

**WESTERN SPRINGS NATIVE BUSH
RESTORATION PROJECT
ANNUAL REPORT**

MARCH 2023



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environments



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RESTORATION PROJECT
ANNUAL REPORT**

Contract Report No. 5850b

March 2023

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CONTENTS

1.	OVERVIEW	1
2.	WORKS UNDERTAKEN	2
2.1	Planting	2
2.1.1	Year 1 Initial Revegetation Grade Planting	2
2.1.2	Year 1 Specimen Grade Tree Planting	2
2.1.3	Year 2 Infill Planting	3
2.1.4	Year 2 Kauri Planting	3
2.2	Pest Plant Control and Plant Maintenance	3
2.2.1	Initial pest plant control	3
2.2.2	Maintenance Visits	4
2.3	Pest Animal Control	4
3.	RESTORATION PROGRESS	4
3.1	Protect areas of high value indigenous vegetation during pine felling	4
3.2	Minimise adverse impacts on the wider area of indigenous understorey.	4
3.3	Revegetate all bare ground	5
3.4	Restore the true right floodplain of Motions Creek	5
3.5	Control all environmental pest plants	5
3.6	Control key pest animals	5
4.	SUMMARY AND MANAGEMENT RECOMMENDATIONS	6
APPENDIX		
1.	Site photographs	10

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1. OVERVIEW

The purpose of this annual report is to satisfy Conditions 72 and 73 of the resource consent for pine tree (*Pinus radiata*) removal and restoration activities at the Western Springs Native Bush Restoration Project:

Annual Restoration Plan Report

72. The consent holder shall provide an annual report, to Council's Team Leader Monitoring (Central), at the end of each planting season following completion of the pine tree removal activity for a fifteen (15) year period.
73. The purpose of this annual report is to detail the outcomes of the pine removal and actions to prevent and minimise damage to the understorey, to detail progress towards achieving the goal and objectives set out in Section 2 of the Wildlands Ecological Management Plan dated March 2019, and to determine the health of the newly planted tree and shrub species and monitor the progress of the site-wide restoration and rehabilitation activities, and provide any recommendations for adaptive management.

The overall goal set out in Section 2 of the Ecological Management Plan (Wildland Consultants 2019) (EMP) is to:

“return exotic pine-dominated vegetation within a Significant Ecological Area to floristically diverse indigenous mixed podocarp-broadleaved species forest that will provide important protected habitat for indigenous fauna as well as significantly enhance the ecological and amenity values of Western Springs Park and surrounding areas.”

The objectives within the EMP are to:

- Protect areas of high value indigenous vegetation during the pine-felling operation, including riparian vegetation buffering the intermittent stream.
- Minimise adverse impacts on the wider area of indigenous understorey.
- Revegetate all bare ground, including the access track, following the pine-felling operation.
- Restore the true right floodplain of Motions Creek.
- Control all environmental pest plants.
- Control key pest animals within the project area to maintain low populations of these species and enhance the habitat value of the site for indigenous fauna.

This report outlines all ecological restoration activities since pine removal works undertaken in May 2021 and assesses the progress of the restoration activities and how they are achieving the EMP goal and objectives. Future management recommendations are also provided.

2. WORKS UNDERTAKEN

2.1 Planting

2.1.1 Year 1 Initial Revegetation Grade Planting

Planting occurred between 14 July and 10 August 2021 (Plate 1). A total of 7,428 revegetation grade plants were planted across the four planting areas (A-D; Figure 1). The number of each species planted within each of the four planting areas is provided in Table 1.

Table 1: Number of each revegetation grade species planted in each planting area in 2021.

Species	Common Name	Area A	Area B	Area C	Area D	Total
<i>Alectryon excelsa</i>	Tītoki				25	25
<i>Carex lessoniana</i>	Rautahi			112	1075	1187
<i>Carex virgata</i>	Pūrei				1036	1036
<i>Carpodetus serratus</i>	Putaputawētā			32	72	104
<i>Coprosma robusta</i>	Karamū	478	179		73	730
<i>Cordyline australis</i>	Ti kōuka, cabbage tree	455		25	74	554
<i>Corynocarpus laevigatus</i>	Karaka	136				136
<i>Dacrycarpus dacrydioides</i>	Kahikatea	111			25	136
<i>Dysoxylum spectabile</i>	Kohekohe	96		10		106
<i>Hoheria populnea</i>	Houhere, lacebark	226	35	20	32	313
<i>Kunzea robusta</i>	Kānuka	1061				1061
<i>Laurelia novae-zelandiae</i>	Pukatea	0			25	25
<i>Leptospermum scoparium</i>	Manuka	95			68	163
<i>Meliccytus ramiflorus</i>	Māhoe	686	50	40	55	831
<i>Phormium tenax</i>	Harakeke	0	75		60	135
<i>Piper excelsum</i>	Kawakawa	95	91	20		206
<i>Pittosporum tenuifolium</i>	Kōhūhū	174				174
<i>Podocarpus totara</i>	Tōtara	200			22	222
<i>Sophora chathamica</i>	Kowhai	122		20		142
<i>Vitex lucens</i>	Pūriri	142				142
Total Year 1		4077	430	279	2642	7428

2.1.2 Year 1 Specimen Grade Tree Planting

Twenty specimen grade trees were planted, staked, and mulched in Planting Area B in 2021 (Table 2; Plate 2).

Table 2: Number of each specimen tree grade species planted in Area B in 2021.

Species	Common Name	Area B
<i>Beilschmiedia tarairi</i>	Tarairi (45L)	5
<i>Corynocarpus laevigatus</i>	Karaka (45L)	5
<i>Dysoxylum spectabile</i>	Kohekohe (45L)	10
Total Specimen Trees		20

2.1.3 Year 2 Infill Planting

Infill planting to replace rabbit-browsed plants and plants that failed to establish within the cleared areas of Planting Area A (Figure 1) was undertaken in September 2022 (Plate 3). The number of each species planted is presented in Table 3.

Table 3: The number of each species planted to infill gaps within Planting Area A, September 2022.

Species	Total
<i>Coprosma robusta</i>	70
<i>Cordyline australis</i>	50
<i>Corynocarpus laevigatus</i>	20
<i>Hoheria populnea</i>	25
<i>Kunzea robusta</i>	120
<i>Leptospermum scoparium</i>	40
<i>Meliccytus ramiflorus</i>	65
<i>Podocarpus totara</i>	20
<i>Hedycarya arborea</i>	50
Total	460

2.1.4 Year 2 Kauri Planting

A total of 720 canopy species plants are scheduled for planting in Year 3 of the project (2023). However, 178 kauri (*Agathis australis*) grown for the project were ready for planting in 2022 and were planted on 20 September 2022 (Table 4). The kauri were planted throughout the site in suitable areas (Plate 4), excluding the upper residential boundary of Area B and the immediate stream edge of Area D.

Table 4: Year 3 kauri planted at Western Springs in September 2022.

Species	Grade	Total
<i>Agathis australis</i>	PB5	178
Total		178

2.2 Pest Plant Control and Plant Maintenance

2.2.1 Initial pest plant control

Pest plant control was undertaken across the entire project area (Figure 1) on the completion of pine removal works (May/June 2021). The project area was systematically searched, and all pest plants encountered were controlled.

The pest plant infestations were dealt with *in situ*, removing the need for disposal. Several pest plant control methods were used, depending on the target species and infestation size. These included hand-pulling seedlings, cutting vines and tree pest plants and treating the stumps with herbicide, applying basal herbicide, and foliar spraying ground-cover pest plants.

2.2.2 Maintenance Visits

Maintenance visits to control re-establishing pest plants and prevent exotic vegetation from smothering indigenous plants were undertaken three times in the first year since planting was completed, and are being undertaken three times in the second year after initial planting (2022/2023).

2.3 Pest Animal Control

Sixteen lockable Ambush rat bait stations and five Timms possum traps were installed across the site. The location of each installed device is illustrated in Figure 2.

Pest animal control pulses are undertaken four times per year. During each pulse the bait stations are filled with 3×84 grams of bait. Each bait station is then visited four times to check and record bait take. Any remaining bait is removed on the fourth visit. Bromadiolone bait blocks are used for Pulse 1 of each year and diphacinone for Pulses 2-4.

Each Timms trap is baited with fresh apple and a cinnamon flour lure applied. The traps are visited four times to check and re-set as required.

3. RESTORATION PROGRESS

3.1 Overview

The ecological restoration activities (pest plant control, planting, maintenance, and pest animal control) undertaken since pine tree removal have enhanced the ecological and amenity values of the Western Springs Bush Restoration site and surrounding areas. Planting the range of species listed in Tables 1-4 have added to the existing indigenous vegetation at the site, which together will develop into a floristically diverse indigenous podocarp-broadleaved species forest. The pest plant and pest animal control undertaken further helps protect indigenous flora and indigenous fauna.

Progress towards achieving each of the objectives set out within the EMP are outlined below, including assessments on the health of planted and pre-existing vegetation as relevant.

3.2 Protection of high value indigenous vegetation during pine felling

During the pine felling operation, measures were undertaken to avoid damage to high value indigenous vegetation at the site. This included felling pines in a direction that would cause the least damage to pre-identified mature indigenous trees, riparian vegetation buffering the intermittent stream and other Priority Areas of Protection identified in the EMP. This objective was satisfied.

3.3 Minimisation of adverse impacts on wider area of indigenous understorey

The health of the existing indigenous understorey appears to have improved since pine felling with new growth observed on existing indigenous plants across the site. Any adverse impacts on the wider area of indigenous understorey from the pine felling have

been off-set by the growth rates and natural regeneration occurring. Pest plant and animal control will continue to improve the health of the existing indigenous vegetation.

3.4 Revegetation of all bare ground

All bare ground (excluding existing and proposed walking tracks) within areas cleared of vegetation during pine removal activities have been revegetated with a diverse mix of suitable indigenous tree and shrub species (Tables 1 and 3). The plants have established well and canopy closure is already occurring within the sheltered parts of the cleared area (Plates 5 and 6). Natural regeneration, and regrowth from indigenous vegetation damaged during pine removal works, is also occurring across much of the cleared area.

Plant growth within exposed areas in the east of Planting Area A (Figure 1) has naturally been slower (Plates 7 and 8). Soil conditions and rabbit browse in the first weeks after initial planting also contributed to slower growth rates in this area. Rabbit control has since been undertaken at the site by Council and plants are now well-established.

The depth of wood chip mulch at one location within the cleared area initially prevented successful plant establishment. As the mulch decomposes over time, plant establishment is expected to be possible. Infill planting that occurred around the area of deep mulch in 2022 has survived. Natural regeneration and regrowth of tree ferns within and near this area is occurring and is expected to cover the area of deep mulch over time.

A slip has occurred below the property at 16 West View Road following the extreme rainfall event on 27 January 2023 (Plate 9) and covers an area where vegetation was both present prior to pine removal and planted since.

3.5 Restoration of the true right floodplain of Motions Creek

The true right floodplain of Motions Creek (Planting Area D) has been revegetated with 2,110 closely planted sedges and 530 trees and shrubs (Table 1) following pest plant control. Plants are well-established and a continuous sedge canopy cover has occurred over most of Planting Area D (Plate 10). Crack willow and other pest plants that were formerly present within Planting Area D have been successfully controlled (Plate 11). Pest plants such as palm grass and nasturtium are controlled during regular maintenance visits to ensure the ongoing restoration of the floodplain is achieved.

3.6 Control of all environmental pest plants

All environmental pest plants at the site were targeted for control after pine removal and before planting, and during regular maintenance visits in spring, summer, and autumn each year. The regular visits to prevent pest plants re-establishing from the seedbank or new arrivals into the site is resulting in lower pest plant incidence.

3.7 Control of key pest animals

Four rat and possum control pulses have been undertaken to date. The total amount of bait taken from all bait stations during each pulse is provided in Table 5. There is a

clear trend of bait take declining with each pulse, indicating that the rat population is likely declining, and therefore the control is effective.

No possums have been caught, indicating the possum population in the area is already very low.

Table 5: Total bait take from all bait stations during each pulse.

Bait used	Apr-22	Jun 22	Sep 22	Dec 22
	Bromadiolone	Diphacinone	Bromadiolone	Diphacinone
Total Bait Take (g)	4,816	3,514	2,072	1,022

4. SUMMARY AND MANAGEMENT RECOMMENDATIONS

The ecological restoration of the Western Springs Native Bush Restoration Project site has progressed well since pine removal. Indigenous plants (existing from pre-pine removal, naturally regenerating, and planted) are well-established and healthy across the site, although exposed parts of the cleared area have been slower to establish and might require further planting in the future. The slip below 16 West View Road requires further assessment before a decision can be made on the management actions, including whether it should be replanted in the 2023 planting season in order to restore stability to the slope and prevent light-demanding pest plants species from establishing. Potential ongoing bank stability and safety issues, and the adjoining property, are factors to consider.

Canopy species requiring shelter are scheduled for planting in autumn/winter 2023 to provide greater diversity for eventual canopy species that require shelter to establish. Ongoing pest plant control occurring at the site as set out in the EMP is effective at maintaining a low incidence of pest plants. Rat control pulses appear to be reducing the rat population (based on bait take).

To formally assess changes in vegetation and the success of restoration activities, a monitoring regime is required. Vegetation measurement to monitor size and number of indigenous plants within the cleared areas is being undertaken by Auckland Council. Further monitoring activities could measure the progress of the site-wide restoration activities (as per Consent Condition 73).

The following ongoing management actions for the Western Springs Restoration site are recommended:

- Plant Year 2 canopy species within suitably sheltered areas of the site as planned.
- Monitor and assess the slip site behind 16 West View Road and decide whether replanting should occur, and if so, when.
- Further monitor plant establishment within the cleared area over the next year and assess whether further infill planting is required in 2024 to ensure canopy closure over the whole site will be achieved.
- Assess any planting requirements after installation of the proposed loop track is completed.

- Continue regular scheduled pest plant control and maintenance visits to maintain a low incidence of pest plants across the site.
- Continue rat control pulses to further reduce and suppress rat populations.
- Continue to monitor rabbit presence and signs of browse on indigenous vegetation and undertake rabbit control if required.
- Design and undertake a monitoring program to formally measure the success of restoration activities.



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Figure 1. Planting Areas within Western Springs native bush restoration project.

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Figure 2. Bait Station and Timms Trap locations within Western Springs native bush restoration project

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SITE PHOTOGRAPHS



Plate 1: Planting within the cleared area in progress. 14 July 2021.



Plate 2: A 45L specimen taraire planted, staked, and establishing well in Planting Area B. 1 February 2022.



Plate 3: Infill plants (foreground) among established plants within the upper areas of Planting Area A. 19 September 2022.



Plate 4: Kauri planted within a suitable, sheltered area. 19 September 2022.



Plate 5: Plant establishment within a sheltered area of Planting Area A (foreground) with vegetation existing prior to pine removal in the background. 19 September 2022.



Plate 6: Indigenous plant establishment and natural regeneration in a sheltered area of Planting Area A. 20 September 2022.



Plate 7: Initially slow plant establishment rates within the higher, exposed parts of the cleared area within Planting Area A. 1 February 2022.



Plate 8: Indigenous plant establishment within exposed cleared areas of Planting Area A. 20 September 2022.



Plate 9: The slip behind 16 West View Road. 1 February 2023.



Plate 10: Indigenous sedge establishment along the true right floodplain of Motions Creek (Planting Area D). 1 February 2022.



Plate 11: Controlled crack willow on the true right side of Motions Creek.
12 May 2022.



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