Ecological effects assessment for a proposed subdivision at Homestead Bay, Queenstown

Contract Report No. 7522

Providing outstanding ecological services to sustain and improve our environments

Wildlands

Ecological effects assessment for a proposed subdivision at Homestead Bay, Queenstown

Contract Report No. 7522

March 2025

Project Team:

Erin Gallagher – Field survey and report author

Olly Ball – Report author

Kelvin Lloyd - Report review

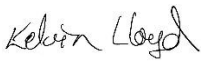
Prepared for:

RCL Homestead Bay Limited

Level 1, 13 Camp Street

Queenstown 9300

Reviewed and approved for release by:



Kelvin Lloyd
Senior Principal Ecologist
Wildland Consultants Ltd
14/03/2025

Cite this report as follows:

Wildland Consultants (2025). *Ecological effects assessment for a proposed subdivision at Homestead Bay, Queenstown.* Wildland Consultants Contract Report No. 7522. Prepared for RCL Homestead Bay Limited. 46pp.

Dunedin Office
764 Cumberland Street, Dunedin, Ph 03-477-2096

Head Office
99 Sala Street, PO Box 7137, Te Ngae, Rotorua Ph 07-343-9017 Fax 07-343-9018 Email: rotorua@wildlands.co.nz

www.wildlands.co.nz

Contents

1.0 Introduction

Remarkable Planning, on behalf of RCL Homestead Bay Limited, is preparing a Fast Track resource consent application for a residential subdivision on approximately 200 hectares of rural land at Homestead Bay, just south of Jacks Point in Queenstown. The subdivision plan will involve the development of residential units, commercial land, schools, roading infrastructure, recreational parks, and indigenous plantings.

Recently, Wildland Consultants (Wildlands) have undertaken a wetland assessment on the property and have identified six natural inland wetlands (Wildland Consultants 2025a). Alongside this survey, Wildlands has also undertaken a lizard survey and are currently preparing a Lizard Management Plan (LMP) for this site (Wildland Consultants 2025b).

RCL Homestead Bay Limited have advised that they cannot avoid five of the natural inland wetlands for their proposed subdivision. Remarkable Planning behalf of RCL Homestead Bay Limited has commissioned Wildland Consultants Ltd (Wildlands) to prepare an Ecological Impact Assessment and provide a description of the management measures required to avoid, minimise, remedy, and offset potential adverse effects associated with the development.

2.0 Methods

2.1 Vegetation and habitat survey

The site was surveyed on 4 March 2025, during which time all vegetation and habitat types on site were described and mapped. Vegetation types were classified using the Atkinson system (Atkinson 1985), and wetlands were classified using the Johnson and Gerbeaux (2004) framework. The current ecological values of these vegetation and habitat types were also assessed. All vascular plant species observed were recorded and are presented in Appendix 3. Vegetation and habitat types were digitised onto aerial imagery using ArcGIS. Desktop reviews of the relevant flora databases were undertaken, including iNaturalist, and DOC Bioweb Threatened Plant database (accessed March 2025).

Another site visit was undertaken on 3 September 2025. The purpose of the site visit was to investigate another potential wetland within an ephemeral stream and to perform a hydric soil and hydrology assessment for a potential wetland that was within the ‘Wet Area 1’ of the wetland assessment undertaken in February 2025 (Wildland Consultants 2025).

2.2 Fauna survey

Targeted fauna surveys were beyond the scope of this report, however the suitability of the vegetation at the site to provide habitat for key indigenous fauna species was assessed and all fauna species observed at the site were recorded. Desktop review of the relevant fauna databases including iNaturalist, and eBird database maintained by Cornell University (accessed March 2025) for the surrounding landscape was reviewed and species collated. A desktop assessment of avifauna within a two-kilometre radius of the sites were conducted by searching the online database eBird. Assessment of habitats included identification of resources within vegetation types that are (or are likely to be) occupied and used by specific taxa that may be present within that area/region. Assessments were informed by professional opinion and expertise, including liaison with subject matter experts as required.

Lizard information was taken from a recent survey undertaken by Wildlands (Wildland Consultants 2025). Freshwater fauna information was taken from a report completed by Water Ways Consultants (Alibone 2023).

The terrestrial invertebrate desktop survey involved searching the Global Biodiversity Information Facility (GBIF.org 2025[1]) for species records. Amateur and expert observations alike are stored in GBIF, and though some data standards are applied, a desktop survey is no substitute for a field survey by a qualified entomologist. To filter the data, a polygon was drawn encompassing the site plus the area surrounding the site within five kilometres from the site perimeter. The Scientific Name filter was also applied, using the terms Arachnida, Athoracophoridae, Rhytididae, Insecta, and Onychophora to represent spiders, leaf-veined slugs, indigenous giant land snails, insects, and velvet worms respectively. From the records retrieved by the GBIF search, freshwater invertebrates were removed. This dataset was used to characterise the fauna based on the most commonly-represented orders. Observations that were not identified further than order, or were marked as doubtful, were then deleted. All remaining records were scanned for notable species[2]. These were compared with vegetation and habitat on-site to judge the likelihood of each notable species occurring within the project area.

2.3 Evaluation of ecological effects

The ecological significance of the ecological values present on the property was assessed based on ecological significance criteria within the Otago Regional Policy (Otago Regional Council 2019).

The Quality Planning guidelines for undertaking assessments of ecological effects have been referred to when preparing this report (Quality Planning 2023). The ecological values of affected vegetation and habitats, and the magnitude and extent of the potential adverse ecological effects associated with the proposed subdivision have been evaluated using the methods described in the Quality Planning guidelines.

3.0 Ecological Context

3.1 Remarkables Ecological District

The proposed subdivision development at Homestead Bay is located within the Remarkables Ecological District and the following description is adapted from McEwen (1987).

This district contains the extremely steep, rugged, and strongly glaciated, Remarkables, and Hector Mountains (500-2,300 metres a.s.l.) as well as the southern part of Lake Wakatipu. The geology is mainly Paleozoic Haast Schist with small areas of Pleistocene outwash gravels and Holocene alluvium in valleys. This district is cool, dry, and is affected by rainshadow of the Main Divide. Rainfall is between 750-1,500 millimetres per year. The northwest winds prevail with occasional strong gales. Snow may lie for weeks in winter, above 1,000 metres.

The soils are mainly stony steepland soils from schist and related slope deposits passing to alpine soils with extensive areas of bare rock and scree at higher altitudes. Deeper soils on easier slopes where

[1] GBIF.org (12 March 2025) GBIF Occurrence Download https://doi.org/10.15468/dl.dp8p2m

[2] Notable species are locally endemic, known or suspected to be declining, particularly sensitive to habitat loss or predation by introduced mammals, or listed as Threatened or At Risk.

variable cover of loess overlies gravelly alluvium, till and schist. Soils mainly strongly leached but those at lower altitudes weakly to moderately leached and droughty in summer.

A few small patches of montane tawhairauriki/mountain beech forest (*Fuscospora cliffortioides*) are present in narrow valleys occasionally with tawairauhui/red beech (*Fuscospora fusca*) and tōtara kōtukutuku/Hall's tōtara (*Podocarpus laetus*). Elsewhere this ecological district contains scrub, fernland, tussockland and alpine cushionfield.

Notable indigenous fauna are present within the Remarkables Ecological District. However, there are few forest birds in this ecological district due to the little forest remains. Miromiro/tomtit (*Petroica macrocephala*) and korimako/bellbird (*Anthornis melanura*) are present in some forest remnants. Kārearea/falcon (*Falco novaeseelandiae*) widespread and relatively common. Tōrea/South Island pied oystercatcher (*Haematopus finschi*) and pohowera/banded dotterel (*Charadrius bicinctus*) breed in low numbers on top of ranges. Moko pāpā/common gecko (*Woodworthia maculatus*) persist on the Remarkables Range. Invertebrates on the Remarkables Range include four endemic moths, grasshoppers (*Sigaus campstris*, *S. australis* and *Alpinacris tumidicauda*), chafer beetle (*Scythrodes squalidus*), leaf beetle (*Allocharis subsulcatus*), speargrass weevil (*Lyperobius spedeni*), carabid beetles (*Holcaspus ovatella* and *H. ogregialis*), big striped weevils (*Lyperobuis huttonii* and *L. spedeni*) (amongst *Anisotome* and *Aciphylla*), a large Byrrhid ground beetle (under stones, 1,524-1,828 metres). On the Hector Range is a flightless furry chafer (*Prodontria pinguis*). Alpine cicadas (*Maoricicada nigra frigida* and *M. otagensis otagensis*) most likely occur on both ranges.

Today, the mountains are grazed (extensive sheep and cattle), apart from some retired areas on the upper slopes.

3.2 Site description

The site is located at the bottom of The Remarkables Mountains, and is located in between the Jacks Point subdivision and Oraka residential area. The site is currently used as a productive farm for sheep and cattle, with a smaller area designated to a commercial business, NZONE. The topography consists of terraces, gentle undulations and two gullies. Exotic pasture grassland dominates the site. Exotic tree shelterbelts are planted along paddock fence edges and there is an exotic conifer woodlot within the northern gully. Small patches of indigenous shrublands are occasionally present on terrace slopes.

4.0 Vegetation and Habitats

4.1 Overview

Nineteen vegetation and habitat types were identified within the property and are mapped in Figure 1, with descriptions provided below.

4.2 Terrestrial habitats

1. **Mountain beech treeland** (planted)

   This treeland is at the northern end of the property and has been planted with several tawhairauhiki/mountain beech.

2. **Mountain beech-tī kōuka-kāpuka-mānatu-*Prunus* sp. treeland** (planted amenity garden)

   This area is an amenity garden that has been planted with predominantly indigenous trees and shrubs around the NZONE skydive buildings.

3. **Blue gum/(mikimiki-sweet briar) treeland**

   This treeland abundant with large blue gum (*Eucalyptus globulus*) is located at the lower end of the southern gully (Plate A4-1). Various shrubs including mikimiki (*Coprosma propinqua*), sweet briar (*Rosa rubigonosa*), Scotch broom (*Cytisus scoparius*) and tūmatakuru/matagouri (*Discaria toumatou*) are scattered within the treeland. The ground cover is a mix of exotic grasses, mosses, bare soils and leaf litter.

4. **Tūmatakuru-(mikimiki-sweet briar) scrub**

   The tūmatakuru-(mikimiki-sweet briar) scrub is a regenerated indigenous scrub on the lower terrace slope above the lake margin (Plate 1). Tūmatakuru/matagouri and mikimiki range from 0.5-3.0 metres tall throughout. Kōhuhu is emergent near the southern end of the scrub. Rare and emergent exotic tree elder (*Sambucus nigra*) is present along with the occasional radiata pine (*Pinus radiata*) saplings. Exotic shrubs scattered within the scrub include sweet briar (more common) and occasionally Scotch broom. The hemiparasite pirita/green mistletoe (*Ileostylus micranthus*) is present on mikimiki, tūmatakuru/matagouri and sometimes Scotch broom. The understorey of the scrub ranges from bare soils to areas of exotic grasses. Some species in the understorey species include male fern, necklace fern (*Asplenium flabellifolium*) and porcupine shrub (*Melicytus alpinus*) near the scrub edges.

Plate 1 - Tūmatakuru-(mikimiki-sweet briar) scrub on the terrace slope and (common mat daisy) mossfield on the terrace.

Figure 1. Vegetation and habitat types present at Homestead Bay, Queenstown

5. Blackwood/elder-mikimiki-puka scrub

The mid-section of the southern gully is dense with mikimiki, elder, puka/large-leaved muehlenbeckia (*Muehlenbeckia australis*) and blackwood (*Acacia melanoxylon*) on the upper gully margins (Plate 2).

Plate 2 - Blackwood/elder-mikimiki-puka scrub in the mid-section of the southern gully.

6. [Kōhuhu]/mikimiki-sweet briar shrubland

This shrubland is on the slopes at the lower end of the southern gully (Plate 3). Large blue gum trees are present at the lower end of the gully slopes. Mikimiki and sweet briar area scattered across the slopes at various densities. Where mikimiki is denser, there are occasional emergent kōhuhu (*Pittosporum tenuifolium*) and climbing puka/large-leaved muehlenbeckia. The gully slopes are a mix of exotic grass species, unvegetated gravel slips and eroding cliff edges. Other shrubs occasionally present within the exotic grass areas include tūmatakuru/matagouri, Scotch broom and buddleia (*Buddleja davidii*). Clusters of male fern (*Dryopteris filix-max*) feature on the south-facing slope).

7. Tūmatakuru shrubland

Several patches of tūmatakuru/matagouri are present within the productive farmland paddocks. The density of tūmatakuru/matagouri varies between each shrubland and heights of shrubs range from 0.5-2.5 metres (Plate A4-2 and A4-3). Sweet briar and occasionally mikimiki and porcupine shrub are dispersed in between the tūmatakuru/matagouri. Inter-shrub space is mostly exotic herbs and grasses including sweet vernal (*Anthoxanthum odoratum*), cocksfoot (*Dactylis glomerata*), barley grass (*Hordeum murinum*), Californian thistle (*Cirsium arvense*) and burdock (*Arctium lappa*).

Plate 3 – [Kōhuhu]/mikimiki-sweet briar shrubland on the lower slopes below the cliffs in the southern gully. Stonefield/ephemeral stream on the flat gently sloping gully bottom.

8. (Elder-sweet briar-tūmatakuru) shrubland

This shrubland covers the north end of the southern gully and includes eroded terrace edges and an ephemeral stream.

9. (Common mat daisy) mossfield

The terrace above the lake margin and in between the tūmatakuru-(mikimiki-sweet briar) scrub is a mossfield containing a mosaic of common mat daisy (*Raoulia australis*), mosses (*Polytrichum juniperinum* and possibly *Ceratodon purperelus*) and an unidentified grass (likely exotic) (Plate 1). Other less common species within the mossfield include pātōtara (*Styphelia nesophila*), moth mullein (*Verbascum virgatum*), St John's wort (*Hypericum perforatum*), *Colobanthus strictus*, *Hydrocotyle novae-zeelandiae,* mouse-ear hawkweed (*Pilosella officinarum*) and *Raoulia beauverdii*. Sweet briar and porcupine shrub are infrequent within the mossfield.

10. Radiata pine forest (plantation)

A radiata pine forest/plantation is present on the lower section of the northern gully. The plantation covers the ephemeral stream and contains a canopy gap in the middle. A dense area of elder and puka is located in a canopy gap. A small section of the ephemeral stream was flowing and pooling at the time of the survey. The forest understorey sometimes contains shrubs such as mikimiki, tūmatakuru/matagouri and sweet briar. The forest groundcover is mostly leaf litter and bare soils.

Many recreational motorbike tracks run through the plantation forest and ephemeral stream.

11. **Lombardy poplar-Lawson's cypress-argle apple treeland** (shelterbelt)

    Exotic shelterbelts are present along some of the fencelines within the farmland paddocks. The shelterbelt treelands are either dominated by Lombardy poplar (*Populus nigra*), Lawson's cypress (*Chamaecyparis lawsoniana*) and/or argle apple (*Eucalyptus cinerea*), or is a combination of two of the species.

12. ***Eucalyptus* spp.-pin oak-Lombardy poplar treeland** (planted)

    This area consists of a small linear paddock dominated by exotic grass species and has been planted with a variety of exotic and indigenous trees. A few of the exotic trees include blue gum, Lombardy poplar, alder (*Alnus* sp.), and pin oak. Sycamore (*Acer pseudoplatanus*), and rowan (*Sorbus aucuparia*) are also present but may have naturalised into this area. Indigenous trees present include tī kōuka/cabbage tree (*Cordyline australis*) and mountain beech/tawhairauhiki.

13. **Ryegrass-(browntop-cocksfoot-sweet vernal) grassland (exotic pasture grassland)**

    This exotic dominated grassland contains various grasses at various abundances with ryegrass (*Lolium perenne*) being the most common in the main paddocks. This grassland is mostly grazed by sheep and/or cattle, except for the areas that are fenced off to exclude stock. Exotic herbs such as white clover are common in the grassland. One paddock is used for crops.

14. **Cocksfoot-sweet vernal stonefield**

    The stonefield is located at the bottom of the southern gully and also contains one of the ephemeral streams (Plate 3). The stonefield of the stream bed is a mix of exotic grass dominated areas with shrubs such as sweet briar or tūmatakuru/matagouri or bare rocks with a few exotic herbs and grasses in between the rocks and pebbles.

4.3 Freshwater and wetland habitats

Seven natural inland wetlands are present at Homestead Bay (Figure 1; Appendix 1; Wildland Consultants 2025).

15. **Soft rush-browntop-sharp spike sedge rushland marsh**

    Clusters of soft rush are spread throughout a mosaic of browntop, sharp spike sedge (*Eleocharis acuta*) and Yorkshire fog (*Holcus lanatus*). Other species occasionally present include white clover, wīwī/leafless rush and jointed rush (*Juncus articulatus*). A sedge species is also present in very low abundance. The sedge did not have an inflorescence to confirm identification but is likely Sinclair's

sedge (*Carex sinclairii*), due to its leaf characteristics[1] and habitat match. This vegetation description was taken from the wetland assessment report (Wildland Consultants 2025).

16. Yorkshire fog marsh

Within one of the ephemeral streams is a small marsh wetland. The marsh wetland is dominated by Yorkshire fog and has the other occasional exotic herb and grass within it. It is surrounded by drier areas dominated with browntop.

17. Soft rush-floating sweet grass-Yorkshire fog grassland swamp

This swamp wetland lays in a channel that sits below the pond in Wet Area 1 (Plate 2). The swamp wetland contains a mosaic of soft rush, Yorkshire fog, floating sweetgrass (*Glyceria fluitans*), curled dock (*Rumex crispus*) and jointed rush. The wetland contains the occasional clusters of water fern (*Azolla rubra*) sitting on the water surface. This vegetation description was taken from the wetland assessment report (Wildland Consultants 2025).

18. Ephemeral wetland

Four ephemeral wetlands are present. Ephemeral wetlands are typically in closed depressions and contain low statue plant species that are often arranged in a zonation pattern. This type of wetland has unique hydrology characteristics by being typically inundated in winter and spring and gradually lowering in summer (Johnson and Rogers 2003). Vegetation descriptions are adapted and taken from the wetland assessment report (Wildland Consultants 2025). One ephemeral wetland is on the north side of the northern gully and is a concave hollow that is lined with soft rush (*Juncus effusus*) and leafless/wīwī rush. The ephemeral wetland contains abundant kneed foxtail (*Alopecurus geniculatus*) with common patches of the indigenous herb *Lobelia perpusilla*. The next ephemeral wetland is just east and is within an oval depression and is mostly unvegetated. A few exotic species scattered near the edges and include: marsh plantain (*Plantago australis*), ryegrass, nettle (*Urtica urens*), and clammy goosefoot (*Dysphania pumilio*).

One ephemeral wetland is located in between the gullies and is a mostly unvegetated oval depression (Plate 4). Scattered exotic species located near the edges of the wetland include floating sweetgrass (*Glyceria fluitans*), browntop (*Agrostis capillaris*), clammy goosefoot, white clover (*Trifolium repens*), and black nightshade (*Solanum nigrum*).

[1] Double folded leaf, leaf width of 4-4.5 millimetres, leaf length of *c.* 40 centimetres and light yellow-green leaf colouration.

Plate 4 – Ephemeral wetland on the upper terrace near the southern end of the property.

Another unvegetated ephemeral wetland is present nearby one of the shelterbelt treelines. This wetland may be a recently developed wetland, as suggested by the 'uncertain' soil result in the guidelines (Fraser *et al.* 2018). The ephemeral wetland is at the lowest point (paler soil) of a compacted open soil patch.

Ephemeral wetlands are listed as a historically rare ecosystem (Williams *et al.* 2007) and a critically endangered naturally uncommon ecosystem (Holdaway *et al.* 2012). The ephemeral wetlands have been further subcategorised in the wetland assessment (Wildland Consultants 2025) on their present status, but some ephemeral wetlands do have different vegetation stages depending on last inundation length.

- Kneed foxtail-*Lobelia perpusilla* grassland ephemeral wetland
- [Swamp plantain] herbfield ephemeral wetland
- [Floating sweetgrass-kneed foxtail-clammy goosefoot] grassland ephemeral wetland
- Mudflat ephemeral wetland

19. Pond

One natural and two man-made ponds are present. The natural pond is located in between the swamp and marsh wetlands at the northern end of the property. Soft rush, sharp spike sedge, browntop, jointed rush, Yorkshire fog and floating sweet grass line the margin of the natural pond.

One of the man-made ponds is a large hole that has steep sides and contains an island in the middle (Plate A4-4). This area may have historically been a wetland but was modified by the landowner. The bottom on the hole contains a herbfield of marsh bedstraw (*Galium palustre* subsp*. palustre*), sharp spike sedge, kneed foxtail, waoriki (*Ranunculus glabrifolius*) and Shepard's purse (*Capsella bursa-pastoris*). As identified by the wetland assessment, this area is considered a wetland under

the Resource Management Act (Wildland Consultants 2025). However, this wetland is excluded from the 'natural wetland' definition because it has been formed in a constructed excavation and was likely intended to be a pond (currently dry).

The other man-made pond is present near the middle of the property. Exotic grasses and herbs line the margin on this pond, with exotic trees planted around the west edge. This pond has an artificial input of water that supplies the water to the pond (Allibone 2023). The duck decoys in the pond suggest that this pond is used for recreational duck shooting (Allibone 2023).

20. Ephemeral stream

Several ephemeral streams are present within the gullies and near the northern end of the property (Plate 3). These streams are likely dry most of the year and only flow during and after high rainfall. The stream within the radiata pine forest contained water at the time of survey and likely flows more regularly or permanently as hydrophytic plants such as soft rush were present along the margin. One of the ephemeral streams runs through the stonefield and contains some deeper channels and scours from past high flow events.

5.0 Flora

Forty-nine indigenous and 87 exotic vascular plant species were recorded during the field survey. Four of the indigenous species have a National At Risk or Threatened status. National threat status has been taken from de Lange *et al.* 2024, and the regional threat status has been taken from Jarvie *et al.* 2024.

Threatened, At Risk and Rare plant species

Cypress hebe (*Veronica cupressoides*) has a Threatened-Nationally Endangered status and has been planted within the amenity garden (mountain beech-tī kōuka-kāpuka-mānatu-*Prunus* sp. treeland) near the NZONE building. Cypress hebe has been planted in many new residential areas within Tāhuna/Queenstown and Wānaka.

- Cypress hebe (*Veronica cupressoides*); Threatened-Nationally Endangered
- Desert broom (*Carmichaelia petriei*); At Risk-Declining
- Common mat daisy (*Raoulia australis*); At Risk-Declining
- *Raoulia beauverdii;* At Risk-Declining
- *Colobanthus strictus*; Not Threatened

One desert broom[1] (*Carmichaelia petriei*) plant is located on the scrub edge of the blackwood/elder-mikimiki-puka scrub in the southern gully. Desert broom is Nationally At Risk-Declining and also At Risk-Declining within the Otago Region. Only one plant was found, although there are likely more plants within the scrub. Common mat daisy and *Raoulia beauverdii* are both Nationally At Risk-Declining and are located on the terrace flat and ridges within the mossfield. *Raoulia beauverdii* has a Threatened-Regionally Vulnerable threat status in Otago. *Colobanthus strictus* is Nationally Not Threatened but is At Risk-Regionally Declining in Otago. A few plants are present in the (common mat daisy) mossfield. Browse was noted on many of the plants.

[1] GPS location E1265745 N4997699

Environmental weeds and pest plant species

Nineteen ecological pest plants were recorded during the field survey (Table 1). Five of these species are listed in the Otago Regional Pest Management Plan (Otago Regional Council 2019). The remaining species are classified as Organism of Interest (Otago Regional Council); and/or environmental weed in the latest national list published by the Department of Conservation (McAlpine and Howell 2024). Ecological pest plants have a different level of threat to ecosystems. A suggested priority for control of these ecological pest plants is listed in Table 1.

Table 1 – Ecological pest plant species recorded at Homestead Bay during the field survey and their control programme in the Otago Regional Pest Management Plan (RPMP; Otago Regional Council 2019), and other status such as Organism of Interest (Otago Regional Council 2025), or Environmental Weed (McAlpine and Howell 2024). Priority for ecological pest plant species control is also suggested.

Species	Common Name	Weed Status	Priority for Control
Acacia dealbata	Silver wattle	Environmental weed	Medium
Acacia melanoxylon	Blackwood	Environmental weed	Medium
Acer pseudoplatanus	Sycamore	Otago RPMP (Primary Programme - Site led) and environmental weed	Very High
Alnus sp.*	Alder	Environmental weed	High
Buddleja davidii	Buddleia	Otago organism of interest and environmental weed	High
Cirsium arvense	Californian thistle	Environmental weed	Low
Cirsium vulgare	Scotch thistle	Environmental weed	Low
Cortaderia selloana	Pampas grass	Environmental weed	High
Cytisus scoparius	Scotch broom	Otago RPMP (Primary Programme - Sustained control) and environmental weed	High
Dryopteris filix-mas	Male fern	Environmental weed	Medium
Lupinus arboreus	Tree lupin	Otago organism of interest and environmental weed	Medium
Pinus radiata	Radiata pine	Otago RPMP (Progressive Containment) and environmental weed	High
Pseudotsuga menziesii	Douglas fir	Otago RPMP (Progressive Containment) and environmental weed	Very High
Ribes uva-crispa	Gooseberry	Environmental weed	High
Rosa rubiginosa		Otago organism of interest and environmental weed	High
Sambucus nigra	Elder	Environmental weed	High
Sedum acre	Stonecrop	Environmental weed	Low
Sorbus aucuparia	Rowan	Otago organism of interest and environmental weed	Very High
Ulex europaeus	Gorse	Otago RPMP (Primary Programme - Sustained control) and environmental weed	High

6.0 Fauna

6.1 Avifauna

Six indigenous and three exotic bird species were recorded incidentally during the field survey (Appendix 4). The eBird desktop survey identified a further 24 bird species within a two-kilometre radius of the Homestead Bay property between 10 December 2023 and 17 February 2025. Of these eBird records, three species are classified as Threatened (Robertson *et al.* 2021), including two Nationally Endangered (kārearea/eastern falcon, *Falco novaeseelandiae novaeseelandiae;* tarapirohe/black-fronted tern, *Chlidonias albostriatus*) and one Nationally Vulnerable (pūteketeke/Australasian crested grebe, *Podiceps cristatus australis,* Table 2). Of these Threatened bird species, only the kārearea/eastern falcon was observed onsite, would utilise this property often to hunt for food.

Three species are classified as At Risk, including one Declining (pīhoihoi/New Zealand pipit; *Anthus novaeseelandiae*), one Naturally Uncommon (Australian coot, *Fulica atra australis*), and one Relict (kawau paka/little shag, *Phalacrocorax melanoleucos brevirostris*). There is a possibility that the pūteketeke/Australasian crested grebe and Australian coot would visit the ponds. However, this is unlikely due to the mostly unvegetated, small size and degraded state of the ponds. They have plenty of high-quality habitat nearby (Lake Whakatipu). Although not identified in the eBird search, tōrea/South Island pied oystercatcher (*Haematopus finschi*, At Risk - Declining is highly likely to visit the open exotic pasture grasslands to forage and could potentially breed onsite. The full list of confirmed records retrieved from eBird and the field survey are in Appendix 4.

The kārearea/eastern falcon, utilises the exotic pasture grassland and exotic forests and treelands for foraging habitat. There is a possibility that they may also breed in the exotic forest and treelands, but they would more likely use the higher quality habitat nearby, the rock ledges on The Remarkables mountain slopes. The pīhoihoi/New Zealand pipit also utilises the exotic pasture grassland on the farm.

Many of the indigenous and introduced bird species identified in the field survey and desktop survey will utilise the grassland, shrubland, scrub, treeland and forest habitats within the property, at least on an occasional basis.

6.2 Herpetofauna

Information for lizards has been taken from a recent survey and report competed by Wildlands (Wildland Consultants 2025b). McCann's skinks (*Oligosoma maccannii*) were confirmed during site surveys. McCann's skinks are often found in modified dry, open environments where there is a complex of rocky outcrops, tussock, and scrub. This species is considered to be highly abundant throughout Central Otago.

It is possible that tussock skink (*Oligosoma chionocloescens*) may be present within the site, at low densities in damper areas. However, in these areas on site, mice were observed at high densities during the site survey and can predate on skinks.

Table 2 – Threatened and At Risk avifauna species recorded within two kilometres of the Homestead Bay property from eBird and during the field survey. Habitat preferences and likelihood of occurrence at the site described for Threatened and At Risk species based on their known habitat preferences and distribution in the area and surrounds. Threat classifications are from Robertson *et al.* (2021).

Scientific Name	Common Name	Threat Classification	Preferred Habitat	Likelihood Present
Anthus novaeseelandiae novaeseelandiae	Pīhoihoi, New Zealand pipit	At Risk - Declining	Beaches, riverbeds, high-country riverflats, gravel roads and verges, rough pasture, tussockland, cleared areas of exotic forests.	Presence confirmed
Chlidonias albostriatus	Tarapirohe, Black-fronted tern	Threatened - Nationally Endangered	Riverbeds, waterways, riverflats and farmlands by rivers during breeding. More coastal habitats, including coastal pasture, during autumn and winter.	Unlikely
Falco novaeseelandiae novaeseelandiae[1]	Kārearea, eastern falcon	Threatened - Nationally Endangered	Hilly dry tussockland, farmland, open country, indigenous and exotic forest edges	Presence confirmed
Fulica atra australis	Australian coot	At Risk - Naturally Uncommon	Shallow, sheltered bays in freshwater fringed with submerged vegetation, reeds and raupō beds.	Unlikely
Phalacrocorax melanoleucos brevirostris	Kawau paka, little shag, little pied shag	At Risk - Relict	Breed in sheltered coastal waters, estuaries, harbours, rivers, dams, and lakes up to the subalpine zone. Commonly in willows or silver poplars overhanging fresh water or estuaries, but sometimes on maimai or river gorge ledges or sea cliffs.	Highly unlikely
Podiceps cristatus australis	Pūteketeke, southern crested grebe	Threatened - Nationally Vulnerable	Clear shallow freshwater lakes and ponds with mud, clay, or sandy bottoms with emergent vegetation. Breed on lowland lakes west of Southern Alps, subalpine and alpine lakes within and east of main divide. Wintering sites include coastal lakes and estuaries.	Unlikely

[1] Robertson *et al.* (2021) differentiates *Falco novaeseelandiae*/New Zealand falcon into three forms, whereas New Zealand Bird Atlas does not. The form(s) that could be present are southern falcon (*Falco novaeseelandiae* "southern"; Threatened-Nationally Endangered) and/or eastern falcon (*Falco novaeseelandiae novaeseelandiae*; Threatened-Nationally Vulnerable). All three New Zealand falcon forms are listed as Threatened in Robertson *et al.* (2021). Targeted surveys would be required to identify which form(s) could be present given the distributional limits of both 'forms' within this region are uncertain.

Table 3 - Results of the Department of Conservation Bioweb herpetofauna database search, within a 20-kilometre radius of the site, and an assessment of the likelihood of the presence of these species at the site. Conservation status as per Hitchmough *et al.* 2021 and Jarvie *et al.* 2023. The likelihood of occurrence at the project site has been assessed for each species based on their known habitat preferences and distribution in the area and surrounds.

Species	Common Name	Conservation Status	Regional Status	Record Distance (km)	Preferred Habitats	Likelihood of Occurrence
Oligosoma maccanni	McCann's skink	Not Threatened	Regionally Not Threatened	1.3	Open habitats - dry rocky environments such as rock outcrops, and montane grassland	Presence confirmed during site surveys
Woodworthia "south-western"	Mountain beech gecko	At Risk-Declining	At Risk- Regionally Declining	3.0	Mature indigenous forests, rocky scrub/grasslands, boulderfields and scree	Possible
Woodworthia 'southern mini'	Short-toed gecko	At Risk-Declining	At Risk- Regionally Declining	3.2	Alpine and subalpine areas (600 - 1,700m). Scree boulderfield, creviced rock outcrops. Occasionally rocky scrubland or pasture.	Highly unlikely
Oligosoma inconspicuum	Cryptic skink	At Risk-Declining	At Risk- Regionally Declining	6.4	Prefers tussock grasslands, wetlands and rocky areas such as rocky screes.	Unlikely
Mokopirirakau "Roys Peak"	Orange spotted gecko	At Risk-Declining	At Risk- Regionally Declining	10.4	High-altitude (1,100-1,800m) alpine and subalpine creviced rock outcrops, rocky shrubland, boulderfield, talus, scree and rocky tussockland	Highly unlikely
Oligosoma chionocloescens	Tussock skink	At Risk-Declining	At Risk- Regionally Declining	14.3	Range of habitats including coastal dunes, wetlands, grassland, shrublands, rocky shrubland/herbfield, screes, tussock, stony river beds and even cities	Possible
Woodworthia 'Cromwell'	Kawarau gecko	At Risk-Declining	At Risk- Regionally Declining	15.8	Rocky scrubland, talus, and creviced rock outcrops (from lowland to alpine areas, <1,300m).	Highly unlikely
Oligosoma aff. *chloronoton* "West Otago"	Lakes skink	Threatened-Nationally Vulnerable	Regionally Vulnerable	18.0	Grassland, scrubland, tussockland, rocky areas, scree, herbfield, fellfienld, stony riverbeds, terraces and lake edges (from montane to alpine areas).	Highly unlikely

Mountain beech gecko (*Woodworthia* "south-western") could possibly inhabit rocky scrubland present on site, particularly in the southeastern gully. However, due to the very small and fragmented rocky habitat available, and apparent high mouse densities, are unlikely to be detectable. There are several records indicating remnant mountain beech gecko populations nearby, but all are in areas with different rocky habitats (torr, scree, or boulder field) habitat available.

Cryptic skinks (*Oligosoma inconspicuum*) and short-toed geckos (*Woodworthia 'Southern mini'*) have both been recorded nearby (6.4 and 3.2 kilometres, respectively). These nearby recordings were all in the sub-alpine and alpine rocky slopes of the nearby Remarkables. The Homestead Bay site lacks the high quality rocky or tussock habitats likely needed to support populations of cryptic skinks, and the subalpine habitat required by short-toed geckos. It is highly unlikely that any other species of indigenous lizard typically found in the region are present within the site, due their habitat requirements (orange spotted gecko; *Mokopirirakau* "Roys Peak"; alpine specialist), slow life history characteristics (Lakes skink; *Oligosoma* aff. *chloronoton* "West Otago") and the geographic separation between the site and location the species was recorded (Kawarau gecko; *Woodworthia 'Cromwell'*).

Small rock piles were present in paddocks throughout the site, though these did not provide adequate cover for lizards due to their small size and very heavy grazing by stock and damage from rabbits.

Small patches of tūmatakuru/matagouri shrubland were found on terrace risers close to the western and northern boundaries of the site. Most of these provided relatively patchy, moderate-quality habitat, due to very heavy grazing and damage from rabbits. Populations of lizards were detected in some areas where exotic pasture grass or dense lower cover from shrubs provided better cover for lizards.

The northern gully currently includes a radiata pine forest/plantation on the lower reaches with [kōhuhu]/mikimiki-sweet briar shrubland on the upper section of the gully. Low-quality lizard habitat in the radiata pine forest/plantation was observed during surveys, and no traps were placed due to high risk of mouse predation in traps in this area. While the shrubland area is moderate-quality habitat for McCann's skinks, and some lizards were found in this area (relatively low in the gully), it's expected that the population of lizards here will be small due to this relatively recent disturbance (approximately 30,000 m^3 of clean fill in 2018 was put into the northern gully).

The larger southern gully had habitat ranging from patches of high-quality open stonefield substrate at the upper and lower reaches, to large areas of moderate-quality exotic pasture grass, mixed [kōhuhu]/mikimiki-sweet briar shrubland and taller exotic woody vegetation. It's not expected that the taller vegetation in this area would provide habitat for arboreal lizard species, due to historic disturbance, recent revegetation with exotic species, high mouse abundance and a lack of habitat connectivity. A middle section of the gully close to paddock gates is characterised by exposed soil, heavily grazed pasture grass and has no rocks or indigenous shrubs to provide any suitable habitat for indigenous lizards.

Some exotic treeland/shelterbelts provided suitable moderate-quality lizard habitat with small areas of exotic pasture grass, including those where trees had recently been removed, leaving behind stumps and woody debris that provided good cover for lizards. Other shelterbelts had no grass or other vegetation close to the ground and were not considered suitable lizard habitat.

6.3 Terrestrial invertebrates

The GBIF search retrieved 305 records of terrestrial invertebrates that met the search terms. The invertebrate fauna was characterised mainly by moths, butterflies and beetles, though true bugs, spiders and bees/wasps also regularly featured. Two-hundred and fifty records encompassing 124 species had been identified to a level at which they could be assessed. These were dominated by

indigenous species. There were no records for athoracophorid or rhytid molluscs, or onychophorans (velvet worms). Notable species are presented in Table 4. Five of these are classified as At Risk, including the New Zealand praying mantis (*Orthodera novaezealandiae;* At Risk-Declining), which is highly likely to be present at the site. It is also possible that the broom looper moth (*Samana acutata*; At Risk-Relict) and the mistletoe carpet moth (*Tatosoma agrionata*; At Risk-Declining) are also present. It is considered unlikely that the large ground beetle (*Mecodema rex*; At Risk-Naturally Uncommon) and the chafer beetle (*Prodontria pinguis*; At Risk-Naturally Uncommon) are present.

6.4 Aquatic fauna

Information for aquatic fauna has been taken from the Homestead Bay Aquatic Ecology Assessment (Alibone 2023). The artificial pond cannot be colonised by fish due to no tributaries an outflow connection to other water bodies. Diving beetles, backswimmers (*Anisops*) and water boatmen (*Sigara*) were the only macroinvertebrates seen by Alibone in the pond. The natural pond in between the swamp and marsh wetland was not discussed by Allibone, nor was the larger currently dry artificial pond. Similar conclusions can be made for these ponds as they are not connected to any other water bodies.

Wet tolerant invertebrates may temporarily utilise the wet section of the ephemeral stream in the northern gully (Allibone 2023) and utilise the ephemeral wetlands when they are seasonally inundated. This wet section is insufficient to support fish as there is no fish passage between this wet section and Lake Wakatipu to allow fish to migrate upstream (Allibone 2023). The ephemeral streams do not support any fish, nor any stream macroinvertebrates (Allibone 2023).

6.5 Pest animals

European rabbits (*Oryctolagus cuniculus*), are frequent across the property. The rabbits were often seen and their burrows observed on terrace slopes and shrublands (Plate A4-5). Mice were notably abundant during the lizard survey (Wildland Consultants 2025b).

The typical suite of small introduced pest mammals are likely to be present at the property including including possum (*Trichosurus vulpecula*), rodents (*Rattus* spp.), and mustelids (*Mustela* spp.), feral cats (*Felis catus*), brown hare (*Lepus europaeus*), and hedgehogs (*Erinaceus europaeus*). These pest animals have a range of significant threats to indigenous plants and fauna, through predation of indigenous animals, competition and disturbance, and herbivory of indigenous plants (leaves, bark, and fruits).

7.0 Ecological Values

The blackwood/elder-mikimiki-puka scrub in the southern gully supports the At Risk-Declining desert broom. The (common mat daisy) mossfield supports the At Risk-Declining common mat daisy and *Raoulia beauverdii*. The mossfield also support the At Risk-Regionally Declining *Colobanthus strictus*. The Threatened-Nationally Endangered planted cypress hebe is within the amenity garden (mountain beech-tī kōuka-kāpuka-mānatu-*Prunus* sp. treeland) near the NZONE building.

Table 4 - Noteworthy species of invertebrate recorded within five kilometres of the Homestead Bay property from GBIF. Conservation status as per Leschen *et al.* 2012 (beetles), Buckley *et al.* 2012 (praying mantis), Hoare *et al.* 2017 (moths and butterflies) and Trewick *et al.* 2022 (grasshoppers). Habitat preferences and likelihood of occurrence at the site are based on their known habitat preferences and distribution in the area and surrounds.

Scientific Name	Common Name	Threat Classification	Notability	Preferred Habitat	Likelihood Present
Anagotus helmsi	Helms's beech weevil	Not assessed	Large species, vulnerable to predation from introduced mammals.	Beech forest, exotic pine forest	Possible
Lyperobius cupiendus	Speargrass weevil	Not assessed	Large species, vulnerable to land use change, habitat degradation and predation from introduced mammals. Restricted to Central Otago and Otago lakes areas.	Subalpine to alpine zones, associated with alpine host plants (mainly *Aciphylla* spp.)	Highly unlikely
Lyperobius hudsoni	Speargrass weevil	Not assessed	Large species, vulnerable to land use change, habitat degradation and predation from introduced mammals.	Subalpine to alpine zones, associated with alpine host plants (mainly *Aciphylla* spp.)	Highly unlikely
Lyperobius spedenii	Speargrass weevil	Not assessed	Large species, vulnerable to land use change, habitat degradation and predation from introduced mammals.	Subalpine to alpine zones, associated with alpine host plants (mainly *Aciphylla* spp.)	Highly unlikely
Mecodema lucidum	Ground beetle	Not assessed	Large species, vulnerable to land use change, habitat degradation and predation from introduced mammals.	Lowland to montane (including subalpine to alpine), tussock grasslands, fellfields, herbfields and screes	Possible
Mecodema rex	Ground beetle	At Risk - Naturally Uncommon	Large species, vulnerable to land use change, habitat degradation and predation from introduced mammals.	Subalpine and alpine zones, tussock grasslands and shrublands, alpine meadows, wet beech forests.	Unlikely
Notoreas paradelpha	Looper moth	Not assessed	Likely vulnerable to land use change, habitat degradation and predation from introduced species.	High alpine habitat, found amongst grass and in herbfields. The host plants include species in the genera *Kelleria* and *Pimelea* including *Pimelia oreophila*.	Highly unlikely
Orthodera novaezealandiae	New Zealand praying mantis	At Risk - Declining	Vulnerable to parasitic wasps, pesticide use, interactions with the introduced mantis (*Miomantis caffra*).	Open scrubby or shrubby habitats.	Highly likely
Prodontria pinguis	Chafer beetle	At Risk - Naturally Uncommon	Range restricted.	Subalpine grasslands	Highly unlikely

Scientific Name	Common Name	Threat Classification	Notability	Preferred Habitat	Likelihood Present
Samana acutata	Broom looper moth	At Risk - Relict	Vulnerable to habitat modification, in particular the loss of host species due to farming and urban development. It is also at risk from weed invasion from plants such as sea spurge.	Scrubby areas containing host plants (e.g. indigenous broom species), and dune ecosystems.	Possible
Sigaus australis	Alpine grasshopper	Not Threatened	Genus endemic to South Island. Although fairly widespread, current distribution is more fragmented than in the past and likely to decline further due to effects of climate change.	Tussock grasslands	Unlikely
Tatosoma agrionata	Mistletoe carpet moth	At Risk - Declining	Declining populations, related to declining host plants (mistletoe species).	Forest habitat up to an elevation of 900 metres	Possible
Vanessa gonerilla gonerilla	Red admiral	Not assessed	Anecdotal evidence for population decline, likely vulnerable to land use change, habitat degradation, removal of host plants (nettles etc), and predation from parasitic wasps.	Most habitats (forest, scrub, shrubland, gardens) where the host plants are found.	Possible

Small marsh, swamp and ephemeral wetlands are present within the exotic pasture grasslands. The marsh and swamp wetlands are dominated by exotic species, with soft rush being the most common species present. The ephemeral wetlands are mostly dominated by exotic plant species, nonetheless still contain typical characteristics of their ecosystem type (Wildland Consultants 2025a). Ephemeral wetlands are a unique and uncommon habitat and has been listed as a critically endangered natural uncommon ecosystem, as well as a historically rare ecosystem. They may have different vegetation stages depending on last inundation length. All wetland present are important on a national scale as New Zealand has lost 90% of its pre-human wetland extent, making wetlands the most nationally threatened ecosystem type (Aussiel *et al.* 2008). Ephemeral wetlands threatened by many factors including infilling, sedimentation, nutrient enrichment, pollutants, trampling impacts from mammals, weed invasions and introduced fish (Johnson and Rogers 2003).

McCann's skink (Not Threatened) are present in shrubland and stonefield habitats of the northern and southern gully. They are also present in ungrazed longer exotic pasture grass areas that are within the treelands and ungrazed areas.

The Threatened-Nationally Endangered or Vulnerable, kārearea/eastern falcon and At Risk-Declining pīhoihoi/New Zealand pipit and tōrea/South Island pied oystercatcher utilise the exotic pasture grasslands.

Much of the habitat (exotic pasture grassland) is of low ecological value to invertebrates. The gullies with shrubland, scrub or forest habitat is of low-moderate value to invertebrates. The tūmatakuru-(mikimiki-sweet briar) scrub is likely to provide habitat for the At Risk-Declining mistletoe carpet moth, where its host plant (green mistletoe) is present. The At Risk-Relict broom looper moth may utilise the blackwood/elder-mikimiki-puka scrub where the desert broom is present. The radiata pine forest/ plantation my support the unassessed Helm's beech weevil. All shrubland and scrub habitats adjacent to areas of longer, ungrazed exotic pasture grass, may support the At Risk-Declining New Zealand praying mantis. The unassessed red admiral may utilise the shrubland and exotic pasture grasslands where the exotic nettle (*Urtica urens*) is present.

The ephemeral streams, artificial and natural ponds have very little to no aquatic ecological values. The lack of any wetted connections to any other water body prevents fish colonisation. Only a few winged insect species occupy the artificial pond (Allibone 2023).

8.0 Significance Assessment

The ecological significance of vegetation and habitats of indigenous fauna was assessed based on the criteria in the Otago Regional Policy Statement (Otago RPS; Otago Regional Council 2019). This assessment applies to indigenous vegetation and habitat of indigenous fauna in the environments. The criterion for Rarity has been met for five vegetation and habitat types (Table 5). Vegetation and habitat types present that met the significance criteria at Homestead Bay:

- Vegetation Type 5: Blackwood/elder-mikimiki-puka scrub
- Vegetation Type 9: (Common mat daisy) mossfield
- Vegetation Type 15: Soft rush-browntop-sharp spike sedge rushland marsh
- Vegetation Type 16: Yorkshire fog marsh
- Vegetation Type 17: Soft rush-floating sweet grass-Yorkshire fog grassland swamp
- Vegetation Type 18: Ephemeral wetland

Table 5 – Significance assessment of vegetation and habitats present at Homestead Bay.

Criteria Category	Criteria Description	Evaluation
1. Representativeness	An area that is an example of an indigenous vegetation type or habitat that is typical or characteristic of the natural diversity of the relevant ecological district or coastal marine biogeographic region. This may include degraded examples of their type or represent all that remains of indigenous vegetation and habitats of indigenous fauna in some areas.	Vegetation and habitat types are highly modified and exotic dominated, and are not representative of the Remarkables Ecological District. Criterion not met.
2. Rarity	An area that supports: a. An indigenous species that is threatened, at risk, or uncommon, nationally or within an ecological district or coastal marine biogeographic region; b. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent nationally, regionally or within a relevant land environment, ecological district, coastal marine biogeographic region or freshwater environment including wetlands; c. Indigenous vegetation and habitats within originally rare ecosystems.	a. Three At Risk and Threatened bird species (pīhoihoi/NZ pipit, tōrea/South Island pied oystercatcher and kārearea/eastern falcon) are known to visit the exotic pasture grasslands, but this doesn't make the site's exotic pasture significant. Pasture is widespread in the lowlands of the District. One Regionally At Risk and Two Nationally At Risk plant species (*Colobanthus strictus, Raoulia australis* and *Raoulia beauverdii*) are present in the (common mat daisy) mossfield. One Nationally At Risk plant (desert broom) is present in the blackwood/elder-mikimiki-puka scrub. The At Risk – Relict broom looper moth may be present on it's host plant, desert broom in the blackwood/elder-mikimiki-puka scrub. **Criterion met.** b. Wetland habitat of indigenous fauna has been reduced to less than 20% of it's original extent nationally. **Criterion met.** c. The ephemeral wetland is a historically rare ecosystem. **Criterion met.**

Criteria Category	Criteria Description	Evaluation
3. Diversity	An area that supports a high diversity of indigenous ecosystem types, indigenous taxa or has changes in species composition reflecting the existence of diverse natural features or gradients.	Diversity of indigenous ecosystem types and taxa present are both very low. No vegetation or habitat type in the proposed project area meet this criterion.
4. Distinctiveness	An area that supports or provides habitat for: a. Indigenous species at their distributional limit within Otago or nationally; b. Indigenous species that are endemic to the Otago region; c. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, or has developed as a result of an unusual environmental factor or combinations of factors.	a. No such species present. Criterion not met. b. No endemic species of the Otago region present. Criterion not met. c. No such distinctive vegetation present. Criterion not met.
5. Ecological Context	The relationship of the area with its surroundings, including: a. An area that has important connectivity value allowing dispersal of indigenous vegetation and fauna between different areas; b. An important buffering function that helps to protect the values of an adjacent area or feature; c. An area that is important for indigenous fauna during some part of their life cycle, either regularly or on an irregular basis, e.g. for feeding, nesting, breeding, or refuges from predation.	a. The indigenous and mixed treeland, scrub and shrublands (Vegetation Types 1-8) present will have some value in terms of connectivity as they comprise 'stepping stones' of forest habitat for indigenous avifauna helping to retain connectivity to other small habitat patches in the surrounding modified environment, but they are not important for connectivity. Criterion not met. b. No important buffering functions present. The tūmatakuru-(mikimiki-sweet briar) scrub and (common mat daisy) mossfield will provide some buffering to the lake habitat from any run-off from agricultural activities Criterion not met. c. Indigenous birds do visit the exotic dominated vegetation and habitat types present for feeding and possible breeding. However, they are not important for their life cycle as there is plenty of other more suitable habitats in the local area. Criterion not met.

Criteria Category	Criteria Description	Evaluation
6. Coastal Environment	An area identified in accordance with Policy 11 of the NZCPS.	Inland environment, so not relevant to this site.

9.0 Overview of Proposed Subdivision

Major earthworks will be completed across the development area, including large-scale topography altering earthworks across the site. This includes the creation of screening bunds along the highway. Existing shelterbelts and vegetation within the works areas will be permanently removed during the development of lots and associated services, roads, and reserves.

Landscape plans by STR Landscapes includes a planting plan that will include 19.02 hectares of indigenous plantings and an additional 7.6 hectares of indigenous plantings that will infill and enhance present indigenous shrublands. The planting plan will consist of indigenous riparian, shrubland, and tawhairauhiki/mountain beech forests and will include lizard friendly species as recommended by the Lizard Management Plan (Wildland Consultants 2025b).

10.0 Potential Ecological Effects

10.1 Overview

Potential effects are set out below for the range of ecological features present within and adjacent to the proposed subdivision. Potential adverse impacts on indigenous vegetation, fauna, and their habitats are likely to primarily occur during initial construction of the residential development.

Potential adverse effects associated with the development include:

- Removal of indigenous vegetation.
- Damage and loss of wetlands.
- Removal of habitat for indigenous fauna.
- Disturbance to and/or mortality of indigenous birds and lizards.
- Increase in predation from domestic pets and mammalian pests.
- Increase in weed introductions from residential gardens.

Each of these potential effects is described in detail below.

10.2 Clearance of indigenous vegetation

Most of the area to be cleared is dominated by exotic species (Figure 2; Table 6). Approximately 0.9 hectares of indigenous vegetation will be removed. Most of the vegetation affected will be the lower quality tūmatakuru/matagouri shrubland. The loss of the indigenous vegetation will be a **minor** adverse ecological effect.

Table 6 – Total area and the affected areas of the vegetation and habitat types present at Homestead Bay, Otago.

Vegetation and Habitat Type	Area Size (ha)	Area Affected by Development (ha)	Percentage Effected (%)
Indigenous			

Vegetation and Habitat Type	Area Size (ha)	Area Affected by Development (ha)	Percentage Effected (%)
1. Mountain beech treeland (planted)	0.145	-	0%
2. Mountain beech-tī kōuka-kāpuka-mānatu-*Prunus* sp. treeland (planted)	0.213	0.213	100%
3. Blue gum/(mikimiki-sweet briar) treeland	0.269	-	0%
4. Tūmatakura-mikimiki-(sweet briar) scrub and shrubland	2.442	-	0%
5. Blackwood/elder-mikimiki-puka scrub	2.891	0.332	11%
6. [Kōhuhu]/mikimiki-sweet briar shrubland	3.905	0.269	8%
7. Tūmatakura shrubland	2.09	0.308	15%
8. (Elder-sweet briar-tūmatakura) shrubland	0.713	0.04	6%
9. (Common mat daisy) mossfield	0.625	-	0%
Total	**13.293**	**1.189**	**9%**
Exotic			
10. Radiata pine forest (plantation)	1.324	1.324	100%
11. Lombardy poplar-Lawson's cypress-argle apple treeland (shelterbelt)	2.198	2.198	100%
12. Eucalyptus spp.-pin oak-Lombardy poplar treeland (planted)	1.145	1.139	99%
13. Ryegrass-(browntop-cocksfoot-sweet vernal) grassland (productive farmland)	185.851	134.899	73%
14. Cocksfoot-sweet vernal stonefield	1.222	0.02	2%
Total	**191.74**	**139.58**	**73%**
Freshwater			
15. Soft rush-browntop-sharp spike sedge rushland marsh	0.041	0.041	100%
16. Yorkshire fog marsh	0.032	0.032	100%
17. Soft rush-floating sweet grass-Yorkshire fog grassland swamp	0.009	0.009	100%
18. Ephemeral wetland	0.129	0.040	31%
19. Pond	0.327	0.314	96%
Total	**0.538**	**0.436**	**81%**

10.3 Damage and loss of wetlands

The proposed subdivision development will require the removal of two marsh wetlands (0.073 hectares), one swamp wetland (0.009 hectares), and three ephemeral wetlands (0.045 hectares). The total area of wetlands affected is 0.095 hectares. All these wetlands are in a degraded state due to their small size, isolated location, soil compacted and exotic plant species dominance. However, regardless of their condition the ephemeral wetlands are rare, unique and threatened habitat type in New Zealand. Under a long inundation scenario these wetlands might have indigenous plants in them. The loss of the marsh, swamp and ephemeral wetlands are a **more than minor to major** adverse effect. Ephemeral wetlands are sensitive to infilling, soil compaction from humans, cattle, and vehicles. During the construction phase of the development the remaining ephemeral wetland is at risk of being driven across by a contractor or infilled.

There will be the residential development within 100 metres of the wetland, with an increase in disturbance. The potential damage to the remaining ephemeral wetland would be a **more than minor**

adverse effect. But ephemeral wetlands of this type get the water from rainfall are used to variation in inundation and may preserve its value.

10.4 Indigenous lizards

The proposed works will result in the permanent displacement, injury, and death of individual lizards within the construction footprint. This effect is likely to be **more than minor** without mitigation.

Disturbance during construction to lizards includes dust, vibration, and noise. This disturbance is likely to disrupt normal behaviour, including social dynamics in lizard populations adjacent to the construction footprint as a result of construction activity. Across the site, this effect is likely to be **less than minor** without mitigation.

Lizards and their habitat were found throughout the site and loss of some poorer quality habitats cannot be avoided. This will result in permanent habitat loss for indigenous lizards at this site. Due to the low-moderate density of lizards present, this effect is likely to be **minor** without mitigation.

The proposed subdivision and associated earthworks may lead to temporary effects on behaviour of lizards and/or social interactions, such as increased stress, leading to reduced population functionality, such as poor breeding and low population recruitment. This effect is likely to be **minor** without mitigation.

Figure 2. Vegetation and habitat types present and the footprint of the proposed subdivision development at Homestead Bay, Queenstown

The proposed subdivision will increase domestic cat abundance, as well as attract rodents, which may have an impact on lizard populations adjacent to the impact site. Due to the already high abundance of invasive predators including mice and hedgehogs, the effect is likely to be **minor** without mitigation.

10.5 Indigenous avifauna

Habitats at the site are of low value for indigenous avifauna. Avifauna habitat is found throughout the property and partial loss of habitats cannot be avoided. This habitat loss will likely have little effect on the wider population of avifauna in the area. The proposed development will remove *c.*95 hectares of mostly open exotic pasture grassland habitat, as well as the smaller areas listed above in Section 10.2. Indigenous bird species that may utilise existing open exotic grassland habitats present on site, such as kāhu/swamp harrier (*Circus approximans*), spur-winged plover (*Vanellus miles novaehollandiae*), pīhoihoi/New Zealand pipits and kārearea/eastern falcon will be able to disperse and utilise surrounding and nearby habitats. However, vegetation removal will reduce the habitat size; therefore, this effect is likely to be **minor** without mitigation. As amenity vegetation develops, indigenous and exotic birds will be present and possibly provide a food source for raptors.

Dust, vibration and noise caused by proposed subdivision construction may disturb present avifauna. Given the relatively large ranges and high mobility of avifauna, there is the possibility of encountering birds outside of their usually preferred habitat. Nevertheless, avifauna mobility allows birds (outside of the breeding season) the ability to avoid adverse effects from construction activity. Across the affected area on the property, this effect is likely to be less than **minor** without mitigation.

Overall, the ecological effects of the proposed development on local indigenous bird populations, will be **minor**.

10.6 Indigenous invertebrates

Most of the site comprises habitats likely to be of low value for indigenous terrestrial invertebrates. Moderate value scrub, shrubland and treeland habitats containing indigenous woody vegetation that may support populations of more noteworthy species is also present. However, most of these latter areas are expected to be retained and enhanced through a planting programme. The potential effects on terrestrial invertebrates resulting from the proposed development are presented below.

Vegetation clearance will likely cause the death, injury and displacement of some New Zealand praying mantis (At Risk — Declining) individuals as well as many common species of invertebrate. However, most of the areas that are likely to support the highest numbers of New Zealand praying mantis as well as other potentially notable species will be retained.

Invertebrate habitat is found throughout the site and the permanent loss of some of these habitats cannot be avoided but will be exchanged for amenity vegetation as it develops. This will result in habitat loss for indigenous invertebrates at this site. However, most of the areas potentially subject to future earthworks contain low-value habitats for terrestrial invertebrates. Most of the areas comprising higher value scrub, shrubland and treeland already represent fragmented islands of habitat at the site, and these will be retained and enhanced. The effects of habitat loss and fragmentation are therefore expected to be minor without mitigation.

Ongoing dust and vibrations may impact insect communication and may cause injury and illness due to blocked respiratory apparatus. Dust is likely to be detrimental to all invertebrates, but particularly diurnal insects and herbivores. Invertebrate biodiversity in disturbed areas is likely to be reduced. Vehicle collisions are also likely to cause mortality. However, few if any notable species are likely to be present in the immediate vicinity of the works due to the suboptimal nature of the impacted habitats.

Individuals that happen to be impacted may be able to disperse and utilise the higher value habitats on site. The effects of ongoing disturbance are therefore expected to be minor without mitigation.

The proposed subdivision will likely lead to increases in the abundance of domestic cats as well as rodents. Increases in introduced predators could remove large-bodied species from the ecosystem, which may affect invertebrate assemblages. Large-bodied invertebrates and those with limited defensive mechanisms are at greater risk of predation. However, due to the suboptimal nature of (most of) the habitats impacted by the development, and the likely absence of large-bodied and otherwise notable invertebrates (with the possible exception of the New Zealand praying mantis), the effects of increased risk of predation are expected to be minor without mitigation.

Overall, the ecological effects of the proposed development on local indigenous invertebrate populations, will likely be **minor** without mitigation.

10.7 Effects of residential dwellings

Following completion of the development, increased use of the site by people (residents and visitors) could lead to increased disturbance of fauna and effects on the reserve areas.

There is considerable potential for invasive plant species to be intentionally planted in gardens and then escape or be dumped (as garden waste) into the surrounding natural areas. Gardens are a key source of exotic plants that spread into indigenous habitats (Sullivan *et al.* 2005). Dumping of garden waste can also lead to the establishment of weeds in natural areas and reserves.

Amenity gardens, that plant indigenous plant species such as harakeke (*Phormium tenax*), kōwhai (*Sophora microphylla*), and tī kōuka/cabbage tree (*Cordyline australis*) will benefit indigenous forest bird species that are currently missing from this property. Tūī (*Prosthemadera novaeseelandiae*) are often observed in the neighbouring residential area, Jacks Point. Jacks Point contains a diverse range of indigenous trees, shrubs and tussocks in reserves, along street margins and in private gardens. The current planting plan for the Homestead subdivision has indigenous plantings allocated in fragments on the outer edges of the development.

A typical complement of small introduced pest mammals will already be present within the site and adjoining reserves. The abundance of pest animals could increase following development of the proposed subdivision because pests such as rodents and hedgehogs, often thrive around human habitation. Any increase in the abundance of pest animals will place a greater threat on the indigenous plants and animals in the surrounding natural areas.

Domestic dogs and cats will likely be brought to the subdivision as pets of the residents. Uncontrolled pets can threaten (disturb or kill) indigenous wildlife. However, domestic dogs and feral cats will already be present throughout the landscape, and existing domestic cats will also range across large areas from existing houses.

11.0 Mitigation of Potential Ecological Effects

11.1 Overview

The following opportunities to avoid, minimise, remedy, offset or compensate potential adverse ecological effects of the proposed subdivision development are addressed below:

- Remedy indigenous vegetation loss by enhancing and extending remaining indigenous vegetation.

- Remedy remaining ephemeral wetland by developing and implementing a Wetland Management Plan, that will include indigenous vegetation enhancement and monitoring.
- Compensate for wetland loss by contributing to a local wetland restoration project.
- Minimise potential adverse effects of removing potential lizard habitat.
- Minimise potential adverse effects of removing indigenous avifauna habitat.

Many of the wetlands cannot be avoided due to the development design. To avoid the small wetlands present would require a 100-metre buffer of no construction. This would remove large areas of land that could not be built on. Due to time constraints and expensive impractical development redesign, wetlands cannot be avoided. The development design will require the wetlands to be removed, so they cannot be remedied. The property was also assessed to create more wetland habitat but no appropriate areas were suitable for this. Offsetting the wetland loss is the next option, however due to the relatively dry property there are few freshwater habitats that can be extended or enhanced. However, the gullies present perfect opportunities for indigenous habitat enhancement. Enhancing these gullies will also have a flow on effect by improving the buffering around the ephemeral streams that feed into Lake Whakatipu.

11.2 Enhance indigenous vegetation

To mitigate the indigenous vegetation, fauna habitat and wetland loss, indigenous revegetation is recommended.

Revegetation can be implemented by two methods: 1) indigenous plantings of tūmatakuru and mikimiki within the property, ideally along the shrubland and scrub margins in clusters to increase the overall extent of that shrubland/scrub and 2) undertake weed control of 'very high' and 'high' priority ecological pest plants listed in Table 1, Section 5.0.

The proposed subdivision development already has plans to plant 19.02 hectares with indigenous shrubland, beech forest and riparian plants. It is important that these plantings include important food sources and shelter for indigenous birds and invertebrates. Such as plants like kōwhai, fuchsia (*Fuchsia excortica*), mānuka (*Leptospermum scoparium*), *Olearia* spp. and harakeke. They also plan to infill the remaining indigenous shrublands and scrub with appropriate species to fill in the gaps and increase the diversity of each remaining fragment. Extending and enhancing indigenous vegetation onsite will improve the potential habitat for indigenous lizards, birds, and invertebrates.

The indigenous vegetation will need ongoing monitoring and management of ecological pest plants species. Ecological pest plant species should be checked and controlled every 2-3 years.

11.3 Enhance and monitor ephemeral wetland

The ephemeral wetland could be enhanced through several restoration actions. The first and most beneficial action will be to remove stock from grazing the ephemeral wetland. This will reduce soil pugging created from stock. Planting appropriate low-statue indigenous plants such as *Juncus edgariae*, *Juncus distegus*, *Carex flaviformis*, and bog rush (*Schoenus pauciflorus*) around the wetland will help buffer the wetland from pollutants and retain soil moisture

Ceasing grazing will see grasses grow tall and limit the space for indigenous species found in ephemeral wetlands. This effect could be reduced by putting extra water in winter and spring. This will kill any exotic herbs and grasses and provide space for indigenous creeping plants to thrive.

The remaining ephemeral wetland needs to be fenced or marked out before construction begins to ensure physical damage is avoided. Consider placing permanent large rocks around the wetland to limit vehicles from crossing the wetland.

Information and experience of ephemeral wetlands is limited in New Zealand. The restoration of this wetland should be undertaken with the advice from a wetland specialist/ecologist. A Wetland Management Plan that includes restoration actions and monitoring will be developed to ensure the long-term survival of the ephemeral wetland. Any concerns reported during the monitoring will be addressed at the time.

11.4 Wetland loss compensation

Reconstructing more wetland habitat was also considered, however:

- A key principle of good effects management is "no trading down". It was considered that the creation of entirely new habitat would comprise trading down.
- No suitable location could be found on the property as it is a very dry site that is well drained.
- Reconstructing an ephemeral wetland was considered too risky because of the lack of information in regards to the creation of this wetland type.

Therefore, offsetting and/or compensation is considered the most appropriate way to manage the wetland loss/adverse effect.

Enhancing and protecting another local ephemeral wetland is the best scenario in ensuring these rare ecosystems are sustained in the region. However, gaining access and permission from the current landowner to come to an agreed arrangement to enhance and manage the ephemeral wetland may be complex. Areas managed for the purposes of offsetting or compensation typically require some level of legal protection which may lead to further complexities. Wetlands on private land can present many difficulties in terms of consent, access and ongoing management. A wetland restoration project that already has a management plan is the best option as it provides confidence that compensation is funding a project that is more likely to be successful.

Wetland rehabilitation is strongly preferred over other interventions. Good effects management practice stresses ecological equivalence. Several options were investigated (see memo, Wildland Consultants 2025c).

Estimated costs

The monetary value required to rehabilitate or protect an adequate area of wetland habitat to guide the determination of an appropriate financial contribution for an offsetting or compensation offer needs to be calculated. To estimate the cost to create wetland habitat the NIWA/DairyNZ guide has been used (Tanner *et al.* 2022). This guide focusses on a ‘swamp’ class of wetland, nonetheless is still helpful in estimated wetland construction costs and can help to estimate an appropriate compensation monetary value. Many costs are variable and the average cost has been used for this calculation (Table 7). We note that costs are likely to have gone up since the guide was published in 2022.

We recommend that the wetland area that is considered for the purposes of offsetting/compensation is 0.285 hectares. This represents a 1:3 ratio with lost wetland area. The 1:3 ratio for is typically used to account for the uncertainty of success of the management interventions and the time lag until it reaches full ecological function. In this case, the wetlands that would be lost if the project went ahead are all in a degraded state. However, a 1:3 ratio is nevertheless appropriate to address the loss of wetland margin buffer planting and due to consideration of the unique aspects of ephemeral wetlands. There are complexities in rehabilitating this habitat due to the limited knowledge around these rare ecosystems. This ratio helps ensure that the overall goal of "no net loss" and preferably a "net gain" of biodiversity and function is achieved. We consider that the cost to re-create wetlands should be sufficient in compensating for the loss of the wetlands at the site.

Table 7 – Indicative costs to establish a new wetland if all work is undertaken by contractors at commercial rates in 2022. Indicative costs have been taken from the *Constructed Wetland Practitioners Guide: Design and Performance Estimates* (Tanner *et al.* 2022).

Cost Item	Details	$/ha (excluding GST)	Average	Indicative Project Cost	Notes/Explanation
Site survey and wetland design	Lump sum	$3,000 - $7,000	$5,000.00	1,425.00	Survey of wetland site and design, including positioning of inlet and outlet structures, treatment basins and estimate of excavation works.
Earthworks	$6.25/m^2 of wetland surface area for initial site clearance. $15/m^3 for excavation.	$130,000	$130,000.00	37,050.00	Includes excavation and re-laying of topsoil to form wetland base for planting, and construction of a suitable weir and outlet structure at downstream end.
Fencing	$5.00 - $10.00 /linear metre (plus gate)	$1,000 - $5,000	$5,000.00	1,425.00	Two or four-wire electric fence on two or four sides of wetland (assumes optimised wetland shape to minimise fence length).
Plant purchase	$1.80 - $5.00 /plant	$25,000 - $60,000	$17,500.00	4,987.50	2.04 plants per square metre at 0.7 metre spacings within the wetland area to be flooded. All plants purchased from commercial nurseries.
Planting	$2.00 - $3.00/plant	$28,000 - $43,000	$7,500.00	2,137.50	Assumes planting is done by commercial planters.
Replacement planting (blanking)	$1.80 - $5.00/plant	$2,500 - $5,000	$3,750.00	1,068.75	5% mortality assumed (includes plant purchase and planting).
Project/construction management	$1.00/m2 of wetland	$10,000	$10,000.00	2,850.00	Earthworks and planting supervision and planning.
Resource consent	Variable	Variable		0	Dependent on regional council.
Maintenance/weed control	Lump sum	$2,000 - $4,000	$3,000.00	855.00	Per annum. Assumes bi-yearly clean-out of sedimentation pond. Nine years of maintenance (three years annual visit, six years of bi-annual visits).
Total Construction Cost for 0.285 Hectares of Wetland				**$51,798.75**	

These calculations assume all work is done by professional contractors at commercial rates. Other costs that could be necessary:

- Resource consent.
- Purchase of land to enable wetland restoration, or lease agreement costs.
- Land protection set up.
- Wetland monitoring.
- Ephemeral wetland turf species management. Ephemeral wetland herb species are not readily grown by nurseries. Specialised collection, germination, and monitoring may be needed to source these.

These additional costs are highly dependent on the requirements of the chosen restoration site and could range from $10,000 - $100,000.00.

To account for the wetland loss that will be caused by the proposed development, we estimate that approximately $52,000.00 needs to be contributed to a local wetland restoration project. To account for the loss of the rare ephemeral wetlands, it would be ideal if compensation went towards support the same habitat type. However, as these are a naturally uncommon ecosystem type, it is difficult to find an appropriate site.

Wetland restoration project

After investigating a few local wetland restoration projects to support, three wetlands managed by Mana Tāhuna Charitable Trust (Mana Tāhuna) have been provisionally selected. Mana Tāhuna already have management plans for three local wetlands: north end Waiwhakaata/Lake Hayes wetland, south end Waiwhakaata/Lake Hayes wetland and Dalefield wetland. Restoration works has already begun in the Waiwhakaata wetland areas and is already showing to be significantly improving the wetland habitats. These wetlands however, still need ongoing work and additional funding for ongoing enhancement and sustainability of these wetlands. Restoration works have not begun in the Dalefield wetland, the compensation support from the RCL Group will enable Mana Tāhuna to begin restoration works planned. Mana Tāhuna are a reputable organisation and have proven to be excellent in undertaking and delivering restoration projects.

The RCL Group are proposing to offer three staged compensation grants with a total sum of $150,000.00, to support the restoration of a local wetland. This will be either given to Mana Tāhuna to support their three wetland restoration projects or to another wetland project approved by DOC, Otago Regional Council or Kā Rūnaka. Considering indicative cost to recreate the wetlands and the extra costs listed above, this is an appropriate compensation measure to account for the loss of the wetlands due to the development. These three wetlands are also within the same ecological region as the wetlands that will be lost at Homestead Bay (Lakes Ecological Region). Enhancing these wetlands will benefit the local biodiversity as well as local communities that are able to have access to these freshwater habitats.

11.5 Avoid, minimise, and remedy potential effects on lizards

Most of the high-quality lizard habitat within the Homestead Bay subdivision can be avoided due to minimal disturbance to the gullies and steep terrace risers present on site. Existing areas of tūmatakuru/matagouri and other indigenous shrublands/scrub will be retained where possible in stormwater services and reserve lots. Disturbance to areas of high-quality rocky habitat and indigenous shrubs in the southeastern gully floor will be avoided during construction.

Mitigation for the effects to McCann's skink can be largely achieved through habitat enhancement and gaining the Wildlife Act approval, implementing the Lizard Management Plan that will be satisfactory by the Department of Conservation.

To minimise lizard harm and death during construction of the habitats that cannot be avoided, a salvage of lizards and release will need to be undertaken. Salvages will be staged in concurrently with the staging of works for each area. Earthworks will proceed into salvaged lizard habitats within a maximum of two weeks after the salvage has been completed. This means the expanded or enhanced lizard habitats must be available before any salvaged lizards are caught. The Project Herpetologist will be notified once the works commence. The Department of Conservation's lizard mitigation guidelines (Department of Conservation 2019) recommend monitoring to evaluate the success of the salvage operation, post release. More details on these management measures are outlined in the LMP (Wildland Consultants 2025b).

11.6 Avoid and minimise potential effects on avifauna

Potential adverse effects on indigenous birds will be minimised if the tree-felling works are undertaken outside of the breeding season (August to February) and vegetation management actions outlined above are implemented. If works are required during the breeding season, an experienced and suitably qualified ecologist should undertake a survey for nesting indigenous birds within the proposed trees to be felled. A survey should be undertaken no earlier than eight days prior to works commencing during the breeding season. Or if works stop for more than eight days during the breeding season and

when a new area is to be worked on (staged works). If breeding indigenous birds are identified, a setback of 50 metres (100 metres for open pasture grassland areas) between the active nest and works will be required until the chicks have fledged. The pīhoihoi/New Zealand pipit and tōrea/South Island pied oystercatcher may potentially breed in the open pasture grassland habitat. Pīhoihoi/New Zealand pipit will not breed in intensively grazed paddock areas, so these areas should continue to be intensively grazed until earthworks begin (if starting in the breeding season). If works are to be undertaken during breeding season (August to February) in these areas, then an Incidental Discovery Protocol should be prepared for the earthworks contractors before they begin work. The Incidental Discovery Protocol will need to be followed and will be similar to the management above.

11.7 Foster environmental protection by residents

To enhance the natural character of the gullies and other proposed reserves, future landowners and residents should avoid planting any plant species that may be invasive. This includes species that are listed in the Otago Regional Pest Management Plan 2019-2029 (Otago Regional Council 2019) and the National Pest Plant Accord (Ministry for Primary Industries 2020). Dumping of garden waste in gullies should also be prevented through strong advocacy or high fencing.

A list of suitable indigenous plant species for planting in amenity and residential gardens at this site could also be provided to future residents, to encourage the planting of ecologically-appropriate species (Table 8). All plant species listed in Table 5 provide an important resource for indigenous bird species and or lizards.

Table 8 – List of indigenous plant species suitable for planting in amenity and residential gardens at Homestead Bay, Otago.

Species	Common Name	Plant type
Carmichaelia petriei	Desert broom	Shrub
Carpodetus serratus	Piripiriwhata, marbleleaf	Tree
Coprosma acerosa		Small shrub (low-lying)
Coprosma crassifolia		Shrub
Coprosma dumosa		Shrub and/or small tree
Coprosma intertexta		Shrub
Coprosma lucida	Karamū	Shrub and/or small tree
Coprosma propinqua	Mikimiki	Shrub and/or small tree
Coprosma rugosa		Shrub
Coprosma virescens		Shrub and/or small tree
Cordyline australis	Tī kōuka, cabbage tree	Big tree
Corokia cotoneaster	Korokio	Shrub
Discaria toumatou	Tūmatakuru, matagouri	Shrub and/or small tree
Fuchsia excorticata	Kōtukutuku, tree fuchsia	Tree
Fuscospora cliffortioides	Tawhairauriki, mountain beech	Big tree
Griselinia littoralis	Kāpuka	Tree
Hoheria glabrata	Houhere, lacebark	Tree
Leptospermum scoparium	Mānuka	Tree
Melicytus alpinus		Small shrub

Species	Common Name	Plant type
Myrsine australis	Māpou	Tree
Myrsine divaricata	Weeping māpou	Small tree
Olearia avicenniifolia	Akeake	Tree
Olearia fimbriata		Shrub and/or small tree
Olearia lineata		Shrub and/or small tree
Olearia odorata	Scented tree daisy	Shrub and/or small shrub
Phormium tenax	Harakeke, flax	Shrub
Pittosporum tenuifolium	Kōhūhū	Tree
Podocarpus nivalis	Tauhinu, snow tōtara,	Small shrub
Pseudopanax crassifolius	Horoeka, lancewood	Tree
Pseudopanax ferox	Fierce lancewood	Tree
Sophora microphylla	Kōwhai	Big tree
Veronica salicifolia	Koromiko	Shrub

11.8 Summary

Table 9 provides a summary of the level of potential effects that will remain if all the above mitigation actions are carried out in full.

12.0 Conclusion

A subdivision is proposed for *c.*200 hectares of gently rolling, rural land at Homestead Bay, Otago. The development will mainly consist of residential property but will also have small reserves, commercial land, and a school within it. The development already has plans to plant a significant area with indigenous plant species.

Most of the exotic vegetation, part of the tūmatakuru/matagouri shrubland, swamp and marsh wetlands, pond, and three ephemeral wetlands will be cleared to facilitate the proposed development. McCann's skink is present in low numbers within the exotic pasture grasslands and tūmatakuru/matagouri shrublands. The Threatened – Nationally Endangered kārearea/eastern falcon and At Risk – Declining pīhoihoi/New Zealand pipit occasionally utilise the exotic pasture grassland habitat. Aquatic habitats and wetlands present are dominated with exotic vegetation (except for one ephemeral wetland). Aside, from the exotic dominance, wetlands are still moderately ecological valuable due to them being significantly reduced nationwide. The ephemeral wetlands are particularly valuable due to their unique habitat.

The proposed development will result in the loss of 1.2 hectares indigenous vegetation, 0.44 hectares wetland habitat and 7.5 hectares lizard habitat but will gain 19.0 hectares of indigenous vegetation and habitat. Approximately, 12.1 hectares of current indigenous vegetation will benefit from restoration actions such as plantings, and weed control. The largest remaining, ephemeral wetland will benefit from the development and implementation of a restoration management plan and ongoing management actions and monitoring.

Mitigation measures to manage effects include:

- Increasing extent and diversity of present indigenous vegetation and habitats through restoration actions such as planting, and ecological weed control.
- Developing and implementing an ephemeral wetland restoration/management plan.

- Provide compensation support to a local wetland restoration project.
- Avoid tree-felling in the avifauna breeding season. If earthworks need to be undertaken in the avifauna breeding season, an Incidental Discovery Plan will need to developed before works begin in the exotic pasture grassland areas.
- Continue grazing exotic pasture grasslands until construction works begin.
- Preparation and implementation of a lizard management plan for the site.

Table 9 – Summary of adverse effects following mitigation/compensation actions.

Potential Effect	Ecological Feature Affected	Timescale of Effect	Specific Effect	Initial Level of Effect	Measure to Address Effect	Final Level of Effect
Removal of vegetation	Tūmatakuru/matagouri shrubland	Permanent	Removal of vegetation	Minor	Extend and enhance remaining shrublands by planting appropriate indigenous species and removing ecological weeds.	Less than minor
Loss and/or damage of wetlands	Swamp and marsh wetland	Permanent	Removal of wetland habitat	Major	Provide compensation support to a nearby wetland restoration project.	Less than minor
	Ephemeral wetlands	Permanent	Removal of wetland habitat	Major	Enhance the remaining ephemeral wetland and provide compensation support to a nearby wetland restoration project.	Less than minor
		Temporary	Soil compaction	More than minor	Mark out boundary of wetland with fence or boulders. Restoration plan, implementation, and monitoring.	Less than minor
		Permanent	Wetland disturbed because it is in a dried out state	More than minor	Plant indigenous species around the wetland to help retain soil moisture. Monitor wetland condition and hydrology. Investigate appropriate actions if negative effects are noticed.	Less than minor
Disturbance to and/or mortality of indigenous birds	Threatened, At Risk, and protected bird species	Permanent	Removal of habitat, accidental injury/death/displacement, disturbance during earthworks	More than minor	Create more habitat and enhance current habitat. Avoid removing trees during breeding season.	Less than minor
Disturbance to and/or mortality of	McCann's skink (protected species)	Permanent	Accidental injury/death/ displacement, disturbance during earthworks, habitat loss and fragmentation, and	More than minor	Continue grazing land. Develop a LMP and undertake a lizard salvage before works begin.	Minor

Potential Effect	Ecological Feature Affected	Timescale of Effect	Specific Effect	Initial Level of Effect	Measure to Address Effect	Final Level of Effect
indigenous lizards			breeding failure/behavioural effects			
Disturbance to and/or mortality of indigenous invertebrates	At Risk and unassessed invertebrates	Temporary to permanent	Accidental injury/death/ displacement, disturbance during earthworks, habitat loss and fragmentation	Minor	Enhance and increase shrubland habitat.	Less than minor
Increased predation pressure from domestic pets and pest animals	Indigenous birds, lizards, and invertebrates (At Risk and Threatened)	Permanent	Increased predation	More than minor	Enhance and increase shrubland and scrub habitat for refuge.	Less than minor

* In absence of mitigation measures.

Acknowledgments

Amanda Leith (Planner/Director of Remarkables Planning) is thanked for providing useful information and site access. Farm Managers Dave Atkin and Matt Little are thanked for allowing access to the active farm areas.

References

Allibone, R. (2023): *Homestead Bay Aquatic Ecology Assessment*. Water Ways Consulting Contract Report 127-23. 11 pp.

Ausseil A-G., Gerbeaux P., Chadderton L., Stephens T., Brown D. and Leathwick J. (2008): *Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands*. Prepared for Department of Conservation. Landcare Research Contract Report: LC0708/158. 172 pp
Atkinson I.E. (1985): *Derivation of vegetation mapping units for an ecological survey of Tongariro National Park, North Island, New Zealand*. New Zealand Journal of Botany 23: 361-378.

Beale, S. (2023): *Terrestrial Ecology Assessment*. Beale Consultants Ltd. Reference JEA04. Prepared for RCL Henley Downs Limited. 13 pp.

Buckley T.R., Palma R.L., Johns P.M., Gleeson D.M., Heath A.C.G., Hitchmough R.A., Stringer I.A.N. (2012): *The conservation status of small or less well known groups of New Zealand terrestrial invertebrates*. New Zealand Entomologist 35(2): 137–143.

de Lange, P.J., Gosden, J., Courtney, S.P., Fergus, A.J., Barkla, J.W., Beadel, S.M., Champion, P.D., Hindmarsh-Walls, R., Makan, T. and Michel, P. (2024): *Conservation status of vascular plants in Aotearoa New Zealand, 2023*. New Zealand Threat Classification Series 43. Department of Conservation, Wellington. 105 pp.

Department of Conservation 2019: Key Principles for lizard salvage and transfer in New Zealand. Lizard Technical Advisory Group. Department of Conservation, Wellington. Available online: https://www.doc.govt.nz/contentassets/02b1a908bcb34ff1a37652 ad357d3e2c/lizard-salvage-and-transfer-nz.pdf

Fraser S., Singleton P., and Clarkson B. (2018): *Hydric soils – field identification guide*. Manaaki Whenua – Landcare Research contract report prepared for Tasman District Council. 75 pp.

Holdaway R.J., Wiser S.K. and Williams P.A. (2012): *Status Assessment of New Zealand's Naturally Uncommon Ecosystems*. Society for Conservation Biology. Conservation Biology, Volume 26, No. 4, 619-629. 10 pp.

Jarvie S., Barkla J., Rance B., Rogers G., Ewans R., and Thorson M. (2024): *Regional Conservation Status of Indigenous Vascular Plants in Otago*. Otago Regional Council, Otago Threat Classification Series 3, 2024/3. 138 pp.

Johnson P.N. and Gerbeaux P. (2004): *Wetland types in New Zealand*. Department of Conservation, Wellington. 184 pp.

Johnson P. and Rogers G. (2003): *Ephemeral wetlands and their turfs in New Zealand*. Science for Conservation 230. Department of Conservation, Wellington. 88pp.

Leschen, R. A. B.; Marris, J. W. M.; Emberson, R. M.; Nunn, J.; Hitchmough, R. A.; Stringer, I. A. N. (2012): *The conservation status of New Zealand Coleoptera*. New Zealand Entomologist 35(2): 91–98.

Ministry for the Environment (2020): *National Policy Statement for Freshwater Management 2020*. Wellington: Ministry for the Environment. 70 pp.

Ministry for the Environment (2020): *Resource Management (National Standards for Freshwater) Regulations*. Wellington: Ministry for the Environment. 62 pp.

Ministry for the Environment (2021): *Defining 'natural wetlands' and 'natural inland wetlands'*. Wellington: Ministry for the Environment. 25 pp.

Otago Regional Council (2025). *Otago Organisms of Interest (OOIs).* Otago Regional Council, Dunedin. https://www.orc.govt.nz/environment/biosecurity-and-pests/pest-management/organism-of-interest-ooi/. Accessed March 2025.

Otago Regional Council (2019). *Otago Regional Pest Management Plan 2019-2019.* Otago Regional Council, Dunedin. 101 pp.

Otago Regional Council (2019). *Otago Regional Policy Statement 2019*. Otago Regional Council, Dunedin. 156 pp.

Quality Planning (2023): *Determining the extent of adverse effects*. Quality Planning website is maintained by the Ministry for the Environment. Determining the Extent of Adverse Effects | Quality Planning. Accessed: March 2025.

Robertson H.A., Baird K., Elliott G.P., Hitchmough R.A., McArthur N.J, Makan T., Miskelly C.M., O'Donnell C.J., Sagar P.M., Scofield R.P., Taylor G.A., and Michel P. (2021): *Conservation status of New Zealand birds, 2021*. New Zealand Threat Classification Series 36. Department of Conservation, Wellington. 43 pp.

Tanner C.C., Depree C.V., Sukias J.P.S., Wright-Stow A. E., Burger D.F., and Goeller B.C. (2022): *Constructed Wetland Practitioners Guide: Design and Performance Estimates*. DairyNZ/NIWA, Hamilton, New Zealand. 40pp.

Trewick S., Hegg D., Morgan-Richards M., Murray T., Watts C., Johns P., and Michel P. (2022): *Conservation status of Orthoptera (wētā, crickets and grasshoppers) in Aotearoa New Zealand, 2022*. New Zealand Threat Classification Series 39. Department of Conservation, Wellington.

Wildland Consultants (2025a): *Wetland assessment at Homestead Bay, Queenstown*. Wildland Consultants Contract Report No. 7483a. Prepared for RCL Homestead Bay Limited. 54 pp.

Wildland Consultants (2025b): *Lizard Management Plan for Homestead Bay, Queenstown*. Wildland Consultants Contract Report No. 7483b. Prepared for RCL Homestead Bay Limited.

Wildland Consultants (2025c): *Wetland offsetting/compensation for the proposed development for Homestead Bay, Queenstown*. Wildland Consultants Contract Report No. 7522c. Prepared for RCL Homestead Bay Limited. 4 pp.

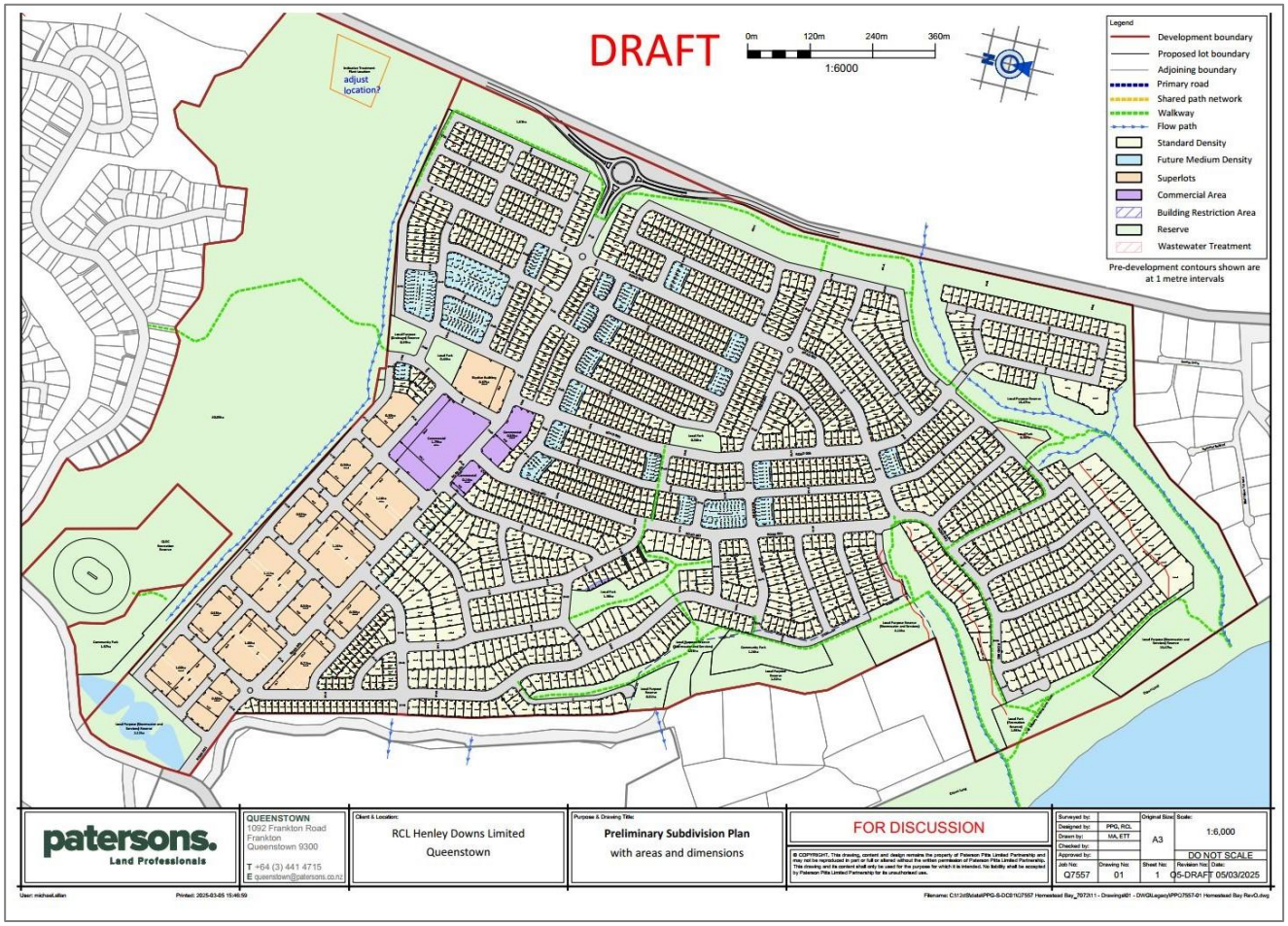
Queenstown Lakes District Council (2024): *Operative District Council Plan 2024*. Queenstown Lakes District Council (QLDC), Queenstown.

Appendix 1

Proposed draft plan of the subdivision development

Appendix 2

Proposed draft plan of the subdivision development



Appendix 3

Plant species list

Species	Common Name	Plant Type	Status	National Threat Status
Acacia dealbata	Silver wattle	Tree	Exotic	-
Acaena agnipila	Australian sheep's bur	Forb	Exotic	-
Acacia melanoxylon	Blackwood	Tree	Exotic	-
*Acaena novae-zelandiae**	Bidibidi	Forb	Indigenous Non-Endemic	Not Threatened
Acer pseudoplatanus	Sycamore	Tree	Exotic	-
Achillea millefolium	Yarrow	Forb	Exotic	-
Agrostis capillaris	Browntop	Graminoid	Exotic	-
Aira caryophyllea	Silvery hair grass	Graminoid	Exotic	-
Alnus sp.*	Alder	Woody mixed	Exotic	-
Alopecurus geniculatus	Kneed foxtail	Graminoid	Exotic	-
Anagallis arvensis	Scarlet pimpernel	Forb	Exotic	-
Anthoxanthum odoratum	Sweet vernal	Graminoid	Exotic	-
Anthosachne solandri	Pātītī taranui	Graminoid	Indigenous Endemic	Not Threatened
Arctium lappa	Burdock	Sub shrub	Exotic	-
Asplenium appendiculatum	Ground spleenwort	Fern	Indigenous Non-Endemic	Not Threatened
Asplenium flabellifolium	Necklace fern	Fern	Indigenous Non-Endemic	Not Threatened
Azolla rubra		Fern	Indigenous Non-Endemic	Not Threatened
Bromus diandrus	Ripgut brome	Graminoid	Exotic	-
Bromus hordeaceus	Soft brome	Graminoid	Exotic	-
Buddleja davidii	Buddleia	Shrub	Exotic	-
Callitriche petriei		Forb	Indigenous Endemic	Not Threatened
Capsella bursa-pastoris	Shepherds purse	Forb	Exotic	-
Carex sp.		Graminoid	Indigenous Non-Endemic	-
Carex sp.		Graminoid	Indigenous Non-Endemic	Not Threatened
Carmichaelia petriei		Shrub	Indigenous Endemic	At Risk-Declining
Cerastium fontanum	Mouse-ear chickweed	Forb	Exotic	-
Chamaecyparis lawsoniana	Lawson cypress	Tree	Exotic	-
Chenopodium album	Fathen	Forb	Exotic	-
Chionochloa rubra subsp. *cuprea**	Copper tussock	Graminoid	Indigenous Endemic	Not Threatened
Chionochloa rigida subsp. *rigida*	Narrow-leaved snow tussock	Graminoid	Indigenous Endemic	Not Threatened
Cirsium arvense	Californian thistle	Forb	Exotic	-
Cirsium vulgare	Scotch thistle	Forb	Exotic	-
Colobanthus strictus		Forb	Indigenous Endemic	Not Threatened
Conium maculatum	Hemlock	Forb	Exotic	-

Species	Common Name	Plant Type	Status	National Threat Status
Coprosma petriei	Turfy coprosma	Shrub	Indigenous Endemic	Not Threatened
Coprosma propinqua	Mikimiki	Tree	Indigenous Endemic	Not Threatened
Coprosma sp.*		Woody mixed	Indigenous Non-Endemic	-
*Coprosma rugosa**		Shrub	Indigenous Endemic	Not Threatened
Cordyline australis	Tī kōuka, cabbage tree	Grass tree	Indigenous Endemic	Not Threatened
Cortaderia selloana	Pampas grass	Graminoid	Exotic	-
Cynosurus cristatus	Crested dogstail	Graminoid	Exotic	-
Cytisus scoparius	Broom	Shrub	Exotic	-
Dactylis glomerata	Cocksfoot	Graminoid	Exotic	-
Digitalis purpurea	Foxglove	Forb	Exotic	-
Discaria toumatou	Tūmatakuru, matagouri	Tree	Indigenous Endemic	Not Threatened
Dryopteris filix-mas	Male fern	Fern	Exotic	-
Dysphania pumilio	Clammy goosefoot	Forb	Exotic	-
Eleocharis acuta	Spike sedge	Graminoid	Indigenous Non-Endemic	Not Threatened
Erodium cicutarium	Storksbill	Forb	Exotic	-
Erythranthe moschata		Forb	Exotic	-
*Eucalyptus cinerea**	Argyle apple, silver dollar tree	Tree	Exotic	-
*Eucalyptus globulus**	Blue gum	Tree	Exotic	-
Festuca novae-zelandiae	Hard tussock	Graminoid	Indigenous Endemic	Not Threatened
Festuca rubra	Red fescue	Graminoid	Exotic	-
Fuscospora cliffortioides	Mountain beech	Tree	Indigenous Endemic	Not Threatened
Galium palustre	Marsh bedstraw;	Forb	Exotic	-
Gaultheria antipoda	Tāwiniwini, bush snowberry	Shrub	Indigenous Endemic	Not Threatened
Geranium molle	Dovesfoot cranesbill	Forb	Exotic	-
Glyceria fluitans	Floating sweetgrass	Graminoid	Exotic	-
Griselinia littoralis	Kāpuka	Tree	Indigenous Endemic	Not Threatened
Helichrysum filicaule	Slender everlasting daisy	SubShrub	Indigenous Endemic	Not Threatened
Hieracium lepidulum	Tussock hawkweed	Forb	Exotic	-
Holcus lanatus	Yorkshire fog	Graminoid	Exotic	-
Hordeum murinum	Barley grass	Graminoid	Exotic	-
Hydrocotyle novae-zeelandiae		Forb	Indigenous Endemic	Not Threatened
Hypericum humifusum	Trailing Saint John's wort;	Forb	Exotic	-
Hypericum perforatum	St Johns wort	Sub Shrub	Exotic	-
Hypochaeris radicata	Catsear	Forb	Exotic	-
Ileostylus micranthus	Pirita, green mistletoe	Mistletoe	Indigenous Non-Endemic	Not Threatened
Isolepis sp.		Graminoid	Exotic	-
Juncus articulatus	Jointed rush	Graminoid	Exotic	-
Juncus australis	Wīwī	Graminoid	Indigenous Non-Endemic	Not Threatened
Juncus bufonius	Toad rush	Graminoid	Exotic	-

Species	Common Name	Plant Type	Status	National Threat Status
Juncus effusus	Soft rush	Graminoid	Exotic	-
Juncus tenuis subsp. *dichotomus*		Graminoid	Exotic	-
Leontodon saxatilis		Forb	Exotic	-
Leucopogon fraseri	Pātōtara	Shrub	Indigenous Non-Endemic	Not Threatened
Lobelia perpusilla		Forb	Indigenous Endemic	Not Threatened
Lolium arundinaceum	Tall fescue	Graminoid	Exotic	-
Lolium perenne	Ryegrass	Graminoid	Exotic	-
Lupinus arboreus	Tree lupin	Shrub	Exotic	-
Malva neglecta	Dwarf mallow	Forb	Exotic	-
Malus sp.	Crabapple	Tree	Exotic	-
Marrubium vulgare	Horehound	Forb	Exotic	-
Melicytus alpinus		Shrub	Indigenous Endemic	Not Threatened
Muehlenbeckia australis	Puka	Vine	Indigenous Non-Endemic	Not Threatened
Muehlenbeckia axillaris	Pōhuehue	Vine	Indigenous Non-Endemic	Not Threatened
Muehlenbeckia complexa	Pōhuehue	Vine	Indigenous Non-Endemic	Not Threatened
Mycelis muralis	Wall lettuce	Forb	Exotic	-
Myosotis laxa	Water forget-me-not	Forb	Exotic	-
Pentapogon crinitus				-
Pilosella officinarum	Mouse-ear hawkweed	Forb	Exotic	-
Pinus radiata	Radiata pine	Tree	Exotic	-
Pittosporum tenuifolium	Kōhūhū	Tree	Indigenous Endemic	Not Threatened
*Plagianthus regius**	Mānatu, lowland ribbonwood	Tree	Indigenous Endemic	Not Threatened
Plantago australis	Swamp plantain	Forb	Exotic	-
Poa annua	Annual poa	Graminoid	Exotic	-
*Poa cita**		Graminoid	Indigenous Endemic	Not Threatened
Poa colensoi	Blue tussock	Graminoid	Indigenous Endemic	Not Threatened
Polystichum vestitum	Pūniu, prickly shield fern	Fern	Indigenous Endemic	Not Threatened
*Populus nigra**	Lombardy poplar	Tree	Exotic	-
Prunus sp.*	Ornamental cherry	Woody mixed	Exotic	-
Pseudotsuga menziesii	Douglas fir	Tree	Exotic	-
Pteridium esculentum	Rārahu, bracken	Fern	Indigenous Non-Endemic	Not Threatened
*Pyrus pyrifolia**	Nashi pear	Tree	Exotic	-
Quercus palustris	Pin oak	Tree	Exotic	-
Ranunculus glabrifolius	Kawariki	Forb	Indigenous Non-Endemic	-
Raoulia australis	Common mat daisy	Sub shrub	Indigenous Endemic	At Risk-Declining
Raoulia beauverdii		Sub shrub	Indigenous Endemic	At Risk-Declining
Raoulia subsericea	Turf mat daisy	Sub shrub	Indigenous Endemic	-
Ribes uva-crispa	Gooseberry	Shrub	Exotic	-

Species	Common Name	Plant Type	Status	National Threat Status
Rosa rubiginosa		Shrub	Exotic	-
Rubus schmidelioides		Vine	Indigenous Endemic	Not Threatened
Rumex acetosella	Sheep's sorrel	Forb	Exotic	-
Rumex crispus	Curled dock	Forb	Exotic	-
Rumex obtusifolius	Broad-leaved dock	Forb	Exotic	-
Sagina procumbens	Pearlwort	Forb	Exotic	-
Sambucus nigra	Elder	Shrub	Exotic	-
Sedum acre	Stonecrop	Forb	Exotic	-
Solanum nigrum	Black nightshade	Sub shrub	Exotic	-
Sonchus asper	Prickly puha	Forb	Exotic	-
Sophora microphylla	Kōwhai	Tree	Indigenous Endemic	Not Threatened
Sorbus aucuparia	Rowan	Tree	Exotic	-
Spergula arvensis	Spurrey	Forb	Exotic	-
Stellaria alsine	Bog stitchwort	Forb	Exotic	-
Taraxacum officinale	Dandelion	Forb	Exotic	-
Trifolium arvense	Haresfoot trefoil	Forb	Exotic	-
Trifolium pratense	Red clover	Forb	Exotic	-
Trifolium repens	White clover	Forb	Exotic	-
Ulex europaeus	Gorse	Shrub	Exotic	-
Urtica urens	Nettle	Forb	Exotic	-
Veronica cupressoides[1]	Cypress hebe	Shrub	Indigenous Endemic	Threatened-Nationally Endangered
Veronica sp.		Mixed	Indigenous	Not Threatened
Veronica salicifolia	Koromiko	Shrub	Indigenous Non-Endemic	Not Threatened
Verbascum thapsus	Woolly mullein	Forb	Exotic	-
Verbascum virgatum	Moth mullein	Forb	Exotic	-
Wahlenbergia albomarginata	New Zealand harebel	Forb	Indigenous Endemic	Not Threatened

[1] Planted species

Appendix 4

Avifauna species list

Scientific Name	Common Name	Threat Classification	Record Source	Likelihood Present
Indigenous				
Anthus novaeseelandiae novaeseelandiae	Pīhoihoi, New Zealand pipit	At Risk - Declining	Field survey eBird	Present
Anas gracilis	Tētē-moroiti, grey teal	Not Threatened	Field survey	Present
Anas rhynchotis variegata	Kuruwhengi, Australasian shoveler	Not Threatened	eBird	Unlikely
Aythya novaeseelandiae	Pāpango, New Zealand scaup	Not Threatened	eBird	Unlikely
Chlidonias albostriatus	Black-fronted tern	Threatened - Nationally Endangered	eBird	Unlikely
Circus approximans	Kāhu, swamp harrier, Australasion harrier	Not Threatened	Field survey and eBird	Likely
Cygnus atratus	Kakīānau, black swan	Not Threatened	eBird	
Egretta novaehollandiae	Mataku, white-faced heron	Not Threatened	eBird	Unlikely
Falco novaeseelandiae	Kārearea, bush hawk, bush falcon, southern falcon, eastern falcon	Threatened - Nationally Endangered	Field survey eBird	Present
Fulica atra australis	Australian coot	At Risk - Naturally Uncommon	eBird	Unlikely
Gerygone igata	Riroriro, grey warbler	Not Threatened	eBird	Likely
Heamatopus finschi	Tōrea, South Island pied oystercatcher	At Risk – Declining	eBird	Likely
Hirundo neoxena neoxena	Warou, welcome swallow	Not Threatened	eBird	
Larus dominicanus dominicanus	Karoro, southern black-backed gull	Not Threatened	Field survey eBird	Present
Phalacrocorax melanoleucos brevirostris	Kawau paka, little shag, little pied shag	At Risk - Relict	eBird	Unlikely
Podiceps cristatus australis	Pūteketeke, southern crested grebe	Threatened - Nationally Vulnerable	eBird	Unlikely
Porphyrio melanotus melanotus	Pūkeko	Not Threatened	eBird	Unlikely
Rhipidura fuliginosa fuliginosa	Pīwakawaka, South Island fantail	Not Threatened	Field survey	Present
Tadorna variegata	Pūtangitangi, paradise shelduck	Not Threatened	Field survey eBird	Present
Vanellus miles novaehollandiae	Spur-winged plover, masked lapwing	Not Threatened	eBird	Likely
Zosterops lateralis lateralis	Tauhou, silvereye, wax-eye, white-eye	Not Threatened	eBird	Likely
Introduced				
Alauda arvensis	Eurasian skylark	Introduced and Naturalised	eBird	Likely
Anas platyrhynchos	Mallard	Introduced and Naturalised	eBird	
Callipepla californica bunnescens	California quail	Introduced and Naturalised	Field survey eBird	Present

Scientific Name	Common Name	Threat Classification	Record Source	Likelihood Present
Carduelis carduelis britannica	European goldfinch	Introduced and Naturalised	eBird	Likely
Carduelis chloris	European greenfinch	Introduced and Naturalised	Field survey eBird	Present
Carduelis flammea cabaret	Common redpoll	Introduced and Naturalised	eBird	Likely
Emberiza citrinella caliginosa	Yellowhammer	Introduced and Naturalised	Field survey eBird	Present
Fringilla coelebs gengleri	Chaffinch	Introduced and Naturalised	eBird	Likely
Gymnorhina tibicen	Australian magpie	Introduced and Naturalised	eBird	Likely
Passer domesticus	House sparrow	Introduced and Naturalised	eBird	Likely
Sturnus vulgaris vulgaris	Common starling	Introduced and Naturalised	eBird	Likely
Turdus merula merula	Eurasian blackbird	Introduced and Naturalised	eBird	Likely
Turdus philomelos clarkei	Song thrush	Introduced and Naturalised	eBird	Likely
Emberiza citrinella caliginosa	Yellowhammer	Introduced and Naturalised	Field survey eBird	Present

Appendix 5

Site photographs

Plate A4-1 – Blue gum/(mikimiki-sweet briar) treeland in the southern gully.

Plate A4-2 – Dense tūmatakuru shrubland on lower hills slope at the northern end of the property.

Plate A4-3 – Less dense tūmatakuru shrubland on a terrace near the mid-section of the property.

Plate A4-4 – Pūtangitangi/paradise ducks within the currently dry modified pond near northern end of the property.

Plate A4-5 – European rabbit burrow under the tūmatakura-(mikimiki-sweet briar) scrub.

Call Free 0508 WILDNZ
Ph +64 7 343 9017
Fax +64 7 349018
ecology@wildlands.co.nz

99 Sala Street
PO Box 7137, Te Ngae
Rotorua 3042, New Zealand

Regional Offices located in Auckland; Christchurch;
Dunedin; Hamilton; Invercargill; Queenstown; Tauranga;
Wānaka; Wellington; Whangārei.

wildlands.co.nz

Wildlands