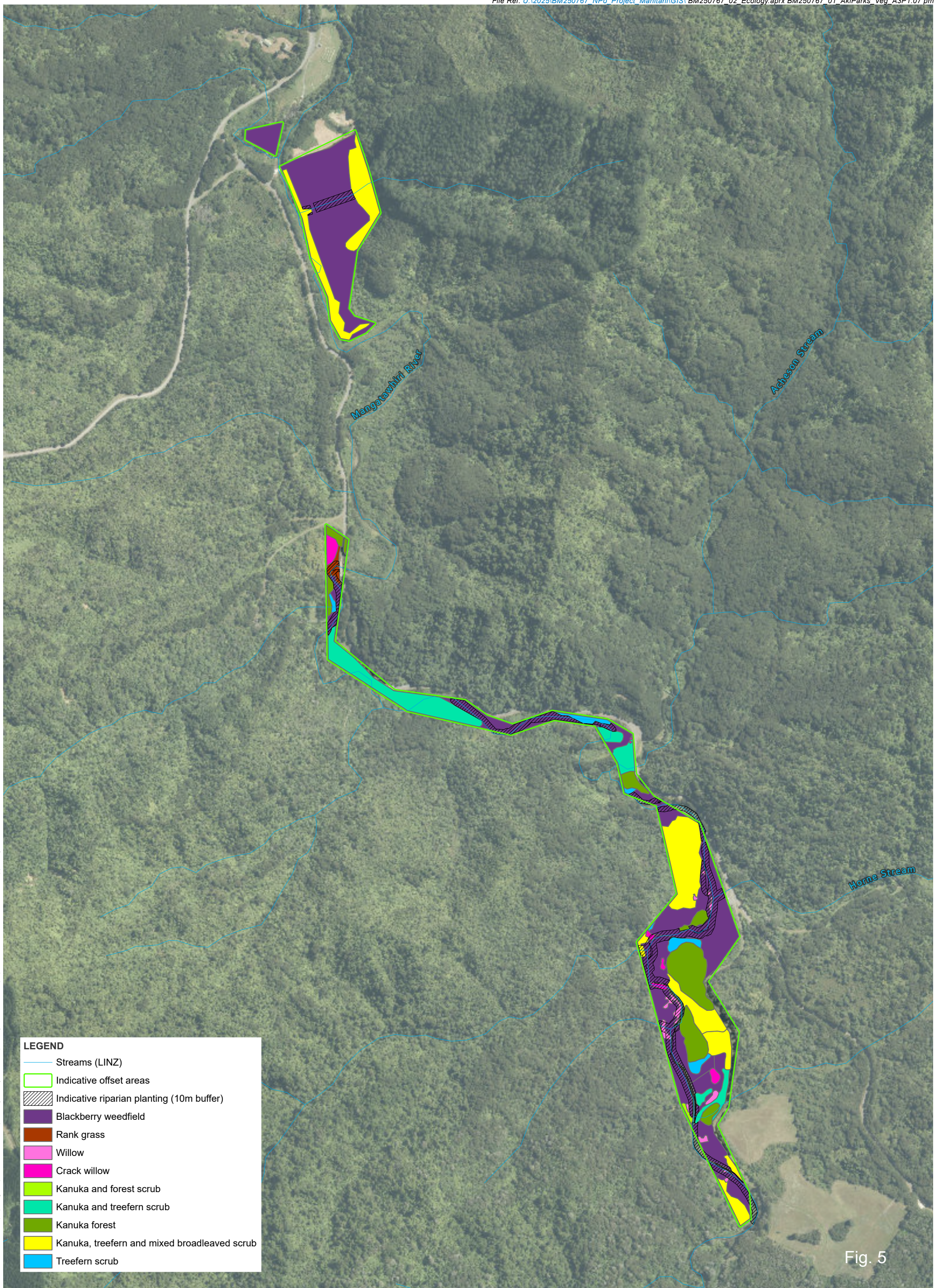
Riparian corridor

The riparian section has a varied vegetation cover, with a mix of indigenous scrub and kanuka forest and blackberry weedfield on alluvial terraces and stands of crack and grey willow along the stream banks. Privet, pampas, Japanese honeysuckle and other invasive weeds are also present and locally abundant.

Proposed ecological enhancement works include:

- removal of weed infestations and terrestrial revegetation of a minimum 20 ha of regional parkland to infill gaps in areas of established indigenous scrub and forest.
- Removal of blackberry infestations and reinstatement of an indigenous wetland vegetation community on a minimum 2 ha of low-lying, flood-prone alluvial river terrace.
- riparian planting along 2.58 km of the Mangatawhiri Stream within Hunua Regional Park to create a continuous vegetated corridor with a minimum 10 m width on both stream banks.

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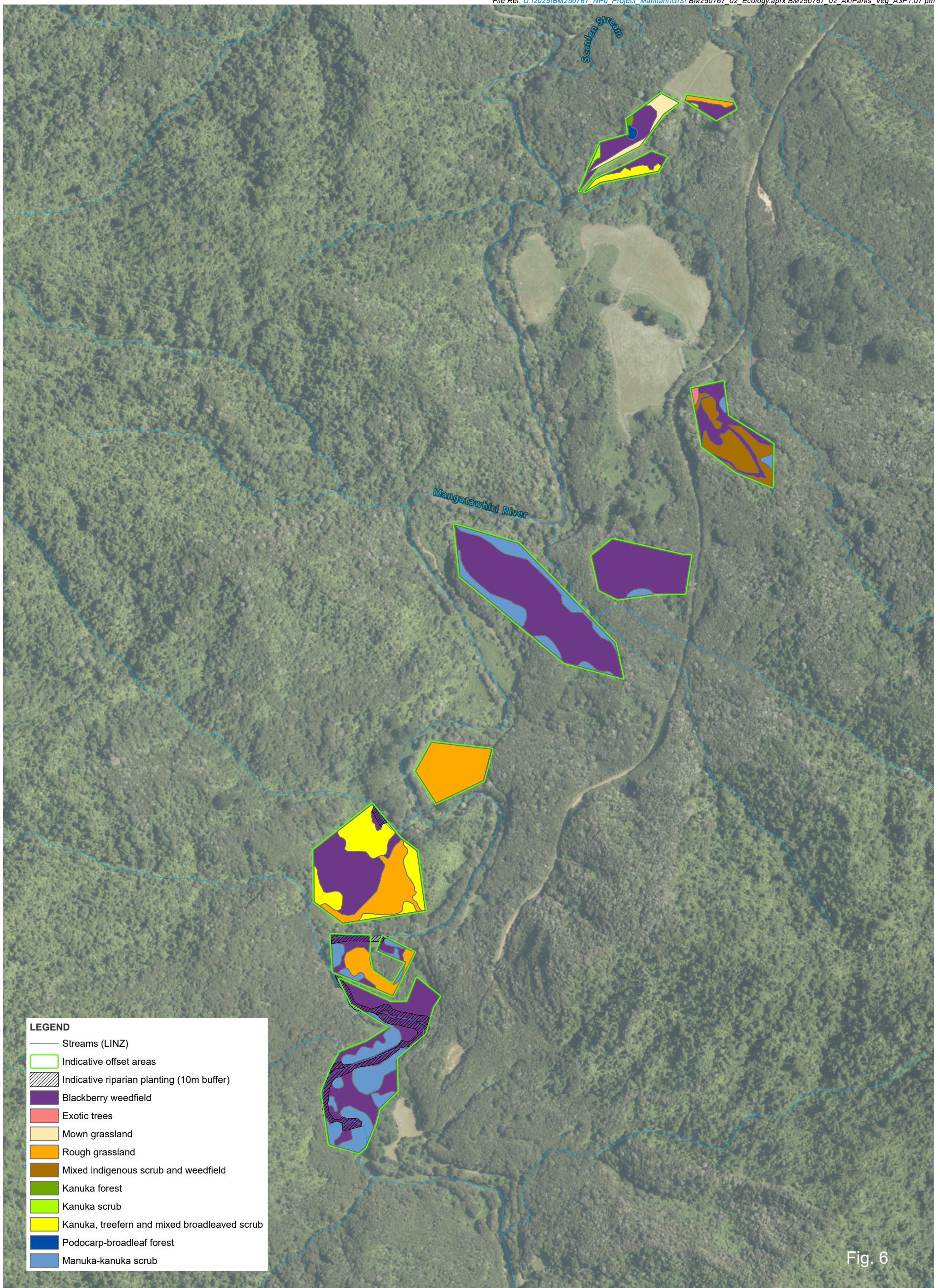


LEGEND

- Streams (LINZ)
- Indicative offset areas
- Indicative riparian planting (10m buffer)
- Blackberry weedfield
- Rank grass
- Willow
- Crack willow
- Kanuka and forest scrub
- Kanuka and treefern scrub
- Kanuka forest
- Kanuka, treefern and mixed broadleaved scrub
- Treefern scrub

Fig. 5

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LEGEND

- Streams (LINZ)
- Indicative offset areas
- Indicative riparian planting (10m buffer)
- Blackberry weedfield
- Exotic trees
- Mown grassland
- Rough grassland
- Mixed indigenous scrub and weedfield
- Kanuka forest
- Kanuka scrub
- Kanuka, treefern and mixed broadleaved scrub
- Podocarp-broadleaf forest
- Manuka-kanuka scrub

Fig. 6

3.0 Ecological Management Approach

3.5 Vegetation Clearance Protocols within Quarry Development Site

3.5.1 Overview

Measures to avoid or minimise adverse ecological effects of vegetation clearance have been factored into design, staging and management of works.

Requirements and specifications for lizard survey, salvage and relocation are set out in the **Lizard Management Plan**.

Requirements and specifications for salvage and relocation of aquatic fauna are set out in the **Aquatic Fauna Salvage and Rehabilitation Plan**.

3.5.2 Bird nest checks

Native birds observed on the Site are all species that nest in native and exotic vegetation and have a nesting season that can extend from August to March (inclusive). The most sensitive time of the year (in regard to disturbance or mortality risk) for native birds is the nesting season.

Where practicable, vegetation clearance will be undertaken outside of the bird breeding season. Otherwise, prior to vegetation clearance scheduled during the breeding season (August to March inclusive) surveys will be undertaken for native bush birds to ensure that any nest sites are avoided to minimise mortality or injury to native birds. This approach can be ensured through conditions of consent.

3.5.3 Bat roost checks

The lack of recorded bat activity within the Site and the vicinity of the Hunua Quarry indicates an absence of favoured maternity and nocturnal roost trees and a lack of preferred foraging areas. However, individual long tailed bats may occasionally utilise the Site for foraging and/or solitary roosts.

Potential bat roosts include:

- Stands of mature native conifer and broadleaved forest trees that contain trees and tree ferns ≥ 15 cm diameter at breast height (dbh);
- Stands of mature exotic trees (not pine) that contain trees ≥ 15 cm dbh; and
- Standing dead trees ≥ 15 cm dbh.

Pre-clearance bat monitoring by a Bat Specialist shall be undertaken in accordance with Department of Conservation roost check protocols to ensure possible roost trees are not occupied at the time of clearance, in order to avoid injury or mortality to bats.

3.5.4 Stockpiling of vegetation and organic material

Where practicable, vegetation stripped from the quarry development site will be mulched and stockpiled for later use in the Symonds Pit rehabilitation. Details of vegetation removal and stockpiling are included in the Landscape Rehabilitation Strategy and Management Plan².

3.6 Pre-Planting Site Preparation

3.6.1 Pre-planting site inspection

Revegetation sites shall be inspected by the planting contractor **at least 12 months prior** to commencement of planting to assess the condition of the vegetation cover and soils, and to determine whether amendments (knock-down spray of grass cover, ripping of compacted soil, targeted management of browsing pests, etc) are required in advance of planting.

Fencing requirements will be assessed, with consideration of whether browsing ungulates and pigs are present and effectively controlled, and whether grazing by domestic stock will be used as a means of reducing grass cover prior to planting.

The pre-planting inspection will allow confirmation of plant numbers, availability and suitability for specific microsites in advance of ordering plant stock.

3.6.2 Pine forest clearance

As far as is practicable, pines will be felled in the spring/ summer season immediately prior to planting, in order to minimise encroachment of invasive weeds that are abundant around all Focus Areas. Site preparation following pine harvest prior to planting will include removal or mulching of woody debris and litter (mulched material and stumps to remain in situ), and surveillance and control of invasive weeds that may have been present but suppressed beneath the pine canopy.

3.6.3 Weed Control

Woody weeds

Woody weeds, in particular tree privet, Chinese privet, crack and grey willows, are common to abundant throughout parts of all the Focus Areas and must be effectively controlled prior to revegetation of areas where they occur.

Targeted foliar spraying with herbicide deployed via drone is the most efficient and effective means of killing mature (canopy-height) privet and willow trees (and other invasive exotic trees) with a high degree of precision and minimal disturbance or damage to surrounding vegetation. This method is suitable for use where invasive exotic trees are interspersed amongst native vegetation.

Targeted weed trees are to be treated with herbicide and left to die standing, and subsequently felled and mulched (or left in situ where access is impractical or unsafe). Woody weed herbicide treatment will be undertaken in the year prior to planting to ensure effective and complete control of woody weeds and will include follow-up surveillance and treatment of surviving specimens, and ground-based control of juvenile specimens.

Blackberry weedfield

Well-established thickets of blackberry (and associated weed species) cover large patches of Focus Area 3 and will require herbicide treatment and physical clearance to enable access for revegetation works. Where areas of indigenous scrub are naturally regenerating in and around blackberry infestations,

Herbicide treatment is the most reliable blackberry control method. Physical control alone is rarely successful due to regrowth from extensive root systems and the seed bank.

Heavy infestations are to be cut back with a scrub bar to promote regrowth of new foliage, and then foliar sprayed with herbicide. Care will be taken to as far as possible avoid naturally regenerating indigenous vegetation in and around the blackberry sward.

Initial control in late spring when growth is most vigorous, with one or more follow-up treatments throughout summer and autumn. Blackberry control will be undertaken in the year prior to planting to ensure effective and complete control and will include follow-up surveillance and treatment of surviving infestations.

General site preparation

Pasture areas will be grazed immediately prior to planting if accessible. Otherwise, vegetation may require cutting or application of herbicide prior to herbicide application.

Only applicators with a minimum of Growsafe "Standard" certification or equivalent shall supervise and be responsible for the application of herbicides. All those applying herbicides under supervision should hold a minimum of Growsafe "Basic" or equivalent.

The Contractor shall provide details of the proposed herbicide and spraying method for approval by the Principal's Project Officer prior to spraying. Particular care shall be taken by the Contractor to ensure that adjacent land uses (e.g. grazed pasture) are not compromised by any herbicide application.

Spraying of herbicides shall not take place in windy conditions. Where a translocated herbicide is used around plants in leaf to be retained, an adequate guard must be used, or a suitable hood applicator used for spot treatment. All spraying equipment is to be carefully calibrated to prevent over or under dosing. No herbicide containers; empty or full, are to be left unattended on site at any time.

Planting shall not proceed until at least six weeks after any application of a residual, soil active, herbicide if used for the purposes of pest plant control.

3.7 Revegetation planting

3.7.1 Revegetation objectives

Revegetation and management of terrestrial forest, wetlands and riparian margins across the proposed offset sites will enhance biodiversity and habitat values within areas directly adjacent to the Hunua Quarry site, as well as river terraces within the Hunua Ecological District. It will also improve ecological function of these sites by increasing connectivity of wetland, riverine and forest habitat features across the landscape, and in some cases, reduce sediment and nutrient inputs to the receiving environment that would otherwise arise from ongoing productive land use adjacent to the restoration areas.

Areas identified for restoration at offset sites include terrestrial pasture to be planted into native forest similar in type and function to the impact site, a section of weedy river/stream area to be restored to native riparian vegetation, existing wetlands to be restored, as well as stock ponds to be rehabilitated into wetland areas.

3.7.2 Revegetation Planting Specifications

The species mix selected for revegetation planting is based on the best, most locally representative early-successional mixture of native plants to quickly create a canopy, allowing habitat to be formed and encouraging further stages of succession. Surrounding forest areas, such as mature forest remaining around Symonds Pit, will then act as seed sources for future forest development into a habitat representative of the region's biodiversity.

Planting of seedlings will include site preparation and maintenance as required to provide seedlings with competition and predation-free sites.

Focus Area 1 Plant Schedules

Hunua Road and Judge Richardson Drive properties

The vegetation cover of these properties is dominated by pasture and rank grasses, so spot spraying at least 3 months prior to planting is likely to be required to make room for the native plants.

Table 1: Indicative planting mix for the terrestrial forest revegetation of the Hunua Road and Judge Richardson Drive offset properties adjacent to the Hunua Quarry.

Common Name	Botanical Name	% Mix
Ti kouka	<i>Cordyline australis</i>	10
Kānuka	<i>Kunzea robusta</i>	15
Pigeonwood	<i>Hedycarya arborea</i>	15
Nīkau	<i>Rhopalostylis sapida</i>	10
Tōtara	<i>Podocarpus totara</i>	10
Mahoe	<i>Melicytus ramiflorus</i>	15
Karamu	<i>Coprosma robusta</i>	15
Māpou	<i>Myrsine australis</i>	10

Overburden disposal areas

These areas will be made up of bare clay soils and very vulnerable to invasion of weeds, so quick-growing colonising plant species are required to quickly create a canopy, stabilise soils, and outcompete weeds. The plant mix specified is the same as that used for 'Bench and Hunua Pit OBDA Planting' in the Hunua Quarry Landscape Rehabilitation Plan².

Table 2: Indicative planting mix for the revegetation of Overburden Disposal Areas at Hunua Quarry.

Common Name	Botanical Name	% Mix
Mānuka	<i>Leptospermum scoparium</i>	10
Kānuka	<i>Kunzea robusta</i>	15
Toetoe	<i>Austroderia fulvida</i>	10
Koromiko	<i>Hebe stricta</i>	10
Tutu	<i>Coriaria arborea</i>	15
Mahoe	<i>Melicytus ramiflorus</i>	10
Karamu	<i>Coprosma robusta</i>	10
Māpou	<i>Myrsine australis</i>	10
Tarata	<i>Pittosporum eugenioides</i>	10

Focus Area 2 - Meremere Quarry Plant Schedules

Dry hillslopes

Steep, pasture-dominated slopes dominate this landscape currently, so quick-growing colonisers are once again preferred to establish rapidly, develop a canopy and suppress weed/grass growth.

Table 3: Indicative planting mix for the revegetation of the dry hillslope forest areas at Meremere Quarry

Common Name	Botanical Name	% Mix
Mānuka	<i>Leptospermum scoparium</i>	15
Kānuka	<i>Kunzea robusta</i>	15
Tarata	<i>Pittosporum eugenioides</i>	15
Tōtara	<i>Podocarpus totara</i>	15
Mahoe	<i>Melicytus ramiflorus</i>	15
Karamu	<i>Coprosma robusta</i>	15
Māpou	<i>Myrsine australis</i>	10

Toe slope and valley floor

Conditions are moderately wet in the lower slope and gully area, with some winter flooding possibly and summer droughts. Weedy wet-tolerant herbs and rank grasses dominate the gully at present, thus a mixture of representative, wet-tolerant colonisers are preferred to develop a canopy here.

Table 4: Indicative planting mix for the revegetation of the toe slope valley floor forest areas at Meremere Quarry

Common Name	Botanical Name	% Mix
Ti kouka	<i>Cordyline australis</i>	10
Mānuka	<i>Leptospermum scoparium</i>	15
Pigeonwood	<i>Hedycarya arborea</i>	10
Nīkau	<i>Rhopalostylis sapida</i>	10
Tōtara	<i>Podocarpus totara</i>	15
Toetoe	<i>Austroderia fulvida</i>	10
Karamu	<i>Coprosma robusta</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	10
Putaputawētā	<i>Carpodetus serratus</i>	10

3.8 Management and infill planting in indigenous forest and scrub

3.8.1 Restoration objectives

Existing areas of exotic/weedy scrub intermixed with native forest can have their ecological function greatly improved through removal and sustained control of invasive weeds. Creation of canopy gaps as woody weeds are removed provides an opportunity to introduce later successional secondary forest trees into regenerating bush that has been depleted due to successive clearance and stock grazing. Interplanting will facilitate canopy closure and reduce the likelihood of weed reinvasion and will maintain and enhance ecological functions and habitat complexity. It will also accelerate the trajectory of early successional forest towards later successional stages, resulting in a more diverse canopy, as well as greater habitat and food availability for fauna.

3.8.2 Planting specifications

The species mix selected for infill planting is based on the current species makeup of the surrounding forest stand. Planting of seedlings will include site preparation and maintenance as required to provide seedlings with competition-free sites, without harm to existing native vegetation. Planting density, coupled with natural regeneration, is estimated as equivalent to 500 stems per ha.

Focus Area 1 - Hunua Road and Judge Richardson Drive properties

Secondary forest infill

Areas of secondary forest on these properties exist with some weeds present, and evidence of grazing underneath, resulting in a reduced understory and slowed succession. Infill species

have been selected to accelerate succession and make up for plant diversity lost to grazing and browse.

Table 5: Indicative planting mix for the infill plantings of the Hunua Road and Judge Richardson Drive properties

Common Name	Botanical Name	% Mix
Ridge/dry species		
Tanekaha	<i>Phyllocladus trichomanoides</i>	10
Kauri	<i>Agathis australis</i>	10
Miro	<i>Prumnopitys ferruginea</i>	10
Rimu	<i>Dacrydium cupressinum</i>	10
Tōtara	<i>Podocarpus totara</i>	10
Gully/wet species		
Mangeao	<i>Litsea calicaris</i>	10
Pukatea	<i>Laurelia novae-zelandiae</i>	10
Pūriri	<i>Vitex lucens</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	10
Taraire	<i>Beilschmiedia tarairi</i>	10

Kanuka and tree fern scrub infill

Kanuka and tree-fern dominated scrub is found within retained areas surrounding Symonds Pit, with some canopy gaps caused by weeds and pest browse. Species that will accelerate the regeneration and succession of these areas into secondary forest are suggested below.

Table 6: Indicative planting mix for the infill planting of the kanuka and tree fern scrub areas surrounding Symonds Pit.

Common Name	Botanical Name	% Mix
Ridge/dry species		
Tanekaha	<i>Phyllocladus trichomanoides</i>	15
Kauri	<i>Agathis australis</i>	10
Rimu	<i>Dacrydium cupressinum</i>	10
Tōtara	<i>Podocarpus totara</i>	15
Gully/wet species		
Pigeonwood	<i>Hedycarya arborea</i>	15
Nīkau	<i>Rhopalostylis sapida</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	15
Putaputawētā	<i>Carpodetus serratus</i>	10

Focus Area 2 - Meremere Quarry

Weedy and grazed secondary forest patches are found within the Meremere planting site, with reduced understory and slowed succession. Infill species have been selected to accelerate succession and make up for plant diversity lost to grazing and weeds.

Table 7: Indicative planting mix for the infill planting of the existing secondary forest areas at Meremere Quarry.

Common Name	Botanical Name	% Mix
Ridge/dry species		
Tanekaha	<i>Phyllocladus trichomanoides</i>	15
Kauri	<i>Agathis australis</i>	10
Rimu	<i>Dacrydium cupressinum</i>	10
Tōtara	<i>Podocarpus totara</i>	15
Gully/wet species		
Pigeonwood	<i>Hedycarya arborea</i>	15
Nīkau	<i>Rhopalostylis sapida</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	15
Putaputawētā	<i>Carpodetus serratus</i>	10

Focus Area 3 (Hunua Ranges)

Forest found on and adjacent to the alluvial terraces surrounding the Mangatawhiri River is generally early successional, with very large areas of blackberry and invasive weeds interrupting it. Flood and wet-tolerant species have been selected that can grow to effectively suppress weeds and stabilise the watercourse.

Secondary forest infill

Table 8: Indicative planting mix for the infill planting of the existing secondary forest areas in the Hunua Ranges planting sites.

Common Name	Botanical Name	% Mix
Pukatea	<i>Laurelia novae-zelandiae</i>	15
Tawa	<i>Beilschmiedia tawa</i>	15
Rimu	<i>Dacrydium cupressinum</i>	10
Tōtara	<i>Podocarpus totara</i>	10
Pigeonwood	<i>Hedycarya arborea</i>	10
Nīkau	<i>Rhopalostylis sapida</i>	15
Kahikatea	<i>Dacrycarpus dacrydioides</i>	15
Putaputawētā	<i>Carpodetus serratus</i>	10

Kanuka and treefern scrub infill

Table 9: Indicative planting mix for the infill planting of the existing kānuka and tree fern scrub areas in the Hunua Ranges planting sites

Common Name	Botanical Name	% Mix
Kohekohe	<i>Dysoxylum spectabile</i>	10
Pūriri	<i>Vitex lucens</i>	15
Kōwhai	<i>Sophora microphylla</i>	10
Karamu	<i>Coprosma robusta</i>	15
Pigeonwood	<i>Hedycarya arborea</i>	10
Nīkau	<i>Rhopalostylis sapida</i>	15
Kahikatea	<i>Dacrycarpus dacrydioides</i>	15
Putaputawētā	<i>Carpodetus serratus</i>	10

3.9 Wetland Enhancement

3.9.1 Wetland Restoration and Enhancement objectives

The degraded state of the wetland features identified for restoration are the result of historic indigenous vegetation clearance and replacement with pasture species, and ongoing stock grazing. In addition to habitat depletion, these activities cause continued soil erosion and contribute to deposition of sediment and nutrients in the receiving environment.

Exclusion of stock and revegetation of the wetland features will re-establish indigenous wetland community assemblages and habitat for wetland fauna and restore wetland hydrological and physico-chemical functions (e.g., capture and detention of sediment, assimilation of nutrients and buffering of the receiving environment by reducing the rate of peak flows of water and sediment).

3.9.2 Farm Pond Decommissioning

Pond drainage and redesign

Farm pond decommissioning (across 7 features within Focus Area 1) will involve earthworks to lower the existing bund that prevents flows from discharging (other than in flood events).

The pond will be gradually drained, with the discharge directed to ground, to prevent accumulated sediment or stagnant water entering the natural watercourse.

The bathymetry of pond will remain unmodified, and a low bund or weir will be retained to allow the feature to accumulate standing water. Pond edges will be recontoured as appropriate to prevent erosion and scour. Pond substrates shall be assessed to ensure they are suitable for planting and amended as required.

Fish passage reinstatement

In order to provide access to upper catchment for climbing fish, the wetland bund will be designed to allow fish passage. Conventional weir designs that incorporate smooth concrete bottoms and steep hydraulic drops are unsuitable for providing fish passage and should be avoided where practicable. The NZ Fish Passage Guidelines³ provide design criteria for nature-based solutions for fish passage over weirs:

- Broad-crested weir designs shall be used.
- Weir crests shall be rounded.
- The weir shall have a V-shaped lateral profile providing shallow, low velocity wetted margins on the weir face across the fish passage design flow range.
- The slope of the downstream weir face shall be minimised.
- The use of smooth concrete on the weir face shall be avoided or minimised.
- Vertical wing walls shall be avoided.

Where practicable the weir should be built as a rock ramp fishway (e.g. **Figure 7**). Rock ramp and conventional weir designs should have a V-shaped lateral profile that rises towards the riverbanks producing zones of calmer flow in the marginal areas and a low-flow channel towards the centre of the weir.

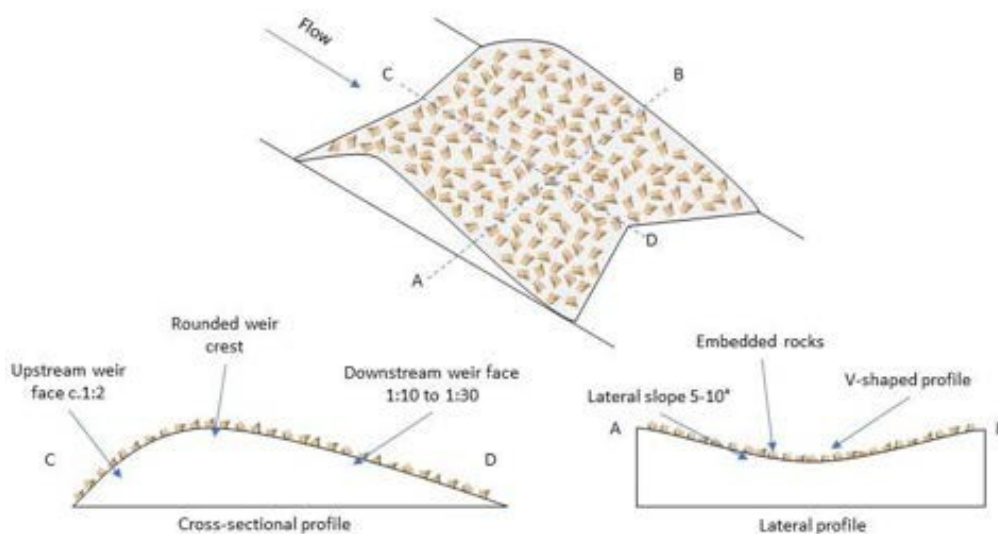


Figure 7: Indicative weir design for wetland outfall (from NZ Fish Passage Guidelines).

3.9.3 Wetland Planting Specifications

Focus Area 1 – Hunua Road

Rehabilitated and reclaimed stock ponds shall be revegetated with canopy-forming rushes and sedges to prevent stagnation of water features and create habitat for cryptic wetland birds. Sedges and rushes will be planted in intermittently wet flowpaths and margins, while wet-

tolerant forest species will be planted in the surrounding revegetation plantings to create a wetland-forest ecotone and provide a seed source for natural colonisation into the wetland feature, to promote succession to a wet forest community assemblage.

Table 10: Indicative planting mix for areas of standing water for the Hunua Quarry expansion wetland offset.

Common Name	Botanical Name	% Mix
Kutakuta	<i>Eleocharis sphacelata</i>	15
Jointed twig rush	<i>Machaerina articulata</i>	15
Raupō	<i>Typha orientalis</i>	40
Rautahi	<i>Carex geminata</i>	15
Kūwī	<i>Carex secta</i>	15

Table 11: Indicative planting mix for intermittently wet flowpaths and wetland margins adjoining decommissioned ponds

Common Name	Botanical Name	% Mix
Tī kouka	<i>Cordyline australis</i>	10
Rautahi	<i>Carex geminata</i>	15
Toetoe	<i>Austroderia fulvida</i>	10
Upoko tangata	<i>Cyperus ustulatus</i>	10
Wiwi	<i>Juncus pallidus</i>	10
Purei	<i>Carex virgata</i>	15
Hukihuki	<i>Coprosma tenuicaulis</i>	15
Harakeke	<i>Phormium tenax</i>	15

Table 12: Indicative planting mix for forest/wetland gradient surrounding wetland features

Common Name	Botanical Name	% Mix
Tī kouka	<i>Cordyline australis</i>	10
Mānuka	<i>Leptospermum scoparium</i>	10
Mānatu	<i>Plagianthus regius</i>	10
Nīkau	<i>Rhopalostylis sapida</i>	10
Harakeke	<i>Phormium tenax</i>	10
Toetoe	<i>Austroderia fulvida</i>	10
Karamu	<i>Coprosma robusta</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	20
Putaputawētā	<i>Carpodetus serratus</i>	10

Focus Area 2 – Meremere Quarry

Three small swamp features surround the upper reaches of the stream that intersects the valley floor to the north-east of the quarry pit, The planting specifications for these features comprise an assemblage of sedgeland and wet scrubland.

As with Focus Area 1, wet-tolerant forest species will be planted in the surrounding revegetation plantings to create a wetland-forest ecotone and provide a seed source for natural colonisation into the wetland feature, to promote succession to a wet forest community assemblage.

Table 13: Indicative planting mix for the swamp features of the Meremere quarry planting area

Common Name	Botanical Name	% Mix
Tī kouka	<i>Cordyline australis</i>	10
Rautahi	<i>Carex geminata</i>	15
Toetoe	<i>Austroderia fulvida</i>	10
Upoko tangata	<i>Cyperus ustulatus</i>	10
Wiwi	<i>Juncus pallidus</i>	10
Purei	<i>Carex virgata</i>	15
Hukihuki	<i>Coprosma tenuicaulis</i>	15
Harakeke	<i>Phormium tenax</i>	15

Table 14: Indicative planting mix for forest/wetland gradient surrounding wetland features at Meremere Quarry

Common Name	Botanical Name	% Mix
Tī kouka	<i>Cordyline australis</i>	10
Mānuka	<i>Leptospermum scoparium</i>	10
Mānatu	<i>Plagianthus regius</i>	10
Nīkau	<i>Rhopalostylis sapida</i>	10
Harakeke	<i>Phormium tenax</i>	10
Toetoe	<i>Austroderia fulvida</i>	10
Karamu	<i>Coprosma robusta</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	20
Putaputawētā	<i>Carpodetus serratus</i>	10

Focus Area 3 – Hunua Regional Parkland

Blackberry has infested areas on low-lying, flood-prone alluvial terraces where disturbance associated with periodic flooding has removed or suppressed other vegetation cover, creating an opportunity for blackberry colonisation due to its extremely fast growth rate and ability to

spread both vegetatively and from a persistent seed bank. Blackberry persists through seasonal wet/dry cycles typical of alluvial wetlands, as while it is not regarded as a wet-adapted species (and may die back during periods of prolonged saturation), it is very quick to re-establish. However, blackberry is light-demanding and quickly loses its vigour when shaded.

Accordingly, replanting of alluvial terraces will require dense plantings to rapidly establish a closed canopy. Selected species must be able to withstand wet conditions and periodic disturbance.

As with Focus Areas 1 and 2, wet-tolerant forest species will be planted in the surrounding revegetation plantings to create a wetland-forest ecotone from the low-lying terrace to the toeslopes of surrounding hills. Woody specimens and harakeke will be established in sites that are buffered from flood flows to ensure they are not dislodged.

Table 15: Indicative planting mix for the blackberry-infested alluvial terraces surrounding Mangatawhiri River

Common Name	Botanical Name	% Mix
Tī kouka	<i>Cordyline australis</i>	10
Rautahi	<i>Carex geminata</i>	20
Toetoe	<i>Austroderia fulvida</i>	15
Mingimingi	<i>Coprosma propinqua</i>	10
Hukihuki	<i>Coprosma tenuicaulis</i>	10
Harakeke	<i>Phormium tenax</i>	10

Table 16: Indicative planting mix for forest/wetland gradient surrounding wetland features at Mangatawhiri Stream

Common Name	Botanical Name	% Mix
Tī kouka	<i>Cordyline australis</i>	10
Mānuka	<i>Leptospermum scoparium</i>	10
Mānatu	<i>Plagianthus regius</i>	10
Nīkau	<i>Rhopalostylis sapida</i>	10
Harakeke	<i>Phormium tenax</i>	10
Toetoe	<i>Austroderia fulvida</i>	10
Karamu	<i>Coprosma robusta</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	20
Putaputawētā	<i>Carpodetus serratus</i>	10

3.10 Riparian Enhancement

3.10.1 Riparian Restoration objectives

The primary purpose of riparian planting is to provide canopy cover to the watercourse, and to create a vegetated ecotone that improves connectivity with the adjacent forest area. Exclusion of stock (from Focus Areas 1 & 2) and revegetation of riparian buffers will improve aquatic habitat values and productivity of the stream environment, address stream bank erosion rates and reduce nutrient and sediment inputs to the receiving catchments.

3.10.2 Riparian Planting specifications

Specifications for the diversion, reconstruction and enhancement of the Mangapū Stream Tributary is detailed in the Stream Realignment Management Plan⁴.

Focus Area 1 - Hunua Road

Table 17: Indicative planting plan for the riparian zone of the Hunua Road planting areas.

Common Name	Botanical Name	% Mix
Ti kouka	<i>Cordyline australis</i>	10
Rautahi	<i>Carex geminata</i>	15
Toetoe	<i>Austroderia fulvida</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	10
Pukatea	<i>Laurelia novae-zelandiae</i>	10
Tutu	<i>Coriaria arborea</i>	15
Hukihuki	<i>Coprosma tenuicaulis</i>	15
Harakeke	<i>Phormium tenax</i>	15

Focus Area 2 – Meremere Quarry Site

Table 18: Indicative planting plan for the riparian zone of the Meremere Quarry planting areas.

Common Name	Botanical Name	% Mix
Ti kouka	<i>Cordyline australis</i>	20
Rautahi	<i>Carex geminata</i>	20
Toetoe	<i>Austroderia fulvida</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	10
Upoko tangata	<i>Cyperus ustulatus</i>	10
Hukihuki	<i>Coprosma tenuicaulis</i>	15
Harakeke	<i>Phormium tenax</i>	15

Focus Area 3 – Mangatawhiri Stream

Table 19: Indicative planting plan for the riparian zone of the Mangatawhiri Stream planting areas.

Common Name	Botanical Name	% Mix
Ti kouka	<i>Cordyline australis</i>	10
Rautahi	<i>Carex geminata</i>	15
Toetoe	<i>Austroderia fulvida</i>	10
Kahikatea	<i>Dacrycarpus dacrydioides</i>	10
Pukatea	<i>Laurelia novae-zelandiae</i>	10
Tutu	<i>Coriaria arborea</i>	15
Hukihuki	<i>Coprosma tenuicaulis</i>	15
Harakeke	<i>Phormium tenax</i>	15

4.0 Implementation, Maintenance and Monitoring

This section provides overarching guidance for planting implementation, staging and aftercare, including maintenance and monitoring, to help Winstone Aggregates achieve timely and effective outcomes.

4.1 Responsibilities

Winstone Aggregates will oversee the implementation of this plan and ensure the intended outcomes for the Site are achieved. Planting and aftercare are expected to be carried out by contractors with proven experience and capacity to deliver high-quality, consistent work across the project.

All ecological actions shall be confirmed on Site with the approval of Winstone Aggregates or its nominated representative to ensure that the intended landscape, ecological and visual outcomes are achieved.

4.2 Review and re-certification

This EMP is being provided with the substantive application and will be certified by Auckland Council prior to implementation by Winstone Aggregates, in accordance with the Conditions of Consent.

4.3 Plant Supply

The genetic source of all New Zealand native plant material shall be from the relevant Ecological Region, and preferably Ecological District.

Plant material refers to all plants required for the project, as shown on the plans and detailed in the plant schedules. No plant species may be substituted without the prior approval of Winstone Aggregates or its nominated representative. If specified species are unavailable at the time of planting, substitute alternatives may be proposed and approved by a qualified landscape architect or ecologist.

All plants shall be high-quality nursery stock, true to name and type, with well-shaped trunk or stem and head. Stock shall be well hardened to suit local site conditions and free from pests, diseases, and physical defects.

Root systems shall be healthy and fibrous, with roots just reaching the container edge. Plants showing root circling or poor structure should be rejected.

Plants shall also be free from damage such as knots, bark abrasions, wind, or frost injury, and should show evidence of correct pruning.

All plant material is to be made available for inspection by Winstone Aggregates or its nominated representative, prior to planting.

Each plant, or bundle of plants, shall carry a legible label showing the approved botanical name, quantity, and any other required identified details. Plant sizes are to be specified by root trainer or litre container size.

4.4 Maintenance

Extended maintenance will continue for at least five years after planting is completed. During this period, site inspections will occur at least once every three months, and any planting failures will be replaced to maintain full cover. By the end of this period, at least 90% of plants must be well established and demonstrating strong growth, with compliance confirmed by a suitably qualified and experienced Ecologist.

Control of browsing ungulates, possums, rabbits and hares will be implemented if maintenance inspections identify indications of browsing pests. If rabbits are regularly seen, abundance will be assessed in late summer (February/ March) using the Modified McLean Scale (BioNet 2020) with a score of 3 used as a threshold for control.

4.5 Monitoring and Performance Targets

Monitoring of all plantings is required to determine overall plant mortality, survivorship and growth rates. Key elements include:

- Recording the survival and growth of planted areas and refine future species selection and planting programmes.
- Identifying animal pest damage (e.g., browsing, digging, or trampling) as a trigger for pest control actions.
- Monitoring the incidence and persistence of invasive plant species.

Tracking of survivorship and growth of specimens will provide quantitative data of progress and success. Key measurements will include percentage survivorship of specimens, and percentage canopy cover.

Photographic records, including fixed point photos, aerial imagery, and views from key vantage points, will be used to monitor progress. General observations of site conditions, pest browse, frost/ drought damage, encroachment of weeds, overall plant condition, etc. also be noted, along with remediation actions required.

Comprehensive record-keeping will support the accumulation of site-specific knowledge. Management practices will be reviewed and updated annually based on monitoring insights.

Initial monitoring and maintenance by Winstone or their nominated representative will occur at least every two months for the first six months following planting, and again in spring, early summer, and late summer during the first two years. Monitoring each season and stage will enable timely supplementary planting or management actions to ensure plant establishment and survival.

Independent monitoring by a suitably qualified ecologist will also be undertaken to assess the success of planting and determine whether additional management is required. Ecological monitoring will occur twice in the first year following planting, and then annually thereafter.

Terrestrial, riparian and wetland revegetation will be assessed as completed when all of the following metrics are achieved:

- 80% canopy closure, in general accordance with composition and densities specified in detailed planting plans;
- Minimum plant survival rate of 90% planted specimens (or the original planting density); and
- All planting areas free of invasive weed species (<5% vegetation cover).

Infill planting in indigenous forest and scrubland will be assessed as completed when the following metrics are all achieved:

- Plant specimens established in general accordance with composition and densities specified in detailed planting plans;
- Minimum plant survival rate of 90% planted specimens (or the original planting density); and
- All planting areas free of invasive weed species (<5% vegetation cover).

4.6 Reporting

Works will be documented as they are completed, including records of plant replacements, any management adaptations required. Results of survivorship and growth monitoring and photographic records of each stage of works will be compiled. Photographs shall be taken at least annually and captured from similar locations and at the same times of year to enable year-to-year comparisons. Photo images shall be dated, clear and not affected by sunstrike.

A brief annual Monitoring Report shall be prepared each year for Winstone Aggregates until the completion targets are met. Monitoring reports shall include:

- Dates of visits;

- Photographs as appropriate;
- Condition of the vegetation;
- Number of plants replaced during the year;
- Stages of implementation completed;
- Pest and weed status;
- Condition of plant health;
- Identification of any arising issues that require special monitoring; and
- Any actions required.

The Monitoring Report shall be made available to Auckland Council on request.

4.7 Implementation Phases and Schedule

A high-level implementation schedule for key components of the ecological enhancement measures set out in the EMP is provided in **Table 20**.

Table 20: Implementation schedule for ecological enhancement measures.

			YEAR 1			YEAR 2	YEARS 3 - 5	YEARS 5 - 10	c. Year 30				c. Year 31-35															
Focus Area 1	OBDA	Revegetation											Formalise legal protection of OBDA site	Contractor Site Inspection	Order Plants	Pre-planting site preparation (soil amendment, etc); undertake planting	Monitoring and maintenance, >90% canopy cover achieved in all plantings by Year 35											
		Rural properties																Riparian planting	Formalise legal protection of offset/compensation sites	Contractor Site Inspection: Assess presence of browsing pests (and associated fencing requirements), soil conditions, existing vegetation cover, confirm plant schedules	Order plants	Farm pond decommissioning	Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake riparian and wetland planting		Monitoring and maintenance; >90% canopy cover achieved by Year 7			
	Wetland enhancement																	Plantation forest harvest					Foliar spray woody weeds		Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake revegetation and infill planting		Monitoring and maintenance, >90% canopy cover achieved in all plantings by Year 10	
	Revegetation																						Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake riparian and		Monitoring and maintenance; >90% canopy cover achieved by Year 7			
	Infill planting																						Foliar spray woody weeds		Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake revegetation and infill planting		Monitoring and maintenance, >90% canopy cover achieved in all plantings by Year 10	
Focus Area 2	Meremere Quarry	Riparian planting	Existing reserve status			Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake riparian and		Monitoring and maintenance; >90% canopy cover achieved by Year 7																				
		Wetland enhancement				Plantation forest harvest	Foliar spray woody weeds		Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake revegetation and infill planting		Monitoring and maintenance, >90% canopy cover achieved in all plantings by Year 10																	
		Revegetation					Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake riparian and		Monitoring and maintenance; >90% canopy cover achieved by Year 7																			
		Infill planting					Foliar spray woody weeds		Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake revegetation and infill planting		Monitoring and maintenance, >90% canopy cover achieved in all plantings by Year 10																	
Focus Area 3	Hunua Regional Park	Riparian planting	Existing reserve status			Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake riparian and wetland planting		Monitoring and maintenance; >90% canopy cover achieved by Year 7																				
		Wetland enhancement				Foliar spray woody weeds	Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake riparian and		Monitoring and maintenance; >90% canopy cover achieved by Year 7																			
		Revegetation					Foliar spray woody weeds, cut back blackberry and spray regrowth		Pre-planting site preparation (soil amendment, fell and mulch dead exotic trees),undertake revegetation and infill planting		Monitoring and maintenance, >90% canopy cover achieved in all plantings by Year 10																	

5.0 References

- (1) Boffa Miskell. Hunua Quarry Long Term Development Project: Assessment of Ecological Effects. Prepared for Winstone Aggregates., 2026.
- (2) Boffa Miskell. Hunua Quarry Development Landscape Rehabilitation Strategy and Management Plan. Prepared for Winstone Aggregates Ltd., 2026.
- (3) NIWA. New Zealand Fish Passage Guidelines, Version 4.5, 2025.
- (4) Boffa Miskell. Hunua Quarry Development Mangapu Stream Tributary Realignment Management Plan. Prepared for Winstone Aggregates Ltd., 2026.