

ECOLOGICAL ASSESSMENT OF THE PROPOSED BELMGROVE SUBDIVISION, STAGES 2-5, RANGIORA



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ECOLOGICAL ASSESSMENT OF PROPOSED THE BELLGROVE SUBDIVISION, STAGES 2-5, RANGIORA



Contract Report No. 6375

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Project Team:

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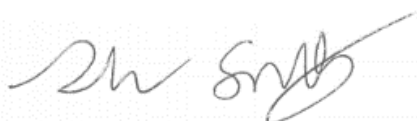
Prepared for:

Bellgrove Rangiora Limited
C/- Aurecon Group

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1. INTRODUCTION

Aurecon Group, on behalf of their client Bellgrove Rangiora Limited (BRL) engaged Wildland Consultants Ltd. to undertake an assessment of vegetation values and potential wetland habitats on a proposed residential development site at Bellgrove farm, east of Rangiora. A full assessment of indigenous fauna and habitat values was outside the scope of this report, however a lizard survey of the site was undertaken by Wildland Consultants in February 2022 (Wildlands 2022). An assessment of ecological effects is also outside the scope of this report.

BRL are looking to develop around 100 hectares as part of the Bellgrove residential subdivision, with Stage 1 (20 hectares) currently being considered by the Environmental Protection Authority (EPA) under the COVID-19 Recovery (Fast-track Consenting) Act 2020. The Stage 1 area includes the Bellgrove homestead, and the head waters of both the Cam River and another unnamed stream that is a tributary of Ashley/Rakahuri River.

This assessment is for Stages 2-5 of the proposed development, which covers approximately 40 hectares of farmland that is currently been used for rotational grazing and cropping. Hereafter this area is referred to as the ‘site’ (Plate 1).

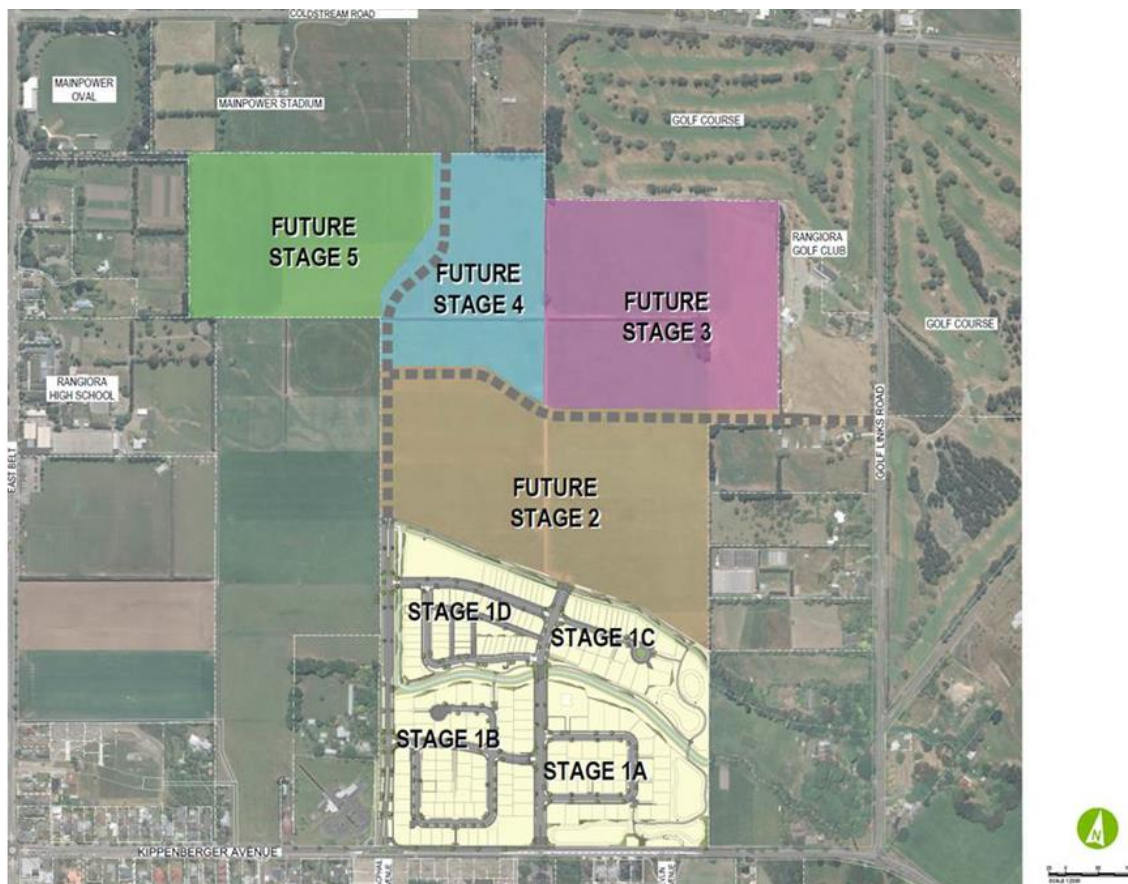


Plate 1: Bellgrove residential subdivision site.

2. METHODS

The Stage 2-5 development footprint was assessed for vegetation values and potential wetlands on 18 May 2022. The site was assessed by way of a walk-through survey. Desktop surveys using records from the New Zealand Plant Conservation Network and iNaturalist, as well as reviewing historical aerial imagery were additionally carried out.

Wetland Delineation

The vegetation and habitats on the site were evaluated for wetland status according to the Resource Management Act (RMA; 1991), 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”, and the National Policy Statement for Freshwater Management (NPS -FM; 2020), which excludes the following situations from the RMA definition:

- A wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former natural wetland); or
- A geothermal wetland; or
- Any area of improved pasture that, at the commencement date, is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain derived water pooling.

Also, the NPS-FM defines improved pasture as an area of land where exotic pasture species have been deliberately sown or maintained for the purpose of pasture production, and species composition and growth has been modified and is being managed for livestock grazing.

The NPS-FM refers to the Ministry for the Environment (MfE) wetland delineation protocols (August 2020) in order to determine the status of wetlands. These rely 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: Clarkson 2013 and subsequent updates) are:

- Obligate (OBL): occurs almost always in wetlands (estimated probability >99% in wetlands).
- Facultative Wetland (FACW): occurs usually in wetlands (67–99%).
- Facultative (FAC): equally likely to occur in wetlands or non-wetlands (34–66%).
- Facultative Upland (FACU): occurs occasionally in wetlands (1–33%).
- Upland (UPL): rarely occurs in wetlands (<1%), almost always in ‘uplands’ (non-wetlands).

Other methods of wetland delineation exist, for example the presence of hydric soils (i.e. soils which have been wet for sufficient time so that they develop under anoxic conditions, Fraser *et al.* 2018).

In accordance with the methods described in MFE (2020), in areas of potential wetland we:

- Established three representative plots (2 m × 2 m) in each vegetation type present within the potential wetlands. This plot size was considered sufficient for the size of the wetlands present.
- In each plot, the species in each stratum were identified and percent cover estimated (i.e. tree, sapling/shrub, herb). Note that only the herb layer remained intact within the wetlands onsite because of historic land clearance and grazing.
- A hydrophytic vegetation determination was completed for each vegetation plot. This followed the flow chart presented in Figure 1 of MFE (2020) in terms of steps, while species hydrophyte categories were taken from Clarkson (2013). Where species were not included in Clarkson (2013) they were categorised as noted in the individual plot information provided in Attachment 1.
 - Firstly, the Rapid test was completed. For this test to confirm the area as a wetland, all dominant species must be either OBL or FACW vegetation.
 - If the Rapid test failed to identify the area as a wetland, then the Dominance test was completed. For this test to confirm the area as a wetland >50% of the dominant species must be OBL, FACW or FAC and all/most dominant species must not be FAC.
 - If both the Rapid test and the Dominance test failed to identify the area as a wetland, then the Prevalence Index (PI) was used. For this test, a plot-based algorithm derived from the unique combination of OBL–UPL plants and their cover is calculated. The vegetation is considered to be hydrophytic (wetland) if $PI \leq 3.0$, but values around 3.0 should be used alongside other wetland indicators.
 - If the Rapid, Dominance, and Prevalence tests failed to identify the area as a wetland, then indicators of hydric soils were taken to determine if there was wetland hydrology present.
 - If the hydrology of the soil passed, then the definition of a wetland was met for the site under the RMA and NPS-FM¹.

For more detailed methodology refer to MFE (2020; 2021) and/or Clarkson (2013).

Ecological Significance

Areas of ecological significance in Canterbury are areas or habitats that meet one or more of the criteria listed in the Canterbury Regional Policy Statement (CRPS; Appendix 3). Areas identified as significant are to be protected to ensure no net loss of indigenous biodiversity or indigenous biodiversity values as a result of land use activities. We assessed the site against these criteria.

¹ With conditions – see MFE (2021) for more detail.

3. CURRENT VEGETATION

At the time of this survey the entire site (with the exception of tracks and hedge rows) was covered with improved pasture and cropland (Figure 1). In total three vegetation type were identified:

1. Pine hedgerows
2. Perennial ryegrass grassland (improved pasture)
3. Kale cropland

1. Pine hedgerows

A single long radiata pine (*Pinus radiata*) hedgerow, running east-west was located on the boundary between the proposed Stage 2 and Stage 3-4 areas of the site. A second pine hedgerow running north-south marked the boundary between the proposed Stage 3 and 4 development areas. The pines formed a dense canopy in these hedgerows with little vegetation underneath. Along the margins a number of common herbaceous weed species were observed including stinging nettle (*Urtica urens*), hedge mustard (*Sisymbrium officinale*), large-flowered mallow (*Malva sylvestris*) and nightshades (*Solanum chenopodioides*, *S. nigrum*).

2. Perennial ryegrass grassland (improved pasture)

At the time of the survey improved pasture covered all of the proposed Stage 2 and 4 development areas, as well as parts of the proposed Stage 3 and 5 development areas. The pasture predominately consisted of perennial rye grass (*Lolium perenne*) with occasional Italian ryegrass (*Lolium multiflorum*) and prairie grass (*Bromus catharticus*). In places clover (mostly *Trifolium repens* and *T. pratense*) were locally abundant. Around paddock margins a number of common herbaceous weed species were also observed including broad-leaved dock (*Rumex obtusifolius*), broad-leaved plantain (*Plantago major*), Californian thistle (*Cirsium arvense*) and dandelion (*Taraxacum officinale*; Plate 2).



Plate 2: Perennial ryegrass grassland, (improved pasture) in the proposed Stage 2 development area (left) and kale cropland, in the proposed Stage 3 development area (right).



Legend

- Site boundary (Stages 1-5)
- Development stages
- Farm track
- Vegetation and habitat types
 - 1. Pine hedgerows
 - 2. Perennial ryegrass grassland (improved pasture)
 - 3. Kale cropland

Data Acknowledgment
 Map contains data sourced from LINZ
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Figure 1. Vegetation cover, Bellgrove residential development site, Stages 2-5.



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 Date: 20/05/2022
 Cartographer: KM
 Format: A3R

3. Kale cropland

At the time of the survey, kale (*Brassica oleracea* var. *acephala*) cropland covered most of the proposed Stage 3 and 5 development areas. Interspersed with the kale was abundant stinging nettle. Around the crop margins, fathen (*Chenopodium album*), shepherds purse (*Capsella bursa-pastoris*), musky storksbill (*Erodium moschatum*), staggerweed (*Stachys arvensis*) and field pansy (*Viola arvensis*) were all abundant (Plate 2).

4. FLORA

4.1 Overview

A total of 54 species were recorded on the site during the survey (Appendix 1). Only two of these, tī kōuka/cabbage tree (*Cordyline australis*) and Jersey cudweed (*Pseudognaphalium luteoalbum*), were indigenous. There were no threatened or at-risk indigenous species recorded on the site (de Lange *et al* 2018).

4.2 Pest plants

The only pest plant that is identified under the Environment Canterbury Regional Pest Management Plan (RPMP) (2018-2038) that was recorded on the site was gorse (*Ulex europaeus*). This was in very low abundance with a few individual plants scattered along fence lines and boundaries. Four other species found on the site are listed as ‘Organisms of Interest’ within the Environment Canterbury RPMP (Table 1). Pines and conifers recorded on the site had all been planted. These are not wilding conifers and are therefore not considered pest plants under the RPMP.

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

Species	Common Name	Pest Classification
<i>Conium maculatum</i>	Hemlock	RPMP-Ool
<i>Crataegus monogyna</i>	Hawthorn	RPMP-Ool
<i>Echium vulgare</i>	Vipers bugloss	RPMP-Ool
<i>Rosa rubiginosa</i>	Sweet briar	RPMP-Ool
<i>Ulex europaeus</i>	Gorse	RPMP-Pest

4.3 Vegetation values

Vegetation on the site was highly modified. The site was nearly completely covered with improved pasture and cropland. The two indigenous plant species recorded were both common throughout Canterbury and New Zealand and are considered to be of low value. We do not consider the vegetation at the site to be ecologically significant under the CRPS, however the site does meet the CRPS ecological significance criteria because of the presence of lizards and their habitats, this is addressed separately in Wildlands (2022).

5. POTENTIAL WETLANDS

A walk over of the entire site (Stage 2-5) was undertaken to identify and (if necessary) delineate any natural inland wetlands.

A number of areas of rain derived surface water pooling were observed on the site. These were all within areas of improved pasture and are formed through the trampling of vegetation and compaction of soil by cattle beside drinking troughs (Plate 4, Appendix 2). These areas are excluded from the RMA natural inland wetlands definition by the NPS-FM on the basis that they are areas of improved pasture that are dominated by exotic pasture species that are subject to temporary rain derived water pooling. These areas were dry when surveyed for lizards in February 2022 (Samantha King, pers. comm).

Within the proposed Stage 3 development area, a number small undulations in the topography were observed. A review of aerial imagery determined that these were most likely historic river channels from the Ashley/Rakahuri River (Figure 3).



Figure 3: Aerial image showing historic river channels within the proposed Stage 3 development area (outlined in red) and location of vegetation plots in channelised depression area in the northwest corner.

A low-lying depression in one of these channels was observed to have a distinctive change in vegetation pattern, with an abundance of facultative wetland species,

indicating the possible presence of a natural wetland¹. Three 2 × 2 metre vegetation plots were measured along a transect spanning the potential wetland area. The plots covered the representative vegetation types found along the length of the depression and associated channel area (photopoints of the depression and the three plots are shown in Appendix 2). They were located as follows:

- Plot 1, in the centre of the depression.
- Plot 2, in associated historic channelised area to northwest.
- Plot 3, in associated historic channelised area to southeast.

Regulatory Assessment

All three plots failed the rapid test, the dominance test and the prevalence test (Table 2; Appendix 2). Soils were investigated at Plot 1 and found not to be hydric. The soil was very gravelly and where a soil profile could be observed it was a light grey high chroma soil (Appendix 2, Plate 6). These observations do not meet the hydrophytic vegetation, or hydric soils threshold and the area was therefore considered not to be a wetland under the RMA or under NPS-FM.

Table 2: Assessment of the plots using vegetation, soil, and hydrology indicators.

Criteria	Plot 1	Plot 2	Plot 3
Hydrophytic vegetation	Exotic broad-leaved dock (FAC) makes up 70% of the total vegetative cover. The prevalence test outcome was 3.16.	Exotic perennial ryegrass (FACU) makes up 85% of the total vegetative cover. The prevalence test outcome was 3.99.	Exotic perennial ryegrass (FACU) makes up 65% of the total vegetative cover. The prevalence test outcome was 4.06.
Soils	Soil was dry and at the time of survey and the soil profile taken between 0-30 centimetres was 5YR 6/1 soil with high chroma. It stayed consistent throughout the soil profile.	Not assessed	Not assessed
Hydrology	No hydric soil indicators	N/A	N/A
Resulting classification	Not a wetland	Not a wetland	Not a wetland

6. CONCLUSIONS

The area of the proposed Bellgrove residential development (Stages 2-5), does not constitute ecologically important vegetation under the CRPS. None of the areas of surface water pooling, historic river channels or depressions on the site meet the definition of a wetland under the RMA or NPS-FM. Based on these findings, further ecological investigation and assessment of ecological effects is not deemed necessary for the future urban development of this site.

¹ All areas of historic river channel were investigated; however, no other areas of hydrophytic vegetation were identified.

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- Fraser S., Singleton P., and Clarkson B. 2018: Hydric soils – field identification guide. *Manaaki Whenua Landcare Research Contract Report LC3233*.
- Ministry for the Environment 2021: Wetland delineation hydrology tool for Aotearoa New Zealand. Wellington: Ministry for the Environment.
- Wildland Consultants 2022: Lizard habitat assessment and survey – Bellgrove Farm, Rangiora. *Wildland Consultants Ltd Contract Report No. 6236*. Letter prepared for Bellgrove Rangiora Limited. 4 pp.

PLANT SPECIES RECORDED DURING THE SURVEY

Species Name	Common Name	Growth Form	Species Status	Threat Status
<i>Achillea millefolium</i>	Yarrow	Dicot Herb	Exotic	
<i>Brassica oleracea</i>	Wild Cabbage	Dicot Herb	Exotic	
<i>Bromus catharticus</i>	Prairie grass	Grass	Exotic	
<i>Bromus hordeaceus</i>	Soft Brome	Grass	Exotic	
<i>Capsella bursa-pastoris</i>	Shepherd'S Purse	Dicot Herb	Exotic	
<i>Chenopodium album</i>	Fathen		Exotic	
<i>Cirsium arvense</i>	Californian Thistle	Dicot Herb	Exotic	
<i>Cirsium vulgare</i>	Scotch Thistle	Dicot Herb	Exotic	
<i>Conium maculatum</i>	Hemlock	Dicot Herb	Exotic	
<i>Cordyline australis</i>	tī kōuka / Cabbage Tree	Tree or Shrub	Indigenous Endemic	Not Threatened
<i>Crataegus monogyna</i>	Hawthorn	Tree	Exotic	
<i>Crepis capillaris</i>	Hawksbeard	Dicot Herb	Exotic	
<i>Cupressus macrocarpa</i>	Macrocarpa	Tree	Exotic	
<i>Dactylis glomerata</i>	Cocksfoot	Grass	Exotic	
<i>Echium vulgare</i>	Viper'S Bugloss	Dicot Herb	Exotic	
<i>Erigeron canadensis</i>	Horseweed	Dicot Herb	Exotic	
<i>Erodium moschatum</i>	Musky Storksbill	Dicot Herb	Exotic	
<i>Euonymus europaeus</i>	Spindleberry	Tree or Shrub	Exotic	
<i>Hypochaeris radicata</i>	Catsear	Dicot Herb	Exotic	
<i>Jacobaea vulgaris</i>	Ragwort	Dicot Herb	Exotic	
<i>Lolium multiflorum</i>	Italian Ryegrass	Grass	Exotic	
<i>Lolium perenne</i>	Perennial Rye Grass	Grass	Exotic	
<i>Malva sylvestris</i>	Large-Flowered Mallow	Dicot Herb	Exotic	
<i>Pinus radiata</i>	Radiata Pine	Tree or Shrub	Exotic	
<i>Pinus species</i>	Pine	Tree or Shrub	Exotic	
<i>Plantago lanceolata</i>	Narrow-Leaved Plantain	Dicot Herb	Exotic	
<i>Plantago major</i>	Broad-Leaved Plantain	Dicot Herb	Exotic	
<i>Poa annua</i>	Annual Poa	Grass	Exotic	
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	Tree or Shrub	Indigenous Non-Endemic	Not Threatened
<i>Rosa rubiginosa</i>	Sweet Briar	Shrub	Exotic	
<i>Rumex obtusifolius</i>	Broad-Leaved Dock	Dicot Herb	Exotic	
<i>Sisymbrium officinale</i>	Hedge Mustard	Dicot Herb	Exotic	
<i>Solanum chenopodioides</i>	Velvety Nightshade	Dicot Herb	Exotic	
<i>Solanum nigrum</i>	Black Nightshade	Dicot Herb	Exotic	
<i>Sonchus asper</i>	Prickly Sow Thistle	Dicot Herb	Exotic	
<i>Sonchus oleraceus</i>	Sow Thistle	Dicot Herb	Exotic	
<i>Stachys arvensis</i>	Staggerweed	Dicot Herb	Exotic	
<i>Taraxacum officinale</i>	Dandelion	Dicot Herb	Exotic	
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	Dicot Herb	Exotic	
<i>Trifolium pratense</i>	Red Clover	Dicot Herb	Exotic	
<i>Trifolium repens</i>	White Clover	Dicot Herb	Exotic	
<i>Ulex europaeus</i>	Gorse	Shrub	Exotic	
<i>Urtica urens</i>	Nettle	Dicot Herb	Exotic	
<i>Viola arvensis</i>	Field Pansy	Dicot Herb	Exotic	

SITE PHOTOGRAPHS AND PLOT LOCATIONS



Plate 3: Areas of rain derived surface water pooling within improved pasture and associated with drinking troughs for cattle.



Plate 4: Depression in northwest of proposed Stage 3 development area with a distinctive change in vegetation pattern indicating the possible presence of a natural wetland (vegetation plots determined a natural wetland was not present).



Plate 5: Plot 1 (left) and soil profile (right).



Plate 6: Plot 2 (left) and plot 3 (right).

DETAILED PLOT INFORMATION - WETLAND ASSESSMENT

Plot 1 (Plate 6)Rapid test: **Fail**Dominance Test: **Fail (all/most dominant species must not be FAC)**Hydric soil: **Absent**Prevalence test: **3.16 (Fail)**Natural inland wetland: **No (Dominated by FAC species)**

Scientific Name	Common Name	Status	Percent Cover	Origin / Pasture	Notes
<i>Rumex obtusifolius</i>	Broad-leaved dock	FAC	70	Exotic	Dominant species
<i>Lolium perenne</i>	Perennial ryegrass	FACU	5	Exotic	
<i>Stellaria media</i>	Chickweed	FACU	5	Exotic	
<i>Trifolium repens</i>	White clover	FACU	1	Exotic	
<i>Taraxacum officinale</i>	Dandelion	FACU	1	Exotic	
<i>Jacobaea vulgaris</i>	Ragwort	FACU	1	Exotic	

Plot 2 (Plate 7)Rapid test: **Fail**Dominance Test: **Fail**

Hydric soil: N/A

Prevalence test: **3.99 (Fail)**Natural inland wetland: **No (95% pasture species)**

Scientific Name	Common Name	Status	Percent Cover	Origin / Pasture	Notes
<i>Lolium perenne</i>	Perennial ryegrass	FACU	85	Exotic / Pasture	Dominant species
<i>Trifolium repens</i>	White clover	FACU	10	Exotic / Pasture	
<i>Taraxacum officinale</i>	Dandelion	FACU	0.1	Exotic	
<i>Poa annua</i>	Annual poa	FACU	0.1	Exotic	
<i>Stellaria media</i>	Chickweed, Kohukohu	FACU	0.1	Exotic	
<i>Plantago major</i>	Broad-leaved plantain	FACU	1	Exotic	
<i>Rumex obtusifolius</i>	Broad-leaved dock	FAC	1	Exotic	
<i>Cerastium fontanum</i>	Mouse-ear chickweed	FACU	0.1	Exotic	

Plot 3 (Plate 7)

Rapid test: **Fail**

Dominance Test: **Fail**

Hydric soil: N/A

Prevalence test: **4.06 (Fail)**

Natural inland wetland: **No (80% pasture species)**

Scientific Name	Common Name	Status	Percent Cover	Origin / Pasture	Notes
<i>Lolium perenne</i>	Perennial ryegrass	FACU	65	Exotic / Pasture	Dominant species
<i>Lolium multiflorum</i>	Italian ryegrass	UPL	15	Exotic / Pasture	
<i>Taraxacum officinale</i>	Dandelion	FACU	1	Exotic	
<i>Rumex obtusifolius</i>	Broad-leaved dock	FAC	10	Exotic	
<i>Trifolium repens</i>	White clover	FACU	1	Exotic / Pasture	
<i>Malva parviflora</i>	small-flowered mallow	UPL	1	Exotic	
<i>Stellaria media</i>	Chickweed	FACU	1	Exotic	
<i>Cerastium fontanum</i>	Mouse-ear chickweed	FACU	1	Exotic	

ECOLOGICAL EVALUATION OF THE VEGETATION AT BELLGROVE SUBDIVISION STAGES 2-5 USING THE CANTERBURY REGIONAL POLICY STATEMENT'S ECOLOGICAL SIGNIFICANCE CRITERIA

Criteria	
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.	Does not meet threshold The site does not contain indigenous vegetation or indigenous fauna habitat that is representative, typical or characteristic of the ecological district.
2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.	Does not meet threshold The site does not contain a large example of indigenous vegetation or indigenous fauna habitat.
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.	Does not meet threshold The site does not contain an example of indigenous vegetation or fauna that has been reduced to less than 20% of its former extent in the region.
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.	Meets the criteria Lizard habitat has been identified on the site (Wildlands 2022).
5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.	Does not meet threshold The site does not contain any distributional limits of indigenous flora and fauna.
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 combination of factors.	Does not meet threshold The site does not contain any indigenous species that are distinctive or restricted in their range.
Diversity and Pattern	
7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients ¹ .	Does not meet threshold The site has negligible diversity of indigenous biodiversity and habitats.
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.	Does not meet threshold There is no vegetation or habitat present that provides and important ecological linkage or network for indigenous fauna.
9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.	Does not meet threshold No wetlands
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.	Does not meet threshold There is no vegetation or habitat present that serves as a refuge from predation, or is key feeding, breeding or resting habitat for indigenous fauna.



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