

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE
WAIMAKARIRI DISTRICT COUNCIL**

IN THE MATTER OF

The Resource Management Act 1991 (**RMA** or
the Act)

AND

IN THE MATTER OF

Hearing of Submissions and Further
Submissions on the Proposed Waimakariri
District Plan (**PWDP** or **the Proposed Plan**)

AND

IN THE MATTER OF

Hearing of Submissions and Further
Submissions on Variations 1 and 2 to the
Proposed Waimakariri District Plan

AND

IN THE MATTER OF

Submissions and Further Submissions on the
Proposed Waimakariri District Plan by
Bellgrove Rangiora Limited

**EVIDENCE OF MORGAN LEE TRACY-MINES
ON BEHALF OF BELLGROVE RANGIORA LIMITED
REGARDING HEARING STREAM 12E**

Dated: 30 April 2024

Presented for filing by:
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INTRODUCTION

- 1 My full name is Dr Morgan Lee Tracy-Mines.
- 2 I am a vegetation ecologist at Wildland Consultants Ltd. I have a PhD in Biological Sciences from the University of Canterbury. In 2020 I was awarded the Bill Makepeace Prize in Botany. I am a member of New Zealand Plant Conservation Network.
- 3 I have more than six years' experience in researching vegetation ecology and botany throughout the Canterbury region. This includes vegetation and habitat mapping and species identifications in many different ecosystems, including farmland, braided rivers, tussock grasslands, plains, forests, and scrub/shrublands.
- 4 I frequently prepare ecological assessments, including assessments of ecological effects, for resource consent applications.
- 5 My role in relation to the proposed Waimakariri District Plan (**pWDP**) and Variation 1 is as an independent expert witness to Bellgrove Rangiora Limited (**Bellgrove** or **the Submitter**) on ecological matters.

CODE OF CONDUCT

- 6 Although these are not an Environment Court proceeding, I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.
- 7 My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

SCOPE OF EVIDENCE

- 8 In my evidence I address the following issues:
- a) The methodology used to undertake ecological assessment of the Site.
 - b) Ecological context of the Site including the existing vegetation and habitats; the extent of any waterways and wetland habitats; and indigenous fauna.
 - c) An ecological assessment of the potential effects on indigenous vegetation and indigenous biota of the proposed rezoning and the Bellgrove South-ODP proposed by the Submitter; and.
 - d) An assessment of the significance of the Site using the criteria outlined in the Canterbury Regional Policy Statement (CRPS, **Appendix 1**) and the National Policy Statement for Indigenous Biodiversity (NPS-IB, **Appendix 2**).

PURPOSE OF EVIDENCE

- 9 The purpose of my evidence is to provide an assessment of the ecological values at the Site, and to provide expert analysis of the effects of the proposed rezoning and ways to avoid, mitigate, or remedy any potential negative effects caused by rezoning, including measures to achieve biodiversity gain.

THE PROPOSAL

- 10 Bellgrove are seeking to rezone the full extent of Bellgrove South from Rural Lifestyle Zone (RLZ) to Medium Density Residential Zone (MRZ) in the pWDP. Excluding Lot 4 DP 25508 (100 Northbrook Road) which is already proposed to be zoned MRZ as part of Variation 1, this is an area of approximately 31.2 hectares (ha) (**the Site**).
- 11 No land use change, subdivision or soil disturbance is proposed as part of the rezoning proposal.
- 12 Included within this rezoning request is a 3.3 ha area of 'Additional Land' currently located to the east of (outside) the notified SER-DA directly adjacent to

the Cam/Ruataniwha River. This area has been included in our Site assessment and is included in figures provided in this evidence.

13 Bellgrove also seek changes to the notified SER-ODP as shown in the Bellgrove South-ODP (Aurecon 2024) to provide a better development outcome for the Site.

14 Changes proposed by the Bellgrove South-ODP of relevance to this evidence are as follows:

- i. Changes to the open space network to include the provision of a stormwater facility within the southern portion and south-eastern corner of Bellgrove South (approximately 6.5 hectares in size);
- ii. Identification of all the residential land as Medium Density Residential;
- iii. Inclusion of the area of Additional Land within the Bellgrove ODP; and
- iv. Removal of the three shown green links on the notified SER-ODP. Inclusion of two new green links:
 - i. new north-south green link adjacent to the Cam/Ruataniwha River and eastern boundary extending south to Northbrook Road; and
 - ii. new east-west green link south of the Truman Road extension road connection Truman Street to the stormwater reserve.
- v. Inclusion of open space reserve along the length of the Cam/Ruataniwha River boundary to provide opportunities for riparian planting and connecting through to the stormwater reserve location in the south.

15 The on-Site spring located in the eastern portion of the Site, and potential additional spring identified following the Site investigation are not shown on the Bellgrove South-ODP. This is because the underlying pWDP waterway setback provisions will apply.

SUMMARY OF EVIDENCE

- 16 This evidence outlines the results of fauna desktop assessments and field surveys.
- 17 Very few ecological values were recorded on the Site, however the Site may provide habitat for indigenous fauna. Further surveys are required to determine the presence of indigenous lizards, avifauna, invertebrates, and fish.
- 18 It is unlikely that rezoning will negatively impact indigenous biodiversity present at the site, however an ecological management plan to avoid and enhance ecological values, developed by suitably qualified and experienced ecologists, is recommended prior to any site development.

METHODOLOGY

- 19 In preparing this evidence, I used the methods discussed below:
- a) Desktop evaluation: A desktop assessment was undertaken to determine the ecological value likely to be present at the Site, including assessment of recent and historical aerial imagery, survey records (Canterbury Black Maps) and reviewing survey databases. Online databases (iNaturalist, eBird, Department of Conservation Bioweb) were searched for information on vegetation and habitats, lizards, birds, fish, and invertebrates within and around the Site. Lizard records were searched within a 10 kilometre radius, while eBird records were restricted to a two kilometre radius. The New Zealand Freshwater Fish Database was searched for fish and large invertebrate survey records in waterways connected with the Site^{1,2}.
 - i. The terrestrial invertebrate desktop survey involved searching the Global Biodiversity Information Facility (GBIF.org 2024³) for records of spiders, leaf-veined slugs, indigenous giant land snails, insects, and velvet worms within five kilometres of the Site.
 - ii. For the records retrieved by the GBIF search, freshwater invertebrates were removed. Observations that were not identified

¹ Stoffels R. (2022): *New Zealand Freshwater Fish Database (extended)*. The National Institute of Water and Atmospheric Research (NIWA). Christchurch. Dataset downloaded April 2023, from <https://nzffdms.niwa.co.nz/search>

² Jowett I.G. (2022): NZ Species DB (Version 1.1) [Computer software] Jowett Consulting Ltd. Retrieved from <https://www.jowettconsulting.co.nz/home/nz-species-db>

³ GBIF.org (9 April 2024) GBIF Occurrence Download <https://doi.org/10.15468/dl.gbe3cv>

further than Biological Order level, or were marked as dubious, were also removed. This dataset was used to characterise the fauna based on the most commonly-represented taxonomic Orders. All remaining terrestrial invertebrate records were scanned for notable species⁴. These were compared with the vegetation and habitat types present on-Site to assess the likelihood of each notable species occurring within the project area.

- b) Site surveys: The Site was surveyed for freshwater values on 27 March 2024 by my colleague Stella McQueen, and I surveyed the Site for terrestrial vegetation and wetlands on 31 March 2024. All vegetation and associated habitat types were mapped and described broadly using structural classes⁵. Potential natural inland wetland areas were assessed and delineated where present, using the methods described below. Field mapping was digitised onto aerial imagery using ArcGIS. All vascular plant species observed were recorded and are listed in **Appendix 3**.
- c) Natural wetlands assessment: A walkover of the entire Site was undertaken to identify and (if necessary) delineate any natural inland wetlands. The vegetation and habitats on the Site were evaluated for wetland status according to the Resource Management Act (RMA; 1991)⁶, which defines wetlands as *permanently or intermittently wet areas, shallow water, and land/water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions*, the National Policy Statement for Freshwater Management (NPS-FM; 2020)⁷, and the Canterbury Regional Policy Statement⁸. A natural inland wetland is defined in the operative NPS-FM as a wetland (as defined in the RMA) that is not:

i. In the coastal marine area; or

⁴ 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.

⁵ Atkinson, I. A. E. (1985). Derivation of vegetation mapping units for an ecological survey of Tongariro National North Island, New Zealand. *New Zealand journal of botany*, 23(3), 361-378.

⁶ New Zealand Government 1991: Resource Management Act. Wellington

⁷ Ministry for the Environment 2020: National Policy Statement for Freshwater Management 2020. Wellington: Ministry for the Environment. 70 pp.

⁸ Environment Canterbury Regional Council 2021: Canterbury Regional Policy Statement 2013. 331 pp.

- ii. *A deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland; or*
- iii. *A wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or*
- iv. *A geothermal wetland; or*
- v. *A wetland that:*
 - i. *Is within an area of pasture used for grazing; and*
 - ii. *Has vegetation cover comprising more than 50% exotic pasture species (as identified in the National List of Exotic Pasture Species using the Pasture Exclusion Assessment Methodology)⁹; unless*
 - iii. *The wetland is a location of a habitat of a threatened species identified under clause 3.8 of the NPS-FM, in which case the exclusion in (e) does not apply.*

d) The NPS-FM refers to the Ministry for the Environment (MfE) wetland delineation protocols (December 2022)¹⁰ in order to determine the status of wetlands. The hydrophytic vegetation test relies on the presence of hydrophytes. Hydrophytes are plant species capable of growing in soils that are often or constantly saturated with water during the growing season. The hydrophyte categories (wetland indicator status ratings)¹¹ are:

- i. Obligate (OBL): occurs almost always in wetlands (estimated probability >99% in wetlands).
- ii. Facultative Wetland (FACW): occurs usually in wetlands (67–99%).

⁹ Ministry for the Environment 2022: Pasture exclusion assessment methodology. Wellington: Ministry for the Environment. 51 pp

¹⁰ Ministry for the Environment 2022: Wetland delineation protocols. Wellington: Ministry for the Environment. 14 pp

¹¹ Clarkson B. 2013: A vegetation tool for wetland delineation in New Zealand. Manaaki Whenua Landcare Research Contract Report LC1793

- iii. Facultative (FAC): equally likely to occur in wetlands or non-wetlands (34–66%).
 - iv. Facultative Upland (FACU): occurs occasionally in wetlands (1–33%).
 - v. Upland (UPL): rarely occurs in wetlands (<1%), almost always in 'uplands' (non-wetlands).
- e) For the purpose of this assessment and in accordance with the methods described in MFE (2022), areas of potential wetland were assessed using the 'Rapid Test' defined as follows:
- i. Rapid Test: All dominant species across all strata are rated OBL and/or FACW.
- f) In areas where the vegetation was sparse, indicators of wetland hydrology and hydric soil were used to determine presence of wetland conditions. If wetland hydrology, and hydric soil indicators were present and no exclusions applied (i.e. pasture exclusion test) then the definition of a wetland would be met under the RMA and NPS-FM. For more detailed methodology refer to MFE (2022; 2021)¹² and/or Clarkson (2013).
- g) An assessment of potential wetlands under the proposed Waimakariri District Plan (pWDP) was undertaken. The pWDP defines wetlands as *permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.*
- h) An assessment was also undertaken of any wetland adapted fauna using the wetlands identified on Site, or likely to use them.
- i) The Site was assessed for ecological significance using the criteria outlined in the CRPS (Appendix 1) and the NPS-IB (Appendix 2).

¹² Ministry for the Environment 2021: Wetland delineation hydrology tool for Aotearoa New Zealand. Wellington: Ministry for the Environment. 83 pp

- 20 Status of Waterways: The drains were assessed against definitions in relevant legislation as follows:
- 21 The Resource Management Act (1990) definition for a 'river' is used in the National Policy Statement – Freshwater Management (NPS-FM 2020), the National Environmental Standards for Freshwater (NES-F 2020), the Waimakariri District Plan and the Canterbury Land & Water Regional Plan (LWRP) and as follows:
- a) "River means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal)."
- 22 The Canterbury Regional Policy Statement does not have a definition for 'river' or similar watercourses.

ECOLOGICAL CONTEXT

- 23 The property is located within the Low Plains Ecological District (**ED**), that covers the eastern part of the Canterbury Plains. It stretches from Waipara in the north to Timaru in the south. The following description is adapted from Harding (2009)¹³.
- 24 The Ecological District covers a sloping plain formed by the deposition of glacial outwash and recent river gravels. It extends from sea level to approximately 300 metres above sea level, and has no significant hills. Older surfaces are covered with loess; younger surfaces comprise recent river gravel. The long coastline of the district comprises sand and sand/gravel beaches with low dunes, dune lakes, and lagoons.
- 25 Droughts, wind, and occasional natural fires would have strongly influenced the pre-human vegetation of Low Plains Ecological District. The presence of only a few small remnants of indigenous vegetation in the district makes interpretation of the pre-human vegetation difficult. Early European surveyors noted the

¹³ Harding M.A. 2009: Canterbury Land Protection Strategy. Published by the Nature Heritage Fund, Wellington

presence of areas of forest at a number of locations on the coastal plain north of Christchurch, presumably remnants of previously more-extensive forests. Intervening areas supported raupō swamp, flax swamp, swamp forest, or in very dry areas, grassland and shrubland.

- 26 It is likely that the severity of the climate on the open plains, including the desiccating effect of frequent strong northwest winds and relatively low rainfall (<800mm per annum), and the frequency of natural fires, prevented the perpetuation of extensive forests. More extensive areas of podocarp forest and wetland would have been present at well-watered sites nearer the coast, such as north of Christchurch. Freshwater wetlands were relatively extensive on eastern parts of the plains, and saline wetlands present along the coast.
- 27 The original vegetation of Low Plains Ecological District has been substantially depleted by human-induced fire, and land clearance for agriculture and settlement. Nearly all parts of the ED outside of Christchurch are now intensively farmed. Most soils have been cultivated and many areas are irrigated. Remnants of wetland and coastal vegetation are present north of Christchurch. Only a very small part (c.1%) of Low Plains ED is protected. There are few opportunities for further protection, though braided rivers are increasingly protected.
- 28 Based on the Black Maps, historical survey maps which recorded vegetation zones in the period 1848-1870, the southern part of the Site was covered in a raupō (*Typha orientalis*) and flax (*Phormium tenax*) wetland swamp. The northern part of the property (presumably the swamp margins) was recorded as New Zealand aniseed (*Gingidia montana*), grass, and tūpāki/tutu (*Coriaria* species).

TERRESTRIAL VEGETATION AND HABITATS

- 29 At the time of the current survey, the Site was predominately improved pasture with tracks and excavated drainage channels throughout (Figure 1). In total four vegetation types (three terrestrial and one wetland) were identified and are described below.
1. Indigenous treeland. A small area of treeland is present along the northeastern boundary of the Site and comprises mostly kōhūhū (*Pittosporum tenuifolium*), kāpuka (*Griselinia littoralis*), tī kōuka (*Cordyline*

australis), and *tarata* (*Pittosporum eugenioides*). Other species observed here included silver birch (*Betula pendula*), English ivy (*Hedera helix*), English oak (*Quercus robur*), and blue gum (*Eucalyptus globulus*). This treeland follows the Cam/Ruataniwha River, and appears to be naturally-occurring, rather than planted, but it is possible indigenous shrubs have been planted in this area over time.

2. Ryegrass pasture grassland. Pasture grassland covers most of the Site, with perennial rye grass (*Lolium perenne*) being the most common species. Cocksfoot (*Dactylis glomerata*) is locally abundant along the edges of paddocks near tracks and fence lines. Other common pasture species were white clover (*Trifolium repens*), broad-leaved dock (*Rumex obtusifolius*), browntop (*Agrostis capillaris*), and broad-leaved plantain (*Plantago major*).
3. Ryegrass pasture/wetland matrix. Some areas throughout the southern section of the Site were either damp underfoot or had standing water present. The vegetation in these areas did not differ from the drier pasture vegetation.
4. Riparian vegetation. Vegetation along the drainage channels mainly comprised cocksfoot and brome grasses (*Bromus* spp.). In addition, creeping buttercup (*Ranunculus repens*), vetch (*Vicia sativa*), bitter cress (*Cardamine hirsuta*), blackberry (*Rubus fruticosus*), and hawthorn (*Crataegus monogyna*) were also observed. Common duckweed (*Lemna minor*) was observed on some of the open water.

WETLANDS

- 30 A number of damp and wet areas were observed in the southernmost section of the property. The southeastern paddock was characterised by small winding channels, some holding water. The ground cover was predominately ryegrass, often with patches of soft ground, liquid mud, or open water. However, there was no hydrophytic vegetation observed, and as these areas are in grazed pasture, comprise more than 50% exotic pasture cover, and contain no Threatened or At Risk indigenous species, they are excluded from the NPS-FM and CRPS definition of natural inland wetland.

31 The damp and wet areas observed do not support a natural ecosystem of plants and animals and are also therefore not considered to be a wetland under the pWDP definition.

AQUATIC HABITATS

32 The freshwater assessment was undertaken by my colleague Stella McQueen (Senior Freshwater Ecologist, Wildlands).

33 The Site was visited in autumn (April) 2024 following a period when there had not been significant rain. As a result, the water in the on-Site drains was assumed to be primarily groundwater emerging at late summer-early autumn low-flow levels. In winter, the amount of water in the drains would be higher and the wetted habitat would extend further up the drains as the water table would be higher and rainwater inputs would be greater.

34 Aquatic habitats on the Site consist of linear excavated farm drains. Most had permanent farm fences on both sides with rank pasture grasses growing in between. The upper banks were less than one metre wide. The contours of the drains appeared to be generally shallow but the electric fencing made access to most drains difficult. The drains were generally wetter towards the southern end of the Site and dry in their northern ends.

35 Drains with more water also had watercress (*Nasturtium officinale*) and creeping buttercup present. Generally, the water surface was not visible, due to thick vegetation growing on the banks or bed of the drains. When the surface was visible it was usually covered with small floating duckweed (*Lemna* sp.). Where the base of the drain was visible (generally below taller overhanging vegetation that shaded out undergrowth), the substrate was soft mud with submerged vegetative detritus.

36 There is one large spring in the east of the Site, part way along a drain (Figure 1). This spring appears to originate from within a fenced area encompassing tall tree stumps, rank grass and blackberry. Upstream of this point the drain shows no evidence of water-loving vegetation. Immediately downstream there are several large sedges (*Carex* sp.), creeping buttercup and watercress enter the riparian

vegetation, and the drain has areas of open water from this point down to the property boundary.

- 37 The southeastern paddock has seasonal water emerging across a large area, distinguished by soft, bouncy ground and lush grass growth. The remains of a natural stream channel pass through the middle of this area (Figure 1). Most of this channel is thick mud, and the upstream end (i.e. away from the drain) had open water.
- 38 The southwestern paddock has a very short drain in the southern end, 50 metres long, that runs parallel to another drain only 20 metres away (Figure 1, 'probable spring'). This drain was not closely viewed due to stock. The very close proximity to the other drain indicates that it was probably dug to channel water from a spring or a diffuse area of groundwater emergence.



FLORA

Overview

39 Nine indigenous and 36 exotic vascular plant species were recorded at the proposed rezoning Site (Appendix 3). Most of the indigenous species were observed in the indigenous treeland along the Cam/Ruataniwha River, with the exception of common duckweed, which was found in standing and slow moving water throughout the drainage channels.

Threatened or At Risk Species

40 No threatened or at risk indigenous plant species were recorded on the Site.

Pest Plants

41 Two pest species and four organisms of interest (as identified in the Environment Canterbury Regional Pest Management Plan (RPMP) (2018-2038))¹⁴ were recorded on the Site (Table 1). Pines and conifers recorded on the Site had all been planted. These were not wilding conifers and are therefore not considered pest plants under the RPMP.

Table 1: Environment Canterbury RPMP (Pest) and Organisms of Interest (OoI) found on the Site.

Species	Common Name	Pest Classification
<i>Betula pendula</i>	silver birch	Organism of Interest
<i>Crataegus monogyna</i>	hawthorn	Organism of Interest
<i>Cytisus scoparius</i>	broom	Pest
<i>Rosa rubiginosa</i>	sweet briar	Organism of Interest
<i>Rubus fruticosus</i>	blackberry	Organism of Interest
<i>Ulex europaeus</i>	gorse	Pest

¹⁴ Environment Canterbury 2013: Canterbury Regional Policy Statement 2013. Environment Canterbury

FAUNA

Lizards

- 42 A desktop herpetological assessment was undertaken by my colleague Jess Randall (Herpetologist, Wildlands).
- 43 The Department of Conservation Bioweb Herpetofauna database and iNaturalist were searched for lizard records within a 20 kilometre radius of the Site. In addition, information was included from previous Wildland Consultants reports from the initial stages of the Bellgrove North residential subdivision. There are relatively few records of lizards within the Waimakariri District, which reflects the highly modified low plains area, and a lack of formal surveys. Three species have been recorded from this area: jewelled gecko (*Naultinus gemmeus*; At Risk – Declining), Waitaha gecko (*Woodworthia* cf. *brunnea*; At Risk – Declining) and Canterbury grass skink (*Oligosoma* aff. *polychroma* Clade 4; At Risk – Declining) (Table 2).
- 44 Previous lizard surveys at Bellgrove North found no evidence of jewelled gecko. It is highly unlikely that jewelled gecko persist within such a highly modified environment.
- 45 Waitaha gecko is also unlikely to be present given the habitat available and the extent of modification at the Site. It may be possible that a remnant population is present within the indigenous treeland vegetation, but this species would also be difficult to detect at low densities.
- 46 Canterbury grass skink is the most likely species to be present given the habitat quality and extent within the Site. This species has been recently captured and identified at the northern part of Bellgrove Farm, approximately 0.5km away. A Lizard Management Plan¹⁵ has been implemented as part of the development of Stage 1 off Bellgrove North with six Canterbury grass skinks salvaged from the Site¹⁶, to date. This species is most likely to inhabit modified environments such as the ryegrass pasture grassland and indigenous treeland (where unmanaged)

¹⁵ Wildland Consultants (2022). Lizard Management Plan for a Bellgrove Subdivision. *Wildland Consultants Contract Report No. 6236*. Prepared for Bellgrove Rangiora Ltd. 32 pp.

¹⁶ Wildland Consultants (2023). Lizard salvage report for the Bellgrove Subdivision at 52 Kippenberger Avenue and 174 East Belt Rangiora. *Wildland Consultants Contract Report No. 6236c*. Prepared for Bellgrove Rangiora Ltd. 27 pp.

and riparian vegetation, where there is a complex of rank grass, scrub and woody debris.

- 47 There is no reason why the presence of the above-mentioned lizard species or their habitats should prevent rezoning, but more detailed lizard surveys may be required prior to any development. If lizards are present, effects on them will need to be managed, to through avoidance or mitigation, in accordance with the Wildlife Act (1953 -refer section below).

Table 2: Lizard species potentially present at the Site, as assessed prior to the field survey. Conservation status is as per Hitchmough *et al.* 2021¹⁷. The likelihood of occurrence for each species is based on their known habitat preferences and distribution in the general area.

Species	Common Name	Conservation Status	Nearest Record	Preferred Habitats	Likelihood of Occurrence
<i>Oligosoma</i> aff. <i>polychroma</i> Clade 4	Canterbury grass skink	At Risk – Declining	0.5 km Bellgrove North Block (2023)	Lowland/montane shrublands grasslands, scree, talus slopes and rocky or boulder areas	Highly likely
<i>Naultinus gemmeus</i>	Jewelled gecko	At Risk – Declining	1.1 km North Block (pre-1970)	Scrub, regenerating forest, shrubland	Highly unlikely
<i>Woodworthia</i> cf. <i>brunnea</i>	Waitaha gecko	At Risk – Declining	3.6 km Woodend (2021)	Loose rocks, rock tors, and outcrops, and occasionally forest from mid-Canterbury to southern Marlborough.	Unlikely

¹⁷ Hitchmough R.A., Barr B., Knox C., Lettink M., Monks J.M., Patterson G.B., Reardon J.T., van Winkel D., Rolfe J., and Michel P. 2021: Conservation status of New Zealand reptiles, 2021. *New Zealand Threat Classification Series 35*. Department of Conservation, Wellington. 15 pp

AVIFAUNA

48 The avifauna assessment was undertaken by my colleague Dr Della Bennet (Senior Avifauna Ecologist, Wildlands).

49 An eBird database search identified records of 54 bird species within two kilometres of the Site between January 2019 and December 2023 (Table 3). Thirty-four indigenous and 20 exotic bird species were recorded.

50 Four of the indigenous species are classified as 'Threatened' (as per Robertson *et al.* 2021)¹⁸:

- Tarapirohe/black-fronted tern (*Chlidonias albostratus*) (Nationally Endangered).
- Kōtuku/white heron (*Ardea alba modesta*) (Nationally Critical).
- Taranui/Caspian tern (*Hydroprogne caspia*) (Nationally Vulnerable).
- Pūteketeke/Australasian crested grebe (*Podiceps cristatus australis*) (Nationally Vulnerable).

51 Thirteen indigenous species are classified as 'At Risk' (as per Robertson *et al.* 2021)¹⁹:

At Risk – Declining

- Pohowera/banded dotterel (*Charadrius bicinctus bicinctus*).
- Tarāpuka/black-billed gull (*Chroicocephalus bulleri*).
- Kotoreke/marsh crake (*Zapornia pusilla affinis*),
- Pīhoihoi/New Zealand pipit (*Anthus novaeseelandiae novaeseelandiae*).

¹⁸ Robertson H.A., Baird K.A., Elliott G.P., Hitchmough R.A., McArthur N.J., Makan T.D., Miskelly C.M., O'Donnell C.F.J., Sagar P.M., Scofield R.P., Graeme Taylor G.A. and Michel P. (2021). *Conservation status of birds in Aotearoa New Zealand, 2021*. New Zealand Threat Classification Series 36. Department of Conservation, Wellington, New Zealand.

¹⁹ Robertson H.A., Baird K.A., Elliott G.P., Hitchmough R.A., McArthur N.J., Makan T.D., Miskelly C.M., O'Donnell C.F.J., Sagar P.M., Scofield R.P., Graeme Taylor G.A. and Michel P. (2021). *Conservation status of birds in Aotearoa New Zealand, 2021*. New Zealand Threat Classification Series 36. Department of Conservation, Wellington, New Zealand.

- Tarāpunga/red-billed gull (*Chroicocephalus novaehollandiae scopulinus*).
- Tōrea/South Island pied oystercatcher (*Haematopus finschi*).
- Tara/white-fronted tern (*Sterna striata striata*).

At Risk - Relict

- Māpunga/black shag (*Phalacrocorax carbo novaehollandiae*).
- Kawaupaka/little shag (*Microcarbo melanoleucos brevirostris*).

Naturally Uncommon

- Australian coot (*Fulica atra australis*).

52 Of these species, tarapirohe/black-fronted tern, tōrea/South Island pied oystercatcher, pohowera/banded dotterel, and tarāpuka/black-billed gull are likely to forage with the ryegrass pasture/wetland matrix on earthworms and insect larvae. It is also possible that tōrea/South Island pied oystercatcher may attempt to breed within the ryegrass pasture.

53 Karoro/southern black-backed gulls (*Larus dominicanus*, Not Threatened), spur-winged plover (*Vanellus miles novaehollandiae*, Not Threatened), pūkeko (*Porphyrio melanotus*, Not Threatened), poaka/pied stilt (*Himantopus leucocephalus*, Not Threatened), matuku moana/white-faced heron (*Egretta novaehollandiae*, Not Threatened), mallard (*Anas platyrhynchos*, Introduced and Naturalised) and pūtangitangi/paradise shelduck (*Tadorna variegata*, Not Threatened) may utilise areas of open surface water which has accumulated within the ryegrass pasture/wetland matrix. These birds may forage within the wet area seasonally. Mallard and pūtangitangi/paradise shelduck may also utilise areas of the farm drains, if clear open water is accessible through the rank grass.

54 The small area containing carex may provide seasonal foraging habitat for matuku-hūrepo/Australasian bittern (*Botaurus poiciloptilus*, Threatened – Nationally Critical) and kotoreke/march crake (*Zapornia pusilla affinis*, At Risk – Declining). However, this would only be while passing through the area to other more substantial wetland sites.

55 It is not expected that māpunga/black shag or kawaupaka/little shag will forage within any areas of open water as the drains are small and narrow. Also, there are no trees in close proximity to open water for these species to be considered nest at the Site.

Table 3 – Records from the eBird website within two kilometre radius of the Site, between January 2019 and December 2023. The likelihood of occurrence for each species is given based on their known habitat preferences and distribution in the general area. Threat classifications follow Robertson *et al.* (2021).

Common Name(s)	Scientific Name	Threat Classification	Likelihood of Occurrence
Indigenous			
Black-fronted tern/tarapirohe	<i>Chlidonias albostratus</i>	Threatened – Nationally Endangered	Possible
White heron/kōtuku	<i>Ardea alba modesta</i>	Threatened – Nationally Critical	Highly unlikely
Australasian crested grebe/pūteketeke	<i>Podiceps cristatus australis</i>	Threatened – Nationally Vulnerable	Highly unlikely
Caspian tern/taranui	<i>Hydroprogne caspia</i>	Threatened – Nationally Vulnerable	Highly unlikely
Black shag/māpunga	<i>Phalacrocorax carbo novaehollandiae</i>	At Risk – Relict	Unlikely
Banded dotterel/pohowera	<i>Charadrius bicinctus</i>	At Risk – Declining	Possible
Black-billed gull/tarāpuka	<i>Chroicocephalus bulleri</i>	At Risk – Declining	Likely
Marsh crake/kotoreke	<i>Zapornia pusilla affinis</i>	At Risk – Declining	Unlikely
New Zealand pipit/pīhoihoi	<i>Anthus novaeseelandiae</i>	At Risk – Declining	Unlikely
Red-billed gull/tarāpunga	<i>Chroicocephalus novaehollandiae scopulinus</i>	At Risk – Declining	Unlikely
South Island pied oystercatcher/tōrea	<i>Haematopus finschi</i>	At Risk – Declining	Highly likely
White-fronted tern/tara	<i>Sterna striata</i>	At Risk – Declining	Unlikely
Australian coot	<i>Fulica atra australis</i>	At Risk – Naturally Uncommon	Highly unlikely
Little shag/kawaupaka	<i>Microcarbo melanoleucos brevirostris</i>	At Risk – Relict	Unlikely
Australasian shoveler/kuruwhengi	<i>Spatula rhynchotis</i>	Not Threatened	Unlikely

Common Name(s)	Scientific Name	Threat Classification	Likelihood of Occurrence
Bellbird/korimako	<i>Anthornis melanura melanura</i>	Not Threatened	Unlikely
Black swan	<i>Cygnus atratus</i>	Not Threatened	Unlikely
Grey duck – mallard hybrid	<i>Anas superciliosa × platyrhynchos</i>	Not Threatened	Possible
Grey teal/tētē-moroiti	<i>Anas gracilis</i>	Not Threatened	Unlikely
Grey warbler/riroriro	<i>Gerygone igata</i>	Not Threatened	Unlikely
New Zealand kingfisher/kōtare	<i>Todiramphus sanctus vagans</i>	Not Threatened	Possible
New Zealand scaup/pāpango	<i>Aythya novaeseelandiae</i>	Not Threatened	Unlikely
Paradise shelduck/pūtangitangi	<i>Tadorna variegata</i>	Not Threatened	Likely
Pied stilt/poaka	<i>Himantopus himantopus leucocephalus</i>	Not Threatened	Likely
Pūkeko	<i>Porphyrio melanotus melanotus</i>	Not Threatened	Likely
Shining cuckoo/pīpīwharau	<i>Chrysococcyx lucidus lucidus</i>	Not Threatened	Unlikely
Silvereye/tauhou	<i>Zosterops lateralis lateralis</i>	Not Threatened	Possible
South Island fantail/piwakawaka	<i>Rhipidura fuliginosa fuliginosa</i>	Not Threatened	Possible
Southern black-backed gull/karoro	<i>Larus dominicanus dominicanus</i>	Not Threatened	Highly likely
Spur-winged plover	<i>Vanellus miles novaehollandiae</i>	Not Threatened	Highly likely
Swamp harrier/kāhu	<i>Circus approximans</i>	Not Threatened	Likely
Welcome swallow/warou	<i>Hirundo neoxena neoxena</i>	Not Threatened	Highly likely
White-faced heron/matuku moana	<i>Egretta novaehollandiae</i>	Not Threatened	Likely
Exotic			
Australian magpie	<i>Gymnorhina tibicen</i>	Introduced and Naturalised	Likely
California quail	<i>Callipepla californica</i>	Introduced and Naturalised	Unlikely
Canada goose	<i>Branta canadensis</i>	Introduced and Naturalised	Unlikely
Chaffinch	<i>Fringilla coelebs</i>	Introduced and Naturalised	Likely
Cirl bunting	<i>Emberiza cirlus</i>	Introduced and Naturalised	Highly unlikely
Common pheasant	<i>Phasianus colchicus</i>	Introduced and Naturalised	Unlikely

Common Name(s)	Scientific Name	Threat Classification	Likelihood of Occurrence
Common redpoll	<i>Acanthis flammea</i>	Introduced and Naturalised	Likely
Dunnock	<i>Prunella modularis</i>	Introduced and Naturalised	Likely
Eurasian blackbird	<i>Turdus merula</i>	Introduced and Naturalised	Highly likely
Goldfinch	<i>Carduelis carduelis</i>	Introduced and Naturalised	Highly likely
Greenfinch	<i>Chloris chloris</i>	Introduced and Naturalised	Highly likely
House sparrow	<i>Passer domesticus</i>	Introduced and Naturalised	Highly likely
Little owl	<i>Athene noctua</i>	Introduced and Naturalised	Unlikely
Mallard	<i>Anas platyrhynchos</i>	Introduced and Naturalised	Highly likely
Rock pigeon	<i>Columba livia</i>	Introduced and Naturalised	Possible
Skylark	<i>Alauda arvensis</i>	Introduced and Naturalised	Highly likely
Song thrush	<i>Turdus philomelos</i>	Introduced and Naturalised	Highly likely
Starling	<i>Sturnus vulgaris</i>	Introduced and Naturalised	Highly likely
Yellowhammer	<i>Emberiza citrinella</i>	Introduced and Naturalised	Highly likely

TERRESTRIAL INVERTEBRATES

56 The invertebrate assessment was undertaken by my colleague Dr Victoria Smith (Senior Invertebrate Ecologist, Wildlands).

57 The GBIF search retrieved records of 138 terrestrial invertebrates that met the search terms. The invertebrate fauna was characterised mainly by beetles, and moths and butterflies. Of these, 128 had been identified to a level at which they could be assessed. The invertebrate fauna was an approximately even mixture of indigenous and exotic species. Notable species are listed in Table 4.

Table 4 – Notable terrestrial invertebrate species recorded within five kilometres of the Site.

Species Name	Common Name	Threat Classification	Notability	Likelihood of Presence On-Site
<i>Vanessa gonerilla</i>	New Zealand red admiral butterfly	Not assessed	Declining due to habitat loss	High in sunny, open land, particularly where nettles are present.
<i>Orthodera novaezealandiae</i>	New Zealand mantis	At Risk – Declining (Buckley <i>et al.</i> 2012)	Threat status	High on shrubs and other upright, open vegetation
<i>Podagrion</i> sp.	Mantis parasitoid	At Risk – Declining (Ward <i>et al.</i> 2017)	Threat status	High wherever New Zealand mantises are present
<i>Hemiandrus celaeno</i>	Ground wētā	At Risk – Naturally Uncommon (Trewick <i>et al.</i> 2022)	Threat status	Medium, habitat constraints are unknown but they prefer firm, silty or clay soils to dig their burrows
<i>Gadira leucophthalma</i>	Beaked moss moth	Threatened – Nationally Vulnerable	Threat status	Low, as they prefer mossy areas of grassland and foredunes.

FISH

- 58 The freshwater fish assessment was undertaken by my colleague Stella McQueen (Senior Freshwater Ecologist, Wildlands).
- 59 Waterways on this Site consist of the Cam/Ruataniwha River along part of the northeastern boundary, and farm drains carrying mainly groundwater off the southern boundary of the Site. At the southern boundary the drains enter a larger road drain which is part of the North Brook catchment, which joins the Cam/Ruataniwha River further downstream. The Cam/Ruataniwha River flows into the Kaiapoi River at Kaiapoi, and then into the Waimakariri River Estuary.
- 60 There are 17 fish survey records in the New Zealand Freshwater Fish Database in the Cam/Ruataniwha River, North Brook and South Brook and tributaries (Table 5). For the size of the area this is a moderately low intensity of surveying. The dataset is generally older, with 10 records from 1991 and earlier. Only four records are from 2015 and later. Two records are from the Cam/Ruataniwha River at Kippenberger Ave (dated 1946, 1963 and 2021), and one is from a North Branch tributary close to the Site to the east (1991).
- 61 The likelihood of each species being present at the Site is based on their known habitat preferences and distribution in the surrounding catchment.
- 62 There is a moderate likelihood of the presence of eels of either species (longfin eel, *Anguilla dieffenbachii*, shortfin eel, *A. australis*) and a low or unlikely likelihood for most other species.
- 63 Canterbury mudfish (*Neochanna burrowsius*, Threatened – Nationally Critical) were recorded in surveys in 1946 and 1965 at the Site, upstream of the area listed as a historic waterbody or wetland in the Canterbury Black Maps. The 1965 survey comments note that mudfish were present at the Site five years prior. These records suggest that the historic wetland at the Site was a mudfish habitat. The drains may once have also had mudfish present, though there is a low probability that they are still present.
- 64 There are no other records of mudfish in the Cam/Ruataniwha River catchment or wider Plains area. The only extant mudfish populations north of the Waimakariri River are in a series of dune-slack wetlands along the coast between

the Ashley and Waimakariri, and in the headwaters of the Eyre River. The dune-slack habitats are threatened by sea level rise.

65 The area is poorly surveyed, and surveys for mudfish often target different habitats to surveys for other species. The drains and trees at the large fenced spring in the east of the Site have been in situ since before 1940. This could have created a stable refuge habitat for mudfish in times of drought and drain maintenance, allowing persistence at the Site to the present time.

66 If mudfish are still present, they would be significant and important to protect. A mudfish survey is recommended to be undertaken prior to any subdivision development.

Table 5: New Zealand Freshwater Fish Database records for The Cam/Ruataniwha River, North Brook and South Brook tributaries, and an assessment of the likelihood of the presence of these species at the Site. Conservation statuses are from Dunn *et al.* 2018²⁰. The likelihood of occurrence for each species is given based on their known habitat preferences and distribution in the surrounding catchment. An asterisk (*) indicates that one of the surveys records was within or adjacent to the Site.

Scientific Name	Common Name	Threat Classification	Number of Records	Likelihood at Site
<i>Salmo trutta</i>	Brown trout	Introduced	1	Unlikely
<i>Anguilla australis</i>	Shortfin eel	Not Threatened		Moderate
<i>Anguilla dieffenbachii</i>	Longfin eel	At Risk - Declining		Moderate
<i>Gobiomorphus cotidianus</i>	Common bully	Not Threatened		Low
<i>Gobiomorphus breviceps</i>	Upland bully	Not Threatened		Low
<i>Neochanna burrowsius</i>	Canterbury mudfish	Threatened – Nationally Critical		Low
<i>Paratya curvirostris</i>	Freshwater shrimp	Not Threatened	1	Low
<i>Paranephrops zealandicus</i>	Koura	At Risk - Declining		Low
<i>Galaxias argenteus</i>	Giant kōkopu	At Risk - Declining		Unlikely
<i>Retropinna retropinna</i>	Common smelt	Not Threatened	1	Unlikely

²⁰ Dunn, N. R., Allibone, R. M., Closs, G., Crow, S., David, B. O., Goodman, J., Griffiths, J., Jack, M. H., Ling, N., Waters, J. M., & Rolfe, J. R. (2018). *Conservation status of New Zealand freshwater fishes, 2017*. Publishing Team, Department of Conservation.

ECOLOGICAL VALUES

Vegetation

67 Vegetation on the Site is highly modified, the land has been cleared of any remnant indigenous vegetation and planted/oversown with exotic pasture grasses. The majority of the indigenous species were observed within the indigenous treeland and within the waterways. The remainder of the Site comprised exotic pasture species.

Freshwater and Wetlands

68 Waterways and wet areas on the Site are highly modified with few indigenous plants. Habitat diversity is low, only providing shallow, soft-bottomed, straight channels with dense vegetation low flow. The waterways and wet areas do provide habitat for indigenous eels, aquatic invertebrates, and seasonal use by water birds.

Lizards

69 Fragments of rank grassland and scrub, such as along fence lines or boundaries and within unmanaged areas of indigenous treeland and riparian vegetation, provide small amounts of habitat that are suitable for Canterbury grass skink (At Risk – Declining). However, no targeted surveys have been undertaken to confirm the presence of this species.

Avifauna

70 Although three avifauna species (one Threatened and two At Risk) may use the ryegrass pasture grassland and ryegrass pasture/wetland matrix, these areas are highly modified and do not provide optimal habitat for these species.

Terrestrial Invertebrates

71 Although five significant invertebrate species are found within five kilometres of the Site, only three (New Zealand red admiral butterfly, New Zealand mantis, mantis parasitoid) are likely to be present on-Site. The mantis and its parasitoid are suffering decline due to the introduced South African mantis (*Miomantis*

caffra), rather than habitat loss, and plenty of habitat is available in the vicinity of the Site.

- 72 The New Zealand red admiral butterfly is suffering a decline due to loss of indigenous nettle species which its larvae need for food. However, there are no indigenous nettles on-Site, so it is not an important Site for this species. However, New Zealand red admiral butterflies use introduced nettle species as a less-desirable larval food source, so they are still likely to be present.

SIGNIFICANCE ASSESSMENT

- 73 The Site was evaluated against ecological significance criteria in the Canterbury Regional Policy Statement (CRPS, Appendix 1)²¹ and the National Policy Statement for Indigenous Biodiversity (NPS-IB) (Appendix 2)²².
- 74 The Site may be considered ecologically significant under the rarity and distinctiveness criteria in the CRPS and NPS-IB as it potentially supports Threatened and At Risk avifauna and lizards. Fauna surveys in appropriate seasons are needed to confirm the potential presence of these species and the ecological significance of the Site.

ECOLOGICAL EFFECTS OF THE PROPOSAL

Assessment of the proposed rezoning

- 75 Rezoning is not expected to result in any significant adverse effects on the ecology of the Site. Most of the Site has a cover of exotic vegetation with few ecological values.
- 76 There is no indication that indigenous vegetation on the Site would be cleared or damaged as a result of rezoning.
- 77 Threatened and At Risk avifauna and lizards may utilise the Site, and fauna surveys during appropriate seasons are therefore required prior to any development of the Site.

²¹ CRPS; APPENDIX 3 - Criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity.

²² NPS-IB; Appendix 1: Criteria for identifying areas that qualify as significant natural areas (SNAs)

- 78 There are a number of excavated drains, wet areas, and springs on the property. Development of the Site needs to be designed and implemented to achieve no net loss; and preferably a significant net gain, of aquatic habitat and appropriate indigenous riparian plantings.
- 79 Red admiral butterfly may use the nettles on-Site as low-quality larval habitat. Any nettles removed should be replaced with indigenous nettle species in planted areas, to maintain and improve habitat for red admiral butterfly.
- 80 Subject to the above measures being addressed, the Site is an appropriate location for the proposed rezoning.

Assessment of the Bellgrove South-ODP

- 81 Provision of increased green space along the eastern boundary could provide habitat for indigenous vegetation and fauna,
- 82 The open space reserves indicated throughout the Bellgrove South-ODP would provide opportunities for indigenous plantings, which would benefit the ecological values of the Site.
- 83 Provision of a large area of green space (through a 6.5ha stormwater reserve) provides additional opportunities for indigenous planting and to contribute to habitats and ecological linkages for indigenous avifauna and invertebrates. The stormwater basins may also provide some benefits for wetland avifauna, depending on the design and amount of water retention.
- 84 An ecological management plan should be developed, by suitably qualified and experienced ecologists, to ensure that indigenous plantings and fauna habitats are created that are appropriate for the location and the indigenous species that will utilise it.

RELEVANT PLANNING PROVISIONS / STATUTORY REGULATIONS

National Policy Statement for Freshwater Management and the National Environmental Standards for Freshwater

- 85 The regulatory status of the waterways on the Site is based on the 'river' definition of the Resource Management Act (1991), which is as follows:

a) "River means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal)."

86 A watercourse is considered a 'river' if the source is natural, it flows for at least part of the year, and was not constructed for artificial purpose (Greer 2021²³, Otago Regional Council 2022²⁴). A 'river' may be highly modified from the natural state, such as a straightened farm drain or a piped urban stream. Natural sources of water can include surface and ground water, as well as lakes and wetlands.

87 Artificial watercourse move water to or from a human purpose (e.g. stormwater removal, stock and municipal water, irrigation, hydroelectricity etc.), rather than the natural flow of water across the land (e.g. springs and groundwater flows).

88 A farm drain is not automatically a 'farm drainage canal'. A 'canal' is an entirely artificial structure, whereas many farm drains are natural watercourses that have been straightened.

89 Man-made channels dug to drain historic wetlands or to direct water from springs and seepages are likely to be 'rivers', as these are natural sources of water and flow (Greer 2021, Otago Regional Council 2022). They are still 'rivers' if the flow ceases during dry periods, as this is intermittent flow.

90 Farm drains that only carry surface stormwater runoff are not 'rivers' as these are ephemeral (i.e. only flowing after rain) rather than intermittent (Greer 2021, Otago Regional Council 2022).

91 The drains on the Site are all modified natural watercourses as they were dug historically to drain a large wetland, they are still fed by springs and seepages, and the flow is intermittent or perennial.

92 Resource Management (National Environmental Standards for Freshwater) Regulations (NES-F; 2020), protect urban and rural streams from in-filling and

²³ Greer M. 2021: Guidance Note: How to determine whether a watercourse is a river, ephemeral watercourse, highly modified river or stream or artificial watercourse. Aquanet Consulting Ltd.

²⁴ Otago Regional Council 2022: Practice Note: What is 'Water' and What is an 'Artificial Watercourse'? Otago Regional Council.

prohibits earthworks in, and around wetlands. Reclamation of the bed of any river (or infilling streams) is a discretionary activity, requiring resource consent (Regulation 57 NES-F 2020). Earthworks, vegetation clearance, or disturbance of natural wetlands, or within a 10-metre setback from a natural wetland, is heavily restricted and in most cases a non-complying activity (Regulation 53, 54 NES-F 2020).

- 93 The drains on Site are likely to be considered 'rivers' under the NPS-FM, but further work would be needed to determine this. If they are proven to be rivers, they will need to be protected. The proposed rezoning will accommodate the status of the drains should they be determined to be rivers. Therefore, NES-F regulations should not constrain the rezoning.
- 94 No natural inland wetlands, as defined under the National Policy Statement for Freshwater Management (NPS-FM), were found on the Site. None of the wet areas observed on Site are considered to comprise wetlands under the CRPS or the pWDP definitions.

National Policy Statement for Indigenous Biodiversity

- 95 The objective of the NPS-IB is to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity. For subdivisions or developments outside of a Significant Natural Area (SNA), any significant adverse effects on indigenous biodiversity must be managed by applying the effects management hierarchy (Clause 3.16(1)).
- 96 Based on the Bellgrove South-ODP (2024), it is not considered that the rezoning, would result in adverse effects on indigenous biodiversity because development avoids the wetter parts of the Site, where the greatest biodiversity is found. Wetter parts of the Site are to be used as part of the stormwater management scheme under the Bellgrove South-ODP (2024). Furthermore, the proposed riparian setbacks for the Cam/Ruataniwha River and indigenous planting in and around the stormwater management area, open space reserves, the green links, and Site boundaries, will likely result in a net gain for indigenous biodiversity.
- 97 If lizards are present, some habitats on the Site would be considered ecologically significant under criteria sets in both CRPS and the NPS-IB. However, further

surveys would be required to determine the presence of the lizard species identified as being possibly present in the desktop evaluation. In general, the habitat values identified have low ecological value due to the highly modified nature of the Site, and the prevalence of exotic vegetation. If lizards are present, the loss of lizard habitat and opportunities to avoid or mitigate this should be considered during the development design, and could include restoration of lizard habitat in other parts of the property.

- 98 The proposed rezoning and development in accordance with the Bellgrove South-ODP and relevant waterway and natural character provisions of the pWDP will avoid adverse effects on indigenous biodiversity if an ecological management plan is developed for the Site. The ecological management plan will need to provide measures for avoiding and enhancing indigenous vegetation and fauna values at the site.

Wildlife Act 1953

- 99 Most indigenous vertebrate animal species are protected under the Wildlife Act (1953, s63 (1) (c)). In cases where proposed activities affect indigenous fauna and their habitats, a Wildlife Act Authority (WAA) must be applied for and approved by the Department of Conservation. A permit under the Wildlife Act must also be obtained from the Department before any indigenous fauna (and/or their habitats) can be disturbed, handled, translocated or killed. This includes clearance of exotic vegetation that provides habitat for indigenous fauna. Additionally, the submission of a species-specific management plan (for example, a Lizard Management Plan) would be required if indigenous lizards were found within vegetation on the Site that was proposed for clearance.

CONCLUSION

- 100 The rezoning Site is actively grazed and cultivated farmland. The Bellgrove South-ODP developed for the 31.2 hectare Site sought to be rezoned MRZ includes 6.5 hectares to be used for stormwater management.
- 101 There is historical evidence of wetlands in the southern part of the Site and several old channels and shallow depressions are present in this area. Threatened and At Risk indigenous water birds use these areas seasonally, and eels are likely

to be present in the farm drains. Several boggy areas were also observed across the Site. Investigations found that these depressions and boggy areas were not natural inland wetlands under the NPS-FM definition.

- 102 If At Risk lizards are found to be present through further survey effort prior to development then some habitats on Site could be considered ecologically significant under both CRPS and NPS-IB criteria. If At Risk bird and fish species are found to be present, some habitats at the Site could also be considered ecologically significant under CRPS criteria but not the NPS-IB, unless multiple At Risk bird and fish species were present in the same habitat. Further surveys would be required to determine the presence of any At Risk fauna found in the desktop evaluation.
- 103 Based on these findings, if rezoning goes ahead the waterways and springs on the Site are protected and enhanced with appropriate indigenous riparian planting, as detailed in the Bellgrove South-ODP. Further gains could be made through indigenous planting in the proposed stormwater management reserves and enhancement of habitat for lizards.
- 104 Prior to any subdivision consent and development works, additional surveys should be undertaken for indigenous lizards, nesting birds, and freshwater fauna.
- 105 The rezoning proposal is well-aligned with the NPS-IB, and should future development of the Site follow the Bellgrove South-ODP, it will give effect to the NPS-IB. If the recommendations outlined above are followed and implemented, with guidance from suitably qualified and experienced ecologists, then MRZ zoning of the Site and future development in accordance with the revised Bellgrove South-ODP, proposed for the Site, would result in no net loss of biodiversity, and most likely, a net gain for indigenous biodiversity.

Dated 29 April 2024



Dr Morgan Lee Tracy-Mines

Appendix 1

Canterbury Regional Policy Statement Significance Criteria

Criteria	Bellgrove South Property
Representativeness	
1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.	Criterion not met
2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.	Criterion not met
Rarity/Distinctiveness	
3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the region, or relevant land environment, ecological district, or freshwater environment.	Criterion not met
4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.	Criterion potentially met. This habitat could potentially support Threatened and At Risk avifauna and lizards.
5. The Site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.	Criterion not met
6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.	Criterion not met
Diversity/Pattern	
7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous	Criterion not met

Criteria	Bellgrove South Property
taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.	
Ecological Context	
8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.	Criterion not met
9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.	Criterion not met
10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.	Criterion not met

Appendix 2

National Policy Statement for Indigenous Biodiversity Significant Natural Area Criteria (Appendix 1)

Representativeness criterion

- (1) Representativeness is the extent to which the indigenous vegetation or habitat of indigenous fauna in an area is typical or characteristic of the indigenous biodiversity of the relevant ecological district.
- (2) Significant indigenous vegetation has ecological integrity typical of the indigenous vegetation of the ecological district in the present-day environment. It includes seral (regenerating) indigenous vegetation that is recovering following natural or induced disturbance, provided species composition is typical of that type of indigenous vegetation.
- (3) Significant indigenous fauna habitat is that which supports the typical suite of indigenous animals that would occur in the present-day environment. Habitat of indigenous fauna may be indigenous or exotic.
- (4) Representativeness may include commonplace indigenous vegetation and the habitats of indigenous fauna, which is where most indigenous biodiversity is present. It may also include degraded indigenous vegetation, ecosystems and habitats that are typical of what remains in depleted ecological districts. It is not restricted to the best or most representative examples, and it is not a measure of how well that indigenous vegetation or habitat is protected elsewhere in the ecological district.
- (5) When considering the typical character of an ecological district, any highly developed land or built-up areas should be excluded.
- (6) The application of this criterion should result in identification of indigenous vegetation and habitats that are representative of the full range and extent of ecological diversity across all environmental gradients in an ecological district, such as climate, altitude, landform, and soil sequences. The ecological character and pattern of the indigenous vegetation in the ecological district should be described by reference to the types of indigenous vegetation and the landforms on which it occurs.
- (7) An area that qualifies as an SNA under this criterion has at least one of the following attributes:
 - a. indigenous vegetation that has ecological integrity that is typical of the character of the ecological district:
 - b. habitat that supports a typical suite of indigenous fauna that is characteristic of the habitat type in the ecological district and retains at least a moderate range of species expected for that habitat type in the ecological district.

Diversity and pattern criterion

- (1) Diversity and pattern is the extent to which the expected range of diversity and pattern of biological and physical components within the relevant ecological district is present in an area.
- (2) Diversity of biological components is expressed in the variation of species, communities, and ecosystems. Biological diversity is associated with variation in physical components, such as geology, soils/substrate, aspect/exposure, altitude/depth, temperature, and salinity.
- (3) Pattern includes changes along environmental and landform gradients, such as ecotones and sequences.

- (4) Natural areas that have a wider range of species, habitats or communities or wider environmental variation due to ecotones, gradients, and sequences in the context of the ecological district, rate more highly under this criterion.
- (5) An area that qualifies as a significant natural area under this criterion has at least one of the following attributes:
 - a. at least a moderate diversity of indigenous species, vegetation, habitats of indigenous fauna or communities in the context of the ecological district:
 - b. presence of indigenous ecotones, complete or partial gradients or sequences.

Rarity and distinctiveness criterion

- (1) Rarity and distinctiveness is the presence of rare or distinctive indigenous taxa, habitats of indigenous fauna, indigenous vegetation or ecosystems.
- (2) Rarity is the scarcity (natural or induced) of indigenous elements: species, habitats, vegetation, or ecosystems. Rarity includes elements that are uncommon or threatened.
- (3) The list of Threatened and At Risk species is regularly updated by the Department of Conservation. Rarity at a regional or ecological district scale is defined by regional or district lists or determined by expert ecological advice. The significance of nationally listed Threatened and At Risk species should not be downgraded just because they are common within a region or ecological district.
- (4) Depletion of indigenous vegetation or ecosystems is assessed using ecological districts and land environments.
- (5) Distinctiveness includes distribution limits, type localities, local endemism, relict distributions, and special ecological or scientific features. Attributes of rarity and distinctiveness.
- (6) An area that qualifies as an SNA under this criterion has at least one of the following attributes:
 - a. provides habitat for an indigenous species that is listed as Threatened or At Risk (declining) in the New Zealand Threat Classification System lists:
 - b. an indigenous vegetation type or an indigenous species that is uncommon within the region or ecological district:
 - c. an indigenous species or plant community at or near its natural distributional limit:
 - d. indigenous vegetation that has been reduced to less than 20 per cent of its prehuman extent in the ecological district, region, or land environment:
 - e. indigenous vegetation or habitat of indigenous fauna occurring on naturally uncommon ecosystems:
 - f. the type locality of an indigenous species:
 - g. the presence of a distinctive assemblage or community of indigenous species:
 - h. the presence of a special ecological or scientific feature.

Ecological context criterion

- (1) Ecological context is the extent to which the size, shape, and configuration of an area within the wider surrounding landscape contributes to its ability to maintain indigenous biodiversity or affects the ability of the surrounding landscape to maintain its indigenous biodiversity.
- (2) Ecological context has two main assessment principles:
 - a. the characteristics that help maintain indigenous biodiversity (such as size, shape, and configuration) in the area; and

- b. the contribution the area makes to protecting indigenous biodiversity in the wider landscape (such as by linking, connecting to or buffering other natural areas, providing 'stepping stones' of habitat or maintaining ecological integrity).
- (3) An area that qualifies as an SNA under this criterion has at least one of the following attributes:
- a. at least moderate size and a compact shape, in the context of the relevant ecological district:
 - b. well-buffered relative to remaining habitats in the relevant ecological district:
 - c. provides an important full or partial buffer to, or link between, one or more important habitats of indigenous fauna or significant natural areas:
 - d. important for the natural functioning of an ecosystem relative to remaining habitats in the ecological district

Appendix 3

Vascular plant species recorded at the Bellgrove South Site.

Species	Common Name	Status
<i>Agrostis capillaris</i>	browntop	Exotic
<i>Arrhenatherum elatius</i>	tall oat grass	Exotic
<i>Betula pendula</i>	silver birch	Exotic
<i>Bromus</i> sp.	brome grass	Exotic
<i>Cardamine hirsuta</i>	bitter cress	Exotic
<i>Carex</i> sp.	sedge	Indigenous
<i>Cirsium arvense</i>	Californian thistle	Exotic
<i>Cordyline australis</i>	tī kōuka, cabbage tree	Indigenous
<i>Crataegus monogyna</i>	hawthorn	Exotic
<i>Cytisus scoparius</i>	broom	Exotic
<i>Dactylis glomerata</i>	cocksfoot	Exotic
<i>Erigeron canadensis</i>	Canadian fleabane	Exotic
<i>Eucalyptus globulus</i>	blue gum	Exotic
<i>Griselinia littoralis</i>	kāpuka	Indigenous
<i>Hedera helix</i>	ivy	Exotic
<i>Lemna minor</i>	common duckweed	Indigenous
<i>Lepidium africanum</i>	peppergrass	Exotic
<i>Linum catharticum</i>	purging flax	Exotic
<i>Lolium perenne</i>	ryegrass	Exotic
<i>Malva sylvestris</i>	large-flowered mallow	Exotic
<i>Nasturtium officinale</i>	watercress	Exotic
<i>Onopordum acanthium</i>	cotton thistle	Exotic
<i>Phormium tenax</i>	harakeke	Indigenous
<i>Pinus</i> sp.	pine	Exotic
<i>Pittosporum eugenioides</i>	tarata, lemonwood	Indigenous
<i>Pittosporum tenuifolium</i>	kōhūhū	Indigenous
<i>Plantago lanceolata</i>	narrow-leaved plantain	Exotic
<i>Plantago major</i>	broad-leaved plantain	Exotic
<i>Polygonum aviculare</i>	wireweed	Exotic
<i>Quercus robur</i>	English oak	Exotic
<i>Ranunculus acris</i>	giant buttercup	Exotic
<i>Ranunculus repens</i>	creeping buttercup	Exotic
<i>Rosa rubiginosa</i>	sweet briar	Exotic
<i>Rubus fruticosus</i>	blackberry	Exotic
<i>Rumex acetosella</i>	sheep's sorrel	Exotic
<i>Rumex obtusifolius</i>	broad-leaved dock	Exotic

Species	Common Name	Status
<i>Senecio australis</i>	N/A	Indigenous
<i>Solanum carolinense</i>	horse nettle	Exotic
<i>Taraxacum officinale</i>	dandelion	Exotic
<i>Trifolium pratense</i>	red clover	Exotic
<i>Trifolium repens</i>	white clover	Exotic
<i>Ulex europaeus</i>	gorse	Exotic
<i>Verbascum thapsus</i>	woolly mullein	Exotic
<i>Vicia sativa</i>	vetch	Exotic