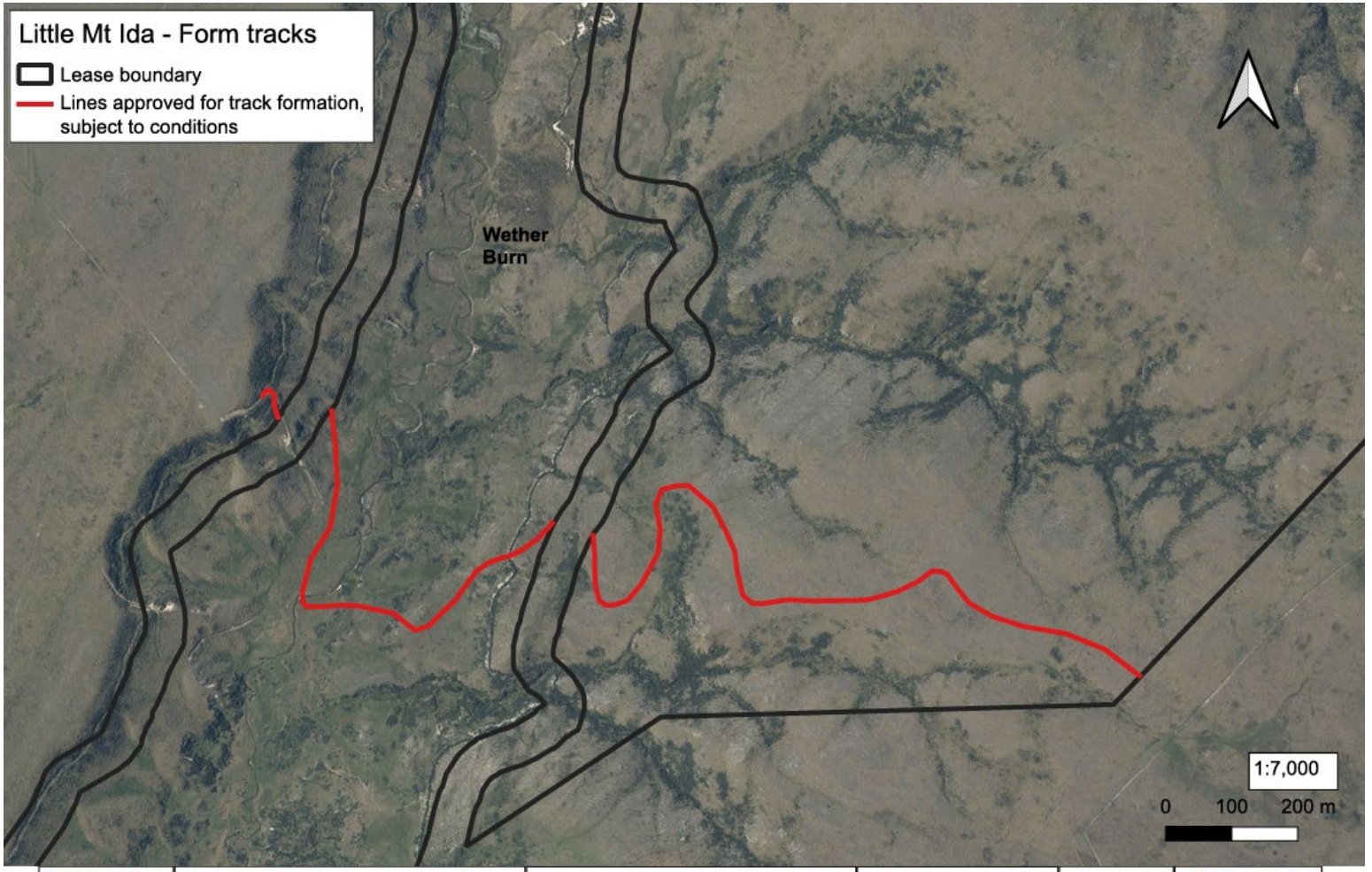
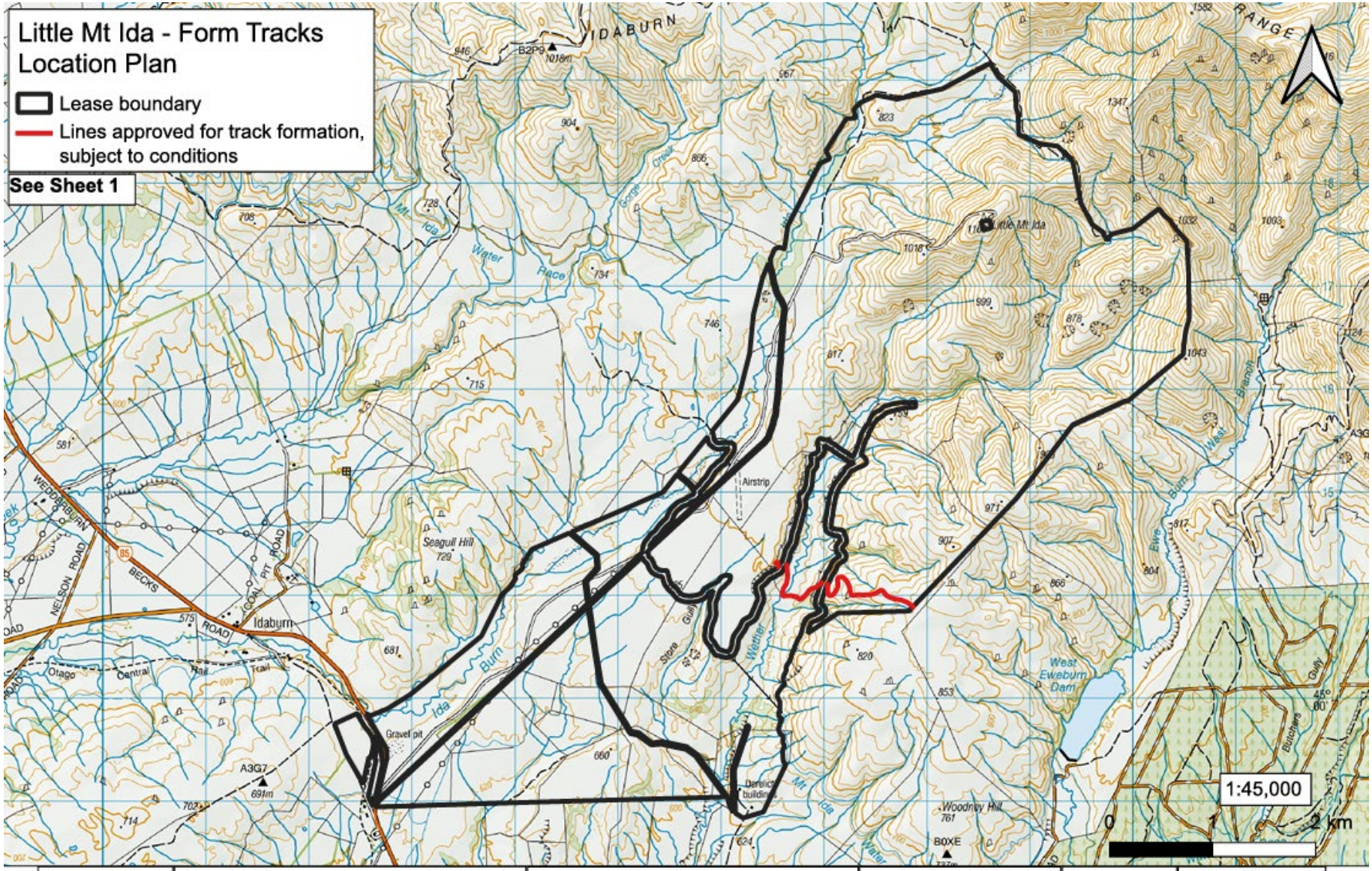
Operational Area – Form Tracks



Latham Ag LTD Consulting	Lease Registration Reference: Po321 / 12574	Run Name: Little Mt Ida	Version date: 20/11/2024	Version:
	Land District: Otago Land District	Boundary sourced from LINZ Data Service	Sheet 1 of 2	1 2 3 4 5

Land Information New Zealand



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Culverts & Fish Passage

Summarised from the New Zealand Fish Passage Guidelines (structures up to 4m) by National Institute of Weather and Atmospheric Research, Department of Conservation and the New Zealand Fish Passage Advisory Group.

Culverts are to be sized, installed and maintained to minimise erosion and prevent sediment entering waterways, and to meet the following key objectives for the passage of fish and other aquatic species:

- Maintain continuity of instream habitat.
- Minimise alterations to stream alignment and gradient.
- Maintain water velocities and water depths within a range equivalent to adjacent stream reaches.
- Minimise constraints on bank-full channel capacity resulting from the culvert.
- Avoid vertical drops.
- Provide an uninterrupted pathway along the bed of the structure.

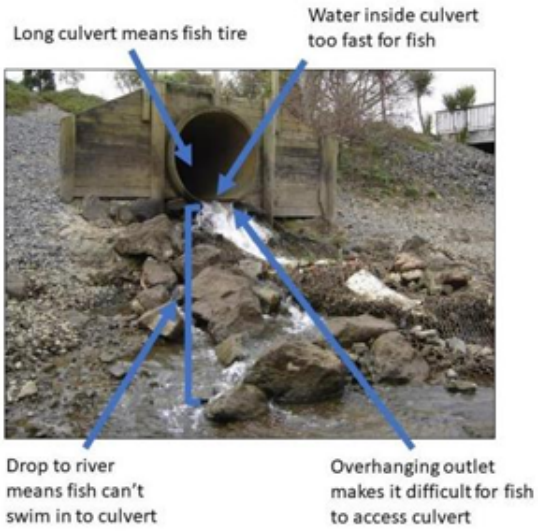

Figure 2-1: Example of a culvert that impedes fish movements.

Figure 3-2: An example of a stream simulation culvert design.

Except… Providing for unimpeded fish passage is advantageous for most fish, but some of New Zealand's native freshwater fish are impacted by exotic species and benefit from having a safe refuge area. If there are known populations of non-migratory galaxias and mudfish upstream, and predatory exotic fish such as trout downstream, there may be benefits to preventing passage for the latter, for example with a perched culvert.

Threatened and At Risk plant species to avoid during track construction

Coprosma intertexta, Raoulia parkii, scabweed, coral broom and desert broom (see photos below)

Coral Broom:

Desert Broom:

Coprosma intertexta (brown bushes in centre) **and desert broom:**

***Raoulia parkii*:**

Scabweed:

Waypoints and GPS data marking the location of Threatened and At Risk species in the area of the new track: