Fish Management Plan (FMP) for Waikato Thoroughbred Racing at Pencarrow Road, Tamahere

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Project name: Fish Management Plan for Waikato Thoroughbred Racing at Pencarrow Road, Tamahere

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1 Background

Awa Ecology has been engaged by BCD Group Ltd on behalf of Waikato Thoroughbred Racing (WTR) to prepare a Fish Management Plan (FMP) to address the fish management procedures required during the proposed infilling of artificial watercourses at the c.160 ha block of land at Pencarrow Road, Tamahere.

The site is bordered by State Highway 1, Pencarrow, Hooker and Duncan Roads and is currently a working dairy farm. There is a network of artificial watercourses present throughout the site, and these are proposed to be infilled to enable site development.

It is anticipated that a Fish Management Plan (FMP) will be required under the resource consent, to manage potential adverse effects on the stream and any resident aquatic biota. This FMP has been prepared to meet that requirement and specifies the following:

- Protocols and methods for the capture and transfer of indigenous fish prior to works commencing, including the timing, extent of fishing effort and release points;
- Protocols and methods to address discoveries of fish during the works, including recovery techniques to relocate fish to designated release points;
- Protocols and methods for recording and reporting to Waikato Regional Council, the numbers, diversity, and size range of all fish removed (recovered or accidentally injured or killed);
- Requirements for permits and certificates to handle native fish from the relevant authorities;
- Defined roles and responsibilities for all those involved (consent holder, contractor, ecologist) and the details of who will be responsible for overseeing the FMP;
- Notification and reporting procedures relevant to Waikato Regional Council;
- Ensuring that the capture and transfer of indigenous fish is undertaken in accordance with the FMP, with a suitably qualified ecologist present to ensure any remaining fish potentially left stranded by the dewatering activities are captured and relocated.

Details of the proposed fish recovery and management procedures are provided in the sections below.

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2 Site description

There is a network of artificial watercourses throughout the property which drain to the northwestern boundary with Pencarrow Road. This watercourse connects into the Mangaone Stream further downstream and then into the mainstem of the Waikato River. The network of watercourses is shown in Figure 1. The onsite watercourses were classified as artificial in October 2025, and this classification was confirmed in agreement with the Waikato Regional Council[1].

The artificial watercourses on the property range from 0.2 to 2 m wide and 0.05 to 0.2 m deep. The channels are very slow flowing, and the substrate is comprised of a mixture of deposited silt and sand. The watercourses on the property are likely ephemeral (only flow for part of the year) and therefore dry out during summer, as was seen during a site visit in November 2025.

A fish survey was undertaken at five sites throughout the property in November 2025[1]. No fish or large invertebrates were captured during the fish survey. However, three eDNA samples were taken in September 2025 at the outlet of the artificial watercourse network in the northwestern border of the property. The eDNA results detected the presence of shortfin eel/tuna (*Anguilla australis*). The detection of this common indigenous species represents low abundance and diversity which may indicate the presence of a barrier downstream. This will be confounded by the shallow nature of the watercourses contributing due to lack of instream cover and refuge for fish.

New Zealand Freshwater Fish Database (NZFFDB) records show that a range of native freshwater fish species have been recorded in the Mangaonua Stream catchment, downstream of the site. These species include the At-Risk-Declining longfin eel (*Anguilla dieffenbachii*), giant kokopu (*Galaxias argenteus*) and smelt (*Retropinna retropinna*). The At-Risk -Naturally uncommon Crans bully (*Gobiomorphus basalis*). The Threatened-Nationally vulnerable inanga (*Galaxias maculatus*), and the not threatened common bully (*Gobiomorphus cotidianus*), shortfin eel and the freshwater crayfish or koura (*Paranephrops planifrons*) (Dunn et al., 2025).

[1] Awa Ecology report dated 16 April 2026, Ecological Impact Assessment at Pencarrow Rd, Tamahere

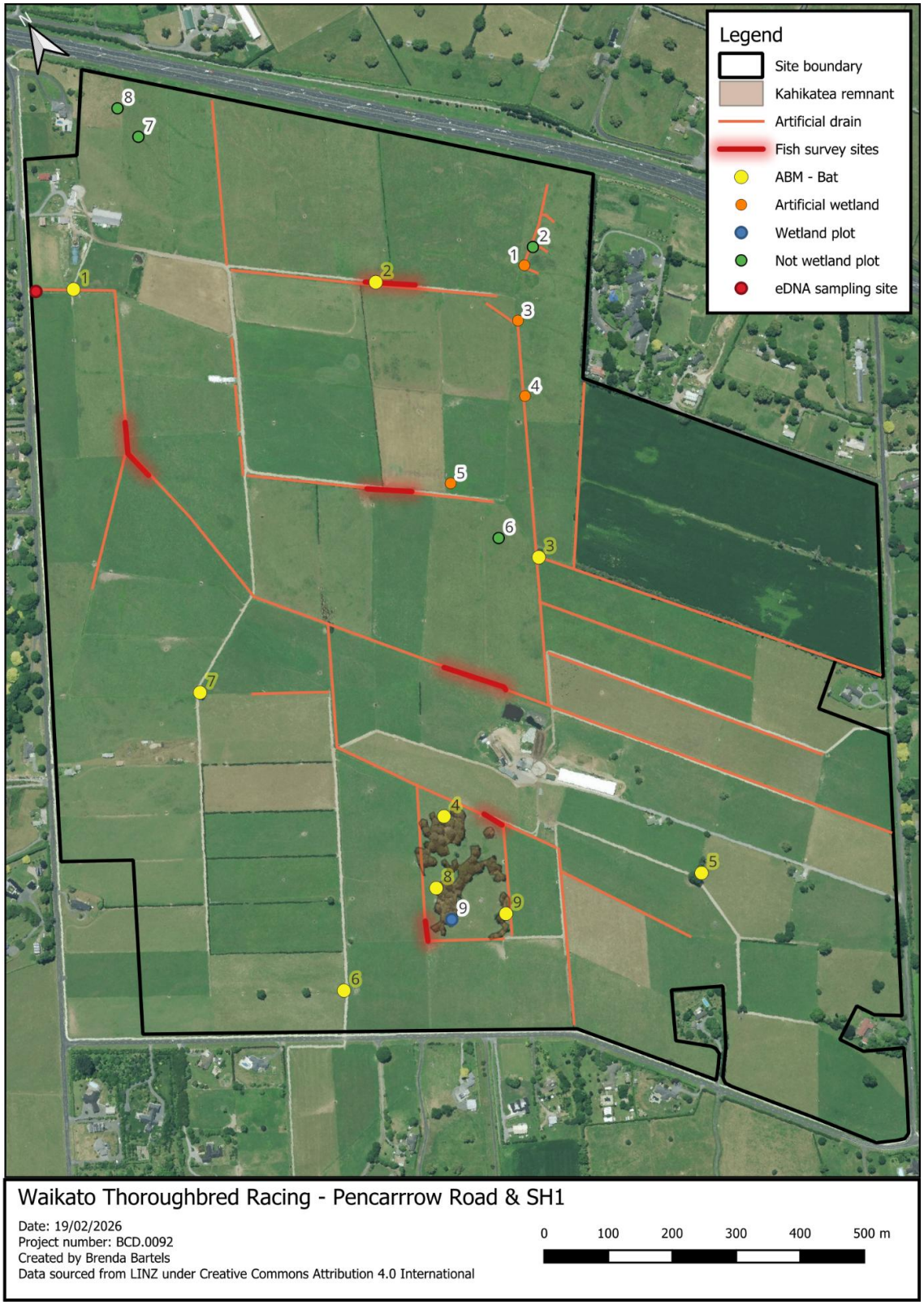


Figure 1: Site location. The red highlighted bars represent the locations that were fished in November 2025. All watercourses on site will be infilled.

3 Permits

A MPI special permit is required to conduct fish capture and relocation. Awa Ecology have a MPI Special Permit (820) to take and possess fish and aquatic life and relocate it to a suitable habitat when it is necessary or required to mitigate for any potential adverse effects.

No other permit is required as fish will not be transferred between different catchments.

4 Roles and responsibilities

A suitably qualified ecologist shall be present for the fish recovery works to supervise and carry out various tasks in this FMP and provide advice as required during the works. Awa Ecology or another suitably qualified ecologist will be responsible for the management and implementation of this Fish Management Plan (FMP). In addition, there needs to be a minimum of one other person to help with the fish recovery.

5 Fish relocation methodology

Fish recovery and relocation is only required if the watercourses have water at the time of the proposed works. If the watercourses are dry, then infilling can occur without the need to undertake fish recovery. However, if water is present, the methodology in the following sections will be undertaken.

5.1 Fish capture

As many fish as possible will be transferred from the affected reaches prior to the dewatering and infilling associated with the proposed works. This is necessary to reduce the risk of species burrowing into sediments and banks and becoming unfishable as the channel is de-watered.

Based on the species composition known and likely to be present at the site, the primary methods for capturing fish within the ephemeral watercourses will be the use of baited fyke nets and traps set overnight.

The general fishing procedure will be as follows:

- Prior to undertaking any instream works, all affected sections of waterway will be isolated as far as practicable with stop-nets or other permeable barrier to limit fish movement while maintaining stream flows. Stop nets will likely comprise mesh supported by standards/waratahs.
- Fish recovery will be undertaken through overnight trapping/netting. Whereby fine mesh Gee minnow traps will be set at high densities throughout the site, due to the shallow nature and the impracticalities of setting fyke nets. However, baited fine mesh fyke nets (small and mini size where appropriate) will be set in all available habitats where depth allows. Trapping density will be in accordance with the standard fish sampling protocols[2].
- Set nets/traps for at least two nights where moderate to high abundance of native fish are found (>3 per net/trap). One night trapping is appropriate few fish are captured (<2 per net/trap). An additional night may be needed where native fish with an elevated conservation status are found or if high numbers of fish are suspected of being missed.

The minimum effort for the fish transfer exercise will be overnight netting/trapping. Any remaining fish within the affected reaches would then be rescued and relocated during dewatering and prior to infilling as described below.

[2] Joy, M., David, B., & Lake, M. (2013). New Zealand Freshwater Fish Sampling Protocols. Part 1—Wadeable Rivers & Streams.

Any pest fish captured will be euthanised with an overdose of anaesthetic and then buried on site, away from the watercourses.

5.2 Dewatering

A suitably qualified ecologist is to be present on site at the time of dewatering of the affected reaches to ensure that any remaining aquatic life are captured and relocated. Hand netting will be undertaken to capture remaining aquatic life. Responsibility for transfer of remaining aquatic life may be handed over to site staff or the contractor as appropriate.

Where fish are discovered during works the protocols in this FMP, including the storage, transport, release and reporting detailed below shall be followed.

5.3 Fishing procedure

All fish recovered will be recorded, transported and released to the relocation site. Recovered fish will be transferred into fish bins containing clean aerated water. If eels are captured, they will be kept separate from other aquatic life.

- Fish will be held for the minimum time possible.
- The density of the fish within the fish bin will be monitored and kept to an appropriate level to ensure that low dissolved oxygen within the fish bin does not lead to mortality (an air bubbler will be used if needed).
- Fish shall be handled as little as possible and shall not be handled with dry hands. If any individuals show signs of stress (loss of righting response, gaping, gulping air) the water shall be changed to provide more oxygen.
- Eels, particularly larger eels (>500 mm) shall be isolated from other captured fish to avoid injury to any smaller fish.

The following fishing procedures are proposed:

1. Fish barriers are installed downstream of the works area.
2. Baited traps and nets are deployed in the afternoon and left overnight.
3. Traps and nets are checked and retrieved in the morning.
4. If large abundances of fish are captured, or species of conservation status, then netting/trapping is to be repeated for an additional night.
5. Hand netting will be undertaken during dewatering to recovery any stranded fish.
6. Any fish found shall be identified, counted and length estimated and then relocated downstream of the works area, into the upper tributary of the Mangaone Stream, or in the Mangaone Stream mainstem, dependant on water levels.
7. Once dewatering and the associated fish recovery is undertaken, and there are no more fish to be recovered, infilling will take place.

5.4 Supervision During Earthworks

If the salvage methods in Sections 5.1 to 5.3 are insufficient or deemed unsuitable by the suitably qualified ecologist, the bed of the waterbody will be cleared through a ‘muck out’ and the ‘spoil checked’ by an ecologist in accordance with the following protocols:

• An excavator will scrape the top layer of material / spoil from the waterbody bed to a depth where the bed is not inhabitable by fish (e.g. when the excavator reaches clay, bedrock, or anoxic material) c. 30 cm.

• The spoil will be laid out in a thin layer on the bank/ground near the waterbody, for immediate inspection by an ecologist(s).

• When safe to access, an ecologist will visually and manually search the spoil (by hand) for any fish. Once the spoil has been thoroughly searched, it will be cleared away, and the next bucket of spoil will be laid out for inspection.

5.5 Fish release

Fish recovered will be recorded, transported and released to a suitable site, as identified by a suitably qualified ecologist (see stars in Figure 2). Option 1 is downstream of Pencarrow Road, if this is dry then the Mangaone stream at Tamahere is Option 2. The third option is the Waikato Awa at Narrows boat ramp.

Recovered aquatic life should be transferred into fish bins containing clean aerated water, keeping eels separate from other fish species. Appropriate handling methods will be used to minimise stress on aquatic life. Fish will be held in covered bins that will be regularly refreshed with stream water and transferred and released within one hour of being caught. Aerators will be used to maintain dissolved oxygen levels.

The isolation barriers will isolate the fish from returning to the affected reach until works have been completed.

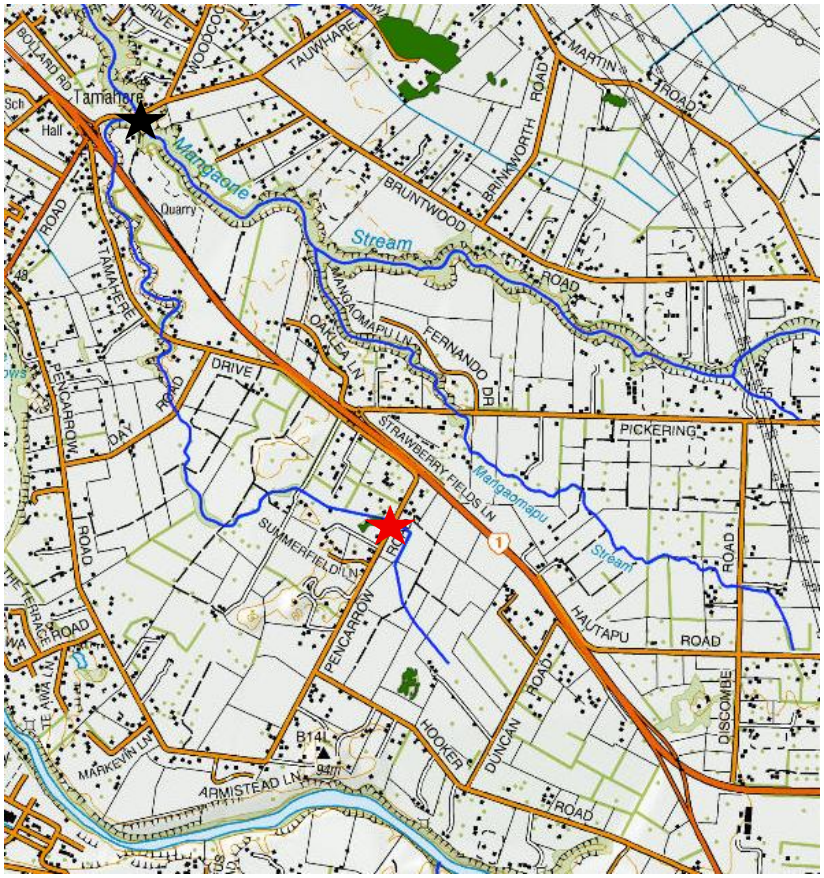


Figure 2: Proposed fish release locations depicted by stars. Red star is option 1 if the watercourse is flowing. If option 1 is dry, then fish will be released at the black star, option 2 (Mangaone Stream mainstem at Tamahere).

5.6 Reporting

Aquatic life captured (species, number and length range) shall be recorded and a summary email/memo prepared for presentation to BCD Ltd along with other compliance data. This can then be submitted to Waikato Regional Council. Capture records shall also be electronically submitted to the New Zealand Freshwater Fish Database and retained as part of MPI permit compliance requirements.

5.7 Biosecurity

The 'Check Clean Dry' procedures must be implemented on all gear. The procedures can be found on the MPI website here: Check Clean Dry for the North Island | NZ Government are further detailed in Appendix 1.

Appendix I: MPI Biosecurity requirements

Biosecurity New Zealand
Ministry for Primary Industries
Manatū Ahu Matua

Full list of cleaning treatment options for gear made of absorbent material

Refer to this document when you need to clean any absorbent gear when moving between waterways in the North Island. For full instructions, go to the Check Clean Dry web page

Type of treatment	Protocol	Details
Hot water	70°C, soak for 2 minutes, OR 50–55°C, soak for at least 5 minutes, OR Above 45°C, soak for at least 20 minutes.	 Most homes have hot water set at 50–55°C Note: Caution is advised, especially with the higher temperatures.
Freezing	Until solid, usually overnight	
Bleach solution	5% bleach solution, soak for 60 minutes, OR 10% bleach solution, soak for 30 minutes.	5% bleach solution: 5-litre mix = 250ml bleach in 4.75 litres water 10% bleach solution: 5-litre mix = 500ml bleach in 4.5 litres water Note: Take care of how you dispose with the used bleach solution.
Salt	100 parts per thousand (ppt) household salt in warm water, soak for 4 hours.	100ppt salt solution: 5-litre mix = 500g salt in 5 litres warm water Note: Seawater is not a suitable alternative, as the salt content is too low (on average 35ppt ratio) to be effective against clams.

Other treatment options

Type of treatment	Method	
2 steps: Vinegar + detergent	20% household vinegar solution, soak for 10 minutes AND 10% dishwashing detergent solution, spray and leave item wet for 10 minutes.	20% vinegar solution: 5-litre mix = 1 litre vinegar in 4 litres water AND 10% detergent solution: 5-litre mix = 500ml detergent in 4.5 litres water Note: Vinegar and detergent must both be used as part of a 2-step treatment in order to be effective against a range of invasive freshwater species (including clams and didymo).
Steam	Apply steam at 100°C or higher for a minimum of 30 seconds, at 3-4 cm from the material surface.	Note: For safety reasons, ensure you follow the manufacturer's instructions when operating the equipment.
Virkon Aquatic solution (a disinfectant typically used in marine farming)	1% Virkon Aquatic solution, soak for 5 minutes, or 2% Virkon Aquatic solution, soak for 2 minutes.	1% Virkon Aquatic solution: 5-litre mix = 50ml Virkon-Aquatic in 4.95 litres water 2% Virkon Aquatic solution: 5-litre mix = 100ml Virkon-Aquatic in 4.9 litres water Note: Virkon–S (a disinfectant used in on-land situations), is not a treatment option as the efficacy for managing all invasive aquatic organisms has not been proven.
Isopropyl alcohol (70%) Note: For hard surfaces only. This is NOT a viable option for absorbent materials.	Dilute Isopropyl alcohol (70% strength) in a 50:50 mix with water, spray surface and leave for 10 minutes, OR Dilute Isopropyl alcohol (70% strength) to an 80:20 mix with water, spray surface and leave 5 minutes.	50% Isopropyl alcohol solution: 1-litre mix = 500ml Isopropyl alcohol in 500 ml water 80% Isopropyl alcohol solution: 1-litre mix = 800ml Isopropyl alcohol in 200 ml water Note: For safety reasons follow the manufactures warnings.

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