



Ladies Mile Ecological Assessment

Queenstown Lakes
District Council

December 2020



**Ladies Mile
Ecological Assessment**

Document Status

Version	Purpose of Document	Prepared By	Reviewer	Review Date
0.1	Draft for internal review	MJ	GD	9 December 2020
0.2	Draft for client review	MJ	GD	11 December 2020
0.3	Draft for client review	MJ	GD	23 April 2021
0.4	Draft for client review	MJ	RT/GD	28 July 2021
1.0	Final	MJ	GD	3 September 2021



TABLE OF CONTENTS

1	Introduction	1
1.1	Overview	1
1.2	Ecological Report Structure	1
1.3	Limitations	2
2	Description of the Activity and Existing Environment	4
2.1	Environmental Context	4
2.1.1	Physical Environment	4
2.1.2	Biological Environment	5
2.2	Description of Activity	6
3	Methodology	7
3.1	Desktop Research and Site Visit	7
4	Ecological Values	8
4.1	Vegetation	8
4.1.1	Vegetation Conservation Status	12
4.2	Fauna	13
4.2.1	Lizards	13
4.2.2	Avifauna	13
4.2.3	Other	15
4.3	Summary of Ecological Values	16
5	Ecological Significance and Value	17
5.1	Ecological Significance Criteria	17
5.1.1	Bird Ecological Values	20
5.2	Summary of Ecological Significance and Values	20
6	Ecological Constraints	21
7	Conclusions and Recommendations	23
7.1	Conclusions	23
7.2	Recommendations	24
8	References	25



LIST OF FIGURES

Figure 1: Area of Ladies Mile to be rezoned.	1
Figure 2: Properties in green visited and assessed by a site visit.	3
Figure 3: Associated property numbers.	8
Figure 4: Location of additional properties where matagouri was observed.	13

LIST OF TABLES

Table 1: Changing conservation status of bird species.	14
Table 2: Summary of Ecological Values.	16
Table 3: Assessment of the indigenous vegetation and habitat of indigenous fauna using the ecological criteria in the EIANZ Guidelines and the QLDC District Plan.	18

LIST OF APPENDICES

Appendix A – Lizard Assessment



1 Introduction

1.1 Overview

The Queenstown Lakes District Council (QLDC) has engaged Candor3 to undertake comprehensive master planning for the Ladies Miles area in Queenstown (see Figure 1). In order to understand if the land associated with the masterplan has any ecological constraints, Candor3 commissioned e3Scientific to identify the ecological values and assess the potential impacts of future development within the study area.

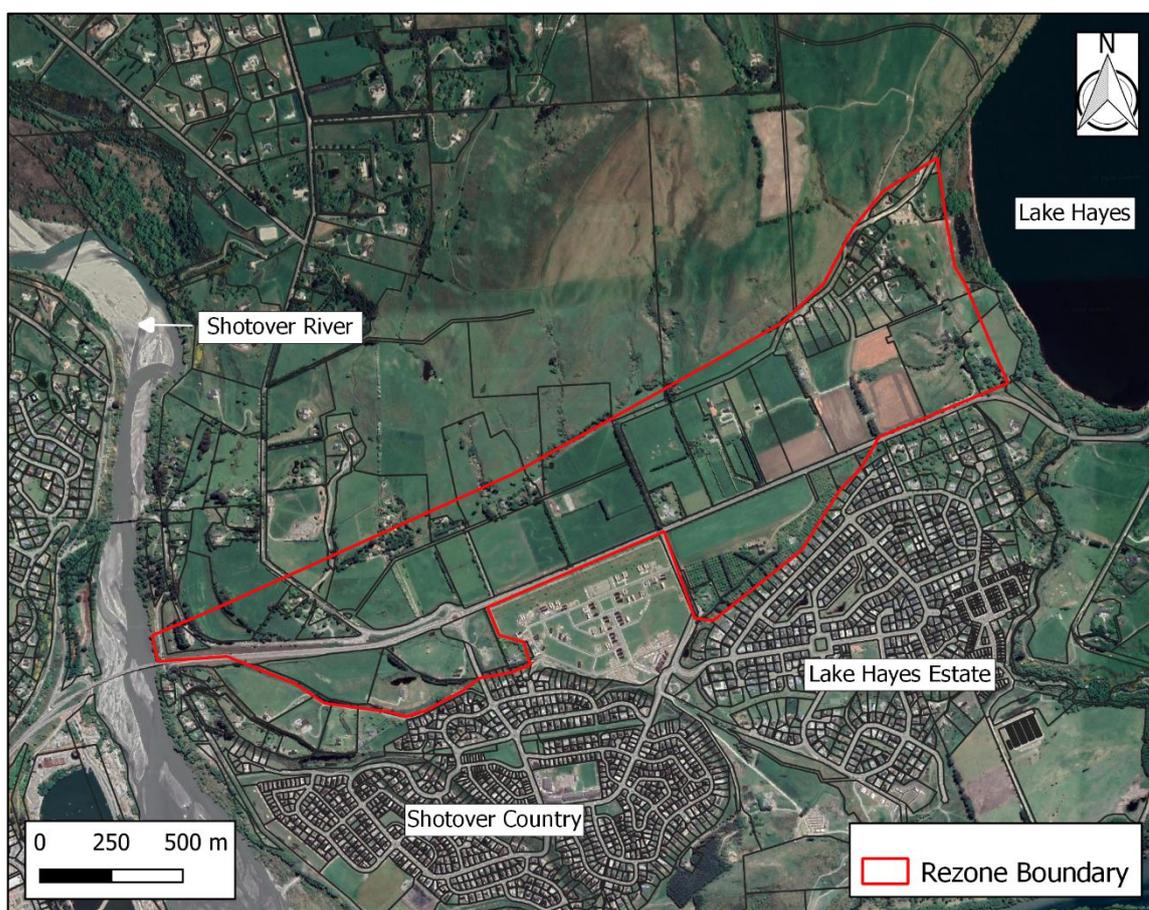


Figure 1: Area of Ladies Mile to be rezoned.

Basemap Source: Aerial imagery sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 4.0 New Zealand Licence.

1.2 Ecological Report Structure

The report is structured as follows:

Ladies Mile Ecological Assessment
Document ID: 20077



- Section 2: Description of the environmental context.
- Section 3: The methodology employed during the ecological assessment.
- Section 4: Description of the flora and faunal values present within the study area.
- Section 5: Assessment of the significance of the ecological values within the study area.
- Section 6: Ecological constraints
- Section 7: Conclusions and recommendations.

1.3 Limitations

e3s performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental science profession. No warranties, express or implied, are made. The confidence in the findings is limited by the Scope of Work, and limited data due to the site visit being at one time of year. A full range of biota that are present at this site may not have been seen or recorded, however, desktop research was utilised to aid the assessment.

The results of this assessment are based upon site inspections conducted by e3s personnel, and information provided in scientific literature. All conclusions and recommendations regarding the properties are the professional opinions of e3s personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, e3s assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside e3s, or developments resulting from situations outside the scope of this project.

Due to site access restrictions the areas that have been assessed through a site visit are shown in Figure 2.



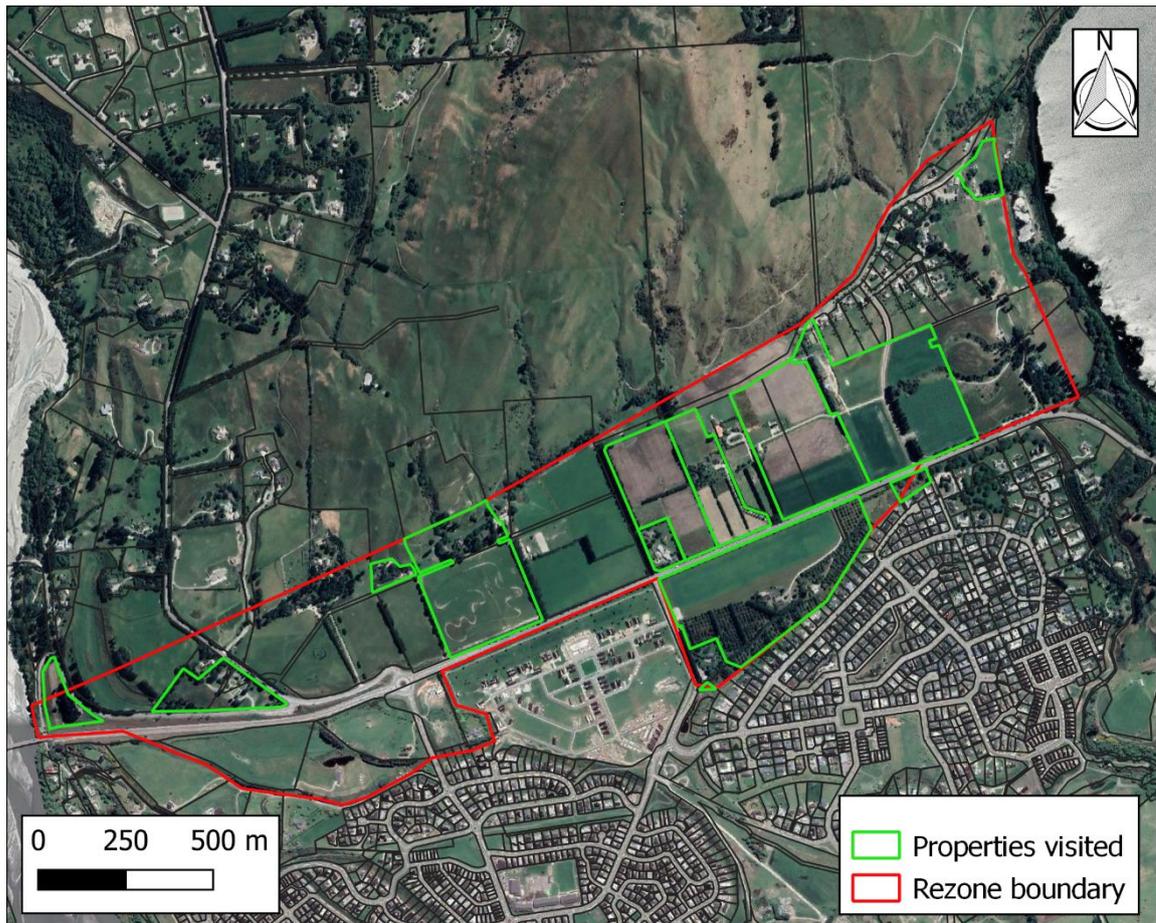


Figure 2: Properties in green visited and assessed by a site visit.

Basemap Source: Aerial imagery sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 4.0 New Zealand Licence.



2 Description of the Activity and Existing Environment

2.1 Environmental Context

The Ladies Mile rezone area is located along the stretch of Frankton-Ladies Mile Highway (State Highway 6) from Lake Hayes to the Shotover River and typically encompasses the 'flat' land either side of the highway. On the northern side of the highway the study area encompasses the land from the highway to part way up the toe of Slope Hill, and on the southern side of the highway the study area includes the flat land from the highway to the bottom of the terrace riser that leads down to Lake Hayes Estate and Shotover Country. We note the study area excludes the land occupied by the Queenstown Country Club.

The study area is located within the Shotover Ecological District of the Lakes Ecological Region (DOC, 2020). The properties that have been assessed under this report are shown in Figure 2. Values outside these green boundaries have been commented on where possible. The ecological assessment has been limited due to property access.

2.1.1 Physical Environment

The study area is located on a relatively flat terrace between Slope Hill to the north, Lake Hayes to the east, Queenstown Country Club, Lake Hayes Estate and Shotover Country to the south, and the Shotover River to the west. The terrace has a length of 3 km and an elevation that varies between 330 m to 370 m above sea level. The geology of the area is Holocene River deposits (loose, commonly angular, boulders, gravel, sand, and silt forming alluvial fans; grades into scree (upslope) and valley alluvium) Holocene Lake Deposits (laminated micaceous silt, mud, and sand in old lake deposits) and Late Pleistocene glacier deposits (generally unweathered, unsorted to sorted, loose sandy gravel silt and sand (fill) in terminal and ground moraines) (GNS, 2020).



2.1.2 Biological Environment

Flora

The original vegetation cover along Ladies Mile would have consisted of scrub, shrubland and tussock-grassland (Landcare Research, 2018). Leathwick *et al.* (2003), suggests that the vegetation around the toe of Slope Hill area would have consisted of woodlands of kanuka, matagouri, small-leaved coprosmas and olearia, native broom and kowhai, with abundant lianes including *Rubus* and *Muehlenbeckia*. Finer-textured soils would have supported grassland of hard and silver tussock and *Elymus*. The flatter terrace area would have consisted of continuous grassland with some areas of kanuka. However, within the Wakatipu Basin, there is no evidence that kanuka as a species was present. Manuka would have instead likely occupied these areas along with the listed range of woodland species. Much of the Shotover Ecological District has been grazed with the low altitude disturbed areas occasionally having remnants of shrubland of *Olearia odorata*, matagouri (*Discaria toumatou*) and *Coprosma* species (McEwen, 1987). Small remnants of the shrubland community are present within the study area.

Fauna

The native bird species that are known to be found in or use habitats comparable to those that are present and surrounding the site and have a distribution that encompasses the Ladies Mile area are listed below (Heather & Robertson, 2015).

- harrier hawk (*Circus approximans*)
- silvereye (*Zosterops lateralis lateralis*)
- grey warbler (*Gerygone igata*)
- tui (*Prothemadera novaeseelandiae novaeseelandiae*)
- bellbird (*Anthornis melanura melanura*)
- South Island fantail (*Rhipidura fuliginosa fuliginosa*)
- yellow-breasted tomtit (*Petroica macrocephala macrocephala*)
- kereru (*Hemiphaga novaeseelandiae*)
- paradise shelduck (*Tadorna variegata*)
- white-faced heron (*Egretta novaehollandiae*)
- pukeko (*Porphyrio melanotus melanotus*)
- spur-winged plover (*Vanellus miles novaehollandiae*)
- pied stilt (*Himantopus himantopus leucocephalus*)
- black-billed gull (*Larus bulleri*)
- South Island pied oystercatcher (*Haematopus finschi*)
- black-fronted tern (*Chlidonias albostratus*)



- Southern black-backed gull (*Larus dominicanus dominicanus*)

A desktop assessment by Carey Knox from Wildland Consultants Limited of the lizard species potentially present within the Ladies Mile area showed that there is a low likelihood of lizard species being present. The only species that may be present is the common McCann's skink (*Oligosoma maccanni*).

2.2 Description of Activity

The Queenstown Lakes District Council are developing the Ladies Mile Master Plan which will be used in the proposed rezoning of the area to allow for comprehensive mixed-use development. The rezone area includes the land either side of the Frankton-Ladies Mile Highway from Lake Hayes to the Shotover River (excluding the Queenstown Country Club). No physical works are proposed as part of this application.

This ecological assessment covers the properties shown in Figure 2 which were able to be accessed at the time of the site visit. Ecological values of surrounding properties were noted if they were able to be viewed. These areas are commented on within the report.



3 Methodology

The ecological values identified for the proposed development of the Ladies Mile area is based on a desktop study, and a site visit completed on 22 October 2020 and 3 February 2021.

3.1 Desktop Research and Site Visit

The desktop and site visits included:

- Review of existing ecological information to determine terrestrial ecological habitats and species likely present on the site;
- Establish the representativeness of the ecological habitats present, and the significance of those habitats, through a site visit and a review of the expected pre-disturbance vegetation and Land Environments of New Zealand (LENZ) classification (Leathwick, *et al.*, 2003).
- Establish the presence and significance of plant species through a site visit and the Department of Conservation's threat classification for New Zealand indigenous vascular plants (de Lange, *et al.*, 2018).
- Establish the likely presence and significance of native avifauna species through a site visit, existing scientific knowledge, and the Department of Conservation's threat classification for New Zealand birds (Robertson, *et al.*, 2017).
- A separate desktop assessment was conducted by herpetologist Carey Knox to establish the likely presence and significance of lizard species (Hitchmough *et al.*, 2016).



4 Ecological Values

4.1 Vegetation

The vegetation within each property surveyed (as shown in Figure 3 below) has been described and assessed individually. A brief description is given, especially where the property has been highly modified and contains no natural vegetation.

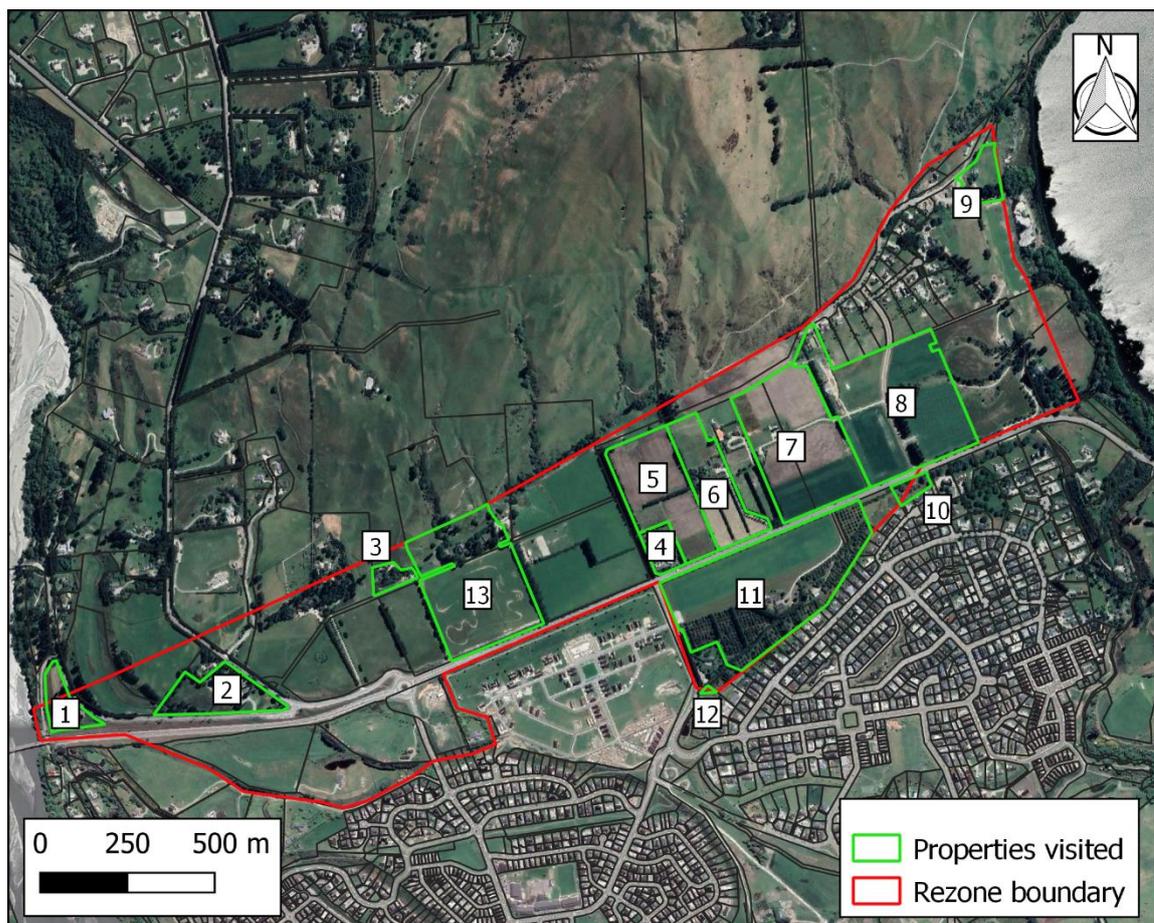


Figure 3: Associated property numbers.

Property 1 - Spence Road Lower Shotover - Section 159 Block III Shotover SD

This property is predominantly a paddock of exotic grass, with a stand of Douglas Fir (*Pseudotsuga menziesii*). On the eastern side of the Douglas Fir stand is an area of rank grass and a gravel pit. One large native *Muehlenbeckia complexa* was present within this site. Other exotic plants present included blue gum trees, hawthorn (*Crataegus monogyna*), broom (*Cytisus scoparius*), briar (*Rosa rubiginosa*), buddleia (*Buddleja davidii*), crack willow (*Salix x fragilis*), St John's wort (*Hypericum perforatum*), hemlock (*Conium maculatum*), elderberry



(*Sambucus nigra*), tree lupins (*Lupinus arboreus*) and a range of exotic grasses such as cocksfoot (*Dactylis glomerata*).

Property 2 - Lower Shotover Cemetery - Part Section 62 Block III Shotover SD & Part Section 888R Block III Shotover SD

The eastern half of this property is being used as a cemetery, and as a result has been highly modified and maintained. This section is predominantly mowed lawn with scattered large exotic trees including silver birch (*Betula pendula*), larch (*Larix decidua*), sycamore (*Acer pseudoplatanus*) and poplars (*Populus nigra*). The remainder of the property is a paddock consisting of rank grass dominated by cocksfoot, with an area of exotic trees including larch, Douglas fir, poplar and crack willow. No native species were observed within this property.

Property 3 - 399 Frankton-Ladies Mile Highway - Lot 1 DP 22874

This property is occupied by private residential dwellings with associated buildings and curtilage. The property has been highly modified and landscaped with a variety of native and exotic plants. Native species present include mountain beech (*Fuscospora cliffortioides*), kowhai (*Sophora* sp.), marble leaf (*Carpodetus serratus*), cabbage tree (*Cordyline australis*), broadleaf (*Griselinia littoralis*), *Coprosma rugosa*, red tussock (*Chionochloa rubra*), silver tussock (*Poa cita*), wind grass (*Anemanthele lessoniana*) and flax (*Phormium* sp.). A range of large exotic trees are present throughout the property including a row of Douglas fir. Prickly shield ferns (*Polystichum vestitum*) are growing in the retaining wall above the dwelling.

Property 4 - 465-467 Frankton-Ladies Mile Highway - Lot 1 DP 12822 & Lot 16 DP 12921

This property is occupied by the Ladies Mile Pet Lodge and two residential dwellings. The property has been highly modified and landscaped with a variety of native and exotic plants. Native species present include kowhai, beech, cabbage tree, silver tussocks, hebe and flaxes. A wide range of ornamental exotic trees are present within this property as well as large areas of mowed lawn and a vegetable garden. No naturally occurring native species are present within this property.



Property 5 - Frankton-Ladies Mile Highway - Part Section 45 Block III Shotover SD, Part Section 46 Block III Shotover SD, Section 50 Block III Shotover SD & Part Section 51 Block III Shotover SD

This property consists of grazed paddocks with a poplar hedge row. No naturally occurring native species were present within this property.

Property 6 - 497 Frankton-Ladies Mile Highway - Lot 1 DP 359142

This property comprises of two residential dwellings, one of which is used as the Queenstown Country Lodge. The property is highly modified with large, grazed paddocks and mowed lawn areas to the north and south of the dwellings. Ornamental tree plantings such as maples, rowan, dog woods, silver birch, orange tree blossom and fruit trees are present as well as a peony garden. Silver tussocks have been planted near the turnaround area. No naturally occurring native vegetation was present within this property.

Property 7 - 21 & 25 McDowell Drive - Part Section 49 Block III Shotover SD, Section 54 Block III Shotover SD & Lot 1 DP 475308

This property consists mostly of large open farm paddocks with a single residential dwelling and a separate shed. Ornamental plantings of both native and exotic species have occurred. Native species have typically been planted on mounds and include red tussock, mountain beech, cabbage trees, flax, hebes and toetoe. No naturally occurring native vegetation was present within this property.

Property 8 - 28 Strains Road - Lot 2 DP 475308 & Lot 25 DP 378242

On the western side of McDowell Drive the property consists of large farm paddocks (grassed and ploughed) and the Threepwood farming sheds. The farm sheds are surrounded by cherry laurel (*Prunus laurocerasus*) and Douglas fir hedges. On the eastern side of McDowell Drive are more ploughed paddocks, a stand of Douglas fir and a small gully. Within this gully, crack willow, hemlock, elderberry, hawthorn, gorse (*Ulex europaeus*) and broom are present. No naturally occurring native vegetation is present within this property.

Property 9 - 2 Marshall Avenue - Lot 2 DP 21614 & Lot 2 DP 21614

This property is occupied by a private residential dwelling with two sheds. The property has been highly modified and landscaped with a variety of native and exotic plants as well as having large, mowed grass areas. Native species present include *Pittosporum tenuifolium*, cabbage trees, wind grass and *Brachyglottis*



greyi. Exotic trees are scattered around the outside of the property with a cluster of trees present in the south east corner. Exotic species present include elm (*Ulmus* sp.), poplars, oaks (*Quercus* spp.), elderberry and hawthorn. No naturally occurring native vegetation is present within this property.

Property 10 - Sylvan Street - Lot 2 DP 375714

This is Council owned land with the Lake Hayes walking track running through the middle of the property. Either side of the walking track amongst rank grass, herbaceous and woody weeds are scattered groups of large matagouri plants (see Plate 1). Other exotic trees are present including crack willow, broom, hawthorn and elderberry.



Plate 1: Matagouri present within Property 10 - Sylvan Street - Lot 2 DP 375714.

Property 11 - 516 Frankton-Ladies Mile Highway - Lot 4 DP 22156

This Council owned property consists of a large field and a chestnut orchard. Amongst the chestnut trees on the slope at the rear of the property three scattered matagouri (*Discaria toumatou*) plants are present. Poplar wind breaks are present throughout the orchard. Other exotic species that are scattered within the orchard include broom, hawthorn, elderberry and silver birch.

Property 12 - Howards Drive - Lot 3 DP 447156

This is Council owned land with a walking track present near the northern boundary of the property. Only the area to the north of the walking track was assessed. This area was predominantly rank grass and herbaceous weeds. Elderberry trees, willow and one matagouri plant are present.



Property 13 – 429 Frankton-Ladies Mile Highway – Lot 1 DP 463532, Lot 2 DP 463532 & Lot 1 DP 20162

This property is occupied by a private residential dwelling with associated buildings, curtilage and farming paddocks. The curtilage of the house area has been highly modified and landscaped with native and a wide variety of exotic plants. Native species around the dwelling include mountain beech, red beech (*Fuscospora fusca*), broadleaf (*Griselinia littoralis*) and *Brachyglottis greyi*. An ephemeral stream is present within a steeply incised gully located uphill from the residential dwelling. This stream flows as result of a leaking irrigation pipe located near the top of the property. When the irrigation scheme is turned off, the stream dries up. The stream flows onto an adjacent property and appears to flow into another man-made pond, however this property was not able to be accessed. Scattered matagouri and prickly shield fern are present along the edges of the gully. To the west of the residential dwelling is a man-made pond which is used for irrigation and surrounding the pond is pasture grass which was been grazed by horses. The large paddock located between the dwelling and the Highway consists of a range of pasture grasses and herbaceous weeds. This paddock has been used for grazing of animals but is currently being used for recreational activities.

Additional Properties

During the survey matagouri was viewed in the gully located on 41 Strains Road (Lot 1 DP 495771) and on the slopes of 13 Sylvan Street (Lot 111 DP 333981) and 15 Sylvan Street (Lot 112 DP 333981). The location of these properties is shown in Figure 4. It is important to note that this vegetation was only viewed from a distance and was not inspected up close as the property was not accessed. The vegetation was only viewed from properties where access had been granted.

4.1.1 Vegetation Conservation Status

Of the species recorded within the study area matagouri have a conservation status of At Risk – Declining and wind grass (*Anemanthele lessoniana*) has a conservation status of At Risk – Relict (de Lange, *et al.*, 2018). Of these species, matagouri is naturally occurring within the study area, and wind grass has been planted for ornamental purposes. Wind grass would not naturally be found within the study area and therefore no further assessment has been completed for this species.



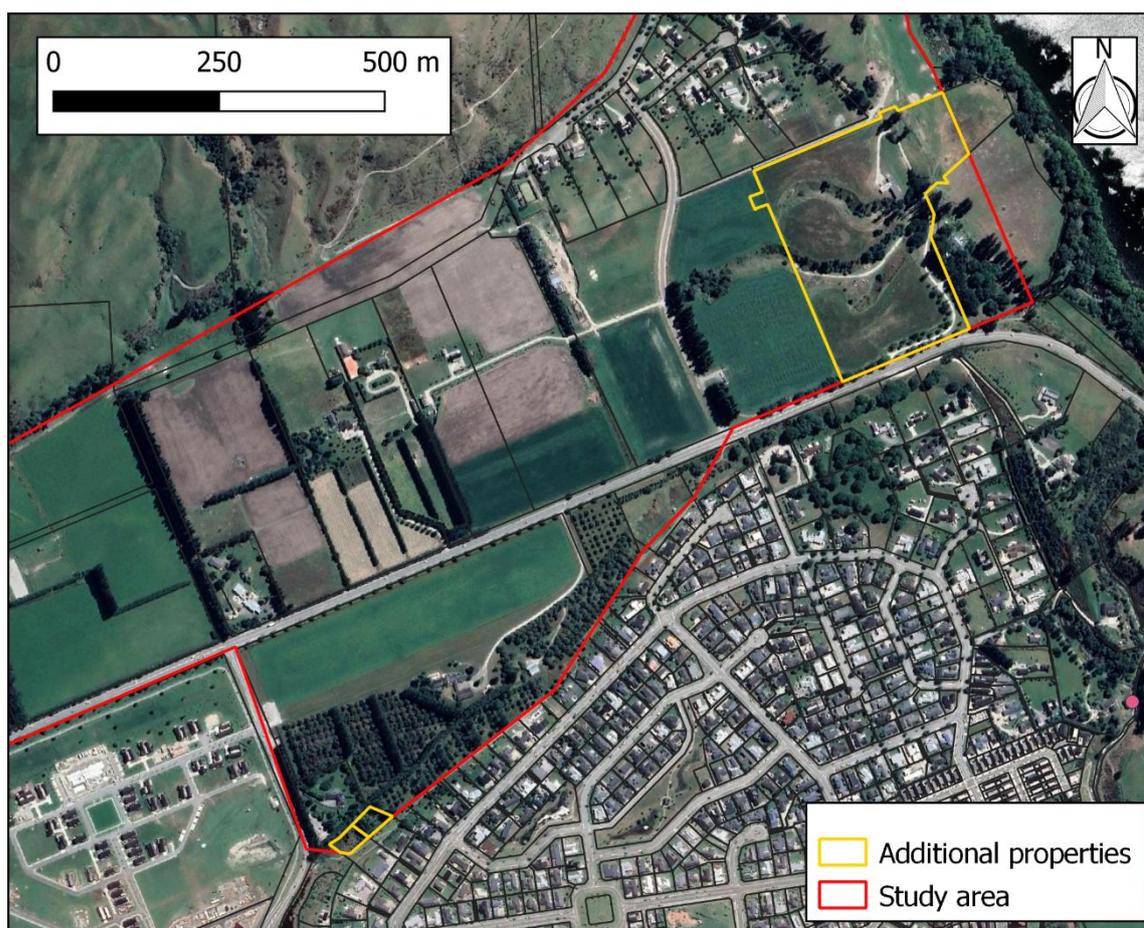


Figure 4: Location of additional properties where matagouri was observed.

4.2 Fauna

4.2.1 Lizards

McCann's skinks were observed within the rank grass along the road berm of Property 2 - Lower Shotover Cemetery. McCann's skink has a conservation status of Not Threatened (Hitchmough *et al.*, 2016). McCann's skink is likely to be the only lizard species present in the area and is probably present in low numbers where suitable habitat such as rank grass, rock or ground cover is present (Knox, 2020 – Appendix A).

4.2.2 Avifauna

Native species that were observed during the site visits included silvereyes, tui, Southern black-backed gulls, paradise shelducks (with ducklings), spur-winged plovers, South Island pied oystercatchers and harrier hawks. Other species observed included the introduced and naturalised song thrush (*Turdus*



philomelos), blackbird (*Turdus merula*), starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), chaffinch (*Fringilla coelebs*), yellowhammer (*Emberiza citrinella*), redpoll (*Carduelis flammea*), greenfinch (*Carduelis chloris*), goldfinch (*Carduelis carduelis*), Californian quail (*Callipepla californica*), skylark (*Alauda arvensis*) and Australian magpies (*Gymnorhina tibicen*). Of the native species recorded the South Island pied oystercatcher has a conservation status of At Risk – Declining, all the other native species are classified as Not Threatened (Robertson *et al.*, 2017).

Other native species not observed during the site visit, but have been sighted along Ladies Mile include the Threatened – Nationally Endangered black-fronted tern (*Chlidonias albostratus*) and the Threatened – Nationally Critical black-billed gull (*Larus bulleri*) (Robertson *et al.*, 2017). The conservation statuses of the South Island pied oystercatcher, black-fronted tern and black-billed gull have changed over the lifespan of these birds (see Table 1). These are all migratory species which breed on inland South Island riverbeds and farmland and then migrate to coastal areas for the remainder of the year.

Table 1: Changing conservation status of bird species.

Species	2002	2005	2008	2012	2016
Black-billed gull	Serious Decline		Nationally Endangered	Nationally Critical	
Black-fronted tern	Serious Decline	Nationally Endangered			
SI Pied Oystercatcher	Not Threatened		At Risk - Declining		

The black-billed gull is the most threatened gull species in the world (McClellan, 2019). The conservation status of this species has declined twice since the 2002 conservation status of Chronically Threatened - Serious Decline. In 2008 it was listed as Threatened – Nationally Endangered and in 2012 re-classified to Threatened – Nationally Critical as the population numbers worsened. Nationally Critical is the highest conservation status a species can achieve before being listed as extinct. (Hitchmough, 2002; Hitchmough *et al.*, 2007; Miskell *et al.*, 2008; Robertson *et al.*, 2013; Robertson *et al.*, 2017). The rapid worsening in conservation status is representative of an 80 % population decrease in stronghold populations as well as being a data poor species and having known recruitment failure (DOC,



2021; Robertson *et al.*, 2017). A black-billed gull has a maximum lifespan of approximately 25 years (McClellan, 2019) and the change in conservation status over the lifespan of an individual indicates that the species is not only declining from unsuccessful clutches but also adult birds are dying at a rapid rate. During the breeding season black billed gulls feed primarily on invertebrates taken from rivers and adjacent pasture (McClellan *et al.*, 2019).

The black-fronted tern currently has a conservation status of Threatened – Nationally Endangered, which decreased from Chronically Threatened – Serious Decline back in 2005 due to both improved knowledge of the species and continuing decline (Hitchmough *et al.*, 2007; Robertson *et al.*, 2017). The black-fronted tern is a conservation dependent species with known recruitment failure and a sparse distribution. This species has a moderate population with between 1000 – 5000 mature individuals and a predicted decline of between 50 – 70 % over the next three generations (Robertson *et al.*, 2017). The black-fronted tern has a maximum lifespan of approximately 11 years and although many rivers hold small breeding populations, over 50 % of the terns breed on a handful of rivers (Bell, 2019). During the breeding season black-fronted terns feed on emerging nymphs including mayflies and stoneflies or small fish. Black-fronted terns will also feed in nearby fields on earthworms, grass grub larvae and skinks. After breeding, most birds move to the coast where they feed in coastal waters (Bell, 2019). If disturbed when nesting black-fronted terns are likely to abandon the nest and the clutch inside. Human activity including land development and recreational activities disturb nesting birds (Bell, 2019).

The conservation status of the South Island Pied oystercatcher (SIPO) was reclassified from Not Threatened to At Risk – Declining in 2008 and currently remains as At Risk – Declining (Miskell *et al.*, 2008; Robertson *et al.*, 2017). The maximum lifespan of a SIPO, which is approximately 27 years, indicates that the SIPO populations have decreased and as such the conservation status has changed within the potential lifetime of an adult bird. This indicates that oystercatcher numbers are not achieving replacement rates and also indicates the death of mature birds. SIPO's usually breed inland in the South Island on riverbeds and farmland (Sagar, 2013).

4.2.3 Other

Rabbits were present throughout the study area as well as horses, sheep and cattle in a number of paddocks.



4.3 Summary of Ecological Values

The ecological values within the Ladies Mile area that were observed during the site visit are associated with the matagouri shrubland and the avifauna species and habitat present (see Table 2 below).

Table 2: Summary of Ecological Values.

Ecological Value	Description
Matagouri stands	Scattered groups of matagouri are present on Property 10 - Sylvan Street - Lot 2 DP 375714. Matagouri shrubland could be present on properties not viewed during this assessment.
Presence of At Risk plant species	At Risk – Declining matagouri plants were observed within the study area and on neighbouring properties.
Presence of At Risk and Threatened avifauna species	The habitat present on site provides hunting, nesting and foraging habitat for the At Risk and Threatened avifauna species.



5 Ecological Significance and Value

The assessment of the significance of the ecological values associated with the study area are based on the following:

- The QLDC District Plan Criteria for assessing ecological significance (QLDC, 2020);
- The Ecological Impact Assessment (EclA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems, 2nd edition (Roper-Lindsay *et al.*, 2018); and,
- New Zealand's Department of Conservation threatened flora and fauna lists.

5.1 Ecological Significance Criteria

A significance assessment based on the criteria in the QLDC District Plan Chapter 33 and ecological value assessment based on the EIANZ guidelines has been completed for the matagouri, avifauna and avifauna habitat (Table 3). No further assessment of the planted native species has been completed. No assessment has been completed for the properties that were not visited and surveyed as the values cannot be determined.



Table 3: Assessment of the indigenous vegetation and habitat of indigenous fauna using the ecological criteria in the EIANZ Guidelines and the QLDC District Plan.

Matter	Reasoning	Score (EIANZ)	QLDC Criteria Satisfied
Representativeness	The mature matagouri present on Property 10 either side of the Lake Hayes Link track and on Property 11 - 516 Frankton-Ladies Mile Highway, Property 12 - Howards Drive - Lot 3 DP 447156 and Property 13 – 429 Frankton-Ladies Mile Highway are small remnants of the former shrubland community that would have once been present within this area. The lack of diversity and lack of ability to regenerate through the surrounding grass sward means that it is not representative of the vegetation which formerly covered the ecological district.	Moderate	No
	The habitat that is utilised by the native avifauna is a modified pastoral environment.	Low	No
Rarity	The study area contains matagouri which has a conservation status of At Risk – Declining and is located within an area where there is <10% of the original indigenous vegetation cover left and is a National priority 1 habitat.	High	Yes
	The study area is utilised seasonally and or periodically by the At Risk – Declining South Island pied oystercatcher, the	Very High	Yes



	Threatened – Nationally Endangered black-fronted tern and the Threatened – Nationally Critical black-billed gull and is a National priority 4 habitat.		
Diversity	The level of natural diversity, abundance and distribution of plant species within the study area is low. Within the matagouri stands, only one native species is present.	Low	No
	The diversity of habitat that is present for the native avifauna species to utilise within the study area is low, and consists mainly of pasture and exotic hedgerows.	Low	No
Distinctiveness	The matagouri plants are a distinctive feature of the shrubland vegetation which would have occupied the area and are now restricted in distribution within the Ladies Mile area.	Moderate	Yes
	The habitat provided for indigenous avifauna is not distinctive and has not developed as a result of unique environmental factors.	Low	No
Ecological context	The areas of matagouri are too small to provide for important connectivity between areas.	Low	No



	The habitat within the study area, although predominantly exotic pasture is important for foraging, and breeding for a range of indigenous avifauna including At Risk and Threatened species.	Moderate	Yes
--	---	----------	-----

The overall EIANZ Value for the vegetation is Moderate and the Overall EIANZ Value of the habitat for indigenous fauna is also Moderate. The study area satisfies criteria within the QLDC significance criteria and is therefore considered to be significant.

5.1.1 Bird Ecological Values

The pastoral habitat within the study area is be utilised by a range of indigenous bird species for feeding, foraging and breeding. These include the At Risk – Declining South Island pied oystercatcher, the Threatened – Nationally Endangered black-fronted tern and the Threatened – Nationally Critical black-billed. The assigned ecological value under the EIANZ (2018) guidelines for species that are At Risk – Declining is High, and Threatened species are Very High. All other native bird species have a Low ecological value.

5.2 Summary of Ecological Significance and Values

The ecological values within the Ladies Mile study area has been determined using the criteria outlined in the 2018 EIANZ Guidelines and the significance criteria in the QLDC District Plan. The overall ecological value of the terrestrial vegetation and habitat that is located within the sites assessed is Moderate. The matagouri within the study area satisfies two of the QLDC significance criteria and the habitat for fauna also satisfies two of the significance criteria. The ecological value of the At Risk – Declining matagouri and the South Island pied oystercatcher is High, and the Threatened black-billed gull and black-fronted tern is Very High. All other Not Threatened plant and fauna species are considered to have Low ecological value under the EIANZ guidelines. The ecological values have not been determined for properties that were not surveyed during the site visit.



6 Ecological Constraints

The ecological values associated with the Ladies Mile area are the presence of matagouri, and the modified pastoral habitats that the At Risk and Threatened bird species utilise. This ecological assessment is considered to be a constraint analysis as it identifies the values that should be incorporated into the masterplan. The level of effect of the development of the Ladies Mile area cannot be determined until a plan has been proposed and analysed, however the following measures should be considered to provide for loss of habitat and areas used within the Ladies Mile area by the threatened birds identified during this ecological survey. The measures include the avoidance of matagouri where possible and the management of open undeveloped pastoral spaces to minimise habitat for avifauna.

Open pastoral spaces are an important habitat for the South Island pied oystercatcher, black-billed gull, black-fronted tern as well as other native wader, gull and waterfowl species which are known to be present in the study area. The pastoral land within the Ladies Mile area also provides a corridor that these species use to move between Lake Hayes and the Shotover River as well as providing space close to these waterbodies on which the above species can feed, forage and breed. The rezoning of the Ladies Mile area to allow for comprehensive mixed-use development will result in a reduction in space and habitat for At Risk and Threatened bird species.

The inclusion of open spaces within the development area can create population sinks for gulls and terns, which are the species most affected by the new subdivision and intensification of the land. Because it is unlikely that there will be restrictions on cats and dogs within the Ladies Mile area, this area becomes unsuitable habitat for breeding as they are more likely to get predated upon. It is recommended that birds are actively deterred from breeding in these areas. To do this, the green spaces should be limited, actively manicured, and the grass kept very short. Birds may still come in and feed on these open spaces, but will then have the opportunity to move on if a predator comes.

By changing and intensifying the land use, habitat that is used by Nationally Threatened species will be lost. As it is not recommended that mitigation occur



on site due to the creation of population sinks, off-site impact management measures are considered necessary. These include:

- Monitoring of the terns and gulls on the Lower Shotover river for 10 consecutive breeding seasons (approximately 1 August to end of January) to determine if there has been an impact on the population due to habitat loss. This length of time will allow baseline data to be collected before development starts, then during development and partial habitat and land loss, and then full development and occupation as well as full habitat loss.
- Monitoring is to be of productivity which is number of fledged chicks per total breeding pairs as well as general population and colony number counts.
- A public awareness campaign of breeding birds in the Shotover River, including how to manage cats and dogs is to occur.
- No dogs within the Shotover River during breeding season. This needs to be enforced not just a bylaw. There is no point undertaking such intensive monitoring to have external factors such as uncontrolled dogs disturbing breeding pairs and killing chicks.
- Pest control along the Shotover River, particularly around breeding colonies.

The ecological constraints for the development of the masterplan have only been determined for the areas assessed through the site visit and through aerial imagery. No specific constraints have been determined for properties not visited as part of this report. A site visit is required before an assessment can be completed for these properties.



7 Conclusions and Recommendations

Based on the ecological assessment the following conclusions and recommendations are made.

7.1 Conclusions

1. Queenstown Lakes District Council are developing a master plan to rezone the Ladies Mile area to allow for a comprehensive mixed-use development.
2. The Ladies Mile rezone area is located along the stretch of Frankton-Ladies Mile Highway from Lake Hayes to the Shotover River and typically encompasses the 'flat' land either side of the highway but excludes the land occupied by the Queenstown Country Club.
3. Due to site access restrictions not all of the area to be rezoned has been assessed. The areas that have been assessed through a site visit and in this report are shown in Figure 2.
4. The ecological values within the Ladies Mile area that were observed within the properties visited are associated with the matagouri and the avifauna species and habitat. Matagouri has a conservation status of At Risk – Declining.
5. The At Risk – Declining South Island pied Oystercatcher was observed within the study area. The Threatened – Nationally Critical black-billed gull and Threatened – Nationally Endangered black-fronted tern may periodically and or seasonally use the habitat provided.
6. The Not Threatened McCann's skink was present within rank grass at the Lower Shotover cemetery.
7. The overall ecological value of the matagouri stands is Moderate and the habitat for avifauna is also Moderate.
8. The ecological value of the individual Threatened and At Risk avifauna species ranges from High to Very High, and the ecological value of the At Risk matagouri is High. All other Not Threatened plant, bird and lizard species are considered to have Low ecological value.



7.2 Recommendations

1. Measures that should be adopted to reduce the impact of any potential development as a result of the rezoning include the avoidance of matagouri where possible and mitigation planting if the matagouri is to be removed. Off-site impact management measures are considered necessary due to the loss of habitat for avifauna.
2. Ecological values were observed on neighbouring properties during the survey. Site visits are required for the remainder of the rezone area before the ecological impact on those areas can be determined.



8 References

- Bell, M. (2013) [updated 2019]. Black-fronted tern. In Miskelly, C.M. (ed.) *New Zealand Birds Online*.
- de Lange, P.J., Rolfe, J.R., Barkla, J.W., Courtney, S.P., Champion, P.D., Perrie, L.R., Beadel, S.M., Ford, K.A., Breitwieser, I., Schonberger, I., Hindmarsh-Walls, R., Heenan, P.B., & Ladley, K. (2018). *Conservation status of New Zealand indigenous vascular plants, 2017. New Zealand Threat Classification Series 22*. Wellington: Department of Conservation.
- DOC. (2020). Department of Conservation Maps – General map viewer. Retrieved from <http://maps.doc.govt.nz/mapviewer/index.html?viewer=docmaps>
- DOC. (2021). Black billed gull/tarāpuka. Retrieved from <https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/black-billed-gull/>
- GNS Science. (2020). *New Zealand Geology Web Map*. Retrieved from <http://data.gns.cri.nz/geology/>
- Heather, B., & Robertson, H. (2015). *The field guide to the birds of New Zealand*. Penguin Random House, New Zealand.
- Hitchmough, R. (comp.) (2002) *New Zealand Threat Classification System lists—2002*. Threatened species occasional publication 23, 210 p.
- Hitchmough, R., Bull, L., Cromarty, P. (comps) (2007). *New Zealand Threat Classification System lists—2005*. Department of Conservation, Wellington. 194 p.
- Hitchmough, R., Barr, B., Lettink, M., Monks, J., Reardon, J., Tocher, M., van Winkel, & D., Rolfe, J. (2016). *Conservation status of New Zealand reptiles, 2015. New Zealand Threat Classification Series 17*. Wellington: Department of Conservation.
- Landcare Research. (2018). Our Environment Potential Natural Vegetation Map. Retrieved from <https://ourenvironment.scinfo.org.nz/maps-and-tools/app/>



- Leathwick, J., Wilson, G., Rutledge, D., Wardle, P., Morgan, F., Johnston, K., McLeod, M., & Kirkpatrick, R. (2003). *Land Environments of New Zealand*. Auckland: David Bateman Ltd.
- McClellan, R.K.; Habraken, A. (2013) [updated 2019]. Black-billed gull. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. <http://www.nzbirdsonline.org.nz/>
- McEwen, W.M. (1987). *Ecological Regions and Districts of New Zealand. Third revision*. New Zealand Biological Resources Centre Publication No.5 (in four parts) Part 4. Department of Conservation, Wellington, New Zealand.
- QLDC. (2020). *Proposed Queenstown Lakes District Plan*. Queenstown Lakes District Council.
- Robertson, H.A., Dowding, J.E., Elliott, G.P., Hitchmough, R.A., Miskelly, C.M., O'Donnell, C.F.J., Powlesland, R.G., Sagar, P.M., Scofield, R.P., Taylor, G.A. (2013). *Conservation status of New Zealand birds, 2012*. NZ Threat Classification Series 4. Department of Conservation, Wellington.
- Robertson, H. A., Baird, K., Dowding, J. E., Elliott, G. P., Hitchmough, R. A., Miskelly, C. M., McArthur, N., O'Donnell, C. F.J., Sagar, P. M., Scofield, R. P., & Taylor, G. A. (2017). *Conservation status of New Zealand birds, 2016. New Zealand Threat Classification Series 19*. Wellington: Department of Conservation.
- Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., & Ussher, G.T. (2018). *Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition*.
- Sagar, P.M. (2013). South Island pied oystercatcher in Miskelly, C.M. (ed.) *New Zealand Birds Online*.



Appendices

**Appendix A:
Lizard Assessment**

9 November 2020

e3 Scientific
Postal address
P.O. Box 2450
Wakatipu 9349
Queenstown

To whom it may concern,

Please find below an assessment of lizard species (or potential lizard species) present along Ladies Mile Highway, between Lake Hayes and the Shotover River, Otago.

Methods

A desktop assessment of indigenous lizard (gecko and skink) values at Ladies Mile Highway, Lake Hayes was undertaken. This involved evaluation of previous records in the area from the Department of Conservation's Bioweb herpetofauna database and a consideration of the habitat present in the area and its suitability for relevant lizard species. Google Earth imagery, field guides, site maps, and site photographs also aided in this assessment.

Results

The desktop assessment for indigenous lizards revealed only one possible lizard species (McCann's skink, *Oligosoma maccanni*) in the area of interest, which was likely observed by an e3 Scientific ecologist who sighted a 'skink' moving through rank grass in the project area. There are also several prior records of this species within 1 kilometre of the project area, but no records for any other lizard species. McCann's skinks are a 'Not Threatened' species (Hitchmough *et al.* 2016). All other lizard species known from Otago are considered unlikely to be present.

McCann's skink (Plate 1) is a very common skink species in the drier parts of the South Island, ranging from low altitudes up to c.1,700 m asl (Jewell 2006; van Winkel *et al.* 2018). They are typically grey or brown in colour with blotches, and/or stripes. In Otago, most individuals are blotched with a checker-board pattern, whereas in Canterbury most individuals have a prominent mid-dorsal stripe.

They are distributed from inland Southland and Otago, through Canterbury, and up into southern Marlborough. McCann's skinks are abundant in a wide variety of habitats, but are particularly abundant in dry, rocky habitats and are more tolerant of harsh dry habitats than most of our other native lizards. This species is diurnal and an avid sun basker, and is commonly encountered by people, as they can live in town/rural gardens and in long grass.



Plate 1: McCann's skink (*Oligosoma maccanni*) near Ranfurly, Otago

REFERENCES

Hitchmough R., Barr B., Lettink M., Monks J., Reardon J., Tocher M., van Winkel D., and Rolfe J. 2016: Conservation status of New Zealand reptiles, 2015. *New Zealand Threat Classification Series 17*. Department of Conservation, Wellington. 14 pp.

Jewell T. 2006: Central Otago Lizards. Jewell Publications. 125 pp.

van Winkel D., Baling M., and Hitchmough R. 2018: Reptiles and amphibians of New Zealand: A Field Guide. Auckland University Press. 366 pp.

Yours sincerely,

Carey Knox

Senior Herpetologist
Wildlands Consultants Ltd.