



Macraes MP4 Project

Stream Compensation Plan

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Cover photo: Permanent reach of Trimbells Gully to be impacted by proposed works, photo December 2025.

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1 INTRODUCTION

1.1 Background

OceanaGold (New Zealand) Limited ('OGNZL') currently undertakes open pit and underground gold mining operations at the Macraes Operation located at Golden Point Road, Macraes Flat, East Otago ('the site'). As part of their ongoing operations, OGNZL continually reviews the remaining life of the Macraes Operation in light of updated knowledge of the gold resource and the economics of mining.

Reflecting recent exploration success and optimisation work, together with higher gold prices, the Macraes Phase Four Project ('MP4' or 'the Project') seeks to extend the life of mining at the Macraes Operation until at least 2039. The Project, which will enable ongoing gold production at a rate of approximately 130,000 ounces per annum, is identified as a Listed Project in Schedule 2 of the Fast-track Approvals Act 2024 ('FTAA') as a project providing significant national or regional benefits.

Parts of the works associated with MP4 require the reclamation of portions of two waterways.

The contents of this plan set out the requirements for enhancement of the nominated compensation waterways – Murphys Creek and North Branch Waikouaiti River. It includes planting plans, schedules, and recommended maintenance to establish vegetation within the compensation reaches.

1.2 Compensation Requirements

The Assessment of Aquatic Environmental Effects report (AAEE)¹ prepared for the MP4 Project identifies residual stream habitat loss associated with the proposed works in Trimbells Gully and the Clydesdale Creek tributary. The realignment of Trimbells Gully will result in the loss of 180 m of permanent stream. This is partly offset by an additional 75 m of intermittent stream habitat created in the new channel, giving a net loss of 105 lineal metres of stream. Separately, reclamation will result in the loss of 22 m of permanent stream in the Clydesdale Creek tributary, and construction of a sediment retention pond will result in the loss of 80 m of intermittent stream in the Trimbells Gully tributary. The AAEE identifies that these residual losses are to be compensated through enhancement of Murphys Creek and the North Branch Waikouaiti River.

The AAEE applies widely used and accepted ecological compensation ratios to determine the minimum compensation required. Permanent stream losses in Trimbells Gully and the Clydesdale Creek tributary are to be compensated through enhancement of the permanent Murphys Creek, while intermittent stream loss in Trimbells Gully tributary is to be compensated through enhancement of the intermittent North Branch Waikouaiti River. While there will be no overall loss of intermittent stream habitat in Trimbells Gully as the realignment will result in additional intermittent habitat, there will be a lag between constructing the realignment and the channel functioning as a natural stream. Proposed enhancement of North Branch Waikouaiti River is also intended to compensate for this lag. The final compensation reach lengths exceed the minimum compensation lengths required by the calculated compensation ratios.

The required compensation outcomes identified in the AAEE, and the corresponding compensation works provided for in this plan, are summarised in Table 1.

¹ Viridis 2026. Macraes MP4 Project - Assessment of Aquatic Environmental Effects. A report prepared for Oceana Gold (New Zealand) Limited by Viridis Limited. August 2026. 10023-011-1.

Table 1. Summary of required compensation outcomes and proposed delivery through this plan.

Impacted reach	Stream habitat loss	Compensation reach	Required compensation outcome from AAEE	Proposed delivery in this plan	Relevant plan section
Trimbells Gully — permanent reach	180 m / 126 m ² permanent stream	Murphys Creek	Compensation ratio of 3.5:1, requiring 539 m of Murphys Creek enhancement	Included within 640 m of Murphys Creek enhancement, with 20 m riparian planting from the stream edge where practicable	Sections 2.2, 2.4–2.7 and 3
Clydesdale Creek tributary — permanent reach	22 m / 15 m ² permanent stream	Murphys Creek	Compensation ratio of 3.5:1, requiring 66 m of Murphys Creek enhancement	Included within 640 m of Murphys Creek enhancement, with 20 m riparian planting from the stream edge where practicable	Sections 2.2, 2.4–2.7 and 3
Trimbells Gully — intermittent reach*	0*	North Branch Waikouaiti River	0*	Included within 950 m of North Branch Waikouaiti River enhancement, with 10 m riparian planting from the stream edge and instream boulder placement to improve habitat heterogeneity	Sections 2.2, 2.3, 2.4–2.7 and 3
Trimbells Gully tributary — intermittent reach	80 m / 38 m ² intermittent stream	North Branch Waikouaiti River	Compensation ratio of 2.4:1, requiring 31 m of North Branch Waikouaiti River enhancement, rounded up to 80 m because the compensation reach should not be shorter than the impact reach	Included within 950 m of North Branch Waikouaiti River enhancement, with 10 m riparian planting from the stream edge and instream boulder placement to improve habitat heterogeneity	Sections 2.2, 2.3, 2.4–2.7 and 3

Notes: * While no compensation is strictly necessary for the intermittent reach of the Trimbells Gully, there will be a lag time between establishing the realignment and the realignment functioning as a natural stream. Therefore, the enhancement of North Branch Waikouaiti River is also considered to compensate for this impact.

1.3 Local Environment

The reclaimed streams, as well as the compensation reaches, are situated in the Macraes Ecological District (ED) of the Lammerlaw Ecological Region. The district is characterised by a series of faulted, gently sloping ridges around 600 m above sea level (asl), extending to 800 m asl. The climate is generally cool and dry, and snow can remain in place for weeks during winter. Historically (pre-human), vegetation in the area would have included podocarp, broadleaf, hardwood forest, however post-human arrival areas of forest have significantly decreased and tussock land with areas of coprosma-flax scrubland have proliferated. Review of historic aerial images shows the site has been devoid of significant areas of vegetation for the duration of the available record.

The wider Macraes Operation area has been subject to various scales of gold mining activity for more than a century. The Macraes Operation in its current form was first established in 1990, and it has expanded over time to occupy its current footprint. Prior to establishment of the current mining operation, the area was characterised as extensive agricultural land (sheep and beef), and this activity continues on site where mining operations do not occur.

1.4 Impacted Reaches²

1.4.1 Trimbells Gully

The ecological value of Trimbells Gully tributary is considered to be low.

Trimbells Gully originates to the east of the current Trimbells Gully waste rock stack (WRS), draining from the north-western face of Highlay Hill. It flows in a generally north-western direction, around the base of the WRS before joining with Maori Hen Creek and discharging to Mare Burn. It ultimately sits within the Taieri River catchment.

The permanent reach downstream of the sediment pond was contained within a moderately incised channel with banks formed by both natural soil substrates, and large tussocks. The stream substrates were heavily dominated by fine sediment, however beneath the sediment the channel was relatively firm. Periphyton and macrophyte growth formed a moderate component of the channel. Macrophytes were generally limited to areas where tussocks were thinner and included emergent exotic grasses including *Glyceria* sp. and creeping bent (*Agrostis stolonifera*). The relatively small catchment upstream of the site suggests flow will be flashy, rapidly increasing and then decreasing following rainfall.

Upstream of the sediment pond the reach was considered to be intermittent. The wetted channel was generally narrower and shallower than the permanent reach, and there were portions where water appeared to flow just below ground level. Substrates were more variable in this reach with gravels and small cobbles present as well as fine sediment. Flow was also variable, generally depending on water depth. As with the permanent reach, macrophytes were present and included both *Glyceria* sp. and creeping bent. Small amounts of exotic monkey musk (*Erythranthe guttata*) were also present where tussock growth was lower and less dense.

No fish were present in either reach. eDNA sampling undertaken downstream of the sediment pond detected no fish. The pond presents a significant barrier to fish movement, although it is possible eels may be able to negotiate it if they are ever present in the channel. Given the lack of fish detected, and the high location in the catchment, fish are not expected to be present.

² Impacted and compensation reaches are shown on Figure 1 with full descriptions provided in the AAEE.

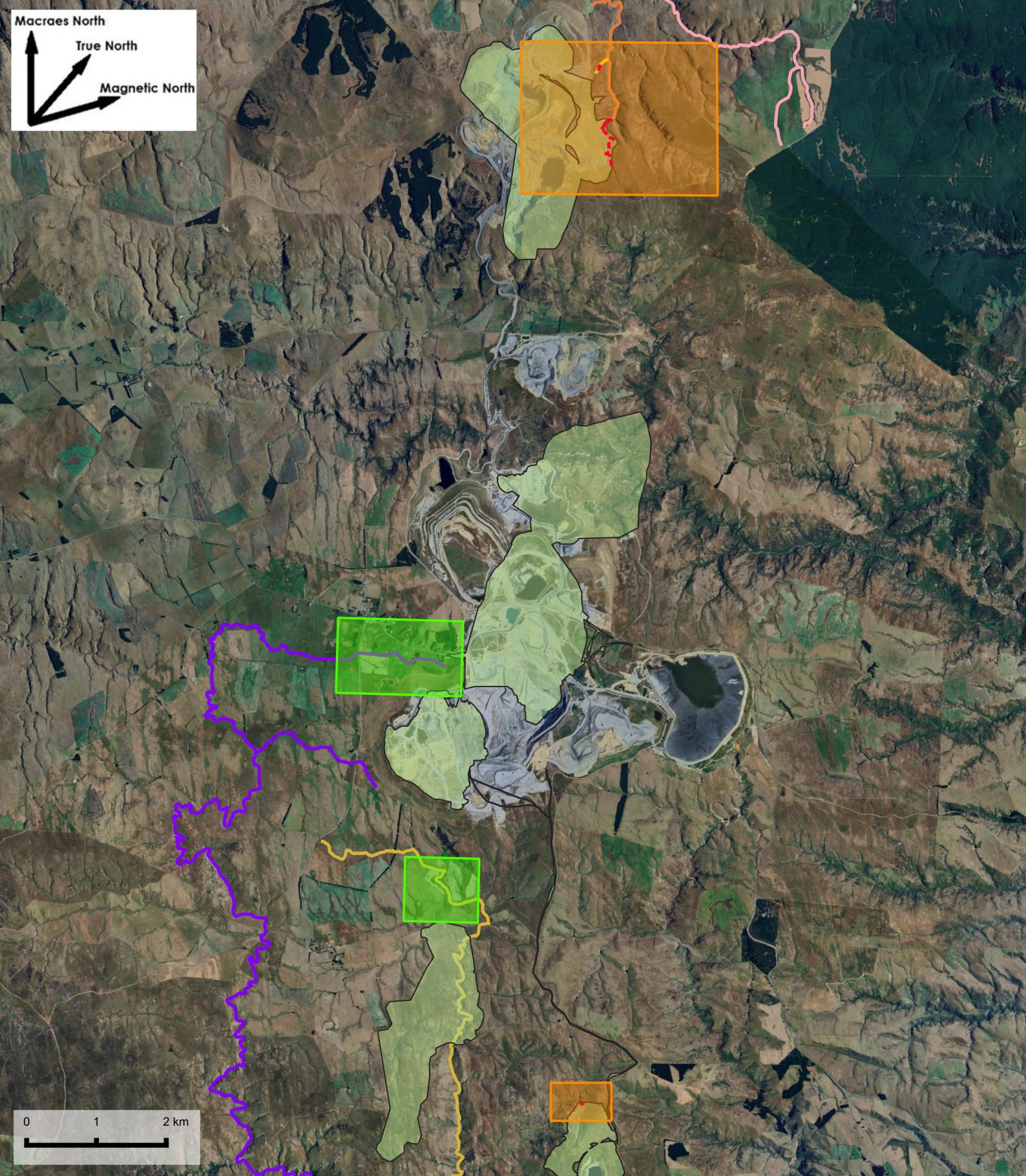


Figure 1. MP4 stream impact and compensation reaches

PROJECT NO. 10023
 DRAWN BY: AJC
 DATE: 30/07/2026
 SCALE 1:70,000 @ A4

 MP4 Footprint	 Murphys Creek
 Compensation	 Mare Burn
 Impact	 Maori Hen Creek
Impacted waterways	 North Branch Waikouaiti River
 Intermittent	 Trimbells Gully tributary
 Permanent	
Watercourses	
 Trimbells Gully Creek	



SOURCES
 Google Satellite 2023

DISCLAIMER: This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

1.4.2 Clydesdale Creek Tributary

The ecological value of the Clydesdale Creek tributary is considered to be low.

A short reach (22 m) of stream was present on the north-western side of the Golden Bar WRS, fed by seepage from the WRS and an area of wetland in the upper reaches of the channel. The channel discharges to the Clydesdale Creek sediment pond which, in turn, discharges to Clydesdale Creek.

Stock have unrestricted access to the channel and the stream and riparian margins are generally heavily pugged. The upper reaches of the channel were difficult to define due to the pugging, though the lower reaches were more defined and appeared to contain a permanent flow of water. Substrates were entirely soft sediment. Riparian vegetation was limited to grazed pasture grass and some tussocks in the upper reaches, which provided minimal shading.

No fish are expected to be present in the channel. The sediment pond is contained by a significant bund, and discharges via a perched culvert. The bund and culvert present a total barrier to fish passage.

1.4.3 Trimbells Gully Tributary

The ecological value of the Trimbells Gully tributary is considered to be low.

The Trimbells Gully tributary originates as an ephemeral channel on the northern side of the existing Coronation North WRS, flowing northwards for a short distance before discharging to Trimbells Gully. The channel transitions from ephemeral to intermittent at a constructed vehicle access track which acts as a bund across the channel. A small culvert/pipe is present here too that conveys overland flow from the upper catchment into the intermittent channel.

The channel is characterised by areas of obvious channel with gravel substrates interspersed by reaches where flow appeared to go subsurface and no clear channel was present. It is essentially identical in character to the intermittent reaches of Trimbells Gully itself.

The intermittent nature, location high in the catchment, and lack of detection of fish in the adjacent Trimbells Gully means it is unlikely fish are present within the stream.

1.5 Compensation Reaches³

1.5.1 Murphys Creek

The ecological value of Murphys Creek is considered to be moderate.

Murphys Creek originates south of the current active mining area, near the southern end of Red Bank Road. It flows through a steep gully system, in a generally south-easterly direction, before discharging to the North Branch Waikouaiti River.

The upper reaches flow through a relatively flat area. The flatness, coupled with pugging from stock has allowed the stream to widen significantly and become more diffuse. A lack of shading in this area has resulted in significant growth of *Glyceria sp.* Within and below the heritage covenant area (administered by the Department of Conservation), present at the downstream extent of the compensation reach, the creek is much more defined. Flow is variable, with deep still pools, and shallow riffles. Substrates are variable and range from areas of exposed bedrock to areas dominated by silt. Macrophyte coverage is

³ The current state of the compensation reaches in Murphys Creek and North Branch Waikouaiti River is shown on Figure 2.

seasonally influenced. Significant growths of exotic water buttercup (*Ranunculus trichophyllus*) are present given appropriate conditions.

Stock have direct access to the majority of the creek. Riparian vegetation is typical of the extensive agricultural landscape and includes mixed tussocks and exotic pasture grasses, with some scrubby vegetation. The vegetation provides very limited shading.

Taieri flathead galaxiid, shortfin eel (*Anguilla australis*; Not Threatened) and longfin eel (At Risk – Declining) are present within the stream, though galaxiids are limited to areas of clear flowing water. Where *Glyceria* clogs the channel only eels are expected to be present, and likely in low numbers.

1.5.2 North Branch Waikouaiti River

The ecological value of the North Branch Waikouaiti River, within land owned by OGNZL, is considered to be low.

The river originates just to the east of the Macraes township. The upper reaches of the North Branch Waikouaiti River are contained within OGNZL land where it flows through a highly modified, straightened channel, before leaving OGNZL land via a culvert under Red Bank Road, and continuing its flow downstream.

The identified compensation reaches are intermittent and generally only contain flow during wetter winter months. The channel is subject to excessive macrophyte growth year-round. Substrates are dominated by soft, fine sediment, beneath the macrophyte growth. Native riparian vegetation is absent, with pasture the only vegetation type along its length. Stock, when present in the adjacent paddocks, have direct access to the channel.

No fish have been recorded within the channel. Annual monitoring immediately upstream of Red Bank Road has not detected any fish since it commenced in 2018. Fish are highly unlikely to be present given the intermittent nature and low-quality habitat. It is possible a small number of tolerant shortfin eels may occasionally be present providing there is surface flow connecting the site to permanent downstream reaches.

a)



b)



Figure 2. Current state of compensation reaches: a) Murphys Creek, b) North Branch Waikouaiti River.

2 STREAM COMPENSATION PLANTING PLAN

2.1 Objectives

Planting a total of 17,450 m² at North Branch Waikouaiti River and 26,765 m² at Murphys Creek, including riparian planting within the compensation reaches, will have a number of beneficial effects on both terrestrial and freshwater ecological values for the reaches and wider environment. The details below describe the approach to successfully revegetate the identified areas in order to enhance ecological values within the reaches and provide the following beneficial outcomes:

- To reinstate and enhance riparian function
- To restore the forest ecosystem potential (CLF4.2⁴), and increase biodiversity of the sites
- To provide shade to the waterways
- To prevent waterway bank erosion
- To provide filtration of runoff, including nutrients, sediment and other stormwater contaminants
- To increase natural habitat and food resources for native fauna
- To improve landscape and amenity values
- To promote the successful establishment and persistence of planted species

2.2 Timing

Compensation works will be implemented in accordance with the approved project staging and consent conditions. At a minimum, stock exclusion fencing and initial weed control will occur before planting, and pioneer planting will occur during the first suitable planting season following reclamation works associated with Trimbells Gully.

2.3 Fencing

A stock exclusion fence will be installed around the perimeter of all enhancement reaches (Figure 3 and Figure 4). At a minimum the fence will be sufficient to exclude all domestic stock animals, as well as feral pigs. Gates providing access to the plantings for maintenance will be installed at appropriate locations. The fence will be located a minimum of 10 m from the edge of the North Branch Waikouaiti River, and 20 m from the edge of Murphys Creek. Where topographic constraints (e.g. steep gully walls, rock outcrops) prevent the fence along Murphys Creek being installed at 20 m from the stream edge, the fence may be located further away, but not within 20 m of the stream edge. If moved further from the stream, the area between the fence and the edge of the planting (20 m from the stream edge) will be managed in one of two ways. Either the additional area will be planted using the same plant list and methodologies as 'upper bank' planting areas, or it will be subject to ongoing periodic maintenance to ensure weeds and exotic pasture grasses do not become a nuisance. Once the upper bank planting has developed a canopy and is generating shade, control of pasture in these areas can be reduced.

⁴ Wildlands 2022. Planting lists for selected forest, wetland, and coastal ecosystems in Otago. Contract Report No. 6408, prepared for Otago Regional Council.



Figure 3. Compensation planting plan - North Branch Waikouaiti River

PROJECT NO. 10023

DRAWN BY: AJC

DATE: 11/06/2023

SCALE **1:7,000** @ A4

--- Stock proof fence

Compensation planting

Stream side

Mid bank

Upper bank

VIRIDIS
Environmental Consultants

SOURCES

Google Satellite 2023

DISCLAIMER: This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

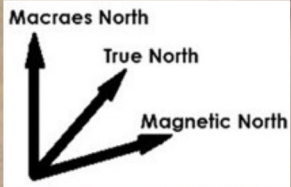


Figure 4.
Compensation planting
plan - Murphys Creek

PROJECT NO. 10023
DRAWN BY: AJC
DATE: 11/06/2023
SCALE **1:2,000** @ A4

-  Murphys Creek Heritage Reserve
-  Stock proof fence
- Compensation planting**
 -  Stream side
 -  Mid bank
 -  Upper bank



SOURCES
Google Satellite 2023

DISCLAIMER: This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

2.4 Instream Enhancement

No physical works within the streams are proposed as part of the enhancement works. Murphys Creek currently follows a natural alignment and therefore no realignment or instream habitat additions are considered necessary as part of the enhancement.

North Branch Waikouaiti River is highly modified, and the compensation reaches are artificially straight. While wider works constraints prevent full realignment of this channel, instream habitat variability will be created through the addition of boulders to the channel. The boulders, placed on the stream edges, extending into the channel, will create small meanders and introduce flow variability and habitat heterogeneity. No earthworks are required to install the boulders. They will be placed in North Branch Waikouaiti River compensation reaches using the following procedure:

- Boulders will be placed before planting commences and ideally before fencing to allow for easy access to the channel by machinery.
- All boulders will be at least 500 mm x 500 mm.
- Boulders will be placed approximately every 10 m to 15 m.
- Boulders will be placed on the channel edges, in contact with water when present.
- Boulders will be placed on alternating sides of the channel, i.e. the left bank, then the right bank, then the left bank.
- No boulder should extend further into the channel than one quarter of the channel's width, unless an engineer is consulted to determine if the boulders will impact conveyance of flood flows. If this occurs, boulders should be placed at the recommendation of the engineers.
- Boulders can be placed in groups, i.e. more than one boulder can be placed at each location.
- All boulders will be placed in the channel during periods of no flow/dry conditions where practicable in order to minimise sediment disturbance.
- Machinery tracking within the riverbed should be avoided as far as practicable.

2.5 Plant Sourcing

The sites are located within the Macraes Ecological District. The plants to be established will as far as practicable be eco-sourced from the Macraes Ecological District to maintain the local genetic lineage of plants and improve the likelihood that plants are adapted to environmental conditions. Where this is not possible, i.e. there are no populations of this species within the district to act as a source, plants will be sourced from adjacent districts.

2.6 Plant Schedule

2.6.1 Overview

Approximate planting areas are shown in Figure 3 and Figure 4. The topography of the planting area on North Branch Waikouaiti is largely flat, while on Murphys Creek it is variable and includes areas of rocky outcrop. Planting has been split into three zones. Stream side planting extends from the stream edge to approximately 2 m. Some variation is provided for Murphys Creek where the wider, shallow gully bottom means the wetted channel is wide. Mid bank planting extends from 2 m (with the exception of the variation on Murphys Creek) out to 5 m for North Branch Waikouaiti River and 10 m for Murphys

Creek. Upper bank planting extends beyond this. Planting schedules for each zone within the North Branch Waikouaiti River and Murphys Creek enhancement reaches are provided in Sections 2.6.2 and 2.6.3, respectively.

Plants have been selected based on the relevant potential ecosystem types for each area and based on guidance within Otago Regional Council's riparian planting guide for east Otago⁵ and the planting lists for CLF4.2 vegetation type as per Wildlands 2022⁴. Where exact number of plants of species of plants are not able to be sourced, they may be substituted for an appropriate similar species. Any substitutions will be undertaken following consultation with the planting contractor and/or project aquatic ecologist.

To account for normal die off and/or failure to thrive of plants prior to and following planting, 10% more plants of each species have been added to the total number of plants required. The 10% extra provides a buffer and limits the impact of needing to reorder seedlings which could take more than one growing season to be available for replanting.

2.6.2 North Branch Waikouaiti River enhancement reaches

Planting schedules for streamside zones are provided for North Branch Waikouaiti River compensation reaches A and B in Table 2 and Table 3, mid bank zones in Table 4 and Table 5, and upper bank zones in Table 6 and Table 7.

Table 2. North Branch Waikouaiti River compensation reach A streamside planting (0-2 m, 1,802 m²).

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
<i>Carex virgata</i>	Sedge	1	25	496
<i>Carex secta</i>	Pūrei	1	25	496
<i>Carex sinclairii</i>	Sinclair's sedge	1	30	595
<i>Chionochloa rubra</i>	Red tussock	1	20	396
Total + 10% to account for die off				1,982

Table 3. North Branch Waikouaiti River compensation reach B streamside planting (0-2 m, 1,684 m²).

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
<i>Carex virgata</i>	Sedge	1	25	463
<i>Carex secta</i>	Pūrei	1	25	463
<i>Carex sinclairii</i>	Sinclair's sedge	1	30	556
<i>Chionochloa rubra</i>	Red tussock	1	20	370
Total + 10% to account for die off				1,852

⁵ Otago Regional Council, Riparian planting guide, www.orc-riparian-plant-guide_east_digital.pdf

Table 4. North Branch Waikouaiti River compensation reach A mid bank planting (2-5 m, 2,719 m²).

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Leptospermum scoparium</i>	Mānuka	1.4	8	122
<i>Coprosma propinqua</i>	Mingimingi	1.4	4	61
<i>Cordyline australis</i>	Cabbage tree	1.4	6	92
<i>Phormium tenax</i>	Harakeke	1.4	5	76
<i>Veronica salicifolia</i>	Koromiko	1.4	6	92
<i>Coprosma crassifolia</i>	Mingimingi	1.4	4	61
<i>Coprosma linariifolia</i>	Mingimingi	1.4	4	61
<i>Pseudopanax crassifolius</i>	Lancewood	1.4	4	61
<i>Myrsine divaricata</i>	Weeping matipo	1.4	5	76
<i>Discaria toumatou</i>	Matagouri	1.4	6	92
<i>Hoheria angustifolia</i>	Houhere	1.4	6	92
<i>Carpodetus serratus</i>	Marble leaf	1.4	5	76
Enrichment planting				
<i>Olearia hectorii</i>	Hector's Tree Daisy	5	8	10
<i>Olearia odorata</i>	Scented Tree Daisy	5	8	10
<i>Corokia cotoneaster</i>	Korokio	5	6	7
<i>Podocarpus laetus</i>	Thin barked tōtara	5	7	8
<i>Sophora microphylla</i>	Kowhai	5	8	10
Total + 10% to account for die off				1,006

Table 5. North Branch Waikouaiti River compensation reach B mid bank planting (2-5 m, 2,597 m²)

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Leptospermum scoparium</i>	Mānuka	1.4	8	117
<i>Coprosma propinqua</i>	Mingimingi	1.4	4	58
<i>Cordyline australis</i>	Cabbage tree	1.4	6	87
<i>Phormium tenax</i>	Harakeke	1.4	5	73
<i>Veronica salicifolia</i>	Koromiko	1.4	6	87
<i>Coprosma crassifolia</i>	Mingimingi	1.4	4	58
<i>Coprosma linariifolia</i>	Mingimingi	1.4	4	58
<i>Pseudopanax crassifolius</i>	Lancewood	1.4	4	58
<i>Myrsine divaricata</i>	Weeping matipo	1.4	5	73
<i>Discaria toumatou</i>	Matagouri	1.4	6	87

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Hoheria angustifolia</i>	Houhere	1.4	6	87
<i>Carpodetus serratus</i>	Marble leaf	1.4	5	73
Enrichment planting				
<i>Olearia hectorii</i>	Hector's Tree Daisy	5	8	9
<i>Olearia odorata</i>	Scented Tree Daisy	5	8	9
<i>Corokia cotoneaster</i>	Korokio	5	6	7
<i>Podocarpus laetus</i>	Thin barked tōtara	5	7	8
<i>Sophora microphylla</i>	Kowhai	5	8	9
Total + 10% to account for die off				961

Table 6. North Branch Waikouaiti River compensation reach A upper bank planting (5-10 m, 4,465 m²)

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Kunzea ericoides</i>	Kānuka	2	6	74
<i>Coprosma propinqua</i>	Mingimingi	1.4	6	150
<i>Cordyline australis</i>	Cabbage tree	1.4	5	125
<i>Coprosma crassifolia</i>	Mingimingi	1.4	5	125
<i>Coprosma linariifolia</i>	Mingimingi	1.4	5	125
<i>Pseudopanax crassifolius</i>	Lancewood	1.4	5	125
<i>Myrsine divaricata</i>	Weeping matipo	1.4	6	150
<i>Pittosporum eugenioides</i>	Lemonwood	1.4	6	150
<i>Hoheria angustifolia</i>	Houhere	1.4	6	150
<i>Carpodetus serratus</i>	Marble leaf	1.4	6	150
<i>Plagianthus regius</i>	Ribbonwood	2	6	74
Enrichment planting				
<i>Olearia hectorii</i>	Hector's Tree Daisy	5	7	14
<i>Olearia odorata</i>	Scented Tree Daisy	5	7	14
<i>Corokia cotoneaster</i>	Korokio	5	8	16
<i>Podocarpus laetus</i>	Thin barked tōtara	5	8	16
<i>Sophora microphylla</i>	Kowhai	5	8	16
Total + 10% to account for die off				1,475

Table 7. North Branch Waikouaiti River compensation reach B upper bank planting (5-10 m, 4,183 m²)

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Kunzea ericoides</i>	Kānuka	2	6	69
<i>Coprosma propinqua</i>	Mingimingi	1.4	6	141
<i>Cordyline australis</i>	Cabbage tree	1.4	5	117
<i>Coprosma crassifolia</i>	Mingimingi	1.4	5	117
<i>Coprosma linariifolia</i>	Mingimingi	1.4	5	117
<i>Pseudopanax crassifolius</i>	Lancewood	1.4	5	117
<i>Myrsine divaricata</i>	Weeping matipo	1.4	6	141
<i>Pittosporum eugenioides</i>	Lemonwood	1.4	6	141
<i>Hoheria angustifolia</i>	Houhere	1.4	6	141
<i>Carpodetus serratus</i>	Marble leaf	1.4	6	141
<i>Plagianthus regius</i>	Ribbonwood	2	6	69
Enrichment planting				
<i>Olearia hectorii</i>	Hector's Tree Daisy	5	7	13
<i>Olearia odorata</i>	Scented Tree Daisy	5	7	13
<i>Corokia cotoneaster</i>	Korokio	5	8	15
<i>Podocarpus laetus</i>	Thin barked tōtara	5	8	15
<i>Sophora microphylla</i>	Kowhai	5	8	15
Total + 10% to account for die off				1,382

2.6.3 Murphys Creek enhancement reach

Planting schedules for streamside, mid bank and upper bank zones at the Murphys Creek compensation reach are provided in Table 8, Table 9 and Table 10.

Table 8. Murphys Creek compensation reach streamside planting (0-2 m, 4,210 m²).

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
<i>Carex virgata</i>	Sedge	1	25	1,158
<i>Carex secta</i>	Pūrei	1	25	1,158
<i>Carex sinclairii</i>	Sinclair's sedge	1	30	1,389
<i>Chionochloa rubra</i>	Red tussock	1	20	926
Total + 10% to account for die off				4,631

Table 9. Murphys Creek compensation reach mid bank planting (2-10 m, 8,930 m²)

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Leptospermum scoparium</i>	Mānuka	1.4	6	301
<i>Coprosma propinqua</i>	Mingimingi	1.4	4	200
<i>Cordyline australis</i>	Cabbage tree	1.4	6	301
<i>Phormium tenax</i>	Harakeke	1.4	5	251
<i>Chionochloa rubra</i>	Red tussock	1.4	8	401
<i>Veronica salicifolia</i>	Koromiko	1.4	6	301
<i>Coprosma crassifolia</i>	Mingimingi	1.4	4	200
<i>Coprosma linariifolia</i>	Mingimingi	1.4	4	200
<i>Pseudopanax crassifolius</i>	Lancewood	1.4	4	200
<i>Myrsine divaricata</i>	Weeping matipo	1.4	5	251
<i>Discaria toumatou</i>	Matagouri	1.4	6	301
<i>Hoheria angustifolia</i>	Houhere	1.4	6	301
<i>Carpodetus serratus</i>	Marble leaf	1.4	5	251
Enrichment planting				
<i>Olearia hectorii</i>	Hector's Tree Daisy	5	5	20
<i>Olearia odorata</i>	Scented Tree Daisy	5	8	31
<i>Corokia cotoneaster</i>	Korokio	5	5	20
<i>Podocarpus laetus</i>	Thin barked tōtara	5	5	20
<i>Sophora microphylla</i>	Kowhai	5	8	31
Total + 10% to account for die off				3,580

Table 10. Murphys Creek compensation reach upper bank planting (10-20 m, 13,625 m²)

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Kunzea ericoides</i>	Kānuka	2	6	225
<i>Coprosma propinqua</i>	Mingimingi	1.4	6	459
<i>Cordyline australis</i>	Cabbage tree	1.4	5	382
<i>Coprosma crassifolia</i>	Mingimingi	1.4	5	382
<i>Coprosma linariifolia</i>	Mingimingi	1.4	5	382
<i>Pseudopanax crassifolius</i>	Lancewood	1.4	5	382
<i>Myrsine divaricata</i>	Weeping matipo	1.4	6	459
<i>Pittosporum eugenoides</i>	Lemonwood	1.4	6	459
<i>Hoheria angustifolia</i>	Houhere	1.4	6	459

Species name	Common name	Spacing (m)	Abundance (%)	Number of plants
Pioneer planting				
<i>Carpodetus serratus</i>	Marble leaf	1.4	6	459
<i>Plagianthus regius</i>	Ribbonwood	2	6	225
Enrichment planting				
<i>Olearia hectorii</i>	Hector's Tree Daisy	5	7	42
<i>Olearia odorata</i>	Scented Tree Daisy	5	7	42
<i>Corokia cotoneaster</i>	Korokio	5	8	48
<i>Podocarpus laetus</i>	Thin barked tōtara	5	8	48
<i>Sophora microphylla</i>	Kowhai	5	8	48
Total + 10% to account for die off				4,501

2.7 Planting Guide

The planting will be undertaken in general accordance with the following guidelines:

- Exclusion fencing will be erected around the perimeter of the enhancement reaches. The fencing will, at a minimum, exclude all stock as well as feral pigs.
- Weed and grass removal will occur in the summer immediately prior to planting, employing the methods set out in Section 3. Spraying will not occur in any locations where spray may enter water.
- Planting is to be undertaken during the planting season (September-November and late March-April) to establish root systems during the seasons which typically have higher rainfall and lower plant moisture stress.
- Any grasses/annual weeds that have established after initial weed removal has occurred will be skimmed off the surface using a spade to reduce the risk of smothering the new plant.
- Prior to planting, plants will be thoroughly watered and allowed to drain, out of direct sunlight. They will then be laid out according to the spacing recommended, in a natural pattern (i.e., not in straight rows).
- A hole twice the size of the root ball or plant container will be dug for each plant. A slow-release fertiliser may be added to the dug hole and be mixed well into the soil to avoid root burn.
- Plants will be carefully removed from the pot/bag, retaining as much of the soil as possible. The roots may need to be loosened/untangled at the base of the root mass prior to planting to stimulate growth and in-soil establishment.
- Soil will then be gradually filled around the plant, firming the soil well. The base of the main stem will be located slightly below the soil.
- To protect new plantings from pest browse (e.g. from rabbits), it is recommended that biodegradable plant guards (e.g., EmGuard™; Fibre Guard) are installed until plants become well established. Where plants are planted immediately adjacent to flowing water the person/s undertaking the planting will make a judgement call as to whether plant guards are appropriate. If the plant is likely to be inundated during high flows, a plant guard may not be appropriate.

- Pioneer plants as per Table 2 to Table 10 will be planted in the first planting season. Enrichment planting will be undertaken following the same steps as above one or two planting seasons following completion of pioneer planting. Depending on the season, two or more years may be required to allow sufficient establishment of pioneer plants. The decision regarding whether enrichment planting will occur one or two seasons following pioneer planting will be made by the person responsible for managing planting and plant maintenance after considering how much establishment of the pioneer plants has occurred. Enrichment planting may also be delayed if seedlings require additional time to reach a size suitable for planting out. It is preferable to delay enrichment planting than to plant too small plants, or plants in areas where sufficient shelter has not yet established as these factors will influence survival of the enrichment species.

2.8 Ongoing Maintenance

2.8.1 Inspections and activities

Ongoing maintenance is required until five years have passed following enrichment planting. Maintenance will ensure successful establishment of the native plantings. Plant maintenance may include the following:

- Plant releasing – by hand or via herbicide spraying to prevent grasses/annual weeds from smothering young plantings.
- Plant replacement – infill planting (during planting season only) of the same species assemblage where more than 10% of plant loss has occurred, or if concentrated plant loss has occurred, leaving a gap of more than 10 m wide.
- Pest plant control where these may be invading the planting area.
- Fertilisation if plants are not performing well.
- Watering if any areas are particularly dry.
- Assessing for signs of pest damage (e.g. rabbits, insects) and implementing control as required.

Table 11 recommends the frequency of plant maintenance checks during the months specified. Maintenance checks will be required more frequently during the first 2-3 years when young plants are most susceptible to competition and abiotic influences. Maintenance frequency can then be reduced as 90% canopy cover is achieved within the relevant planting area or zone. Maintenance should continue until five full years of maintenance have occurred following completion of enrichment planting, or until 90% canopy cover is achieved, whichever is longest.

Table 11. Recommended maintenance schedule for native plantings

Year	Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Fence installation	Before any planting occurs											
	Initial weed control		✓	✓					✓	✓			
	Pioneer planting			✓	✓					✓	✓	✓	
	Pioneer plant maintenance							✓		✓		✓	
2	Enrichment planting weed control*		✓	✓					✓	✓			
	Enrichment planting*			✓	✓					✓	✓	✓	
	Pioneer plant maintenance	✓		✓		✓		✓			✓		
3	Plant maintenance	✓			✓			✓			✓		
4	Plant maintenance			✓						✓			
5	Plant maintenance			✓						✓			
6	Plant maintenance #			✓						✓			

Notes: * Enrichment planting to occur in year two only if pioneer planting has established sufficiently. If not, enrichment planting will be delayed; # If enrichment planting is delayed, additional years of plant maintenance will be required until five years have been completed post completion of enrichment planting.

2.8.2 Maintenance and weed control records

Records will be kept of each maintenance period, including but not limited to:

- Number or proportion of plants that have died and/or are not thriving including the species and location of these plants.
- Number of plants that are replaced, including the general location of these and what species the replacement plants are.
- Whether plant browse or damage as a result of pest animals is present, including location of damaged plants.
- Condition of plant guards including if any are missing or have been replaced.
- Condition of the stock proof fence.
- Any additions of water or fertiliser.
- Application of herbicides including location, type and quantity.
- General comments regarding condition and establishment of planting.

3 PEST MANAGEMENT

3.1 Overview

The management of weeds and pest animals is recommended within the compensation sites to prevent pest plants and other exotic weeds from outcompeting native plantings. Weeds and pest animals are present in areas around and adjacent to the compensation reaches.

Weed control will occur over the entire area of all enhancement reaches, for a period of five years following the completion of planting in the compensation reaches.

3.2 Pest Control

Pest control methods are outlined in the Pest Control and Elimination Plan⁶. All pest control within the enhancement reaches will occur in accordance with the recommendations in this plan.

3.3 Weed Control Methods

3.3.1 Weed species

Table 12 outlines all pest plants/weeds likely to be present within the site or may invade the site over time. It provides best practice methodologies for removal of each species listed. Any plants identified in the site at a later date but not listed in Table 12 will be managed according to best practice methods outlined by Otago Regional Council or other relevant guidance.

3.3.2 General weed control guidance

Manual (by hand) or mechanical removal of pest plants is recommended where possible. If chemical control is required, control methods such as 'cut and paste' or 'drill and fill' using gels are preferred over foliar spraying to minimise chemical usage, particularly around waterways.

3.3.3 Herbicide use

Chemical controls will be applied to terrestrial areas only, in accordance with the Agrichemical Users' Code of Practice, NZS 8409 2004: "The Management of Agrichemicals" (or any update or replacement of that Code) and will be undertaken in a way that avoids damage to new plantings or established native vegetation. The manufacturer's instructions will be followed carefully, along with any recommended safety precautions to protect the user and environment. General guidance notes for using herbicides:

- Care will be taken when using herbicide around/under valuable native trees.
- Avoid spraying on windy days to minimise potential non-target damage.
- A marker dye (e.g., Envirodye) will be mixed in when using herbicide spraying or gels to avoid spray drift and to show where control has been undertaken.
- No single herbicide will be effective for all species, active ingredients will be considered and chosen carefully.
- Chemical control will only be undertaken by those holding the relevant certificates, where required.
- If chemical controls are used within areas prior to planting, planting efforts may need to be delayed, ensuring the new plantings are not adversely affected by residual chemicals in the soil.

⁶ Alliance Ecology 2026. Pest Control and Elimination Plan. Macraes Phase 4 Project (MP4). Prepared for OceanaGold (New Zealand) Limited by Alliance Ecology Limited. August 2026.

Table 12. Recommended weed removal methodologies for weeds observed in the area.

Common name	Species name	Weed removal method
Blackberry	<i>Rubus fruticosus</i> agg.	• Dig out plant manually including root system and dispose at refuse/green waste station or burn in an appropriate location on site, or • Cut stump and paste freshly cut base of stems with metsulfuron gel.
Pampas	<i>Cortaderia jubata</i> and <i>C. selloana</i>	• Dig or pull out plant manually including root system and dispose at refuse/green waste station or burn in an appropriate location on site, or • Foliar spray with 200 mL glyphosate green per 10 L of water.
Broom	<i>Cytisus scoparius</i> and <i>Teline monspessulana</i>	• Cut plant and treat stump using herbicide gel containing either metsulfuron, triclopyr or glyphosate, or • Foliar spray when the plant is actively growing using suitable herbicides such as Tordon or Grazon
Gorse	<i>Ulex europaeus</i>	• Cut plant and treat stump using herbicide gel containing either metsulfuron, triclopyr or glyphosate, or • Foliar spray when the plant is actively growing using suitable herbicides such as Tordon or Grazon
Nodding thistle	<i>Carduus nutans</i>	• Foliar spray with MCPB or similar, or • Grubbing to remove at least 5 cm of the root to prevent regrowth
Old man's beard	<i>Clematis vitalba</i>	• Cut the stem/trunk and apply metsulfuron gel (10 g/L strength) or picloram gel (43 g/L strength) to cover the entire stump, or • Foliar spray with glyphosate at a rate of 20 mL/L or to cover entire plant, or other suitable herbicides
Wilding conifers	<i>Pinus spp.</i>	• Pull or dig out small plants, or • Fell at ground level ensuring no branches or green needles below cut, or • Stump swab with metsulfuron-methyl 1 g/L or a product containing 100 g picloram+300 g triclopyr/L (50 mL/L) or triclopyr 600 EC (50 mL/L) or picloram gel, or • Foliar spray with glyphosate (100 mL/10 L)

3.3.4 Timing and follow-up control

Initial weed control efforts will be completed in the summer immediately prior to native revegetation planting being undertaken.

Follow-up weed control is generally recommended every **three** months until successful eradication of each species has occurred, and then less frequently as required to maintain little-to-no weed presence. Preferably, weed control will be undertaken prior to, or during, active growth periods, or prior to each species producing seeds.

3.3.5 Documentation of control efforts

It is recommended that regular documentation of physical and chemical weed control efforts is kept. Maintaining up to date records of agrichemical usage is a legal requirement for the management of agrichemicals under the Hazardous Substances and New Organisms (HSNO) Act and specified in the Code of Practice (NZS 8409:2004). Records should be included in an annual report.

Weed control records will include the following details:

- Date and location of weed control/herbicide application
- Weed species targeted, and any new species that have established in the area
- Herbicide type and quantity used, and control method (e.g., cut and paste, foliar spraying)
- Details of any follow up work anticipated

3.3.6 Ecotoxic herbicides to avoid

The following chemical controls will be avoided as far as practicable due to their potential effects when entering surface water such as the adjacent streams and downstream receiving environments. Toxins in the following chemicals could bioaccumulate and cause significant damage to the environment:

- | | |
|---------------------------------------|--------------------------------------|
| • 2, 4-D ester (e.g., broadleaf kill) | • Fluroxypyr |
| • Clopyralid | • Saflufenacil |
| • Asulam | • Haloxyfop-p-methyl (e.g., Gallant) |

Chemicals such as Tordon brush killer and metsulfuron should be avoided if practicable. If their use is required, extra care should be taken to ensure no chemicals, including spray drift, enter surface waters.

3.3.7 Safe weed disposal

To prevent pest plants from spreading, reinvading, or dispersing to nearby sites, it is essential that seeds, seed pods, seed heads and roots are disposed of safely. Once pest plant material has been controlled/removed, green waste will be removed off-site and disposed of at an approved disposal site, such as a community weed waste bin, an approved refuse transfer site or burned on site at an appropriate burning facility/location. If burning is utilised, care should be taken to ensure all green waste is burned and no green vegetation is blown from the area by the wind, hung up on infrastructure or vehicles, or left unburned for any period of time.

For on-site disposal of soft (non-woody), seed-free weed materials, a composting weed bin or bag may be used which aims to break down waste within 6 to 12 months.

4 REPORTING

An annual report will be prepared providing information on the activities and maintenance that have occurred during the preceding 12 months. The report will be incorporated into the Annual Ecological Report (AER) and provided to DC/DCC on 31 July each year. In addition to reporting on the points listed in section 2.8.2 and 3.3.5, the report should include records of planting that has been completed, as per the pioneer and enrichment planting schedules.

If more than 10% of the same species is lost for two or more consecutive monitoring years, or if concentrated plant loss leaving a gap of more than 10 m occurs in the same location for two or more consecutive monitoring years, the monitoring report will provide recommendations for addressing the losses. Options may include, but not be limited to, planting of a different species, addition of water, and/or addition of fertiliser.

The inspections and annual report will be prepared by OGNZL or a suitably qualified contractor engaged by OGNZL.

Reporting will continue on an annual basis until the completion of the plant maintenance period (five years following completion of enrichment planting, or when 90% canopy coverage is achieved, whichever is longer). If enhancement planting does not occur in year two, five years of maintenance is still required following completion of enrichment planting. At a minimum, the AER will contain six annual reports on planting progress. Maintenance, including reporting will continue until 90% canopy cover is achieved.

This plan is considered to be a 'live' document and may be updated at any time to improve ecological outcomes.

5 SUMMARY OF ACTIVITIES

Table 13 provides a summary of the activities associated with achieving stream compensation associated with MP4 works. It provides an indicative timeline, noting maintenance will continue until 90% canopy cover has been achieved.

Table 13. Summary of stream compensation activities, including indicative timeline.

Year	Activity	Comments
0	Trimbells Gully reclamation works commence	
0	Installation of rocks in North Branch Waikouaiti River	
0	Installation of stock proof fencing around compensation reaches	To be completed prior to commencement of pioneer planting
1	Pioneer planting and maintenance	To occur during the first planting season following reclamation works in Trimbells Gully
2	Pioneer planting maintenance; Enrichment planting if appropriate	Enrichment planting to only occur if pioneer planting sufficiently established, and enrichment plants are large enough to be planted out
3	Plant maintenance; Enrichment planting if delayed from year 2	
4	Plant maintenance; Enrichment planting if delayed from year 2	
5	Plant maintenance	
6	Plant maintenance	If 90 % canopy closure has been achieved, maintenance can cease following completion of year 6. If not achieved, maintenance will continue until 90% canopy cover achieved

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