Terrestrial Ecological Impact Assessment

Bangor Village

Hughes Developments Limited

Prepared for: Hughes Developments Limited
Project: Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment

Effects Management Ecology Ltd
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Drafted inputs by:	Quinn O'Halloran	Ecologist	18 May 2026
Finalised, reviewed and approved by:	Mark Hansen	Principal Ecologist	08 July 2026

Revision No:	Date:	Details:
0	26/06/2026	Draft for client review
1	06/07/2026	Revised following client review
2	08/06/2026	Final

This report ('report') has been prepared by Effects Management Ecology Ltd ('EME') on behalf of Hughes Developments ('the Client') for the Bangor Village subdivision (the 'Project') and in accordance with the agreed offer of service between EME and the Client, dated 19 March 2026. This report has relied upon data and information supplied by the Client and or the Project team, along with publicly accessible sources available at the time of writing. The findings within this report are accurate and though Site conditions or wildlife composition are subject to change over time, a precautionary approach and professional opinion have been used to ensure the findings are as accurate as possible. This report may be relied on by the expert panel appointed to determine the substantive application for the Project under the Fast-track Approvals Act 2024. EME does not accept any liability for any unauthorised use or reliance on information within this report.

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ABBREVIATIONS

✓	Confirmed (on-site or within the ZOI)
°C	Degrees Celsius
AC	Anecdotally confirmed
AR-D	At Risk – Declining
AR-NU	At Risk – Naturally Uncommon
AR-R	At Risk – Relict
CPUE	Catch per unit effort
CRPMP	Canterbury Regional Pest Management Plan
CRPS	Canterbury Regional Policy Statement
DOC	Department of Conservation
ECAN	Environment Canterbury (Canterbury Regional Council)
ED	Ecological District
EIANZ	Environment Institute of Australia and New Zealand
EME	Effects Management Ecology Ltd
ER	Ecological Region
GIS	Geographic Information System
ha	Hectares
I&N	Introduced and Naturalised
LRA	Lizard release area
m	Metres
mm	Millimetres
MfE	Ministry for the Environment
NPS-IB	National Policy Statement for Indigenous Biodiversity
NCO	Natural cover object
Not Pro	Not Protected
NT	Not Threatened
Pro	Protected
RMA	Resource Management Act 1991
SDC	Selwyn District Council
SH73	State Highway 73
SH77	State Highway 77
SIPO	South Island pied oystercatcher
SQEE	Suitably qualified and experienced ecologist
SQEH	Suitably qualified and experienced herpetologist
TEcIA	Terrestrial Ecological Impact Assessment
T-NC	Threatened – Nationally Critical
T-NE	Threatened – Nationally Endangered
T-NI	Threatened – Nationally Increasing
T-NV	Threatened – Nationally Vulnerable
WAA	Wildlife Act Authority
ZOI	Zone of influence

GLOSSARY

Abiotic factors	Non-living physical and chemical components of an ecosystem that affect living organisms and shape their environment.
Accidental death	Non project-related, not intentional and not avoidable; not requiring mitigation or a Wildlife Act Authority from DOC to approve.
Active nest	A nest with eggs and/or vulnerable chicks within it.
Active nest period	An indicative combined period of time, including the egg incubation, and vulnerable chick periods, based upon available data.
Anthropogenic	Environmental changes, pollution, or hazards originating from human activity.
Biodiversity compensation	Means a conservation outcome that meets the requirements in Appendix 4 (of the National Policy Statement for Indigenous Biodiversity) and results from actions that are intended to compensate for any more than minor residual adverse effects on indigenous biodiversity after all appropriate avoidance, minimisation, remediation and biodiversity offsetting measures have been sequentially applied.[1]
Brumation	A state of sluggishness or inactivity in reptiles.
Buffer zone	The area around an active nest that must be avoided to ensure Project-related effects to not adversely affect adult birds, such that an active nest may be vacated, and eggs and/or chicks may be at risk of mortality.
Connectivity	Refers to the structural or functional links or connections between habitats and ecosystems that provide for the movement of species and processes among and between the habitats or ecosystems.[1]
Crepuscular	An animal primarily active during twilight periods (dawn and dusk).
Disturbance	Project-related affects that may result in an adult bird vacating or abandoning an active nest.
Diurnal	An animal primarily active during the daytime.
Ecological District	The ecological districts as shown in (McEwen, 1987).
Ecological Region	The Ecological regions as shown in (McEwen, 1987).
Ecosystem	Means the complexes of organisms and their associated physical environment within an area (and comprise: a biotic complex, an abiotic environment or complex, the interactions between the biotic and abiotic complexes, and a physical space in which these operate).[1]
Ecosystem function	Means the abiotic (physical) and biotic (ecological and biological) flows that are properties of an ecosystem.[1]
Ectothermic	Refers to animals that rely on external environmental sources to regulate their body temperature.
Effects management hierarchy	Means an approach to managing the adverse effects of an activity on indigenous biodiversity that requires that: a) Adverse effects are avoided where practicable; then b) Where adverse effects cannot be avoided, they are minimised where practicable; then c) Where adverse effects cannot be minimised, they are remedied where practicable; then d) Where more than minor residual adverse effects cannot be avoided, minimised or remedied, biodiversity offsetting is provided where possible; then e) Where biodiversity offsetting of more than minor residual adverse effects is not possible, biodiversity compensation is provided; then f) If biodiversity compensation is not appropriate, the activity itself is avoided.[1]
Endemic	Refers to species only found within New Zealand and nowhere else in the world.
Fragmentation	In relation to indigenous biodiversity, refers to the fragmentation of habitat that results in a loss of connectivity and an altered spatial configuration of habitat for a given amount of habitat loss.[1]
Habitat	Means the area or environment where an organism or ecological community lives or occurs naturally for some or all of its life cycle, or as part of its seasonal feeding or breeding pattern; but does not include built structures or an area or environment where an organism is present only fleetingly.[1]
Highly mobile fauna area	Means an area outside an SNA that is identified under clause 3.20 as an area used intermittently by specified highly mobile fauna.[1]
Improved pasture	Means 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.[1]
Inactive nest	A constructed nest that does not contain any viable eggs and/or vulnerable chicks.[1]

[1] As defined by the National Policy Statement for Indigenous Biodiversity (Ministry for the Environment, 2025).

Incidental death	The unintentional killing of protected species (lizards) following the implementation of all reasonable measures.
Incidental death	Project-related and avoidable, but unintentional death of protected species (lizards) following the implementation of all reasonable measures; requires a Wildlife Act Authority from DOC.
Indigenous	Referring to species originally found within New Zealand prior to human settlement.
Indigenous biodiversity	Means the living organisms that occur naturally in New Zealand, and the ecological complexes of which they are part, including all forms of indigenous flora, fauna, and fungi, and their habitats.[1]
Indigenous vegetation	Means vascular and non-vascular plants that, in relation to a particular area, are native to the ecological district in which that area is located
Native	Referring to species that are endemic, indigenous or were self-introduced to New Zealand in the relative recent past, without human assistance.
Natural inland wetland	Has the meaning in the National Policy Statement for Freshwater Management 2020.[1]
Natural range	In relation to a species, refers to the geographical area within which that species can be expected to be found naturally (without human intervention).[1]
Nesting habitat	Habitat (not restricted to vegetation) suitable for protected birds to utilise for nesting.
Nocturnal	An animal primarily active during the nighttime.
Pre-start survey	A survey, conducted by a suitably qualified and experienced ecologist within a defined habitat type, for a specific protected bird's active nest.
Protected bird	All species of bird, not listed in Schedule 5 of the Wildlife Act 1953.
River	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).[2]
Site	Means 160 Bangor Road, Darfield.
Species	Means a group of living organisms consisting of similar individuals capable of freely exchanging genes or interbreeding, including subspecies, varieties and organisms that are indeterminate.[1]
Specified highly mobile fauna	Species as defined in Appendix 2 of the National Policy Statement for Indigenous Biodiversity.[1]
Suitably qualified ecologist	A professional ecologist with a background and expertise in conducting terrestrial ecological assessments.[1]
Threatened or **At Risk**	The meanings given in the *New Zealand Threat Classification System Manual* (Townsend, et al., 2008) or its current successor publication.[1]
Zone of Influence	The area in which Project-related effects can be expected to impact ecological features.

[2] (New Zealand Government, 2026b).

EXECUTIVE SUMMARY

Hughes Developments Limited proposes to develop Bangor Village, being a new, 741 lot residential subdivision on a 130-hectare site of highly modified farmland immediately west of Darfield, Canterbury (the Project).

This Terrestrial Ecological Impact Assessment is provided in support of a substantive application for the Project, which seeks resource consents under the Resource Management Act 1991 and an approval under the Wildlife Act 1953. It details the terrestrial ecological features on-site, the actual and potential impacts of the Project on those features, and actions recommended or required to address any adverse effects on the terrestrial ecological values and features of the Site. A combination of desktop and field assessments were used to identify terrestrial ecological features on-site and within the expected zones of influence. The Environmental Institute of Australia and New Zealand Ecological Impact Assessment Guidelines, the New Zealand Threat Classification System and regional significance criteria, in the Canterbury Regional Policy Statement, were applied to determine the value of ecological features confirmed to be present.

The bird community on-site is dominated by exotic species, consistent with highly modified agricultural land on the Canterbury Plains. The Site provides foraging and nesting habitat, mostly for common 'Not Threatened' native species, though some 'Threatened' and 'At Risk' indigenous species are known to occasionally use the Site or habitats within proximity to the Site. Although habitat of 'At Risk' species meets a criterion for significance, pursuant to the Canterbury Regional Policy Statement, habitat on-site supporting 'At Risk' species is not significant based on the fact that the Site is regularly and highly impacted by existing farming activities, and the species are merely tolerant of highly disturbed areas. A small number of protected 'Introduced and Naturalised' bird species were also confirmed or can be expected to utilise the Site or zone of influence for nesting.

Without specific management, the Project may result in disturbance to birds, including the vacation of active nests where vulnerable eggs and/or chicks may suffer mortality, or direct death to vulnerable eggs and/or chicks during habitat clearance. Appropriate management of the potential adverse effects of the Project on birds and their habitats will be outlined within a draft Bird Management Plan prepared in accordance with the draft conditions of resource consent and this TEcIA, and must be implemented by a suitably qualified and experienced ecologist in accordance with the draft conditions of resource consent.

No valid historical records of bats exist within 25 kilometres to the Site. Site surveys failed to confirm bats during suitable seasonal conditions. Based on the Site survey results, historical lack of records and vast distance from known bat presence, the Site is not considered to hold any value for bats, and no bat management is required.

'At Risk' skinks were confirmed on-site and within habitat immediately adjacent to the Site. There is a low chance of a 'Not Threatened' skink presence on-site also. The Site is highly dynamic and while habitat is suitable to support skinks during periods of grass growth, routine heavy grazing and farm practices significantly reduces the Site's quality and ability to support populations of indigenous protected lizards for any significant period, other than in very small discrete locations. Some habitat on-site that is considered suitable to support indigenous lizards at the time of the field surveys was sprayed with glyphosate and/or grazed, further reducing the quality of habitat. The Site likely only supports very few skinks. Habitat

supporting lizards off-site within the zone of influence is restricted to state highway road reserves. Road shoulders are regularly impacted by mowing and spraying, while the remainder of the road reserve may be irregularly impacted (i.e.: woody weed control or highway maintenance). The species of lizard confirmed on-site is considered a tolerant species of dynamic and modified environments. Although habitat of 'At Risk' species meets a criterion for significance, pursuant to the Canterbury Regional Policy Statement, habitat on-site supporting this species is not considered significant based on the fact that the Site is regularly and highly impacted by existing farming activities.

Appropriate management of the Project's actual and potential adverse effects on lizards and their habitats has been outlined within the Lizard Management Plan. The Lizard Management Plan must be implemented by a suitably qualified and experienced herpetologist in accordance with the draft conditions of the wildlife approval.

Vegetation on-site is dominated by 'Introduced and Naturalised' plants. Of the 130ha Site, over 100ha is high producing pasture grass, with several hectares of short-rotation crops observed during the field surveys. Some native plants were confirmed on-site but they were not natural remnant plants from the ecological district. Amenity planted native species within gardens, and seedlings and saplings (introduced by birds) are the only native plants on-site. These plants hold little or no ecological value other than as habitat or for providing food resources to birds as there is no knowing if these plants are progeny from the Ecological District or from garden centres that may have sourced plants from elsewhere in the country.

The Landscape Plan proposes to deliver native planting and dedicated greenspaces throughout the Site, create a dedicated dryland ecosystem habitat area, remove exotic weeds and eucalyptus trees around the irrigation race, retain areas of mature trees where practicable, remediate or otherwise enhance the riparian planting along the irrigation race, and vegetate a noise bund adjacent to State Highway 73. The Bird and Lizard Management Plans include measures that will enhance foraging and nesting habitat or create high-quality lizard habitat.

The vegetation communities were assessed regarding wetlands, however, no areas on-site or within proximity to the site met the definition of a natural inland wetland.

Terrestrial impacts include vegetation clearance and the subsequent loss of habitat for fauna, along with the potential for the disturbance and/or death of protected species during construction works. After implementing avoidance, minimisation, and remediation measures in accordance with the Bird and Lizard Management Plans, impacts to terrestrial ecological features as a result of the Project are expected to be Very Low or result in a Net Gain outcome.

A Wildlife Act Authority is required to authorise the capture, salvage and transfer of lizards, and the incidental death of lizards. Those activities will be carried out in accordance with the Lizard Management Plan and the Wildlife Act 1953.

1 INTRODUCTION

1.1 Background

This Terrestrial Ecological Impact Assessment (TEcIA) has been prepared in support of a substantive application by Hughes Developments Limited for resource consents and a wildlife approval to authorise the subdivision and development of land at 160 Bangor Road (State Highway 77 (SH77)), Darfield, Selwyn (the Site), for the purpose of establishing a master-planned community, to be named Bangor Village (the Project).

The Project will involve the subdivision of the Site to create 741 allotments for residential dwellings, landscaping and development of an open space network, including reserves and enhancement of an existing water race, and associated infrastructure (e.g. three waters services and transport that includes external site access works).

1.2 Site Location, Description and Ecological Context

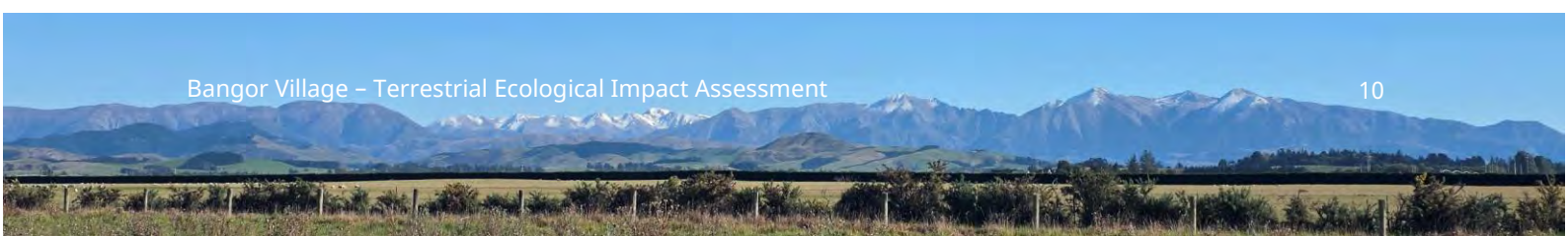
The Site spans the High Plains and Low Plains Ecological Districts (ED) of the Canterbury Plains Ecological Region (ER), though the majority of the Site (approximately 124 hectares (ha)) falls within the High Plains ED. For the purposes of this TEcIA, the Site is to be treated as entirely within the High Plains ED (Figure 1).

The Site is located approx. 2 kilometres (km) to the west of the Darfield township, 6 km south of the Waimakariri River and 1.5 km east of the Hawkins River. It is bordered to the northeast by State Highway 73 (SH73), and to the south, by SH77. All other adjoining land comprises rural and agricultural properties (Figure 1).

Although the Site is zoned under the Selwyn District Plan for residential development (Selwyn District Council, 2020)a, the Site can be broadly defined as highly dynamic agricultural land, comprising predominantly grassland and short rotation cropland for sheep grazing. No natural indigenous vegetation exists on-site with all arborescent vegetation either planted or introduced to the Site by birds. Arborescent vegetation on-site comprises hedgerows, garden amenity plantings and mature eucalyptus (*Eucalyptus* sp.) planted, presumably as a crop.

A residential dwelling, pool and tennis court are present on the Site along with buildings and infrastructure typical of a sheep and cropping farm, including sheering sheds, storage sheds and stock yards. Rank exotic grass is present primarily on the property edge adjacent to other land parcels, such as SH73 & SH77. Clusters of gorse are also present along the northern and eastern boundaries. An irrigation race bisects the Site flowing south while another branch of the race flows southwest along the southeastern boundary.

Typical farming practices see a high rotation of sheep grazing and fodder crops, resulting in a highly dynamic environment dominated by exotic vegetation providing little to no habitat for indigenous species, other than those tolerant of highly impacted and instable areas. Mature trees are limited and restricted to a few hedgerows and the dwelling area, providing little connectivity for species reliant on contiguous habitat and only supporting species capable of traversing vast open areas or highly fragmented narrow corridors, consistent with the wider landscape (Figure 1).

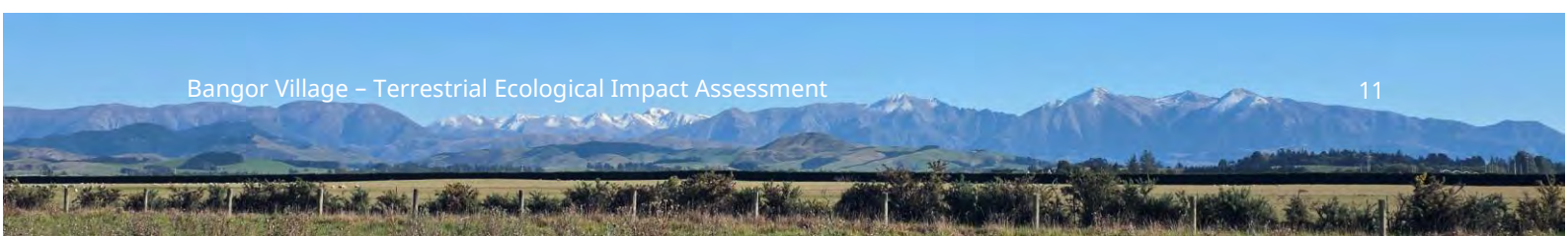


The Site is entirely on the historic alluvium of the Canterbury Plains associated with the Waimakariri River and other smaller river networks. The current Waimakariri Riverbed lies approx. 7 km to the northeast of the Site. The Waimakariri River is a large, braided river, originating on the eastern slopes of the Southern Alps, and is largely responsible for the wider ecological context of the North Canterbury plains. The river's braid plain provides important nesting habitat for various 'Threatened' and 'At Risk' indigenous birds and provides foraging and connective opportunities for several species. It is listed on Canterbury Maps as an area of a 'site of special wildlife significance' (Canterbury Maps, 2026).

The proximity of the Site to this area and to the Canterbury foothills results in opportunities for locally rare species to traverse past the Site or even utilise the Site for roosting, foraging or nesting opportunities.

Based on the Site's current features and condition, the Site is not expected to provide any tangible contribution to the ecological context of the local or wider environment.

For the purposes of defining specific locations on-site, the Farmer's Paddock Numbers, or other defining characteristics, as shown in Figure 2, have been used throughout this report.



Legend:

- Project boundary
- Irrigation race (on-site)
- Existing races
- State Highways
- NZ Topo 1-50k 20m Contours
- NZ Topo 1-50k Lakes
- NZ Topo 1-50k Property Titles
- NZ Topo 1-50k Railways
- ESRI Satellite

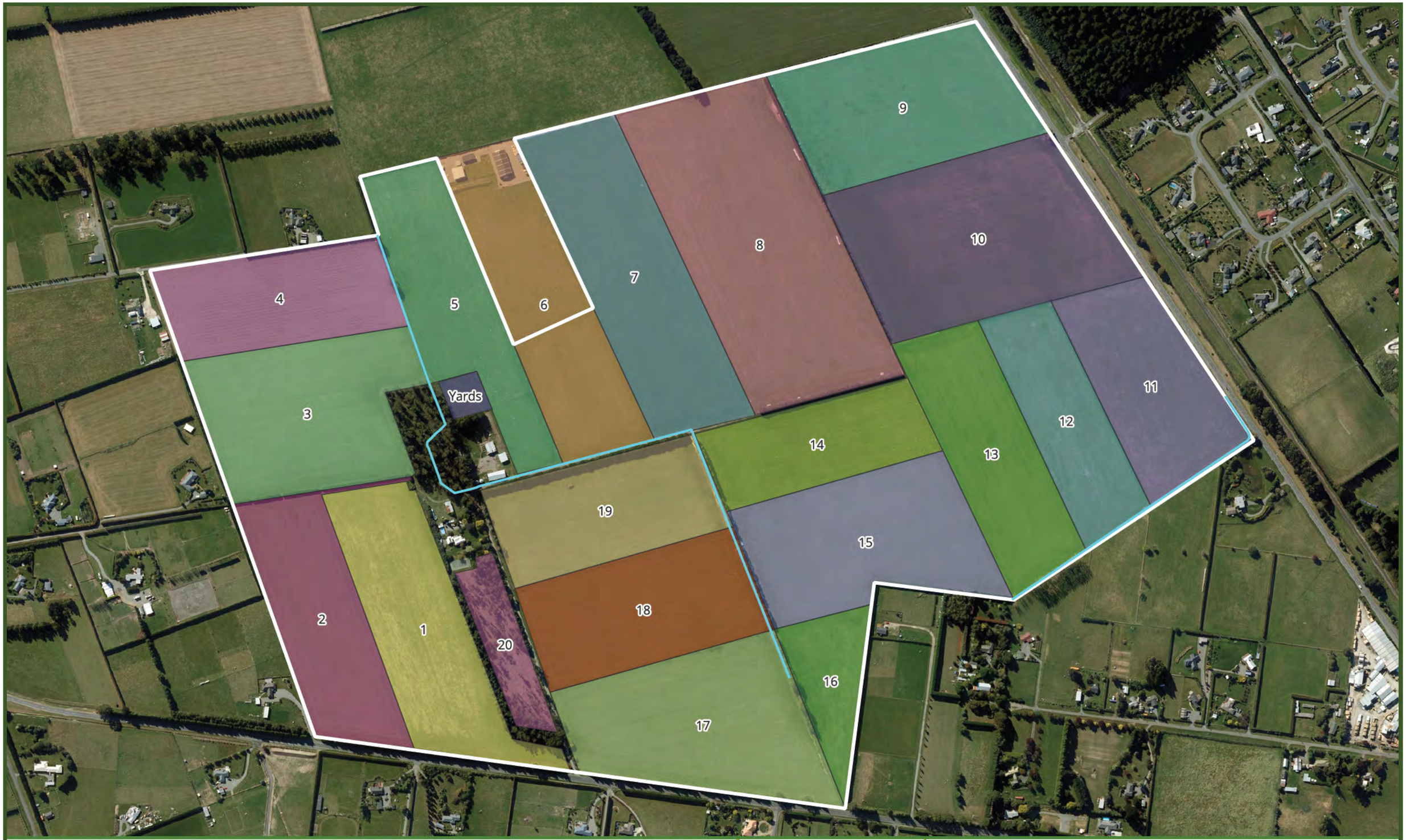
Client: Hughes Developments Ltd
Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 04/07/2026
Reviewed by: M. Hansen
Revision: 1

0 50 100 150 200 250 m

1:5,750

N

Figure 1: Site location and overview.



Legend:

Farm blocks
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16
17
18
19
20
Yards
Project boundary

Irrigation race (on-site)
Existing races

ESRI Satellite

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0 50 100 150 200 250 m

1:5,500

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Figure 2: Farm map.

1.3 KEY ECOLOGICAL FEATURES

As set out further in this assessment, the key ecological features identified within the Site of relevance to the Project are:

- Avifauna
- Herpetofauna
- Flora
- Habitats (of fauna)

Desktop assessments and on-site surveys undertaken did not detect the presence of any bats on the Site or the surrounding area. Consequently, the Site holds **no value for bats.** As bats are not an ecological feature of the Site, the Project will not impact bats or their habitat and therefore they are not assessed further within this TEcIA.

As no indigenous frogs are extant in the South Island of New Zealand, no surveys were conducted specifically for frogs. Southern bell frog may be present, associated with the irrigation races on-site, and brown tree frogs could be present within vegetation on-site, however as exotic frogs they hold a **no ecological value**. As frogs are not an ecological feature of the Site, the Project will not impact protected frogs and therefore they are not assessed further within this TEcIA.

No vegetation communities were identified during Site surveys that would meet the definition of a natural inland wetland (Ministry for the Environment, 2025), therefore the Site holds **no value for wetlands.** As wetlands are not an ecological feature of the Site, the Project will not impact wetlands and therefore they are not assessed further within this TEcIA.

2 PROPOSED PROJECT

2.1 Project Works

An overview of the Project is provided in Figure 3. The primary works associated with this Project include:

- Subdivision of the Site, including the creation of approx. 741 allotments that will accommodate residential dwellings.
- Enabling works and construction activities to develop the Site and associated infrastructure, including vegetation clearance.
- Development new green spaces, including dedicated reserves and amenity planting along road reserves. The green spaces will incorporate existing mature trees as well as new native planting and a dedicated dryland ecosystem habitat area proposed as the lizard release area.
- Enhancement of the existing water race which runs through the Site, including riparian planting.

Construction of the Bangor Village is proposed to be staged. Enabling works involve the removal of grassland, topsoil and most of the arborescent vegetation on-site along with the existing farm buildings (sheds) and the dwelling prior to construction. Construction will involve an increase in human activity, and increases in noise, vibration and dust associated with heavy machinery excavations. Civil infrastructure and residential housing will result in permanent changes to land-use. Following subdivision and establishment of the infrastructure and public realm, the construction and subsequent occupation of the residential

dwellings will also progress in stages. This phase is therefore expected to result in temporal effects to some species which will reduce over time as amenity gardens and greenspaces are developed. The land-use change from rural farmland to residential dwellings, roading and greenspaces will result in the permanent loss of some habitats on-site. The provision of new, dedicated dryland ecosystem habitat areas within the Project is intended to address the loss of those habitats.

Staging to be completed in any order and combination

Stage 1
Stage 2
Stage 3
Stage 4
Stage 5
Stage 6
Stage 7
Stage 8
Stage 9
Stage 10
Stage 11
Stage 12
Stage 13
Stage 14
Stage 15
Stage 16
Stage 17
Stage 18
Stage 19
Stage 20
Stage 21
Stage 22
Stage 23

Lot 1 DP 307576
Lot 2 DP 307576
Lot 3 DP 307576
Lot 4 DP 307576
Lot 9 DP 307576
Lot 10 DP 307576
Lot 2 DP 4512
Section 1 SO 438579
Section 2 SO 438579
Lot 1 DP 81020
Lot 2 DP 81020
Lot 1 DP 358412
Lot 2 DP 358412
Lot 1 DP 56983

Bangor Road
Future Cridges Road
West Coast Road - SH 73
Midland line Railway
McHugh Crescent

NOTES:

1) Areas and dimensions are approximate & subject to final survey and deposit of plans.
2) Service easements to be created as required.
3) This plan has been prepared for subdivision consent purposes only. No liability is accepted if the plan is used for any other purpose.
4) Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.
5) This plan is subject to the granting of subdivision and/or resource consents and should be treated as a proposal until such time as the necessary consents have been granted by the relevant authorities.
6) This plan has been prepared for the use of Hughes Developments Limited only and no liability is

Total Area : 130.3900ha
Comprised in: RTs C847A/153 & 548760

Proposed Memorandum of Easements

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING
118 Wrights Road, PO Box 6183, Christchurch 8110, New Zealand
Telephone: 03 379 0131 Website: www.dls.co.nz E-mail: office@dls.co.nz

TITLE:
Hughes Developments Limited
Bangor Road, Darfield

SHEET TITLE:
Proposed Subdivision of Section 2 SO 438579 & Lot 2 DP 81020

DRAWING STATUS:
For Subdivision Consent

SCALE: 1:2500@A1 1:5000@A3 DATE: June 2026

NO.	BY	REVISION
R5	08.04.26	LAYOUT UPDATED
R6	17.04.26	LAYOUT UPDATED
R7	12.05.26	LAYOUT UPDATED
R8	14.05.26	LAYOUT UPDATED TO SUBDIVIDE
R9	27.05.26	LAYOUT UPDATED

Legend:

- Project boundary

Irrigation race (on-site)

- Existing races
- Proposed new race alignment

ESRI Satellite

Client: Hughes Developments Ltd
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Drawn by: M. Hansen
Date: 04/07/2026
Reviewed by: M. Hansen
Revision: 1

Figure 3: Proposed proposed.

0 50 100 150 200 250 m

1:5,500

N

2.2 Actual and Potential Project Effects

As described in further detail in the respective Sections, in the absence of mitigation the Project may cause the following actual and potential effects on the Site and its ecological features (also described in the following sections):

- Temporary increase in dust, noise, vibration and human presence.
- Temporary disturbance of protected wildlife.
- Temporary to permanent displacement of protected wildlife and introduced mammalian pests.
- Permanent loss of habitat for native fauna.
- Potential death of protected birds.
- Actual or Potential death of protected lizards.
- Permanent loss of exotic grassland.
- Permanent loss of mature vegetation.
- Permanent positive effect on indigenous vegetation by stock exclusion and cessation of glyphosate spraying for broad spectrum weed control.
- Permanent increase in human presence and activity.
- Permanent indigenous vegetation enhancement and habitats in residential properties and greenspaces.
- Improved ecological connectivity though vegetation enhancement.
- Increased number of domestic pets, which may prey upon indigenous fauna.

2.2.1 Temporal scale

Timescales applied to effects and used to determine the magnitudes of effect within this TEcIA have been adapted from Table 9 of the Environment Institute of Australia and New Zealand (EIANZ) Ecological Impact Assessment (EcIA) Guidelines (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018) and are defined in Table 1.

Table 1: Timescales for the duration of effects[3]

Permanent	Effects continuing for an undefined time beyond the span of one human generation (taken as approx. 25 years).
Semi-permanent	Where there is likely to be a substantial improvement after a 25-year period (e.g.: the replacement of mature trees by young trees that need >25 years to reach maturity).
Long term	15 – 25 years
Medium term	5 – 15 years.
Short term	Up to 5 years.
Temporary	Construction phase (days or months).

2.2.2 Spatial scale

A spatial scale is required to determine the magnitude of effects that a given Project impact causes. A spatial scale provides a context for assessing the effect that a Project impact causes to an ecological feature in relation to:

- the relative abundance of a species' population within the spatial scale; or
- the availability and effective use of habitats within the spatial scale

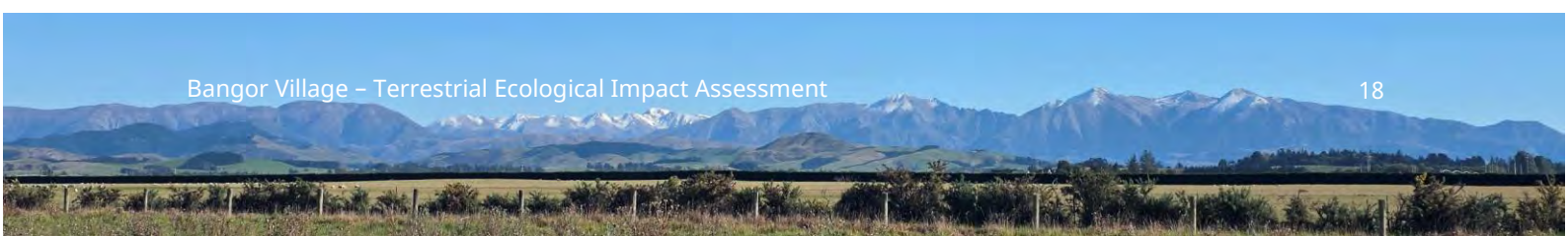
Identification of a suitable spatial scale is required by the ecologist assessing the ecological impact; often, the ED. If a spatial scale is too large, it can inappropriately dilute the magnitude of an effect. Conversely, if a

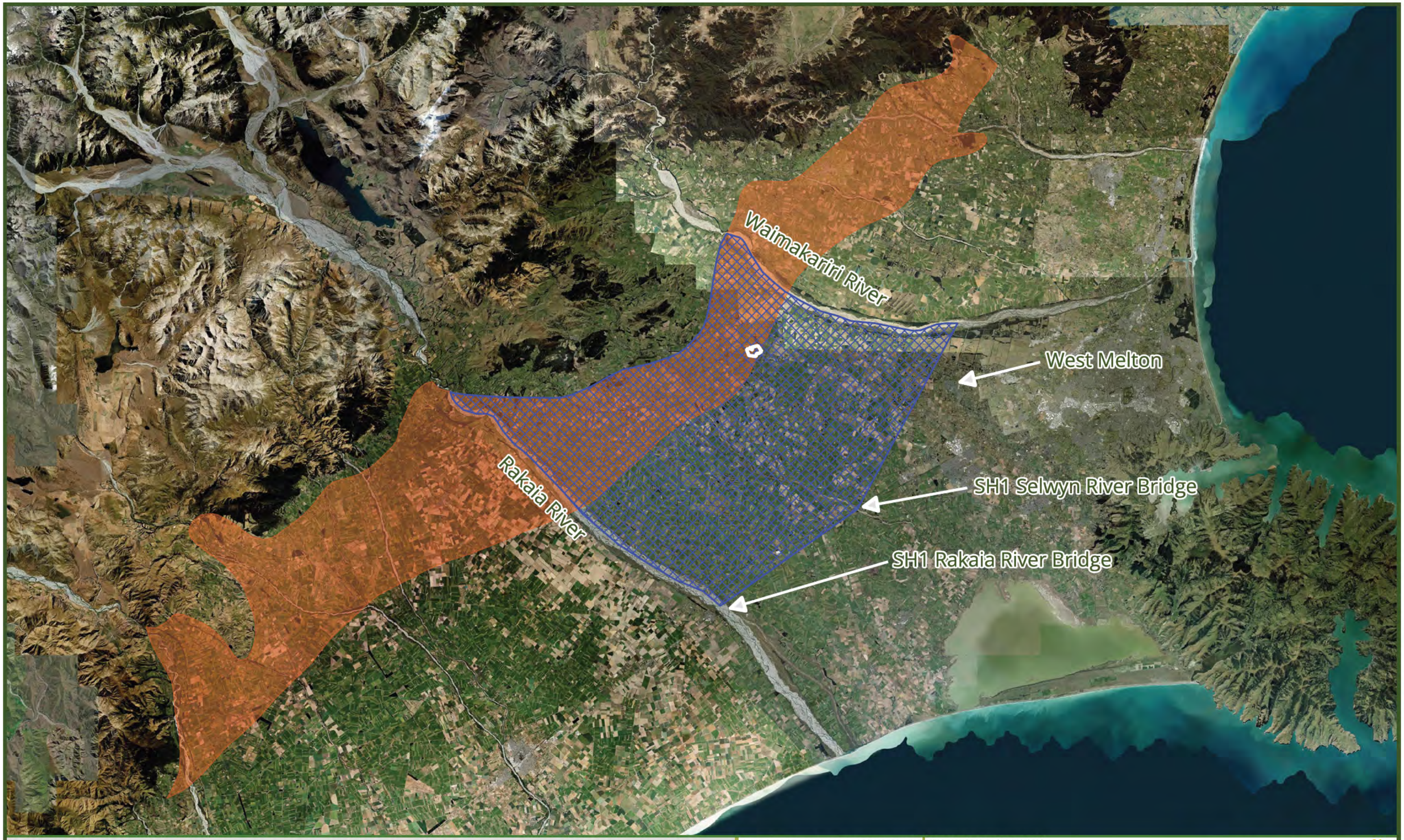
[3] Based on Table 9 (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).

spatial scale is too small, the effects of a project on a given ecological feature can be inappropriately exaggerated.

The spatial scale utilised to determine the magnitude of effects within this TEcIA is defined as a subsection of the High Plains and Low Plains EDs between the Waimakariri River and Rakaia River. The western boundary of the spatial scale is provided by the western edge of the High Plains ED and the two major rivers to the north and south are logical geographic barriers. The eastern boundary of the spatial scale is loosely defined as SH1 and west of the built-up area of the urban Christchurch sprawl (West Melton). Figure 4 outlines this area and equates to approx. 107,000ha, approx. 34,000ha smaller than that of the ED.

This area has been selected instead of the full ED as it is a representative subsection of the Canterbury Plains dominated by agricultural land, which is consistent with the characteristics of the Site and is comparable to the Site in ecological context. This scale serves to provide a more appropriate ecological context for understanding the magnitude of the Project's impacts on the local habitats and populations.





Legend:

- Spatial scale area
- High Plains ED
- Project boundary

ESRI Satellite

Client: Hughes Developments Ltd
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Date: 20/05/2026
Reviewed by: M. Hansen
Revision: 2

0 5 10 15 km

1:400,000

N

Figure 4: Spatial scale.

3 TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT

This TEcIA has been based on the Environment Institute of Australia and New Zealand guidelines for Ecological Impact Assessments in New Zealand. For efficiency to assist the reader, a summary of the assessment is provided in Appendix A – EIANZ Methodology with key Tables from the EIANZ guidelines reproduced in 'Appendix B – EIANZ Tables'.

A high-level overview of the assessment methods is provided in each 'Identification of Values' Section, with additional information regarding the implementation of conducting this TEcIA being provided in Appendix C – Supplementary Impact Assessment Information.

3.1 AVIFAUNA (BIRDS)

3.1.1 Identification of Bird Values

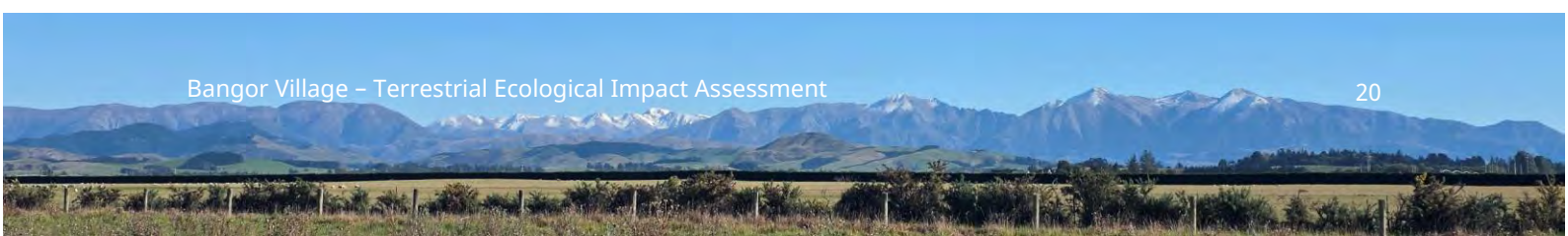
The identification of avifauna (birds) values on-site and within the zones of influence (ZOI) around the Site was undertaken using desktop assessments and field surveys, including incidental observations and long-term acoustic recording devices (ARDs). The ZOI varies between bird species and is dependent on their sensitivity to human activity or the Project effects. More threatened species, or game birds are more sensitive, as such a larger ZOI is caused by construction works, requiring a larger buffer zone to avoid disturbing them. ZOIs have been estimated based on typical ECan consent conditions for construction work within braided riverbeds and or professional judgement. For sensitive birds (i.e.: rare or game birds), a ZOI of 50m has been used, where as the ZOI for other less sensitive species ranges from 10m to 25m.

Desktop assessments for birds included reviewing four eBird 'New Zealand bird atlas grids' around the Site, and iNaturalist observations from within 15km of the Site. These sources identified that a total of 59 bird species have previously been recorded within proximity to the Site. Those bird species are recorded in Table 4.

Of the 59 species recorded, 32 are indigenous and 38 are protected pursuant to the Wildlife Act 1953 (New Zealand Government, 2025). Protected species exclude the native southern black-backed gull (*Larus dominicanus dominicanus*) and spur-winged plover (*Vanellus miles novaehollandiae*), but include a range of Introduced and Naturalised, mostly game birds including, mallard (*Anas platyrhynchos*), California quail (*Callipepla californica*) and ring-necked pheasant (*Phasianus colchicus*) as well as the little owl (*Athene noctua*).

As illustrated in Table 4, four indigenous birds previously recorded in the wider area are classified as 'Threatened' and seven are 'At Risk' (Robertson, et al., 2021). Many of the 'Threatened' and 'At Risk' species are associated with the nearby Waimakariri River which is classified as 'Land of National Significance' by DOC[9] because it provides important feeding and nesting habitat for many protected bird species.

The desktop assessment assisted in 'field survey design' appropriate to determine species' presence, absence and utilisation of the Site and the expected ZOI (Figure 5). Personal communications with the farmer also provided valuable insight into previous bird sightings.



Due to the seasonal timing of field surveys falling outside the primary bird nesting season, and when migratory species are absent from mid-Canterbury, field surveys were restricted to incidental observations of birds while on-site and the use of ARDs. ARD-1 was installed to survey for species that utilise bare earth, grassland, short-rotation crops and hedgerow habitats while ARD-2 and ARD-3 were installed to survey for species that utilise rank grassland and arborescent habitats (Figure 5).

Legend:

ARD

1

2

3

10 m buffer

25 m buffer

50 m buffer

Project boundary

ESRI Satellite

Client: Hughes Developments Ltd
Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 04/07/2026
Reviewed by: M. Hansen
Revision: 1

0 50 100 150 200 250 m

N

1:6,000

Figure 5: Long-term bird acoustic recording device locations and bird zones of influence around the Site.

ARDs were set to record for 5 minutes to simulate a 5-minute bird count (5MBC), but without visual observations by physically performing 5MBCs. ARDs were set to record for 5 minutes every hour commencing daily at 06:00 and ending at 19:00, thus covering the full day from pre-dawn to dusk. A summary of ARD recording times is provided in Table 2. All three ARDs successfully recorded from the time they were installed until the time they were collected, with a total of 1,507 5MBCs (Table 3).

Table 2: ARD recording period and 5MBC times.

ARD start time	ARD end time
06:00	06:05
07:05	07:10
08:10	08:15
09:15	09:20
10:20	10:25
11:25	11:30
12:30	12:35
13:35	13:40
14:40	14:45
15:45	15:50
16:50	16:55
17:55	18:00
19:00	19:05

Table 3: ARD recording summary.

	ARD-1		ARD-2		ARD-3	
First recording date and time	20/03/26	17:55	20/03/26	17:55	21/03/26	12:30
Final recording date and time	28/04/26	13:35	28/04/26	14:40	28/04/26	15:45
Total 5MBCs	**504**		**505**		**498**	

Incidental bird observations of all birds seen or heard were recorded during every site visit to contribute to the inventory of species. All birds recorded during visual encounter surveys or calls recorded on ARDS were recorded multiple times. Birds which were seen or heard are identified in Table 4 as 'confirmed' (✓).

Due to the survey's seasonal timing all species recorded are 'resident' birds and can be expected to utilise the Site year-round. Where surveys failed to detect rare or seasonal migrant birds, a precautionary approach has been applied in relation to their potential to utilise the Site for foraging or nesting, as surveys were conducted largely outside the active nesting period for most birds.

Table 4 records all bird species identified in the desktop assessment, along with their threat classification, assessment of the likelihood of those species foraging on the Site or nesting on- or their respective ZOI and their EIANZ value. The 'tick' symbol indicates where the birds have been seen or heard on the Site through the surveys undertaken.

Table 4: Birds, their likelihood of utilisation of habitats on-site and/or within the ZOI, and their ecological value.

Scientific name	Common names	Threat classification[4]	Likelihood on-site or within ZOI		ZOI during nesting (m)	EIANZ value
			Foraging[5]	Nesting[5]		
Ardea modesta	white heron / kotuku	T-NC	HU	HU		
Chlidonias albostriatus	black-fronted tern / tara piroe	T-NE	HU	HU		
Falco novaeseelandiae novaeseelandiae	eastern falcon / kārearea	T-NV	**AC**	**HU**	50	Very High
Anarhynchus frontalis	wrybill / ngutu pare	T–NI	HU	U		
Charadrius bicinctus bicinctus	banded dotterel / pohowera	AR-D	HU	U		
Anthus novaeseelandiae novaeseelandiae	New Zealand pipit / pīhoihoi	AR-D	**P**	**P**	50	High
Haematopus finschi	South Island pied oystercatcher / tōrea tuawhenua	AR-D	**AC**	**P**	50	High
Larus bulleri	black-billed gull / tarāpunga	AR-D	**L**	U	50	High
Phalacrocorax carbo novaehollandiae	black shag / māpua	AR-R	HU	HU		
Phalacrocorax melanoleucos brevirostris	little shag / kawaupaka	AR-R	HU	HU		
Elseyornis melanops	black-fronted dotterel	AR-NU	HU	HU		
Anas gracilis	grey teal / tētē	NT	U	**P**	50	Low
Anas rhynchotis	Australasian shoveler / crushing	NT	HU	**P**	50	Low
Anas superciliosa x *platyrhynchus*	grey duck x mallard hybrid	NT	**L**	**P**	50	Low
Anthornis melanura melanura	bellbird / korimako	NT	**P**	**P**	25	Low
Aythya novaeseelandiae	New Zealand scaup / pāpango	NT	HU	HU		
Chrysococcyx lucidus lucidus	shining cuckoo / pīpīwharauroa	NT	**P**	**L**	25	Low
Circus approximans	Australasian harrier / kāhu	NT	✓	**P**	50	Low
Cygnus atratus	black swan / wani	NT	HU	HU		
Egretta novaehollandiae	white-faced heron / matuku moana	NT	**HL**	**P**	25	Low
Gerygone igata	grey warbler / riorio	NT	✓	**HL**	25	Low
Hemiphaga novaeseelandiae	New Zealand pigeon / kererū	NT	HU	HU		
Himantopus himantopus leucocephalus	pied stilt / poaka	NT	**P**	HU		Low
Hirundo neoxena neoxena	welcome swallow / warou	NT	✓	✓	10	Low
Larus dominicanus dominicanus	southern black-backed gull / karoro	NT / Not Pro	✓	HU	N/A	Low

[4] Threatened – Nationally Critical (T-NC); Threatened – Nationally Endangered (T-NE); Threatened – Nationally Vulnerable (T-NV); Threatened – Nationally Increasing (T-NI); At Risk – Declining (AR-D); At Risk –Naturally Uncommon (AR-NU); At Risk –Relict (AR-R).

[5] Anecdotally Confirmed (AC); Highly Likely (HL); Likely (L); Possible (P); Unlikely (U); Highly Unlikely (HU).

Scientific name	Common names	Threat classification[4]	Likelihood on-site or within ZOI		ZOI during nesting (m)	EIANZ value
			Foraging[5]	Nesting[5]		
Petroica macrocephala macrocephala	South Island tomtit / ngirungiru	NT	HU	HU		
Porphyrio melanotus melanotus	Australasian swamphen / pūkeko	NT	P	P	50	Low
Rhipidura fuliginosa fuliginosa	South Island fantail / pīwakawaka	NT	✓	✓	10	Low
Tadorna variegata	paradise shelduck / pūtangitangi	NT	✓	L	25	Low
Todiramphus sanctus vagans	New Zealand kingfisher / kōtare	NT	P	P	25	Low
Vanellus miles novaehollandiae	spur-winged plover	NT / Not Pro	✓	HL	N/A	Low
Zosterops lateralis lateralis	silvereye / tauhou	NT	✓	L	25	Low
Gymnorhina tibicen	Australian magpie	I&N	✓	HL		-
Alauda arvensis	Eurasian skylark	I&N	✓	HL		-
Anas platyrhynchos	mallard	I&N / Pro	✓	P	50	Negligible
Anser anser	feral (greylag) goose	I&N	HU	HU		-
Athene noctua	little owl	I&N / Pro	✓	HL	25	Negligible
Branta canadensis	Canada goose	I&N	P	HU		-
Cacatua galerita	sulphur-crested cockatoo	I&N	P	P		-
Cairina moschata	Muscovy duck	I&N	HU	HU		-
Callipepla californica	California quail	I&N / Pro	P	P	50	Negligible
Carduelis carduelis	goldfinch	I&N	✓	HL		-
Carduelis chloris	greenfinch	I&N	✓	HL		-
Carduelis flammea	common redpoll	I&N	✓	HL		-
Columba livia	rock pigeon	I&N	✓	✓		-
Corvus frugilegus	rook	I&N	HU	HU		-
Emberiza citrinella	yellowhammer	I&N	✓	HL		-
Fringilla coelebs	chaffinch	I&N	✓	HL		-
Gallus gallus	red junglefowl	I&N	P	HU		-
Meleagris gallopavo	wild turkey	I&N	HU	HU		-
Numida meleagris	helmeted guineafowl	I&N	HU	HU		-
Passer domesticus	house sparrow	I&N	✓	HL		-
Phasianus colchicus	ring-necked pheasant	I&N / Pro	P	P	50	Negligible
Prunella modularis	dunnock	I&N	✓	HL		-
Streptopelia chinensis tigrina	Malay spotted dove	I&N	P	P		-
Streptopelia risoria	barbary dove	I&N	P	P		-

Scientific name	Common names	Threat classification[4]	Likelihood on-site or within ZOI		ZOI during nesting (m)	EIANZ value
			Foraging[5]	Nesting[5]		
Sturnus vulgaris	starling	I&N	✓	✓		-
Turdus merula	blackbird	I&N	✓	✓		-
Turdus philomelos	song thrush	I&N	✓	✓		-

3.1.2 Assessment of Bird Values

3.1.2.1 Threatened or At-Risk Species

None of the 'Threatened' or 'At Risk' species listed in Table 4 were identified via the ARDs or sighted during field surveys. The farm manager nevertheless advised that:

- Eastern falcon/kārearea (*Falco novaeseelandiae novaeseelandiae*) (Threatened – Nationally Vulnerable) have been observed foraging, from the Site (Pers. Comm. Jenny (Farm Manager) verbal communication 20 March 2026); and,
- South Island pied oystercatchers/tōrea tuawhenua (*Haematopus finschi*) (SIPO) (At Risk – Declining) are observed on-site over the summer period (Pers. Comm. Jenny (Farm Manager) verbal communication 20 March 2026).

In response to these two species observations, the likelihood of these species foraging on site is identified in Table 4 as 'anecdotally confirmed'.

Kārearea (*Falco novaeseelandiae novaeseelandiae*) are relatively rare; however, the Site likely falls within the wider foraging territory for kārearea. Kārearea have been observed from the Site by the farmer (Pers. Comm.). Foraging on the wing (searching for and obtaining food) on birds above the Site is most likely, however kārearea are known to prey upon skinks. The Site is unlikely to provide high-quality skink foraging opportunities given only small numbers of skinks were identified, and most were off-site (discussed in the proceeding sections). Generally, the Site provides very little suitable nesting opportunities for kārearea. Those opportunities are further compromised by the current conditions of the Site and the activities which are undertaken in support of an active and dynamic sheep and short crop rotation farm. Consequently, it is highly unlikely for kārearea to nest on-site.

SIPO are well known from the ER and are known to breed on South Island farms. Foraging and attempts to nest on-site are likely. With sheep grazing and short rotation crop farming occurring on site however, SIPO are unlikely to establish successful nests on site, therefore the potential likelihood of SIPO nesting on site has been assessed as 'possible' in Table 4.

SIPO can be attracted to construction sites when grassland is removed as earthworks expose foraging opportunities and can create potential nesting habitat (Pers. Obs.).

In relation to the other 'Threatened' or 'At Risk' species listed in Table 4:

- The only known breeding colony in New Zealand white heron/kōtuku (*Ardea modesta*) is near the ````````Ōkārito lagoon, Westland. Although listed as highly mobile[1], it is not surprising they have been recorded within proximity to the Site previously. They are defined as utilising wetland/riverine ecosystems[1] and therefore the Site provides no suitable habitat for foraging or nesting.

- A range of 'Threatened' and 'At Risk' birds (Robertson, et al., 2021) that utilise braided river ecosystems are known from the Waimakariri River. Although the Site typically provides little or no suitable foraging or nesting habitat for the majority of these species, some species may forage within grassland habitats or could be attracted to the Site following heavy rain events and surface flooding. Some species have also been confirmed to utilise farmland for nesting, especially following repeat spring floods within Canterbury rivers.

- Black-fronted tern/tara piroe (*Chlidonias albostriatus*) breed in colonies, almost exclusively on braided riverbeds. Records of black-fronted terns in the area are likely associated with the nearby Waimakariri River, or sightings may have occurred over rough pastureland as they are known to utilise grassland for preying upon skinks. During typical conditions, it is highly unlikely for black-fronted tern to utilise the Site. It would be a very rare occurrence that black-fronted tern may be attracted to the Site during earthworks, should their breeding areas be affected by flooding and suitable conditions are present on-site.

- Black-billed gull/tarāpunga (Larus bulleri) typically nest in colonies on riverbeds, however they are known to utilise a variety of habitats for nesting, including famously using abandoned building Sites after the Christchurch earthquakes, and farmland when nesting is impacted by floods in spring. Although unlikely, the Site may provide suitable foraging habitat for black-billed gulls during tilling. The Site is not otherwise expected to provide nesting habitat.

- Wrybill/ngutu pare (Anarhynchus frontalis), banded dotterel / pohowera (Charadrius bicinctus bicinctus), and black-fronted dotterel (Elseyornis melanops) are all strongly associated with braided river systems and typically forage within shallow river channels. Records in the area are likely attributed to the nearby Waimakariri River and therefore the Site is not considered to provide suitable foraging or nesting habitat during normal conditions.

- Although not recorded during Site surveys, New Zealand pipit/pīhoihoi (Anthus novaeseelandiae novaeseelandiae) may utilise habitats on-site or adjacent to the Site for both nesting and foraging.

- Shags identified during the desktop assessment typically nest in colonies, and breeding sites are often associated with aquatic systems making it the Site highly unlikely to be utilised for nesting. Furthermore, due to their colony nesting behaviour if shags did utilise the Site for nesting, this would have been observed during Site visits. The irrigation races on-site and adjacent to the Site are not considered to be suitable for foraging habitat for shags.

The Site provides suitable foraging habitat for the Australasian harrier/kāhu. Kāhu were seen numerous times traversing the Site, searching for prey. Areas on-site and within the ZOI may also provide suitable nesting habitat for kāhu within rank grass.

3.1.2.2 Not Threatened and Introduced and Naturalised Species

A range of waterfowl have previously been recorded within proximity to the Site, while the indigenous paradise shelduck/pūtangitangi (*Tadorna variegata*) and 'Introduced & Naturalised', but partially protected (New Zealand Government, 2025) mallards (*Anas platyrhynchos*) were confirmed on-site visually and/or through ARDs. The Site provides suitable foraging habitat for pūtangitangi within grassland and crops, while mallards may be attracted to the Site for worms following rain events. Pūtangitangi were seen on-site on every Site visit and ARDs regularly recorded them. Mature trees on-site and within the ZOI may provide suitable cavities for pūtangitangi nesting, while rank grass adjacent to irrigation races may be utilised by mallard for nesting.

Several other protected species (indigenous and exotic) were also confirmed on-site through visual encounters and/or ARD recordings, including grey warbler (*Gerygone igata*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), silvereye (*Zosterops lateralis lateralis*), and little owl (*Athene noctua*).

These were all commonly seen or heard around the existing house-gardens, though grey warbler, South Island fantail, silvereye and little owl were also recorded within proximity to ARD-1. Nests of protected indigenous birds were confirmed within vegetation on-site (Figure 6), as were previous nests of welcome swallow / warou (*Hirundo neoxena neoxena*) within farm buildings (Figure 7).

Figure 6: Nest found on-site, likely to be of South Island fantail.

Figure 7: Welcome swallow nest found within a farm building on-site.

Southern black-backed gulls (*Larus dominicanus dominicanus*) and spur-wing plover (*Vanellus miles novaehollandiae*) were regularly recorded on-site visually or through ARDs. Both species are often found farmlands, with southern black-backed gulls particularly attracted to tilling operations for foraging, while spur-wing plovers routinely nest in open fields. Although native, both species are listed in Schedule 5 of the Wildlife Act 1953[6] and are not protected pursuant to the Wildlife Act 1953 (New Zealand Government, 2025).

[6] Updated taxonomic names are used within this TEcIA Report.

Other protected species with a Not Threatened classification (recorded in Table 4) may utilise the Site for foraging and/or nesting, these include white-faced heron / matuku moana (*Egretta novaehollandiae*) and bellbird (*Anthornis melanura melanura*) within trees. Cavities within mature trees with may also provide suitable nesting habitat for New Zealand Kingfisher (*Todiramphus sanctus vagans*) and grey teal/tētē (*Anas gracilis*). Due to the likely nesting of grey warbler on-site, shining cuckoo (*Chrysococcyx lucidus lucidus*) may also nest on-site as they parasitise grey warbler nests. Rank grass may also provide suitable nesting habitat for grey teal, ring-necked pheasant (*Phasianus colchicus*), California quail (*Callipepla californica*) and when adjacent to watercourses such as the irrigation race, Australasian swamphen / pūkeko (*Porphyrio melanotus melanotus*).

3.1.2.3 Bird Value Summary

When applying Table 21 and Table 22 (Appendix B – EIANZ Tables) the bird community on-site is of **Low** overall value, as explained in Table 5.

Table 5: Bird community value assessment.

Matter	Criteria	Values	Overall EIANZ value
Representativeness	• Species assemblage is considered typical for habitats available on-site. • Species likely somewhat representative of those utilising the Site compared to 1840. • Indigenous species guild moderately representative of the resources available on-site.	Moderate	**Low**
Rarity/Distinctiveness	• Habitat on-site can be expected to support nationally 'At Risk' SIPO, at least seasonally.	High	
Diversity and Pattern	• The level of diversity, abundance, distribution and level of complexity of native birds is very poor, reflecting the poor habitats available. • Routine and highly dynamic impacts significantly reduce the Site supporting native species.	Very low	
Ecological Context	• The Site history has seen significant land-use change and regular and highly impactful conditions, resulting in a Site that supports only a few native species tolerant of highly dynamic and modified landscapes. • The Site is highly fragmented and provides little in the way of ecological network/ linkage. • The species present on-site provide little in ecosystem functioning.	Very low	

However, by assessing the bird community as a whole, this can downgrade individual bird values. 'Threatened' birds that may utilise the Site for important life stages should be independently assessed as **Very High** value, while 'At Risk' species should be assessed as **High** value. Remaining birds can be grouped together as resident forest 'Not Threatened' birds, are assessed as **Low** value while exotic protected birds are of **Negligible** value.

3.1.3 Assessment of Project Effects to Birds

A range of actual and potential effects from the Project may impact birds that have been identified as 'possible' to 'confirmed' on-site and within the ZOI (Table 4). Project impacts to birds vary across the

construction phase and the post-development or operational phase. The effects to birds have been assessed as actual or potential based on the likelihood of that impact occurring if the birds are present at the time. The magnitude of effect has been determined, based on professional judgement, considering the duration of impact (temporal scale; Section 2.2.1) and the impact the effect would cause to the expected population of that bird within the spatial scale applied (Figure 4; Section 2.2.2).

The spatial scale selected is considered an appropriate, representative area of habitat used by the species on-site. Using national or regional population sizes would downgrade Project effects. The ED is a typical spatial scale used, by ecologists, however the spatial scale applied for this Project is smaller than that of the ED. A reduced spatial scale provides a more appropriate effect caused by the Project, to the bird population within proximity to the impacts.

Project impacts are outlined for each phase of the Project below, while magnitudes of effect have used criteria outlined by the EIANZ guidelines (Table 23; Appendix B – EIANZ Tables). The level of effect has been determined by assessing the bird values against the magnitude of effect to that species, as per Table 24 (Appendix B – EIANZ Tables).

Project effects for each phase are summarised in Table 5.

3.1.3.1 Construction Phase

Enabling works and construction activities for the Project may cause a range of actual or potential impacts to birds on-site and within the ZOI.

The increase in human activity and heavy machinery operations is likely to displace more sensitive species of birds. Impacts to, and losses of, habitat will cause displacement of resident birds utilising those habitats. Birds utilising habitats adjacent to the Site may also be displaced during periods of works within proximity to those habitats.

If birds are actively nesting within the impact area, adult birds can evade impacts but construction activities would result in direct impacts to immobile eggs and/or chicks.

If active nests are within the ZOI around construction activities, adult birds may abandon nests, which may also result in indirect egg and/or chick mortality.

Enabling works and construction may provide foraging opportunities for less sensitive species known to be attracted to such activities. South Island fantail often forage around excavation work within or near vegetation they inhabit because of the disturbed invertebrates (Pers. Obs.). Species such as SIPO and southern black-backed gull are attracted to earthworks and are not adversely affected by heavy machinery.

The construction phase can may therefore cause the following actual or potential effects to birds:

- Temporary displacement due to increased human presence, vehicle activity, noise, dust and vibration.
- Temporary increase in foraging opportunities.
- Disturbance of species that may be actively nesting within the Site which may result in indirect mortalities.

- Incidental death of eggs and/or chicks if works impact nesting habitat during the active nesting period.

3.1.3.2 Post-development / Operational Phase

The post-development/operational phase will also cause a range of actual or potential impacts to birds on-site.

The provision of increased planting on site in reserve areas and through planting associated with individual dwellings will provide increased opportunity for foraging and habitats. The land-use change from rural farmland, hedges and most of the arborescent vegetation south of the existing dwelling, to residential dwellings, roading and greenspaces will result in the permanent displacement of some birds but is also expected to benefit a range of bird species, primarily those that avoid vast open spaces, such as South Island fantail and grey warbler.

The post-development phase may therefore result in the following actual or potential effects to birds:

- Short-term to permanent displacement through the loss and remediation of foraging and nesting habitats depending on their growth rates (i.e.: shrubs vs. mature trees)
- Permanent displacement through the permanent loss of some habitats.
- Increased risk of mortality through residential window and vehicle-strike.
- Permanent improvement in linkages and habitat connectivity for some species.
- Permanent increase in foraging and nesting habitat compared to existing conditions on Site.

The actual or potential Project effects to birds are outlined in Table 6. While the Wildlife Act does not explicitly require mitigation, as disturbance or death of protected birds without a Wildlife Act Authority is an offense, mitigation is required to avoid these impacts.

Table 6: Project effects on birds.

Feature	Effect	Likelihood	EIANZ Value	Temporal effect[7]	Magnitude of effect[8]	Pre-mitigated level of effect[9]	Mitigation
Construction Phase							
SIPO Anecdotally confirmed on-site, possible to forage and/or attempt to nest on-site.	Displacement through construction activities (Noise, dust, vibration, human presence etc).	Potential	High	Temporary	Negligible	Very low	N/A
	Mortality through disturbance of adults abandoning an active nest if nesting on-site.	Potential		Permanent	Low	Very low	Yes – Wildlife Act 1953.
	Mortality through direct impact of an active nest if nesting on-site.	Potential		Permanent	Low	Very low	Yes – Wildlife Act 1953.
	Loss of foraging and possible nesting habitat.	Potential		Permanent	Low	Low	No
New Zealand pipit Potential to forage and/or attempt to nest on site.	Displacement through construction activities (Noise, dust, vibration, human presence etc).	Potential	High	Temporary	Negligible	Very low	N/A
	Mortality through disturbance of adults abandoning an active nest.	Potential		Permanent	Low	Very low	Yes – Wildlife Act 1953.
	Mortality through direct impact of an active nest.	Potential		Permanent	Low	Very low	Yes – Wildlife Act 1953.
	Loss of foraging and possible nesting habitat.	Potential		Permanent	Low	Low	No
'Not Threatened' resident birds	Displacement through construction activities (Noise, dust, vibration, human presence etc).	Potential	Low	Temporary	Negligible	Very low	Yes – Wildlife Act 1953.
	Mortality through disturbance of adults abandoning an active nest.	Potential		Permanent	Negligible	Very low	Yes – Wildlife Act 1953.
	Mortality through direct impact of an active nest.	Potential		Permanent	Negligible	Very low	Yes – Wildlife Act 1953.
Protected exotic birds	Displacement through construction activities (Noise, dust, vibration, human presence etc).	Potential	Negligible	Temporary	Negligible	Very low	Yes – Wildlife Act 1953.
	Mortality through disturbance of adults abandoning an active nest.	Potential		Permanent	Negligible	Very low	Yes – Wildlife Act 1953.

[7] As described in Table 1 (Section2.2.1).
[8] As described in Table 23 (Appendix B – EIANZ Tables).
[9] As per Table 24 (Appendix B – EIANZ Tables).

Feature	Effect	Likelihood	EIANZ Value	Temporal effect[7]	Magnitude of effect[8]	Pre-mitigated level of effect[9]	Mitigation
	Mortality through direct impact of an active nest.	Potential		Permanent	Negligible	Very low	Yes – Wildlife Act 1953.
		Post-development Phase					
'Not Threatened' resident birds	Habitat creation.	Actual	Low	Short-term to Permanent	Positive	Net gain	N/A – BMP / Landscape Plan.
	Improved linkages.	Actual		Short-term to Permanent	Positive	Net gain	N/A – Landscape Plan.
	Accidental mortality through vehicle and window collisions.	Potential		Permanent	Negligible	Very low	No, accidental[10].
	Mortality through increased pet cat predation pressure.	Potential		Permanent	Negligible	Very low	N/A
Protected exotic birds	Displacement (ring-necked pheasant / California quail if present).	Potential	Negligible	Permanent	Negligible	Very low	N/A
	Habitat creation (mallard).	Actual		Short-term to Permanent	Positive	Net gain	N/A – Landscape Plan.

[10] As defined in Glossary (Pers. Comm. DOC Permissions).

3.1.3.3 Project Effects to Birds Summary

In summary, Project effects are likely to cause temporary displacement of most species within proximity to the area of construction, while the loss of habitat will cause short-term to permanent displacement depending on the habitat type and the time it would take to be replaced. Short-term displacements can be expected for areas of shrubs and small trees (that will be replaced within 5 years), medium to long-term displacement for birds utilising mature trees, and permanent displacement for species reliant on grassland as it will be converted to housing, and large mature tree requiring more than 25 years to be replaced, or never permanently removed due to housing developments and farm buildings to be removed.

Project works affecting habitats during the active nesting season may disturb adult birds who could abandon nests resulting in indirect mortality of eggs and/or chicks. If habitat removal occurs while an active nest is present, direct egg and/or chick mortality can be expected. The species that are most likely to be nesting on-site are common, 'Not Threatened' birds. Should several nests be lost, this will likely only cause a Negligible effect to the known or assumed population within the spatial scale (Table 23; Appendix B – EIANZ Tables).

Although remote, there is a possibility that the construction phase creates suitable nesting habitat for 'Threatened' and 'At Risk' riverbed birds, such as black-fronted tern, dotterels, SIPO or black-billed gulls, by exposing bare earth and gravels, or through aggregate stockpiles on-site. If attracted to Site during the nesting period, construction work may then incidentally kill eggs and/or chicks through indirect disturbance of adults or directly by machinery if the nest is not identified. When comparing the potential loss of a nest or two on-site with the assumed populations of each species within the given spatial scale, the magnitudes of effect are likely to be High for black-fronted tern, Low for SIPO and other 'At Risk' riverbed bird species (Table 23; Appendix B – EIANZ Tables).

Displacement of SIPO or New Zealand pipit from foraging or even nesting on-site may affect only up to a few pairs of each. It is unlikely either species has been using the Site as a high-quality nesting area due to the current conditions of, and activities associated with, the highly dynamic farmland. The more suitable foraging habitats and vast nesting habitat available within the spatial scale will mean the Project effects will be Negligible (Table 23; Appendix B – EIANZ Tables) to either population. SIPO are also specified highly mobile fauna (Ministry for the Environment, 2025), as such they are capable of freely moving within or outside the spatial area to seek alternative foraging and nesting habitats.

The operational phase of the Project can be expected to benefit resident 'Not Threatened' birds through an increase in available foraging and nesting habitat. The increase in tree and shrub plantings across the Site will also create corridors and link off-site habitats for the common species on-site that cannot cross vast open landscapes (i.e.: New Zealand fantail, grey warbler). Greenspace development may attract mallards, providing improved foraging opportunities, while the increase in human presence will likely permanently displace any ring-necked pheasants and California quail if they reside within proximity to the Site.

Species such as South Island fantail and grey warbler are expected to increase locally with the reduction of open grassland and conversion to amenity plantings. Birds are known to fly into windows and it can be expected that a proportion of residents will own pet cats, which are likely to depredate birds on-site. Fencing around residential properties should reduce the risk to window-strike by causing birds to fly over windows. and the only exposed windows are likely to be those facing roads without front fences. Cat predation, while likely to increase at this Site, would be no more than if those residents were living in alternative locations.

Furthermore, the Site is dominated by exotic bird species. Indigenous birds present or likely to inhabit the Site during the operational phase are common 'Not Threatened' resident species that often inhabit residential gardens, such as South Island fantail, grey warbler and silvereye. Considering the abundance of the population of these species within the spatial scale, any effects of the operational phase of the Project on native birds is therefore expected to be Negligible (Table 23; Appendix B – EIANZ Tables). The expected increase in population of these species due to the development of suitable foraging and nesting habitats is a positive effect of the Project.

In summary, for the majority of birds which do or may utilise the Site, the construction phase of the Project will likely have no adverse effects on those species other than a Negligible displacement impact. The post-development phase will result in a permanent loss of potential habitat for SIPO and New Zealand pipit and only if they utilise the Site. A positive effect is expected for all resident 'Not Threatened' birds due to the increase in foraging and nesting habitat.

To avoid the risk of death to protected birds during the construction phase, implementation of a bird management plan is recommended, as discussed in the next section.

3.1.4 Bird Effects Management

A draft Bird Management Plan (BMP) has been prepared as part of this TEcIA and includes measures to avoid the effects of the Project on birds during the construction phase of the Project. Those measures have been informed by the effects management hierarchy approach required by the NPS-IB. Consistent with the requirements of the Wildlife Act 1953, the BMP also includes measures to ensure that protected birds are not disturbed or killed (Effects Management Ecology Ltd, 2026a).

In summary, the BMP:

1. Clearly outlines the nesting habitat types (i.e.: grassland, arborescent vegetation, cavities and structures) and where these habitats are on-site and the recommended buffer zone to be applied to the habitat types.
2. Describes the measures that will be implemented during construction of the Project to avoid disturbing or killing birds. These include:
    a. Where practicable, staging the construction works to avoid disturbing active nests of protected birds.
    b. If avoiding nesting habitat during the active nest season cannot be achieved, a suitably qualified and experienced ecologist must conduct a pre-start nest survey of the identified nesting habitats within seven days of construction commencing to identify the presence of any active nests of protected birds.
    c. Implementing measure to avoid any active nest confirmed on-site, through implementation of a buffer zone around that nest.
    d. Establishing measures during the nesting season for braided riverbed birds to ensure the Site is unattractive for nesting, including minimising bare earth, exposed gravel, or aggregate stockpiling; and installing bird deterrents if required.
3. Identifies the accidental discovery protocols that must be implemented if 'Threatened' or 'At Risk' birds are found on-site during construction of the Project.
4. Describes the measures that will be implemented in the reserve areas to improve nesting and foraging opportunities for birds.

Through implementation of the measures set out in the BMP (required as a condition of resource consent), it is expected that all adverse effects of the Project during the construction and operational phases will be reduced to less than minor, or net gains (as outlined in Table 7).

Table 7: Post-mitigated magnitude of effect and residual levels of effect to birds

Feature	Value	Post-mitigated magnitude of effect	Residual level of effect	Planning term conversion	Offsetting required?	Compensation required?
Construction Phase						
SIPO	High	Negligible	Very low	Less than minor	No	No
New Zealand pipit	High	Negligible	Very low	Less than minor	No	No
'Not Threatened' resident birds	Low	Negligible	Very low	Less than minor	No	No
Protected exotic birds	Negligible	Negligible	Very low	Less than minor	No	No
Operational Phase						
'Not Threatened' resident birds	Low	Positive	Net Gain	Positive	No	No
Protected exotic birds	Negligible	Negligible	Very low	Less than minor	No	No

3.2 HERPETOFAUNA (FROGS AND LIZARDS)

3.2.1 Identification of Frog and Lizard Values

The identification of herpetofauna (frogs and lizard) values on-site and the ZOI around the Site was undertaken using desktop assessments and fine level surveys including artificial cover objects (ACOs) Gee's minnow funnel traps (GMTs), casual observations (walkthrough surveys) and systematic searches (manual habitat searches (MHS)). The ZOI for lizards has been defined as 5m as they are not highly mobile.

Desktop assessments for frogs and lizards included reviewing the known geographic ranges from relevant literature (van Winkel, Baling, & Hitchmough, 2018) (Purdie, 2022) the New Zealand Herpetological Society website (New Zealand Herpetological Society, 2021), and the latest regional threat classification document that lists lizard presence within the Selwyn District (Lettink, et al., 2026). A total of ten indigenous lizards and two exotic frogs have known geographic ranges that include the Site or are known from the Selwyn District.

The DOC Bioweb GIS database[11] and iNaturalist show several lizards have previously been confirmed within 25km of the Site. Literature and historic records reviewed include inaccurate identifications and/or synonyms due to modern taxonomic advances. For the purposes of this TEcIA, inaccuracies and out-of-date taxonomic records have been grouped with their updated and modern species' names. By applying this grouping, the Bioweb records confirm the following indigenous lizards have been previously recorded within 25km to the Site:

- Canterbury grass skink (*Oligosoma* aff. *polychroma* Clade 4) (CGS);
- southern grass skink (*O. chionochloescens* syn: *O.* aff. *polychroma* Clade 5) (SGS);
- McCann's skink (*O. maccanni*) (MCS);
- jewelled gecko (*Naultinus gemmeus*); and
- greywacke gecko (*Woodworthia* "Southern Alps northern").

With the exception of McCann's skink which is 'Not Threatened', all these lizards are nationally and regionally 'At Risk – Declining' (Hitchmough, et al., 2026) (Lettink, et al., 2026).

Desktop assessments identified the 'Introduced and Naturalised'[11] southern bell frog (*Ranoidea raniformis*) and brown tree frog (*Rawlinsonia ewingii* syn: *Litoria ewingii*) have previously been recorded near the Site.

Desktop assessments along with aerial photographs of the Site and professional judgement, based on experience, were used to determine the species that would most likely be present on-site and to guide survey design. The historic and continued impacts and the highly dynamic nature of the Site meant that habitat supporting populations of lizards would likely be restricted to areas less frequently affected by or avoiding routine farm practices.

Following completion of the desktop assessments, surveys were designed to target lizards expected on-site. The habitat requirements for, and the relative rarity of the most species identified in the desktop surveys meant it was unlikely that many would be present on the Site, however, the surveys performed on-site would be sufficient to detect those species if they were present.

[11] (Burns, et al., 2025).

Lizards are ectothermic. As such the temperature of their surrounding environment directly influences their activity. To detect the lizard species on-site from mid-March to late April, a range of survey techniques were employed based on best practice (Lettink & Monks, 2012), including ACOs, GMTs, walkthrough surveys and MHS. In relation to those techniques:

- Casual observations during walkthrough surveys are suitable to detect grass skinks and McCann's skinks, with more activity and therefore increased likelihood of observations with increasing ambient daily temperatures above 15°C.
- MHS of existing ACOs (i.e.: timber, broken concrete, farm equipment etc) and natural cover objects (NCOs) (i.e.: branches and logs) on-site provides an increased opportunity of detection as these microhabitats have been in situ and are more likely to be utilised by resident lizards. Surveying existing ACOs and NCOs, and MHS is the most likely methods of survey to detect Waitaha geckos, should they be present.
- The use of survey equipment such as ACOs and GMTs (or pitfall traps) are the best methods to determine presence and can provide indices of abundance and population estimates, when attempting to determine minimum number of animals alive (MNA). and catch per unit effort (CPUE). Traps and survey equipment attract lizards within a given area allowing a catch-mark-recatch (CMR) survey.

Five transects of ten ACOs were installed on 20 and 21 March (based on best practice) and targeted habitats within the Site that would be largely unsuitable to trap using GMTs. Those habitats include paddocks with low grass or areas of no lizard habitat adjacent to suitable lizard habitat.

All ACOs were approx. 500 millimetres (mm) x 600mm double stacked Onduline tiles, exceeding minimum best practice for terrestrial lizards (Lettink M. , 2012a), with small pebbles used as spacers to allow lizards to utilise the space between ACOs.

Transects followed fencelines, as fencelines are known to be used by skinks when habitats (rank grass) along fence lines avoid impacts. The dynamic nature of crop rotation and grazing creates suitable habitat for lizards as grassland grows, which could allow lizards to colonise and spread across the paddock. Heavy grazing was observed across the Site, removing all suitable habitat, in most cases, forcing any lizards within the paddock to seek habitat outside the paddock. Targeting fencelines therefore increased the likelihood of detecting lizards that may be present on-site. Fencelines also decreased the risk of ACO disturbance by farm practices between the installation date and the inspection dates. ACO transects were installed along the western fence of Paddock 9 and 15 (where they would be expected to get morning sun and warmth), along the fenceline between Paddock 13 & 15 (extending from suitable off-site habitat), south of Paddock 7 (along the north side of the irrigation race) and south of Paddock 2 (on the north side of the hedgerow where it would get sun and warmth throughout most of the day).

Four 5x5 ACO grids were installed on-site with 3m spaces. An increased density of ACOs aimed to increase recapture rates through an improved chance of ACO 'encounter rate' by lizards, if they were present within the survey grids. ACO grids were strategically installed to estimate population and to determine if lizards colonise paddocks from adjacent habitat during periods when paddocks provided suitable lizard habitat.

GMTs are best installed within dense rank grass where shade from the grass provides heat stress protection to any trapped animals. In moderately dense grass, GMTs are often best used as they are immediately effective and do not require settling in periods. In such areas additional shade protected is required, while

not compromising airflow (Hare, 2012b). GMT use followed industry standards with baited traps being deployed within suitable habitats where GMTs would be more effective than ACOs, or where long-term ACO deployment was unable to be achieved due to farm practices. Where rank grass was lacking to provide suitable shade, shade cloth was used to mitigate heat stress to any trapped lizards. The internal trap temperature was monitored, though temperatures inside traps did not reach levels of concern during the trapping survey.

As with ACOs, GMTs were installed in transects for Site coverage and grids to estimate population abundances in the locations. GMTs were installed on 14 April 2026 and were inspected daily for three days. Transects comprised mostly 5-trap transects spaced 5m apart while the two 5x5 grids were installed with trap spacings of 3m to replicate the ACO surveys. GMTs were installed on-site and within the ZOI of the most likely habitats to support populations of lizards. This assumption was due to habitat quality (i.e.: rank grass known to support grass skinks on the Canterbury Plains) and the lack of impact by routine farm or road-side impacts, such as grazing, spraying or mowing.

All ACOs and GMTs installed on-site and within the ZOI are shown in Figure 8.

Legend:

- Artificial cover objects
- Gee's minnow funnel traps
- Project boundary

ESRI Satellite

Client: Hughes Developments Ltd
Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 05/07/2026
Reviewed by: M. Hansen
Revision: 1

0 50 100 150 200 250 m

N

1:5,500

Figure 8: Lizard survey device locations on-site and within ZOI.

Lizard trapping, catching and handling was conducted under a valid Wildlife Act Authority[12]. The GMT trapping survey was conducted between 14 and 17 April 2026 with the first trap installed at approx. 9am on the 14th and the last trap collected at approx. 13:15 on the 17th. Temperatures on-site exceeded 15°C for approx. 6.5 hours on the 14th, 5.75 hours on the 15th, 7.25 hours on the 16th and exceeded 15°Cat 9:27am, reaching a high of 17.9°C at 12:17pm) on the 17th. Based on these temperatures on-site, the trapping survey was considered a valid survey for lizards.

A single skink was caught within a GMT within the road reserve of SH73 on 16 April 2026 (Figure 9).

Figure 9: Skink caught in GMT off-site within SH73 road reserve.

No skinks were caught within any other GMTs. Catch per unit effort (CPUE) can provide a relative abundance. CPUE indices are generated by dividing the number of animals caught by the effort expended, typically reported as *n/100* trap nights when trapping (Hare, 2012). As GMTs were installed both on-site and off-site within the ZOI, CPUE can provide a relative abundance comparison. The CPUE on-site compared to the ZOI is 0% and 2.22% respectively, with a combined GMT CPUE of 0.39%. Table 8 summarises the GMT trapping results.

Table 8: GMT survey results.

	15/04/2026		1`6/04/2026		17/04/2026		Totals		
	On-site	ZOI	On-site	ZOI	On-site	ZOI	On-site	ZOI	Total
GMTs inspected	70	15	70	15	70	15	**210**	**45**	**255**
Lizards caught	0	0	0	1	0	0	**0**	**1**	**1**
CPUE	0%	0%	0%	6.67%	0%	0%	**0%**	**2.22%**	**0.39%**

ACO inspections were conducted between four and six weeks after installation, complying with best practice of between one and three months. ACO inspections were performed on 17, 25 and 28 April when daily temperatures ranged from 15.3°C to 22.9°C on the 17th, from 13.5°C to 17.9°C on the 25th and from 20.4°C to 21.1°C on the 28th. For optimal sampling conditions, ACOs should not be checked at extreme temperatures of <5°C and>25°C (Lettink M. , 2012a), therefore this ACO survey was conducted during optimal seasonal and

[12] WAA Held by M. Hansen.

daily conditions. ACO transects and grids were checked in different sequential orders during each of the three inspections. This minimises the risk of always checking the same ACOs later in the day when the temperature has increased and when lizards may have vacated the ACOs. The order of inspection of the ACOs was changed to increase the chances of detecting lizards at different locations across the Site.

On 17 April 2026 during the first ACO inspections, a single skink was caught under ACO5-1 (adjacent to the hedgerow beside SH77, south of Paddock 2) (Figure 10), and another under ACO5-2 (Figure 11). A third skink was observed by not caught under ACO1-6 (adjacent to the irrigation race, south of Paddock 7).

Figure 10: Skink caught under ACO5-1.

Figure 11: Skink caught under ACO5-2.

Skinks were again observed under ACO5-1 and ACO5-2 during the second ACO inspection on 25 April 2026, however the animals were not recaught due to the warmer temperature and their increased ability to flee. Although assumed to be the same animals from inspection 1, unique animals cannot be ruled out. Similar to

17 April, a skink was observed and unable to be caught under ACO1-5. Following the completion of the third ACO inspection on 28 April 2026, all ACOs were removed from Site.

A maximum of up to 7 skinks were caught or observed under ACOs, although if all skinks observed were previously caught or observed, as few as 3 unique animals may have been encountered on-site. Combining the ACO survey results with those of the GMT survey, a maximum of up to 8 skinks and as few as 4 may have been encountered, with the majoring being off-site within the ZOI.

Two open population 5x5 ACO grids within Paddock 9 (Figure 12) immediately adjacent to high-quality lizard habitat within the SH73 road reserve, and one open population 5x5 ACO grid within Paddock 17, immediately adjacent to the hedgerow beside SH77 (Figure 13), all in a relatively dense array of 3m spacing did not detect a single skink. All three grids were within paddocks of suitable grassland habitat and protected from sheep impacts through temporary electric fencing (Figure 14). This result demonstrates an apparent lack of skink colonisation into the Site, even in areas undisturbed for several weeks.

Figure 12: ACO grids within Paddock 9 (21/03/2026).

Figure 13: ACO grid area within Paddock 17 (2/03/2026).

Figure 14: ACO grid within Paddock 17 (25/04/2026).

Skinks caught on-site are shown in Figure 15, while those caught in habitats 'off-site', within the ZOI are shown in Figure 16.

Legend:

Skinks on-site

Observed (17/04/26)

Observed (28/04/26)

Project boundary

ESRI Satellite

Client: Hughes Developments Ltd
Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 05/07/2026
Reviewed by: M. Hansen
Revision: 1

Figure 15: Lizards observed on-site.

0 50 100 150 200 250 m

N

1:5,500

Legend:

Skinks off-site

GMT trapped (16/04/26)

ACO caught (17/04/26)

ACO observed (25/04/26)

ACO observed (28/04/26)

Project boundary

ESRI Satellite

Client: Hughes Developments Ltd
Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 05/07/2026
Reviewed by: M. Hansen
Revision: 1

0 50 100 150 200 250 m

N

1:5,500

Figure 16: Lizards caught or observed off-site.

All ACOs were installed on-site, though ACO transect 5, south of Paddock 2 is technically off-site as it was surveying skinks within the hedgerow along SH77 that will be avoided. As no animals were recaptured to prove the animals observed on different days were the same animal, all animals are assumed to be unique, resulting in a maximum value. The results of the ACO survey are summarised in Table 9.

Table 9: ACO survey results.

	17/04/2026		25/04/2026		28/04/2026		Totals		
	On-site	ZOI	On-site	ZOI	On-site	ZOI	On-site	ZOI	Total
ACOs inspected	140	10	140	10	140	10	**420**	**30**	**450**
Lizards caught / observed (min-max)	1	2	0	2	1	1	**2**	**5**	**7**
CPUE (min-max)	0.71%	20%	0%	20%	0.71%	10%	**0.48%**	**16.67%**	**1.56%**

When combining the GMT and ACO survey effort and results, the CPUE was many times higher 'off-site' than 'on-site' (Table 10).

Table 10: Total lizard survey results.

	Survey effort on-site	Survey effort off-site (ZOI)	Totals
Total survey devices (GMT & ACO)	630	75	705
Total lizards observed / caught	2	6	8
Total CPUE	0.32%	8%	1.13%

In summary, on-site trapping effort was far higher and yielded far fewer skinks, demonstrating a significant lack of abundance on-site.

Based on the morphological features, large ear hole and notched / jagged dorsolateral and lateral stripes, compared to smaller ear hole and smooth edged in McCann's skinks in this area (New Zealand Herpetological Society, 2026). Although there is no published morphological differences to distinguish Canterbury grass skinks from other grass skinks (New Zealand Herpetological Society, 2026) an apparent short, blunt snout is a feature that may differentiate it from a southern grass skink, which tends to have a longer and less blunt snout (Pers. Comm. G. Patterson (taxonomist November 2025). Based on the geographic location of the Site and the morphological features, in the absence of genetic testing skinks caught are believed to be a CGS and it is highly likely that all skinks observed were also CGS.

A summary of all frogs and lizards identified during the desktop assessments as potentially present on the Site and the surrounding area is included in Table 11. Table 11 also identifies the national[13] and regional[14] threat classifications, the likelihood of their presence on-site or within the ZOI and their value.

[13] Amphibians: (Burns, et al., 2025). Reptiles: (Hitchmough, et al., 2026).
[14] (Lettink, et al., 2026).

Table 11: Frogs and lizards, and their likelihood of presence on-site or within the ZOI.

Scientific name	Common names	Recorded within Selwyn District	National threat classification	Regional threat classification	Likelihood of presence on-site	EIANZ value
Oligosoma lineoocellatum	Canterbury spotted skink	Yes	T-NE	T-RE	HU	
Oligosoma aff. *laxa* "Central Canterbury" Syn: *O.waimatense*	central Canterbury scree skink	Yes	T-NV	T-RV	HU	
Oligosoma aff. *longipes* "southern"	southern long-toed skink	Yes	AR-D	AR-D	HU	
Oligosoma aff. *polychroma* Clade 4	Canterbury grass skink / mokomoko	Yes	AR-D	AR-D	✓	High
Oligosoma chionochloescens Syn: *O.* aff. *polychroma* Clade 5	southern grass skink / mokomoko	Yes	AR-D	AR-D	**P**	High
Naultinus gemmeus	jewelled gecko / kākāriki	Yes	AR-D	AR-D	HU	
Woodworthia cf. *brunnea*	Waitaha gecko / mokomoko	Yes	AR-D	AR-D	HU	
Woodworthia "Southern Alps"	Southern Alps gecko	Yes	AR-D	AR-D	HU	
Woodworthia "Southern Alps northern"	greywacke gecko	Yes	AR-D	AR-D	HU	
Oligosoma maccanni	McCann's skink	Yes	NT	NT	**P**	Low
Ranoidea raniformis	southern bell frog	Yes	I&N	-	P	Nil
Rawlinsonia ewingii	brown (whistling) tree frog	Yes	I&N	-	P	Nil

3.2.2 Assessment of Frog and Lizard Values

As outlined in the previous section, the only species of grass skink identified on the Site during field surveys was believed to be CGS ('At Risk – Declining'). Recent genetic results show the Canterbury grass skink extends further south within the Canterbury Plains ER than is currently mapped (New Zealand Herpetological Society, 2026), and may extend as far as Hinds, Mid-Canterbury.

The SGC ('At Risk – Declining') has been confirmed at least as far north as Rolleston and is mapped as extending as far as the Waimakariri River (New Zealand Herpetological Society, 2026). While not confirmed during surveys of the Site, the likelihood of SGC being present on the Site is considered possible.

As identified in Table 11, both 'At Risk' skinks receive a **High** EIANZ value. The 'Not Threatened' MSC is unlikely to be present on-site, based on habitat availability and the lack of detection through surveys conducted. However, taking a precautionary approach, they have been included as possible in very low abundance, as such they hold a **Low** value.

All other lizards can be ruled out as highly unlikely to be on-site, based on the history of impacts, habitat available on-site, lack of detection during surveys and their general rarity.

3.2.3 Assessment of Project Effects to Lizards

A range of actual and potential effects from the Project may impact lizards that have been identified as 'possible' to 'confirmed' on-site and within the ZOI (Table 11). Project impacts to lizards vary across the construction phase and the post-development or operational phase. The effects to lizards have been assessed as actual or potential based on the likelihood of that impact occurring if the lizards are present at the time. The magnitude of effect has been determined, based on professional judgement, considering the duration of impact (temporal scale; Section 2.2.1) and the impact the effect would cause to the expected population of that lizard within the spatial scale applied (Figure 4; Section 2.2.2).

The spatial scale selected is considered an appropriate, representative area of habitat used by the species on-site. Using national or regional population sizes would downgrade Project effects. The ED is a typical spatial scale used, by ecologists, however the spatial scale applied for this Project is smaller than that of the ED. A reduced spatial scale provides a more appropriate ecological context for determining the magnitude of the effects caused by the Project to the lizard population within proximity to the impacts.

Project impacts are outlined for each phase of the Project below, while magnitudes of effect have used criteria outlined by the EIANZ guidelines (Table 23; Appendix B – EIANZ Tables). The level of effect has been determined by assessing the lizard values against the magnitude of effect to that species, as per Table 24 (Appendix B – EIANZ Tables).

Project effects for each phase are summarised in Table 12.

3.2.3.1 Construction Phase

Enabling works and construction activities will cause a range of actual or potential impacts to lizards on-site. Removal of habitat supporting skinks on-site (i.e.: adjacent to the irrigation race) can be expected to kill lizards or force them to vacate habitat into open paddocks where they are likely to be preyed upon due to the lack of cover.

Grass skinks often thrive in roadside habitats where baseline conditions include constant noise, and vibration from vehicles and routine road shoulder mowing.

The construction phase of the Project may be expected to cause the following actual or potential effects to lizards:

- Mortality when works impact habitat.
- Temporary disturbance within the ZOI.

3.2.3.2 Post-development / Operational Phase

The post-development/operational phase is not expected to cause any ongoing effects to lizards. Where they remain on site in reserve areas, there is a low risk of impacts to lizards resulting from routine maintenance, such as weed control, however this is not expected to be any more impactful that parks maintenance that occurs as standard practice throughout the Selwyn District.

The increase in residents may cause a displacement of some lizard predators on-site, such as rodents, hedgehogs and feral cats, reducing predator impacts to lizards. However, it can be expected that the number of pet cats will increase as the Bangor Village is populated, which may result in predator pressure on lizards.

As road reserves, greenspaces and residential gardens are developed following construction, amenity plantings may benefit lizards through an increase in available habitat and connectivity across the Site.

The post-development phase may therefore result in the following actual or potential effects to lizards:

- Permanent improvement in linkages and habitat connectivity.
- Permanent increase in habitat availability.
- Potential predation pressure increase from residential cats

Table 12: Project effects on lizards.

Feature	Effect	Likelihood	EIANZ Value	Temporal effect[26]	Magnitude of effect[27]	Pre-mitigated level of effect[28]	Mitigation
Construction Phase							
Canterbury grass skink	Disturbance through construction activities (Noise & vibration).	Potential	High	Temporary	Negligible	Very low	Yes – Wildlife Act 1953.
	Mortality.	Actual and Potential	High	Permanent	Negligible	Very low	Yes – Wildlife Act 1953.
southern grass skink	Disturbance through construction activities (Noise & vibration), if present within ZOI.	Potential	High	Temporary	Negligible	Very low	Yes – Wildlife Act 1953.
	Mortality, if present on-site.	Actual	High	Permanent	Negligible	Very low	Yes – Wildlife Act 1953.
McCann's skink	Disturbance through construction activities (Noise & vibration), if present within ZOI.	Potential	Low	Temporary	Negligible	Very low	Yes – Wildlife Act 1953.
	Mortality, if present on-site.	Actual	Low	Permanent	Negligible	Very low	Yes – Wildlife Act 1953.
Post-development Phase							
Canterbury grass skink	Habitat creation.	Actual	High	Permanent	Positive	Net gain	N/A – LMP / Landscape Plan.
	Improved linkages.	Potential	High	Permanent	Positive	Net gain	N/A – Landscape Plan.
southern grass skink	Habitat creation, if present.	Actual	High	Permanent	Positive	Net gain	N/A – LMP / Landscape Plan.
	Improved linkages, if present.	Potential	High	Permanent	Positive	Net gain	N/A – Landscape Plan.
McCann's skink	Habitat creation, if present.	Actual	Low	Permanent	Positive	Net gain	N/A – LMP / Landscape Plan.
	Improved linkages, if present.	Potential	Low	Permanent	Positive	Net gain	N/A – Landscape Plan.

3.2.3.3 Project Effects to Lizards Summary

Lizards are not considered to be highly mobile, they have limited ability to evade habitat clearance activities, especially in colder conditions. Considering the current baseline conditions that lizards are exposed to (agricultural practices and roadside maintenance) and the small patches of very low-quality lizard habitat on-site, it is likely that lizards will be unable to relocate to other suitable habitat areas.

Vegetation removal within areas that support populations of lizards can therefore result in direct mortality. Lizards within habitat immediately adjacent to works or the Site, such as the road reserve along SH73 and hedges along SH77 are not expected to be directly affected by works carried out for the Project. They may however experience minor disturbance resulting from increased activity near those habitat areas.

Based on the survey results, a relatively very low abundance of CGS is expected on and adjoining the Site. A very low abundance of SGC and/or MCS is also possible on the Site.

Grass skinks can reach population densities of approx. 1,000 per ha in rank grass habitat areas within any predator control (Pers. Obs.) and have been estimated at over 9,200 per ha in areas with long-term pest control (Lettink, O'Donnell, & Hoare, 2011). The number of individuals of any species affected by this Project would be Negligible. This negligible effect has been determined by the very few individual lizards found on-site and given the extensive habitat available and the expected population within the spatial scale used for this TEcIA (Figure 4). Even in the absence of any mitigation, the loss of all individuals estimated on-site (as calculated within the associated Lizard Management Plan (Effects Management Ecology Ltd, 2026b) will have a negligible effect on the population within the spatial scale[15], which could be estimated in the tens of thousands given the suitable habitat across the 107,000ha.

Furthermore, the proposed revegetation within the Site is anticipated to enhance its value for lizards by providing increased habitat and connectivity as the amenity planted vegetation becomes established (Effects Management Ecology Ltd, 2026b).

In summary, the construction phase of the Project will likely have very low adverse effects on lizards, and the post-development operational phase of the Project is likely to provide net gain outcomes for local lizard populations through the creation of new habitat areas.

It is nevertheless possible that the Project works could result in death of lizards. A Wildlife Act Authority (WAA) is therefore required and sought for the Project to authorise the capture, salvage and transfer of lizards for relocation to release sites and the incidental killing of lizards only when all reasonable steps to avoid death have been implemented.

[15] As defined in (Table 23; Appendix B – EIANZ Tables).

3.2.4 Lizard Effects Management

A draft Lizard Management Plan (LMP) has been prepared as part of this TEcIA and includes measures to address the effects of the Project on lizards during construction and post development phases of the Project (Effects Management Ecology Ltd, 2026b).

In summary, the LMP:

1. Clearly outlines the habitat types for lizards, where these habitats are on-site, and ZOI, and the recommended buffer zone to be applied when required.
2. Describes the measures that will be implemented prior to and during construction of the Project to avoid or minimise disturbance and incidental killing of lizards. These include:
    a. Prioritising establishment of the new dryland ecosystem habitat, as priority location for the lizard release area (LRA) at an early stage of the Project.
    b. Staging the construction works avoid impacts to actual or potential lizard habitat on-site until the LRA is suitable to receive lizards.
    c. Avoiding impacts to lizard habitat between 1 May and 30 September, when lizards are likely to be in brumation.
    d. Engaging a suitably qualified and experienced herpetologist with appropriate lead in time, prior to commencing habitat impacts to salvage lizards within the identified habitat areas and relocate them to the LRA.
        i. Lizard salvage trapping and habitat clearance will avoid cold weather days <15°C.
        ii. Lizard salvage and transfer will comply with the Key Principles of Lizard Salvage and Transfer (Department of Conservation, 2019).
        iii. Preferably lizards will be retained on-site within the preferred LRA or transferred to a suitable off-site LRA.
3. Outlines where and how high-quality lizard habitat is to be created on-site.

Through implementation of the measures set out in the LMP (required as a condition of resource consent and the WWA), it is expected that all adverse effects of the Project during the construction phase will be reduced to less than minor (as illustrated in Table 13), and the Project will generate net gain outcomes for lizards in the post-development phase.

Table 13: Post-mitigated magnitude of effect and residual levels of effect to lizards.

Feature	Value	Post-mitigated magnitude of effect	Residual level of effect	Planning term conversion	Offsetting required?	Compensation required?
Construction Phase						
Canterbury grass skink	High	Negligible	Very low	Less than minor	No	No
Southern grass skink	High	Negligible	Very low	Less than minor	No	No
McCann's skink	Low	Negligible	Very low	Less than minor	No	No
Post-development Phase						
Canterbury grass skink	High	Positive	Net gain	Positive	No	No
Southern grass skink	High	Positive	Net gain	Positive	No	No
McCann's skink	Low	Positive	Net gain	Positive	No	No

4 FLORA (VEGETATION) AND HABITATS

4.1.1 Vegetation and Habitat Values

The predicted pre-human vegetation type for much of the ER, and the entirety of the Site is Matai-Kahikatea-Totara Forest. Through early Māori and European occupation, this was almost entirely cleared and by 1840, most of the eastern South Island was grassland and scrub (Weeks, Overton, & Walker, 2012).

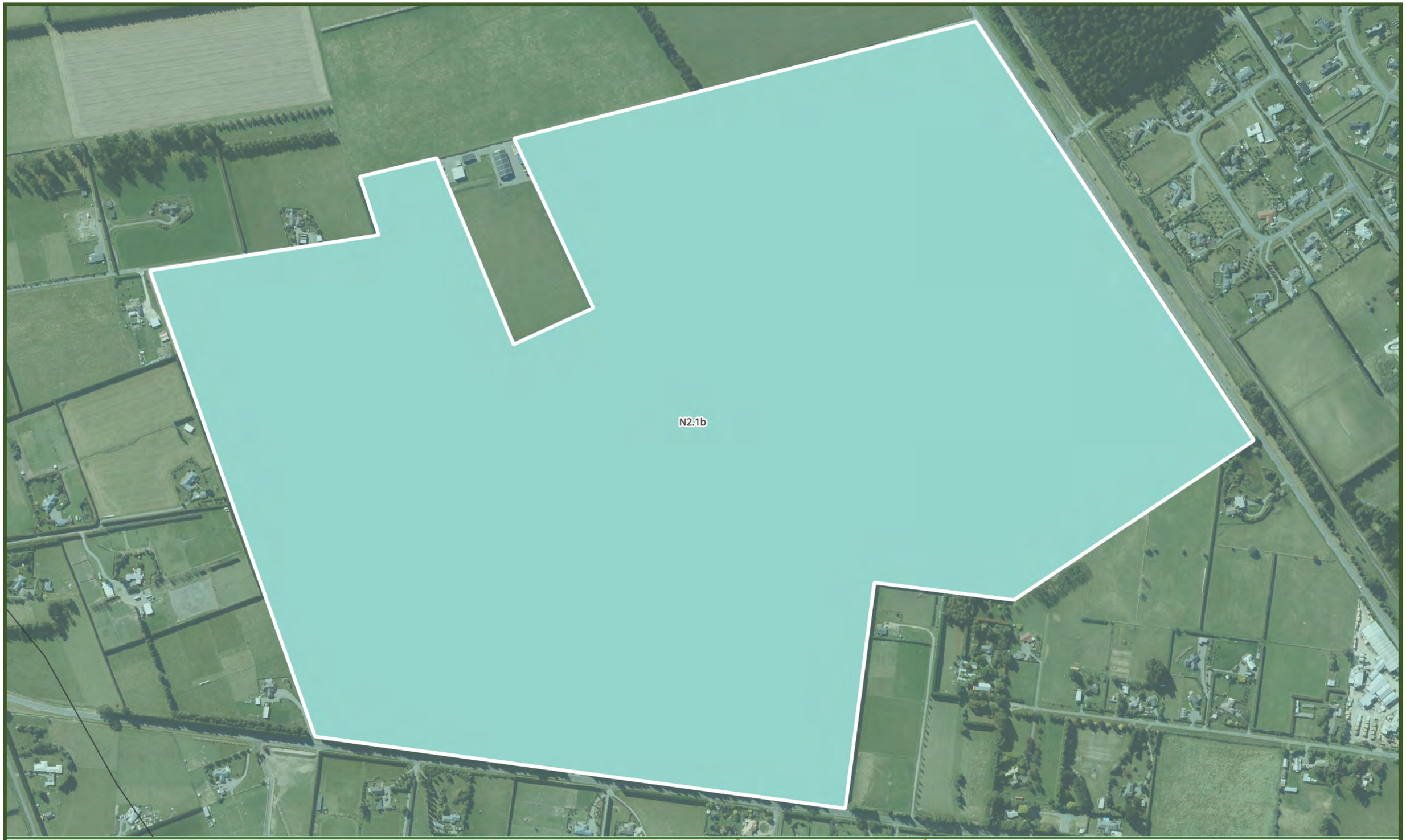
The LENZ database is an environmental classification system that identifies climatic and landform factors that can influence in the distribution of species, which then uses these factors to define a landscape classification that groups together sites with similar environmental conditions. The entirety of the Site comprises Environment type N1.2b (Figure 17). This environment type has suffered extensive indigenous cover losses since human arrival and is now classed as 'Threat Category 1 with less than 10% of indigenous cover remaining nationally (Walker, Cieraad, & Barringer, 2015).

Environment N1[16]
Most of Environment N1 is located on the Canterbury Plains extending from the Conway to the Rangitata River with some small areas occurring in Central Otago. The climate is mild, with high solar radiation, high vapour pressure deficits (mainly because of the föhn winds) and moderate annual water deficits. Parent materials are predominantly greywacke gravels with some loess and fine alluvium. Soils are imperfectly drained and of high natural fertility.

The Landcover Database V6.0 (LCDB) shows most of the Site now comprises mostly 'High Producing Exotic Grassland', with small areas of the Site made up of 'Exotic Forests' and 'Built Up Area (Settlement) (Figure 18).

With the exception of some minor and inconsequential differences, the LCDB classification of the land cover types on the Site was confirmed through on-site surveys conducted in March and April 2026 along with high-resolution aerial imagery (Figure 19).

[16] (Leathwick, et al., 2002).



Legend:

LENZ Lvl 4

N2.1b

Project boundary

ESRI Satellite

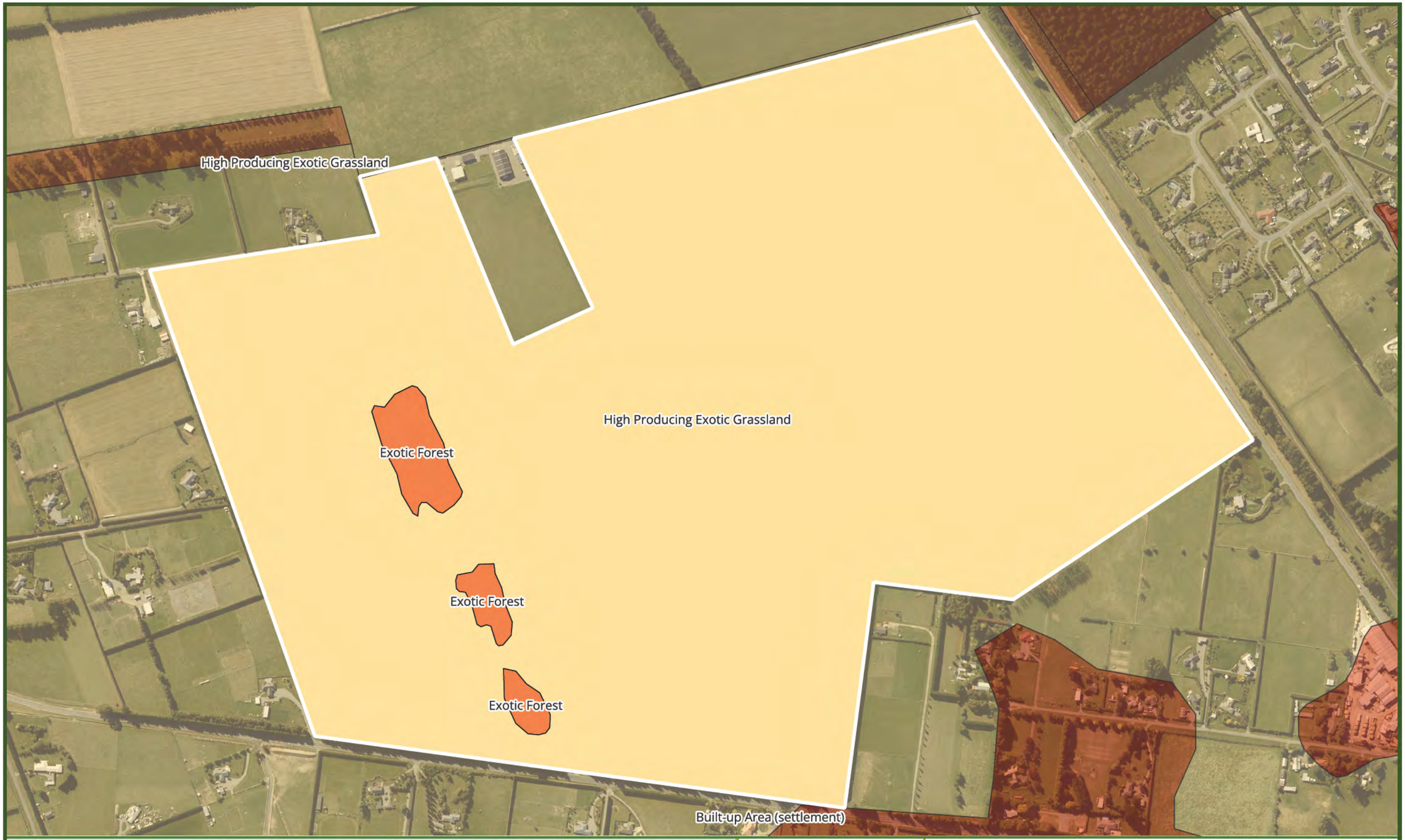
Client: Hughes Developments Ltd
Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 05/07/2026
Reviewed by: M. Hansen
Revision: 1

Figure 17: Threatend environment types on-site.

0 50 100 150 200 250 m

N

1:5,500



Legend:

LCDB V6.0

- Built-up Area (settlement)
- Exotic Forest
- High Producing Exotic Grassland
- Project boundary

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Deliverable: Terrestrial Ecological Impact Assessment
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Date: 05/07/2026
Reviewed by: M. Hansen
Revision: 1

0 50 100 150 200 250 m

N

1:5,500

Figure 18: Landcover database land cover types on-site.

Legend:

Land cover types on-site

- Built-up Area (settlement)
- Deciduous Hardwoods
- Exotic Forest
- Gorse and/or Broom
- High Producing Grassland
- Short-Rotation Cropland
- Project boundary

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Date: 05/07/2026
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Revision: 1

0 50 100 150 200 250 m

N

1:5,500

Figure 19: Land cover types confirmed on-site.

A summary of the land cover type and percentages they contribute to the Site are shown in Table 14.

Table 14: Land coverage of the Site.

Land cover type	LCBD V6.0 (ha)	Confirmed on-site (ha)	Site percentage
Build-up Area (Settlement)	0.0001	0.7	0.5%
Deciduous Hardwoods		0.04	0.03%
Exotic Forest	2.6	6.1	4.7%
Gorse and/or Broom		0.3	0.2%
High Producing Exotic Grassland	127.4	105.4	80.8%
Short-Rotation Cropland		17.4	13.4%

As Table 14 illustrates, the land cover types on-site are dominated by exotic species. High production agricultural grassland and short-rotation crop species make up almost 95% of the Site. As a short rotation crop farm, the Site is also highly dynamic with grazing and tilling occurring within the same month. Areas of bare dirt observed in March (Figure 20) were grassland by late April (Figure 21). Over the same period, other areas of grassland (Figure 22) were grazed to bare earth up to and including along fencelines (Figure 23), or short-rotation crops (Figure 24) were grazed and tilled within the same one-month period (Figure 25), confirming the Site is highly dynamic.

Figure 20: Grazed grassland within Paddock 1, with grass in Paddock 2 on the right (21/03/2026).

Figure 21: Grassland within Paddock 1, with Paddock 2 on the right (28/03/2026).

Figure 22: Grassland within Paddock 2 (21/03/2026).

Figure 23: Grazed grassland within Paddock 2 up to and including the fenceline (28/04/2026).

Figure 24: Short-rotation crop within Paddock 18 (20/03/2026).

Figure 25: Paddock 18 following grazing and during tilling (25/04/2026).

Exotic conifers such as radiata pine (*Pinus radiata*), cypress (*Thuja* sp.) and macrocarpa (*Cupressus macrocarpa*) have been planted for shelterbelts south of Paddock 3, east and south of Paddock 8, east of Paddocks 17, 18 and 19, and north of Paddock 19. Cypress hedgerows have also been planted along SH77.

The dominant mature tree species on-site is Eucalyptus (*Eucalyptus globulus*) with a dense Eucalyptus dominated stand north of the existing dwelling. The Eucalyptus dominant stand has rank grassland in some open areas which is routinely sprayed, a mix of exotic weed and native understory primarily elderflower (*Sambucus nigra*), flowering cherry (*Prunus* sp.) and poroporo (*Solanum aviculare*) with little or no groundcover, or dense ivy smothering groundcover. Pōhuehue (*Muehlenbeckia australis*) and old man's beard (*Clematis vitalba*) vines are also present within this area, which is a Sustained Control and site-led pest weed.

A sparse Eucalyptus stand with grassland is present south of the existing dwelling. This area (Paddock 20) is used to temporarily hold cull sheep, as such typically receives a light grazing.

South and west of Paddock 20 comprises a conifer dominant stand. Within this conifer stand, Douglas fir (*Pseudotsuga menziesii*), sparse Eucalyptus and sycamore (*Acer pseudoplatanus*) and a mix of exotic and native understory species are present. Many of the understory species appeared to be fruit baring and are commonly introduced by birds, such as blackberry, karo (*Pittosporum crassifolium*), and various Coprosma (*Coprosma* spp.).

Amenity garden plants surrounding the existing dwelling are a mix of exotic and native species, such as golden elm (*Ulmus glabra* 'Lutescens'), black locust (*Robinia pseudoacacia*), princess tree (*Paulownia tomentosa*) European beech (*Fagus sylvatica*), golden tōtara (*Podocarpus totara* 'Aurea'), lancewood (*Pseudopanax crassifolius*), and cabbage tree (*Cordyline australis*) along with various common domestic garden shrubs, such as rose (*Rosa* spp.) and groundcover weeds, such as blue periwinkle (*Vinca major*).

Along the driveway amenity planted trees are present including, birch (*Petula pendula*), Mexican weeping pine (*Pinus patula*) and spruce (*Picea* sp.). Individual mature poplar (*Populus* sp.) are present between Paddocks 4 & 5, and within the macrocarpa hedgerow east of Paddocks 17, 18 & 19.

Clusters of gorse (*Ulex europaeus*) are present along the northern boundary within Paddock 5, while isolated gorse shrubs are found along the irrigation race beside Paddock 5, within Paddock 20 and along the eastern boundary adjacent to SH73. Most of the gorse adjacent to SH73 is off-site within the road reserve. A small cluster of scotch broom (*Cytisus scoparius*) was found on the property edge adjacent to SH77.

When applying Table 21 and Table 22 (Appendix B – EIANZ Tables) the vegetation on-site is of **Negligible** overall value, as explained in Table 15.

Table 15: Vegetation value assessment.

Matter	Criteria	Values	Overall EIANZ value
Representativeness	• By 1840[17], much of the Canterbury Plains had already been converted from mixed podocarp forest to grassland for agricultural purposes. The Site can therefore be expected to at least be moderately reflective of the structure and composition of the species and tiers (or lack thereof), present in 1840.	Moderate	**Negligible**
Rarity/Distinctiveness	• Complete lack of natural indigenous 'plains' vegetation. • The few native species present on-site are amenity planted garden species or self-introduced by birds spreading seed, likely to have come from other gardens within proximity to the Site and there is no guarantee these plants have not come from garden centres or other locations and are not eco-sourced from the ED. • No nationally 'Threatened' or 'At Risk' species.	Very low	
Diversity and Pattern	• Very low diversity of native vegetation	Very low	

[17] 1840 is the baseline against which representativeness is assessed (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).

Matter	Criteria	Values	Overall EIANZ value
	• Very low abundance of native species • Lack of complexity on-site.		
Ecological Context	• Considering the Site history, local environment, size and shape of the Site, the sensitivity to change, the lack contribution to native vegetation communities and ecosystem functioning within the ED, the vegetation on-site contributes very little to the ecological context of the landscape.	Very low	

Vegetation on-site does not meet the CRPS significance criteria (reproduced in Appendix d – CRPS Appendix 3) (Environment Canterbury Regional Council, 2021). The ZOI for vegetation is restricted to the plants directly impacted, while the ZOI on habitats relates to the fauna inhabiting them, as outlined in Section 3.1 & 3.2. A comprehensive list of vascular plants is provided be Table 16, and is sufficient to determine vegetation values for the Site.

Table 16: Vegetation confirmed on-site.

Scientific name	Common names	Threat classification[18]	CRPMP pest weed status[19]	EIANZ value
Coprosma lucida	shining karamu	NT		Low
Coprosma spp.	small leaved coprosma	NT		Low
Cordyline australis	cabbage tree	NT		Low
Corokia sp.	korokio	NT		Low
Muehlenbeckia australis	pōhuehue	NT		Low
Pittosporum crassifolium	karo	NT		Low
Pittosporum tenufolium	kōhūhū	NT		Low
Podocarpus totara 'Aurea'	golden tōtara	NT		Low
Pseudopanax crassifolium	lancewood	NT		Low
Solanum aviculare	poroporo	NT		Low
Veronica spp.	hebe	NT		Low
Acer negundo	box elder	I&N		
Acer palmatum	Japanese maple	I&N		
Acer pseudoplatanus	sycamore	I&N	OoI	Negative
Agrostis capillaris	brown top	I&N		
Atropa belladonna	deadly nightshade	I&N		
Aucuba japonica	Japanese aucuba	I&N		
Berberis glaucocarpa	barberry	I&N	OoI	Negative
Betula pendula	silver birch	I&N	OoI	Negative
Brassica spp.	brassica fodder crops	I&N		
Cedrus atlantica	atlas cedar	I&N		
Ceratostigma plumbaginoides	blue leadwort	I&N		
Chamaecyparis sp.	false cypress	I&N		
Clematis vitalba	old man's beard	I&N	Sustained Control / site-led / GNR	Negative

[18] (de Lange, et al., 2024).
[19] (Environment Canterbury Regional Council, 2018).

Scientific name	Common names	Threat classification[18]	CRPMP pest weed status[19]	EIANZ value
Conium maculatum	hemlock	I&N	OoI	Negative
Cortaderia selloana	pampas	I&N		
Cupressus x leylandii	leyland cypress	I&N		
Cupressus sempervirens	Mediterranean cypress	I&N		
Cytisus scoparius	scotch broom	I&N	Sustained Control / site-led / GNR	Negative
Eucalyptus globulus	Tasmanian blue gum	I&N		
Euonymus europaeus	European spindle tree	I&N		
Euphorbia characias	Mediterranean spurge	I&N		
Fagus sylvatica	European beech	I&N		
Fraxinus excelsior	golden ash			
Garrya elliptica	coast silk tassel	I&N		
Grevillea sp.	grevillea	I&N		
Hedera helix	common ivy	I&N		
Hesperocyparis arizonica	Arizona cypress	I&N		
Hesperocyparis macrocarpa	Monterey cypress	I&N		
Hordeum murinum	barley grass	I&N		
Juncus spp.	rushes	I&N		
Laurus nobilis	bay laurel	I&N		
Ligustrum lucidum	tree privet	I&N		
Lolium perenne	perennial ryegrass	I&N		
Magnolia grandiflora	southern magnolia	I&N		
Malus sp.	apple	I&N		
Nandina domestica	heavenly bamboo	I&N		
Nerine bowdenii	Cornish lily	I&N		
Onopordum acanthium	scotch thistle	I&N		
Paulownia tomentosa	princess tree	I&N		
Photinia × fraseri	photinia	I&N		
Phytolacca octandra	inkweed	I&N		
Picea sp.	spruce	I&N		
Pinus patula	Mexican weeping pine	I&N		
Pinus radiata	radiata pine	I&N		
Platanus orientalis	plane	I&N		
Populus sp.	poplar	I&N		
Prunus avium	wild cherry	I&N		
Prunus serrulata	flowering cherry	I&N		
Prunus yedoensis	yoshino cherry	I&N		
Pseudotsuga menziesii	Douglas fir	I&N		
Quercus palustris	pin oak			
Robinia pseudoacacia	black locust	I&N		
Rubus fruticosus	blackberry	I&N	OoI	Negative
Rumex obtusifolius	broadleaved dock	I&N		
Rununculus sp.	buttercup	I&N		
Salix sp.	willow	I&N		
Sambucus nigra	elderflower	I&N		
Taxus baccata	English yew	I&N		

Scientific name	Common names	Threat classification[18]	CRPMP pest weed status[19]	EIANZ value
Thuja occidentalis	cypress	I&N		
Trifolium repens	white clover	I&N		
Ulex europaeus	gorse	I&N	Sustained Control / site-led / GNR	Negative
Ulmus carpinifolia 'Variegata'	variegated elm	I&N		
Ulmus glabra 'Pendula'	Weeping elm			
Urtica urens	small nettle	I&N		
Vinca major	blue periwinkle	I&N		

A summary of the habitats and fauna supported by the vegetation identified on Site is included in Table 17. Table 17 also identifies whether the habitat is considered significant in accordance with the CRPS criteria (reproduced in Appendix d – CRPS Appendix 3).

Table 17: Habitats on-site, their value and significance.

Habitat type	Species	Permanent or Seasonal	Life stage	CRPS significance	EIANZ value
Grassland	'AR-D' SIPO and New Zealand pipit	Seasonal / possibly Permanent	Foraging, roosting and nesting.	Yes, habitat likely to support 'AR-D' birds, but unlikely with current and ongoing farm practices.	High as 'AR-D' SIPO and New Zealand pipit may forage and attempt to nest within habitat type.
	'NT' birds	Permanent	Foraging and roosting.	No	Low
Rank grassland	Birds	Permanent	Nesting.	No	Low
	Lizards	Permanent	Foraging and birthing.	Yes, habitat supports 'AR-D' lizards.	High as 'AR-D' lizards are present within habitat type.
Trees & Shrubs	Birds	Permanent	Foraging, roosting and nesting.	No	Low as only 'NT' birds expected to nest within habitat type.
Structures	Birds	Permanent	Roosting and nesting	No	Low as only 'NT' birds expected to nest within habitat type.

4.1.2 Assessment of Project Effects to Vegetation and Habitats

The adverse effects of the Project on existing vegetation (shown in Table 16) are restricted the construction phase. Any effects on remaining on-site vegetation during the operational phase will be consistent with the maintenance undertaken as part of reserve management throughout the Selwyn district.

The magnitude of effects has been determined based on professional judgement and has accounted for the permanent loss (temporal scale; Section 2.2.1) and the impact the effect would cause to vegetation within the spatial scale (Figure 4; Section 2.2.2).

Adverse effects of the Project on existing habitats (shown in Table 17) are expected during to the construction phase of the Project, while the creation and/or enhancement of new habitats proposed as Reserves will result in positive effects during the post-development / operational phase.

The magnitude of effects has been determined based on professional judgement and has accounted for the permanent loss or timeframes in which those habitats would regenerate in the absence of human intervention (temporal scale; Section 2.2.1) and the impact the effect would cause to habitat provided for species within the spatial scale applied (Figure 4; Section 2.2.2).

The spatial scale selected is considered an appropriate, representative area of vegetation and habitat on-site. Using national or regional areas for the vegetation or habitat type would significantly downgrade Project effects. The ED is a typical spatial scale used, by ecologists, however the spatial scale applied for this Project is smaller than that of the ED. A reduced spatial scale provides a more appropriate ecological context for understanding the magnitude of the effects caused by the Project on the vegetation and the habitats within proximity to the impacts.

Project impacts are outlined for each phase of the Project below, while magnitudes of effect have used criteria outlined by the EIANZ guidelines (Table 23; Appendix B – EIANZ Tables). The level of effect has been determined by assessing the vegetation and habitat values against the magnitude of effect to vegetation or that habitat type, as per Table 24 (Appendix B – EIANZ Tables).

Project effects for each phase are summarised in Table 18Table 18.

4.1.2.1 Construction Phase

Vegetation

Enabling works and construction activities will result in the removal of some of the native vegetation on-site. Most of the native vegetation associated with the amenity gardens surrounding the existing dwelling are proposed to be avoided and retained where possible. Loss of native vegetation will be restricted to seedlings, saplings and small plants within the understories of the Eucalyptus stand, conifer stand.

The construction phase will cause the following effects to native vegetation:

- Staged removal/Loss

Grassland

Enabling works and construction activities will result in the removal of grassland habitat for Project construction. Protected birds, such paradise shelducks and potentially SIPO, can be expected to be slightly displaced for foraging during the staged development and progressive loss of grassland habitat. In the case of SIPO and New Zealand pipit, nesting habitat will also be progressively removed over the staged development, but only if they utilise the Site for nesting.

The construction phase, will cause the following effects to grassland habitat:

- Staged removal/loss of approx. 105ha over several years.

Rank grassland

Enabling works and construction activities will result in the removal of, or impact to, low-quality rank grassland habitat for Project construction. The construction phase will result in the permanent loss of the rank grassland within the Yards, and Paddock 20. The small areas of rank grassland within the eucalyptus stand, and along the irrigation race may be lost or impacted through remediation/enhancement planting. The rank grass adjacent to the irrigation race was the only on-site area confirmed to support protected lizards.

Rank grassland confirmed to support 'At Risk' lizards is present in areas off-site adjacent to SH73 and SH77. These off-site areas are not expected to be impacted by the Project.

The construction phase can be expected to cause the following actual or potential effects to rank grassland habitats:

- Confirmed removal/loss of approx. 1.6ha rank grassland habitat within Paddock 20 and the Yards.
- Moderate impact to or loss of approx. 0.1ha of rank grassland habitat within the eucalyptus stand north of the existing dwelling and along the irrigation race.

Trees & Shrubs

Enabling works and construction activities will result in the removal of trees & shrub habitat for Project construction. Trees & shrubs provide nesting habitat for a range of protected birds confirmed or may utilise the Site. Dense exotic conifer hedgerows are most likely to support unprotected introduced birds, while native shrubs and trees are most likely to support both introduced and native protected birds' nests. Most of the mature trees & shrubs that can be expected to support nests are located around the existing dwelling. Where practicable, those mature trees and shrubs will be retained as part of the Project however nesting bird habitat is likely to be lost during the clearance of trees and understory shrubs within the conifer stand, Paddock 20 and the eucalyptus stand north of the existing dwelling.

Hedgerows will be removed except for those along the southern boundary of Paddock 8, the northern boundary for Paddock 19 and adjacent to SH77. The poplars between Paddocks 4 & 5, the amenity trees along the existing driveway and all trees & shrubs south of the existing dwelling will also be removed.

The construction phase can be expected to cause the following actual or potential effects to tree and shrub habitat:

- Staged removal / loss of trees & shrubs habitat over a 2.9ha area over several years.

Structures

Enabling works and construction activities will require removal of all existing structures on-site associated with farm buildings and the existing dwelling. Some of these areas are known to or can provide suitable nesting habitat for protected birds.

The construction phase will cause the following effects to structures used by birds for nesting:

- Removal/Loss of 0.14ha of farm and existing dwelling buildings, (though only a fraction of these buildings provide suitable nesting habitat for protected birds to utilise).

Figure 26 provides indicative areas of vegetation and habitat impacts on-site during the construction phase.

Legend:

- Trees and Shrubs to be avoided
- Selective Eucalyptus removals
- Grassland to be removed
- Rank grassland to be removed
- Trees and Shrubs to be removed
- Eucalyptus removal due to roads or properties
- Eucalyptus removal within 10m of irrigation race
- Structures to be removed
- ESRI Satellite

Disclaimer: This drawing has been developed based on information provided by the client, obtained by Effects Management Ecology Ltd, approved subcontractor(s) or another Third Parties for the purposes of providing contracted ecological services. The information shown is assumed to be true and accurate within reasonable accuracies for the size, scale and equipment used to capture data in the field, or produce this drawing. Information shown is subject to change over time. Effects Management Ecology Ltd holds no responsibility for any liability or action caused by any reliance on this drawing, should there be any inaccuracies or it be incompleted. This drawing has been developed for the client for the purpose in which is is intende. ©Effects Mgmt Ecology Ltd

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Revision: 1

Figure 26: Vegetation and habitat impacts on-site.

0 50 100 150 200 250 m

1:5,500

N

4.1.2.2 Post-development / Operational Phase

Vegetation

The post-development/operational phase is not expected to cause any ongoing effects to vegetation that remains. Trees & shrubs that avoid impact during the construction phase will continue to grow and provide food resources and nesting habitat for birds.

The post-development phase can be expected to cause the following actual and potential effects to vegetation:

- Permanent creation of approx. 0.7ha of dryland ecosystem habitat, comprising mostly of indigenous vegetation.
- Permanent creation of approx. 1ha of riparian habitat adjoining the reserve area.
- Permanent creation of approx. 0.6ha of grassland and clusters of amenity native plants associated with a noise bund adjacent to SH73.
- Greenspace development comprising grass and amenity native plants of approx. 3.5ha.
- Potential 0.4ha of irrigation race amenity planting beyond the reserve area.
- Residential properties can also be expected to create a permanent and significant increase in amenity planted trees and shrubs across the Site

Grassland

The post-development/operational phase is expected to create several greenspace areas which are likely to include areas of remediated grassland. The greenspaces can be expected to be subject to routine 'Parks' management. This routine maintenance and the small size of these greenspaces are therefore unlikely to provide foraging or nesting opportunities for SIPO, but mallards may become habituated and utilise the area.

The post-development phase, can be expected to cause the following actual effects to grassland:

- Remediation/enhancement within the greenspace areas.

Rank grassland

Following the construction phase, no ongoing Project effects are expected to rank grassland habitats.

Remediation of a 3m high noise bund on-site, adjacent to SH73, and the enhancement/creation of a 'dryland ecosystem' amenity planting are expected to result in high-quality habitat suitable for 'At Risk' lizards. The 'dryland ecosystem' area, within Reserve 816 & 817 is proposed within the LMP as a preferred lizard release area. As such the Site will be enhanced to promote high-quality lizard habitat.

Riparian plantings associated with the irrigation race within Reserve 801 can be expected to at least provide low-quality lizard habitat as lizards have been found to utilise similar amenity planted areas, albeit at a reduced abundance (WSP New Zealand Ltd, 2025).

The riparian plantings are directly connected to the dryland ecosystem area where skinks are proposed to be released, and off-site rank grassland adjacent to SH77 where skinks were confirmed. It is therefore likely that Canterbury grass skinks will utilise this riparian planting as a corridor. This area will be contiguous with the avoided hedgerow, developed greenspace area and the avoided trees & shrubs associated with the

exiting dwelling gardens. All of these initiatives could result in a large area of habitat that may be suitable to support skinks.

The proposed fenceline along the hedgerows adjacent to SH77 can be expected to have a few meters gap for access along the hedgerow and may result in rank grassland development and a buffer to lizard habitat from the residential properties.

The cessation of ongoing glyphosate use on-site for weed control by the farmer can be expected to eliminate adverse effects on rank grassland and lizards that inhabit those marginal areas.

The post-development phase can be expected to cause the following actual or potential effects to lizard habitat:

- Remediation/enhancement of approx. 1.3ha of high-quality lizard habitat.
- Remediation/enhancement of approx. 1ha of riparian habitat lizards can be expected to utilise as low-quality habitat.
- Connectivity to adjacent greenspaces and trees & shrubs habitat next to the irrigation race, resulting in up to approx. 2.5ha of low-quality lizard habitat.

Although not directly Project-related, an indirect effect caused by this Project will result in residential amenity gardens being developed. Amenity plantings may not create rank grassland specifically, but residential gardens may benefit lizards.

The indirect Project-related post-development effects to rank grassland/lizard habitat can be expected to be:

- Continued increase lizard food resources and habitat as stages are completed.
- Permanent improvement in linkages and habitat connectivity.

Trees & Shrubs

Exotic hedgerows that avoid impact during the construction phase can be expected to continue being pruned and maintained, consistent with current baseline conditions.

As with native vegetation, trees & shrubs habitat that avoid impact will also continue to support birds within this habitat type.

Areas are proposed for enhancement on-site through a Landscape Plan, such as riparian plantings along the irrigation race to improve water quality and can be expected to provide bird food resources and nesting habitats. Greenspaces proposed as part of the Project can also be expected to provide bird food resources and nesting habitats as well as provide some corridors and linkages. Incorporation of a 'dryland ecosystem' area has been accepted to mitigate effects to lizard habitats.

The post-development phase can be expected to cause the following actual or potential effects to trees & shrubs habitat:

- Permanent increase in bird resources and nesting habitat for common species.
- Increased risk of residential window and vehicle-strike for some species.
- Permanent increase in food resource and nesting habitat for resident 'Not Threatened' birds.
- Permanent increase in food resource and habitat for 'At Risk' Canterbury grass skinks.

Although not directly Project-related, an indirect effect caused by this Project will result in residential amenity gardens being developed. Amenity plantings may benefit lizards but will benefit the common bird species through an increase in available food resources, nesting habitat and connectivity across the Site.

The indirect Project-related post-development effects to trees & shrubs habitat can be expected to be:

- Continued increase in bird and lizard food resources and nesting habitat as stages are completed.
- Permanent improvement in linkages and habitat connectivity.

Figure 27 provides an overview of the expected vegetation / habitat creation on-site following development.

Legend:

- Greenspace to be remediated
- Indicative SH73 noise bund
- Indicative dryland ecosystem development
- Indicative riparian remediation and enhancement
- Potential indicative riparian planting

ESRI Satellite

Disclaimer: This drawing has been developed based on information provided by the client, obtained by Effects Management Ecology Ltd, approved subcontractor(s) or another Third Parties for the purposes of providing contracted ecological services. The information shown is assumed to be true and accurate within reasonable accuracies for the size, scale and equipment used to capture data in the field, or produce this drawing. Information shown is subject to change over time. Effects Management Ecology Ltd holds no responsibility for any liability or action caused by any reliance on this drawing, should there be any inaccuracies or it be incompleted. This drawing has been developed for the client for the purpose in which is is intende. ©Effects Mgmt Ecology Ltd

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Project: 20260008 Bangor Village
Deliverable: Terrestrial Ecological Impact Assessment
Drawn by: M. Hansen
Date: 06/07/2026
Reviewed by: M. Hansen
Revision: 1

Figure 26: Vegetation and habitat remediation, enhancement and creation, post-development on-site.

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Table 18: Project effects to vegetation and habitats of protected fauna.

Feature	Effect	Likelihood	EIANZ Value	Temporal effect[26]	Magnitude of effect[27]	Pre-mitigated level of effect[28]	Mitigation
Construction Phase							
Vegetation	Loss	Actual	Negligible	Permanent	Negligible	Very low	No – not more than minor (RMA).
Grassland	Loss	Actual	High (only if SIPO/New Zealand pipit successfully nest on-site)	Permanent	Negligible	Very low	No – not more than minor (RMA).
Rank grassland	Loss	Actual	High	Permanent	Negligible	Very low	No – not more than minor (RMA).
Trees & Shrubs	Loss	Actual	Low	Short- term to Permanent	Negligible	Very low	No – not more than minor (RMA).
Structures	Loss	Actual	Low	Permanent	Negligible	Very low	No – not more than minor (RMA).
Post-development Phase							
Vegetation	Amenity plantings Greenspace creation Noise bund development	Actual	Negligible	Short- to Medium-term	Positive	Net gain	N/A – Landscape Plan.
Grassland	Creation within greenspaces	Actual	N/A (as it will not be usable by At Risk birds for nesting.	Permanent	N/A	Nil	N/A – Landscape Plan.
Rank grassland / lizard habitat	Noise bund development Constructed/enhanced habitat for lizards	Actual	High	Short-term to permanent	Positive	Net gain	N/A – LMP / Landscape Plan
Trees & Shrubs	Amenity plantings within greenspaces, within riparian plantings, the dryland ecosystem area and along roadways	Actual	Low	Short-term to Permanent	Positive	Net gain	N/A – Landscape Plan.

4.1.2.3 Project Effects to Vegetation and Habitats Summary

Very few indigenous plants are present on-site. Those that are present are either amenity planted garden plants or seedling/saplings within the 'exotic forest' on-site introduced by birds. Native plans on-site hold little to no ecological value other than as habitat for protected birds, because they are not remnant natural vegetation. It is possible they are genetically polluted by garden varieties which may have been imported into the district from elsewhere in the country. Even if they were native from the ED, the species present are all 'Not Threatened'.

Grassland habitat on-site could support 'At Risk – Declining' SIPO and New Zaland pipit, therefore meets a CRPS regional significance criterion within the Rarity/Distinctiveness matter. However, this habitat on-site is regularly impacted and disturbed by routine farm practices. The current baseline conditions are such that this habitat does not qualify as a Significant Natural Area, which was the intention of the criteria listed within Appendix 3 of the CRPS.

The staged approach to the loss of this habitat during the construction phase is expected to reduce overall effects. When considering the total and permanent loss of this habitat, the magnitude of effect may be considered very high[20], however, the loss of this habitat is only expected to have a negligible effect on the known population[20] of SIPO within the spatial scale when considering the few birds affected and the vast available habitat within the spatial scale by which effects are assessed in this TEcIA. Greenspaces are proposed to be created (as set out in the Landscape Plan); however, these can be expected to be a mix of highly maintained grassland and trees & shrubs. The small areas, with extensive residential developments surrounding them will not allow the grassland to be effective in remediating this habitat type on-site, though mallards may utilise the grassland for foraging and roosting if they become accustomed to human presence. No post-development negative effect is expected due to the loss during the construction phase and so the overall Project effect will remain negligible to grassland habitat.

Rank grassland supports 'At Risk' lizards on-site and within the ZOI. However, like SIPO utilising grassland, the habitat on-site supporting lizards is regularly impacted by routine farm practices including glyphosate spraying. The current baseline conditions are such that this habitat does not qualify as a Significant Natural Area, which was the intention of the criteria listed within Appendix 3 of the CRPS. Rather, these are simply tolerant species that are utilising highly modified habitats. As Project effects will avoid all the high-quality habitat within the road reserve of SH73, and the loss on-site will have a negligible effect[20] on 'rank grass supporting lizards' within the spatial scale. Remediation, habitat creation/enhancement is expected to result in an overall net gain[20] increase of almost 1ha of lizard habitat with 1.8ha being dedicated to the development of high-quality lizard habitat, improving upon rank grassland.

Trees & hhrubs will be partly lost on-site, though the effect will be negligible to this habitat[20]. Post-development, no negative effects to trees & shrubs are expected, beyond management pruning of hedgerows consistent with current baseline conditions. The Landscape Plan outlines areas of greenspaces; the irrigation race riparian and road reserve areas on-site will result in the remediation of trees & shrubs. The proposed dryland ecosystem area will be developed into high-quality lizard habitat; however, some

[20] Table 23 (Appendix B – EIANZ Tables).

native shrubs are also proposed to be used. The overall effect on trees & shrubs post-development will be a net gain[20].

The permanent loss of structures that provide minimal nesting habitat for swallows and possibly little owls is negligible[20].

4.1.3 Recommended Effects Management

Given the negligible value of the vegetation on site that will be affected by the Project, no dedicated mitigation measures are required to address the effects of the Project. Project impacts to habitats are appropriately addressed within the respective draft bird and lizard management plans (Effects Management Ecology Ltd, 2026a) (Effects Management Ecology Ltd, 2026b).

The proposed increase in planting, establishment of a dedicated dryland habitat for lizards and a noise bund that will support 'At Risk' lizards without routine impact within the road reserve of SH73 will result in an ecological net gain, as summarised in Table 19.

Table 19: Post-mitigated magnitude of effect and residual levels of effect to vegetation and habitats of protected fauna.

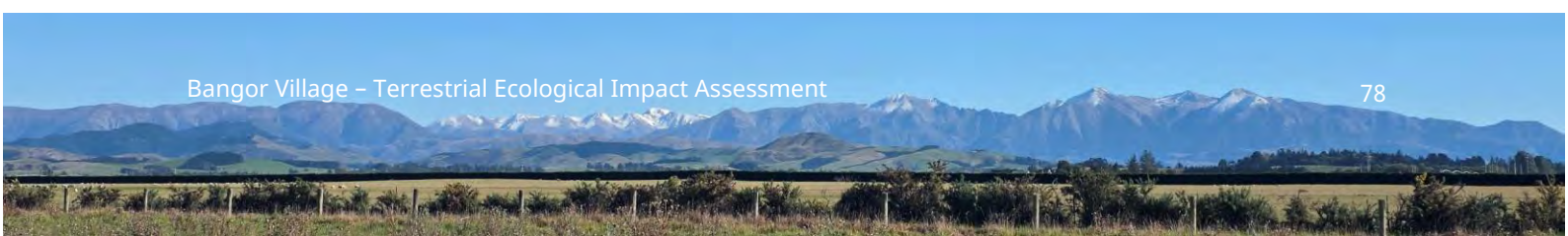
Feature	Value	Post-mitigated magnitude of effect	Residual level of effect	Planning term conversion	Offsetting required?	Compensation required?
Post-development Phase						
Vegetation	Negligible	Positive	Net gain	Positive	No	No
Grassland	High (only if At Risk bird's nest no-site)	Negligible	Very low	Less than minor	No	No
Rank grassland	High	Positive	Net gain	Positive	No	No
Trees & Shrubs	Low	Positive	Net gain	Positive	No	No
Structures	Low	Negligible	Very low	Less than minor	No	No

5 CONCLUSION

This TEcIA report has been prepared for a substantive application by Hughes Developments Limited for resource consents and a wildlife approval. It has detailed the terrestrial ecological features on-site along with the actual and potential impacts of the Project to these features.

Management plans have been developed to mitigate adverse effects to ecological features on-site and within the ZOI. The proposed approach to managing the effects of the Project through these plans follows the effects management hierarchy, and include measures to avoid, minimise, and remediate adverse effects from the Project.

Mitigating effects to ecological features through Project design, construction 'staging and methodologies', and implementing ecological management plans where required, is expected to sufficiently reduce actual and potential residual effects to **Very Low** levels. In addition, through the enhancement initiatives proposed as part of the Project, qualitative and/or quantitative **Net gain** outcomes can be expected, particularly for common native bird and lizard habitats and native vegetation.



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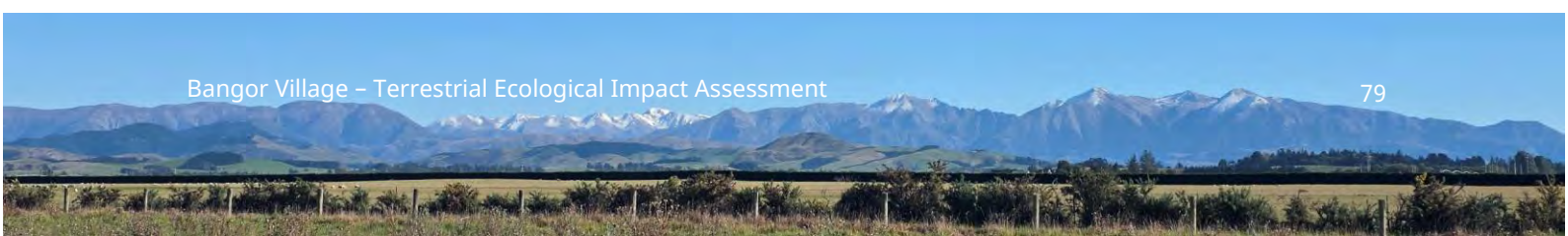

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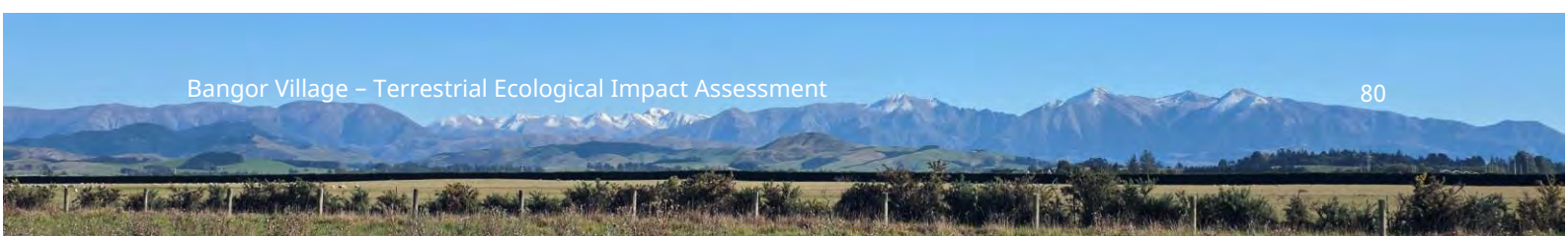

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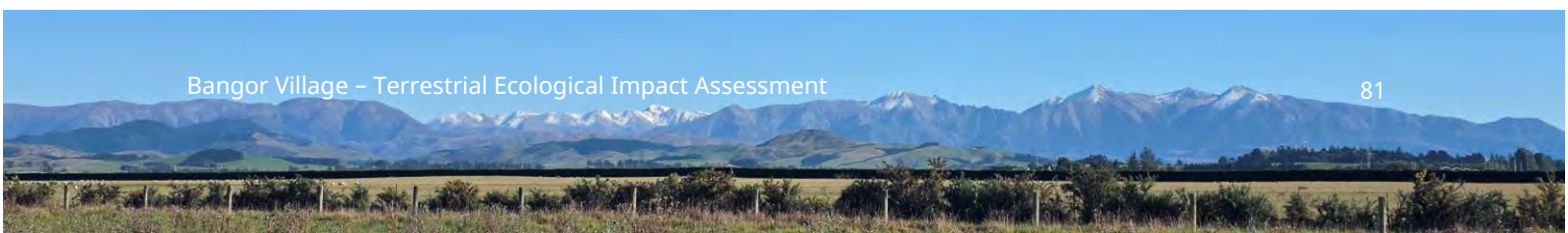


AUTHOR QUALIFICATIONS AND EXPERIENCE

My full name is Mark Hansen. I am a Principal Ecologist and the Managing Director of Effects Management Ecology Limited.

I hold the qualification of Bachelor of Science, with a major in Conservation and Ecology from Lincoln University New Zealand.

I have over 20 years of experience in the ecological, environmental and biosecurity industries, all of which have been in New Zealand. I have been an ecological consultant primarily conducting ecological impact assessments and developing and implementing management plans for projects for the past 8+ years. I was a biosecurity advisor and performed a range of environmental and ecological tasks for approx. 9 years for SPS Biosecurity Ltd. Prior to that I dedicated several years to biodiversity monitoring and wildlife management as a self-employed contractor and Managing Director of a consultancy (FFENZ Ltd) following the completion of my Degree.

I am a full member of the Environment Institute of Australia and New Zealand, Ecological Society of New Zealand, Australasian Bat Society, NZ Birds (Ornithological Society for New Zealand), New Zealand Herpetological Society, Society for Research on Amphibians and Reptiles in New Zealand, and a member of the Sanctuaries of New Zealand Inc Society.

My role in relation to the Bangor Village Project, has been the Terrestrial Project Ecologist. I am the author of this Terrestrial Ecological Impact Assessment and the author of the Bird Management Plan and Lizard Management Plan. I led all desktop and field assessments, designed all field surveys and reviewed or authored all technical inputs into the Terrestrial Ecological Impact Assessment, and wildlife management Plans. I led all meetings with the Department of Conservation and peer reviewer for lizards pertinent to the lizard aspects of the Terrestrial Ecological Impact Assessment and the Lizard Management Plan.

My most recent relevant experience to this Project is as follows:

- Eastern Hills Reservoir. I was Project Ecologist and led all desktop and field assessments to complete the Ecological Impact Assessment and associated Bird, Lizard, Vegetation and Fish Management Plans, including obtaining a Wildlife Act Authority under section 53 of the Wildlife Act 1953 on behalf of the Wellington Water Limited for Project consent. I also provided expert witness evidence at the Council Hearing for Project consent.

- Speed & Infrastructure Programme, State Highway 1 Templeton to Ashburton. I was Project Ecologist and led and all desktop and field assessments to complete the Ecological Impact Assessment and associated Bird, Lizard and Fish Management Plans, including obtaining one of the first Wildlife Act Consents under section 71 of the Wildlife Act 1953 in New Zealand, on behalf of the NZ Transport Agency Waka Kotahi, for Project consent. I have subsequently been engaged to implement lizard and bird management implementation for Projects associated with this Project.

- Ōpihi River Water Main Renewal. I was Project Ecologist and led and all desktop and field assessments to complete the Ecological Impact Assessment and associated Bird, Bat, Lizard,

Vegetation and Fish Management Plans on behalf of Timaru District Council. I led all stakeholder engagement and received endorsement and recognition from Fish & Game, Department of Conservation and iwi regarding the implementation of the bat, bird and fish management on-site during the construction phase. Remediation of the Project Site, with an agreed mix of indigenous vegetation and fast-growing exotics (required for flood protection), resulted in a qualitative Net Gain outcome for indigenous biodiversity.

- 725 Kane Road, Hāwea Flat. I was the Project Ecologist and led the desktop assessment and completed the Desktop Ecological Impact Assessment and associated bird, lizard and fish mitigation recommendations and requirements, resulting in non-notified Project consent for a proposed subdivision on farmland near Hāwea, Central Ōtago.

While this application is not before the Environment Court, I confirm that I have read and am familiar with the Code of Conduct for Expert Witnesses contained in the current Environment Court of New Zealand 'Practice Note 2023'. Accordingly, I have complied with the Code in the preparation of this report and associated management plans.

APPENDIX A – EIANZ METHODOLOGY

This terrestrial ecological impact assessment has been performed, based on the methods to undertake ecological impact assessments in Aotearoa New Zealand, as outlined within the EIANZ guidelines (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018). For efficiency to assist the reader, key Tables from the EIANZ guidelines have been reproduced in 'Appendix B – EIANZ Tables', however for detailed information and criteria used for assigning values to ecological features, determining magnitudes and levels of effect within this Report, refer to the EIANZ guidelines.

Fauna has been assessed as a feature within their respective sections (i.e.: birds, bats, lizards), while the habitats they utilise (i.e.: for foraging and/or nesting), has been assessed within the Flora (Vegetation) and Habitats Section.

5.1 Ecological Values Assessment

The criteria by which the values are assigned with respect to indigenous biodiversity and ecosystems are outlined within Section 5 of the EIANZ guidelines.

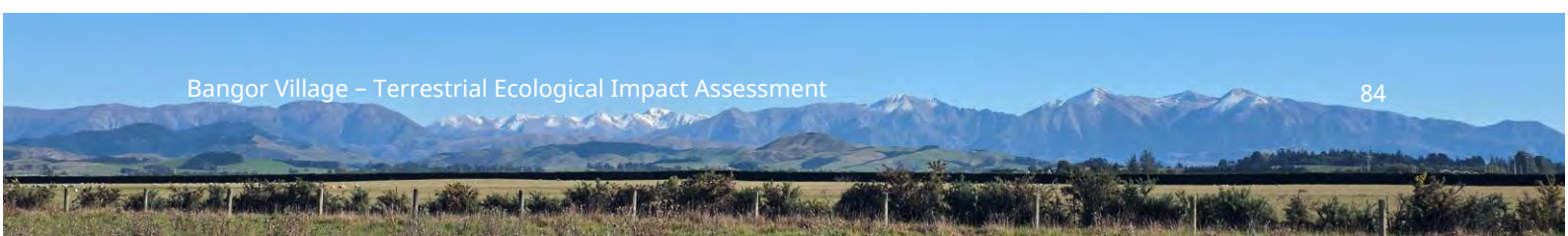
When considering individual species of flora and fauna, values are assigned based on the species' threat, as listed in the New Zealand Threat Classification System (Townsend, et al., 2008). Table 5 of the EIANZ guidelines identifies factors to consider when assessing species' value, reproduced as Table 20 (Appendix B – EIANZ Tables).

When assessment vegetation, habitats or communities, four matters are considered, with values assigned to each based on a range of criteria. The four matters are 'Representativeness', 'Rarity/Distinctiveness', 'Diversity and Pattern', and 'Ecological Context'. Individual flora species' values contribute to the assessment of the 'Rarity/Distinctiveness' matter for terrestrial vegetation, so too does individual fauna species' values contribute towards habitat values or faunal community (i.e., birds) values. The 'Very high', 'High', 'Moderate', 'Low', 'Very low' or 'Negligible' values assigned to each matter are then assessed to give an overall ecological value for the vegetation, habitat or community. Table 6 of the EIANZ guidelines provides a guide on how determine an overall ecological value, reproduced as Table 28 (Appendix B – EIANZ Tables).

5.2 Levels of Effect Assessment

5.2.1 Magnitude of effect

Considering the actual and/or potential impacts of a Project-related activity on any given ecological feature, the extent of effects on that feature can be quantified using the same 'Negligible' to 'Very high' scale previously mentioned. When determining the magnitude of effect, consideration is given to the temporal and spatial scales that effect is expected to cause to the species' population, community, habitat or ecosystem. The magnitude of effect is determined in lieu of any management measures being implemented Table 1 (Section 2.2.1) provides guidance on the timescale in which potential effects must be considered while Table 29 (Appendix B – EIANZ Tables) outlines the criteria for describing the magnitude of effect.



5.2.2 Pre-mitigated level of effect

The pre-mitigated level of effect the proposed Project is expected to have on an ecological feature, is determined by combining the ecological value of that feature with the magnitude of effect caused to that feature in the absence of any mitigation or management. As ecological values and magnitude of effects lie on a continuum ('Negligible' to 'Very high'), matrices assist in clarifying what the pre-mitigated level of effect on the ecological feature will be. This assessment framework allows for pre-mitigated levels of effect to be ranked on a gradient of 'Very low' to 'Net gain'. Positive effects can result in Net gains and are considered in the magnitude of effect assessment framework, as many Projects offer, as part of their design, positive environmental outcomes.

The pre-mitigated level of effect provides rationale or justification for mitigation, pursuant to the Resource Management Act 1991 (RMA) (New Zealand Government, 2026b), and/or Regional (Environment Canterbury Regional Council, 2021) or National Policy Statements (Ministry for the Environment, 2025). When determining the pre-mitigated level of effect on a given ecological feature, Table 10 of the EIANZ guidelines was used and has been reproduced as Table 30 (Appendix B – EIANZ Tables).

5.2.3 Management of effects

Section 3.16 (1) of the National Policy Statement for Indigenous Biodiversity (NPS-IB) states that;

"*If a new subdivision, use, or development is outside an SNA and not on specified Māori land, any significant adverse effects of the new subdivision, use, or development on indigenous biodiversity outside the SNA must be managed by applying the effects management hierarchy*"

and Section 3.16 (2) states that;

"*All other adverse effects of any activities that may adversely affect indigenous biodiversity that is outside an SNA (other than indigenous biodiversity on specified Māori land (see clause 3.18)), must be managed to give effect to the objective and policies of this National Policy Statement.*

Section 7.2 of EIANZ guidelines describes measures to manage impacts. These measures generally align with the effects management hierarchy (EMH) described in the NPS-IB (Ministry for the Environment, 2025). The EMH prioritise avoiding impacts, then minimising and remediating impacts where avoidance is not practicable. Offsetting and/or compensation may be required should 'more than minor' residual levels of effect remain (see Section 3.2.5 below). The NPS-IB states that;

"A biodiversity offset is a commitment to redress more than minor residual adverse effects and should be contemplated only after steps to avoid, minimise, and remedy adverse effects are demonstrated to have been sequentially exhausted"

As such, it is a requirement to determine 'pre-mitigated' and 'residual' levels of effect are accurately described to warrant 'mitigation' or 'biodiversity offsetting respectively', should adverse effects be 'more than minor'. 'Not more than minor', 'minor' and 'more than minor' are planning terms and require input and agreement between the Ecologist and Project Planner to ensure accurate translation from ecological terms.

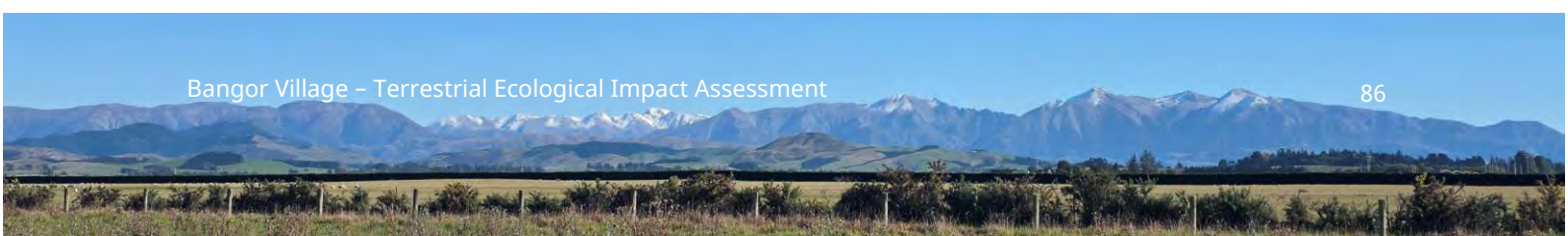
5.2.4 Post-mitigated magnitude of effect

Following the application of the EMH, the magnitude of effect for any given ecological feature must be re-assessed to account for the implementation of all the proposed management measures. This re-assessed effect, termed the post-mitigated magnitude of effect, reuses Table 29 (Appendix B – EIANZ Tables), as in Section 3.2.1 above along with the Ecologist's professional judgement.

5.2.5 Residual level of effect

The final step of the ecological impact assessment process is to determine the residual level of effect that may remain on ecological features after the implementation of the EMH. A residual level of effect is assessed reusing Table 30 (Appendix B – EIANZ Tables) as it was for the pre-mitigated level of effect, except now the ecological value is combined with the post-mitigated magnitude of effect.

If a 'more than minor' residual level of effect remains after sequentially exhausting avoidance, minimisation, and remediation measures, biodiversity offsetting must be implemented (Ministry for the Environment, 2025). If biodiversity offsetting is still not sufficient to reduce Project effects, or it is not appropriate (as defined in Appendix 3 of the NPS-IB) then biodiversity compensation is required. Appendix 3 and Appendix 4 of the NPS-IB provides guidance on applying biodiversity offsetting or compensation for more than minor adverse residual effects.



APPENDIX B – EIANZ Tables

Tables below are key tables for conducting a terrestrial ecological impact assessment. These have been reproduced from the EIANZ guidelines to assist the reader if they are unfamiliar with the guidelines.

Table 20: Factors to consider in assigning value to a terrestrial species for EcIA. [21]

Determining Factors	Value
Nationally Threatened species, found in the ZOI either permanently or seasonally	Very High
Species listed as At Risk – Declining, found in the ZOI, either permanently or seasonally	High
Species listed as any other category of At Risk, found in the ZOI either permanently or seasonally	Moderate
Locally (ED) uncommon or distinctive species	Moderate
Nationally and locally common indigenous species	Low
Exotic species, including pests, species having recreational value	Negligible

Table 21: Attributes to be considered when assigning ecological value or importance to a terrestrial site or area of vegetation/habitat/community. [22]

Matters	Attributes to be Considered
Representativeness	Criteria for representative vegetation and aquatic habitats: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: • Species assemblages that are typically of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity / Distinctiveness	Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining — Distinctive ecological feature • National priority for protection Criteria for rare/distinctive species or species assemblages: • Habitat supporting nationally Threatened or At Risk species, or locally18 uncommon species • Regional or national distribution limits of species of communities • Unusual species or assemblages • Endemism
Diversity and Pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological Context	• Site history, and local environmental conditions which have influenced the development of habitats and communities

Table 22: Scoring for sites or areas combining values for four matters listed in Table 9. [23]

Description	Value
Area rates High for 3 or all of the four assessment matters. Likely to be nationally important and recognised as such.	Very High
Area rates High for 2 of the assessment matters, Moderate and Low for the remainder, or Area rates High for 1 of the assessment maters, Moderate for the remainder. Likely to be regionally important and recognised as such	High
Area rates High for one matter, Moderate and Low for the remainder, or	Moderate

[21] Table 5 (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).
[22] Table 4 (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).
[23] Table 6 (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).

Description	Value
Area rates Moderate for 2 or more assessment matters Low or Very Low for the remainder Likely to be important at the level of the Ecological District	
Area rates Low or Very Low for majority of assessment matters and Moderate for one. Limited ecological value other than as local habitat for tolerant native species.	Low
Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder.	Negligible

Table 23: Criteria for describing magnitude of effect. [24]

Description	Value
Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature	Very High
Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature	High
Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature	Moderate
Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR Having a minor effect on the known population or range of the element/feature	Low
Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature	Negligible

Table 24: Criteria for describing level of effects. [25]

Ecological Value → Magnitude ↓	Very High	High	Moderate	Low
Very High	Very High	Very High	High	Moderate
High	Very High	Very High	Moderate	Low
Moderate	High	High	Moderate	Low
Low	Moderate	Low	Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low
Positive	Net gain	Net gain	Net gain	Net gain

[24] Table 8 (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).
[25] Table 10 (Roper-Lindsay, Fuller, Hoosan, Sanders, & Ussher, 2018).

APPENDIX C – SUPPLEMENTARY IMPACT ASSESSMENT INFORMATION

The approach to this TEcIA utilised methods and criterion provided by the EIANZ guidelines. EIANZ guidelines are not procedural and require professional judgement to be applied by the implementing Ecologist. The guidelines do however provide a stepwise approach to assigning values, magnitudes of effect and levels of effect, deemed to be appropriate for this Project. As per the EcIA guidelines, where risk or uncertainty was identified, a precautionary approach has been applied.

5.3 DESKTOP ASSESSMENTS

A desktop review of historic and currently available aerial imagery and of relevant databases was conducted to determine the actual and potential ecological features and/or species expected on-site or to utilise the Site and the ZOI. Information sources reviewed as part of this assessment included:

- Grey literature (including EcIAs for similar Projects or different Projects near Darfield).
- eBird NZ Bird Atlas[26].
- iNaturalist[27].
- Relevant websites (including but not limited to the NZ Herpetological Society[28] and Canterbury Maps[29]).
- Relevant literature.
- Aerial imagery databases.
- Relevant Geographic Information System (GIS) data
    - Department of Conservation (DOC) bat[30] and herpetofauna[31] records
    - Land Environments of New Zealand (LENZ)[32].
    - Landcover Database (LCDB)[33].
    - Predicted pre-human vegetation[34].
    - Predicted pre-human wetland[35] and wetland extents[36].

5.4 FIELD SURVEYS

The Site was visited numerous times, and a variety of field surveys (Table 25) were conducted between mid-March and late April 2026. Every Site visit was conducted by at least a Principal Ecologist from EME as a minimum, or by suitably qualified ecologist assistants, operating under the supervision of the Principal Ecologist to conduct the required field surveys. Long-term monitoring devices were installed in mid-March

[26] eBird grids CX44, CW44, CW45 & CX45 (New Zealand Bird Atlas, 2026).
[27] (iNaturalist, 2026).
[28] (New Zealand Herpetological Society, 2021).
[29] (Canterbury Maps, 2026).
[30] DOC Bioweb 2025 Bat GIS Layer.
[31] DOC Bioweb '2023 Herpetological', '2025 Public Conservation Land Lizard' and '2025 Public Conservation Land Frog' GIS Layers.
[32] Land Environments of New Zealand GIS Layer (Lvl 4).
[33] Landcover Database Version 6.0 GIS Layer.
[34] Landcare Research 'New Zealand's Potential Vegetation' GIS Layer (2023).
[35] Ministry for the Environment (MfE) Predicted pre-human wetland GIS Layer (2015).
[36] MfE Wetland Extents GIS Layer (2001).

for bats, birds and lizards, and fine level surveys for lizards, mammalian pests and vegetation was performed in mid- to late-April during appropriate seasonal timing and weather conditions for detectability, meeting 'valid survey' definitions as defined in respective fauna best practice methodologies.

Table 25: Summary of field assessment effort.

Date	Tasks Performed
20/03/2026	• Site scoping visit • Lizard artificial cover object installations • Lizard exclusion fence installations • Acoustic bat monitoring and acoustic bird monitoring device installations • Bird, bat and lizard habitat assessments • Incidental bird observations
21/03/2026	• Lizard Artificial cover object installations • Pest mammal tracking tunnels installations • Additional acoustic bird monitoring device installation • Bird, bat and lizard habitat assessments • Incidental bird observations
14/04/2026	• Gee's minnow funnel trap installations for lizard trapping on-site and at potential lizard release area. • Lizard habitat assessments • Vegetation assessments • Incidental bird observations
15/04/2026	• Lizard trap inspections on-site and at lizard release area. • Incidental bird observations
16/04/2026	• Lizard trap inspections on-site and at lizard release area. • Incidental bird observations
17/04/2026	• Lizard trap inspections and collection on-site and at lizard release area. • Lizard artificial cover object inspections • Incidental bird observations
25/04/2026	• Lizard artificial cover object inspections • Tracking tunnels ink card installation (baited with peanut butter or chicken) • Incidental bird observations
28/04/2026	• Lizard artificial cover object inspections and collection • Lizard exclusion fence collection • Tracking tunnel and ink card collections • Vegetation survey • Acoustic bat and bird monitoring device collections • Incidental bird observations

5.4.1 Meteorological data

A range of meteorological factors influence species activities and therefore their detection probability when conducting surveys. Atmospheric conditions heavily influence animal behaviour such as breeding but also foraging activity for bats and lizards. Without appropriate conditions, surveys are not valid when following best practice guidelines, whereas during appropriate conditions, the lack of detectability can in some cases be interpreted as absence. A range of specific meteorological factors are considered when performing ecological surveys including seasons (that have been defined in best practice guidelines), sunrise and sunset, and daily weather conditions.

5.4.1.1 Survey Seasons

No specific season is defined for when to conduct surveys for birds in New Zealand. Depending on the species, and location their presence can vary throughout the year. Some birds are migratory and are absent from vast part of the South Island outside the breeding season, while some species highly mobile, covering vast distances throughout the year, while others are resident in localised areas year-round. As outlined in Section 3.2.4, it is an offense to disturb protected bird or damage their nests, therefore surveys performed

for EcIAs typically focus on the nesting period for species expected on-site, to increase the chances of determining likelihoods of species utilising the Site for nesting. Although birds can nest at variable times throughout the year, with some species able to lay eggs year-round, typically the bird nesting season is defined as **between August and February**.

The Bat Recovery Group (BRG) have developed protocols to minimise the risk of felling an occupied bat roost (the Bat Roost Protocols (BRP)) (Department of Conservation; Bat Recovery Group, 2024). The BRP are required to be implemented to minimise the risk of disturbing or killing bats. As such they clearly define the survey requirements to determine bat presence, in the absence of recent or appropriate surveys, which includes the requirement to conduct a survey by an approved bat ecologist with Competency 3.1 (Assessing roost tree using Acoustic Bat Monitoring devices (ABMs). Industry guiding documents (Inventory and Monitoring Toolbox) developed by DOC state that to improve chances of encountering bats, surveys should preferably be performed between October and March (Sedgeley & O'Donnell, 2012), while the BRP state ABM surveys should be conducted **between October and April** (Department of Conservation; Bat Recovery Group, 2024). As the BRPs have been developed more recently and are protocols to mitigate effects to bats, these are considered more appropriate to implement and adhere to.

No formal season is defined for when to conduct surveys for herpetofauna in New Zealand. Lizards and frogs are ectotherms and rely on warmer temperatures for activity. Depending on the species, their habitat type and their location in New Zealand, some lizards retreat and are in brumation for a significant period through the colder months of the year, while other species may be able to be found year-round. Historically WAAs were granted for lizard management from September through to May. However, in recent times this has been reduced to October to April. While this period is rather arbitrary, without further research into specific lizard species' activity, with some exceptions, the currently accepted lizard survey and management period is defined as **between October and April**.

No formal season is defined for when to conduct surveys for plants in New Zealand. Plants may be annual, perennial, biennial, or permanent. For some species flowers or seed capsules are required for accurate identification. 'Growing seasons' have been identified for different regions of New Zealand for wetland delineations (Ministry for the Environment, 2024) which provides guidance on survey periods. It is important, therefore, to understand the likelihood of plants on-site prior to performing field surveys and conduct surveys at the appropriate time for the expected vegetation. Generally, vegetation can be surveyed **year-round**.

Table 26 summarises the survey periods and identifies when surveys were conducted on-site for this TEcIA. With the exception of some birds, all field surveys were conducted within suitable seasonal conditions.

Table 26: Preferred survey periods for increased detectability, and when surveys were conducted (✓).

Feature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Birds			✓	✓								
Bats			✓	✓								
Lizards				✓								
Vegetation[37]			✓	✓								

[37] Growing season for mid Canterbury (Ministry for the Environment, 2024).

APPENDIX D – CRPS APPENDIX 3

CRIETERIA FOR DETERMINING SIGNIFICANT INDIGENOUS VEGETATION AND SIGNIFICNAT HABITAT OF INDIGENOUS BIODIVERSITY

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.
2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.

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.
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.
5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.
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.

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.

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.
9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.
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.

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