



Ayrburn Screen Hub

Terrestrial Ecology Assessment

Waterfall Park Developments Limited

c/o Winton Group Holdings Limited
PO Box 105526
Auckland

Prepared by:

SLR Consulting New Zealand

SLR Project No.: 875.016626.00001

15 January 2026

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	15 January 2026	Steve Rate	Ben Ludgate	Ben Ludgate

Basis of Report

This report has been prepared by SLR Consulting New Zealand (SLR) on the instructions of our Client, in accordance with the agreed scope of work. It is intended to support the Client's application under the Fast Track Approvals Act 2024 and may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application. While SLR has exercised due care in preparing this report, it does not accept liability for any use of the report beyond its intended purpose. Where information has been supplied by the Client or obtained from external sources, it has been assumed to be accurate unless otherwise stated.



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1.0 Introduction

Waterfall Park Developments Limited (WPDL) is seeking to develop the Ayrburn Screen Hub, located approximately 3 km southwest of Arrowtown on land adjacent to Mill Creek and an unnamed ephemeral tributary of Mill Creek (Figure 1). The substantive application, under the Fast-track Approvals Act 2024, was reviewed by a planning consultant for Queenstown Lakes District Council (QLDC) who provided comment regarding further information being required in relation to terrestrial ecological values.

WPDL engaged SLR to provide a response regarding terrestrial ecological values at the site. This report aims to describe the terrestrial ecological values of the site and is based on a 2021 assessment completed at the site by Dr Steve Rate of Ryder Environmental Limited (REL), which is now part of SLR. REL was engaged by WPDL to provide an assessment of potential ecological effects of a development at the site, as proposed at the time, on terrestrial values and bird communities. The 2021 assessment was for a larger area of land than that proposed by this application, however the 2021 assessment remains relevant as it included the area covered by the Screen Hub.

The assessment, which is presented below, included the following components:

- a description of the existing habitats and communities.
- a discussion of the potential effects of the proposed development on the existing environment.
- assessment against the National Policy Statement for Indigenous Biodiversity.



Figure 1: Ayrburn Screen Hub – Masterplan (supplied by WPDL, December 2025).

2.0 Methods

A desktop assessment was undertaken for potential ecological values present, including bird records from nearby sites.

A site visit was undertaken on 26 July 2021 which comprised a walk-through of representative habitats at the site. All observed plant species and incidental observations of fauna were recorded, vegetation and habitat types described and mapped onto aerial imagery, and illustrative photographs taken.

Bird observations were supplemented by those made by Dr Mandy Tocher who visited the site between 28 and 30 December 2025.

3.0 Terrestrial Vegetation and Wetlands

3.1 Vegetation and Habitat Types

Eight broad vegetation and habitat types were identified during the 26 July 2021 site visit, which are described below. Exotic plant species are asterisked.

3.1.1 Exotic Grassland

The majority of the property is covered in exotic grassland (Photo 1) dominated by browntop* (*Agrostis capillaris*), with cocksfoot* (*Dactylis glomerata*) also common. Gorse* (*Ulex europaeus*; predominantly sprayed with herbicide), woolly mullein* (*Verbascum thapsus*), foxglove* (*Digitalis purpurea*) and a few sweet briar* (*Rosa rubiginosa*) are also present in gullies. Other species noted include hemlock* (*Conium maculatum*), broad-leaved dock* (*Rumex obtusifolius*), and Scotch thistle* (*Cirsium vulgare*). There are a few patches of soft rush* (*Juncus effusus*), especially on hillslopes.



Photo 1: Exotic grassland, Ayrburn Farm, 26 July 2021.

3.1.2 Exotic Forest and Treeland

A line of Lombardy poplars* has been planted alongside the upper reaches of the ephemeral watercourse. Plantation forest dominated by radiata pine and Douglas fir (*Pseudotsuga menziesii*), and with an open understorey, is present alongside the lower reaches of the ephemeral watercourse (Photo 2). Several other small groups of exotic trees, including silver birch* (*Betula pendula*) and oak* (*Quercus* sp.), are scattered about the site.



Photo 2: Left: Radiata pine plantation alongside the lower ephemeral watercourse, Ayrburn Farm, 26 July 2021. Right: Scotch broom shrubland, Ayrburn Farm, 26 July 2021.

3.1.3 Scotch Broom Shrubland

Small patches of shrubland dominated by Scotch broom* (*Cytisus scoparius*) are present alongside the lower reaches of the ephemeral watercourse (Photo 2). Common associates are blackberry* (*Rubus fruticosus* agg.), elder* (*Sambucus nigra*), hemlock*, bittersweet* (*Solanum dulcamara*), and exotic grasses.

3.1.4 Willow Forest and Treeland

Crack willow* (*Salix fragilis* × *S. euxina*) forest is found alongside the southern part of Mill Creek. Associated vegetation includes exotic grassland, and an area of blackberry* shrubland with ground ivy (*Glechoma hederacea*), burdock* (*Arctium minus*), hemlock*, Scotch broom*, and elder*. A few willow trees are also scattered along the stream margins.

In the upper reaches of the unnamed ephemeral watercourse, there is crack willow* forest, with elder*, and leaf litter, woody debris, exotic grasses, the occasional male fern* (*Dryopteris filix-mas*), and shallow pools of water (Photo 3). The lower reaches of the ephemeral watercourse, alongside the southern property boundary, also contain crack willow* forest. The ground cover there largely comprises litter, bare earth, coarse woody debris, and willow root masses.



Photo 3: Left: Willow forest, middle reaches of ephemeral watercourse, Ayrburn Farm, 26 July 2021. Right: Elder forest, middle reaches of ephemeral watercourse, Ayrburn Farm, 26 July 2021.

3.1.5 Elder Forest

The middle section of the ephemeral watercourse contains forest with large elder* trees (up to 30-40 cm diameter at breast height) with an understorey of bare earth, litter, coarse woody debris, abundant sheep droppings, and some cocksfoot (Photo 3).

3.1.6 Wetlands

The location of wetland delineation plots in the ephemeral watercourse is shown in Figure 2.

The ephemeral waterway forms a series of flat areas separated by runnels that were flowing with water during the site visit. There is an old weir above the upper area of willow forest that is partly breached, but behind which water pools, forming a small artificial wetland. Other wetland areas within the waterway channel appear to be naturally formed.

Wetland vegetation within the channel of the ephemeral waterway is dominated by exotic species and mostly comprises glaucous sweet grass* (*Glyceria declinata*), with soft rush*, and patches of monkey musk* (*Erythranthe guttata*) and watercress* (*Nasturtium microphyllum*). Other species present include *Glossostigma elatinoides*, water forget-me-not* (*Myosotis laxa*) and starwort* (*Callitriche stagnalis*).

3.1.7 Plantings

Plantings of indigenous species have been undertaken at several locations within the property, including along Mill Creek, alongside Ayr Avenue, along the ephemeral tributary (Winton 2025), and on mounds in the south-west of the site. Other plantings are planned.

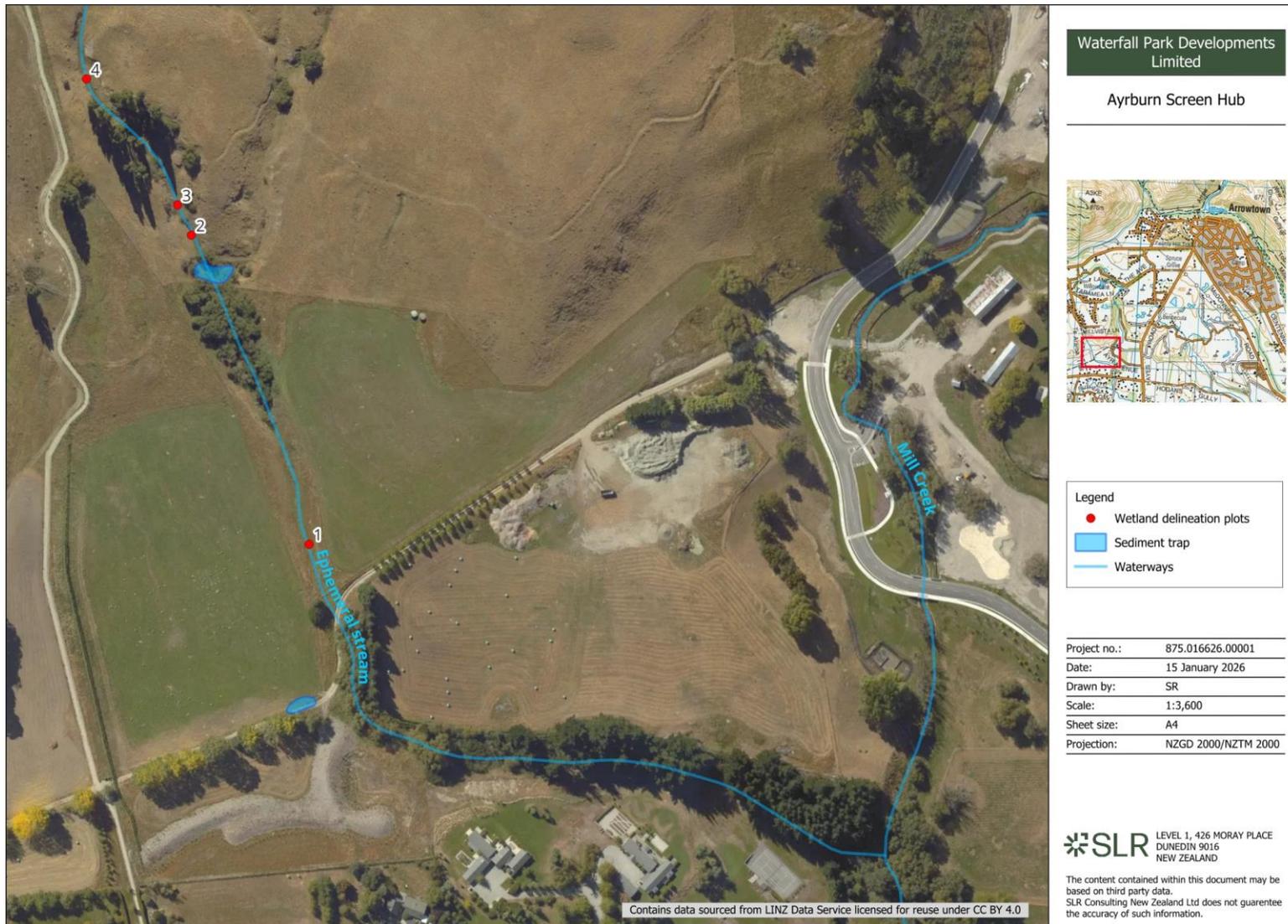


Figure 2: Location of wetland delineation plots. At the time of survey, the ephemeral stream north of the road crossing contained natural wetlands. The location of proposed sediment traps is overlaid.



3.2 Flora

Four naturally occurring indigenous and 50 introduced vascular plant taxa were recorded during the 26 July 2021 site visit (Appendix A). Several other deciduous exotic tree species were also present that could not be identified due to lack of foliage. An additional 16 indigenous plant taxa which had been planted at the site were also identified.

Of the naturally occurring indigenous species, scattered shield ferns (*Polystichum vestitum*) were present along the ephemeral waterway, the sedge *Carex appressa* was present alongside Mill Creek, *Glossostigma elatinooides* was present in wetland habitats in the ephemeral watercourse, and a group of about 20 silver tussocks (*Poa cita*) was observed on Christine's Hill.

No Threatened or At Risk plant species (as per de Lange et al. 2024) are known from within the site, apart from recent plantings which included *Veronica cupressoides* (Threatened-Nationally Endangered).

Several of the recorded plant species are listed in the Otago Regional Pest Management Plan 2019-29 (Otago Regional Council 2019) (Table 1).

Table 1: Plant species listed in the Otago Regional Pest Management Plan 2019-29.

Species	Common Name	Category
<i>Arctium minus</i>	Burdock	Organisms of interest
<i>Cytisus scoparius</i>	Scotch broom	Sustained control
<i>Pinus radiata</i>	Radiata pine	Progressive containment ¹
<i>Pseudotsuga menziesii</i>	Douglas fir	Progressive containment ¹
<i>Rosa rubiginosa</i>	Sweet brier	Organisms of interest
<i>Rubus fruticosus</i>	Blackberry	Organisms of interest
<i>Salix xfragilis</i>	Crack willow	Organisms of interest
<i>Ulex europaeus</i>	Gorse	Sustained control
<i>Vinca major</i>	Periwinkle	Organisms of interest

¹ For wilding conifers.

3.3 Potential Effects on Terrestrial Vegetation and Wetlands

Overall, apart from recent indigenous plantings undertaken by the applicant, the site is highly disturbed and dominated by exotic vegetation. Vegetation at the site fails to meet the significance threshold set out in Policy 33.2.1.8 of the QLDC Proposed District Plan (2019). Rules pertaining to clearance of indigenous vegetation (33.4) are not triggered.

Wetlands in the ephemeral watercourse are considered to be 'natural wetlands' under the National Policy Statement for Freshwater Management (2020) (Ministry for the Environment (MfE) 2025a) (Figure 2, Appendix B). However, the proposed works within the ephemeral wetland are for restoration of the existing wetland which is a permitted activity under Rules 38 (1)-(3) and complies with Rules (conditions) 38 (4)-(8).

Overall, adverse effects on terrestrial vegetation and wetlands are expected to be no more than minor, and are likely to be positive, given that the current vegetation is dominated by exotic species and revegetation is being undertaken with indigenous species (RMM 2025) which have the potential to improve ecological function and indigenous biodiversity at the site.

Removal of pest plant species, as per the draft Landscape Management Plan (RMM 2025), also has the potential to benefit indigenous biodiversity by providing additional habitats for indigenous wetland species to be planted.

There is the potential for new weed species to be introduced to the site or spread within the site during earthmoving activities. However, if appropriate weed hygiene practices are adopted, as proposed under the draft Landscape Management Plan, then adverse effects are expected to be no more than minor.

4.0 Avifauna

4.1 Bird Species Recorded or Likely to be Present

The 26 July 2021 site visit comprised a walk-through of representative habitats at the site, recording all bird species seen or heard. Thirteen bird species were recorded, of which nine were indigenous and four were introduced (Appendix C). Of the indigenous species recorded, South Island pied oystercatcher (*Haematopus finschi*) is classified as 'At Risk-Declining', while the remainder are classified as 'Not Threatened' (Robertson et al. 2021).

Since the 2021 site assessment, a pair of eastern falcon (*Falco novaeseelandiae novaeseelandiae*) have started to utilise the site (Tocher 2025).

Bird records for the area directly surrounding the site, including Lake Hayes, were obtained from iNaturalist NZ (<https://inaturalist.nz/>) and eBird (<https://ebird.org/>). Three eBird sites were located within three kilometres of the site: 'Lake Hayes-North end', 'Lake Hayes (General)', and 'Bush Creek Reserve, Arrowtown'.

Potential bird habitats present at the site were ascertained by referring to species' habitat requirements in New Zealand Birds online (<http://nzbirdsonline.org.nz/>) and Heather and Robertson (2005).

The existing land use at the site provides habitat for a range of open country/farmland bird species, along with visitors from Lake Hayes and the surrounding hills. At least 36 bird species (18 indigenous, 18 introduced) could utilise habitats within the site (Appendix C). Exotic species are asterisked when mentioned below.

Open country passerines such as yellowhammer* (*Emberiza citrinella*) and skylark* (*Alauda arvensis*) will likely be common. Swamp harrier (*Circus approximans*) will forage over the site year-round, including the rough pasture (uncultivated) that occurs over steeper parts of the site such as the flanks of Christine's Hill. Groups of southern black-backed gulls (*Larus dominicanus*), South Island pied oystercatchers, and black-billed gulls (*Larus bulleri*) may utilise freshly cultivated areas. Pasture will likely be frequented by spur-winged plover (*Vanellus miles*), paradise shelduck (*Tadorna variegata*), and South Island pied oystercatcher.

Grey warbler (*Gerygone igata*), fantail (*Rhipidura fuliginosa*), silvereve (*Zosterops lateralis*), and welcome swallow (*Hirundo neoxena*) may utilise vegetation along watercourses, roads and tracks, along with common exotic passerines such as blackbird* (*Turdus merula*), and the occasional tūī (*Prosthemadera novaeseelandiae*) and bellbird (*Anthornis melanura*). Australian magpie* (*Gymnorhina tibicen*) may occasionally use exotic habitats at the site. Waterfowl and water birds such as pūkeko (*Porphyrio melanotus*) and mallard* (*Anas platyrhynchos*) are likely to utilise watercourses and riparian vegetation.

Birds generally found in mature native forest, such as South Island robin (*Petroica australis*) and tomtit (*Petroica macrocephala*), or on lakes, such as Australasian shoveler (*Anas*

rhynchotis), New Zealand scaup (*Aythya novaeseelandiae*), shags (*Phalacrocorax* spp.), and Australasian crested grebe (*Podiceps cristatus*), are unlikely to use habitats at the site.

In general, there is not good quality habitat present at the site for the Threatened species, or many of the At Risk species, listed in Appendix C. Of the Threatened species, black-billed gull may utilise cultivated areas of farmland for feeding. Of the At Risk species, New Zealand pipit (*Anthus novaeseelandiae*) and South Island pied oystercatcher may utilise pasture habitats.

4.2 Significance of Bird Habitat

Ayrburn Farm lies on the valley floor of the Wakatipu Basin, within 1 km of Lake Hayes and in close proximity to the foothills and mountains. The majority of the approximately 42.2 ha site is developed farmland dominated by exotic grasses. Mill Creek, which runs through the site, is fed by an ephemeral watercourse from the west. Only Mill Creek has permanent open water suitable for water birds. The instream and riparian vegetation are dominated by exotic plant species.

No critical or significant habitat (breeding/roosting/feeding) was identified for any indigenous or native bird species listed in Appendix C, during any part of their life cycle. However, eastern falcon have utilised the site since Ayrburn opened, potentially indicating the ecological benefits of enhancement works that have been undertaken. In addition, forest vegetation at the site may provide some connectivity at a landscape scale for some indigenous bird species, e.g., tūī, bellbird, and kererū (*Hemiphaga novaeseelandiae*).

4.3 Potential Effects on Birds

The existing aquatic habitats at the site will remain largely intact following the proposed works, and some habitats will be increased in size and extent to manage stormwater runoff and enhanced with riparian plantings. With these changes, there is expected to be more use of the site by indigenous and exotic waterfowl and other water birds, including some bird species already known from the site, e.g., paradise shelduck. Riparian habitat of Mill Creek will likely contain a similar suite of indigenous and exotic bird species as are present now.

Large areas of indigenous plantings are proposed. These plantings will enhance the bird habitat at the site, and it is expected that this may benefit a range of indigenous bird species, including fantail, grey warbler, tūī and bellbird, along with a host of common exotic bird species.

With the reduction in farmland and cultivated paddocks, it is likely that there would be a reduction in open country passerines, and foraging groups of gulls and oystercatchers. Foraging habitat for swamp harrier will be similarly reduced by the proposed development. This adverse effect would be somewhat reduced by the proposed long-term retention of pastoral land over Christine's Hill.

With the amenity plantings planned around the buildings of the proposed development, an increase in exotic bird species such as house sparrow* (*Passer domesticus*), dunnock* (*Prunella modularis*), blackbird* and song thrush* (*Turdus philomelos*) will be expected, with occasional visits by tūī and bellbird likely to continue.

It is expected that any loss in landscape level connectivity by the proposed development will be mitigated by the planned native and amenity plantings and retention of some mature trees.

Therefore, the overall effects of the proposed development on the habitat of native and endemic bird species are likely to be positive. Any adverse effects on indigenous species will be compensated for by creating additional aquatic habitat in the form of ponds and

undertaking indigenous riparian plantings in and around the ephemeral watercourse and amenity plantings.

5.0 National Policy Statement for Indigenous Biodiversity

The site is not an identified significant natural area (SNA) and there is no indigenous vegetation present, therefore there is no requirement to apply the effects management hierarchy for any effects on vegetation under the National Policy Statement for Indigenous Biodiversity (NPSIB; MfE 2025b).

There is currently only poor quality habitat at the site for all of the highly mobile fauna listed in Appendix 2 of the NPSIB. Restoration of wetlands and waterways is likely to improve and maintain habitats at the site for these species by increasing the cover of indigenous vegetation and improving the quality of aquatic habitats.

The proposed restoration of waterways and wetlands aligns with the restoration objectives of the NPSIB (s.3.21) by prioritising (b) rare ecosystems [freshwater wetlands], (c) connectivity and buffering functions, and (d) natural inland wetlands.

6.0 Conclusions

Overall effects on terrestrial vegetation are likely to be positive, as vegetation clearance comprises exotic species, and the proposed native plantings more than compensate for any loss of values during construction.

Overall effects on birds are also likely to be positive, given the generally poor-quality habitat that is present prior to construction, the proposed enhancement and plantings of the ephemeral waterway which will improve habitat quality, and the proposed retention of pastoral land on Christine's Hill and adjacent to Arrowtown-Lake Hayes Road.

7.0 References

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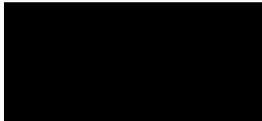
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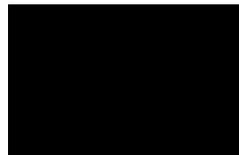
8.0 Closure

Sincerely,

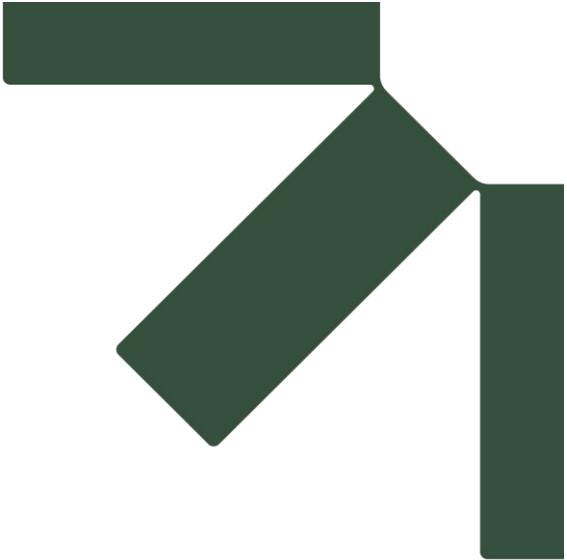
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Appendix A Vascular Plant Species Recorded at the Site

Ayrburn Screen Hub

Terrestrial Ecology Assessment

Waterfall Park Developments Limited

SLR Project No.: 875.016626.00001

15 January 2026

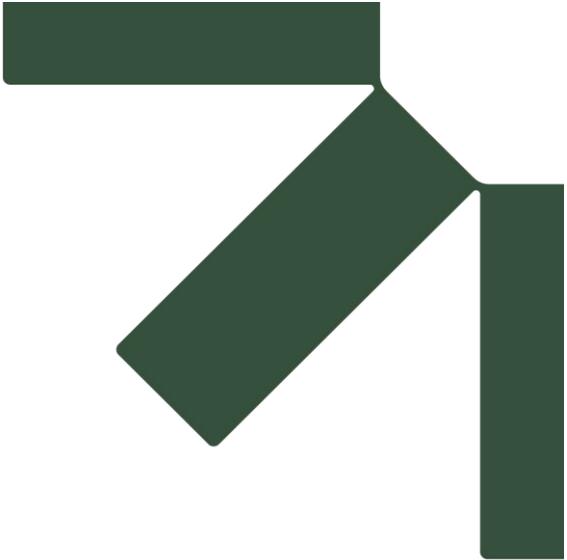
Table A-1: Vascular plant species recorded at Ayrburn Farm, 26 July 2021. Relative abundance was estimated over the entire site.

Species	Common Name	Growth Form	Planted (P)	Relative Abundance
Native Species				
<i>Austroderia richardii</i>	Toetoe	Grass	P	Rare
<i>Carex</i> sp.1		Sedge	P	Rare
<i>Carex appressa</i>		Sedge		Rare
<i>Chionochloa rubra</i>	Red tussock	Grass	P	Rare
<i>Coprosma propinqua</i>	Mingimingi	Tree	P	Rare
<i>Cordyline australis</i>	Cabbage tree; Tī kōuka	Monocot tree	P	Rare
<i>Fuscospora cliffortioides</i>	Mountain beech	Tree	P	Rare
<i>Glossostigma elatinoides</i>		Dicot herb		Rare
<i>Griselinia littoralis</i>	Broadleaf; Kāpuka	Tree	P	Rare
<i>Hoheria angustifolia</i>	Narrow-leaved lacebark	Tree	P	Rare
<i>Juncus edgariae</i>		Rush	P	Rare
<i>Leptospermum scoparium</i>	Mānuka	Tree	P	Rare
<i>Pachystegia insignis</i>	Marlborough rock daisy	Shrub	P	Rare
<i>Phormium tenax</i>	Flax; Harakeke	Monocot herb	P	Rare
<i>Pittosporum tenuifolium</i>	Kōhūhū	Tree	P	Rare
<i>Plagianthus regius</i>	Lowland ribbonwood	Tree	P	Rare
<i>Poa cita</i>	Silver tussock	Grass		Rare
<i>Polystichum vestitum</i>	Prickly shield fern	Fern		Rare
<i>Veronica cupressoides</i>		Shrub	P	Rare
<i>Veronica salicifolia</i>	Koromiko	Shrub	P	Rare
Introduced Species				
<i>Abies</i> sp.	Fir	Tree		Rare
<i>Achillea millefolium</i>	Yarrow	Dicot herb		Rare
<i>Agrostis capillaris</i>	Browntop	Grass		Abundant
<i>Agrostis stolonifera</i>	Creeping bent	Grass		Rare
<i>Anthoxanthum odoratum</i>	Sweet vernal	Grass		Occasional
<i>Arctium minus</i>	Burdock	Dicot herb		Rare
<i>Betula pendula</i>	Silver birch	Tree		Rare
<i>Callitriche stagnalis</i>	Starwort	Dicot herb		Rare
<i>Cardamine</i> sp.		Dicot herb		Rare
<i>Cerastium fontanum</i>	Mouse-ear chickweed	Dicot herb		Occasional
<i>Cirsium vulgare</i>	Scotch thistle	Dicot herb		Rare
<i>Claytonia perfoliata</i>	Miner's lettuce	Dicot herb		Rare
<i>Conium maculatum</i>	Hemlock	Dicot herb		Occasional
<i>Cupressus × leylandii</i>	Leyland cypress	Tree		Rare
<i>Cytisus scoparius</i>	Scotch broom	Shrub		Occasional
<i>Dactylis glomerata</i>	Cocksfoot	Grass		Occasional
<i>Digitalis purpurea</i>	Foxglove	Dicot herb		Occasional
<i>Dryopteris filix-mas</i>	Male fern	Fern		Rare
<i>Erythranthe guttata</i>	Monkey musk	Dicot herb		Rare
<i>Galium aparine</i>	Cleavers	Dicot herb		Rare
<i>Geranium molle</i>	Dove's-foot cranesbill	Dicot herb		Rare
<i>Glechoma hederacea</i>	Ground ivy	Dicot herb		Rare
<i>Glyceria declinata</i>	Floating sweet grass	Grass		Rare
<i>Holcus lanatus</i>	Yorkshire fog	Grass		Rare
<i>Juglans</i> sp.	Walnut	Tree		Rare
<i>Juncus effusus</i>	Soft rush	Rush		Rare
<i>Lactuca virosa</i>	Acrid lettuce	Dicot herb		Rare
<i>Larix decidua</i>	European larch	Tree		Rare
<i>Myosotis laxa</i>	Water forget-me-not	Dicot herb		Rare
<i>Nasturtium microphyllum</i>	Watercress	Dicot herb		Rare



Species	Common Name	Growth Form	Planted (P)	Relative Abundance
<i>Phleum pratense</i>	Timothy	Grass		Rare
<i>Picea sp.</i>	Spruce	Tree		Rare
<i>Pinus radiata</i>	Radiata pine	Tree		Occasional
<i>Poa annua</i>	Annual poa	Grass		Rare
<i>Populus nigra</i>	Lombardy poplar	Tree		Rare
<i>Populus sp.</i>	Poplar species	Tree		Rare
<i>Pseudotsuga menziesii</i>	Douglas fir	Tree		Occasional
<i>Quercus sp.</i>	Oak	Tree		Occasional
<i>Ranunculus repens</i>	Creeping buttercup	Dicot herb		Rare
<i>Rosa rubiginosa</i>	Sweet brier	Shrub		Rare
<i>Rubus fruticosus</i> agg.	Blackberry	Liane		Rare
<i>Rumex obtusifolius</i>	Broad-leaved dock	Dicot herb		Rare
<i>Salix fragilis</i> × <i>S. euxina</i>	Crack willow	Tree		Occasional
<i>Sambucus nigra</i>	Elder	Shrub		Occasional
<i>Solanum dulcamara</i>	Bittersweet	Dicot herb		Rare
<i>Stellaria media</i>	Chickweed	Dicot herb		Occasional
<i>Trifolium repens</i>	White clover	Dicot herb		Occasional
<i>Ulex europaeus</i>	Gorse	Shrub		Occasional
<i>Urtica urens</i>	Nettle	Dicot herb		Occasional
<i>Verbascum thapsus</i>	Woolly mullein	Dicot herb		Occasional
<i>Vinca major</i>	Periwinkle	Dicot herb		Rare
Unid. chestnut species	Chestnut	Tree		Rare





Appendix B Wetland Delineation Worksheets

Ayrburn Screen Hub

Terrestrial Ecology Assessment

Waterfall Park Developments Limited

SLR Project No.: 875.016626.00001

15 January 2026

Project Site	Ayrburn	Soil Map Unit Name	
Region	Otago	Climatic/ hydrological conditions typical for time of year?	Yes
Sampling Date	26-Jul-21		
Applicant/Owner	Waterfall Park Developments Limited	Vegetation disturbed?	No
Altitude (m asl)		Soil disturbed?	No
Sampling point number	1	Hydrology disturbed?	No
Investigator(s)	SR	Normal circumstances present?	Yes
Nearby town/city	Arrowtown	Vegetation naturally problematic?	No
Landform	Concave	Soil naturally problematic?	No
Slope	Gentle	Hydrology naturally problematic?	No
NZTM easting	1269312	Remarks: Lower ephemeral creek upstream of willows	
NZTM northing	5013179		

Summary of Findings	
Hydrophytic Vegetation Present?	Yes
Hydric Soil Present?	Not assessed
Wetland Hydrology Present?	Yes
Site comprises pasture	No

Is the sample area within a wetland?	Yes
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Stratum	Plot size	Species code	Species	Absolute cover (%)	Dominant species?	Indicator Status	Pasture species
Shrub	5m circular						
Shrub	5m circular						
Shrub	5m circular						
Shrub	5m circular						
Total cover				0	50%	0	20%

Stratum	Plot size	Species code	Species	Absolute cover (%)	Dominant species?	Indicator Status	Pasture species
Herb	2 x 2m	GLYdec	Glyceria declinata	70	Yes	OBL	
Herb	2 x 2m	AGRcap	Agrostis capillaris	15	No	FACU	Yes
Herb	2 x 2m	CALsta	Callitriche stagnalis	2	No	OBL	
Herb	2 x 2m	PHLpra	Phleum pratense	2	No	FACU	Yes
Herb	2 x 2m	MYOlax	Myosotis laxa subsp. ca	1	No	OBL	
Herb	2 x 2m	ERYgut	Erythranthe guttata	1	No	OBL	
Herb	2 x 2m	TRlrep	Trifolium repens	0.5	No	FACU	Yes
Herb	2 x 2m	(water / mud)					
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Total cover				91.5	50%	45.75	20%

Dominance Test Worksheet

Number of dominant species that are OBL, FACW, or FAC	1	(A)
Total number of dominant species across all strata	1	(B)
Percent of dominant species that are OBL, FACW, or FAC	100	(A/B)×100

Dominance Test is >50%	Yes
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Prevalence Index Worksheet

	Total % cover		
OBL species	74.00	×1	74
FACW species	0.00	×2	0
FAC species	0.00	×3	0
FACU species	17.50	×4	70
UPL species	0.00	×5	0
Column totals	91.5	(C)	144 (D)
Prevalence index = D/C =	1.57		

Prevalence Index is <3.0	Yes
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Hydrophytic Vegetation Indicators	Yes/No	Remarks
Morphological Adaptations (Provide supporting data in Remarks)		
Problematic Hydrophytic Vegetation (Explain)		

Hydrological indicators	Remarks
Primary 1A: Surface water	
Secondary 2L: Drainage patterns	



Project Site	Ayrburn	Soil Map Unit Name	
Region	Otago	Climatic/ hydrological conditions typical for time of year?	Yes
Sampling Date	26-Jul-21	Vegetation disturbed?	No
Applicant/Owner	Waterfall Park Developments Limited	Soil disturbed?	No
Altitude (m asl)		Hydrology disturbed?	No
Sampling point number	3	Normal circumstances present?	Yes
Investigator(s)	SR	Vegetation naturally problematic?	No
Nearby town/city	Arrowtown	Soil naturally problematic?	No
Landform	Concave	Hydrology naturally problematic?	No
Slope	Gentle	Remarks: Above weir	
NZTM easting	1269225		
NZTM northing	5013371		

Summary of Findings		Is the sample area within a wetland?
Hydrophytic Vegetation Present?	Yes	Yes
Hydric Soil Present?	Not assessed	
Wetland Hydrology Present?	Yes	
Site comprises pasture	No	

Stratum	Plot size	Species code	Species	Absolute cover (%)	Dominant species?	Indicator Status	Pasture species
Shrub	5m circular						
Shrub	5m circular						
Shrub	5m circular						
Shrub	5m circular						
Total cover				0	50%	0	20%

Stratum	Plot size	Species code	Species	Absolute cover (%)	Dominant species?	Indicator Status	Pasture species
Herb	2 x 2m	NASmic	Nasturtium microphyll	90	Yes	OBL	
Herb	2 x 2m	GLYdec	Glyceria declinata	5	No	OBL	
Herb	2 x 2m	RUMobt	Rumex obtusifolius	0.5	No	FAC	
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Herb	2 x 2m						
Total cover				95.5	50%	47.75	20%

Dominance Test Worksheet				Dominance Test is >50%
Number of dominant species that are OBL, FACW, or FAC	1	(A)		Yes
Total number of dominant species across all strata	1	(B)		
Percent of dominant species that are OBL, FACW, or FAC	100	(A/B)×100		

Prevalence Index Worksheet		Total % cover		Prevalence Index is <3.0
OBL species	95.00	×1	95	Yes
FACW species	0.00	×2	0	
FAC species	0.50	×3	1.5	
FACU species	0.00	×4	0	
UPL species	0.00	×5	0	
Column totals	95.5	(C)	96.5	
Prevalence index = D/C =	1.01			

Hydrophytic Vegetation Indicators		Yes/No	Remarks
Morphological Adaptations (Provide supporting data in Remarks)			
Problematic Hydrophytic Vegetation (Explain)			

Hydrological indicators		Remarks
Primary	1A: Surface water	
Secondary	2L: Drainage patterns	



Project Site	Ayrburn	Soil Map Unit Name	
Region	Otago	Climatic/ hydrological conditions typical for time of year?	Yes
Sampling Date	26-Jul-21	Vegetation disturbed?	No
Applicant/Owner	Waterfall Park Developments Limited	Soil disturbed?	No
Altitude (m asl)	c.375	Hydrology disturbed?	No
Sampling point number	4	Normal circumstances present?	Yes
Investigator(s)	SR	Vegetation naturally problematic?	No
Nearby town/city	Arrowtown	Soil naturally problematic?	No
Landform	Concave	Hydrology naturally problematic?	No
Slope	Gentle	Remarks: Flat area before steep drop	
NZTM easting	1269168		
NZTM northing	5013441		

Summary of Findings	
Hydrophytic Vegetation Present?	Yes
Hydric Soil Present?	Not assessed
Wetland Hydrology Present?	Yes
Site comprises pasture	No

Is the sample area within a wetland?	Yes
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Stratum	Plot size	Species code	Species	Absolute cover (%)	Dominant species?	Indicator Status	Pasture species
Shrub	5m circular						
Shrub	5m circular						
Shrub	5m circular						
Shrub	5m circular						
Total cover				0	50%	0	20%

Stratum	Plot size	Species code	Species	Absolute cover (%)	Dominant species?	Indicator Status	Pasture species
Herb	2 x 2m	GLYdec	Glyceria declinata	70	Yes	OBL	
Herb	2 x 2m	JUNeff	Juncus effusus	5	No	FACW	
Herb	2 x 2m	NASmic	Nasturtium microphyll	4	No	OBL	
Herb	2 x 2m	AGRsto	Agrostis stolonifera	1	No	FACW	
Herb	2 x 2m	ERYgut	Erythranthe guttata	1	No	OBL	
Herb	2 x 2m	CALsta	Callitriche stagnalis	1	No	OBL	
Herb	2 x 2m	MYOlax	Myosotis laxa subsp. c.	0.5	No	OBL	
Herb	2 x 2m	(moss)					
Herb	2 x 2m	(gravel / water)					
Herb	2 x 2m	(mud)					
Total cover				82.5	50%	41.25	20%

Dominance Test Worksheet		
Number of dominant species that are OBL, FACW, or FAC	1	(A)
Total number of dominant species across all strata	1	(B)
Percent of dominant species that are OBL, FACW, or FAC	100	(A/B)×100

Dominance Test is >50%	Yes
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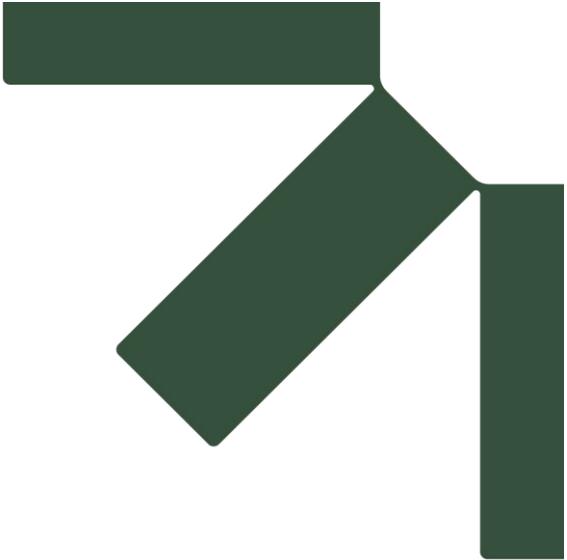
Prevalence Index Worksheet		Total % cover	
OBL species	76.50	×1	76.5
FACW species	6.00	×2	12
FAC species	0.00	×3	0
FACU species	0.00	×4	0
UPL species	0.00	×5	0
Column totals	82.5	(C)	88.5
Prevalence index = D/C =	1.07		(D)

Prevalence Index is <3.0	Yes
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Hydrophytic Vegetation Indicators	Yes/No	Remarks
Morphological Adaptations (Provide supporting data in Remarks)		
Problematic Hydrophytic Vegetation (Explain)		

Hydrological indicators		Remarks
Primary	1A: Surface water	
Secondary	2L: Drainage patterns	





Appendix C Bird Species Recorded at and Potentially Present at the Site

Ayrburn Screen Hub

Terrestrial Ecology Assessment

Waterfall Park Developments Limited

SLR Project No.: 875.016626.00001

15 January 2026

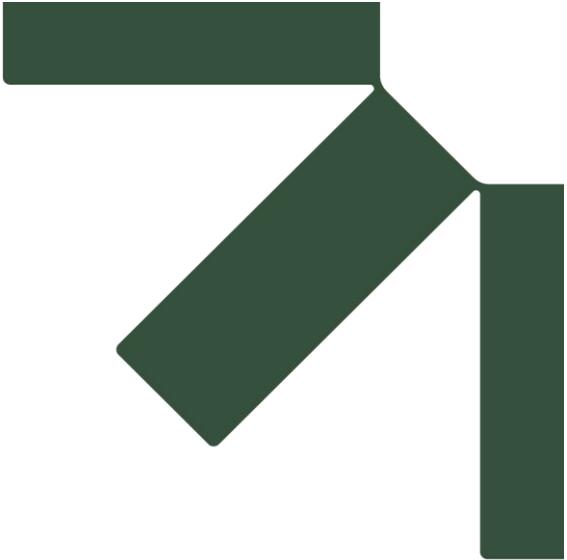
Table C-1: Bird species present and likely to utilise habitats on Ayrburn Farm. Species list based on nearby records from eBird and iNaturalist. Threat classifications are from Robertson et al. (2021). An asterisk indicates bird species recorded at the site on 26 July 2021.

Species	Common Name	Threat Classification	Likelihood of Presence
Native Species			
<i>Acanthisitta chloris chloris</i>	South Island rifleman	Not Threatened	Low
<i>Anas gracilis</i>	Grey teal	Not Threatened	Low
<i>Anas rhynchos</i>	Australasian shoveler	Not Threatened	Low
<i>Anas platyrhynchos</i> × <i>supercilliosa</i>	Mallard × grey duck (hybrid)	Not Threatened	Moderate
<i>Anas superciliosa</i>	Grey duck	Threatened-Nationally Vulnerable	Low
<i>Anthornis melanura</i>	Bellbird, korimako	Not Threatened	High*
<i>Anthus novaeseelandiae</i>	Australasian pipit	At Risk-Declining	Moderate
<i>Aythya novaeseelandiae</i>	New Zealand scaup	Not Threatened	Low
<i>Chlidonias albostratus</i>	Black-fronted tern	Threatened-Nationally Endangered	Low
<i>Chroicocephalus bulleri</i>	Black-billed gull	At Risk-Declining	Moderate
<i>Circus approximans</i>	Australasian harrier	Not Threatened	High*
<i>Cygnus atratus</i>	Black swan	Not Threatened	Low
<i>Egretta novaehollandiae</i>	White-faced heron	Not Threatened	Moderate
<i>Falco novaeseelandiae novaeseelandiae</i>	Kārearea, eastern falcon	Threatened-Nationally Vulnerable	High*
<i>Fulica atra</i>	Australian coot	At Risk-Naturally Uncommon	Low
<i>Gerygone igata</i>	Grey warbler	Not Threatened	High*
<i>Haematopus finschi</i>	South Island pied oystercatcher	At Risk-Declining	High*
<i>Hemiphaga novaeseelandiae</i>	Kererū	Not Threatened	Moderate
<i>Himantopus himantopus</i>	Pied stilt	Not Threatened	Low
<i>Hirundo neoxena</i>	Welcome swallow	Not Threatened	High*
<i>Larus dominicanus</i>	Southern black-backed gull	Not Threatened	High
<i>Microcarbo melanoleucos brevirostris</i>	Little shag	At Risk-Relict	Low
<i>Mohoua novaeseelandiae</i>	Brown creeper	Not Threatened	Low
<i>Nestor meridionalis meridionalis</i>	South Island kākā	Threatened-Nationally Vulnerable	Low
<i>Petroica australis australis</i>	South Island robin	At Risk-Declining	Low
<i>Petroica macrocephala macrocephala</i>	South Island tomtit	Not Threatened	Low
<i>Phalacrocorax carbo</i>	Black shag	At Risk-Relict	Low
<i>Platalea regia</i>	Royal spoonbill	At Risk-Naturally Uncommon	Low
<i>Podiceps cristatus</i>	Great crested grebe	Threatened-Nationally Vulnerable	Low
<i>Porphyrio melanotus</i>	Pūkeko	Not Threatened	High
<i>Porzana pusilla</i>	Marsh crake	At Risk-Declining	Low
<i>Prosthemadera novaeseelandiae</i>	Tūī	Not Threatened	High*
<i>Rhipidura fuliginosa</i>	Fantail	Not Threatened	High*
<i>Stictocorbo punctatus</i>	Spotted shag	Threatened-Nationally Vulnerable	Low
<i>Tadorna variegata</i>	Paradise shelduck	Not Threatened	High*
<i>Todiramphus sanctus</i>	Sacred kingfisher	Not Threatened	Moderate
<i>Vanellus miles</i>	Spur-winged plover	Not Threatened	High*



Species	Common Name	Threat Classification	Likelihood of Presence
<i>Zosterops lateralis</i>	Silvereye	Not Threatened	High
Introduced Species			
<i>Alauda arvensis</i>	Skylark		High
<i>Anas platyrhynchos</i>	Mallard (incl. domestic type)		High*
<i>Anser anser</i>	Greylag goose (incl. domestic type)		Moderate
<i>Branta canadensis</i>	Canada goose		Low
<i>Cairina moschata</i>	Muscovy duck (domestic type)		Moderate
<i>Callipepla californica</i>	California quail		High*
<i>Carduelis carduelis</i>	Goldfinch		High
<i>Carduelis chloris</i>	Greenfinch		High
<i>Carduelis flammea</i>	Redpoll		High
<i>Columba livia</i>	Rock pigeon		Low
<i>Emberiza citrinella</i>	Yellowhammer		High
<i>Fringilla coelebs</i>	Chaffinch		High*
<i>Gymnorhina tibicen</i>	Australian magpie		High
<i>Passer domesticus</i>	House sparrow		High
<i>Phasianus colchicus</i>	Ring-necked pheasant		Moderate
<i>Prunella modularis</i>	Dunnock		High
<i>Sturnus vulgaris</i>	European starling		High
<i>Turdus merula</i>	Eurasian blackbird		High*
<i>Turdus philomelos</i>	Song thrush		High





Appendix D Authors Qualifications and Experience

Ayrburn Screen Hub

Terrestrial Ecology Assessment

Waterfall Park Developments Limited

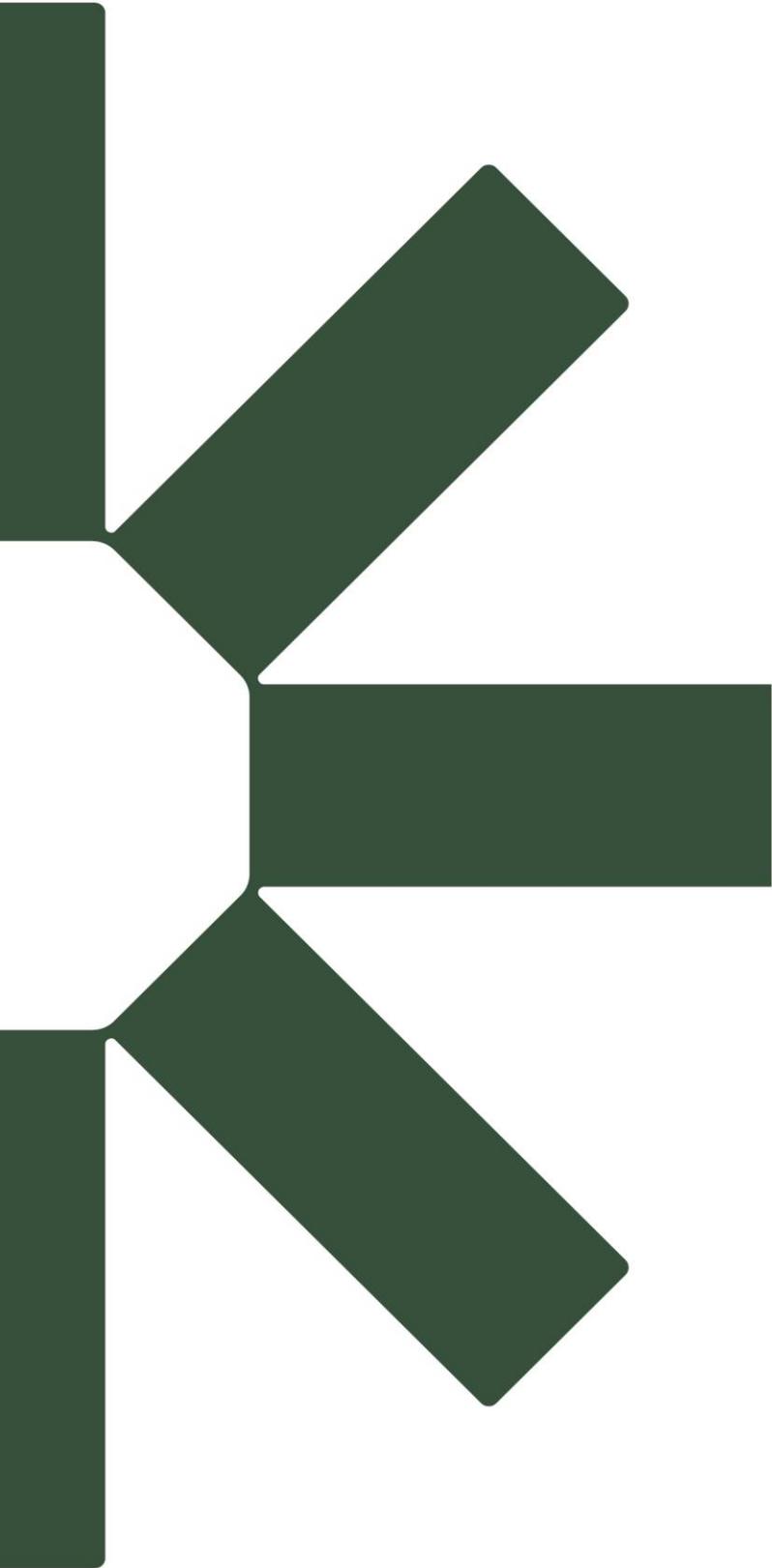
SLR Project No.: 875.016626.00001

15 January 2026

The contributing authors, in their capacity as authors of this report, have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023. Where this report relies on information provided by other experts, this is outlined within the report.

Name & Role	Qualifications	Experience
Steve Rate Senior Ecologist	PhD., Ecology, University of Otago (2005) Graduate Diploma, University of Otago (1999) BSc. (Honours), Biochemistry, University of Canterbury (1987)	Steve joined SLR Consulting as a Senior Ecologist in November 2023 having completed his PhD in ecology at the University of Otago in 2005 and being based in Dunedin since 2007, working as a consultant ecologist on terrestrial and wetland systems throughout New Zealand. Steve has undertaken assessments of ecological effects and significance assessments for a range of activities including airports, residential subdivisions, irrigation schemes, wind and hydroelectric energy schemes, afforestation, ski field expansions, industrial and quarry developments. He has appeared as an expert witness at resource consent hearings for several of these developments. He regularly undertakes natural wetland assessments under the National Policy Statement for Freshwater Management (NPS-FM). Steve also undertakes bird surveys and prepares restoration plans.





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