

FISH MANAGEMENT PLAN FOR THREE MANAGED FILL AREAS AT GLEESON QUARRY, HUNTLY



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FISH MANAGEMENT PLAN FOR THREE MANAGED FILL AREAS AT GLEESON QUARRY, HUNTLY

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Reviewed and approved for release by:



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1. INTRODUCTION

Gleeson Managed Fill Ltd is seeking resource consent for the disposal of quarry overburden material and imported managed fill into three gullies (Fill Areas 2, 3, and 4; Figure 1) within the Gleeson Quarry landholdings, Huntly. Construction of the fill sites and associated sediment ponds will result in the permanent loss of stream, wetland, and pond habitat. Indigenous shortfin eels (*Anguilla australis*) were recorded in all three gullies during fieldwork undertaken for an Ecological Impact Assessment of the proposed works (Boffa Miskell 2019). Kōura (*Paranephrops planifrons*) have been recorded in an already consented fill area and this species may be present in Fill Areas 2 and 4. Suitable habitat for longfin eel (*Anguilla dieffenbachii*) and banded kōkopu (*Galaxias fasciatus*) is also present.

As the streams, wetlands, and ponds provide habitat for indigenous fish species, proposed works at the site have the potential to injure or kill resident aquatic fauna at the time of works. As a result, measures must be undertaken to remove fish and kōura from the watercourse before works commence.

The client has requested a Fish Management Plan for the site that covers the following:

- Details of the fishing required to capture and relocate fish.
- Details on how the affected reach will be isolated to prevent fish movement back into the reach.
- The location of a suitable release site.

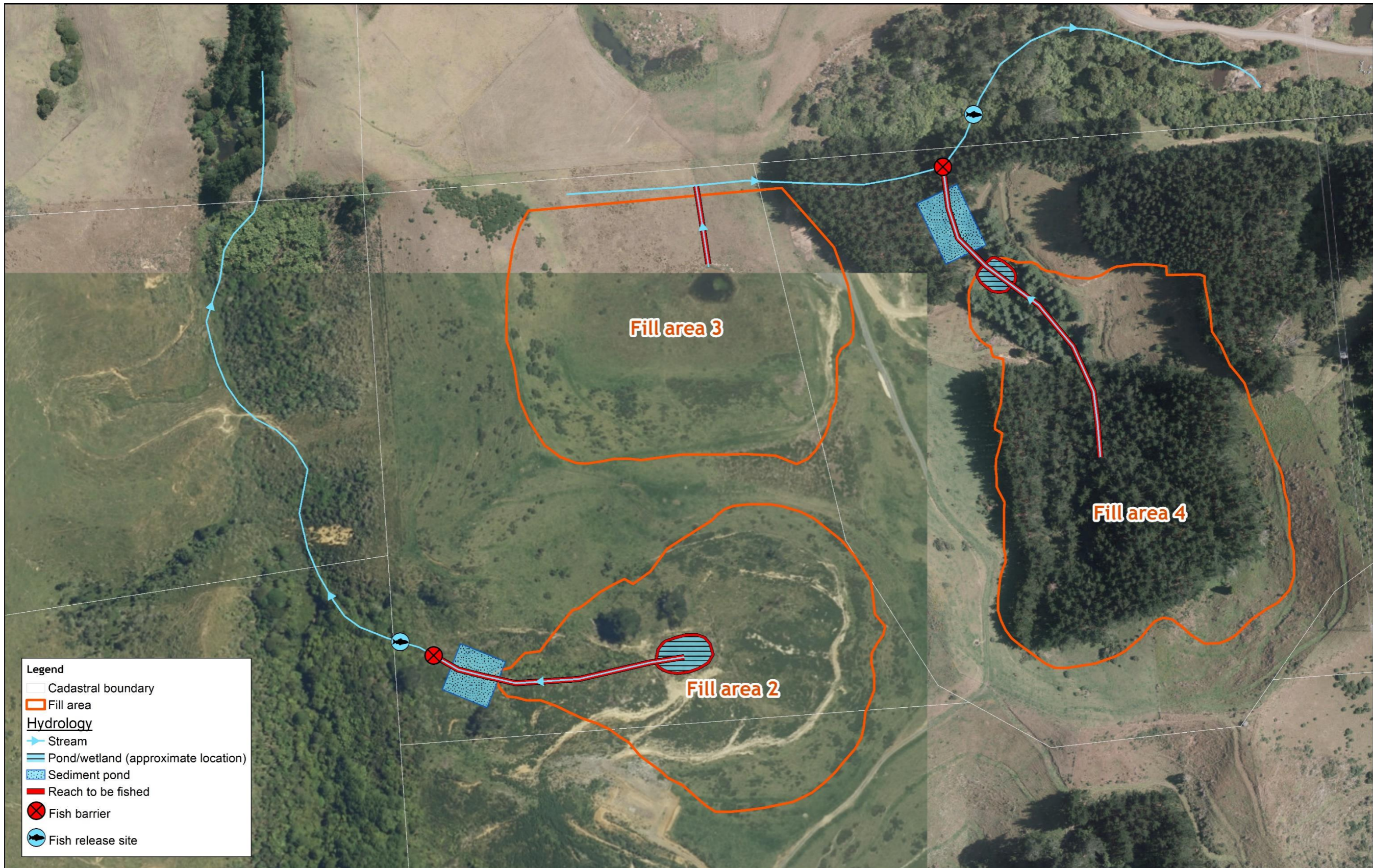
2. SITE DESCRIPTION

2.1 Overview

The following site descriptions are taken from the Ecological Impact Assessment prepared for the project (Boffa Miskell 2019). All fill areas were visited by a Wildlands ecologist in November 2019 and it is assumed that the streams, wetlands, and ponds have not changed significantly since then. An assessment of wetland habitats under the National Environmental Standards for Freshwater (NES-FW) was undertaken by Stantec Ltd in December 2021 (Stantec 2021). This report was reviewed by Nicholas Singers (Ecological Solutions Ltd) on behalf of Waikato Regional Council (Ecological Solutions 2022), and he determined that the wetlands were ‘artificial’ as per the NES-FW. The streams are largely ephemeral in nature and as a result do not flow year-round.

2.2 Fill Area 2

Fill Area 2 covers 3.8 hectares and is situated in a relatively shallow gully. A single stream flows along the gully floor with a small patch of wetland and open water situated approximately two thirds up the gully. Approximately 160 metres of stream and 570 m² of pond/artificial wetland habitat will be impacted by the proposed works.



Legend

- Cadastral boundary
- Fill area

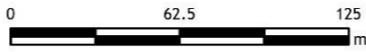
Hydrology

- Stream
- Pond/wetland (approximate location)
- Sediment pond
- Reach to be fished
- X Fish barrier
- 🐟 Fish release site

Data Acknowledgment
 Map contains data sourced from LINZ
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 Client: Gleeson
 Ref: 06 1962
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Figure 1. Areas to be fished and fish relocation sites at Gleeson Quarry, Huntly



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 www.wildlands.co.nz, 0508 WILDNZ

Scale: 1:2,500
 Date: 21/06/2022
 Cartographer: KM
 Format: A3R

2.3 Fill Area 3

Fill Area 3 covers 4.2 hectares within a grazed paddock, a large part of which is relatively regularly inundated. An artificial wetland surrounding an area of shallow open water was located near the middle of the fill area, but this was removed in 2020. Approximately 145 metres of drain will be impacted.

2.4 Fill Area 4

Fill Area 4 covers 5.1 hectares and comprises a shallow basin with two stream branches in the upper reaches that converge to form a single main stem. A small pond and wetland are located in the downstream section of the middle reach, and appears to have been artificially induced through the bunding of the stream to create a forestry track. Approximately 150 metres of stream and 484 m² of pond/wetland habitat will be removed.

3. METHODS TO CAPTURE AND RELOCATE FISH

3.1 Overview

Development of the site will be staged over multiple years and it is likely that each gully will be fished independently of the others. Indigenous fish and other aquatic fauna will be removed from the watercourses, ponds, and wetlands using a combination of the following methods:

- Gee minnow traps.
- Fine-mesh fyke nets.
- Hand-netting.

Efforts to relocate indigenous fish and kōura will be undertaken as close to the commencement of the works as practicable, with no more than a one-week delay between the habitats being de-fished and the works beginning. Although not always possible, it is preferable to undertake fish salvage works during a period of settled weather. Fishing will not occur within 48 hours following a heavy rainfall event.

3.2 Isolation of the impacted reaches

Temporary fish barriers will be installed at the upstream extent of each reach (Figure 1) to ensure that fish do not enter the impact reaches while stream works are in progress. No upstream barrier is required as works will remove aquatic habitat within each gully.

The barriers will be constructed from plastic fencing held in place by steel waratah stakes hammered into the bank and streambed. A layer of heavy-duty shade cloth with a three-millimetre mesh will be attached on the upstream side of the construction fence to block fish passage, while still allowing water to flow through. The bottom edge of the shade cloth will be attached to a horizontal steel waratah to ensure that the barrier remains fixed to the streambed so that fish are unable to swim underneath.

Fish barriers will remain in place until the stream works have been completed to prevent fish from moving into the area of works. For this reason, the barriers will be installed as close to the commencement of the works as possible to minimise the length of time that they will be required to be in place.

High flows may result in overtopping or breaching of the barriers, which will reduce their effectiveness. Therefore, the barriers should be checked daily to ensure that they are functioning as intended, with any observed damage repaired immediately.

Following the completion of the stream works, all barriers will be removed from the watercourses.

3.3 Dewatering of streams and ponds

All pumps used to dewater the streams and ponds will require fish excluders (wire mesh) to be installed at the end of their intakes to prevent fish from being accidentally entrained. Additionally, pump operators will be instructed to alert the attending ecologist when any fish are observed in the vicinity of the pump so that they can be captured using hand-netting.

3.4 Trapping

Fine-mesh fyke nets, each baited with a tin of sardines, will be set around the perimeter of ponds and wetlands and along streams at approximately 30-metre spacing (depending on the availability of suitable habitat). All fyke nets will be fitted with an eel excluder in the final compartment, which reduces the potential for smaller fish to be predated upon while captured in the net.

Gee minnow traps will be used to supplement the fyke nets, set at a spacing of around 8-10 metres. It is expected that eels will comprise the majority of the fish present within the gullies, with baited fyke nets being the best method to capture them (where in-stream habitat allows for their placement).

All traps and nets will be set for three consecutive nights, and will be checked and cleared each morning to remove any captured fish. Netting and trapping will continue until the total number of indigenous fish captured is less than 20% of the total number caught on the first trap night. The estimated number of traps and nets required for the three fill areas are presented in Table 1. It is possible that fewer traps will be required if works are undertaken in summer given the ephemeral nature of the watercourses. The drain in fill area 3 in particular is dry for much of the year following removal of the upstream pond and wetland.

Table 1: Estimated number of fine mesh fyke nets and Gee minnow traps required for each fill area.

Fill Area	Fine mesh fyke nets	Gee minnow traps
Fill Area 2	7	20
Fill Area 3	8	25
Fill Area 4	7	20

3.5 Hand-netting

Hand-netting will also be used to target any fish that still remain once the ponds and streams have been partially drained. The client will need to communicate with Wildlands ecologists regarding the timing of the pond draining to ensure that any fish left within the pond can be salvaged before the ponds and wetlands are fully drained.

Works that require the removal of material from within the bed of ponds and streams will need to be supervised by a suitably qualified freshwater ecologist so that any fish disturbed or scooped up by the excavator can be rescued.

Any material excavated from the bed of the pond will be spread in a shallow pile on the bank to allow ecologists to capture and relocate any remaining fish.

3.6 Handling of aquatic fauna

Captured freshwater fauna will be placed into chilly bins containing water taken from the pond and treated with API Stress Coat, an aquarium additive that restores the mucus coatings on fish and reduces stress. A battery-powered aerator will be used in each chilly bin to keep the water well-oxygenated and, where possible, the bins will be placed in a shaded area.

Large fish (particularly eels) will be kept separate from smaller individuals to reduce the risk of stress, injury, or predation. All aquatic fauna will be relocated as soon as possible following capture to reduce stress.

All fish captured will be counted and identified to species level before being released.

Any non-native pest species captured (e.g., mosquitofish, *Gambusia affinis*) will be humanely euthanised via blunt force trauma and disposed of on-site.

3.7 Relocation sites

All aquatic fauna will be relocated within 30 minutes of capture, where practicable, and released at the relocation sites shown in Figure 1. Both relocation sites may be used during works in any particular gully, if necessary, to avoid releasing excessive numbers of fish into one particular stream. Other release sites within the quarry land holdings are available should they be required, and fish may also be released directly into the Waikato River as a last resort, if necessary.

4. REPORTING

A report will be provided following completion of the stream works in each gully. The report will contain a detailed inventory of the fish species and kōura captured and relocated, together with supporting photographs. This will be provided within ten working days of the completion of the fish translocation. Records of all fish captured will be submitted to the NIWA Freshwater Fish Database and the Ministry for Primary Industries, as required by Wildlands' fish capture permit.

REFERENCES

Boffa Miskell 2019: Gleeson Quarries Huntly Limited - District and Regional Resource consents for new fill sites within quarry landholdings: Ecological Impact Assessment.

Ecological Solutions 2022: Wetland review: Gleeson Managed Fill Ltd wetland areas.

Stantec 2021: Huntly Managed Fill: Wetland Peer Review.



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