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November 2026

Remarkables Doolans Ski Area Expansion

Terrestrial Ecology Management Plan – Alpine Project Area

Submitted to: Mitchell Daysh Limited

water fauna flora land

Quality Assurance

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Revision History

This Terrestrial Ecology Management Plan (TEMP) is to be certified by the Queenstown Lakes District Council, the Central Otago District Council, and the Otago Regional Council. Any subsequent amendments to this plan must, at a minimum, meet the requirements set out in the certified version. The following outlines a record of report versions and amendments.

Issue	Date	Summary of revisions
Draft v1	22/10/2026	Initial draft for client feedback.
Draft v2	2/11/2026	Full revision to align with H.02 draft conditions (3 September 2026), e3Scientific TEcIA (B.12, 26 August 2026) recommendations, and Wildlands (CODC), Rossaak (wetlands) and Watts (DOC invertebrates) technical advice. Content from an unrelated project template removed.

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Appendices

Appendix A – Recommendations Cross-reference Table.

Appendix B – Plant Species Required for Translocation (Conditions ECO.10; ATCH B & C).

Appendix C – Monitoring and Incident Record Templates.

Appendix D – Protocol for the Rehabilitation of Natural Alpine Environments (ATCH D).

1.0 Introduction

1.1 Background

NZSki Limited (NZSki, the Consent Holder) is seeking approval under the Fast-track Approvals Act 2024 (FTAA-2605-1236) to upgrade The Remarkables Ski Area and expand it into the adjacent Doolans Basin ('the Project'). This Terrestrial Ecology Management Plan (TEMP) applies to the Alpine Project Area, being the parts of the Project within the Rastus Burn and Doolans Basin (as shown in Figure 1). The Alpine Project Area excludes the Lower Remarkables Transit Hub.

The existing ski area lies within the Rastus Burn Recreation Reserve (Queenstown Lakes District). The Doolans expansion lies within the Remarkables Conservation Area (Central Otago District). Both are public conservation land administered by the Department of Conservation (DOC). The Alpine Project Area is situated within the Remarkables Ecological District.

This TEMP updates the draft TEMP lodged with the application (EMM Consulting for Mitchell Daysh, Version 1.0, 19 May 2026), as required by Condition ECO.2. It is consistent with the draft resource consent conditions (H.02, 3 September 2026) and gives effect to:

- the recommendations of the Terrestrial Ecological Impact Assessment (TEcIA) (e3Scientific, 26 August 2026; B.12);
- the review of terrestrial ecology prepared for Central Otago District Council (Wildland Consultants, Report 7955c, September 2026);
- the wetland and tarn technical advice prepared under section 53 of the FTAA (A. Rossaak, 12 October 2026); and
- the terrestrial invertebrate advice prepared for the Director-General of Conservation (C. Watts, 12 October 2026).

Every recommendation from these documents (excluding lizards) is listed in Appendix A, with the section of this TEMP that implements it and the condition that applies. Where a recommendation goes further than the current draft conditions, this is identified.

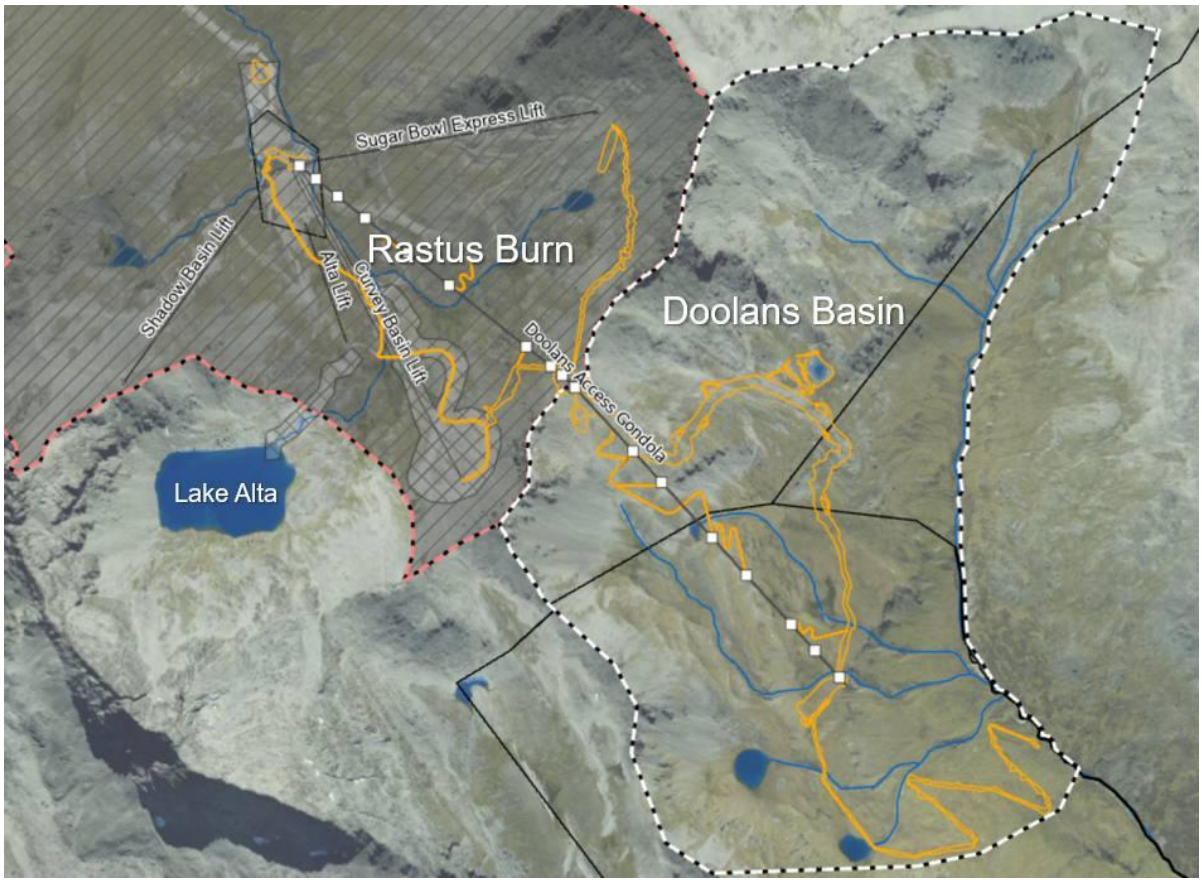


Figure 1: Location of the Alpine Project Area (Rastus Burn and Doolans Basin) (adapted from e3Scientific 2026).

1.2 Purpose

This TEMP will manage the effects of the Project during its construction, operation and maintenance phases. It will remain in effect for **40 years**, which covers the full life of the approvals sought for the Project.

The purpose of this TEMP is to set out the ecological management measures required to avoid, minimise, remedy or mitigate potential adverse effects on indigenous vegetation (including taonga plants), wetland and stream habitats, invertebrates and avifauna within the disturbance footprint and its surrounds. The disturbance footprint is identified in Section 2.2 and shown in Figure 2 to Figure 7. The effects management approach is set out in Section 4.0. To achieve this purpose, the TEMP details management and monitoring of:

- **Vegetation and flora** – including clearance, and translocation of Taonga Plants (Sections 9.1and 9.2);
- **Identification of Taonga Plants** – following discussions with Kā Rūnaka (Sections 6.0 and 9.2);
- **Wetlands** – maintain ecological and hydrological functions (Section 9.3);
- **Streams** – maintain connectivity, detail remediation and native planting works (Section 9.4);
- **Biosecurity and weeds** – hygiene, prevention and control of invasive exotic plants (Section 9.5);

- **Invertebrates** – minimise effects, and provide protective habitat provision (Section 9.6);
- **Birds** – best practice protective measures, particularly during the breeding, nesting and fledgling seasons, with a particular focus on 'Threatened' and 'At Risk' birds, specifically kea (*Nestor notabilis*), kārearea/eastern falcon (*Falco novaeseelandiae*) and pīhoihoi/pipit (*Anthus novaeseelandiae*) (Section 9.7); and
- **Rubbish/refuse** – annual rubbish collections, reducing degradation of indigenous vegetation and minimising ingestion of rubbish by kea (Section 9.8).

Note: The management of activities which affect indigenous lizards is managed separately through the Lizard Management Plan (Conditions ECO.26 to ECO.30) and is not included here.

1.3 Objectives

The overarching objective (Condition ECO.2) is to identify how the potential adverse effects of the Project on terrestrial ecology and biodiversity values (excluding lizards) within the project area and its surrounds will be appropriately managed. The specific objectives listed below in Table 1 are each linked to measurable performance standards in Section 11.0.

Table 1: TEMP objectives and the monitoring that measures them (monitoring IDs refer to Table 18).

Value	Objective	Measured by
Indigenous vegetation	No vegetation clearance outside the authorised footprint. Disturbed surfaces are rehabilitated with salvaged indigenous vegetation, achieving at least 60% indigenous cover after seven years.	M1, M3–M5
Threatened, At Risk and taonga plants	All required plants are translocated before clearance (ECO.10), achieving at least 60% survival after seven years.	M2
Wetlands	Wetland loss is confined to the authorised extent. Hydrological function and indigenous wetland vegetation are maintained in retained wetlands, including against sediment and water-chemistry change.	M7–M12
Streams	Stream connectivity is maintained, and disturbed banks are stabilised and revegetated.	M11, M13
Biosecurity	No new exotic species are introduced, and existing exotic species do not increase in extent.	M6
Invertebrates	Effects on invertebrates are minimised through avoidance, habitat transfer and host-plant translocation, and verified by before–after, control–impact (BACI) monitoring.	M14, M15
Avifauna	No project-related death or injury of indigenous birds and no nest disturbance contrary to ECO.21–ECO.22B. Kea interactions are minimised, and bird strike is detected and addressed.	M16–M19
Rubbish	No rubbish accumulates in the alpine environment, and kea cannot access waste.	M20

1.4 Scope and Relationship to Other Plans

This TEMP covers the Alpine Project Area for the construction, operation and maintenance of the Project. It does not cover lizards, the Lower Remarkables Transit Hub, or the design and delivery of the Biodiversity Compensation Project (Conditions BIO.1 to BIO.15). It must be read with the following documents listed below in Table 2.

Table 2: Documents related to this TEMP.

Document	Relationship to this TEMP
Construction Environmental Management Plan (CEMP) (GC.8)	Sets general construction controls (hours, lighting under CON.9–CON.11, hazardous substances, waste). This TEMP sets the ecological requirements that the CEMP must give effect to.
Erosion and Sediment Control Plan (ESCP) (GC.8; certified for each earthworks stage)	Sets the detailed erosion and sediment controls. Section 7.4 of this TEMP sets ecological requirements for the ESCP, including wetland protection.
Lizard Management Plan (ECO.26–ECO.30)	Manages lizards. Vegetation clearance sequencing must be coordinated with the habitat-reduction requirements of ECO.27 and ECO.28.
Stormwater Management Plan and engineering designs (WAT, INF and EW conditions)	Crossing, swale, reservoir and trenching designs must meet the hydrological and ecological requirements of Sections 9.3 and 9.4.
Biodiversity Compensation Project Plan (BIO.1–BIO.15)	Addresses residual effects. Monitoring under this TEMP that shows loss beyond authorised extents, or failed remediation, must be reported so that the residual effect can be accounted for (Sections 4.0 and 12.0).
DOC concession conditions	Landowner requirements on public conservation land. Where they are more stringent, the concession conditions prevail.

1.5 Duration, Phases and Certification

This TEMP applies for 40 years from commencement. Condition ECO.2(b) requires the TEMP to identify which components apply to construction only and which continue after construction. These are set out in Table 3.

Table 3: TEMP components by phase (Condition ECO.2(b)).

TEMP component	Construction	Operation and maintenance	Duration
Footprint control, pre-works surveys, plant translocation (Section 9.1, 9.2)	Yes	For any maintenance or new works that disturb vegetation	Each works event
Translocation and revegetation monitoring (Section 11.0)	–	Yes	7 years after each translocation (ECO.18), and longer if ECO.19 applies
Wetland crossing design, construction controls (Section 9.3)	Yes	Crossing maintenance (ECO.42)	Life of infrastructure
Wetland hydrology, vegetation and chemistry monitoring (Section 11.0)	Yes	Yes	Per Table 18, through operation
Erosion and sediment control (Section 7.4)	Yes	Yes, for permeable roads near wetlands (ECO.40)	Life of tracks
Biosecurity and weeds (Section 9.5)	Yes	Yes	40 years
Invertebrate monitoring (Section 9.6, 11.0)	Yes	Yes	Per Table 18
Kārearea and pīhoihoi nest protocols (Section 9.7)	Yes	For maintenance works in the breeding season	40 years
Kea measures Section (9.7)	Yes	Yes (signage, waste, lead-free materials)	40 years
Bird-strike monitoring (Section 9.7)	–	Yes	5 years after the Doolans Base Building is built (ECO.25), then as triggered
Rubbish collection (Section 9.8)	Yes	Yes, annually	40 years
Snowmaking, grooming and summer-use controls (Section 10.0)	–	Yes	40 years
Annual monitoring report (Section 13.0)	Yes	Yes	Annually

This TEMP must be submitted for certification to Queenstown Lakes District Council and Central Otago District Council, and to the Otago Regional Council (insofar as it relates to wetlands), at least 40 working days before works start in the Alpine Project Area (Condition GC.8). The certification process is set out in Condition GC.7. Any amendment must meet the minimum requirements of Condition ECO.3 and be re-certified. Review triggers are set out in Section 13.4.

2.0 Project and Ecological Setting

2.1 Project Overview

The works within the Alpine Project Area comprise:

- **Rastus Burn (existing ski area):** upgrades to power, water, wastewater, stormwater, communications and snowmaking infrastructure; expansion of the Rastus Burn Base Building; the new Doolans Gondola base station; and upgraded and new access roads and ski return trails.
- **Doolans Basin (expansion):** gondola towers and the Helicopter Ridge Midstation; the Doolans Cabin (Base) Building and return station; combined ski trails and access roads; a learners' area with a covered conveyor; snowmaking; and water supply infrastructure, including a weir and pump station on Doolans Creek, a water-take road and pipeline, and a lined reservoir in Tarn 3; together with operational controls (signage, fencing, avalanche control and boundary markers).

Construction is planned over four consecutive summers, starting in summer 2027 [programme to be confirmed by NZSki]. Earthworks may be staged within and between construction seasons. Each earthworks stage requires its own certified ESCP.

2.2 Disturbance Footprint

The Project disturbance area is detailed below in Table 4, and shown in Attachment A to the conditions and in Figure 2. Earthworks and vegetation clearance must not occur outside it unless this would reduce the footprint and reduce terrestrial ecology effects (Condition ECO.6). The TEcIA assesses direct disturbance (track width) plus edge effects within 2 m either side, where up to 50% of vegetation cover may be lost.

Table 4: Direct disturbance by community (TEcIA Table 14; e3Scientific 2026).

Vegetation / habitat community	Ecological value	Direct disturbance (ha)	Edge effect area (ha)
Snow tussock grassland	Very High	5.53	0.72
North-facing tussock grassland	High	2.31	0.33
Dracophyllum scrub	High	0.15	0.03
Cushionfield	Very High	1.27	0.25
High alpine cushionfield	Very High	1.92	0.21
Rockfield	Very High	4.38	0.46
Rocky outcrop	Very High	0.16	0.01
Snowbank	Very High	0 (avoided)	–
Cushion bog (wetland)	Very High	0.003	0.003
Riparian wetland	Very High	0.03	0.009
Seepage (wetland)	Very High	0.20	0.05
Total indigenous habitat		**15.95**	**2.06**
Disturbed vegetation (existing modified areas)	Moderate	1.26	0.14

Of the indigenous habitat disturbed, about 14.82 ha is in the Doolans (Central Otago District). About 11.88 ha is capable of being revegetated with salvaged vegetation, but is still treated as habitat loss for effects management. The following extents must be reconciled before certification:

- **Wetlands:** the TEcIA text refers to about 0.20 ha, while TEcIA Table 14, B.14 and A-21 give 0.233 ha. This TEMP adopts the TEcIA Table 14 values by wetland type as the authorised maximum wetland disturbance (Section 9.3.1) [to be confirmed against final GIS footprint].
- **Tarn 3:** about 0.445 ha of open water is converted to a lined reservoir (INF.5), and about 55 m of intermittent inflow stream is replaced by armoured swales (WAT.24–WAT.25).

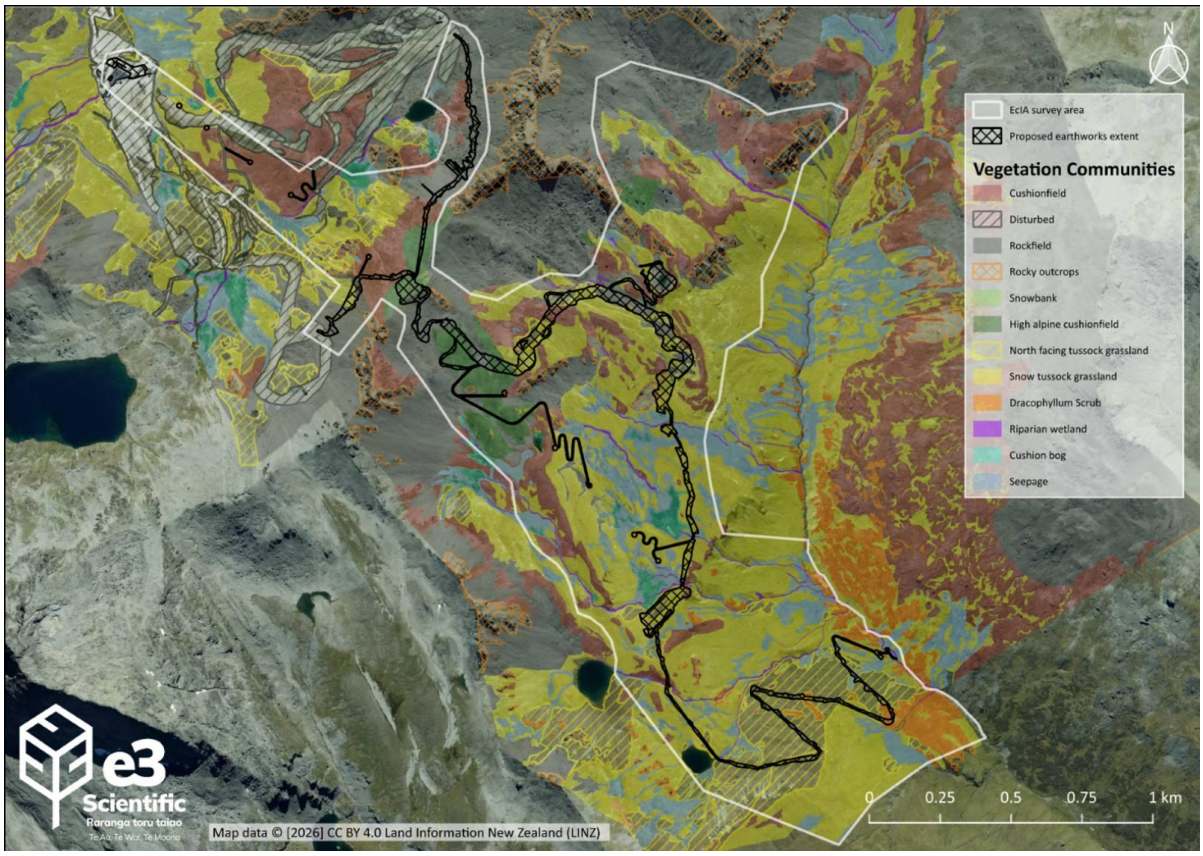


Figure 2: Proposed earthworks footprint within vegetation communities (adapted from e3Scientific 2026).

2.3 Vegetation, Flora and Naturally Uncommon Ecosystems

Twelve vegetation/habitat communities are mapped, characteristic of a relatively unmodified alpine and subalpine environment within the **Remarkables Ecological District**. Indigenous dominance exceeds 99% in the key alpine communities. Exotic species are largely confined to disturbed areas in the Rastus Burn. Several communities are Naturally Uncommon Ecosystems (NUEs):

- Cushion bog, string mire and seepage (seepages are classed as ‘Endangered’ under the IUCN Red List of Ecosystems criteria);
- Rockfield (screes of acidic rocks);
- Rocky outcrops (cliffs, scarps and tors of acidic rocks); and
- Landforms at higher altitude may also qualify as moraines.

Surveys record 247 indigenous vascular plant species in the upper Rastus Burn and Doolans, including species of national and regional conservation interest (following de Lange et al. 2024, and Jarvie et al. 2025):

- One 'Threatened – Nationally Endangered' species (*Craspedia uniflora* var. *uniflora*);
- 34 nationally 'At Risk' species;
- 'Data Deficient' and 'taxonomically unresolved' taxa; and
- 37 regionally 'Threatened', 'At Risk' or 'Data Deficient' species.

The species required to be translocated are listed in Appendix B. Their recorded locations are shown below in Figure 3.

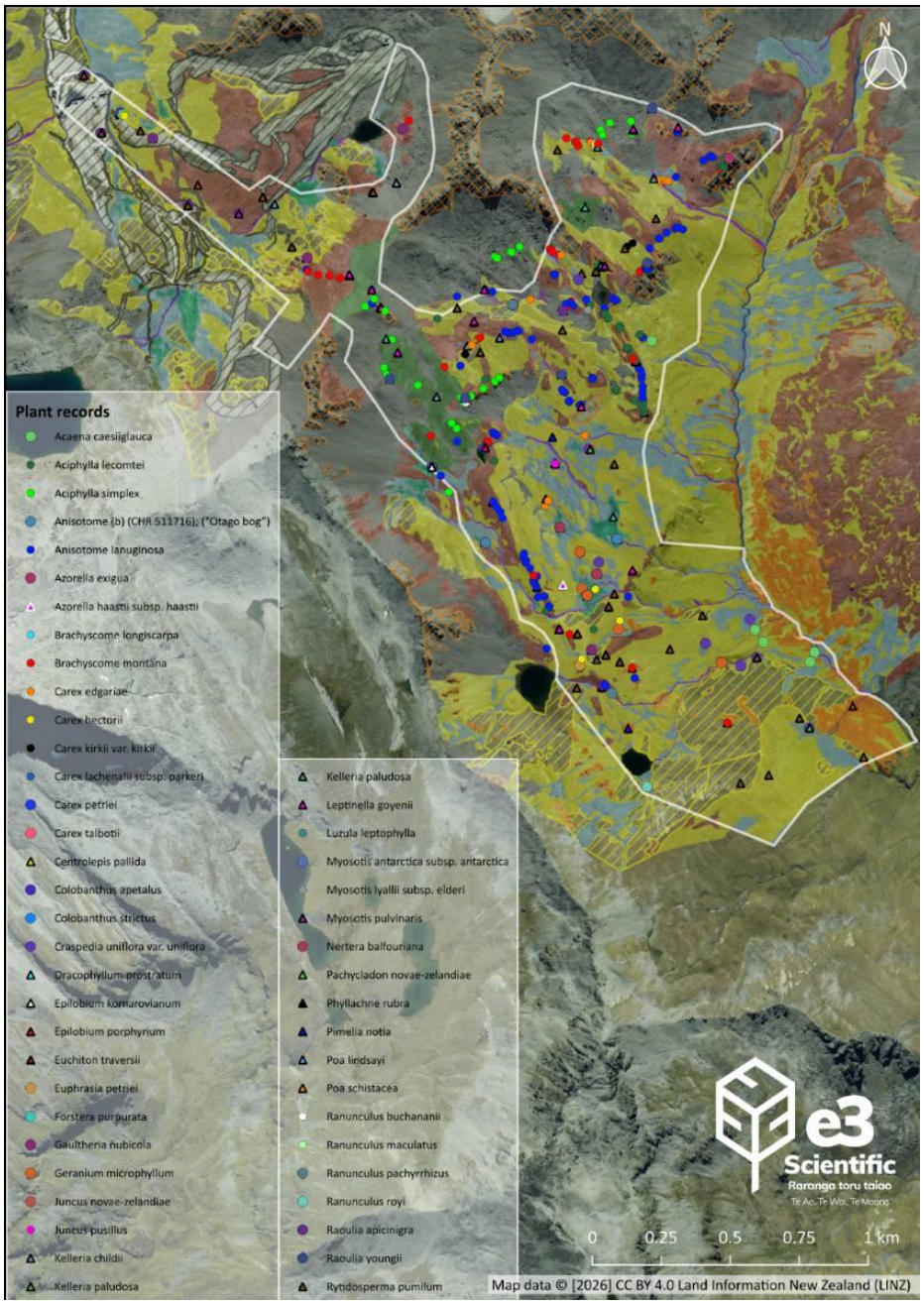


Figure 3: Location of 'Threatened', 'At Risk', 'Data Deficient' and taonga plant records (adapted from e3Scientific 2026).

2.4 Taonga Species

Eight taonga plant species have been identified within the proposed disturbance areas and wider study area (as listed in Table 5). Four already hold a national or regional threat classification. Kārearea, pīhoihoi, kea, kāhu/swamp harrier (*Circus approximans*) and pūtakitaki/paradise shelduck (*Tadorna variegata*) are taonga avifauna. The final list of taonga plants to be translocated, and culturally appropriate handling, will be confirmed with Kā Rūnaka (see Section 6.0).

Table 5: Taonga plant species and community associations (TEcIA Table 16).

Taonga species	Community association
Taramea / *Aciphylla aurea*	Snow tussock grassland, north-facing tussock grassland, *Dracophyllum* scrub
Taramea / *Aciphylla kirkii*	Snow tussock grassland, north-facing tussock grassland, cushionfield, rockfield, rocky outcrop, riparian wetland, seepage
Taramea / *Aciphylla lecomtei*	Snow tussock grassland, cushionfield, rocky outcrop
Taramea / *Aciphylla latipinna* (see note below)	Snow tussock grassland, north-facing tussock grassland, *Dracophyllum* scrub
Taramea / *Aciphylla simplex*	Cushionfield, high alpine cushionfield, rockfield, rocky outcrop
Wīwī / *Juncus pusillus*	Cushion bog, seepage, riparian wetland
Wīwī / *Juncus novae-zelandiae*	Cushion bog, seepage
Koromiko / kōkōmuka / *Veronica salicifolia*	Riparian wetland

Note: TEcIA Table 16 lists Aciphylla latipinna. The lodged TEMP and Attachment B to the conditions list Aciphylla "Lomond". Until Kā Rūnaka confirm the list, both taxa are treated as taonga for translocation purposes. Correction of Attachment B is recommended. Aciphylla latipinna is also an invertebrate host plant under ECO.10(c).
Name change: It appears Aciphylla "Lomond" was formally named Aciphylla latipinna Perrie, Glenny, L.D.Sheph. in 2026 after being recognised as a distinct species (Perrie et al. 2026).

2.5 Wetlands, Tarns and Streams

The Doolans Basin wetlands form an interconnected mosaic of cushion bog, riparian wetland and seepage, with small areas of string mire within the cushion bog. All are rated 'Very High' ecological value and support 'At Risk' and 'Threatened' plants and specialist invertebrates. Wetlands were delineated using the Ministry for the Environment wetland delineation protocols (Figure 4).

Tarn 3 has a naturally fluctuating water level (wetted area about 1,210–4,450 m² between years), an exposed schist margin and groundwater connectivity. Its status is contested:

- The TEcIA and the Wildlands review consider it is not a natural inland wetland; and
- The wetland technical advice (Rossaak) considers it should be treated as one, with 'Very High' value.

This TEMP does not depend on resolving that question. It manages Tarn 3 and its catchment under Section 9.3.6 and records its loss for effects accounting. Streams in the Alpine Project Area are steep alpine channels. Crossings must maintain hydrological connectivity.

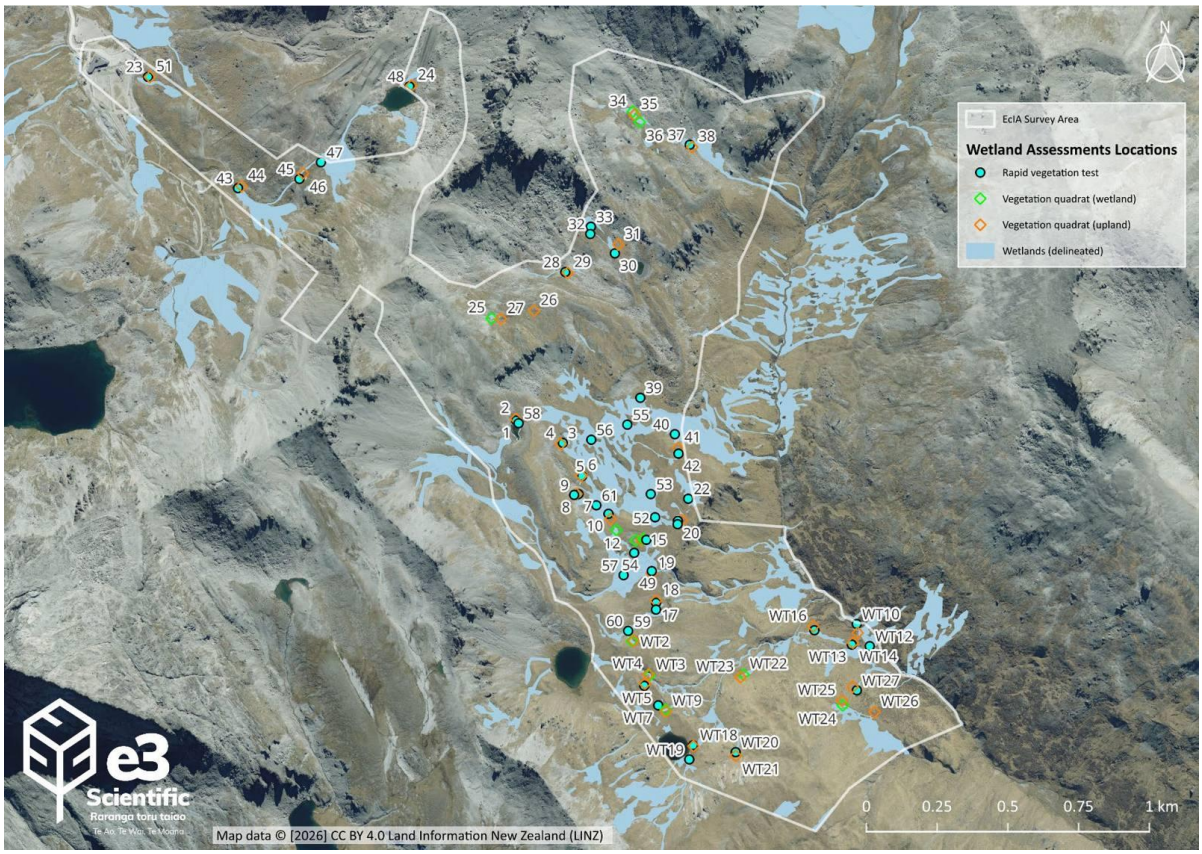


Figure 4: Wetland assessment locations and delineated wetland boundaries (adapted from e3Scientific 2026).

2.6 Invertebrates

Invertebrate surveys in the Doolans recorded 120 taxa from 15 orders and 64 families, using pitfall traps, light traps and hand searches between mid-January and early March. Twenty-five notable taxa ('Threatened', 'At Risk', 'Data Deficient' or unclassified) are recorded or potentially present. Their habitats and host plants are summarised in Section 9.6 (Table 16).

The Remarkables invertebrate fauna is diverse, distinctive and incompletely documented. It includes rare moths, giant weevils, wētā, grasshoppers and undescribed soil micro-arthropods, so the absence of records should be treated with caution (Watts 2026).

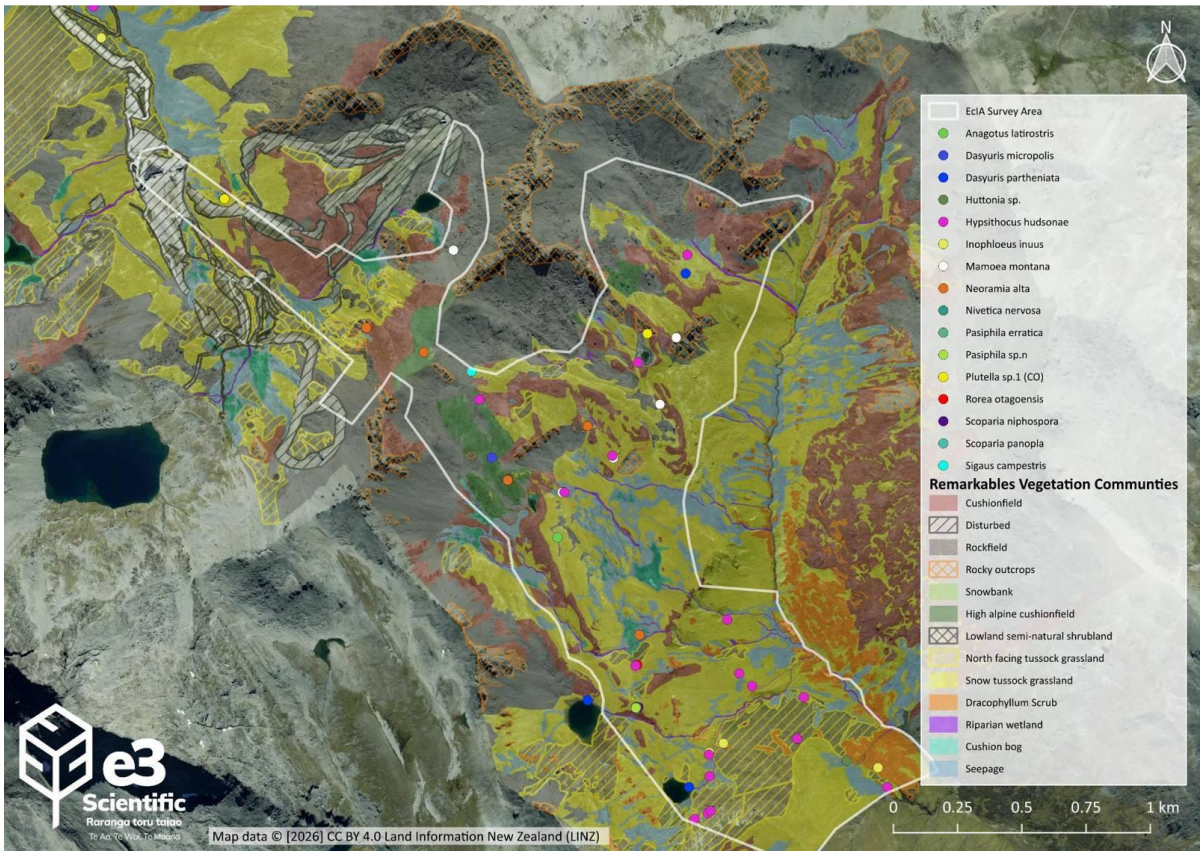


Figure 5: Location of Unclassified, Data Deficient, At Risk and Threatened invertebrate records (adapted from e3Scientific 2026).

2.7 Avifauna

Six indigenous bird species are known from the Alpine Project Area:

- Kārearea/eastern falcon ('Threatened – Nationally Vulnerable'; Robertson et al. 2021): up to three territorial pairs are inferred across the upper and lower Rastus Burn and the headwaters of the Doolans Creek right branch;
- Kea ('Threatened – Nationally Endangered');
- Pīhoihoi/New Zealand pipit ('At Risk – Declining'): the most frequently recorded species, nesting in tussock grassland below 1,700 meters above sea level (m asl);
- Kāhu/Australasian harrier (or hawk);
- Pūtakitaki/paradise shelduck; and
- Karoro/Southern black-backed gull (*Larus dominicanus*).

Bird observations are shown in Figure 6. Pipit nesting habitat overlapping the footprint is shown in Figure 7.

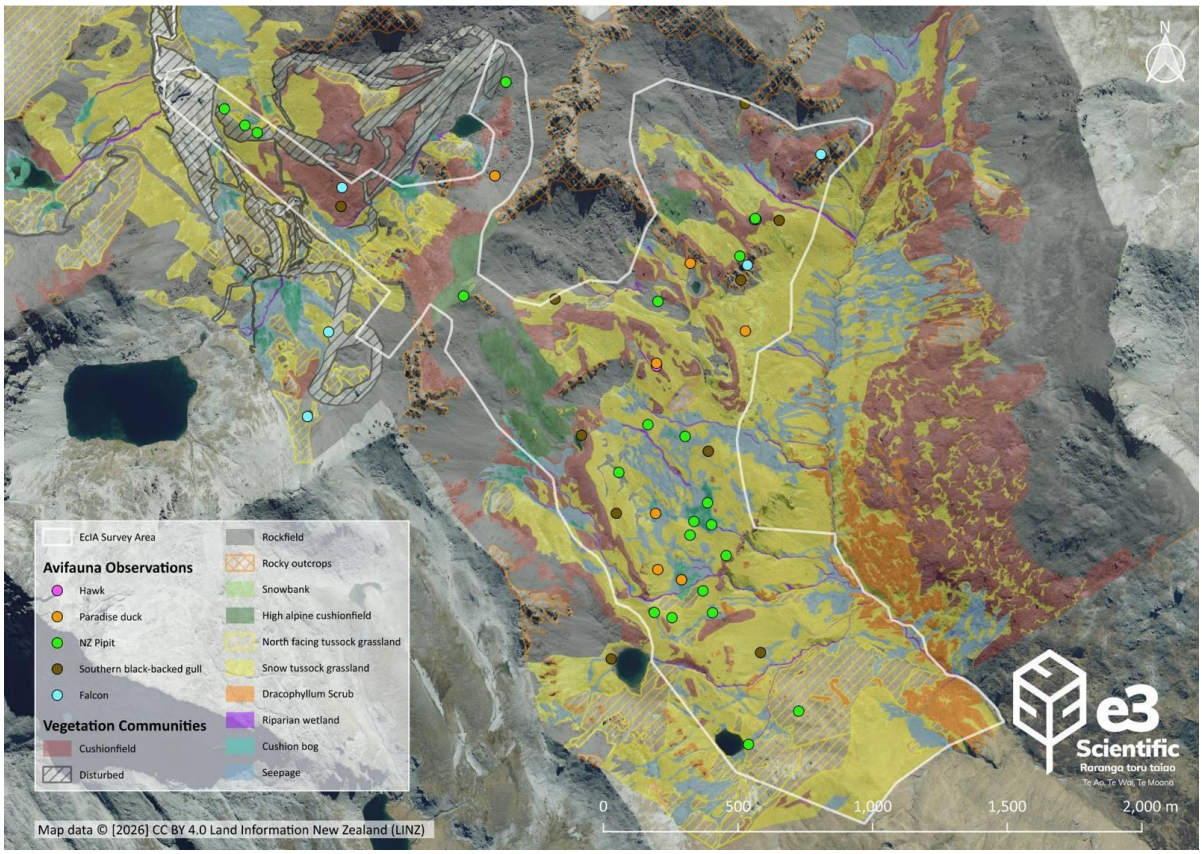


Figure 6: Location of avifauna observations (adapted from e3Scientific 2026).

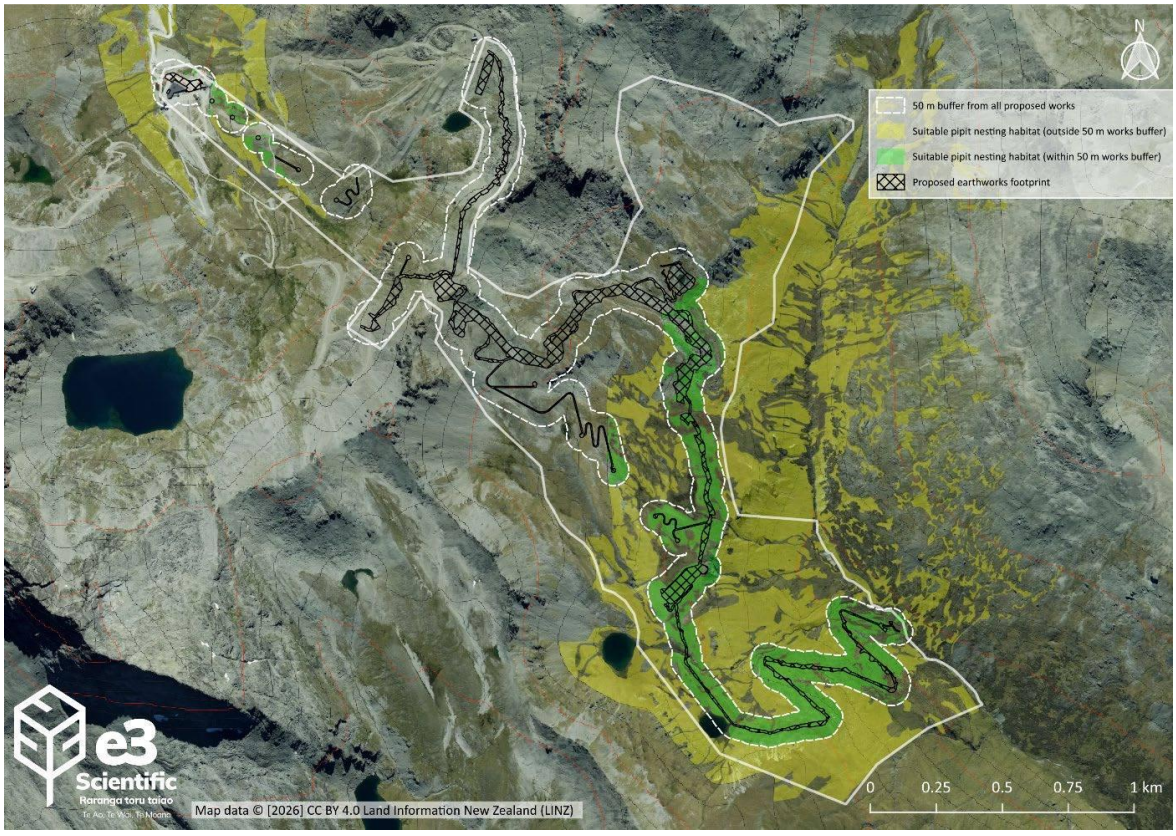


Figure 7: Pīhoihoi nesting habitat in relation to the earthworks footprint (TEcIA Appendix F, adapted from e3Scientific 2026).

2.8 Assessed Residual Effects

Table 6 below summarises the residual effects reported in the TEcIA after its recommended measures. These are the outcomes this TEMP is designed to address.

Table 6: Summary of TEcIA initial and residual effects relevant to this TEMP (excluding lizards).

Effect	Initial level of effect	Residual (TEcIA)
Vegetation loss – high alpine cushionfield	High	Moderate
Vegetation loss – other communities (excluding north-facing tussock and *Dracophyllum*)	Moderate	Moderate
Fragmentation – upland communities (Doolans)	High	High
Fragmentation – cushion bog, riparian wetland, seepage	Very High	Moderate
Weed introduction/mobilisation	Very High	Low
Sedimentation – wetlands and snowbank	Very High	Moderate
Sedimentation – other communities	High	Low
Kārearea – high-quality foraging habitat loss; construction noise	Moderate	Moderate
Pīhoihoi – nesting below 1,700 m / foraging (Doolans)	High	Low / High
Kea – construction noise; operational noise; human presence; materials	Very High	Moderate; Low; Low; Low
Invertebrates – habitat loss (*Plutella* sp. 1 (CO), *Sigaus campestris*)	High	High
Invertebrates – habitat loss (14 taxa)	Moderate	Moderate
Invertebrates – construction noise (seven taxa)	High	High
Threatened plants – human presence/operation	Moderate	Low

3.0 Resource Consent Conditions

Table 7 lists the draft Conditions (H.02, 3 September 2026) relevant to this TEMP and the section that gives effect to each. Condition numbers must be updated to match the final consent. Where the lodged draft TEMP cited superseded numbers, the correct numbers are as follows:

- ECO.41–ECO.49 is now ECO.31–ECO.42;
- FEW.5 is now FEW.4;
- ECO.17 is now ECO.20; and
- ECO.18–ECO.22 is now ECO.21–ECO.25.

Table 7: Draft conditions relevant to this TEMP and where they are addressed.

Condition	Requirement (summary)	TEMP Section
GENERAL		
GC.7	Certification process for management plans (30 working days; resubmission).	1.5
GC.8	TEMP submitted 40 working days before works to QLDC, CODC and ORC (wetlands). ESCP certified 20 working days before each earthworks stage.	1.5, 7.4
TERRESTRIAL ECOLOGY MANAGEMENT PLAN		
ECO.1	Implement the certified TEMP.	All
ECO.2(a)–(e)	Location, extent and type of mitigation, timing and maintenance; construction vs ongoing components; training; signage; monitoring, reporting, review and triggers.	1.5, 7.0, 8.0, 11.0–13.0
ECO.2(f)(i)–(vii)	Vegetation; species identification; wetlands (ECO.31–ECO.41); streams (FEW.4); weeds (ECO.20); invertebrates; avifauna (ECO.21–ECO.25).	9.1–9.7
ECO.3	Minimum content of amended TEMP (objectives, access rights, maps, monitoring, roles and training).	1.5, 2.0, 5.0, 8.0, 11.0
ECO.4–ECO.5	Annual Terrestrial Ecology Monitoring Report: prepared by 30 June, submitted by 30 August.	13.2
VEGETATION CLEARANCE / EARTHWORKS		
ECO.6	No earthworks outside the Attachment A extent unless the footprint and effects are reduced.	2.2, 7.3
ECO.7–ECO.9	Delineate footprint; ecology survey; identify receiver habitat; mark wetland edge and 10 m setbacks; report within 20 working days.	7.2, 9.2, 9.3.2
ECO.10	Translocate (a) Threatened, At Risk – Declining and taonga plants; (b) up to 500 clusters of each Naturally Uncommon / Data Deficient species; (c) invertebrate host plants.	9.2
ECO.11–ECO.15	Receiver sites close to the donor site; salvage of rehabilitation resources; stockpiles within footprint; contiguous-mat revegetation under Attachment D; large tracts.	9.1, 9.2
ECO.16–ECO.19	60% survival / 60% indigenous cover after 7 years; monitoring years 1–3 then biennially to year 7; direct sowing if targets not met.	9.1.6, 9.1.7, 11.0
WEEDS		
ECO.20	Remove existing weeds; no imported soil; machinery checks; quarantine area; soil movement limits; Keep It Clean.	9.5
AVIFAUNA		
ECO.21, ECO.22A	Kārearea nest survey ≤5 days before works (August–May); 200 m exclusion; avoid, relocate, or remove as a last resort.	9.7.2
ECO.22B	Pīhoihoi survey of footprint + 50 m ≤5 days before works (August–February); vegetation reduction; nest and egg protocol; egg-loss compensation method to be set in the TEMP.	9.7.3
ECO.23	Kea: secure materials; minimise interaction; kea-safe playgrounds.	9.7.4
ECO.24	No external bins; annual rubbish collections.	9.8

Condition	Requirement (summary)	TEMP Section
ECO.25	Bird-strike design, review and 5-year monitoring; deterrent measures identified in the TEMP.	9.7.5
ECO.43	No lead-based materials or finishes.	7.5, 9.7.4
WETLANDS		
ECO.31–ECO.33	Crossing information to ORC 40 working days before construction; hydrologist and ecologist review; build to design; inspect within 10 working days.	9.3.4
ECO.34–ECO.41	Temporary diversions; photo/quadrat monitoring; contaminant, flood and debris controls; erosion and sediment control; machinery; public access; downgradient controls; same-day reinstatement.	9.3.5, 7.4, 11.0
ECO.42	Crossings maintained to a safe and serviceable standard.	9.3.4
STREAMS, HYDROLOGY AND INFRASTRUCTURE		
FEW.1–FEW.4	Works within 10 m of watercourses; ESCP; machinery hygiene; bank protection with geotextile and local tussock at 1 m spacing.	9.4
WAT.19–WAT.25, WAT.28	Stream crossing design and review; culverts, splash crossing and swale requirements; inspections at completion and first anniversary.	9.3.4, 9.4
INF.5	Reservoir (Tarn 3) design to CODC and ORC.	9.3.6
BD.5(4)	Towers not located within waterways or wetlands.	9.3.3
EW.5–EW.6	Water found in cuts; 150 m trenching limit.	9.3.5
CON.9–CON.11	Construction lighting restrictions.	7.6
BIO.1–BIO.15	Biodiversity Compensation Project (outside this TEMP).	4.0

4.0 Effects Management Hierarchy

4.1 Approach

The National Policy Statement for Indigenous Biodiversity (NPS-IB) and the National Policy Statement for Freshwater Management (NPS-FM) require adverse effects to be managed in sequence: avoid, then minimise, then remedy, then offset where possible, and then compensate. This TEMP delivers the first three steps on site, as detailed in Table 8. It also adds operational avoidance (no-go areas and controls on snowmaking, grooming and summer use).

Offsetting and compensation are addressed outside this TEMP through Conditions BIO.1 to BIO.15. The TEcIA concluded that credible offsets are not available in this alpine setting. The adequacy of the compensation package is contested by the reviewing experts. This TEMP supports that process in two ways:

- It caps authorised losses, such as wetland extent by type (Section 9.3.1), and records any further loss detected by monitoring; and
- It identifies remediation that fails to meet its targets (Section 9.1.7), so that the true residual effect can be accounted for in the Biodiversity Compensation Project.

4.2 Application by Value

Table 8: Effects management measures by value.

Value	Avoid	Minimise	Remedy	Residual / beyond TEMP
Upland vegetation (tussock, cushionfield, rockfield)	Snowbank avoided; micro-siting within ECO.6; no-go areas	Footprint control; staging; low-impact methods	Contiguous-mat transfer; translocation; seed sowing	Moderate–High residual; BCP
High alpine cushionfield	Micro-siting of trail edges	Hand tools near edges; seasonal timing	Cushion lift and re-plug; monitoring at the same frequency as other communities	Moderate (disputed); BCP
Wetlands (cushion bog, string mire, seepage, riparian)	Towers, snow guns and pump buildings outside wetlands; crossings below transitions	Same-day reinstatement; bulkheads; permeable track; ESC; setbacks	Turf reinstatement; hydrology repair	Capped loss; monitoring feeds BCP
Tarn 3 and inflow stream	Alternatives assessed in A-21 (not avoided)	Water balance; downgradient monitoring	None available	High residual; BCP / BIO.15
Invertebrates	Micro-siting around high-value microhabitats	Large-tract transfer; lighting controls	Habitat blocks; host-plant translocation	High (two taxa); BCP
Kārearea, pīhoihoi	Nest exclusion zones	Seasonal timing; vegetation reduction	–	Moderate / High (foraging)
Kea	Lead-free materials	Secure materials; no external bins; signage	–	Low

4.3 No-go Areas and Operational Avoidance

Before construction, the Project Ecologist will map no-go areas in GIS and mark them on site. No-go areas apply during construction and operation and are shown on all construction drawings and on staff maps. They include:

- The snowbank community, which is wholly avoided by the footprint;
- All delineated wetlands and their 10 m setbacks outside the authorised crossing footprints;
- All tarns other than Tarn 3, with a 20 m buffer;
- Rocky outcrops and *Pachycladon novae-zelandiae* sites outside the footprint (host plant for *Plutella* sp. 1 (CO) and *Xanthorhoe frigida*); and
- Translocation receiver sites and revegetation areas until performance standards are met.

A no-go area map [to be produced from the final footprint GIS and appended as Figure 8 before certification] will be maintained by NZSki and updated whenever the footprint changes.

[Insert Figure 8]

5.0 Roles and Responsibilities

NZSki, as the Approval Holder, is accountable for implementing this TEMP. Table 9 below sets out roles and responsibilities (Condition ECO.3(e)). Named contacts will be confirmed before certification and kept up to date in the site induction pack.

Table 9: Roles and responsibilities.

Role	Responsibilities
Approval Holder (NZSki)	• Overall accountability for implementing the TEMP and complying with conditions. • Engages suitably qualified and experienced people (SQEPs) and provides resources. • Submits the TEMP and amendments for certification, and submits annual reports (ECO.4–ECO.5). • Maintains engagement with Kā Rūnaka and the Mana Whenua Advisory Group, DOC and the councils. • Holds access rights for works on land it does not own (ECO.3(b)).
NZSki Environmental Manager [name TBC]	• Day-to-day owner of the TEMP during operation. • Maintains registers and the no-go map. • Coordinates annual rubbish collections, weed surveillance, snowmaking and grooming controls. • Notifies councils and DOC of incidents.
Project Manager	• Coordinates the contractor, Project Ecologist and specialists. • Ensures hold points (Section 7.2) are met before works proceed.
Construction Site Manager (contractor)	• Implements the TEMP on site. • Installs and maintains footprint marking, no-go fencing, signage and hygiene station. • Ensures inductions and toolbox talks are completed. • Stops work when a trigger or incident occurs (Section 7.7).
Contractors and site personnel	• Comply with the TEMP, induction and instructions of the Project Ecologist. • Report incidents, wildlife encounters and new weeds immediately.
Project Ecologist (SQEP, terrestrial ecology)	• Independent of the construction contractor. • Delineates the footprint, undertakes pre-works surveys, approves receiver sites and oversees translocation and revegetation. • Trains crews (ECO.14(d)) and audits compliance. • Directs adaptive responses and prepares monitoring reports. • May delegate tasks to trained ecologists, but remains responsible.
Specialist advisors (SQEPs)	• **Botanist** – alpine Otago flora, for species identification (Section 9.2.2). • **Wetland ecologist** – MfE delineation, crossing review, wetland monitoring. • **Hydrologist** – crossing design review and certification checks, piezometer network, Tarn 3 water balance. • **Ornithologist** – nest surveys, exclusion zones, egg protocols, bird-strike review. • **Invertebrate ecologist** – micro-siting, habitat transfer, BACI design and identification.
Kā Rūnaka / Mana Whenua Advisory Group	• Confirm taonga species and culturally appropriate handling. • Opportunity to participate in translocation and monitoring and to review annual reports.
DOC (landowner / concession grantor)	• Concession requirements; receives incident notices, reports and destroyed eggs (ECO.22B). • Wildlife Act authorisations.
QLDC, CODC, ORC	Certify the TEMP (ORC for wetlands) and receive reports and notifications.

Suitably qualified and experienced person (SQEP): a person holding a relevant tertiary qualification with at least five years' experience in the relevant discipline, including alpine or subalpine work in Otago or Southland.

6.0 Consultation and Engagement

This TEMP has been prepared with regard to feedback from the councils' and DOC's technical reviewers (Appendix A). Ongoing engagement will include the parties below. Each engagement will be recorded in Table 10 and summarised in the annual monitoring report.

- **Kā Rūnaka / Mana Whenua Advisory Group:** confirm the taonga plant list for Attachment B (ECO.10(a)); agree culturally appropriate practices for translocation (for example karakia before works, and the use or return of taonga plant material that cannot be translocated); and offer opportunities to participate in translocation and monitoring;
- **DOC:** concession requirements; Wildlife Act matters for nest and egg management; receiver sites on public conservation land; and bird-strike and kea incidents;
- **Otago Regional Council:** wetland delineation results, crossing designs, wetland monitoring and wetland-related notifications; and
- **Queenstown Lakes and Central Otago District Councils:** certification, survey reports (ECO.9) and annual reports.

Table 10: Consultation record (to be completed).

Date	Party	Matters discussed	Outcome / action
[TBC]	Kā Rūnaka	Taonga plant list; tikanga for translocation.	[TBC]
[TBC]	DOC	Receiver sites; nest/egg protocol; pīhoihoi egg compensation method.	[TBC]
[TBC]	ORC	Wetland triggers; crossing certification process.	[TBC]

7.0 Construction Management

7.1 Programme and Seasonal Constraints

The construction programme must be planned around the ecological windows in Table 11.

Table 11: Ecological constraints on construction timing.

Activity / value	Window or constraint	Basis
Kārearea breeding	1 August – 31 May: nest survey ≤5 days before disturbance; 200 m exclusion around active nests.	ECO.21, ECO.22A
Pīhoihoi breeding	1 August – 28/29 February: survey footprint + 50 m ≤5 days before disturbance; vegetation reduction below 1,700 m asl.	ECO.22B
Plant translocation and vegetation transfer	Snow-free season, preferably early in the season (from snowmelt to January), when plants are actively growing and before late-summer drought. Not when soils are frozen.	ECO.10, ECO.14; TEcIA
Species identification surveys	Peak flowering and fruiting (December – February), plus a pre-clearance check.	Section 9.2.2
Invertebrate baseline	Two sampling rounds per season: November – December and February – March.	Watts (2026); Section 9.6.6
Wetland crossing works	Low-flow, low flood-risk periods; same-day reinstatement.	ECO.34, ECO.41
Translocation monitoring	Autumn (March – April), to capture late-summer heat and drought losses.	Wildlands (2026)
Lizard habitat clearance	≥14 °C; staged trimming (see Lizard Management Plan).	ECO.27, ECO.28

7.2 Pre-construction Hold Points

Works must not start in any earthworks stage until the Project Ecologist has confirmed in writing that each hold point below has been met, as detailed in Table 12. Confirmations must be kept in the TEMP register.

Table 12: Pre-construction hold points.

#	Hold point	Condition
H1	TEMP certified (and ESCP certified for the stage).	GC.7, GC.8
H2	Baseline monitoring completed (Section 11.0). At least one full snow-free season for wetland hydrology, vegetation and chemistry, and for invertebrates.	ECO.35; Section 11.0
H3	Disturbance footprint and no-go areas delineated and marked by the Project Ecologist (at least 10 working days before works).	ECO.7(a)
H4	Wetland edges and 10 m setbacks delineated (MfE protocols) and physically marked.	ECO.8(d)
H5	Ecology survey completed; species to be translocated recorded and tagged; receiver habitat identified; report provided within 20 working days (to ORC where wetlands are involved).	ECO.7–ECO.9
H6	Required translocations completed before clearance.	ECO.10
H7	Crossing and trenching designs provided (40 working days) and reviewed; certification obtained where required.	ECO.31, WAT.19
H8	Existing weeds in and around the footprint identified and removed; quarantine area operating.	ECO.20(a), (d)
H9	Induction completed by all personnel; signage installed.	ECO.2(c)–(d)
H10	Bird nest surveys completed ≤5 days before disturbance (breeding season).	ECO.21–ECO.22B
H11	ESC and drainage measures installed and inspected.	ECO.37, ECO.40; ESCP

7.3 Footprint Control, Access and No-go Areas

- The footprint and no-go areas will be marked with high-visibility flagging or temporary fencing that can withstand alpine weather. Markers will be inspected weekly.
- Machinery, vehicles and personnel must stay within the footprint and on designated access routes. No parking, turning, laydown or stockpiling is allowed outside the footprint or on indigenous vegetation (ECO.13).
- Any proposed change to the footprint requires prior agreement of the Project Ecologist. The change must reduce the footprint within the same vegetation community, and reduce effects. It must be surveyed (ECO.8) and reported (ECO.9), and the no-go map updated. Changes affecting wetlands must also be reported to ORC.
- Damage outside the footprint is an incident (Section 7.7). It must be remediated using the methods in Section 9.1 within 20 working days, or at the start of the next snow-free season.

7.4 Erosion, Sediment and Drainage Control

Detailed controls are set by the ESCP. To protect ecological values, the ESCP for each stage must:

- Include a **drainage plan** showing how runoff is managed as topography changes, so that long-term sediment runoff and concentrated flows are kept out of wetlands, seepages and indigenous vegetation (TEcIA Recommendation 22);
- Be reviewed by both a hydrologist and the Project Ecologist (or wetland ecologist) before certification;
- Provide controls on the downgradient side of permeable access roads within 10 m of wetlands, kept in place **for the life of the track** (ECO.40);
- Stabilise exposed soils as soon as practicable, and within 48 hours of completing each section. Controls must remain until vegetation covers more than 80% of the site, and on wetland sites that cover must be indigenous wetland species (ECO.37); and
- Require ESC inspections weekly, and within 24 hours of rainfall over 25 mm in 24 hours or significant snowmelt [threshold to be confirmed in ESCP].

Sediment deposition in receiving wetlands is monitored under Section 11.0 (M7). Any sediment discharge to a wetland or watercourse is an incident (Section 7.7).

7.5 Trail Surfaces and Construction Materials

- Unvegetated trail surfaces must be finished with large coarse rock, not fine gravels, to limit fine sediment mobilisation (TEcIA Recommendation 21).
- Rock and aggregate must be sourced from within the same catchment and footprint where possible. Imported material must come from a source inspected and confirmed weed-free by the Project Ecologist (ECO.20).
- No lead-based materials or finishes may be used in construction or maintenance (ECO.43). This applies to flashings, paints and fixings.

- Within or near peat wetlands, use precast concrete (for example trench bulkheads), not cast-in-place concrete, to avoid alkaline leachate. Concrete wash water must be contained and disposed of outside 10 m of any wetland or watercourse.
- Refuelling, mixing of materials and maintenance must occur more than 10 m from any wetland or watercourse. Spill kits must be carried by all machinery (ECO.38).

7.6 Lighting, Noise and Dust

The TEcIA's conclusions on effects on moths and birds assume minimal artificial light. Construction lighting must comply with Conditions CON.9 to CON.11. In addition:

- No external construction or operational lighting is to be used at night during summer. If construction is delayed into autumn, lighting may be used only after sunrise and before sunset where possible, and otherwise only when essential;
- Any lighting must be fully shielded and downward-directed, use warm-colour (≤2,700 K) lamps, and be switched off when not in use;
- Construction noise near active kārearea nests is managed by the 200 m exclusion (ECO.22A). Helicopter flight paths must avoid known nest sites during the breeding season [confirm with ornithologist]; and
- Dust on unsealed tracks is to be controlled with water only (no chemical suppressants), with construction traffic speed limited to 30 km/h [TBC].

7.7 Incidents, Discoveries and Stop-work

The following are ecological incidents. Each requires work in the affected area to stop and the Project Ecologist to be notified immediately (within 2 hours):

- Vegetation damage, stockpiling or machinery entry outside the footprint or within a no-go area;
- Any sediment discharge or plume into a wetland, tarn or watercourse, or any spill;
- Unexpected water in cuts (EW.5);
- Discovery of a bird nest, or of an injured or dead indigenous bird (contact the ornithologist immediately where bird or personnel safety is a concern – TEcIA Recommendation 25);
- Detection of a 'Threatened – Nationally Critical' invertebrate, or a 'Threatened' or 'At Risk' plant not previously recorded;
- A lizard (follow the Lizard Management Plan incidental discovery protocol);
- A new or unusual weed; and
- A kea incident (ingestion of material, injury, or damage requiring intervention).

The Project Ecologist will advise on containment and remediation, record the incident in the incident register (Appendix C), and notify the relevant consent authority and DOC within two working days. Wetland incidents are notified to ORC. A significant incident triggers a review of the relevant TEMP procedures (Section 13.4).

8.0 Training, Signage and Communication

8.1 Site Induction

All personnel (staff, contractors and subcontractors) must complete a site-specific ecological induction before working in the Alpine Project Area (ECO.2(c)). The induction will be delivered or approved by the Project Ecologist and will cover:

- The ecological values of the Rastus Burn and Doolans, including NUEs, wetlands and taonga species;
- The footprint, no-go areas, access routes and hold points;
- Hygiene and weed requirements (ECO.20);
- Wetland protection rules (ECO.36–ECO.41);
- Kārearea and pīhoihoi nesting rules, and falcon interaction and etiquette (TEcIA Recommendation 26);
- Kea interaction and etiquette: no feeding, securing materials and lead-free materials (TEcIA Recommendations 30 and 33);
- Lizard awareness (with reference to the Lizard Management Plan); and
- Incident, stop-work and reporting procedures.

8.2 Specialist Training and Toolbox Talks

- Crews undertaking translocation and vegetation transfer must be trained by a SQEP experienced in alpine vegetation translocation, and works must be overseen by the Project Ecologist (ECO.14(d)).
- Crews building wetland crossings must be briefed on crossing designs, same-day reinstatement and bulkhead requirements before starting.
- Toolbox talks will be held before vegetation clearance or earthworks begin in a new area, when methods or locations change, and after any incident or near miss.

8.3 Signage

- **Construction:** no-go and sensitive-area signs, wetland setback markers, hygiene station signs and kea awareness signs. These must be installed before works and maintained throughout construction.
- **Operation (permanent):** signage in all areas of high visitor traffic (base buildings, gondola stations, the Doolans Cabin, café and walking routes) on appropriate kea interaction and etiquette (TEcIA Recommendation 32). Signs at wetland and no-go boundaries near trails, and boot-brush stations at summer access points, are also required.
- Signage must be durable and visible in alpine conditions. Its location is verified by the Project Ecologist, and it is maintained by NZSki.

8.4 Records

Induction, training and toolbox registers will be kept and summarised in the annual report.

9.0 Habitat and Fauna Management

9.1 Vegetation Management

9.1.1 Background

Vegetation management aims to confine loss to the authorised footprint and to rehabilitate disturbed surfaces with the salvaged indigenous vegetation, soils and rock from that footprint. Rehabilitation follows the DOC–NZSki *Protocol for the Rehabilitation of Natural Alpine Environments Following Ski Area Development* (Attachment D; Appendix D) and the additional requirements below (ECO.12 to ECO.19).

9.1.2 Salvage of Rehabilitation Resources (ECO.12)

- Before excavation, the Project Ecologist will identify the vegetation, topsoil, subsoil and rock to be salvaged in each section.
- Vegetation is lifted as intact turfs or sods with their root mass and topsoil, in pieces as large as the machinery can handle (target ≥0.5 m² [TBC with contractor]). Turfs are placed directly onto a prepared receiving surface wherever practicable (ECO.14(a)).
- Where single movement is not practicable, turfs are stored upright, in shade where possible, for no longer than one day (ECO.14(b)).
- Topsoil and subsoil are stripped and stored separately, within the footprint, away from drainage lines, and are not mixed with imported material.
- Surface rocks, including lichen-covered rock and rock refugia used by invertebrates, are salvaged and replaced with the lichen surface uppermost (Section 9.6).
- Soil from the Rastus Burn Base Building site must not be moved upslope or between catchments. Elsewhere, soil must not move more than 100 vertical metres upslope (ECO.20(e)–(f)).

9.1.3 Vegetation Transfer and Revegetation (ECO.14, ECO.15)

All batter slopes and exposed surfaces must be revegetated as contiguous mats, using all vegetation removed from the footprint that is not separately translocated under ECO.10(a)–(b). The method is:

1. The Project Ecologist delineates and approves each receiving surface before it receives material (ECO.14(c)).
2. The receiving surface is shaped to a stable profile, ripped if compacted, and dressed with salvaged subsoil and topsoil.
3. Turfs are placed tightly together in their original orientation and at a similar aspect and elevation. Gaps are infilled with salvaged soil and small turf fragments.
4. On steep batters, turfs are pinned or held with biodegradable coir mesh. Synthetic mesh, fertiliser and exotic seed are not used.
5. If dry weather follows placement, turfs may be watered with water from the same catchment.
6. Salvaged rock is placed to recreate microtopography and shelter.
7. Works are carried out by contractors trained by a SQEP and overseen by the Project Ecologist (ECO.14(d)).

9.1.4 Receiver and Revegetation Sites (ECO.11)

Community remediation and translocation receiver sites must be as close as practicable to the donor site. This retains invertebrate biodiversity and local genetic diversity (TEcIA Recommendation 8). Selection criteria are set out in Section 9.2.4.

9.1.5 Stockpiles (ECO.13)

All stockpiled material must be within the disturbance footprint and must not be placed on indigenous vegetation. Stockpiles of soil must be located at least 10 m from wetlands and watercourses and protected by sediment controls.

9.1.6 Performance Standards

Table 13 sets consistent performance standards for each vegetation community. It replaces the inconsistent criteria in the lodged draft (for example, cushionfield 60% in one table and 70% in another). Monitoring methods and frequencies are in Section 11.0.

Table 13: Vegetation performance standards.

Community	Interim standard (year 3)	Final standard (year 7)	Condition
All species-specific translocations	≥70% survival of tagged plants	≥60% survival	ECO.16
All community transfer / remediation areas	≥40% indigenous cover; no erosion	≥60% indigenous cover	ECO.17
Snow tussock and north-facing tussock grassland	≥80% survival of transferred tussocks; exotic cover ≤ baseline + 5% (absolute)	≥60% indigenous cover; no net increase in exotic cover	ECO.17, ECO.20
Cushionfield and high alpine cushionfield	≥70% survival of lifted cushions; no new fragmentation of retained cushionfield >0.5 m²	≥60% survival / cover	ECO.16, ECO.17
Rockfield and rocky outcrop	All salvaged refugia replaced; lichen surface uppermost	No net loss of rock refugia	ECO.12
Dracophyllum scrub (retained edges)	No dieback extending >2 m beyond the footprint edge (the assessed edge-effect zone)	As year 3	ECO.6
Snowbank	No disturbance	No disturbance	ECO.6
Retained vegetation outside footprint	No damage (Section 7.3)	No damage	ECO.6

Note: Interim standards are proposed by this TEMP as early-warning milestones. They trigger adaptive management (Section 12) but do not replace the condition standards.

9.1.7 If Standards Are Not Met (ECO.19 and Beyond)

If the year-7 standards are not met, direct sowing or dispersal of indigenous seed collected within the Remarkables Ecological District will be trialled in areas of low survival and continued for a further seven years where it succeeds (ECO.19). In addition (Wildlands 2026):

- supplementary transfer of salvaged turfs from later construction stages, or planting of eco-sourced nursery stock, will be considered from year 3 if interim standards are missed; and
- any area that has not achieved the ECO.17 standard after the ECO.19 trial will be reported as unremediated habitat loss (by area and community). The report will go to the councils and to the Biodiversity Compensation Project parties (BIO.8), so that the residual effect can be accounted for.

9.2 Plant Species Identification and Translocation

9.2.1 Species Required to be Translocated (ECO.10)

- **ECO.10(a):** all 'Threatened', 'At Risk – Declining' and taonga plant species (Attachment B; Appendix B, Table B1).
- **ECO.10(b):** up to 500 clusters of each 'At Risk – Naturally Uncommon' and 'Data Deficien't species (Attachment C; Appendix B, Table B2).
- **ECO.10(c):** all invertebrate host-specific Not Threatened plants not otherwise covered: all *Cardamine* species, *Aciphylla aurea* and *Aciphylla latipinna*.
- **Recommended additions:** *Veronica densifolia* and *V. thomsonii*, which are potential hosts of *Dasyuris micropolis* ('At Risk – Declining'). These should be translocated where they occur within the footprint (Section 9.6.4) [recommended – not currently conditioned].

Taxonomically unresolved taxa, such as *Anisotome* "Otago bog" (CHR 511716) and *Chaerophyllum* aff. *colensoi*, are treated as 'Threatened (precautionary)' and translocated under ECO.10(a).

9.2.2 Species Identification Methodology (ECO.2(f)(ii))

Condition ECO.2(f)(ii) requires a method for identifying the ECO.10 species. Neither the conditions nor the lodged TEMP provided one (Wildlands 2026). The method is:

1. **Who:** surveys are led by a SQEP botanist with experience of Otago alpine flora, supported by trained field ecologists.
2. **When:** a targeted survey is carried out in the flowering and fruiting season (December – February) of the season before clearance, followed by a pre-clearance check no more than 10 working days before works (ECO.7).
3. **Where:** the full footprint plus a 2 m edge zone is searched on parallel transects. Transects are no more than 2 m apart in cushionfield, wetlands and rocky habitats, and no more than 5 m apart in tussock grassland.
4. **Reference material:** the Flora of New Zealand series, the New Zealand Plant Conservation Network database, Simpson (2018) *Native Plants of the Remarkables*, and a project photo-reference library of each listed species compiled from the TEcIA records.
5. **Difficult taxa:** for difficult groups (for example, *Agrostis, Anisotome, Carex*, *Deschampsia*, *Festuca*, *Ranunculus*, *Raoulia*, *Myosotis*), voucher specimens or photographs are collected under DOC authorisation and verified by a specialist or herbarium (OTA/CHR) before translocation decisions are made.
6. **Confidence:** each record is classed as confirmed, probable or unconfirmed. Probable and unconfirmed records of listed taxa are treated as the listed taxon.
7. **Recording:** each plant or cluster is recorded with a sub-metre GPS location (NZTM), a numbered tag, a count, size class, photograph and community. A **cluster** is defined as a discrete individual or patch separated from the next by more than 0.3 m [confirm definition with certifier].
8. **Reporting:** results are reported under ECO.9 within 20 working days, with the selected receiver sites.

9.2.3 Selection of Clusters under ECO.10(b)

Where more than 500 clusters of a species occur, the Project Ecologist will select clusters spread across the footprint and its communities, to capture local genetic variation. Clusters in better condition and those most likely to survive lifting are favoured. Clusters not moved are recorded and transferred within community mats where possible.

9.2.4 Receiver Site Selection

Receiver sites are identified, assessed and tagged before any clearance (ECO.7(c), ECO.9(d)). This includes receiver sites for wetland plants, which must be identified before any wetland clearance (Rossaak 2026). Receiver sites must meet the criteria in Table 14.

Table 14: Translocation receiver site criteria.

Criterion	Requirement
Proximity	As close as practicable to the donor location (ECO.11); outside the footprint, edge-effect zone and no-go buffers.
Habitat match	Same community, similar aspect (±45°), elevation (±100 m), substrate and snow lie. Wetland plants go to the same wetland type, with a water table and pore-water chemistry within the donor's range.
Security	Not on formed ski trails, grooming routes, snowmaking coverage areas or planned future works; recorded in the no-go map.
Capacity	Sufficient suitable microsites without displacing existing indigenous plants.
Condition	Free of weeds; not affected by sedimentation or altered drainage.
Agreement	DOC (landowner) agreement; Kā Rūnaka informed for taonga species.

9.2.5 Translocation Methods

- Plants are lifted with an intact root ball and surrounding soil and turf, using hand tools or a small excavator bucket as appropriate. Cushion plants are lifted whole with their substrate. Deep-rooted *Aciphylla* are lifted to retain as much taproot as possible, preferably within an intact sod.
- Plants are replanted on the same day at the same orientation and depth, firmed in, and watered with catchment water if dry.
- Every translocated plant or cluster is tagged and GPS-recorded at the receiver site, and photographed for monitoring.
- As insurance, seed of Threatened and taonga species is collected (where seed is available) in the season before clearance and held for the ECO.19 direct-sowing programme [recommended].

9.2.6 Taonga Species Protocol

NZSki will advise Kā Rūnaka of the translocation programme at least 20 working days in advance. NZSki will provide the opportunity for mana whenua to attend, to conduct karakia, and to direct the culturally appropriate use or return of taonga material that cannot be translocated. Outcomes will be recorded in Table 10 and the annual report.

9.2.7 Translocation Monitoring (ECO.16–ECO.18)

Tagged plants are censused in autumn (March – April) in years 1, 2 and 3 after translocation, and then in years 5 and 7 (ECO.18). Each census records survival, vigour (three classes) and flowering. Results are reported by species against the interim and final standards in Table 13.

9.3 Wetland Management

The objective is to confine wetland loss to the authorised extent and to maintain the hydrological function and indigenous vegetation of all retained wetlands (ECO.2(f)(iii); ECO.31–ECO.42). Measurable indicators, baselines and triggers for each wetland type are set out in Section 11.0 (M7–M12).

9.3.1 Wetland Types and Authorised Extent

Managed wetland types are cushion bog, string mire (within cushion bog), seepage and riparian wetland. String mire is included as the most hydrologically sensitive, rain-fed wetland type (Rossaak 2026). The authorised maximum direct disturbance is set out in Table 15.

Table 15: Authorised wetland disturbance by type [to be confirmed against final footprint GIS].

Wetland type	Authorised direct disturbance (ha)	Source
Cushion bog (including string mire)	0.003	TEclA Table 14
Riparian wetland	0.03	TEclA Table 14
Seepage	0.20	TEclA Table 14
Total	**0.233**	Consistent with B.14 and A-21

Delineated wetland loss is reconciled against this table after each construction season. Any additional wetland loss, whether from footprint changes or from hydrological or vegetation change detected by monitoring, is treated as unauthorised. It must be notified to ORC within 5 working days and remediated where possible. Any loss that cannot be remediated must be reported for the Biodiversity Compensation Project. Incorporating this cap into ECO.6 is recommended (Rossaak 2026).

9.3.2 Delineation and Setbacks (ECO.8(d))

- Before construction, a person experienced in wetland delineation will delineate wetland boundaries within and next to the footprint, using the MfE *Wetland Delineation Protocols* (2022) (vegetation, hydric soils and hydrology).
- Wetland edges and 10 m setbacks are physically marked. The delineation is extended to all wetlands within 100 m downgradient of the footprint, for monitoring purposes.
- The margin of Tarn 3 is assessed using the same protocols, so that its extent and character are recorded before reservoir construction.
- Delineation results are reported to QLDC/CODC and to ORC (ECO.9).

9.3.3 Avoidance

- Gondola towers must not be located within wetlands, waterways, riparian or seepage areas (BD.5(4)). The same applies to temporary tower access, snow guns, hydrants and pump buildings, and cushion bog is expressly included [recommended extension of BD.5(4)].
- Crossings are located where the wetland is narrowest, or downgradient of the transition from wetland to defined channel (WAT.22, WAT.25). The riparian wetland to stream transition is delineated before Swale A is designed.

- Machinery must remain outside wetlands except where entry is essential for the authorised crossing (ECO.38(2)). It must then be on low-ground-pressure tracks or platforms (ECO.38(3)).

9.3.4 Crossing Design, Certification and Inspection (ECO.31–ECO.33, ECO.42, WAT.19–WAT.25)

For each wetland and stream crossing, including utility trenches, the Consent Holder must provide ORC with the following at least 40 working days before construction:

- the location;
- detailed drawings and materials;
- the construction method, equipment and lengths;
- a hydrological assessment of flow paths, including groundwater and seepage direction (WAT.21);
- rehabilitation details; and
- a programme and site contact.

The design must:

- maintain hydrological function and connectivity, so that surface and shallow groundwater continue to pass beneath or through the crossing at pre-construction levels;
- use permeable track sections, or an equivalent measure, where seepage crosses the alignment (WAT.21, WAT.24);
- install **precast** trench bulkheads (plugs) upgradient and downgradient of each wetland, with backfill no more permeable than the surrounding material (EW.6); and
- use twin culverts at Culvert B unless an equivalent design is certified (WAT.20).

Designs are reviewed by a hydrologist and a wetland ecologist. Submission for ORC certification, with reviewers independent of the design team, is recommended (Rossaak 2026). Each crossing is inspected by **both** a hydrologist and an ecologist:

- within 10 working days of completion (ECO.33); and
- again at **12 months** (TEcIA Recommendation 15).

Crossings must then be maintained so that both serviceability and hydrological function are retained (ECO.42).

9.3.5 Construction In and Near Wetlands

- Works within wetlands are staged so that each disturbed section is completed and reinstated within the same working day, unless otherwise certified by a hydrologist. ORC is notified of any such exception within 2 working days (ECO.41).
- Wetland turf is lifted intact, kept moist and in shade, and reinstated over the completed section on the same day.
- Trenching is limited to 150 m per face (EW.6). Trench water is not discharged into wetlands. Temporary diversions run only as long as necessary, at low flood risk, and must not lower the water table beyond the work area (ECO.34).
- No contaminant discharge, debris or sediment is permitted within 10 m of a wetland, and erosion and sediment controls apply (ECO.36–ECO.37). Machinery is cleaned before entering a wetland (ECO.38(1)).

- Debris, materials and equipment are removed within 5 days of completing works within 10 m of a wetland (ECO.39).

9.3.6 Tarn 3, Reservoir and Inflow Stream (INF.5)

- Before reservoir construction, a water balance for Tarn 3 and its catchment is prepared. It covers the intermittent inflow to be diverted and the downgradient seepages and soakage fields. It is repeated two years after commissioning [recommended addition to INF.5].
- Downgradient seepages and wetlands within 100 m of the swale outlets and soakage fields are monitored under M12.
- Equipment and water transfers from Doolans Creek to the reservoir must follow Check, Clean, Dry (didymo) procedures. Didymo controls on the creek-to-reservoir connection are recommended in the INF.5 design.
- The 20 m no-go buffer applies to all other tarns. The loss of Tarn 3 (≈0.445 ha) and of about 55 m of intermittent stream is recorded in the effects register for the Biodiversity Compensation Project.

9.3.7 Operational Risks to Wetlands

Snowmaking water from Doolans Creek has higher conductivity than the dilute rain and snowmelt that feeds the cushion bogs and string mires. It may enrich these acidic, nutrient-poor peatlands. Grooming may compact snow and prolong snow cover. These risks are managed through the operational controls in Section 10.0 and the chemistry monitoring in M10.

9.4 Stream Management

- **Connectivity:** stream crossings (culverts, fords, splash crossings and utility trenches) are designed under WAT.19–WAT.25 to maintain the hydrological functioning of the stream and of any wetland within 100 m. They are inspected within 10 working days of installation and on the first anniversary (WAT.28).
- **Works near watercourses:** works within 10 m of a watercourse follow the ESCP (FEW.1–FEW.2), and machinery is cleaned before use near water (FEW.3).
- **Bank remediation (FEW.4):** disturbed banks are protected with biodegradable geotextile (coir) matting and replanted with locally sourced native tussock at 1 m spacing. Salvaged tussocks from the footprint are preferred, otherwise nursery stock grown from seed collected in the catchment is used. Salvaged streamside turf is reinstated between tussocks.
- **Swales:** armoured swales (A and D) are designed to discharge beyond wetland boundaries without scour or sediment release (WAT.24–WAT.25). Swale outlets are inspected after the first snowmelt and annually for three years.
- **Monitoring:** bank stability, tussock survival (target ≥80% at year 3) and flow continuity are monitored under M13.

9.5 Biosecurity and Weed Management

The outcomes required are (ECO.2(f)(v); TEcIA Recommendation 16):

- no new exotic species are introduced to the wider landscape;

- existing exotic species do not increase in population or distribution; and
- incursion response and monitoring operate through construction and ongoing operation.

9.5.1 Baseline Survey and Removal (ECO.20(a))

Before works, all existing weed infestations within the footprint, the 2 m edge zone, access routes, laydown areas and receiver sites are mapped (GPS, species, area and density) and removed. The resulting map is the baseline for the 'no increase' standard. Priority species include, but are not limited to:

- hawkweeds (*Pilosella* and *Hieracium* spp.);
- sweet vernal (*Anthoxanthum odoratum*);
- browntop (*Agrostis capillaris*);
- sheep's sorrel (*Rumex acetosella*);
- white clover (*Trifolium repens*);
- mouse-ear chickweed (*Cerastium fontanum*);
- catsear (*Hypochaeris radicata*);
- yarrow (*Achillea millefolium*); and
- wilding conifers.

9.5.2 Hygiene (ECO.20(b)–(f), ECO.38(1))

- No soil from outside the project area is to be brought on site.
- All machinery, equipment and vehicles are inspected and cleaned of soil and plant material at the quarantine area near the Remarkables Ski Field Base before entry. Cleaning follows *Keep It Clean – Best Practice Guide #A16* (National Pest Control Agencies 2013). Each clean-down is recorded and signed off.
- Personal gear (boots, clothing, packs and tools) is cleaned at a boot-wash station before entering the Doolans.
- Geotextiles and coir must be new. Imported aggregate must come from a source confirmed weed-free (Section 7.5).
- Soil movement rules apply (Section 9.1.2).

9.5.3 Surveillance and Incursion Response

- **Construction:** surveillance of the footprint, edges, access routes, laydown areas, quarantine area and receiver sites in early summer (December) and late summer (March) each year.
- **Operation:** annual surveillance (late summer) of trails, base areas, building surrounds, snowmaking infrastructure, swales and the Tarn 3 reservoir margin, for 40 years.
- **Response:** any new species or new infestation is identified, mapped and controlled within 10 working days of detection. Hand removal of whole plants (bagged and removed from site) is preferred. Spot herbicide may be used only with Project Ecologist approval and never within 10 m of a wetland or watercourse. Sites are rechecked for three subsequent seasons. Pest plants listed in the Otago Regional Pest Management Plan are reported to ORC.

- **Vectors in operation:** grooming machines, snowmobiles, summer vehicles and walkers. Machinery entering from other ski areas or lowland sites must pass through the quarantine area, and boot brushes are provided at summer access points.

9.6 Invertebrate Management

The objective is to minimise effects on invertebrates through avoidance, habitat transfer and host-plant translocation (ECO.2(f)(vi)), and to verify outcomes through robust monitoring. Table 16 gives species-level information for notable taxa, as recommended by Watts (2026).

9.6.1 Notable Taxa

Table 16: Notable invertebrate taxa, habitats and assessed residual effects (TEclA Tables 7 and 18).

Taxon (group)	Status (TEclA)	Occurrence	Habitat / host association	Residual (habitat loss)
Plutella sp. 1 (CO) (moth)	At Risk – Declining	Present	Larvae on Brassicaceae: *Pachycladon novae-zelandiae* (rocky outcrop, south-facing) and possibly *Cardamine* (gravelly stream margins, riparian wetland)	High
Sigaus campestris (grasshopper)	At Risk – Declining	Present	Contiguous snow tussock grassland	High
Dasyuris partheniata (moth)	At Risk – Declining	Present	Larvae on *Aciphylla* spp. across tussock, cushionfield, seepage, rockfield, *Dracophyllum* and rocky outcrop	Low
Dasyuris micropolis (moth)	At Risk – Declining	Present	Cushionfield above 1,700 m; probable hosts *Veronica densifolia*, *Veronica thomsonii*	Low
Nivetica nervosa (moth)	At Risk – Declining	Present	Alpine wetlands; host unknown	Low
Xanthorhoe frigida (moth)	At Risk – Declining (Watts: 'Threatened – Nationally Vulnerable')	High likelihood	Host *Pachycladon*; rocky outcrop	–
Pyrausta comastis (moth)	Threatened – Nationally Critical	Moderate likelihood	Fringes of tarns, cushion bog vegetation	Moderate
Hypsithocus hudsonae (shield bug)	At Risk – Naturally Uncommon	Present	Tussock grassland and seepage	Moderate
Neoramia alta (spider)	At Risk – Naturally Uncommon	Present	High alpine cushionfields; drier cushion bog	Moderate
Mamoea montana (spider)	Data Deficient	Present	Generalist; associated with cave wētā	Moderate
Rorea otagoensis (spider)	Data Deficient	Present	Cushionfield, snow tussock grassland	Moderate
Subantarctia centralis (spider)	Data Deficient	Present	Tussock grassland and rockland	Moderate
Huttonia sp. (spider)	Unclassified	Present	Tussock grassland, *Dracophyllum* scrub, seepage (lower site)	Moderate
Anagotus latirostris (weevil)	Unclassified	Present	Snow tussock grassland	Moderate
Inophloeus inuus (weevil)	Unclassified	Present	*Chionochloa rigida* grassland below 1,500 m with *Dracophyllum* and *Aciphylla aurea*	Low
Duvaliomimus walkeri (beetle)	Unclassified	Moderate likelihood	Tussock, cushion bog, riparian wetland, rocky outcrop	Moderate
Taenarthrus capito (beetle)	Unclassified	Moderate likelihood	Cold stream and tarn margins with rubble in the splash zone	–
Peripatus sp. Remarkables	Unclassified	Moderate likelihood	Cushionfield (ridge outside footprint)	Moderate
Scoparia panopla, *S. niphospora* (moths)	Unclassified	Present	Likely grasses (*Poa*, *Chionochloa*) or small herbs	Moderate
Pasiphila eratica, *Pasiphila* sp. n. (moths)	Unclassified	Present	*Veronica* spp. in tussock, seepage and cushionfield	Moderate

Status per the TEcIA. Watts (2026) reports Xanthorhoe frigida and Pyrausta comastis both as 'Threatened – Nationally Vulnerable'. Statuses will be confirmed against the current NZTCS listing in the first annual report. Asaphodes stinaria, Xanthorhoe bulbulata and Protodendrophagus sp. 1 were assessed as very unlikely to be present.

9.6.2 Avoidance and Micro-siting

When the footprint is pegged (ECO.7), the Project Ecologist and an invertebrate ecologist will walk the alignment and identify high-value microhabitats. Where they lie at or near the edge of the footprint, the footprint will be adjusted within ECO.6 to avoid them. The microhabitats include:

- Rock refugia and stable scree;
- Seepage margins and cushion bog fringes (*Pyrausta comastis*);
- Splash-zone rubble at stream and tarn margins (*Taenarthrus capito*); and
- Patches of *Aciphylla*, *Cardamine*, *Pachycladon* and *Veronica*.

9.6.3 Habitat Salvage and Direct Transfer (ECO.15)

- Vegetation is moved in the largest tracts possible, so that ground-dwelling invertebrates and their eggs, larvae and pupae are carried with the turf (ECO.15).
- Where turf transfer is not possible, topsoil, litter and schist debris are transferred as intact blocks to adjacent comparable habitat. This can move life stages that conventional salvage cannot detect (Watts 2026).
- Rock refugia are relocated within 24 hours, lichen side up, into positions with similar exposure and next to retained habitat.
- Transfers are made during the snow-free active season, not when soils are frozen.
- Receiver areas are chosen for long-term habitat quality and continuity with retained habitat (Table 14). The rationale for each is documented in the ECO.9 report.

9.6.4 Host Plants (ECO.10(c))

Host plants (all *Cardamine*, *Aciphylla aurea* and *A. latipinna*, plus *Pachycladon novae-zelandiae* under ECO.10(b), and the recommended *Veronica densifolia* and *V. thomsonii*) are moved with their surrounding soil, litter and adjacent turf. This is because invertebrate life stages may be in the soil and litter rather than on the plant. Host patches are kept together and placed near other host plants.

9.6.5 Lighting

Lighting is limited as set out in Sections 7.6 and 10.5. This protects night-flying moths, including *Xanthorhoe frigida* and *Pyrausta comastis*, for which the TEcIA assessed summer lighting effects.

9.6.6 Monitoring Design

Monitoring uses a before–after, control–impact (BACI) design, strengthened in response to Watts (2026):

- **Strata:** snow tussock grassland; cushionfield and high alpine cushionfield; seepage and cushion bog margins; rockfield.
- **Sites:** at least five impact sites (within 20 m of the footprint edge) and five control sites (at least 200 m from works, matched by community, aspect and elevation) per stratum [final replication confirmed by power analysis].

- **Methods:**
  - Pitfall traps (five per site, 14 days);
  - Light traps (UV, two standardised nights per round, with fixed weather thresholds);
  - Timed hand searches (30 minutes per site); and
  - Litter and soil cores (Berlese extraction) for micro-arthropods.
- **Timing:** two rounds per season (November – December and February – March), adding the early-summer sampling missing from the TEcIA baseline.
- **Baseline:** at least one full season (two rounds) before construction in the Doolans, and two seasons where the programme allows.
- **Identification:** to species or recognisable taxonomic unit (RTU). Abundance data are reported.
- **Power analysis:** after the baseline, a power analysis will confirm that the design can detect a 30% change in abundance of key taxa with 80% power. Replication or effort will be increased if it cannot. Triggers are confirmed at this stage (Section 11.0).

9.7 Avifauna Management

9.7.1 General

All indigenous birds are absolutely protected under the Wildlife Act 1953. Any handling of birds, nests or eggs requires the appropriate DOC authority. Where there is a concern for the safety of any indigenous bird, or for personnel, the project ornithologist must be contacted immediately.

9.7.2 Kārearea / Eastern Falcon (ECO.21, ECO.22A)

1. Where disturbance occurs between 1 August and 31 May, an ornithologist surveys the footprint and surrounding nesting habitat no more than five days (including non-working days) before disturbance, to identify nests or unfledged chicks.
2. Where works could directly disturb a nest or bird, a 200 m exclusion zone is established around the nest (or as otherwise directed by the ornithologist). No works occur within it until the chicks have fledged.
3. Only where avoidance is not practicable, the nest is relocated to adjacent undisturbed habitat by the ornithologist.
4. Only where relocation may harm the adults, the nest is removed as a last resort, within the requirements of ECO.22A(1)(d) and DOC authorisation.
5. All work follows the DOC *New Zealand National Bird Banding Scheme Bird Bander's Manual* (ECO.22A(2)).
6. Kārearea territory occupancy and breeding outcomes near the works are recorded annually during construction (M17).

9.7.3 Pīhoihoi / New Zealand Pipit (ECO.22B)

Between 1 August and 28/29 February, the stepped procedure of ECO.22B applies, using the nesting habitat map (Figure 7):

- **Step 1 – Survey:** an ornithologist surveys the footprint and a 50 m buffer within five days before clearance. If no nests are found and works start within five days, works may proceed.
- **Step 2 – Vegetation reduction:** below 1,700 m asl, where works will start more than five days after the survey, suitable nesting vegetation in the footprint is reduced to 20 cm height within five days of the survey, and the area is marked. If tussock regrows above 40 cm with natural form, reduction is repeated. As an alternative, Step 1 may be repeated within five days of works.
- **Step 3 – Nests in the footprint:** avoid through timing where practicable. Otherwise, as a last resort, the nest is removed and eggs are humanely dispatched following the candling, freezing and crushing protocol in ECO.22B, and eggs are given to DOC.
- **Step 4 – Nests within the 50 m buffer:** the nest is monitored. If it is abandoned (more than six hours of inactivity), eggs are recorded and dispatched as in Step 3. No action is needed for nests established within 50 m of ongoing works that have not increased in extent.
- **Step 5 – Compensation for egg loss:** see below.

Method for determining egg-loss compensation (ECO.22B(1)(g)(iv)) [proposed – to be agreed with DOC]:

1. Every egg and nest lost under Steps 3 or 4 is recorded (date, location, number of eggs and embryo development).
2. Compensation is expressed in **nest-equivalents**. One nest-equivalent is one nest lost, regardless of clutch size.
3. For each nest-equivalent, NZSki funds or delivers predator control (stoats, cats, hedgehogs and rodents) over pīhoihoi breeding habitat in the Remarkables Ecological District for one full breeding season. The control must be designed to protect at least three nests, based on the density of pīhoihoi recorded in the TEcIA surveys. Breeding success is monitored at a sample of nests to confirm the benefit.
4. Alternatively, where agreed with DOC, a payment equal to the cost of step 3 is made to an established ground-nesting bird protection programme in the Remarkables Ecological District.
5. Compensation is delivered in the breeding season after the loss and is reported in the annual monitoring report.

9.7.4 Kea (ECO.23, ECO.24, ECO.43)

- All tools, consumables and loose or soft construction materials (for example insulation, foam, rubber, cabling and sealants) must be secured so that kea cannot reach them.
- Interactions are avoided where practicable and otherwise minimised. Kea must not be fed, and vehicles and buildings are kept closed.
- If kea become a nuisance, kea-safe ‘playgrounds’ (activity frames with durable non-toxic materials, following Kea Conservation Trust guidance) are installed away from the works, under ornithologist supervision.
- No lead-based materials or finishes are used in construction or maintenance (ECO.43).
- There are no external rubbish bins. Waste storage is kea-proof (Section 9.8).

- Kea interactions and incidents are recorded (M18) and serious incidents are reported to DOC.
- Measures stay in place until construction in the area is complete, and the waste, materials and signage measures continue through operation.

9.7.5 Bird Strike (ECO.25)

External windows of the Doolans Base Building are designed to break up the line of sight, and the design is reviewed by an ornithologist (ECO.25(a)–(b)). For five years after construction:

- building surrounds are searched for carcasses or injured birds weekly during the snow-free season, and fortnightly in winter where safe;
- staff report any strike they see; and
- species, date, location and window are recorded (M19).

If a 'Threatened' or 'At Risk' bird strike is recorded, one or more of the deterrents in Table 17 must be installed on the relevant glazing within 20 working days. Further measures are added if strikes continue (ECO.25(d)).

Table 17: Bird-strike deterrent measures (ECO.25(d); TEcIA Recommendation 28).

Deterrent	Specification
High-contrast markers (tape or decals)	External surface; vertical stripes ≥6 mm wide at ≤100 mm spacing, or dots ≥6 mm at ≤50 mm × 100 mm spacing (the '2 × 4' rule)
UV-reflective patterned film	Applied externally across the full pane
Fritted or etched glass panels	Retrofit panels with a pattern density meeting the 2 × 4 rule
External screens, netting or shutters	Mounted ≥75 mm from the glass to absorb impact
Lighting and interior management	Interior lights off or blinds closed at night; no plants or reflective objects visible behind glass

9.7.6 Other Indigenous Birds

Kāhu, pūtakitaki and karoro nests found during surveys or works are protected by a 20 m exclusion zone until fledging, unless the ornithologist advises otherwise.

9.8 Rubbish and Refuse

- No rubbish bins associated with the Project are stored externally within the Doolans or Rastus Burn catchments (ECO.24(a)). Internal waste storage is kea-proof.
- During construction, waste is contained in lidded, secured containers and removed from the alpine area at least weekly. Wind-blown materials are retrieved daily.
- **Annual rubbish collection (ECO.24(b)):** each year, after the main snowmelt (December – January), a walk-through collection is made within and next to all tracks, ski trails, lift lines, gondola towers, buildings and snowmaking infrastructure. It covers at least 20 m either side [TBC], and downwind accumulation areas identified during the first collection.
- Collected material is recorded by type, quantity and location (M20). Hotspots are reported with targeted prevention measures, such as signage, bins inside buildings and fixing of loose materials.

10.0 Operation and Maintenance

Ski-area operation can affect vegetation, wetlands and invertebrates beyond the construction footprint (Watts 2026, Rossaak 2026, Wildlands 2026). The lodged TEMP did not address this. The measures below apply from the start of operation in the Doolans, and to operational changes in the Rastus Burn, for the life of the TEMP.

10.1 Snowmaking

- Snow guns, hydrants and associated infrastructure must not be located in wetlands (Section 9.3.3).
- Snowmaking must not be directed onto mapped cushion bog or string mire, and coverage areas are set to avoid them [recommended; snowmaking layout to be confirmed].
- Source water (Doolans Creek and the reservoir) is sampled for pH, conductivity, calcium, magnesium, nitrate-N and dissolved reactive phosphorus each season during snowmaking. Wetland pore water is monitored under M10.
- If an M10 trigger is reached, the Consent Holder will:
    - review snowmaking coverage and volumes over the affected catchment;
    - relocate or redirect guns; and
    - report to ORC with an assessment of the options.
- Snowmaking volumes and areas covered are recorded annually. This allows the effect of greater reliance on snowmaking as the climate changes to be tracked (Watts 2026).

10.2 Grooming and Skiing

- Grooming is confined to formed trails. Over vegetated terrain outside formed trails, grooming does not occur until there is at least 30 cm of settled snow [TBC], and stops in spring when cover falls below that depth.
- Areas with thin snow over vegetation, wetlands or cushionfield are roped or closed. Boundary ropes keep skiers off exposed vegetation.
- Grooming machines, snowmobiles and other machinery arriving from outside the Alpine Project Area pass through the quarantine area (Section 9.5).
- Each spring after snowmelt, groomed runs over vegetation are inspected for vegetation damage, soil exposure and erosion (M21). Damage is repaired using the methods in Section 9.1.

10.3 Summer Use and Maintenance Works

- Vehicles must use formed tracks only.
- Summer visitors are directed to formed routes, with signage at wetland and cushionfield no-go areas and boot brushes at access points.
- Maintenance works that disturb vegetation or soil (for example trail repairs, culvert clearing or tower maintenance) follow the construction procedures in this TEMP. These are: a pre-works check by the Project Ecologist, footprint marking, nest

surveys in the breeding season, hygiene, erosion and sediment control, and reinstatement of salvaged vegetation.

- Drainage structures, culverts, swales and permeable track sections are inspected annually and after major storms, and kept clear so that flows continue to reach wetlands (ECO.42).
- Dust from unsealed tracks is controlled as in Section 7.6.

10.4 Avalanche Control

Explosive avalanche control alters the timing of avalanches rather than suppressing them. Between 1 August and the end of the ski season, avalanche control routes near known kārearea territories will be reviewed with the ornithologist to reduce disturbance where practicable. Avalanche-related damage to vegetation or wetlands is recorded in the spring inspection.

10.5 Lighting

Operational night lighting is limited to winter grooming and snowmaking. Building and safety lighting must be fully shielded and downward-directed, use warm-colour lamps (≤2,700 K), be on motion sensors or timers where practicable, and not shine upward or across habitat. No external night lighting is used outside the ski season except for emergency or safety needs.

10.6 Climate Change and Periodic Review

Changing snow conditions may increase reliance on snowmaking and extend artificial snow cover. Every five years, the TEMP review (Section 13.4) will assess snowmaking and grooming records, M10 and M21 results and invertebrate monitoring. The aim is to identify any trend in operational effects, and to amend controls if needed.

11.0 Monitoring Programme

Table 18 consolidates all monitoring under this TEMP. It replaces the separate tables and Gantt chart of the lodged draft, which were inconsistent (Wildlands 2026). The general principles are:

- All quantitative indicators have a pre-works baseline and matched control sites, so that natural variation can be separated from project effects (BACI);
- Triggers marked [TBC] are confirmed by the Project Ecologist after the baseline and included in the first annual report; and
- Monitoring is by SQEPs, with locations recorded in NZTM and data held by NZSki and provided to the councils and DOC on request.

Table 18: Monitoring programme, triggers and responses.

ID	Indicator	Method and location	Frequency	Performance standard / trigger	Response	Condition
VEGETATION AND FLORA						
M1	Footprint compliance; damage outside footprint	Site audits; photopoints at no-go boundaries	Weekly during construction; after each maintenance event	Any damage outside footprint or no-go breach	Stop work; remediate within 20 working days (or next snow-free season); retrain crew	ECO.6, ECO.13
M2	Survival of translocated plants (by species)	Census of all tagged plants at receiver sites	Autumn: years 1, 2, 3, 5, 7 after each translocation	Year 3 <70%; year 7 <60% survival	Supplementary translocation from later stages; ECO.19 seed programme; report unremediated loss	ECO.16, ECO.18, ECO.19
M3	Indigenous cover on transferred / remediated surfaces	Permanent 1 × 1 m quadrats (≥30, stratified by community) and photopoints	Autumn: years 1, 2, 3, 5, 7	Year 3 <40%; year 7 <60% indigenous cover; erosion present	Infill turfs or eco-sourced planting; stabilise; ECO.19	ECO.17, ECO.18, ECO.19
M4	Cushion survival; fragmentation (cushionfield and high alpine cushionfield)	Tagged cushions; quadrats; fragmentation mapping at edges	Same as M3 (no less frequent than other communities)	Year 3 <70% survival; any new fragment >0.5 m²	Re-plug cushions; extend no-go; review method	ECO.16, ECO.17
M5	Edge effects on retained vegetation, including *Dracophyllum* dieback	Edge transects (0–2 m and 2–10 m) at 20 locations; photopoints	Baseline; years 1, 3, 5	Dieback or loss extending >2 m beyond footprint edge	Investigate cause (drainage, dust); remedy; report	ECO.6
M6	Weeds: new species; extent of existing infestations	Surveillance of footprint, edges, routes, receiver sites; GPS mapping	December and March during construction; annually (March) in operation	Any new species; any increase over baseline map	Control within 10 working days; three seasons of follow-up; review hygiene	ECO.20
WETLANDS, TARN 3 AND STREAMS						
M7	Sediment deposition in receiving wetlands	Sediment plates or tiles at impact and control wetlands; ESC inspections	Monthly during construction (snow-free); after rain >25	Deposition >2 mm above control in any period; any visible plume or deposit	Stop and repair ESC; remove sediment by hand where safe; notify ORC within 2 working days	ECO.37, ECO.40

ID	Indicator	Method and location	Frequency	Performance standard / trigger	Response	Condition
			mm/24 h; annually in operation			
M8	Wetland water table (seepage, cushion bog, string mire)	Piezometers with data loggers at each crossing (up- and downgradient) and at control wetlands	Continuous logging (snow-free season); baseline at least one season before works	Mean level >10 cm below the control-adjusted baseline range for >14 consecutive days, or loss of saturation in the top 10 cm [confirm after baseline]	Hydrologist investigation within 10 working days; repair crossing or drainage; area affected counted as wetland loss	ECO.31–ECO.35
M9	Wetland vegetation composition (indigenous wetland indicator cover)	Photopoints and quadrats up and downstream of crossings and in wetlands within 100 m downgradient; matched controls	Baseline; 3 months after construction; annually years 1–3; biennially to year 7; then 5-yearly through operation	≥10% absolute decline relative to control change at two consecutive surveys	Remedial measures within 20 working days (ECO.35); restart monitoring cycle; report loss	ECO.35
M10	Pore-water chemistry (cushion bog and string mire); snowmaking source water	pH, conductivity, Ca, Mg in pore water at impact and control sites; source water sampling	Baseline; annually at spring melt (November) while snowmaking operates; source water each snowmaking season	pH increase >0.5 units, or conductivity or Ca >50% above control-adjusted baseline	Review and redirect snowmaking (Section 10.1); report to ORC	Recommended (Rossaak 2026)
M11	Crossing function	Inspection by hydrologist and ecologist	Within 10 working days and at 12 months; annually thereafter	Ponding, drying, scour, or flow bypass	Repair within 20 working days; report to ORC	ECO.33, ECO.42, WAT.28
M12	Tarn 3 catchment and downgradient wetlands	Water balance; photopoints, quadrats and piezometers in wetlands within 100 m of swale outlets and soakage fields	Before construction; annually for 3 years; year 5	As for M8 and M9	As for M8 and M9	INF.5 (recommended)
M13	Stream banks and swales	Bank stability; tussock survival; outlet scour	After first snowmelt; annually for 3 years	Tussock survival <80% at year 3; erosion or scour	Replant; reinforce; repair outlets	FEW.4, WAT.24–WAT.25
INVERTEBRATES						
M14	Invertebrate assemblages (richness, abundance, notable taxa)	BACI design (Section 9.6.6): pitfall, light trap, hand search, litter cores	Baseline; years 1, 2, 3 after construction; then every 5 years	Statistically significant BACI decline ($p<0.1$) in a stratum, or loss of a notable taxon from ≥2 impact sites; interim 20% decline until power analysis	Investigate cause; expand buffers; restore refugia; adjust timing or lighting; specialist review	ECO.2(f)(vi)
M15	Salvaged habitat and refugia	Occupancy checks of relocated refugia and transferred litter blocks	Years 1 and 3	Refugia unoccupied or displaced	Reposition or add refugia	ECO.15
AVIFAUNA AND RUBBISH						
M16	Kārearea and pīhoihoi nests	Pre-disturbance nest surveys	≤5 days before disturbance, August–May (kārearea) and August–February (pīhoihoi)	Any active nest	Apply ECO.22A or ECO.22B procedures	ECO.21–ECO.22B
M17	Avifauna occupancy (kārearea territories; pīhoihoi detection rate)	Repeat TEclA 5-minute bird count points and walkthroughs; territory checks	Annually during construction; years 1, 3, 5 after; then 5-yearly	Kārearea territory unoccupied two consecutive seasons; >30% decline in pīhoihoi detections relative to control	Ornithologist review; adjust timing or buffers; report to DOC	ECO.2(f)(vii)
M18	Kea interactions	Incident register (staff and contractors)	Continuous	>3 nuisance incidents in a month; any ingestion or injury	Reinforce securing; install playgrounds; review waste; notify DOC	ECO.23

ID	Indicator	Method and location	Frequency	Performance standard / trigger	Response	Condition
M19	Bird strike at Doolans Base Building	Carcass searches; staff reports	Weekly (snow-free) and fortnightly (winter) for 5 years	Any 'Threatened' or 'At Risk' bird strike	Install deterrents (Table 17) within 20 working days	ECO.25
M20	Rubbish	Annual collection record (type, quantity, location)	Annually after snowmelt	Increase in quantity, or a recurring hotspot	Targeted prevention	ECO.24
OPERATION						
M21	Snowmaking and grooming effects on vegetation	Snow-depth and grooming records; spring inspection of groomed runs over vegetation	Annually	Vegetation damage or soil exposure outside formed trails	Repair; adjust grooming depth or ropes	ECO.2(b)

11.1 Monitoring Schedule

Table 19 sets out the timing of monitoring events. Years are counted from completion of construction in each area. For translocations, years are counted from the translocation date.

Table 19: Monitoring schedule.

Monitoring	Baseline (pre-works)	Construction	Year 1	Year 2	Year 3	Year 5	Year 7	Years 8–40
M1 Footprint compliance		•						Works only
M2 Translocation survival			•	•	•	•	•	ECO.19 if needed
M3 / M4 Revegetation and cushions			•	•	•	•	•	ECO.19 if needed
M5 Edge effects	•		•		•	•		
M6 Weeds	•	2/yr	•	•	•	•	•	Annually
M7 Sediment	•	Monthly	•	•	•	•	•	Annually
M8 Wetland water table	≥1 season	Continuous	•	•	•	•	•	5-yearly
M9 Wetland vegetation	•		3 mo + yr 1	•	•	•	•	5-yearly
M10 Pore-water chemistry	•		•	•	•	•	•	Annually (snowmaking)
M11 Crossing function		10 days	12 months					Annually
M12 Tarn 3 catchment	•		•	•	•	•		
M13 Stream banks			•	•	•			
M14 Invertebrates	1–2 seasons		•	•	•			5-yearly

Monitoring	Baseline (pre-works)	Construction	Year 1	Year 2	Year 3	Year 5	Year 7	Years 8–40
M15 Refugia			•		•			
M16 Nest surveys		Pre-works						Maintenance works
M17 Avifauna occupancy	•	Annually	•		•	•		5-yearly
M18 Kea incidents		Continuous	•	•	•	•	•	Continuous
M19 Bird strike			•	•	•	•		As triggered
M20 Rubbish		Annually	•	•	•	•	•	Annually
M21 Grooming / snowmaking			•	•	•	•	•	Annually

12.0 Adaptive Management

When a trigger in Table 18 is reached, the following sequence applies, as detailed in Table 20. It addresses reviewers' concerns that the adaptive actions in the lodged draft had no timeframes or end points (Rossaak 2026).

Table 20: Adaptive management sequence.

Step	Action	Timeframe
1. Notify	The person detecting the exceedance notifies the Project Ecologist. The Consent Holder notifies the relevant authority (ORC for wetlands).	Immediately; authority within 2 working days for incidents, otherwise in the annual report
2. Investigate	The Project Ecologist (with the relevant specialist) determines whether the exceedance is attributable to the Project, using control-site data.	Within 10 working days
3. Respond	Implement the response in Table 18, or an alternative of equal or better effect agreed with the Project Ecologist.	Within 20 working days, or at the start of the next snow-free season where works are seasonally constrained
4. Verify	Repeat monitoring to confirm the response has worked.	At the next scheduled event, or within 3 months for wetlands
5. Escalate	If two consecutive responses fail, review the method or design with the certifying authority; amend the TEMP if required (ECO.3).	Next annual report
6. Account	Where the effect cannot be remedied (for example permanent wetland loss, or failed revegetation after ECO.19), record its extent and report it to the councils and Biodiversity Compensation Project parties.	Annual report

The end point for each adaptive response is when the relevant performance standard is met at two consecutive monitoring events, or when the effect has been accounted for under Step 6.

13.0 Reporting, Record Keeping and Review

13.1 Construction-phase Reporting

- **Ecology survey reports (ECO.9):** within 20 working days of each survey, to QLDC (Rastus Burn) and CODC (Doolans), and to ORC where wetlands are involved.
- **Crossing reports (ECO.31, ECO.33, WAT.19, WAT.28):** design information 40 working days before construction, and inspection confirmations within 10 working days and at 12 months, to ORC.
- **Incident notifications:** within 2 working days (Section 7.7).
- **Wetland loss reconciliation:** after each construction season, to ORC (Section 9.3.1).

13.2 Annual Terrestrial Ecology Monitoring Report (ECO.4–ECO.5)

By 30 June each year, a SQEP will prepare a report covering the previous year. It will be submitted by 30 August to ORC (wetlands), QLDC and CODC, with a copy to DOC and Kā Rūnaka. The report will include:

- Works and actions completed in the previous 12 months, including translocations (numbers by species and receiver site) and footprint changes;
- Results of all monitoring in Table 18 against performance standards and triggers, with raw abundance data, species lists (including recognisable taxonomic units) and maps;
- The methods and results of bird-strike monitoring, and any deterrents installed (ECO.5(b));
- Pīhoihoi egg losses and compensation delivered;
- Aspects not implemented on time, the reasons why, and corrective measures (ECO.5(c));
- An assessment of TEMP effectiveness and, where performance indicators are not met, the reasons and the measures taken or proposed (ECO.5(d));
- The wetland loss reconciliation, and any unremediated loss reported under Step 6 of the adaptive management sequence; and
- Any amendments needed to the TEMP or related plans (ECO.5(e)).

ECO.4 requires reporting until all TEMP objectives are met. Because wetland, sediment and snowmaking effects recur each season, this TEMP proposes that reporting continue annually through construction and for at least the first seven years of operation. After that, reporting would be in the years in which monitoring occurs, and for the life of the consent [recommended amendment to ECO.4].

13.3 Record Keeping

NZSki will keep the following registers for the life of the consent and make them available to the councils and DOC on request:

- Hold-point confirmations;
- Induction and training;

- The no-go map and footprint changes;
- Translocation records (tag, GPS, species);
- The weed register;
- Clean-down records;
- The incident register;
- Nest survey records;
- Kea interactions;
- Bird strike;
- Rubbish collection;
- Snowmaking and grooming records; and
- Monitoring data and photopoints.

13.4 Review of the TEMP

The TEMP will be reviewed by the Project Ecologist, and amended and re-certified where required (ECO.3), when:

- Monitoring identifies unanticipated adverse effects, or a response fails twice;
- A significant ecological incident occurs;
- Construction methods, the footprint or operational practices (including snowmaking extent) change materially;
- The threat status of a managed species changes, or new Threatened species are found; and
- In any case, every five years for the life of the consent, including the climate change review in Section 10.6.

14.0 References

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Appendix A Recommendations Cross-reference Table

Table 21 lists every recommendation (excluding lizards) from the TEcIA (B.12), Wildlands (CODC), Rossaak (wetlands) and Watts (DOC invertebrates). For each, it shows the section of this TEMP that implements it, the condition that applies, and its status compared with the lodged draft TEMP V1.0 and H.02.

Table 21: Recommendations from technical reports and reviews, and where they are addressed. IDs: B = e3 TEcIA (B.12); W = Wildlands; R = Rossaak; C = Watts.

ID	Recommendation	TEMP Section	Condition(s)
B1	Rec 1: Prepare and implement one Vegetation, Weed, Invertebrate and Wetland Management Plan defining actions, methods and targets for Recs 2–22 (high plant survival, no weed introduction, hydrological function retained, invertebrate biodiversity preserved).	Whole TEMP; 1.2 Purpose; 11.0 Performance	GC.8, ECO.1, ECO.2, ECO.3
B2	Rec 2: Delineate and mark out the disturbance footprint before ecological surveys.	2.2 Footprint; 9.1	ECO.7(a)
B3	Rec 3: SQE surveys all disturbance areas to record and delineate species to translocate, including any footprint variation during construction.	9.2 Plant ID & translocation	ECO.7(b), ECO.8, ECO.9
B4	Rec 4: Translocate all 'At Risk – Declining' and 'Threatened' plants into nearby comparable habitat or remediated substrate (B.12 Table 5).	9.2	ECO.10(a); Attachment B
B5	Rec 5: Translocate all clusters of 'At Risk – Naturally Uncommon' and 'Data Deficient' plants, to a maximum of 500 clusters per species.	9.2	ECO.10(b); Attachment C
B6	Rec 6: Translocate invertebrate host plants where residual effect on the invertebrate is above Low – all *Cardamine*, *Aciphylla aurea* and *A. latipinna* (lodged TEMP lists *A.* "Lomond").	9.2; 9.6 Invertebrates	ECO.10(c)
B7	Rec 7: Revegetate batters/exposed surfaces as contiguous mats under the DOC/NZSki protocol (B.12 App G); single movement; upright storage ≤1 day; receiver sites approved beforehand; experienced contractors working with the ecologist.	9.1 Vegetation	ECO.14; Attachment D
B8	Rec 8: Undertake community remediation as close as possible to the donor site to retain invertebrate biodiversity and genetic diversity.	9.1; 9.2	ECO.11
B9	Rec 9: Translocate plants in the largest possible tracts to retain habitat and ground-dwelling invertebrates.	9.1; 9.6	ECO.15
B10	Rec 10: ≥60% survival (species) and ≥60% indigenous cover (community) after 7 years; monitor annually 3 yrs then biennially 4 yrs; if insufficient, experimental direct sowing of local seed, continued where successful.	11.0 Monitoring; 12.0 Adaptive management	ECO.16, ECO.17, ECO.18, ECO.19
B11	Rec 11: Project ecologist oversees all translocation/remediation, trains and briefs contractors, and enacts further mitigation where needed.	5.0 Responsibilities; 8.0 Training	ECO.14(d), ECO.3(e)
B12	Rec 12: Before construction, SQE physically marks the wetland edge and setbacks using delineated boundaries and vegetation, soil and hydrology indicators.	9.3 Wetlands	ECO.8(d)
B13	Rec 13: Maintain hydrological function and connectivity of all wetlands and streams.	9.3; 9.4 Streams	ECO.2(f)(iii)-(iv), ECO.31, ECO.42, WAT.19
B14	Rec 14: Provide designs for each stream/wetland crossing (drawings, method, materials, equipment, lengths, hydrological assessment/flow, rehabilitation).	9.3; 9.4	ECO.31, WAT.19
B15	Rec 15: Hydrologist and ecologist approve crossing designs before works; inspect immediately on completion AND again at 12 months; photo points and quadrats up/downstream, annual 3 yrs then biennial 4 yrs; remediate cause and restart monitoring if effects found.	9.3; 11.0	ECO.31, ECO.33, ECO.35 (streams: WAT.28)
B16	Rec 16: Weed management to achieve no new exotic species, no increase in existing exotics, and incursion response and monitoring in construction and operation.	9.5 Biosecurity & weeds	ECO.2(f)(v), ECO.20
B17	Rec 17: No soil from outside the study area brought on site.	9.5	ECO.20(b)
B18	Rec 18: No soil moved between catchments or upslope from the base building area; elsewhere not more than 100 vertical m upslope.	9.5	ECO.20(e)-(f)
B19	Rec 19: Clean and check machinery/equipment for soil before entry; quarantine area near the Remarkables base.	9.5	ECO.20(c)-(d), ECO.38(1)
B20	Rec 20: No disturbance outside the earthworks extent unless it reduces footprint within the same community; ecologist agrees changes first.	2.2; 9.1	ECO.6, ECO.8(c), ECO.9

ID	Recommendation	TEMP Section	Condition(s)
B21	Rec 21: Finish all unvegetated trail surfaces with large coarse rock, not fine gravels.	7.0 Construction; 9.1	None – not conditioned
B22	Rec 22: Erosion and sediment control plan, including a drainage plan for long-term runoff, prepared by an SQEP and approved by a hydrologist and ecologist before works; monitored during and after construction (s6.5).	7.0; 9.3; 11.0	GC.8 (ESCP), ECO.37, ECO.40, FEW.1–FEW.2
B23	Rec 23: Stockpiles contained within the footprint, never on indigenous vegetation.	9.1	ECO.13
B24	Rec 24: Kārearea (Aug–May): nest survey ≤5 days before disturbance; 200 m exclusion (or as ornithologist directs) until fledged; managed by SQE ornithologist.	9.7 Avifauna	ECO.21, ECO.22A
B25	Rec 25: Contact the project ecologist/ornithologist immediately where bird or personnel safety is a concern.	9.7; 5.0	ECO.22A(2) (general)
B26	Rec 26: Train all staff in falcon interaction and etiquette.	8.0 Training	ECO.2(c)
B27	Rec 27: Pīhoihoi (Aug–Feb) Steps 1–5: survey footprint + 50 m within 5 days; vegetation reduction to 20 cm below 1,700 m; avoid nests by timing, else nest removal and humane egg dispatch (eggs to DOC); monitor nests within 50 m; record and retrospectively compensate egg losses.	9.7	ECO.21, ECO.22B (incl. (1)(g)(iv) compensation method)
B28	Rec 28: Glazing designed to break line of sight; 5 years bird-strike monitoring; if Threatened/At Risk strike – high-contrast tape, decals or UV-reflective film, with further measures on repeat strike.	9.7	ECO.25
B29	Rec 30: No lead-based materials or finishes in construction or maintenance (kea).	9.7; 7.0	ECO.43
B30	Rec 31: Kea: secure tools and materials; minimise interaction; kea-safe 'playgrounds' if nuisance; measures stay until risk removed; SQE supervision.	9.7	ECO.23
B31	Rec 32: Kea interaction and etiquette signage in all high visitor traffic areas (operational, not only construction).	8.0 Signage; 9.7	ECO.2(d)
B32	Rec 33: Train all staff in kea interaction and etiquette.	8.0 Training	ECO.2(c)
B33	Rec 34: No external rubbish bins in Doolans or Rastus Burn; annual rubbish collections along all tracks and ski infrastructure.	9.8 Rubbish / refuse	ECO.24
B34	s6.7: Translocate taonga plants (Table 16: *Aciphylla aurea, A. kirkii, A. lecomtei, A. latipinna, A. simplex, Juncus novae-zelandiae, J. pusillus, Veronica salicifolia*); culturally appropriate mitigation to be set by mana whenua.	6.0 Consultation; 9.2	ECO.10(a) [TBC with Kā Rūnaka]
B35	s6.8 (assumption behind residual effects): no external construction or operational lighting in summer; if delayed into autumn, only after sunrise/before sunset; night lighting limited to winter grooming and snowmaking.	9.6; 9.7; 10.0 Operation	CON.9–CON.11
B36	s7.1: Offsetting considered not credible; Moderate–High residual effects to be addressed by a biodiversity compensation project (outside e3 scope).	4.0 Hierarchy (cross-reference)	BIO.1–BIO.15
W1	Align all TEMP tables, Gantt chart and reporting criteria; cross-reference every criterion to a condition.	3.0 Conditions; 11.0	GC.7, ECO.2, ECO.3
W2	List the specific bird-strike deterrent measures (currently missing).	9.7 Avifauna	ECO.25(d)
W3	Monitor high alpine cushionfield at least as often as other types (most affected community), or justify otherwise.	11.0 Monitoring	ECO.2(e)
W4	Add a 3-month wetland monitoring event during initial works; make Gantt match tables (6-monthly for 2 years).	9.3; 11.0	ECO.35, ECO.2(e)
W5	Move translocation monitoring from January to autumn to capture summer heat/drought losses.	11.0 Monitoring	ECO.18
W6	Resolve conflicting thresholds (cushionfield 70% vs 60%; undefined *Dracophyllum* criteria).	9.1; 11.0	ECO.2(e)
W7	Provide a plant species identification methodology (missing from conditions and attachments).	9.2 Plant ID & translocation	ECO.2(f)(ii), ECO.10
W8	Address snowmaking nutrient inputs (cushion bogs) and grooming effects (snow density, extended cover).	10.0 Operation	ECO.2(b); no specific condition
W9	Further management needed if translocation and direct sowing both fail (no backstop at present).	12.0 Adaptive management	ECO.19
W10	Additional invertebrate sampling outside mid-Jan–early Mar, especially Oct–Dec for moths.	9.6; 11.0	ECO.2(f)(vi)
W11	Weed control must be fully successful to support 'High' long-term viability; set clear success measures.	9.5; 11.0	ECO.20, ECO.2(f)(v)
W12	Compensation to be quantified (time lag, success probability), local and similar ecosystems; plan fixed before works.	4.0 (cross-reference)	BIO.1–BIO.12
R1	Add 'and tarns' to the TEMP definition so Tarn 3 is not excluded by default.	1.0 Introduction; 9.3	Interpretation – TEMP definition
R2	Measurable indicators for each wetland type (water-table range, extent, wetland indicator cover), each with baseline and trigger.	9.3; 11.0	ECO.2(f)(iii)
R3	Wetland reporting to continue through operation, not only until objectives are met.	13.0 Reporting	ECO.4
R4	Cap authorised wetland loss by type (ha); any exceedance treated as further loss requiring compensation; footprint changes reported to ORC.	2.2 Footprint; 9.3	ECO.6
R5	Delineate wetlands using MfE protocols by an experienced delineator; reconcile against the cap.	9.3 Wetlands	ECO.8(d)
R6	ORC to receive survey reports involving wetlands; notify ORC of certified exceptions and significant water in cuts within 2 working days.	13.0 Reporting	ECO.9, ECO.41, EW.5

ID	Recommendation	TEMP Section	Condition(s)
R7	Crossing designs submitted for certification; reviewers independent of design team; stated approval criteria; precast (not cast-in-place) bulkheads.	9.3 Wetlands	ECO.31, EW.6, WAT.19, WAT.22, WAT.24
R8	Build crossings 'in accordance with' (not 'general accordance') certified design; maintain hydrological function.	9.3	ECO.32, ECO.42
R9	First-anniversary re-inspection of each crossing by hydrologist and ecologist.	9.3; 11.0	ECO.33
R10	Temporary diversions must not lower wetland water table beyond the work area.	9.3	ECO.34
R11	One season of pre-works baseline; piezometers at seepage, cushion bog and string mire crossings; matched controls; quantified triggers; extend to wetlands within 100 m downgradient; hydrological change counted as loss.	9.3; 11.0	ECO.35
R12	80% cover in wetland sites to be indigenous wetland species; correct cross-reference.	9.3	ECO.37
R13	ESC for the life of the track; deposited sediment trigger in receiving wetlands.	9.3; 11.0	ECO.40
R14	Identify and assess wetland plant receiver sites before clearance, with survival monitoring and targets.	9.2; 9.3	New condition
R15	Add string mire as a managed wetland type.	9.3	ECO.2(f)(iii)
R16	Sediment trigger linked to background deposition; vegetation triggers stated against baseline/control; adaptive actions with timeframes and end points linked to authorised loss.	11.0; 12.0	ECO.2(e), ECO.35
R17	Characterise snowmaking source-water and peat pore-water chemistry; add alkalinisation trigger for cushion bog and string mire.	10.0 Operation; 9.3	No condition – new recommended
R18	Tarn 3: catchment water balance; monitor dependent downgradient wetland and soakage fields; didymo controls on Doolans Creek–reservoir link.	9.3; 9.4; 9.5	INF.5
R19	Swale maintenance/monitoring; delineate riparian wetland–stream transition before Swale A; account for 55 m intermittent stream loss.	9.4 Streams	WAT.24, WAT.25
R20	Exclude towers, temporary tower access, snow guns and pump buildings from wetlands; name cushion bog explicitly.	9.3; 2.2	BD.5(4)
R21	ORC certification of the wetland component of the TEMP and of the compensation plan.	1.5; 13.0	GC.8; BIO.8–BIO.9
R22	Ring-fenced, quantified wetland/tarn compensation certified before Doolans works; boardwalk not compensation.	4.0 (cross-reference)	BIO.1, BIO.2, BIO.4, BIO.7, BIO.10, BIO.15
C1	Species-specific accounts (distribution, habitat, effects) for ‘Threatened’, ‘At Risk’, ‘Data Deficient’ and poorly known taxa.	9.6 Invertebrates	ECO.2(f)(vi)
C2	Prioritise avoidance of important invertebrate habitat (incl. siting of reservoir and tracks); micro-site during footprint marking.	4.0 Hierarchy; 9.6	ECO.6, ECO.8(c)
C3	Justify that salvaged/reinstated cushion, turf, moss, rock and soil/litter retain invertebrate function.	9.6	ECO.15
C4	Direct transfer of topsoil, litter, schist debris and intact habitat blocks; justify receiver sites for long-term habitat quality.	9.1; 9.6	ECO.12, ECO.14, ECO.15
C5	Host-plant translocation to account for life stages and wider soil/litter needs.	9.6	ECO.10(c)
C6	BACI design detail: replication, control sites, effort, seasonality, detection probability, statistical power.	9.6; 11.0	ECO.2(e)
C7	Justify decline thresholds against natural variability; taxon-level triggers for rare/localised species.	11.0	ECO.2(e)
C8	Early–mid summer sampling to complete the baseline.	9.6; 11.0	ECO.2(f)(vi)
C9	Manage snowmaking, grooming and skiing effects (compaction, delayed melt, soil chemistry, runoff), incl. climate-driven increase in snowmaking.	10.0 Operation	ECO.2(b); no specific condition
C10	Manage summer visitor trampling and informal tracks.	10.0 Operation	No specific condition
C11	Manage road dust, vehicle contaminants and roadkill of ground-active invertebrates.	7.0 Construction; 10.0	CEMP (GC.8)
C12	Report abundance data and recognisable taxonomic units in monitoring.	13.0 Reporting; 11.0	ECO.5
C13	Show how residual invertebrate effects are addressed by commensurate measures.	4.0 (cross-reference)	BIO.1–BIO.14

Appendix B Plant Species Required for Translocation

Lists as per Attachments B and C to the draft Conditions (H.02). Taonga species are to be confirmed with Kā Rūnaka. Spelling has been corrected where the attachments contain errors (for example, *Brachyscome longiscapa* and *Ranunculus royi*).

Note: *Acaena caesiiglauca* is referred to as 'At Risk – Regionally Declining' in the draft Conditions (H.02), although regarded as 'Regionally Not Threatened' in Otago by Jarvie et al. (2025).

Table 22: Species to be translocated under ECO.10(a) (Attachment B).

Species	NZTCS status	Otago regional status
TAONGA SPECIES (TBC with Kā Rūnaka)		
Taramea / *Aciphylla aurea*	Not Threatened	Regionally Not Threatened
Taramea / *Aciphylla kirkii*	Not Threatened	At Risk – Regionally Naturally Uncommon
Taramea / *Aciphylla lecomtei*	At Risk – Declining	At Risk – Regionally Declining
Taramea / *Aciphylla* "Lomond" [*Aciphylla* aff. *horrida* (a) (CHR 511521; Lomond)] (see Section 2.4)	Not Threatened – Taxonomically unresolved	Regionally Not Threatened – Taxonomically unresolved
Taramea / *Aciphylla latipinna* (see Section 2.4)	Not assessed	Not assessed
Taramea / *Aciphylla simplex*	At Risk – Naturally Uncommon	At Risk – Regionally Naturally Uncommon
Wīwī / *Juncus novae-zelandiae*	Not Threatened	Regionally Not Threatened
Wīwī / *Juncus pusillus*	At Risk – Naturally Uncommon	Threatened – Regionally Vulnerable
Koromiko / kōkōmuka / *Veronica salicifolia*	Not Threatened	Regionally Not Threatened
THREATENED AND AT RISK – DECLINING SPECIES		
Acaena caesiiglauca	Not Threatened	Regionally Not Threatened
Aciphylla lecomtei	At Risk – Declining	At Risk – Regionally Declining
Carex edgariae	At Risk – Naturally Uncommon	Threatened – Regionally Endangered
Carex parvispica	At Risk – Declining	At Risk – Regionally Naturally Uncommon
Carex talbotii	At Risk – Declining	Threatened – Regionally Vulnerable
Colobanthus strictus	Not Threatened	At Risk – Regionally Declining
Craspedia uniflora var. *uniflora*	Threatened – Nationally Endangered	Regionally Data Deficient
Juncus pusillus	At Risk – Naturally Uncommon	Threatened – Regionally Vulnerable
Poa lindsayi	Not Threatened	At Risk – Regionally Declining
Ranunculus buchananii	At Risk – Declining	Threatened – Regionally Vulnerable
Ranunculus royi	Data Deficient	Threatened – Regionally Vulnerable
Rytidosperma pumilum	Not Threatened	At Risk – Regionally Declining
Taraxacum zelandicum	At Risk – Declining	Not Threatened
Taxonomically unresolved: *Anisotome* "Otago bog" (CHR 511716); *Chaerophyllum* aff. *colensoi* (precautionary)	Taxonomically Unresolved	–

Table 23: At Risk – Naturally Uncommon and Data Deficient species: up to 500 clusters each under ECO.10(b) (Attachment C; threat statuses as listed in Attachment C).

Species (A–G)	Species (L–V)
Aciphylla simplex	*Kelleria childii*
Agrostis pallescens	*Kelleria paludosa*
Agrostis petriei	*Lachnagrostis albida*
Anisotome lanuginosa	*Lachnagrostis uda*
Azorella exigua	*Leptinella albida*
Azorella haastii subsp. *haastii*	*Leptinella goyenii*
Brachyscome longiscapa	*Lobelia linnaeoides*
Brachyscome montana	*Luzula colensoi*
Carex enysii	*Luzula leptophylla*
Carex hectorii	*Myosotis antarctica* subsp. *antarctica*
Carex kirkii var. *kirkii*	*Myosotis bryonoma*
Carex petriei	*Myosotis lyallii* subsp. *elderi*
Carex lachenalii subsp. *parkeri*	*Myosotis pulvinaris*
Carex pterocarpa	*Nertera balfouriana*
Carex purpurata	*Pachycladon novae-zelandiae*
Celmisia ramulosa var. *tuberculata*	*Phyllachne rubra*
Centrolepis pallida	*Pimelea notia*
Colobanthus apetalus	*Poa schistacea*
Deschampsia chapmanii	*Poa tonsa*
Deschampsia pusilla	*Ranunculus maculatus*
Dracophyllum prostratum	*Ranunculus pachyrrhizus*
Epilobium komarovianum	*Raoulia apicinigra*
Epilobium porphyrium	*Raoulia hectorii* var. *mollis*
Euchiton traversii	*Raoulia subulata*
Euphrasia petriei	*Raoulia youngii*
Festuca madida	*Shawia cymbifolia*
Festuca matthewsii subsp. *matthewsii*	*Veronica ciliolata* var. *fiordensis*
Forstera purpurata	*Veronica hectorii* subsp. *demissa*
Gaultheria nubicola	
Gentianella amabilis	
Geranium microphyllum	
Geum pusillum	
Gunnera dentata	

ECO.10(c) invertebrate host plants: all *Cardamine* species, *Aciphylla aurea* and *Aciphylla latipinna*. Recommended additions: *Veronica densifolia* and *Veronica thomsonii*.

Appendix C Monitoring and Incident Record Templates

Table 24: Plant translocation monitoring record.

Field	Entry
Date / observer	
Receiver site ID / NZTM	
Species / cluster tag no.	
Donor location / translocation date	
Status (alive / dead / missing)	
Vigour (1 good, 2 fair, 3 poor)	
Flowering / fruiting (Y/N)	
Threats (erosion, frost heave, browsing, weeds)	
Photo no.	
Comments / action	

Table 25: Wetland quadrat and hydrology record.

Field	Entry
Date / observer	
Wetland ID / type / crossing ID	
Quadrat ID (impact or control; up or downstream)	
Indigenous wetland indicator cover (%)	
Species list with cover (%)	
Bare ground / sediment (%) and depth (mm)	
Piezometer level (logger download ID)	
Pore-water pH / EC (if sampled)	
Photo nos.	
Trigger reached (Y/N) / action	

Table 26: Ecological incident record.

Field	Entry
Date / time / reporter	
Location (NZTM) / works area	
Incident type (Section 7.7)	
Description and extent	
Immediate actions taken	
Project Ecologist notified (time)	
Authority / DOC notified (date)	

Field	Entry
Remediation required and completion date	
Preventive actions / TEMP review needed	

Appendix D Protocol for the Rehabilitation of Natural Alpine Environments (Attachment D)

[Insert the DOC–NZSki *Protocol for the Rehabilitation of Natural Alpine Environments Following Ski Area Development* (Attachment D to the conditions). The text was not available in the documents supplied for this draft.]