

IN THE MATTER of the Resource Management Act 1991 (**RMA**)

AND

IN THE MATTER of **Private Plan Change 28** to the Nelson Resource Management Plan

JOINT WITNESS STATEMENT (JWS) IN RELATION TO:

ECOLOGY – TERRESTRIAL & FRESHWATER (1)

13 May 2022

Expert Conferencing Held on: 20 April 2022, 10 May 2022 and 13 May 2022

Venue: Online

Independent Facilitator: Marlene Oliver

1 Attendance:

- 1.1 The list of participants is included in the schedule at the end of this Statement.
Note: Planners were invited to attend.

2 Basis of Attendance and Environment Court Practice Note 2014

- 2.1 All participants agree to the following:
- (a) The Environment Court Practice Note 2014 provides relevant guidance and protocols for the expert conferencing session;
 - (b) They will comply with the relevant provisions of the Environment Court Practice Note 2014;
 - (c) They will make themselves available to appear before the Hearing Panel;
 - (d) This statement is to be filed with the Hearing Panel and posted on the Council's website.

3 Matters considered at Conferencing – Agenda and Outcomes

3.1 Domestic Pets

Ben Robertson and Tanya Blakely agree that an additional clause could be added to rule X.9 to provide for an assessment of the significance of indigenous biodiversity values and the potential threat to those values from domestic pets at the time of subdivision or development resource consent applications.

Josh Markham was not available to contribute to 3.1. Roger Young did not participate in this item.

Mark Lile to prepare a draft of the additional clause to rule X.9 to be considered at a subsequent Planning expert conference session.

3.2 Terrestrial Ecology Information

Through the expert conferencing sessions further information was requested in addition to the Tonkin and Taylor report lodged with PPC28. Ben Robertson prepared a report titled “Supplementary Terrestrial Ecological Values Assessment (Robertson Environmental Limited, 13 May 2022)”. A copy is attached to this JWS.

Tanya Blakely considers there should now be enough information between the Tonkin and Taylor report (attachment C5 to PPC28), Morphum Environmental Review (attachment C6 to PPC28) and the Supplementary Terrestrial Ecological Values Assessment (13 May 2022) to input into a revised Structure Plan, including the ecological values and connections.

Josh Markham was not available to contribute to 3.2. Roger Young did not participate in this item.

Mark Lile confirmed that the PPC28, Zoning Plan and proposed planning provisions are being revised in light of several of the JWS documents.

3.3 Esplanade Reserve / Riparian Corridors

Tanya Blakely and Roger Young are concerned about the absence of a minimum width of esplanade reserve on each side of the waterway; however, **they agree** that a minimum total width of 40 metres is appropriate and that there is a need for some flexibility to reflect natural topography and geological features.

Mark Lile, Ben Robertson and Josh Markham consider the minimum 40 metres combined with the provisions of Schedule X provide the appropriate assessment criteria, which would be considered at detailed design phase of subsequent subdivision and land use consents. They agree that there is a need for some flexibility to reflect natural topography and geological features.

Mark Lile noted that these standards are supported by Andrew Petheram in the Recreation JWS dated 13 May 2022 (this was not available to all parties at the time of this Ecology expert conference).

Gina Sweetman noted that this matter has yet to be considered by the planners, and it will be addressed during planning conferencing.

3.4 Additional Information PPC28

Mark Lile confirmed that the Applicant’s experts are preparing a draft Stormwater Management Plan (SMP) to be circulated on 20 May 2022. The JWS (Flooding (2) and Stormwater (2) dated 6 May 2022) sets out a timetable for expert conferencing in relation to this draft (Sessions on 27 May 2022 (9 – 11am) and 2 June 2022 (1 – 3pm)). Zoom invitations to these sessions will be sent to the Ecology experts.

Mark Lile also confirmed that the Structure Plan and Zoning Plan are also being revised in light of several of the JWS (including Transport (4 May 2022) and Urban Design (5 May 2022)). Mark Lile anticipates a draft being circulated ASAP and otherwise as part of the Applicant’s evidence to be circulated by 15 June 2022.

3.5 Kaka Stream

All ecologists agree that the water quality and ecology of the lower reaches of the Kaka Stream are highly modified and are currently impacted by existing land use. There is potential to achieve positive outcomes through PPC 28 with respect to the water quality and ecology for either the current alignment or a proposed realignment of the lower reaches of the Kaka Stream.

Mark Lile and Gina Sweetman noted the proposal to realign the Kaka Stream would fall under the Freshwater chapter of the NRMP and the Earthworks rules of the NRMP. Both of these sets of provisions are “regional” matters and are not being amended by PPC 28. The planning expert conference will need to consider this position.

3.6 Schedule X

Tanya Blakely and Roger Young reviewed the provisions in Schedule X (in particular X.9) to ensure that the provisions will achieve positive outcomes. **Tanya Blakely and Roger Young consider** the “ecological outcomes and freshwater” (X.9) should also:

- a) Apply to the entirety of the Structure Plan area
- b) Refer to the mandatory fish passage requirements of the NPS-FM and NES-F
- c) Avoid impervious surfaces and structures within 5 m of Kaka Stream
- d) Avoid or minimise adverse effects of urbanisation and stream loss
- e) Include ecological principles / provisions for terrestrial ecology to ensure areas that provide important connectivity or buffering functions, and significant indigenous vegetation and significant habitats for indigenous fauna
- f) Allow for an alternative to the realignment of Kaka Stream as an enhancement opportunity
- g) Include erosion and sediment control management and vegetation clearance
- h) Ensure there is a link to Stormwater Management Plans.

Ben Robertson sees merit in the inclusion of the above items a) to h) in a revised version of X.9, subject to further consideration.

Josh Markham was not available to contribute to 3.6.

The planning expert conference will need to consider these and the role of Schedule X (in particular X.9).

4 PARTICIPANTS TO JOINT WITNESS STATEMENT

4.1 The participants to this Joint Witness Statement, as listed below, confirm that:

- (a) They agree that the outcome(s) of the expert conferencing are as recorded in this statement; and
- (b) They agree to the introduction of the attached information; and
- (c) They have read Appendix 3 of the Environment Court’s Practice Note 2014 and agree to comply with it; and
- (d) The matters addressed in this statement are within their area of expertise; and
- (e) As this session was held online, in the interests of efficiency, it was agreed that each expert would verbally confirm their position to the Facilitator and this is recorded in the schedule below.

Confirmed online: 13 May 2022

EXPERT'S NAME	PARTY	EXPERT'S CONFIRMATION REFER PARA 4.1
Ben Robertson (Ecol)	Applicant	Yes
Josh Markham (Ecol - freshwater)	Applicant	Yes
Tanya Blakely (Ecol)	S42A NCC	Yes
Roger Young (Ecol - freshwater)	Friends of the Maitai	Yes
Mark Lile (P)	Applicant	Yes
Gina Sweetman (P)	S42A NCC	Yes

13 May 2022

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ECOLOGICAL ASSESSMENT & REPORTING SERVICES

CCKV Maitai Dev Co LP &
Bayview Nelson Limited
C/- Mark Lile
Landmark Lile Limited
51 Halifax Street
Nelson 7010

Attention: Mark Lile

Dear Mark,

Private Plan Change 28 - Maitahi Bayview Supplementary Terrestrial Ecological Values Assessment

1 Introduction

CCKV Maitai Dev Co LP & Bayview Nelson Limited (the Applicant) engaged Robertson Environmental to undertake ecological assessment to inform current terrestrial values associated with proposed residential zone area (refer Figure 1.1) of the PPC28 site.

This letter provides additional assessment in accordance with the plan change request process and supplements information provided in the initial Ecological Opportunities and Constraints Assessment Report by Tonkin + Taylor dated 31 March 2021 (hereafter called the '*EcOCA Report*') and the Preliminary Structure Plan Environmental Review Report by Morphem Environmental dated 13 April 2021 (hereafter the '*EnvR Report*').

2 Purpose and Scope

With detailed methodology outlined in Section 3, and limitations in Section 8, the purpose of this report is to:

- Identify and describe at a broad scale the existing terrestrial habitat types and vegetation within proposed residential zones (Section 4);
- Assess the value of identified habitat types and vegetation, with particular focus on their importance for indigenous fauna (Section 5); and,
- Evaluate identified vegetation in relation to relevant vegetation clearance provisions under the Nelson Resource Management Plan (NRMP) (Sections 6 and 7).

We note that terrestrial values and constraints associated with PPC28 land beyond the proposed residential footprint area, including Significant Natural Area 166 and riparian zones of Kākā Hill tributary, were assessed as part of the EcOCA Report and are not repeated herein.

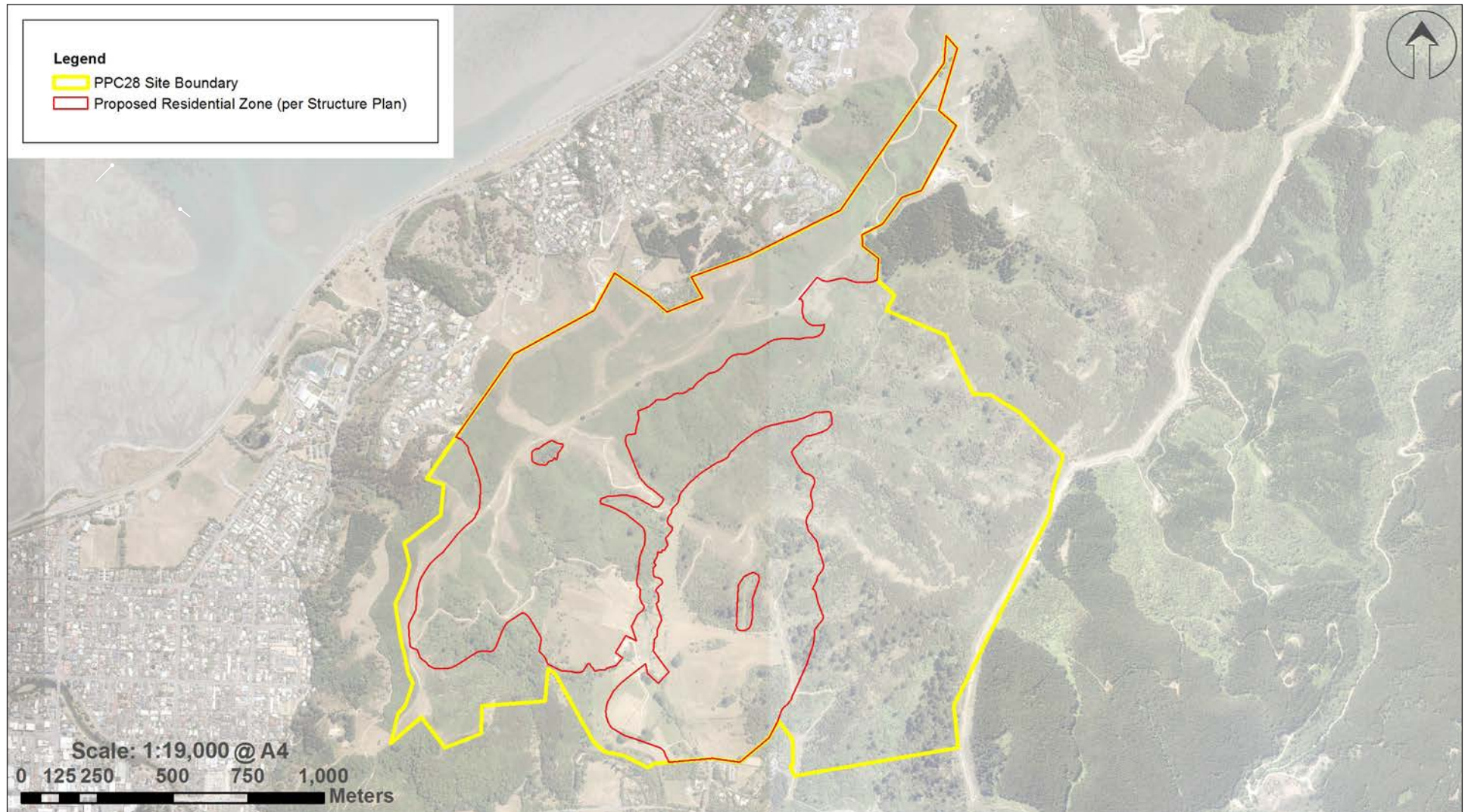


Figure 1.1. Plan change area showing the approximately 146 hectare proposed residential zone assessed in this report, Maitai Valley and Bayview, Nelson.

3 Assessment Methodology

With reference to the EcOCA and EnvR Reports, the terrestrial ecological values assessment of the target area has been undertaken using a combined desktop, database and field survey approach outlined below.

3.1 Desktop Analysis

Existing biological databases and all published information on habitat types and biological values within the study area were researched. This phase also included preparation of site maps and plans to direct the field survey. The extent and differences in vegetation and habitat type within the site were delineated on geographic information systems (GIS) using topographical maps and aerial photography (LINZ rectified ~0.3 m per pixel resolution flown in 2018/19 - <https://data.linz.govt.nz/layer/104165-tasman-03m-rural-aerial-photos-2018-2019/>) prior to site visit. Information was derived from known data sets on landforms, soils, climate, and topography of the site. Preliminary vegetation communities and habitat types were identified and described through a combination of New Zealand Land Cover Database version five (LCDBv5), and the use of aerial photographs. Significant Natural Area (SNA) information was obtained from the NRMP.

The national threat classification of species was derived from the appropriate threat classification list for each taxa (Trewick et al. 2016; Hitchmough et al. 2021; Robertson et al., 2021; van Winkle et al. 2018) and their regional status was derived from the Draft Conservation Management Strategy for the Nelson/Marlborough Conservancy 1996-2006 (Department of Conservation 1996).

3.1.1 Vegetation and Rare Plants

Local plant species lists obtained from the New Zealand Plant Conservation Network website (http://www.nzpcn.org.nz/observation_site_search.aspx) and other sources (e.g., Courtney et al. 2003), were examined to identify any rare or uncommon plants in which to focus field surveys.

3.1.2 Macroinvertebrates

Macroinvertebrate lists obtained from various representative sources (e.g., Butler 2008) were examined to identify any rare or uncommon species in which to focus field surveys.

3.1.3 Lizards

A list of lizard species in the area, as noted in Department of Conservation's Amphibian and Reptile Distribution Scheme (ARDS) database (accessed April 2022), the National Amphibian and Reptile Database System (Herpetofauna), and van Winkle et al. (2018), was collated.

3.1.4 Birds

A list of bird species in the area, as noted in eBird (Grid BY54 Aug 2019-Apr 2022) and , was collated.

3.1.5 Bats

A review of bat records from the wider area on the Department of Conservation's bat distribution database (accessed April 2022) was undertaken.

3.2 Field Survey

Terrestrial habitat within the proposed residential zone area of the PPC28 site were assessed by field survey. The field survey targeted an approximately 146 hectare area based on the current structure plan (Figure 1.1), and was undertaken on 23rd April 2022 when weather conditions were mostly fine.

3.2.1 Habitat Classification

Broad ecological or habitat zones in the study area were identified, and with the aid of a handheld

Garmin GPSMAP 64sc WW unit (accuracy approx. ± 5 -10 m) broadly delineated. Each habitat was subjectively classified into one of several different qualitative habitat type descriptors according to unique features identified. Qualitative inspection of habitats was then conducted to note key flora and fauna for each zone.

Upon completion of field work the broad habitat zones were then imported into a georeferenced aerial photo of the area using Garmin BaseCamp (version 4.8.3) and ArcMap 10.5 GIS software. Using up-to-date, high resolution colour aerial photos (rectified ~3 cm per pixel resolution flown 27-28 April 2022) delineated habitat zones were adjusted accordingly, to more accurately reflect the likely tonal gradations of respective habitats, and a broad scale map of different habitats was produced.

3.2.2 Vegetation and Rare Plants

The desktop delineated vegetation communities were ground-truthed in the field, where each identified community type was described on site. Native and exotic vegetation was noted across the site with a focus on the presence of indigenous species.

3.2.3 Macroinvertebrates

No surveys of terrestrial invertebrates were undertaken. Rather, we relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of macroinvertebrates present within similar habitats regionally.

3.2.4 Lizards

Field surveys for terrestrial lizards were not conducted. Rather, we relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of lizards present within nearby habitats.

3.2.5 Birds

A roaming inventory of birds sighted or heard was taken during the field survey. We also relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of birds present within nearby habitats.

3.2.6 Bats

For bats, we also relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of bats present within the wider area.

3.4 Assessment of Terrestrial Values Methodology

The location of the PPC28 site falls within the jurisdictional boundary of NCC and its operative Nelson Resource Management Plan (NRMP), and is part of the Bryant Ecological District. Evaluation of the terrestrial vegetation aspects within the proposed residential zone area has been undertaken with consideration of policies within the NRMP related to vegetation clearance.

The assessment of ecological values follows the Ecological Impact Assessment guidelines (EcIA) produced by the Environment Institute of Australia and New Zealand (EIANZ, 2018). Ecological values are assigned based on the matters to be considered when assigning ecological value outlined in Table 3.1, with corresponding criteria specific to terrestrial habitats and species as set out in the EcIA guidelines (Table 3.2).

Table 3.1. Assignment of values to species, vegetation and habitats within the surveyed area (adapted from EIANZ, 2018).

Matter	Assessment matters considered; terrestrial ecosystems
Representativeness	<p>Criteria for representative vegetation and habitats:</p> <ul style="list-style-type: none"> • 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 <p>Criteria for representative species and species assemblages:</p> <ul style="list-style-type: none"> • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/distinctiveness	<p>Criteria for rare/distinctive vegetation and habitats:</p> <ul style="list-style-type: none"> • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National priority for protection <p>Criteria for rare/distinctive species or species assemblages:</p> <ul style="list-style-type: none"> • Habitat supporting nationally Threatened or At Risk species, or locally uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and pattern	<ul style="list-style-type: none"> • Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of life cycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	<ul style="list-style-type: none"> • Site history, and local environmental conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from “intrinsic value” as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning – high level, key species identification, habitat as proxy

Table 3.2. Criteria for assigning ecological value to terrestrial habitats and species (adapted from EIANZ 2018)

Value	Species Value requirements	Habitat Value requirements
Very High	Threatened - (Nationally Critical, Nationally Endangered, Nationally Vulnerable)	Area rates High for 3 or all of the four assessment matters listed in Table 3.1. Likely to be nationally important and recognised as such.
High	Important for Nationally At Risk – species and may provide less suitable habitat for Nationally Threatened species	Area rates High for 2 of the assessment matters, Moderate and Low for the remainder, or Area rates High for 1 of the assessment matters, Moderate for the remainder. Likely to be regionally important and recognised as such.
Moderate	At Risk - (Recovering, Relict, Naturally Uncommon) Locally (Ecological District) uncommon or distinctive species	Area rates High for one matter, Moderate and Low for the remainder, or 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.
Low	Native - Not Threatened. Nationally and locally common indigenous species	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.
Very Low	Exotic species, including pests, species having recreational value	Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder.

4 Ecological Description

Based on an initial desktop review of available information the following terrestrial ecological attributes have been identified within the proposed residential zones (the study area).

4.1 Ecological Context

The terrestrial aspect of the plan change has been previously described in the EcOCA Report. Briefly, the site is primarily within lowland flats and hill country of Kākā Valley above the modified flood plains of the Maitai River to the south, a low relief ridgeline at the western extent towards Bayview, with a mixture of regenerating native and exotic vegetation occupying land on the steeper hillslope flanks to the east on Kākā Hill.

The terrestrial environment encompassing the site is classified as either Category 1 (< 10% indigenous cover left — i.e., floodplain area), Category 2 (20-30% indigenous cover left — i.e., lowland hill country area), or Category 6 (> 30% left and > 20% protected — i.e., higher slopes of Kākā Hill) under the Threatened Environment Classification (TEC) version 2012. Expected natural vegetation cover within the plan change area is likely a mixed rimu-broadleaf-beech forest type (Landcare 2022).

4.2 Existing Terrestrial Habitat Types and Vegetation

Key areas of vegetation within the proposed residential footprint area are listed below and described in the following sections. An example, looking west across the lowland hillslope towards Bayview ridgeline, of how habitat margins were delineated is provided in Figure 4.1. A summary of the approximate proportions of each habitat type mapped within the proposed residential zone is presented in Table 4.1. A GIS-based broad scale map of the study area is provided in Figure 4.2.

Indigenous Vegetation¹

- Regenerating kānuka (*Kunzea ericoides*) shrubland with patchy canopy and highly degraded understorey.
- Regenerating mixed māhoe-exotic scrub with patchy canopy and highly degraded understorey.

Non-indigenous vegetation or other

- Predominantly exotic scrub/trees with highly degraded understorey.
- Pasture grasses with very occasional native-exotic shrubs/trees.
- Gorse with very occasional native-exotic shrubs.
- Recently cleared or sprayed vegetation.
- Accessways (no vegetation).

There was no Indigenous Forest² recorded within the survey area, although we cannot exclude this possibility given the broad scale nature of the present survey. Representative field photographs of each identified habitat type are presented in Attachment E.

¹ As defined in the NRMP: ‘...an area of naturally occurring vegetation where the area covered by plant species indigenous to the District is the same as or greater than the area covered by other plants...’.

² Per NRMP definition: ‘...an area of naturally occurring woody vegetation that:

a) has a canopy predominantly formed by trees over 6 m high, and
b) has more than 80% closure of the canopy, and
c) comprises plant species indigenous to the District...’.

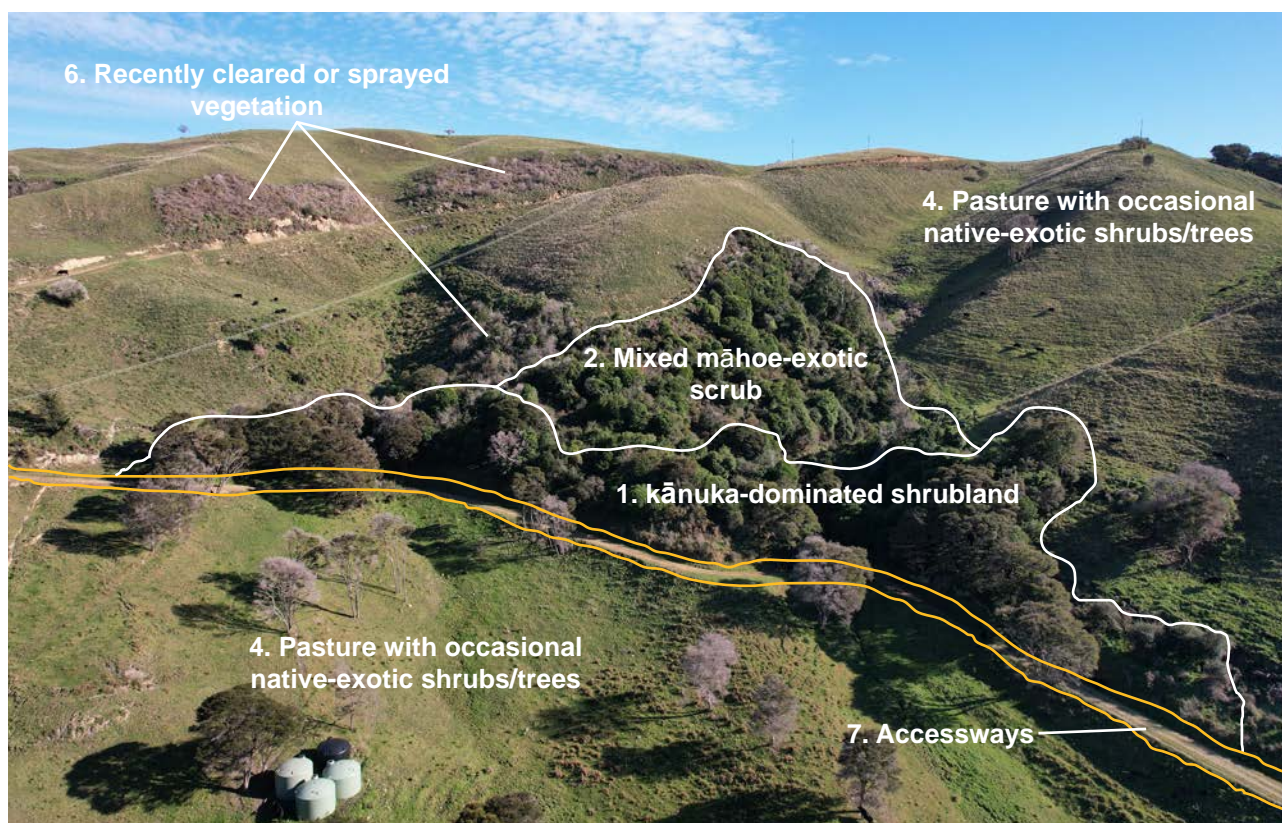


Figure 4.1. Example of the different habitats in the surveyed area and mapped during the field survey. Habitat boundaries are indicative only and do not accurately reflect those presented in Figure 4.2.

Table 4.1 Summary of current broad vegetation and habitat types within the surveyed area, April 2022.

Dominant Vegetation and Habitat Type		Proposed Residential Zone Area (ha)	% of Proposed Residential Zone Area (ha)
1.	Regenerating kānuka shrubland with patchy canopy and highly degraded understorey	16.35 ha	11.2%
2.	Regenerating mixed māhoe-exotic scrub with patchy canopy and highly degraded understorey	0.69 ha	0.5%
3.	Predominantly exotic scrub/trees with highly degraded understorey	6.80 ha	4.7%
4.	Pasture grasses with occasional native-exotic shrubs/trees	106.63 ha	73.2%
5.	Gorse with occasional native-exotic shrubs	5.23 ha	3.6%
6.	Recently cleared or sprayed vegetation	6.60 ha	4.5%
7.	Accessways (predominantly no vegetation)	3.30 ha	2.3%
Total		145.60 ha	100%

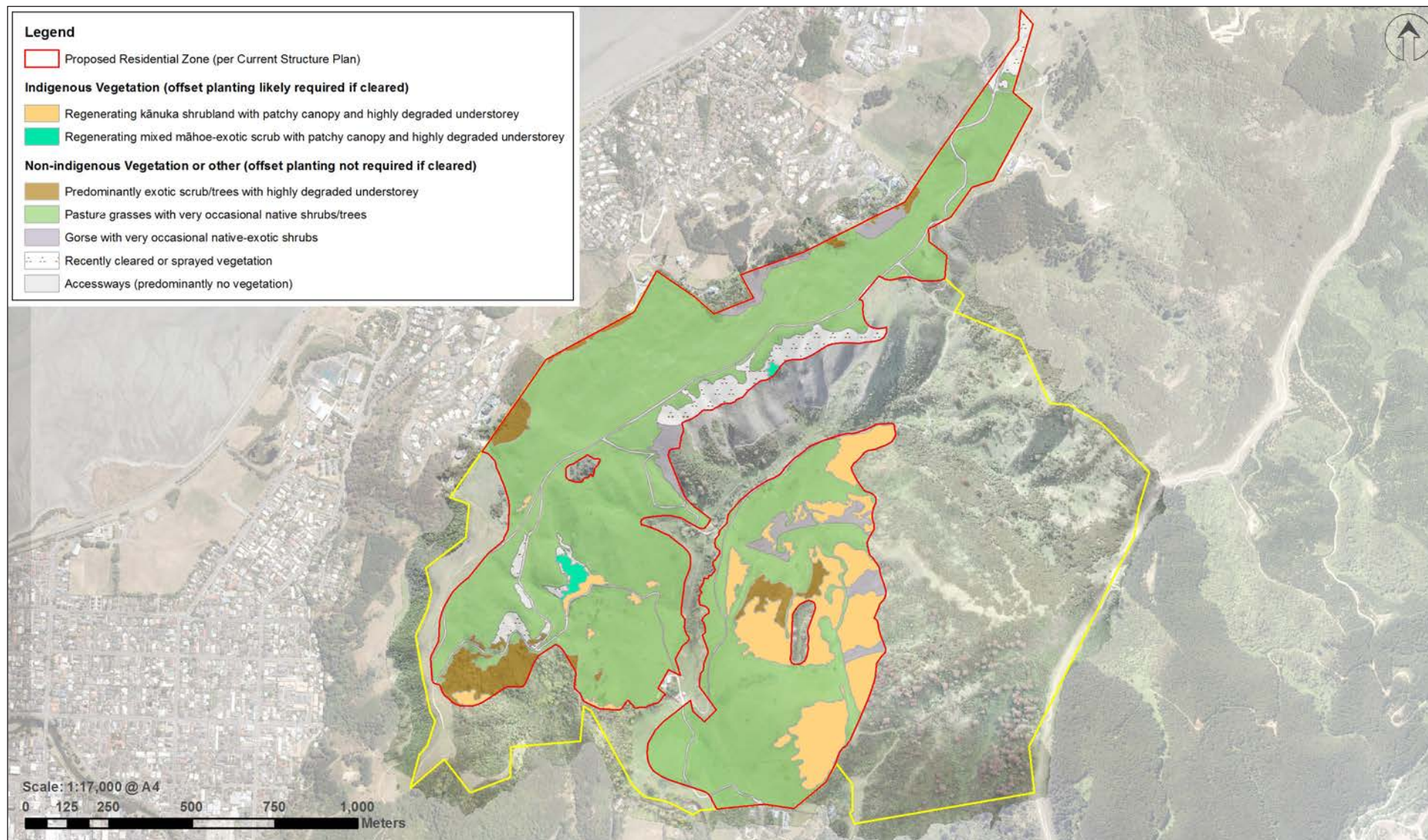


Figure 4.2. Broad scale (indicative) map of existing habitats within the proposed residential zone / study area based on the mapping of vegetation features visible in high resolution aerial imagery flown 28-29 April 2022, supported by ground-truthing to validate the visible features.

4.2.1 Regenerating kānuka shrubland and mixed māhoe-exotic scrub with patchy canopy and highly degraded understorey

Regenerating kānuka dominated shrubland was present in several areas of variable size on the eastern and western hillslopes, but was most prevalent to the eastern extent of the survey area (refer Figure 4.1). Two patches of māhoe dominant scrub were also recorded on the northwestern hillslope below the Bayview ridgeline where surrounding vegetation has recently been cleared or sprayed. These areas of native vegetation meet the definition of Indigenous Vegetation under the NRMP (associated constraints related to NRMP vegetation clearance provisions are addressed in Sections 6 and 7 below).

Kānuka in these areas consisted largely of shrubs with occasional larger trees (>6 m tall) emerging from the thinning canopy. Māhoe (*Meticytus ramiflorus*) formed the sub-dominant canopy species. Several large wilding pines, which appear to have been poisoned, were recorded. Understorey growth (native or otherwise) was generally absent owing to the broken canopy (limiting suitable habitat for shade-tolerant species) and intensive grazing pressure by stock and other pest mammals (namely goats).

Exotic species present hawthorn, gorse, barberry, old man's beard, convolvulus, foxglove and several introduced grasses. Pasture grasses and pasture weeds and gorse were often most abundant at the margins. Fragmentation and edge effects were also apparent. This habitat forms part of the naturally regenerating band of native kānuka shrubland occupying lowland hillslopes of the wider Kākā Hill Valley catchment.

4.2.2 Predominantly exotic scrub/trees with degraded understorey

Areas of mixed exotic vegetation occur in the proposed residential area, mostly bounding similar vegetation at the southwestern extent of the plan change site. Predominantly vegetation comprises scattered ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) with occasional māhoe and kānuka (rare), above exotic grasses and hawthorn, gorse, barberry, and old man's beard.

4.2.3 Pasture grasses and gorse with very occasional native shrubs/trees

A high proportion (>70%) of the terrestrial vegetation in the residential area is characterised by pasture used for grazing sheep and cattle. Pasture is most common within the mapped valley floor, lower hillslopes and along the western ridgeline. Pasture comprises exotic grasses and herbs (e.g., ryegrass (*Lolium perenne*), Cocksfoot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), clover (*Trifolium* spp.), lotus (*Lotus pedunculatus*), dock (*Rumex* spp.), and buttercup (*Ranunculus* spp.). There are individual kānuka (shrubs and trees) and specimen trees (poplars, weeping willows and exotic conifers) highly sparsely distributed within pasture areas.

Several areas of gorse were also recorded, the vast majority of which appeared to have been recently sprayed.

4.2.4 Recently cleared vegetation

Vegetation clearance has been undertaken at various locations across the site (Figure 4.2). Prior to clearance the vegetation comprised a combination of predominantly exotic scrub and exotic grassland (LCDB5). These areas now comprise either dead vegetation, bare ground, or re-establishing pasture grasses and weeds.

4.3 Terrestrial Flora

Plant species encountered during the present survey aligned with the EcOCA Report and are listed in Attachment A. Indigenous species present at the site included:

- kānuka (*Kunzea ericoides*) — Nationally Vulnerable;
- kōwhai (*Sophora fulvida*) — At Risk (Naturally uncommon);
- māhoe, whitey wood (*Melicytus ramiflorus*) — Not Threatened;
- akeake (*Dodonaea viscosa*) — Not Threatened;
- patatē, seven-finger (*Schefflera digitata*) — Not Threatened;
- mamaku, black tree fern (*Cyathea medullaris*) — Not Threatened;
- taratara, lemonwood (*Pittosporum eugenoides*) — Not Threatened; and,
- mikimiki (*Coprosma linariifolia*) — Not Threatened.

In total, twenty-three (23) indigenous vascular taxa were recorded within vegetation and habitat types in the proposed residential area surveyed. Of the recorded taxa, most are relatively common and are typical of regenerating native vegetation in modified lowland hill country of the Bryant Ecological District. However, one species is included in the New Zealand Threat Classification Lists. Kānuka is classified 'Threatened - Nationally Vulnerable' (de Lange et al. 2018), acknowledging the threat it faces from disease (i.e., myrtle rust).

4.4 Terrestrial Fauna

4.4.1 Macroinvertebrates

The overall diversity of ground active macroinvertebrates is expected to be very low within the pasture-dominated areas, but higher within the mapped indigenous vegetation (Attachment B).

Kānuka shrubland typically harbours greater species richness and diversity than other forest types and land dominated by pasture or other monocultures. At the feeding guild level, present communities are likely to be dominated by detritivores and, to a lesser extent, scavengers, predators, parasitoids and phytophages given that on the day of the field survey organic aggregations of readily consumable leaf litter and woody debris (primary food source for detritivores) were present within native vegetated areas. Ecologically, detritivore-based communities are particularly important given their role in nutrient cycling by facilitating the decomposition of organic material.

Most native invertebrates are not legally protected under the Wildlife Act 1953. Protected invertebrates are listed in Schedule 7 of the Act and include a small number of large or threatened species, none of which are known to occur within the application site. Other likely present invertebrate species that are not listed as protected may nevertheless contribute to the identification of valuable habitats by their presence.

It is important to note that Nelson and Tasman Districts hold the most diverse range of giant *Powelliphanta* land snails nationally, with most species are classified as either At Risk or Threatened. *Powelliphanta* snails are prone to dehydration and so they cannot survive in dry conditions. For this reason, they are more common in moist high-altitude forest than in drier forests at lower altitudes (as in the present case). No *Powelliphanta* snails or shells were encountered during the present survey, and in line with the EcOCA Report it is considered unlikely that *Powelliphanta* snails will be inhabiting the habitats within the site.

The overall ecological value of inhabitant invertebrates is considered to be Low given the likely absence of Threatened/At Risk species.

4.4.2 Lizards

Based on the habitat preference and recorded distributions of lizard species (Attachment C), there is several species of lizard with the potential to inhabit the wider area (ARDS database - accessed April 2022, Whitaker 2004, and van Winkle et al. 2018):

- starred gecko (*Naultinus stellatus*) — Nationally Vulnerable;
- northern grass skink (*Oligosoma polychroma*) — Not Threatened;
- forest gecko (*Mokopirirakau granulatus*) — At Risk (Declining); and,
- Raukawa gecko (*Woodworthia maculata*) — Not Threatened.

The kānuka-dominant areas hold the greatest potential for providing habitat for native lizards. The ecological value of lizard populations at the site is Moderate-High given the likelihood for lizard species to utilise the area and which may include Threatened/At Risk species; however, these species are mobile and not restricted to these habitats within the proposed site and likely utilise the extensive regenerating kānuka shrubland or grassland habitats occupying the wider lowland valley floor and hill country environment.

4.4.3 Birds

All birds are protected under the Wildlife Act except those listed in Schedule 5 of the Act. The presence of 'Threatened' and 'At Risk' species would be considered significant if identified within the site. A roaming inventory of birds sighted or heard was taken during the field survey at the site. Of those recorded (several silvereye, fantail, pukeko, and a single weka), none were classified as Threatened or At Risk. The bird life observed during survey within the plan change area generally reflects the modified state of the local environment.

Recent indigenous bird sightings (Attachment D) in the adjacent area included (eBird - Grids BY54, August 2019-April 2022):

- New Zealand pipit (*Anthus novaeseelandiae*) — At Risk (Declining);
- ruru, morepork (*Ninox novaeseelandiae*) — Not Threatened;
- southern falcon (*Falco novaeseelandiae* "southern") — Nationally Endangered;
- red-billed gull (*Larus novaehollandiae*) — At Risk (Declining);
- tūī (*Prothemadera novaeseelandiae novaeseelandiae*) — Not Threatened;
- pūkeko (*Porphyrio melanotus melanotus*) — Not Threatened;
- weka (*Gallirallus australis australis*) — Not Threatened; and,
- kōtuku, white heron (*Ardea modesta*) — Nationally Critical.

The ecological value of bird populations in the terrestrial receiving environment of the study area is Moderate-High given the recent sightings within adjacent area and known inhabitants of the area which include Threatened/At Risk bird species; however, the likelihood that significant numbers of indigenous bird species actually utilise the proposed site is low based on the existing disturbances and the quality/quantity of existing habitat. Again, these species are not restricted to these habitats within the proposed site and likely utilise available habitat across the wider lowland valley floor and hill country environment and adjacent coastal area.

4.4.4 Bats

Department of Conservation's bat distribution database lists several records of long-tailed bat (*Chalinolobus tuberculatus*, Threatened – Nationally Critical) from various habitat types in the Bryant Ecological District over the past decade. According to Department of Conservation's bat distribution database records (accessed April 2022), this species has been detected within approximately 13-14 km of the PPC28 site.

Long-tailed bats forage over farmland and urban areas favouring forest edge and riparian habitats where they feed on aquatic insects. Long-tailed bats can cover 50 km in a single night and have ranges extending up to 100 km². A study of long-tailed bats within the highly fragmented landscape of South Canterbury found they preferred roosting habitat that included indigenous forest, shrubland remnants and riparian zones (Sedgeley and O'Donnell 2004). Long-tailed bats usually find roosts in large old native canopy trees either beneath the bark or in cavities where they rest during the day and breed. They are also known to utilise mature exotic trees such as pine and macrocarpa.

No old growth and very limited large trees which supported cavities and/or epiphytes within which bats could roost were recorded within the survey area. The area is unlikely to be important habitat for bats and although the site may provide some intermittent habitat for bats these potential habitats were of relatively low value. The ecological value of bat populations in the terrestrial receiving environment is Low.

5 Assessment of Terrestrial Ecological Values

Step 1 of the EclA guidelines requires ecological values to be assessed and ranked. As defined by Table 5.1 below, ecology values within the surveyed terrestrial receiving environment range from 'very low' for cleared vegetation to 'high' for the indigenous vegetation habitat within the surveyed area.

Table 5.1 Assignment of values within the terrestrial receiving environment to habitats and species (adapted from EIANZ, 2018).

Habitat/Species	Value	Comments
Regenerating kānuka shrubland and mixed māhoe-exotic scrub with patchy canopy and degraded understorey	High	<p>This secondary native shrubland dominated area is currently Rural Zone, and while it supports recognised biodiversity attributes (indigenous vegetation) is not listed as Significant Natural Area (SNA) (NRMP). The wider, albeit fragmented shrubland area contains Nationally Vulnerable plant species (kānuka) and is considered to act as a buffer and connect adjacent ecosystems. It may support Nationally Threatened, At Risk or locally uncommon or rare species (i.e., birds, lizards); however, the limited canopy diversity and lack of understorey vegetation, existing edge effects (as evidenced through the encroachment of exotic plants species) and exposure to a high degree of disturbance (grazing and to a lesser extent noise) likely significantly reduce the carrying capacity of this habitat for indigenous fauna.</p> <p>The overall High rating reflects kānuka's Threatened status, and the importance of native vegetation as habitat for indigenous fauna and for linking ecosystems within the Bryant Ecological District.</p>
Predominantly exotic scrub/trees with highly degraded understorey	Low-Moderate	<p>This area is dominated by exotic vegetation. It does not support any recognised high biodiversity attributes (e.g. indigenous vegetation/forest) or feature as Significant Native Area (SNA) (NRMP). The wider area may support Nationally Threatened, At Risk or locally uncommon or rare species (i.e., birds, lizards); however, the area has been significantly modified and the exotic vegetation consists of a low diversity of species and is simple in structure. It is unlikely to provide habitat for Threatened or At Risk species.</p>
Pasture grasses and gorse with occasional native shrubs/trees	Low	<p>Highly modified area with little to no representation of indigenous vegetation and very low levels of diversity. This habitat type is not expected to support significant numbers of Threatened or At Risk fauna.</p>
Recently cleared vegetation and accessways	Very Low	<p>Highly modified and comprising either dead vegetation, bare ground, or re-establishing pasture grasses and weeds, these areas have no recognised ecological value.</p>

Habitat/Species	Value	Comments
Macroinvertebrates	Low	<p>Macroinvertebrate communities potentially inhabiting native shrubland areas are most likely to have moderate to high diversity, species richness and abundance but not include Threatened/At Risk species.</p> <p><i>Powelliphanta</i> snail species (the majority At Risk or Threatened) may occupy this part of Nelson; however no <i>Powelliphanta</i> snails or shells were encountered during the present survey, and it is considered unlikely that <i>Powelliphanta</i> snails will be inhabiting the habitats within the site given existing disturbances and their limited tolerance for drier habitat at lower altitudes.</p>
Lizards	Moderate-High	<p>The kānuka-dominant areas hold the greatest potential for providing habitat for native lizards. Known inhabitants of the wider area include Threatened/At Risk species. These species are not restricted to these habitats within the proposed site and likely utilise the wider native shrubland and other lowland habitat throughout the PPC28 site and wider area.</p> <p>It is acknowledged that the range of some native lizard species (e.g., Northern grass skink) could potentially extend to mapped grassland areas, although disturbances from existing land use likely significantly reduce the carrying capacity of this habitat for native lizards.</p> <p>Native lizards are nevertheless protected under the Wildlife Act 1953, hence more detailed ecological assessment (including additional field survey effort and appropriate mitigation) would be warranted at a resource consent stage.</p>
Birds	Moderate-High	<p>Known inhabitants of the wider area include Threatened/At Risk species; these species are not restricted to these habitats within the proposed site and likely utilise available habitat across the wider lowland valley floor and hill country environment and adjacent coastal area.</p> <p>Native birds are also protected under the Wildlife Act 1953, and so more detailed ecological assessment (including additional field survey effort and appropriate mitigation) would be warranted at a resource consent stage.</p>
Bats	Low	<p>The kānuka-dominant shrubland does not provide high-quality roosting habitat for long-tailed bat (Nationally Critical) and no old growth and very limited large trees which supported cavities and/or epiphytes within which bats could roost were recorded within the survey area. The area is unlikely to be important habitat for bats and that although the site may provide some intermittent habitat for bats these potential habitats were of relatively low value.</p>

6 Land Use Constraints Under The Nelson Resource Management Plan (NRMP)

Section 7.8 Private Plan Change Request 24 August 2021 identifies provisions of the NRMP relevant to PPC28. Of particular relevance to this terrestrial ecological values assessment and the proposed rezoning of land from Rural to Residential zone are provisions in Volume 1 and 2 related to vegetation clearance. These provisions are as follows:

Volume 1;

Chapter 2 - Meaning of words

Indigenous Vegetation means an area of naturally occurring vegetation where the area covered by plant species indigenous to the District³ is the same as or greater than the area covered by other plants.

Indigenous Forest means an area of naturally occurring woody vegetation that:

- a) has a canopy predominantly formed by trees over 6 m high, and
- b) has more than 80% closure of the canopy, and
- c) comprises plant species indigenous to the District³

Volume 2;

Chapter 7 - Residential

REr.59 Vegetation clearance

Vegetation clearance requires Resource Consent unless:

- a) it does not take place within 5 m of the banks of any river identified in Appendix 6 (riparian and coastal margin overlays); except for the purpose of: (*exceptions listed not considered relevant to PPC28*).
- c) no vegetative debris is positioned where it may dam or divert any river or stream or adversely affect instream habitats, and
- d) all bare soil areas are, as soon as practicable but no later than six months from the date of disturbance:
 - i) stabilised so that no earth moves off-site or presents a danger to life or property; and
 - ii) vegetated, paved, metalled or built over, and
- e) after reasonable mixing there is no conspicuous change in the colour or visual clarity in any water body or coastal water as a result of undertaking the activity, and
- f) after reasonable mixing there are no significant adverse effects on aquatic life, and
- g) there is no clearance of indigenous forest, and
- h) there is no clearance of vegetation within a Biodiversity Corridor (or area of greenspace shown in Schedule I) unless it is an exotic species, or a species with a pest designation in the current Tasman-Nelson Regional Pest Management Strategy, or is vegetation clearance required for: (*exceptions listed not considered relevant to PPC28*).

This aligns with the NPSFW Section 3.24 “The loss of river extent and values is avoided, unless the council is satisfied: (a) that there is a functional need for the activity in that location; and (b) the effects of the activity are managed by applying the effects management hierarchy.”.

³ and with reference to species listed in Courtney et al. (2003).

7 Discussion and Conclusions

Desktop and field analysis determined that of the approximately 146 hectares of proposed residential zone area, around 107 hectares (74%) of the terrestrial receiving environment is highly modified and has very low ecological value. This extensive area comprises either grazed pasture or bare land (recently cleared vegetation or accessways). Such habitat occurs extensively throughout the modified lowland valley floor and hill country environment associated with the Maitai River and its tributaries, and while a relatively large area will likely be impacted by future development of the site, this is not seen to have any discernible impact on the terrestrial ecology of the area.

The terrestrial assessment delineated a total of approximately 17 hectare indigenous vegetation (combined kanuka-dominated shrubland and mixed māhoe-exotic scrub habitat area) of high ecological value. This area of indigenous vegetation comprises the highest quality habitat for native birds and lizards within the residential footprint area. It also meets the definition of indigenous vegetation under the NRMP and therefore the constraints on complying activities outlined above apply to the indigenous vegetation and surrounding area.

The proposed residential zone area overlaid with the habitat map in Figure 4.2 suggests that the delineated indigenous vegetation area occupies ~12% of the residential footprint. It is anticipated that at least some vegetation clearance would be required to fully develop these areas of the plan change footprint. Under residential zoning, clearance of indigenous vegetation would be permitted without resource consent (i.e., provided the activity aligns with REr.59 Vegetation Clearance provisions (a-f) and (h) of the NRMP as outlined above).

Notwithstanding, if at the subdivision phase the development of this area (or indeed any part of the plan change site) precludes avoidance of indigenous vegetation or indigenous forest then mitigation would be required to compensate for the loss of the vegetation. This is likely to be most effectively achieved by offset planting of vegetation of a similar character to the vegetation lost. Such offset planting would ensure no-net-loss of biodiversity values, or perhaps most likely a net benefit of biodiversity values, in the medium term.

The proposed change in land use to residential within the plan change area is also likely to increase domestic predators such as cats and potential weed species (through garden escapes), which may impact existing and potential vegetation and fauna values. The use of restrictive covenants on lot titles (i.e., those that prohibit certain plants and pets) may help to reduce the impacts on native wildlife. Situating roads or native vegetated buffers on the edge of reserve/native vegetation areas is also preferable to housing, as this reduces the likelihood of garden escapes negatively influencing native vegetation areas.

Finally, noting that native birds and lizards are protected under the Wildlife Act 1953, it is important to reiterate that more detailed ecological assessment involving additional field survey effort and appropriate mitigation measures would be required at a resource consent stage.

8 Limitations and Applicability

As with all one-off field ecological assessments, seasonal or temporal variation in the presence of mobile fauna means that the presence or absence of such fauna cannot be ascertained with great accuracy. The condition of habitat becomes the surrogate for the presence or absence of fauna rather than observed condition on the day of the survey. Potential seasonal variability is not assessed through one site visit. The composition of the avifauna, bat and lizard communities utilising the area could not be established as the survey was only conducted once in the autumn season. Fauna present, in addition to birds, bats and lizards, is reliant solely on the project ecologist's assessment of the habitat type and condition as noted during the field survey.

This assessment has been carried out in line with the proposal given to the Client by Robertson Environmental Limited on the 20th of April 2022. This is assumed in this assessment to be foot-print/activity being sought by this application. We note that this design may not be final. Depending on the scope of any future development and detailed design changes, further ecological assessments, including further quantitative assessments may be required. This report does not include any assessment of freshwater (in-stream, riparian or putative wetland) values present within the PPC28 site.

Robertson Environmental's professional opinions are based on its professional judgement, experience, and training. These opinions are also based upon data derived from the field survey and analysis described in this document, with the support of relevant guidelines (EIANZ, 2018). It is possible that additional surveying, testing and analyses might produce different results and/or different opinions. Should additional information become available, this report should be updated accordingly. Robertson Environmental Limited has relied upon information provided by the Client to inform parts of this document, some of which has not been fully verified by Robertson Environmental Limited. This document may be transmitted, reproduced or disseminated only in its entirety.

We understand and agree that CCKV Maitai Dev Co LP & Bayview Nelson Joint Venture will submit this report to support a private plan change request and that Nelson City Council as the regulatory authority will use this report for the purpose of assessing that plan change request.

Robertson Environmental Limited

Report Prepared by:



Dr Ben Robertson



Principal Consultant, Director

9 References

- Butler, D.J. 2008. Tasman District Biodiversity Overview - Indigenous terrestrial vertebrates and invertebrates. Published by Tasman District Council. Design and Layout: Dry Crust Communications. ISBN 978-1-877445-06-4.
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- Hitchmough, R.A., Barr, B., Knox, C., Lettink, M., Monks, J.M., Patterson, G.B., Reardon, J.T., van Winkel, D., Rolfe, J., and Michel, P. 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.
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- Sedgeley, J.A., O'Donnell, C.F. 1999. Roost selection by the long-tailed bat, *Chalinolobus tuberculatus*, in temperate New Zealand rainforest and its implications for the conservation of bats in managed forests. Journal of Biological Conservation. Volume 88, Issue 2, May 1999, Pages 261-267.
- Trewick, S., Johns, P., Hitchmough, R., Rolfe, J., and Stringer, I. 2016. Conservation status of New Zealand Orthoptera, 2014. New Zealand Threat Classification Series 16. Department of Conservation, Wellington. 15p.
- van Winkel, D., Baling, M., and Hitchmough, R. 2018. Reptiles and Amphibians of New Zealand: A Field Guide. 376p.

Attachment A:

Plant Species List

Species	NVS Code used on field sheets	Common name	Structural Class	Threat Status ¹	Food Type ²
<i>Kunzea ericoides</i>	KUNzea	kānuka	Dicotyledonous Trees & Shrubs	Nationally Vulnerable	N, I
<i>Sophora fulvida</i>	SOPful	kōwhai	Dicotyledonous Trees & Shrubs	At Risk (Naturally Uncommon)	
<i>Dodonaea viscosa</i>	DODvis	akeake	Dicotyledonous Trees & Shrubs	Not Threatened	I
<i>Plagianthus regius</i>	PLAreg	mānatu, ribbonwood	Dicotyledonous Trees & Shrubs	Not Threatened	
<i>Corynocarpus laevigatus</i>	CORlae	karaka	Dicotyledonous Trees & Shrubs	Not Threatened	F, N, I
<i>Melicytus ramiflorus</i>	MELram	māhoe, whitey wood	Dicotyledonous Trees & Shrubs	Not Threatened	N, B, I
<i>Pittosporum crassifolium</i>	PITcra	karo	Dicotyledonous Trees & Shrubs	Not Threatened	F, I
<i>Pittosporum tenuifolium</i>	PITten	kōhūhū, black matipo	Dicotyledonous Trees & Shrubs	Not Threatened	F, I, B
<i>Pittosporum eugenioides</i>	PITEug	tarata, lemonwood	Dicotyledonous Trees & Shrubs	Not Threatened	F, I
<i>Sophora microphylla</i>	SOPmic	small-leaved kōwhai	Dicotyledonous Trees & Shrubs	Not Threatened	N, I, B
<i>Coprosma linariifolia</i>	COPlin	mikimiki	Dicotyledonous Trees & Shrubs	Not Threatened	F, I
<i>Fuscospora cliffortioides</i>	FUScli	mountain beech	Dicotyledonous Trees & Shrubs	Not Threatened	
<i>Schefflera digitata</i>	SCHdig	patatē, seven-finger	Dicotyledonous Trees & Shrubs	Not Threatened	
<i>Muehlenbeckia australis</i>	MUEaus	pōhuehue	Dicotyledonous Lianes/Related Trailing Plants	Not Threatened	F, I, B
<i>Calystegia tuguriorum</i>	CALtug	powhiwhi	Dicotyledonous Lianes/Related Trailing Plants	Not Threatened	
<i>Cordyline australis</i>	CORaus	tī kōuka, cabbage tree	Monocotyledonous Trees & Shrubs	Not Threatened	F, N, I
<i>Polystichum neozelandicum</i>	POLnsz	shield fern	Ferns	Not Threatened	
<i>Pteridium esculentum</i>	PTEesc	bracken	Ferns	Not Threatened	
<i>Pellaea rotundifolia</i>	PELrot	round-leaved fern	Ferns	Not Threatened	
<i>Cyathea medullaris</i>	CYAmec	mamaku, black tree fern	Ferns	Not Threatened	

¹ de Lange et al. (2018).

² Type of food provided by native plant species for birds and lizards (F= Fruit/seeds, N=Nectar, B=Buds/foilage, I=Insects) (Courtney et al. 2003).

Species	NVS Code used on field sheets	Common name	Structural Class	Threat Status ¹
<i>Cyathea dealbata</i>	CYAdea	ponga, silver fern	Ferns	Not Threatened
<i>Carex virgata</i>	CARvir	pureī	Sedges	Not Threatened
<i>Carex geminata</i>	CARgem	rautahi, cutty grass	Sedges	Not Threatened
<i>Ulex europaeus</i>	ULEeur	gorse	Dicotyledonous Trees & Shrubs	Exotic
<i>Rubus fruticosus</i>	RUBfru	blackberry	Dicotyledonous Trees & Shrubs	Exotic
<i>Berberis glaucocarpa</i>	BERgla	barberry	Dicotyledonous Trees & Shrubs	Exotic
<i>Cytisus scoparius</i>	CYTSCO	broom	Dicotyledonous Trees & Shrubs	Exotic
<i>Ligustrum sinense</i>	LIGsin	chinese privet	Dicotyledonous Trees & Shrubs	Exotic
<i>Salix fragilis</i>	SALfra	crack willow	Dicotyledonous Trees & Shrubs	Exotic
<i>Crataegus monogyna</i>	CRAmon	hawthorn	Dicotyledonous Trees & Shrubs	Exotic
<i>Ilex aquifolium</i>	ILEaqu	holly	Dicotyledonous Trees & Shrubs	Exotic
<i>Acer pseudoplatanus</i>	ACEpse	sycamore	Dicotyledonous Trees & Shrubs	Exotic
<i>Juglans regia</i>	JUGpse	common walnut	Dicotyledonous Trees & Shrubs	Exotic
<i>Fraxinus excelsior</i>	FRAexc	common ash	Dicotyledonous Trees & Shrubs	Exotic
<i>Salix babylonica</i>	SALbab	weeping willow	Dicotyledonous Trees & Shrubs	Exotic
<i>Pinus radiata</i>	PINrad	radiata pine	Gymnospermous Trees & Shrubs	Exotic
<i>Ranunculus repens</i>	RANrep	creeping buttercup	Dicotyledonous Herbs other than Composites	Exotic
<i>Lotus pedunculatus</i>	LOTped	lotus	Dicotyledonous Herbs other than Composites	Exotic
<i>Clematis vitalba</i>	CLEvit	oldman's beard	Dicotyledonous Herbs other than Composites	Exotic
<i>Cirsium arvense</i>	CIRarv	californian thistle	Dicotyledonous Herbs other than Composites	Exotic
<i>Galium aparine</i>	GALapa	cleavers	Dicotyledonous Herbs other than Composites	Exotic
<i>Digitalis purpurea</i>	DIGpur	foxglove	Dicotyledonous Herbs other than Composites	Exotic
<i>Juncus effusus</i>	JUNeff	soft rush	Rushes and Allied Plants	Exotic

¹ de Lange et al. (2018).

Attachment B:
Potential Terrestrial Macroinvertebrate Species

Summary of potential ground active terrestrial invertebrate communities based on previous sampling of New Zealand successional vegetation (Munro 1995; Butler 2008). Taxa list is indicative and not exhaustive.

Habitat Type	Taxa	What the species indicates in terms of habitat quality
Forest ¹	Landhoppers	Heavily involved with decomposition, and indicate significant leaf litter and woody debris
	<i>Pachycondyla</i> sp. (ant)	
	Millipedes	
	<i>Saphobius inflatipes</i> (Scarab beetle)	
	<i>Prolasius advenus</i> (ant)	Common taxa in forests which have some type of disturbance
	Diapriidae (parasitoid wasps)	
Pine Forest	Harvestmen	General diversity but not overly specialised
	Darkling beetle	
	Parasitoid wasp (<i>Aucklandella</i> sp., <i>Sphictostethus</i> sp.)	
Riparian ¹	Slaters	General decomposition in disturbed areas
	Landhoppers	
	Rover beetles	Generalists, scavengers
	Relatively low numbers of beetles and wasps	Low general diversity
Pasture ¹	Cricket	Common in grass habitats
	<i>Nylandaria</i> sp. (ant)	Introduced ant, common in disturbed areas
	Relatively low numbers of beetles and wasps	Low general diversity
Tussock	Mites	Likely associated with grasses
	<i>Cicindela tuberculata</i> (tiger beetle)	Common in tussock / bare ground, usually found in open bare ground

¹ indicative habitat types present within the area surveyed in the present study.

References:

- Butler, D.J. 2008. Tasman District Biodiversity Overview - Indigenous terrestrial vertebrates and invertebrates. Published by Tasman District Council. Design and Layout: Dry Crust Communications. ISBN 978-1-877445-06-4.
- Munro, V.W. 1995. Terrestrial invertebrate communities: the effect of successional age, habitat structure and seasonality. Massey University Masters Thesis.

Attachment C:

Potential Lizard Species

Summary the threat classification, habitat preferences and distribution of lizard species known to occur within the Nelson/Tasman area.							
Region	Taxo- nominally determi- nate	Group	Species	Common name	Threat classifica- tion ¹	Distribution ²	Habitat ²
Nelson/ Tasman	Yes	Gecko	<i>Mokopirirakau granulatus</i>	forest gecko	At Risk - Declining	North and South Islands. Wide- spread throughout the upper North Island from South Taranaki to southern part of Bay of Is- lands, including some offshore islands; absent from northern Northland and Aupouri Penin- sula. In the South Island, occurs from Marlborough to Nelson, Tasman and Westland.	Coastal, Lowland, Montane/subalpine, Alpine - Inhabits forest, scrublands, herbfields, and rocky bluffs and sandstone pavements. Com- monly found in mānuka or kānuka scrub and on trunks, branches or foliage of trees. Takes refuge beneath bark, in dense foliage, in hollow tree trunks, in the crowns of ferns and beneath rock slabs or in crevices during the day. Also known to inhabit peri-urban areas, where it lives in gardens and takes refuge beneath outdoor furniture, woodpiles or timber decking. May disperse across open ground, even rural roads, to reach new habitat.
Nelson/ Tasman	Yes	Gecko	<i>Naultinus stel- latus</i>	starred gecko	Nationally Vulner- able	South Island only. Occurs throughout the Nelson and Tas- man regions, from the Maitai Valley east of Nelson to the northern West Coast, and south- wards to Nelson Lakes.	Coastal, Lowland, Montane/subalpine - Oc- cupies scrub, kānuka and mānuka shrubland, beech forest, subalpine shrubland and herb- fields. Usually found among foliage but will shelter on the ground beneath rocks and logs, or in dense low-growing vegetation during inclement weather and in winter, especially when snow covers large areas of their habitat.
Nelson/ Tasman	Yes	Skink	<i>Oligosoma polychroma</i>	northern grass skink	Not Threat- ened	North and South Islands. Central North Island from Gisborne to the Central Plateau southwards to Wellington and across Cook Strait. Occurs on Stephens Island/Takapourewa and other islands in the western Marlbor- ough Sounds. In the South Is- land, occurs in Nelson, Tasman and West Coast regions, from Nelson southwards along the west coast to about Hokitika.	Coastal, Lowland, Montane/subalpine - Oc- cupies a wide range of habitats including littoral zones, duneland, wetlands, grassland, shrublands, forest edges, small rocky islets, offshore islands, scree and talus slopes, rocky or boulder areas, shrublands, subalpine tussockland and even suburban gardens. Also persists in areas of exotic forestry.

¹ Hitchmough et al. (2021)

² van Winkle et al. (2018)

Region	Taxo- nomically determi- nate	Group	Species	Common name	Threat classifica- tion ¹	Distribution ²	Habitat ²
Nelson/ Tasman	Yes	Gecko	<i>Woodworthia maculata</i>	Raukawa gecko	Not Threat- ened	North and South Islands. Widely distributed from Northland to northern South Island (Marlborough and Nelson, just at the northern margins of Westland and Canterbury), including many offshore islands.	Coastal, Lowland - Littoral zone to forest. Occurs on coastal sand dunes, coastal cliffs and rock outcrops, boulder beaches; in flaxland, kānuka and regenerating shrubland, and in old-growth forest.

¹ Hitchmough et al. (2021)

² van Winkle et al. (2018)

Attachment D:

Potential Bird Species

Summary the threat classification of bird species recently sighted within grid BY54 (encompasses the survey site) (eBird - New Zealand Bird Atlas April 2022).				
Species	Common name	Threat classification ¹	Recent observation	
			Location	Date
<i>Ninox novaeseelandiae</i>	ruru, morepork	Not Threatened	DOC 200	17 Apr 22
<i>Ardea modesta</i>	kōtuku, white heron	Threatened - Nationally Critical	Nelson--Neale Park	14 Apr 22
<i>Egretta novaehollandiae</i>	white-faced heron	Not Threatened	Nelson--Neale Park	14 Apr 22
<i>Himantopus himantopus leucocephalus</i>	poaka, pied stilt	Not Threatened	Nelson Haven (bottom)	14 Apr 22
<i>Limosa lapponica</i>	Eastern bar-tailed godwit/kuaka	At Risk (Declining)	Nelson Haven (bottom)	14 Apr 22
<i>Platalea regia</i>	kotuku ngutupapa, royal spoonbill	At Risk (Naturally uncommon)	390 Atawhai Drive, Nelson, Nelson, NZ (-41.251, 173.31)	14 Apr 22
<i>Larus dominicanus dominicanus</i>	kelp gull (Southern black-backed gull)	Not Threatened	Parker's Cove, Nelson	8 Apr 22
<i>Hydroprogne caspia</i>	taranui, caspian tern	Threatened - Nationally Vulnerable	Parker's Cove, Nelson	8 Apr 22
<i>Puffinus gavia</i>	fluttering shearwater	At Risk (Relict)	NA	28 Feb 22
<i>Morus serrator</i>	Australasian gannet	Not Threatened	NA	28 Feb 22
<i>Microcarbo melanoleucos</i>	little pied cormorant	Vagrant	Queens Gardens Ponds, Nelson	30 Nov 21
<i>Phalacrocorax sulcirostris</i>	little black shag	At Risk (Naturally uncommon)	Queens Gardens Ponds, Nelson	30 Nov 21
<i>Sturnus vulgaris</i>	common starling	Introduced and Naturalised	Bishopdale Avenue	12 Nov 21
<i>Hirundo neoxena</i>	welcome swallow	Not Threatened	NZ-Nelson-The Brook-Larges Lane	30 Oct 21
<i>Larus novaehollandiae</i>	red-billed gull	At Risk (Declining)	Alongside Maitai from library to QEII Drive bridge	29 Oct 21
<i>Anthornis melanura melanura</i>	korimako, bellbird	Not Threatened	Bishopdale Avenue	19 Oct 21
<i>Porphyrio melanotus melanotus</i>	pūkeko	Not Threatened	Bishopdale Reserve (walk)	11 Oct 21
<i>Turdus philomelos</i>	song thrush	Introduced and Naturalised	Bishopdale Reserve (walk)	11 Oct 21
<i>Stictocarbo punctatus</i>	spotted shag	Threatened - Nationally Vulnerable	NZ-Nelson-Britannia Heights-Haulashore Island-Picnic Bench	30 Sept 21
<i>Aythya novaeseelandiae</i>	New Zealand scaup	Not Threatened	Airport Carpark _ Monaco	30 Jun 21

¹ Robertson et al. (2021).

Species	Common name	Threat classification ¹	Recent observation	
			Location	Date
<i>Phalacrocorax carbo novaehollandiae</i>	great commorant	At Risk (Naturally uncommon)	170 NILE Street East, Maitai, Nelson, NZ (-41.277, 173.296)	27 Jun 21
<i>Anthus novaeseelandiae</i>	New Zealand pipit	At Risk - Declining	Alongside Maitai from library to QEII Drive bridge	5 May 21
<i>Falco novaeseelandiae</i> "southern"	southern falcon	Threatened - Nationally Endangered	277 Hampden Street, Nelson South NZ-Nelson -41.28587, 173.27997	13 Jan 21
<i>Zosterops lateralis</i>	tauhou, silvereve	Not Threatened	Rawhiti Cave Track, Motupipi, Tasman, NZ (-40.879, 172.856)	4 Jan 22
<i>Egretta sacra sacra</i>	reef heron	Threatened - Nationally endangered (Stable)	Nelson City coastal bird survey, section 48_49	15 Dec 20
<i>Hemiphaga novae-seelandiae</i>	kererū, New Zealand pigeon	Not Threatened	277 Hampden Street, Nelson South NZ-Nelson -41.28583, 173.27980	25 Nov 20
<i>Circus approximans</i>	kāhu, Australasian harrier	Not Threatened	Bishopdale Avenue	28 Oct 20
<i>Gallirallus australis australis</i>	weka	Not Threatened	Nelson--Queens Park	5 Oct 20
<i>Prosthemadera novaeseelandiae novaeseelandiae</i>	tūī	Not Threatened	Bishopdale Avenue	4 Sept 20
<i>Haematopus finschi</i>	South Island pied oystercatcher	At Risk (Declining)	Tahunanui Beach Reserve, Tahunanui NZ-Nelson -41.27979, 173.25031	12 Jul 20
<i>Haematopus unicolor</i>	variable oystercatcher	At Risk (Recovering)	NZ-Nelson-Britannia Heights-Haulashore Island—Perimeter Track	13 Dec 19
<i>Sterna striata striata</i>	white-fronted tern	At Risk (Declining)	NZ-Nelson-Britannia Heights-Haulashore Island—Perimeter Track	13 Dec 19
<i>Rhipidura fuliginosa fuliginosa</i>	South Island fantail	Not Threatened	NZ-Nelson-Britannia Heights-Haulashore Island—Perimeter Track	13 Dec 19

¹ Robertson et al. (2021).

Attachment E:

Field Photographs

PPC28 Maitahi Bayview - Terrestrial Receiving Environment



Photo 1-6: Regenerating kānuka shrubland with patchy canopy and highly degraded understorey.

PPC28 Maitahi Bayview - Terrestrial Receiving Environment



Photo 7-13: Regenerating mixed māhoe-exotic scrub with patchy canopy and highly degraded understorey

PPC28 Maitahi Bayview - Terrestrial Receiving Environment

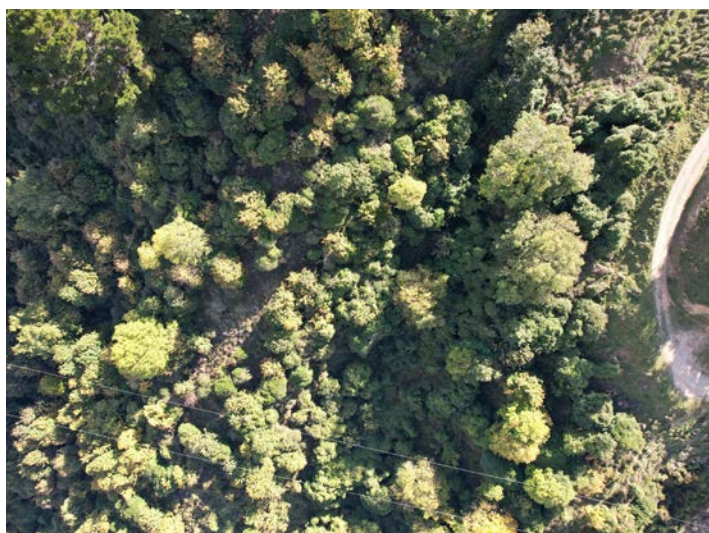


Photo 14-19: Predominantly exotic scrub/trees with highly degraded understorey.

PPC28 Maitahi Bayview - Terrestrial Receiving Environment



Photo 20-25: Pasture grasses and gorse with very occasional native shrubs/trees.

PPC28 Maitahi Bayview - Terrestrial Receiving Environment

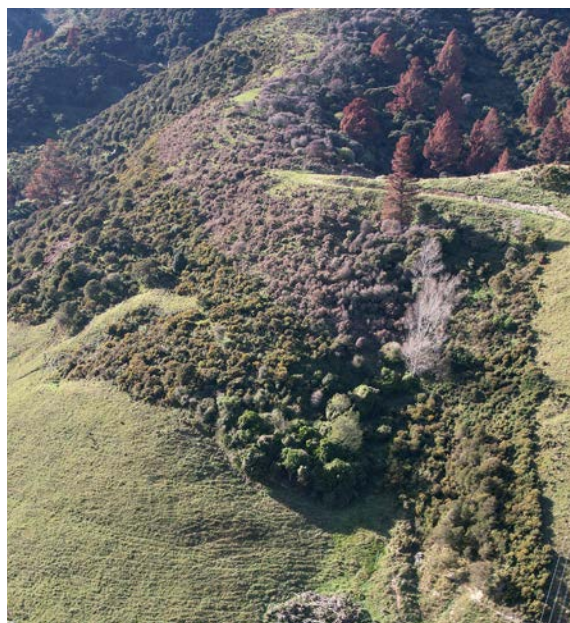


Photo 26-31: Recently cleared or sprayed vegetation.