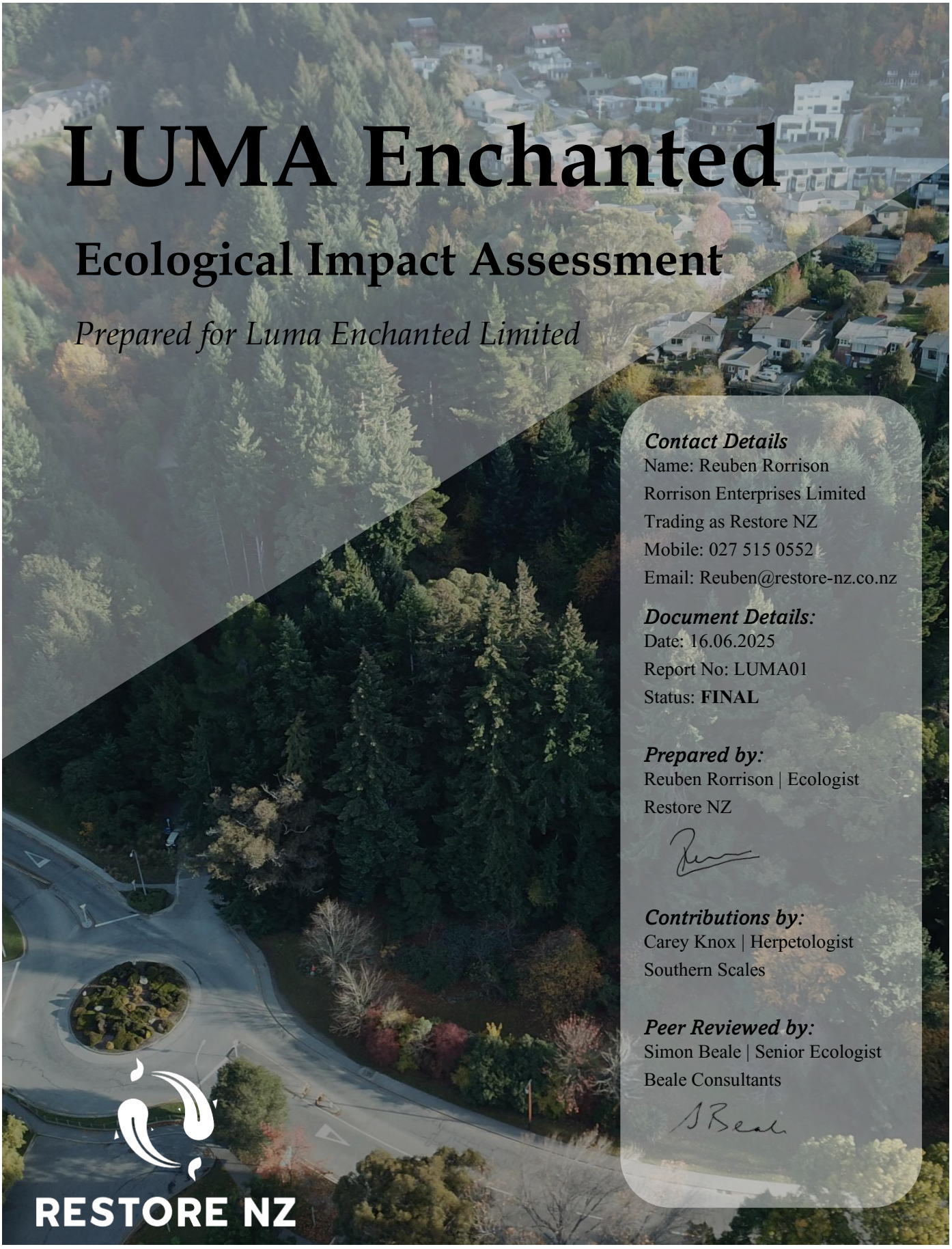

LUMA Enchanted

Ecological Impact Assessment

Prepared for Luma Enchanted Limited

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RESTORE NZ

Table of Contents

1 Introduction

1.1 Overview

This Ecological Impact Assessment (EcIA) has been prepared by Restore NZ, on behalf of LUMA Enchanted Limited (the Client), to support a resource consent application, and an application for a concession under the Reserves Act 1977, for a proposed seasonal light show at the old Sargood Chalet Girl Guide camp at One Mile, Queenstown. The activity involves the temporary installation and operation of a night-time trail experience incorporating lighting, soundscapes, and artistic structures within a defined area of modified forest and exotic scrub/grassland. The project is intended to run annually during the winter months and has been designed from the ground up to incorporate a strong focus on nature-themed storytelling and low-impact site use.

1.2 Site Location

The proposed activity is located at One Mile on the western edge of Queenstown, within the Queenstown–Lakes District (Figure 1). The activity footprint centres around the historical girl guides camp and is accessed via an existing driveway from the One Mile carpark off Lake Esplanade. The property is administered by the Department of Conservation (DOC) who have been involved throughout the preparation of this application.

Figure 1: Site location.

1.3 Purpose and Scope

This Ecological Impact Assessment (EcIA) has been prepared to inform a resource consent application, and an application for a concession under the Reserves Act 1977, for the proposed LUMA Enchanted Forest light show at the property pictured in Figure 1. The report assesses the actual and potential ecological effects associated with the installation, operation, and removal of temporary light and sound installations within the defined activity footprint.

The scope of this assessment includes:

- A description of the existing ecological environment, including vegetation and habitats potentially supporting indigenous fauna,
- Evaluation of ecological values using the EIANZ (2018) framework and Appendix 1 of the National Policy Statement for Indigenous Biodiversity (NPS-IB; MFE, 2023) criteria for identifying areas that qualify as significant natural areas,
- Assessment of actual and potential adverse effects on ecological values, including those associated with light, sound, physical disturbance, and visitor presence,
- Recommendations for avoidance and mitigation of ecological effects where appropriate,
- Consideration of the project in relation to relevant ecological policy and regulatory frameworks.

This report is based on a desktop review and site observations made during a walkover inspection. It is not intended to represent a full ecological survey. The site is relatively small, and the level of assessment has been tailored to the scale and nature of the proposed activity.

1.3.1 Limitations

Comprehensive seasonal surveys for indigenous lizards, birds, or invertebrates were not undertaken as part of this assessment. However, field observations were made during site visits, and potential habitat values for these taxa have been considered based on professional judgment and the nature of the site. Invertebrates have not been assessed in detail. This report reflects site conditions and information available at the time of assessment and is proportionate to the scale and duration of the proposed activity. It does not account for future changes to site conditions or species presence.

This report is intended solely to support the resource consent process under the Resource Management Act 1991, and an application for a concession under the Reserves Act 1977. It is not intended to serve as a comprehensive ecological inventory or to guide detailed restoration design beyond the scope of the proposed activity.

1.3.2 Legislative Objectives

This assessment has been undertaken with under the primary guidance of the RMA, along with the National Policy Statement for Indigenous Biodiversity, and relevant regional and district planning provisions. The overarching objective of the project is to avoid, remedy or mitigate adverse ecological effects, with the aim of achieving at least no net loss of indigenous biodiversity values as a result of the proposed activity.

1.3.3 Zone of Influence

For the purposes of this assessment, the zone of influence encompasses all areas subject to physical works (including installation of structures and temporary walkways), vegetation clearance, artificial lighting, amplified sound, and visitor movement. This includes:

- The main activity footprint within the girl guides clearing,
- The access route from the One Mile carpark to the installation entrance, and
- Any adjacent habitat potentially affected by lighting, noise, or disturbance during the operational period.

The assessment also considers indirect effects such as disturbance to highly mobile fauna from light and sound, any short-term habitat disruption during installation and pack-out periods, and potential downstream effects (if any).

1.4 Report Structure

The remainder of this report is structured as follows:

Section 2: Description of the Proposed Activity
Outlines the nature, timing, and physical extent of the proposed works, including any additional positive ecological actions proposed by the applicant.

Section 3: Assessment Methodology
Summarises the desktop and field-based methods used to identify ecological values and assess effects.

Section 4: Existing Environment
Describes the ecological characteristics of the site and surrounding area, including vegetation, habitats, and fauna.

Section 5: Ecological Values and Effects Assessment
Assesses the ecological value of identified features and the effects of the proposal, following the EIANZ (2018) framework.

Section 6: Avoidance, Mitigation and Recommendations
Outlines measures proposed to avoid or minimise ecological effects and recommends any additional remediation if required.

Section 7: Overall Level of Effect and Conclusion
Summarises the likely residual effects of the activity and the overall ecological outcome.

Section 8: Conclusions
Summarises key findings and provides an overall conclusion regarding the ecological appropriateness of the proposal.

Section 9: References
Lists all information sources and literature cited in the assessment.

Appendices
Supporting information including maps, field data, photographs, and other relevant documentation.

2 Description of the Proposed Activity

2.1 Overview

The Client proposes to establish and operate a seasonal light show known as the 'LUMA Enchanted Forest' at the One Mile property in Queenstown. The activity will involve the temporary installation of artistic light and sound features along a defined trail, with the event operating annually during the winter months. All structures will be temporary in nature, and the event has been designed to minimise physical and ecological disturbance.

2.2 Light Show Area

2.2.1 Layout

The activity footprint centres on the girl guides clearing at the centre of the property. Temporary installations will be spaced along a designated walking loop, with each station representing a themed light display. The layout has been designed to avoid large trees and native vegetation where possible and follows existing clearings or modified understorey. The general layout is shown in Figure 2.

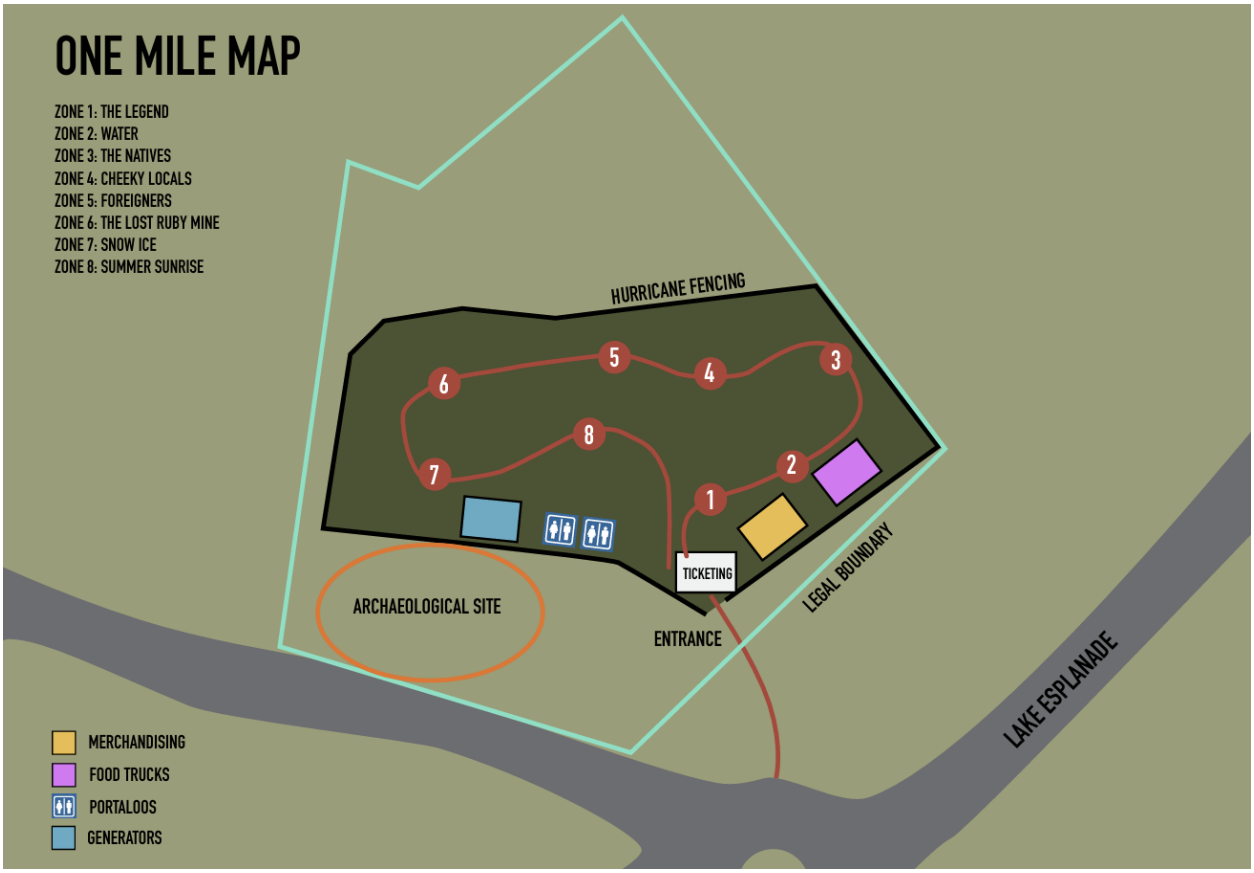

Figure 2: The general layout of the proposed activity.

2.2.2 Site Preparation

Preparation of the site will involve removal of invasive weed species and mowing of exotic grasses within the activity footprint. No excavation or substantive ground disturbance is proposed. All existing mature trees will be retained.

2.2.3 Tracks and Structures

Tracks will consist of temporary low-impact surfacing (e.g. bark, matting, or elevated boardwalk sections) laid directly over existing ground. Temporary structures, such as wireframes or projection platforms, will be lightweight and placed without footings. No permanent foundations or underground services are required.

2.2.4 Lighting and Soundscape

Lighting will include low-intensity, colour-changing LEDs and projectors focused on artistic features and vegetation. No strobe lighting or uplighting will be used. Soundscapes will consist of ambient natural sounds (e.g. birdsong, water, wind) and subtle music, delivered through small, directional speakers positioned to limit sound spill. Lighting and sound will be active only during operating hours.

2.2.5 Operational Duration

The light show will operate each year between mid-April and mid-November. An 8-week pack-in period will precede the opening, and a 3-week pack-out period will follow. The activity will occur between 5 pm and 11 pm each night during this operational timeframe.

2.2.6 Overall Operational Lifespan

The Client intends to operate the event on an annual basis for up to 30 years, subject to approval. All infrastructure will be temporary and removed after each season.

2.3 Site Access

2.3.1 Access Route Description

Access to the site will be via the existing driveway from the One Mile carpark, which will be extended by a temporary walking track leading to the entrance of the installation near the girl guides clearing. This route will largely follow previously modified ground and existing informal paths where possible.

2.3.2 Construction Requirements

During pack-in and pack-out periods, staff and volunteers will require vehicle access along the driveway for delivery of materials and equipment. No widening or surfacing upgrades are proposed, and access will be managed to minimise disturbance.

2.3.3 Public Access / Vehicle Parking

Event attendees will access the site via walking, cycling, or free shuttles operating from Queenstown town centre. No public parking will be provided on-site or at the One Mile Reserve. Signage and event communications will reinforce this restriction to prevent overflow or informal parking impacts within the reserve.

2.4 Additional Positive Ecological Actions

In addition to the low-impact design of the installation itself, the Client has expressed an interest in contributing to broader biodiversity outcomes associated with the project over the operational lifespan. While the following actions are not strictly required to mitigate ecological effects, they represent positive intent and may support the long-term enhancement of ecological values of the site if implemented. Only those actions with measurable outcomes have been considered in the overall assessment of ecological effects as outlined below.

2.4.1 Invasive Plant Control:

The Client proposes ongoing removal of invasive plant species within and adjacent to the installation area. This will focus on exotic woody weeds and rank grasses, with works timed to avoid peak nesting and breeding seasons. Targeted weed control is expected to reduce competition with native vegetation and improve overall habitat condition on the property.

2.4.2 Pest Animal Control

Pest animal control (e.g. rats, possums) will be undertaken on the property year round, with particular focus in & around the operational season.

2.4.3 Opportunistic Restoration Planting

Where appropriate, enrichment planting with suitable native species may be undertaken on the property to enhance the native representation of the habitats present, and the natural theme underlying the Clients proposal. This would complement existing vegetation structure and support long-term ecological values. A list of recommended species is provided in this report to guide implementation.

2.4.4 Ecological Messaging

While not a measurable outcome and therefore not considered a positive effect under this assessment, the Client is committed to maintaining a strong nature-focused theme throughout the installation. Several light features are based on native species or ecological processes, creating potential for subtle conservation messaging. While this cannot be formally assessed and is therefore not considered in the overall level of effects assessment, its goal of contributing to public awareness of biodiversity and the ecological value of native species is noted.

3 Assessment Methodology

3.1 Desktop Assessment

3.1.1 Vegetation and Habitat Types

A desktop review was undertaken to characterise vegetation cover and terrestrial habitat types across the activity footprint and surrounding area. This included interpretation of aerial imagery and relevant spatial datasets and classification tools. The following sources informed this component of the assessment:

- Potential Ecosystem and Habitat Mapping for Otago, based on Singers and Rogers (2014) classification of New Zealand terrestrial ecosystems,
- The Land Cover Database (LCDB), version 5 habitat mapping for mainland New Zealand (MWLR, 2020),
- Manaaki Whenua Landcare Research 'Our Environment' Tool, including Threatened Environment Classification (2012), used to assess remaining indigenous cover relative to original extent,
- LINZ Data Service, including topographic basemaps and historical imagery,
- Queenstown Lakes District Council GIS Viewer, for reserve boundaries, land zoning, and any ecological layer overlays,

This information was used to identify the likely ecological context of the site, classify dominant vegetation types, and help interpret areas of ecological value or potential significance prior to field verification.

3.1.2 Birds

To build a baseline understanding of potential bird species present on-site, a review of the citizen science bird observation platform eBird was conducted (Cornell Lab of Ornithology, 2025). All species recorded within grid square DP17, which encompasses the project site, are listed in Table 4, Appendix B.

3.1.3 Bats

A desktop review was undertaken to identify potential presence of New Zealand's two extant bat species, long-tailed bat (*Chalinolobus tuberculatus*) and lesser short-tailed bat (*Mystacina tuberculata*), within the wider One Mile area. This included a review of the Department of Conservation's national bat database (BioWeb; DOC 2, 2024) for records within a 25 km radius of the site. This distance threshold aligns with the guidance provided in DOC's Protocols for Minimising the Risk of Felling Occupied Bat Roosts (Bat Roost Protocols, Version 4; DOC 3, 2024).

The results of this desktop assessment were used to inform likelihood of occurrence, guide potential roost risk considerations, and guided the field survey described further below.

3.1.4 Lizards and Frogs

A desktop assessment of potential lizard and frog presence within the site and surrounding area was completed by herpetologist Carey Knox (Southern Scales), drawing on regional distribution records, habitat suitability, and professional experience. The findings of this assessment are included in Appendix C and have informed the evaluation of potential ecological values and effects within this report.

3.2 Field Assessments

Field assessments were conducted through multiple visits to the site to carry out ecological monitoring and habitat assessment. The primary survey effort, including a full walkover of the property, was undertaken on 13 May 2025 under fine weather conditions: partly cloudy with mostly sunny periods and a light breeze. Monitoring equipment, including automatic bat monitors (ABMs) and trail cameras, was deployed and later retrieved during these visits to supplement field observations. Further details regarding the survey methodologies implemented during site visits can be found in Sections 3.2.1 – 3.2.5 below). A summary of the equipment locations and tracks walked during site visits is provided in Figure 3.

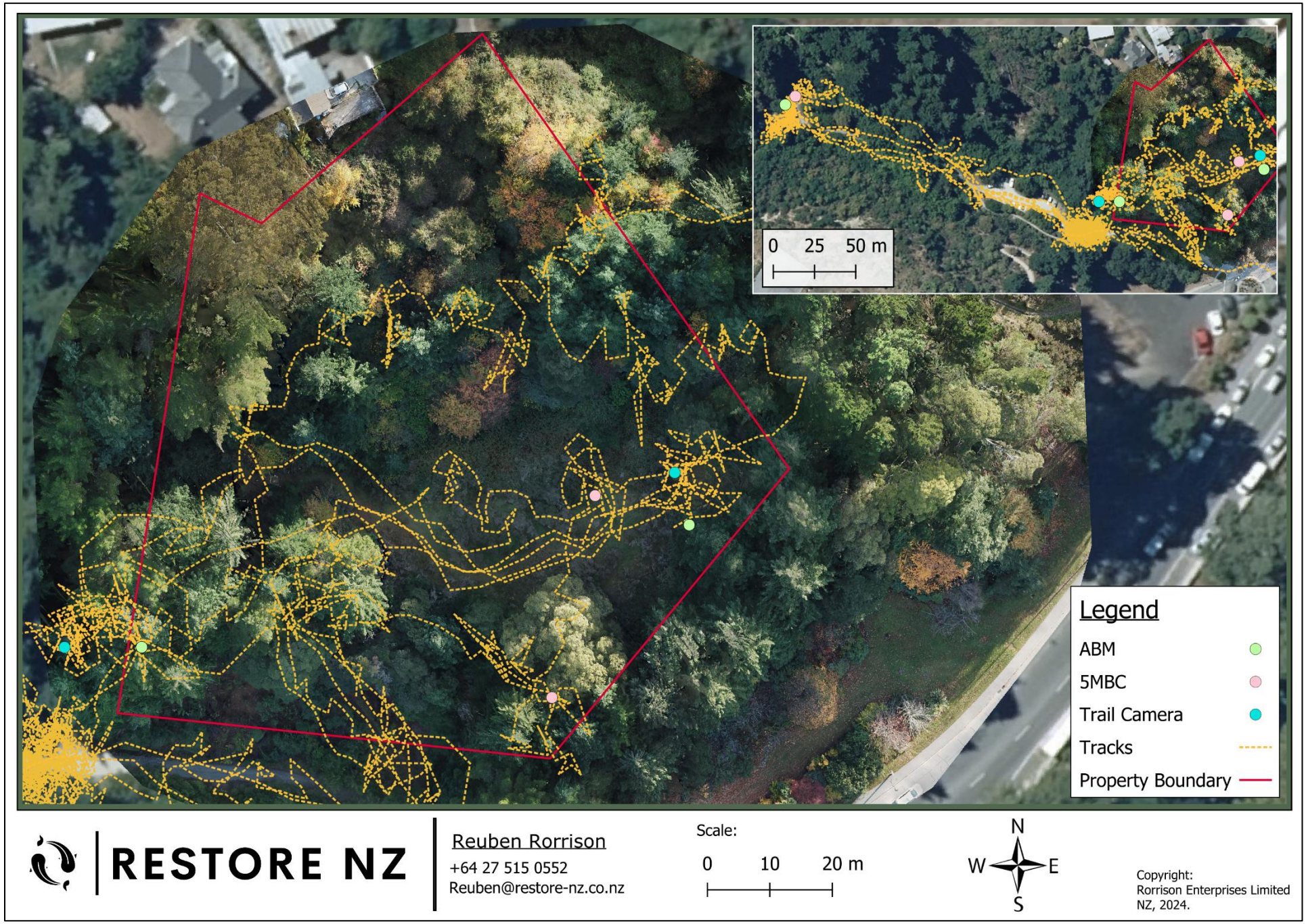

Figure 3: Tracks walked during site visits and locations of relevant data collection points.

3.2.1 Vegetation and Habitats

Given the high dominance of exotic species, limited native understorey, and modified land use history of the site, no formal vegetation plot sampling was undertaken for this assessment as structured vegetation plots were not considered necessary or likely to add substantial value. Instead, habitat assessments were completed through walkovers of the activity footprint and surrounding margins. Dominant plant species were recorded, and broad vegetation patterns and ecotones were noted to characterise habitat types and inform the assessment of ecological value.

3.2.2 Birds

Bird surveys were conducted on-site by Reuben Rorrison (Restore NZ) in May of 2025 to identify avifauna present during the time of survey and activity within the proposed installation footprint. Given the compact size of the site and the relatively open nature of the clearing, a combination of standardised counts and continuous observations was used to build a picture of the bird species assemblage present on-site and in the wider forested area.

3.2.2.1. Five Minute Bird Counts

Three five-minute bird counts were conducted to document species presence. Two counts were located within or adjacent to the property, while a third was recorded further upslope along the One Mile walking track where native vegetation cover increased. This additional point was included to broaden the range of species observed, aiming to further account for birds that may use the habitats on-site intermittently.

Each count followed standard five-minute bird count protocols of Dawson & Bull (1975), which included:

- All bird species seen or heard within a five-minute period were recorded,
- Environmental conditions (e.g. wind, rain, visibility) were noted,
- Efforts were made to avoid double-counting individuals.

Locations were selected to capture representative habitat variation, and GPS coordinates were recorded for all survey points. These counts were used to complement the continuous observation method described below.

3.2.2.2. Continuous Species Observation

In addition to formal counts, all bird species seen/hear during site visits were continually recorded. This method allowed for the detection of species using the site more intermittently and those that may have been missed during the time-limited 5MBCs.

3.2.3 Bats

Three automatic bat monitors (ABMs) were deployed to detect bat activity on-site between 17 April and 12 May 2025. Two ABMs were placed within the proposed installation footprint, and one was positioned upslope along the One Mile walking track in an open clearing adjacent to One Mile Creek (highly suitable foraging habitat if bats are present). Unfortunately, the upslope detector failed to record. The two within the site recorded successfully for the full deployment period, and the properties open clearing combined with its proximity to One Mile Creek would still constitute good quality foraging habitat if bats are present.

A total of 23 valid survey nights were surveyed based on environmental data recorded by the ABMs and verified using regional weather station data, as per the requirements of the DOC Bat Roost Protocols. While nine of these nights fell in May, which is outside the preferred survey window for tree felling risk assessments, they were retained as valid based on environmental conditions, including minimum night temperatures above 7°C, low wind, and minimal precipitation in the first four hours after sunset.

The data gathered during this period informed assessment of the likelihood of bat presence on-site and associated risk (or lack thereof) to roosting bats.

3.2.4 Lizards and Frogs

No formal lizard or frog surveys were undertaken. However, during all time spent on-site, habitat features observed were recorded to inform desktop analysis by the project herpetologist. While no lizards or frogs were encountered opportunistically, habitat characteristics such as ground cover, refuge availability, and vegetation structure were documented to support informed recommendations on potential presence and appropriate management measures.

3.2.5 Mammalian Pests

To gain a baseline understanding of mammalian pest species present at the site, two trail cameras were deployed concurrently with the bat detectors from 17 April to 12 May 2025 (approximately 35 days and nights). One camera was located within the main clearing within the proposed installation footprint, while the second was positioned adjacent to the existing driveway leading up to the site. Both cameras were set to record in three-image bursts, allowing for extended battery life while capturing sufficient data for species identification.

No formal pest monitoring protocols were followed, but all observed species were noted. This information contributed to the assessment of likely pest presence and informed recommendations around potential control measures.

3.3 Impact Assessment of using the EIANZ Guidelines

3.3.1 Ecological Values

The Environmental Institute of Australia and New Zealand Guidelines (EIANZ guidelines) have been used as the framework to guide the layout of this assessment, with the assessment of values on-site occurring through an integrated approach using the guidelines and drawing on multiple pieces of legislation.

This EIANZ Guidelines are widely applied across New Zealand and has been upheld in Environment Court decisions for large infrastructure projects. It assigns ecological values on a scale of **Negligible**, **Low**, **Moderate**, **High**, to **Very High** for each ecological feature.

In addition to site-specific attributes, the assessment also considers the role of on-site ecological features as linkages to wider habitat networks. Potential downstream impacts have also been evaluated. This reflects a holistic application of the EIANZ framework, acknowledging the connected nature of habitats and the movement potential of fauna across landscapes.

The EIANZ guidelines identify four key matters for consideration when assigning ecological value or importance:

- Representativeness
- Rarity / Distinctiveness
- Diversity and Pattern
- Ecological Context

Further detail on how these matters are applied can be found in Table 4 and Table 7 of the EIANZ guidelines, with the overall scoring process outlined in Table 6 (refer to Appendix A).

At the species level, conservation status is used as the starting point for determining value, in accordance with Table 5 of the guidelines. The presence of species classified as Threatened or At Risk conveys a higher value than those classified as Not Threatened. The following threat classification references have been used:

- Birds: Robertson et al. (2021)
- Bats: O'Donnell et al. (2022)
- Herpetofauna: Hitchmough et al. (2021)
- Plants: De Lange et al. (2023)

Where habitat value is linked to species presence, the likelihood of occurrence and the functional importance of the habitat to the species has also been considered.

3.3.1.1. Ecological Significance

Section 6(c) of the Resource Management Act 1991 requires the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. Appendix 1 of the National Policy Statement for Indigenous Biodiversity (NPS-IB, 2023) provides the current national framework for identifying significant natural areas (SNAs), based on four key criteria: representativeness, diversity and pattern, rarity and distinctiveness, and ecological context.

Although the formal identification of SNAs is a function of regional or district councils, understanding whether an area may meet ecological significance thresholds is an important consideration in consent decision-making.

This assessment adopts a consistent and integrated approach: the EIANZ Guidelines are used to assess ecological value, with explicit consideration of the NPS-IB Appendix 1 criteria.

The EIANZ guidelines align closely with the NPS-IB framework, both sharing the same four key assessment matters. Areas assessed as having high or very high ecological value under EIANZ are generally considered to meet the threshold for significance under section 6(c) of the RMA. All relevant information required under Appendix 1 of the NPS-IB, such as habitat descriptions, species present, potential threats, and site context, has been included within this report to support consideration of ecological significance where applicable.

3.3.2 Magnitude of Effects

In determining a rating for the magnitude of effects on each ecological feature, consideration is given to several factors, including:

- The scale of habitat loss relative to the size of the available resource,
- The duration of the effect,
- The likely population-level impact for relevant species, and
- The degree to which the proposed works may affect the integrity of habitats and associated species.

The magnitude of effect is described using the categories **Negligible**, **Low**, **Moderate**, **High**, or **Very High**, as outlined in Table 1. In some instances, a **Positive** magnitude of effect may also be assigned where the activity is expected to result in a measurable ecological gain.

Table 1: Criteria for describing the magnitude of effects (EIANZ, 2018).

Magnitude	Description
Very high	Total loss of, or very major alteration to, key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally change and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature.
High	Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature.
Moderate	Loss or alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature.
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR having a minor effect on the known population or range of the element/feature.
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR having negligible effect on the known population.

3.3.3 Level of Effects

The final step in the effects assessment process is to determine the overall level of effect using the matrix provided in the EIANZ guidelines (Table 2). This matrix combines the ecological value of each feature with the magnitude of effect to generate an overall level of effect.

Levels of effect can range from **Very High** to **Net Gain**. Generally, effects assessed as **Moderate** or greater warrant measures to avoid, remedy, or mitigate adverse impacts. Effects rated as **Low** or **Very Low** are typically not of regulatory concern, although care may still be required to minimise potential impacts through project design, construction practices, or operational controls.

Table 2: Criteria for describing the level of effects (EIANZ, 2018).

Ecological Value > Magnitude v	**Very High**	**High**	**Moderate**	**Low**	**Negligible**
Very High	Very High	Very High	High	Moderate	Low
High	Very High	Very High	Moderate	Low	Very Low
Moderate	High	High	Moderate	Low	Very Low
Low	Moderate	Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low	Very Low
Positive	Net Gain	Net Gain	Net Gain	Net Gain	Net Gain

4 Description of the Existing Environment

4.1 Ecological District / Wider History

The site lies within the Lakes Ecological Region, specifically the Shotover Ecological District (ED). This ED is characterised by steep, schist-based mountains rising to nearly 2,000 m a.s.l., shaped by glacial and erosional processes. The area lies in the rain shadow of the Main Divide, resulting in a dry climate and drought-prone soils, particularly on fans and terraces (DOC, 1981). Native vegetation has been heavily modified, with small remnants of beech forest persisting in some areas, and the wider landscape dominated by exotic scrub, grassland, and wilding conifers.

The ecological condition of the district has been significantly altered by human activity. Polynesian arrival introduced mammalian pests and fire, initiating large-scale deforestation and habitat loss. European settlement brought intensive land conversion for pastoral grazing, the introduction of numerous exotic species, the bankruptcy of several local sheep and beef stations following the explosion of rabbit populations, and the widespread release of mustelids under government-backed rabbit control schemes. These cumulative impacts have driven widespread ecosystem degradation and faunal decline across the region.

4.2 Site Specific History

The project site is located within the One Mile Reserve, previously known as the Sargood Chalet Girl Guide Camp. The area was historically used for recreational and educational purposes, with a girl guide building present until its removal in 2002. No remnant forest cover remains within the main clearing, and the site has been modified through vegetation clearance, mowing, and past informal occupation.

To the west of the site, outside of the property boundary and ZOI, is the One Mile Creek and the One Mile Creek Power Station is located approximately 250 metres upstream of the site. This was the first hydroelectric power station in New Zealand to generate electricity for public use, constructed in 1885 to supply power to Queenstown. The station is still present and historically represents early industrial modification of the surrounding landscape.

According to Otago Regional Council's potential ecosystem and habitat mapping, the site falls within a Cold Forest and Scrub (CDF3 or mountain beech forest), as classified under the Singers and Rogers (2014) ecosystem framework:

> *"Beech forest of abundant mountain beech, with small-leaved Coprosma spp., weeping matipo, mountain celery pine, snow tōtara, broadleaf, three-finger and putaputawētā, and locally Hall's tōtara. Locally also includes scattered silver and red beech in humid locations."*

4.3 Present Day Habitats

Present vegetation, as mapped by Manaaki Whenua's Land Cover Database, is classified as Exotic Forest (Class 71).

Under the Manaaki Whenua Threatened Environment Classification mapping, the site is classified as >30% indigenous vegetation cover remaining, but <10% of that cover is legally protected. These environments are less reduced and fragmented than more threatened categories but are still considered poorly represented within formal conservation networks (MWLR, 2012).

The property can be described as supporting two main terrestrial vegetation communities, both of which are modified and dominated by exotic species. These include exotic scrub/grassland that has colonised the former girl guide clearing, and a surrounding conifer-dominated exotic forest with a lesser component of scattered native beech trees. Vegetation communities were mapped based on field observations and aerial imagery interpretation, as shown in Figure 4 and described further below.

Figure 4: Present day Habitats on-site.

4.3.1 Exotic Scrub and Grassland

This area covers the central clearing where the proposed installations will be located. It is dominated by exotic rank grass species, with discrete patches of exotic scrub and weeds. The two dominant species are scotch broom (*Cytisus scoparius*), which grows up to 4 m high (2–3 m on average), and blackberry (*Rubus fruticosus agg.),* which forms dense, contiguous thickets and currently occupies approximately half of the clearing. Where broom dominates, exotic grasses are generally present in the understorey, less so beneath dense blackberry cover.

Where rank grass is dominant it does not form extensive, uniform swards; instead, it fills gaps between the broom and blackberry and along the margins of the unofficial walking paths. It averaged 15–25 cm in height at the time of survey. This lower stature is likely maintained by grazing from pest species and frequent informal use of the clearing by local dog walkers.

A few young pine (*Pinus spp.)* saplings are beginning to establish within the clearing, and one cabbage tree (*Cordyline australis*) is present at the eastern margin. No large native canopy species are present within the clearing itself, though some native groundcover species may occur at low densities. See Figure 5 below for an overview of the clearing.

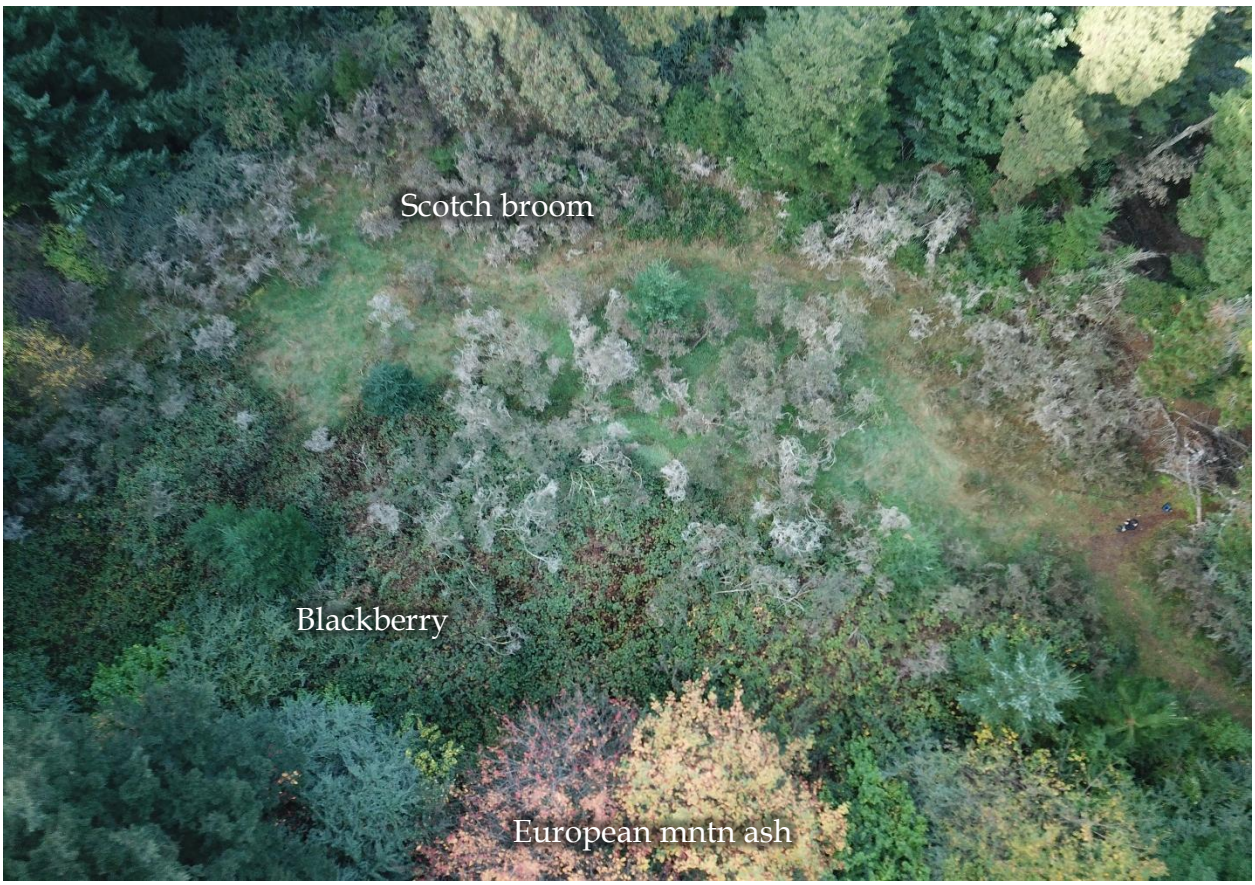

Figure 5: The clearing on site, facing south.

4.3.2 Exotic Forest

The slopes surrounding the clearing are dominated by large exotic conifers, notably Douglas fir (*Pseudotsuga menziesii*), which form a closed canopy over much of the remaining area within the property boundary (Figure 6). Understorey vegetation is sparse, primarily comprising pine litter, with scattered patches of scotch broom (*Cytisus scoparius*) and blackberry (*Rubus fruticosus* agg.). A few smaller hollows are dominated by native hound's tongue fern (*Zealandia pustulata*) generally not more than 5 x 5 m in area. Much of the slope contained virtually no understorey and is characterised by bare soil or a dense mat of compacted Douglas fir needles (Figure 7).

Notably, several mature mountain beech (*Fuscospora cliffortioides*, Not Threatened) are present within this habitat. A small patch of beech trees occurs at the western end of the property, between the clearing and the existing driveway. These trees are approximately 25-40 cm in diameter at breast height (DBH), with around six individuals present. One medium-sized beech overhangs the driveway slightly. Additional beech are present at the eastern end of the property, with 2-3 individuals falling within the official property boundary.

A thicket of European mountain ash or rowan (*Sorbus aucuparia*) is established on the slope meeting the northern edge of the clearing, and several smaller individuals have also become established within the clearing margin adjacent to this thicket.

Figure 6: The exotic dominated forest surrounding the site.

Figure 7: The understory of the exotic forest surrounding the site.

4.4 Freshwater and Aquatic Habitats

No freshwater or aquatic habitats are located within the activity footprint. One Mile Creek and Lake Wakatipu are located nearby but fall outside the property boundary and will not be affected by the proposed works. No other watercourses were observed on-site that warranted further investigation.

No areas were identified that could potentially meet the definition of a natural inland wetland under the National Environmental Standards for Freshwater (NES-F, 2020) or the definition of a river under the RMA, were identified within the site, and therefore no wetland delineation or stream classification assessment was required.

Freshwater or aquatic habitats have not been considered further in this assessment. However, the presence of One Mile Creek and Lake Wakatipu in the broader receiving environment has been taken into account when assessing ecological values and broader landscape context, and recommendations to minimise potential effects where relevant.

4.5 Birds

Native birds observed on-site during formal counts and incidental observation included bellbird (*Anthornis melanura*), grey warbler (*Gerygone igata*), kererū (*Hemiphaga novaeseelandiae*), New Zealand fantail (*Rhipidura fuliginosa*), silvereye (*Zosterops lateralis*), and tui (*Prosthemadera novaeseelandiae*). Bellbird and tui were frequently observed using the large beech trees adjacent to the clearing as song perches.

Anecdotally, bird activity appeared higher further upstream in the One Mile valley where the vegetation is more structurally complex and native-dominant. However, the current survey effort was not intended, nor sufficient, to statistically differentiate any variation in relative abundance.

A small nest from the previous nesting season, likely belonging to a silvereye or fantail, was observed in a beech tree at the eastern end of the clearing. The site visit took place outside of the bird nesting season (broadly considered to be between from 1 August to 31 March, with the bulk of species nesting between September – January).

Review of eBird records from the wider area (grid DP17), including the nearby lakefront and surrounding tracks, indicates a wide range of native species are recorded locally (Appendix B).

While 13 species of native bird with a Threatened or At Risk Threat Classification have been observed in the broader Queenstown area, the site itself is highly modified and lacks the structural diversity or habitat integrity likely required by these more sensitive species. Their use of or reliance on the site is therefore considered highly unlikely on a permanent or intermittent basis.

4.6 Bats

The nearest known bat observation is an unspecified species recorded in 2011, approximately 20.5 km northwest of the site as the crow flies. However, this straight-line distance traverses rugged terrain, including Mt Crichton and Ben Lomond, and is unlikely to represent a viable flight path. The more logical flight corridor (along the lakefront) places the observation at approximately 31.4 km from the site.

Under the DOC Protocols for Minimising the Risk of Felling Occupied Bat Roosts (Version 4, 2024), bat records older than 10 years are not considered valid for determining current presence, and the realised distance exceeds the 25 km threshold where roost protocol compliance is required. On this basis, desktop assessment confirmed there was no requirement to apply bat roost protocols to the proposed activity.

Nonetheless, due to the general lack of bat survey effort in the Queenstown area and the presence of mature trees on-site that could theoretically provide roosting habitat, three automatic bat monitors (ABMs) were deployed between 17 April and 12 May 2025. Two ABMs were located within the activity footprint, and one was placed upslope along the One Mile track, though the latter failed to record. A total of 23 valid survey nights were achieved based on weather and temperature criteria. No bat activity was detected. The only acoustic detections were attributed to rats and insects.

Based on current data, the site is assessed as having no evidence of bat presence and is unlikely to support roosting or foraging activity. Bats have not been considered further in this assessment.

4.7 Lizards and Frogs

A desktop assessment of lizard habitat at the site was undertaken by herpetologist Carey Knox (Southern Scales), with findings summarised here and provided in full in Appendix C. No formal field survey for lizards was undertaken.

The site is surrounded by tall exotic conifer forest and contains a clearing dominated by exotic grasses and woody weeds. The clearing proposed for the light show lacks rocky substrates, woody debris, or other cover features typically associated with lizard habitat. Its history as a Girl Guide camp suggests that the scrub and grassland is not long-standing habitat. No Department of Conservation lizard records are present within 1.5 km of the site. The local population of McCann's skink (*Oligosoma maccanni*) is considered sparse in the wider Queenstown area due to urbanisation and shading from exotic vegetation. The site is also isolated from any known suitable habitat.

Based on these factors, Mr Knox has assessed the site as having very low habitat suitability for lizards and frogs, and a very low likelihood of their presence.

4.8 Mammalian Pests

Trail cameras were deployed across the site between 17 April and 12 May 2025. During this period brushtail possum (*Trichosurus vulpecula*, frequently observed), rats (*Rattus spp.*), and domestic / feral cats (*Felis catus*, frequently recorded) were detected as seen below in Figure 8.

Based on the habitat type, proximity to Queenstown, and the regional pest context, the following species are also assumed to be present: house mice (*Mus musculus*), stoats (*Mustela erminea*), ferrets (*Mustela furo*), weasels (*Mustela nivalis*), European hedgehogs (*Erinaceus europaeus*), and European rabbit (*Oryctolagus cuniculus*).

Additionally, European hare (*Lepus europaeus*), fallow deer (*Dama dama*), red deer (*Cervus elaphus*), and feral goats (*Capra hircus*) may occasionally traverse the area.

Collectively, these species are likely to pose substantial pressure on native vegetation and fauna through browsing, predation, and disturbance.

Figure 8: Mammalian pests (potentially domesticated pet cats) observed on trail cameras.

5 Ecological Values and Effects

5.1 Exotic Scrub and Grassland

5.1.1 Ecological Value & Significance

Representativeness: Very Low
This community is entirely dominated by exotic species and does not reflect the typical composition of any indigenous vegetation type in the Shotover Ecological District.

Rarity / Distinctiveness: Very Low
The vegetation type and species present are widespread and common across modified parts of the region. No Threatened or At Risk species were observed or expected, and the habitat does not support any distinctive ecological features or endemism.

Diversity and Pattern: Very Low
Species diversity is low, with the community largely comprised of a few dominant exotic weeds (broom and blackberry) and interspersed rank grass. There is no expression of biogeographic pattern, ecotones, or seasonal variation in habitat availability relevant to indigenous biodiversity based on the current knowledge of the site.

Ecological Context: Very Low
The clearing is ecologically isolated, lacking connectivity to higher-value indigenous habitats. It provides negligible buffering or contribution to wider ecological networks and is frequently disturbed by human and pest activity. It does not support ecological functions of broader significance.

Overall Ecological Value: Negligible
Based on the above attribute ratings, this vegetation community is assessed as having **Negligible** ecological value under the EIANZ guidelines.
This community does not meet any of the four significance criteria under the NPS-IB.

5.1.2 Magnitude of Effect

The proposed activity will result in the near-total removal of the exotic scrub and grassland community within the clearing. While this represents a fundamental change to the vegetation within the site, this community is highly modified, widespread, and of negligible ecological value at the district-wide scale at which value has been assessed. The removal of this small patch will not measurably reduce the extent or function of this habitat type at the district level.

No restoration is proposed at this stage, and natural regeneration of indigenous vegetation is unlikely given the surrounding exotic forest. However, given the ubiquity of this habitat at the Ecological District, Region, and Nation-wide scale, the magnitude of effect is assessed as **Negligible**, consistent with the scale at which its value was assessed as per the EIANZ guidelines.

5.1.3 Level of Effect

Based on the combination of **Negligible** ecological value and a **Negligible** magnitude of effect, the overall level of effect is assessed as **Very Low** in accordance with the EIANZ guidelines. While the vegetation community will be almost entirely removed, its lack of ecological value means that no further mitigation is considered necessary beyond standard construction best practices.

Lizard are not expected to occur within this habitat, however accidental discovery protocols have been provided in Section 5.4.3 should any be observed during vegetation clearance.

The clearing is dominated by invasive weeds, and this removal could be considered a **Positive** action in some contexts as it may contribute to enhancing the overall habitat quality over time.

5.2 Exotic Forest

5.2.1 Ecological Value & Significance

Representativeness: Low
The vegetation is dominated by exotic pines and does not represent any natural indigenous community expected to occur prior to European colonisation of the country. However, the presence of several mature native mountain beech trees adds limited representation of a native ecosystem, albeit as scattered remnants rather than a contiguous functioning community.

Rarity / Distinctiveness: Low

The exotic forest itself is not rare or distinctive. The scattered mountain beech trees are classified as Not Threatened nationally, due to their widespread occurrence in intact forest systems. However, within the Queenstown area and the Shotover Ecological District, beech forest has been significantly reduced in extent, and remnant trees such as those present on-site may represent locally uncommon features. Despite this, the low abundance and fragmented distribution of these individuals (not surprisingly given the small size of the site) mean the vegetation unit as a whole does not meet the threshold for ecological distinctiveness.

Diversity and Pattern: Very Low
Overall diversity is very low, with an exotic dominated canopy and minimal native understorey. The few native components are scattered and occur at low abundance. There is no evidence of noteworthy ecological pattern, transition, or gradient across the site.

Ecological Context: Low
Although fragmented, the native trees may provide minor habitat or stepping-stone value for mobile fauna such as birds, and their presence contributes limited buffering to the surrounding modified landscape. However, the location of the site on the edge of the wider exotic forest limits the property's value as a connecting corridor and its ability to contribute to wider ecological processes.

Overall Ecological Value: Low
The exotic forest contains limited indigenous elements within a primarily exotic species mix. While the mature beech trees provide some value, they do not represent a cohesive native community and are disconnected by the surrounding exotic forest and bare understory. The overall ecological value of this community is assessed as **Low** under the EIANZ guidelines.

The vegetation does not meet the threshold for ecological significance under the NPS-IB Appendix 1 criteria.

5.2.2 Magnitude of Effects

The proposed activity will not involve any removal of canopy vegetation or significant ground disturbance within the exotic forest area. While temporary paths may be constructed beneath the exotic forest, informal paths already exist, and the understory is largely devoid of life in its present state. The site is already subject to frequent disturbance due to proximity to the road and walking tracks, and no measurable change to forest structure, habitat quality, or ecological function is expected.

One small branch on a beech tree adjacent to the driveway may require trimming to allow access for vehicles to the site; this is not expected to result in measurable ecological impact.

Accordingly, the magnitude of effect is assessed as **Negligible**, consistent with the criteria outlined in the EIANZ guidelines.

5.2.3 Level of Effects

Combining the **Low** ecological value of the Exotic Forest with a **Negligible** magnitude of effect, the overall level of effect is assessed as **Very Low** in accordance with the EIANZ guidelines.

Basic tree care/pruning methodology should be applied to avoid causing unnecessary damage and stress to any trees that require pruning.

General care should be taken during all works to avoid accidental damage to native trees and limit sediment or material runoff, particularly given the proximity of One Mile Creek and Lake Wakatipu in the broader receiving environment.

While no additional measures are required to mitigate ecological effects on this vegetation type, the Client's proposal to undertake opportunistic enrichment planting in selected areas is acknowledged as a **Positive** voluntary action. Although not factored into the level of effect assessment, it may contribute to enhanced habitat diversity and support the long-term persistence of native species on-site.

5.3 Birds

5.3.1 Ecological Value

A number of common native bird species were observed on-site. All species recorded are classified as Not Threatened under the New Zealand Threat Classification System (Robertson et al., 2021). No Threatened or At Risk species were detected, and the site provides limited habitat suitable for such species. These species have therefore been assessed as unlikely to rely on the habitats present on-site on a permanent or seasonal basis.

Based primarily on the conservation status of birds expected to utilise the site, the overall ecological value assigned to birds is **Low** in accordance with the EIANZ guidelines.

5.3.2 Magnitude of Effects

The proposed activity is expected to occur outside of the core nesting season for native birds, which for most species ranges from September to January, and up to March for New Zealand falcon. No native trees or known nesting structures will be removed, and habitat availability will remain largely unchanged. However, the activity may introduce some minor disturbance during night-time hours due to lighting, ambient sound, and increased human presence during winter operation. These changes are expected to cause minimal displacement

or behavioural disruption to common native birds already habituated to edge and human-modified environments.

Importantly, any displacement of birds from the site is expected to occur outside of the nesting season, and there is a much larger area of connected forest located upstream in the One Mile Creek catchment.

As the activity may cause minor but reversible behavioural shifts, without altering habitat structure or species abundance, and these effects are limited to a defined seasonal period which is outside of the nesting season, the magnitude of effect is assessed as **Low** and of short-term duration, consistent with the EIANZ guidelines.

5.3.3 Level of Effects

Based on the **Low** ecological value of the bird species recorded and the **Low** magnitude of effect, the overall level of effect is assessed as **Low**, in accordance with the EIANZ guidelines.

If any tree or vegetation removal is required for unforeseen reasons during the nesting season (September to March), it is recommended that a suitably qualified ecologist inspect the vegetation immediately prior to works to confirm the absence of active nests.

5.4 Lizards and Frogs

5.4.1 Ecological Value

Based on the desktop assessment provided by Mr Knox and the site description outlined above, the habitats on-site have been assessed as likely providing **Negligible** value for indigenous lizards and frogs. The likelihood of lizard or frog presence is considered to be very low.

5.4.2 Magnitude of Effect

Given this assessment, the magnitude of effect is likely to be **Negligible**. As a precautionary measure, an Accidental Discovery Protocol is provided below should lizards be observed on the property.

5.4.3 Level of Effect

Based on the combination of **Negligible** ecological value and **Negligible** magnitude of effect, the overall level of effect is assessed as **Very Low** in accordance with the EIANZ guidelines. No additional recommendations are required to avoid, remedy, or mitigate effects.

The following Accidental Discovery Protocol should be implemented throughout vegetation clearance, pack in/out, and during operation of the light show:

If any lizards are encountered:

- Stop work immediately,
- Record the location of the observation and take photographs if safe to do so,
- Contact a suitably qualified herpetologist or ecologist to advise on next steps,
- Do not handle or attempt to move the lizard,
- Resume work only once advised it is appropriate to do so by a suitably qualified herpetologist or ecologist.

5.5 Mammalian Pests

The site currently supports a typical suite of introduced mammalian pest species for the region, with species such as rats, possums, and cats confirmed during fieldwork, and others (e.g. mustelids, hedgehogs, rabbits) likely present. These species exert sustained pressure on native biodiversity through predation and browsing.

Under the EIANZ guidelines, pest species are assigned **Negligible** ecological value, as they do not contribute positively to indigenous biodiversity. The proposed activity is not expected to materially influence pest dynamics at the site. Any incidental displacement of pests due to seasonal human activity is likely to be minor, temporary, and ecologically insignificant. However, this cannot be substantiated without detailed survey comparing pest populations pre and post works, which is considered unnecessary given the scope and scale of the proposed activity.

While no mitigation should be required for pest species, it is recommended that adequate on-site rubbish disposal is provided to minimise attraction of pests, particularly rats.

In addition, the Client has proposed an ongoing programme of pest control as part of the broader biodiversity management of the site (Section 2.4). This is considered a **Positive** ecological action which, if effectively implemented, may contribute to improved conditions for native fauna over time.

6 Recommendations

The following recommendations have been developed in alignment with the effects management hierarchy of the NPS-IB. This framework prioritises avoidance of ecological effects, followed by minimisation, remediation, and where adverse effects remain, offsetting or compensation.

In this case, the level of ecological effect across all features assessed is **Low or Very Low**, and no formal mitigation is considered necessary to reduce effects to an acceptable level. However, general recommendations have been provided throughout this report to support best ecological practice during implementation, and to assist the Client in achieving their biodiversity goals.

Recommendations are grouped in accordance with the effects management framework, although they are not required mitigation measures under the assessed level of effects.

6.1 Avoidance

If the removal of any trees is required for unforeseen reasons during the bird nesting season (generally 1 August – 31 March), an ecologist should inspect the tree beforehand to ensure no active nests are present.

6.2 Minimisation

- Accidental Discovery Protocols for lizard should be implemented throughout vegetation clearance, pack in/out, and during operation of the light show, as detailed in Section 5.4.3.
- If trimming of beech trees or other native trees is required to allow for access or track placement, best-practice arboriculture methods should be followed to minimise harm.
- Best practice erosion and sediment control measures (Auckland Council, 2016) should be employed during any ground disturbance (e.g. during track placement or structure installation), especially on sloped terrain.
- Adequate rubbish disposal bins should be placed on-site during operation to avoid accumulation of food scraps that may attract pest species.

7 Overall Level of Effects

Table 3 below summarises the ecological values, assessed magnitude of effects, and resulting overall level of ecological effect for each key ecological feature assessed in this report.

Table 3: Summary of the ecological values and effects assessed.

Ecological Feature	Ecological Value	Magnitude of Effect	Overall Level of Effect
Exotic Scrub & Grassland	Negligible	Negligible	Very Low
Exotic Forest	Low	Negligible	Very Low
Aquatic Habitats	Not Applicable	Not Applicable	Not Applicable
Birds	Low	Low	Low
Bats	Not Applicable	Not Applicable	Not Applicable
Lizards and Frogs	Negligible	Negligible	Very Low
Mammalian Pests	Negligible	Negligible	Very Low

While no **Positive** magnitude of effect has been formally assigned in this table, it is noted that the proposed invasive plant management, opportunistic native planting and pest animal control actions have the potential to result in **Net Gains** in ecological value over time. If implemented effectively, these measures may lead to improvements in the condition of vegetation communities on-site and reduce pressure on native fauna. However, due to the absence of robust baseline data and the voluntary nature of these actions, they have not been included in the quantitative assessment of effects.

8 Conclusions

This Ecological Impact Assessment has evaluated the actual and potential effects of the proposed LUMA Enchanted Forest installation at One Mile, Queenstown. The assessment followed the framework set out in the Ecological Impact Assessment Guidelines from the Environmental Institute of Australia and New Zealand, and has considered ecological value, magnitude of effect, and overall level of effect for each relevant ecological feature observed on site.

The site is located within a modified ecological context, with vegetation dominated by exotic species and a fauna assemblage comprising common native bird species. While several mature beech trees are present, no Threatened or At Risk species were recorded during field surveys.

Based on the criteria set out in Appendix 1 of the National Policy Statement for Indigenous Biodiversity, no ecological features within the site are considered to meet the threshold for ecological significance.

All ecological features assessed were found to have either **Negligible** or **Low** ecological value, and the magnitude of effect from the proposed activity was assessed as **Negligible** or **Low** in all cases. Accordingly, the overall level of ecological effects has been assessed as **Low or Very Low** across all features, and no formal mitigation is required under the effects management hierarchy.

Nonetheless, the Client has proposed a range of voluntary **Positive** ecological actions, including pest animal control, weed removal, and opportunistic native planting. If implemented effectively, these actions may support long-term ecological improvement at the site. Recommendations to support ecological best practice during implementation have been outlined in Section 6.

No significant adverse ecological effects are anticipated as a result of the proposed activity. The project is considered ecologically appropriate under the current proposal, and the effects are considered to be acceptable under the RMA and NPS-IB framework.

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Appendix A – EIANZ Guidelines Tables

Table 4 **Attributes to be considered when assigning ecological value or importance to a site or area of vegetation/habitat/community.**

Matters	Attributes to be considered
Representativeness	Criteria for representative vegetation and aquatic habitats: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/distinctiveness	Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National priority for protection Criteria for rare/distinctive species or species assemblages: • Habitat supporting nationally Threatened or At Risk species, or locally[19] uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and Pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	• Site history, and local environmental conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from "intrinsic value" as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning – high level, key species identification, habitat as proxy

Table 6. Scoring for sites or areas combining values for four matters in Table 4.

Value	Description
Very High	Area rates High for 3 or all of the four assessment matters listed in **Table 4**. Likely to be nationally important and recognised as such.
High	Area rates High for 2 of the assessment matters, Moderate and Low for the remainder, or Area rates High for 1 of the assessment maters, Moderate for the remainder. Likely to be regionally important and recognised as such.
Moderate	Area rates High for one matter, Moderate and Low for the remainder, or Area rates Moderate for 2 or more assessment matters Low or Very Low for the remainder Likely to be important at the level of the Ecological District.
Low	Area rates Low or Very Low for majority of assessment matters and Moderate for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder.

Table 7. Matters that may be considered when assigning ecological value to a freshwater site or area

Matters	Attributes to be assessed
Representativeness	• Extent to which site/catchment is typical or characteristic • Stream order • Permanent, intermittent or ephemeral waterway • Catchment size • Standing water characteristics
Rarity/distinctiveness	• Supporting nationally or locally[21] Threatened, At Risk or uncommon species • National distribution limits • Endemism • Distinctive ecological features • Type of lake/pond/wetland/spring
Diversity and pattern	• Level of natural diversity • Diversity metrics • Complexity of community • Biogeographical considerations - pattern, complexity, size, shape
Ecological context	• Stream order • Instream habitat • Riparian habitat • Local environmental conditions and influences, site history and development • Intactness, health and resilience of populations and communities • Contribution to ecological networks, linkages, pathways • Role in ecosystem functioning – high level, proxies

Appendix B – Species Tables

Bird Observations

Table 4 summarises bird species that are either confirmed on-site or observed in the surrounding landscape based on desktop review of eBird records from grid DP17, supported by field observations. Each species is assigned a Likelihood of Presence based on the habitat availability, level of site disturbance, and proximity to known records.

The New Zealand Threat Classification is provided to assist in evaluating potential ecological value.

Table 4: Bird species actually and potentially present on-site based on eBird observations in grid DP17 & observations on-site.

Common Name	Scientific Name	Likelihood of Presence	NZ Threat Classification
Australasian crested grebe	*Podiceps cristatus australis*	Highly Unlikely	Threatened – Nationally Vulnerable
Grey duck	*Anas superciliosa*	Highly Unlikely	Threatened – Nationally Vulnerable
Long-tailed cuckoo	*Eudynamys taitensis*	Unlikely	Threatened – Nationally Vulnerable
New Zealand flacon (sub-sp. eastern falcon)	*Falco novaeseelandiae novaeseelandiae*	Unlikely	Threatened – Nationally Vulnerable
Black-fronted tern	*Chlidonias albostriatus*	Highly Unlikely	Threatened – Nationally Endangered
Kea	*Nestor notabilis*	Unlikely	Threatened – Nationally Endangered
Black-billed gull	*Chroicocephalus bulleri*	Highly Unlikely	At Risk - Declining
South Island pied oystercatcher	*Haematopus finschi*	Highly Unlikely	At Risk – Declining
New Zealand kaka	*Nestor meridionalis*	Unlikely	At Risk - Recovering
Black shag	*Phalacrocorax carbo novaehollandiae*	Highly Unlikely	At Risk – Relict
Little shag	*Phalacrocorax melanoleucos brevirostris*	Highly Unlikely	At Risk – Relict
Eurasian coot	*Fulica atra australis*	Highly Unlikely	At Risk – Naturally Uncommon
New Zealand pipit	*Anthus novaeseelandiae novaeseelandiae*	Highly Unlikely	At Risk – Naturally Uncommon
Australasian harrier	*Circus approximans*	Unlikely	Not Threatened
Australasian shoveler	*Anas rhynchotis*	Highly Unlikely	Not Threatened
Bellbird	*Anthornis melanura melanura*	Confirmed	Not Threatened
Black swan	*Cygnus atratus*	Highly Unlikely	Not Threatened
Brown Creeper	*Mohoua novaeseelandiae*	Unlikely	Not Threatened
Grey duck x mallard hybrid	*Anas superciliosa x platyrhynchus*	Highly Unlikely	Not Threatened
Grey teal	*Anas gracilis*	Highly Unlikely	Not Threatened
Grey warbler	*Gerygone igata*	Confirmed	Not Threatened
Kererū	*Hemiphaga novaeseelandiae*	Confirmed	Not Threatened

Morepork	*Ninox novaeseelandiae*	Possible	Not Threatened
New Zealand fantail	*Rhipidura fuliginosa fuliginosa*	Confirmed	Not Threatened
New Zealand scaup	*Aythya novaeseelandiae*	Highly Unlikely	Not Threatened
Paradise shelduck	*Tadorna variegata*	Unlikely	Not Threatened
Pūkeko	*Porphyrio melanotus*	Unlikely	Not Threatened
Shining Bronze-Cuckoo	*Chalcites lucidus*	Possible	Not Threatened
Silvereye	*Zosterops lateralis lateralis*	Confirmed	Not Threatened
Southern black-backed gull	*Laurus dominicanus dominicanus*	Unlikely	Not Threatened
Spur winged plover	*Vanellus miles novaehollandiae*	Unlikely	Not Threatened
Tomtit	*Petroica macrocephala*	Highly Likely	Not Threatened
Tui	*Prosthemadera novaeseelandiae novaeseelandiae*	Confirmed	Not Threatened
Welcome swallow	*Hirundo neoxena neoxena*	Highly Likely	Not Threatened
White-faced heron	*Egretta novaehollandiae*	Highly Unlikely	Not Threatened
Australian magpie	*Gymnorhina tibicen*	Possible	Introduced and Naturalised
Californian quail	*Callipepla californica*	Highly Likely	Introduced and Naturalised
Canada goose	*Branta canadensis*	Highly Unlikely	Introduced and Naturalised
Common chaffinch	*Fringilla coelebs*	Confirmed	Introduced and Naturalised
Common redpoll	*Acanthis flammea*	Likely	Introduced and Naturalised
Dunnock	*Prunella modularis*	Confirmed	Introduced and Naturalised
Eurasian blackbird	*Turdus merula*	Confirmed	Introduced and Naturalised
Eurasian skylark	*Alauda arvensis*	Possible	Introduced and Naturalised
European goldfinch	*Carduelis carduelis*	Confirmed	Introduced and Naturalised
European greenfinch	*Carduelis chloris*	Confirmed	Introduced and Naturalised
European starling	*Sturnus vulgaris*	Confirmed	Introduced and Naturalised

House sparrow	*Passer domesticus*	Confirmed	Introduced and Naturalised
Mallard duck	*Anas platyrhynchos*	Highly Unlikely	Introduced and Naturalised
Muscovy duck	*Cairina moschata*	Highly Unlikely	Introduced and Naturalised
Rock pigeon	*Columba livia*	Likely	Introduced and Naturalised
Song thrush	*Turdus philomelos*	Confirmed	Introduced and Naturalised
Yellow hammer	*Emberiza citrinella*	Likely	Introduced and Naturalised

Recommended Species for Opportunistic Planting

The following native species were observed in the wider One Mile Reserve and are considered suitable for opportunistic enrichment planting within or adjacent to the activity footprint. Practical guidance is provided to inform appropriate placement and management during planting.

Table 5: Native plants of the wider One Mile walking area.

Common Name	Scientific Name	Max Height	Guidance Notes
Black matipo	*Pittosporum tenuifolium*	6.0	Attractive small tree; tolerates full sun or partial shade; adaptable to most soils.
Mountain akeake	*Olearia avicenniifolia*	6.0	Hardy shrub; thrives in exposed, windy sites; good for edges and dry slopes.
Bush flax	*Astelia fragrans*	1.5	Soft-leaved flax; prefers damp, sheltered spots; avoid planting in exposed dry soils.
Red beech	*Fuscospora fusca*	35.0	Tall, slow-growing canopy tree; plant only where long-term space and shelter is available.
Mountain beech	*Fuscospora cliffortioides*	25.0	Tolerant of cold and wind; slow to establish; best planted in clusters on upper slopes.
Male fern	*Dryopteris filix-mas*	1.2	Low-growing fern; ideal for moist, shady areas; good understorey groundcover.
Broadleaf	*Griselinia littoralis*	7.0	Broad, glossy leaves; tolerates sun or shade; good for shelter belts or infill planting.
Koromiko	*Veronica salicifolia*	3.0	Small-leaved shrub; prefers moist soils; ideal along wetland margins or forest edges.

Flax	*Phormium tenax*	3.0	Versatile, hardy; tolerates wind and sun; good for structure and bank stabilisation.
Small-leaved kōwhai	*Sophora microphylla*	6.0	Deciduous tree; showy yellow flowers; prefers open, sunny sites; attracts birds.
Five-finger	*Pseudopanax arboreus*	6.0	Palmate leaves; fast-growing; tolerates shade; good for quick cover in shrub layers.
Cabbage tree	*Cordyline australis*	15.0	Tall monocot; tolerates wet or dry soils; very hardy; space widely due to size.
Mingimingi	*Coprosma propinqua*	3.0	Dense shrub; wind tolerant; prefers open or partially shaded sites.
Prickly shield fern	*Polystichum vestitum*	1.0	Fern with stiff fronds; best in dappled shade; tolerates dry once established.
Lowland ribbonwood	*Plagianthus regius*	10.0	Fast-growing deciduous tree; tolerates frost; good for fast canopy cover.
Wineberry	*Aristotelia serrata*	8.0	Attractive small tree; fast-growing; best in sheltered, moist sites.
Kotukutuku	*Fuchsia excorticata*	12.0	Deciduous tree; colourful flowers; best in gullies and damp sheltered areas.
Lacebark	*Hoheria sexstylosa*	10.0	Semi-deciduous; tolerates a range of conditions; good filler in revegetation.
Shining karamū	*Coprosma lucida*	6.0	Glossy foliage; uncommon; prefers moist but well-drained soils; part shade.
Hen and chickens fern	*Asplenium bulbiferum*	1.0	Fern with spreading fronds; good for damp gullies; not drought tolerant.
Marble leaf	*Carpodetus serratus*	6.0	Tolerates part shade and moist soils; good in riparian margins.
Ground Spleenwort	*Asplenium appendiculatum*	0.3	Tiny rock fern; prefers dry, well-drained soils; excellent for walls and banks.

Appendix C – Lizard Desktop Assessment

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30 May 2025

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Please find below an assessment of lizard species (or potential lizard species) present at a proposed site to hold the Luma Light Festival at One Mile Creek, Queenstown.

Methods

A desktop assessment of indigenous lizard (gecko and skink) values present (or potentially present) at One Mile Creek, Queenstown was undertaken. This involved evaluation of previous lizard records in the area (and surrounds) from the Department of Conservation's Bioweb herpetofauna database and a consideration of the habitat present in the area and its suitability for relevant lizard species. Google Earth imagery, field guides and site maps. An extensive array of site photographs (including drone imagery) also aided in this assessment.

Results

There are no lizard records within a 1.5 km radius of the site in the Department of Conservation's Bioweb herpetofauna database. Further afield, McCann's skink (*Oligosoma maccanni*; Not Threatened[1]) occurs, but populations of this widespread and adaptable species around Queenstown are sparse, due to urbanisation, and the prevalence of tall exotic vegetation around the periphery of the town - which shades out potential ground cover habitat for lizards.

The proposed Luma Light Festival site is surrounded on all sides by tall exotic vegetation, such as Eucalyptus and European Mountain Ash (see Figures 5,6 & 7 in the project EcIA). These tall exotic trees surround a clearing (where the proposed installations will be located), with sparse coverage of exotic grasses (not extensive, uniform swards), scotch broom (*Cytisus scoparius*), which grows up to 4 m high (2–3 m on average), and dense stands of blackberry (*Rubus fruticosus* agg.). The site has a long history of disturbance and change, meaning that the vegetation in this clearing has only recently become established.

The likelihood of lizards being present at the proposed Luma Light Festival site is deemed to be very low. This is based on a combination of factors, including the long history of disturbance at

[1] Hitchmough R., Barr B., Knox C., Lettink M., Monks J.M., Patterson G.B., Reardon J., van Winkel D., Rolfe J. and Michel P. (2021) Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series, Department of Conservation, Wellington.

the site, the degree of shading provided by the surrounding exotic vegetation, and the patchiness of exotic grasses (which represent the only possible skink habitat at the site). The exotic grasses are likely sparse due to partial shading, trampling by walkers moving through the area, and potentially grazing by rabbits. Skinks require access to dense ground cover and consistent sunlight for basking activities to regulate their internal body temperatures. These requirements would be difficult for skinks to maintain at the proposed Luna Light Festival site. There is also no rock or loose wood cover on the ground within the open clearing at the site, which further reduces the probability of skinks being present. Lastly, the site is well-isolated from the nearest known populations of McCann's skink or area of known lizard habitat. Due to all of the above, the probability of skinks being present is deemed very low and specific management for indigenous lizards is not necessary at the site.

Yours sincerely,

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