

Hokonui Windfarm Ecological Scoping Assessment

Hokonui Energy



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Document Control

Version	Date	Details	Author	Verifier	Approver
1	26/09 - 13/10/2025	EcSA Draft 1 for scoping EcIA procurement	PWH	xx	xx
2	19/10/2025	EcSA Draft 2 for planner comment. Also used to propose ecol. impact avoidance	PWH	xx	xx
3	7/11/2025	EcSA Draft 3 for planner vs HEL discussion	PWH + MH	xx	xx
3.1	12/01/2026	EcSA Draft 3.1: to support pre-FTAA Referral consultation	PWH + MH	xx	xx
4	6/04/2026	Final version: to support FTAA Referral application	PWH + MH	MH	RC

Hokonui windfarm: High level ecological impact assessment

A bat survey, along with a separate Ecological Scoping Assessment of the terrestrial, wetland and freshwater ecology within the proposed Hokonui Wind Farm (HWF) project area have been completed to inform an initial assessment of the potential ecological effects of the HWF.

These assessments indicate that the HWF project area is generally suitable for wind farm development. Nil bat activity was detected over the HWF project area. Further, the current land-use is primarily used for pastoral grazing and exotic plantation forestry, and as such, the ecological value of the project area is largely degraded.

Although, some residual high to medium ecological value indigenous ecosystems are present in the HWF area, there are limited projected impacts on high-value ecological features. Notwithstanding this, areas of ecological importance such as wetlands, rocky outcrops, tussock grassland and indigenous dominated shrubland are present and it is possible these areas may be impacted by the construction of the wind turbines and roading network.

As is common with Project's of this scale, the HWF will result in ecological effects during both the construction and operation of the wind farm. Potential ecological effects during construction of the HWF may include:

- Vegetation clearance and the associated permanent loss or fragmentation of habitats, including terrestrial vegetation and potentially wetlands;
- Disturbance to indigenous fauna, including invertebrates, herpetofauna and birds as a result of earthworks and vegetation clearance activities; and
- Potential impacts on water quality of surrounding waterbodies without the appropriate management measures in place.

In addition, although, the habitat quality for birds is low in the project area, operational effects of the wind farm will primarily relate to the potential for bird collision with the wind turbines and transmission line. In addition, there may be some disturbance to indigenous fauna from the ongoing operational activities of the wind farm (e.g. noise and lighting).

These potential effects are to be addressed further in the ecological impact assessment that will be prepared for the substantive application for the HWF project, including the measures proposed to manage these effects. Preliminary mitigation options have been identified for the most significant projected impacts.

Given the modified nature of much of the wind farm footprint, the construction effects should be able to be readily quantified and there will be options to avoid, remedy and mitigate effects on higher value elements. The degraded landscape also means there is likely to be a number of onsite management measures that can be implemented to enhance biodiversity values of the Project site, such as ecological restoration and weed and pest control.

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In addition, some of the HWF project area is adjacent to Public Conservation Land (PCL) administered by the Department of Conservation. The applicant may therefore propose the use of PCL for herpetofauna relocation and / or ecological restoration of PCL.

The applicant is pursuing a vision of environmental guardianship; and aims to leave a legacy of the ecological function and ecosystem services of the project area improved from its present condition. (Trap_and_Trigger 2023)

Trap_and_Trigger. (2023). *Makarewa Headwaters Feral Ungulate Survey*. Retrieved from <https://www.thrivingsouthland.co.nz/>:

Ecological Scoping Assessment Executive Summary

This Ecological Scoping Assessment (EcSA) indicates the nature and extent of ecological features that are likely to be impacted by the proposed Hokonui Windfarm (HWF) construction and operation.

This information is to be used in refining the proposed wind turbine generator (WTG) layout and associated infrastructure design, to avoid impacting features of high- and medium value ecological value, where possible. This EcSA will also inform and direct the subsequent, more detailed ecological survey work and mitigation strategies required for the HWF Ecological Impact Assessment (EcIA), which will be prepared for the substantive application for the HWF project.

The findings and recommendations of this EcSA are:

- a) The landscape the HWF project area spans is almost entirely modified. Of the total HWF project area (approximately 16000ha.), approximately 10600 ha. is under managed grass land, and approximately 3000 ha under actively managed plantation forestry.
- b) The HWF project area includes no terrestrial, waterway or wetland features that are considered very-high ecological value ecosystems (using the EIANZ evaluation framework).
- c) However, in the HWF area some residual high ecological value indigenous ecosystem fragments remain, and there are some areas of indigenous ecosystem regeneration. These areas provide an opportunity for protecting and/or restoring as a mitigation measure.
- d) The HWF area appears generally suitable for infrastructure development, as there are limited projected impacts on these high-value ecological features.
- e) The terrestrial, waterway and wetland areas that will be impacted are mostly assigned low to negligible combined ecological value. This is primarily because of the generally heavily degraded indigenous ecological value of the dominant farmland and exotic forestry in HWF area, and the proposed road routing follows existing road and farm track networks.
- f) There are some exceptions to the low to negligible impacts within the currently proposed HWF and road routing layouts. These are seventeen proposed WTG and road-routing ecological intercept sites that are forecast to impact:
 - i. Eight waterbody or wetland features assigned high and medium combined ecological value, and
 - ii. Four vegetation features with assigned high ecological value, and three vegetation features with medium combined ecological value.
- g) We believe the impact on many of the high ecological value WTG sites and vegetation features can largely be avoided by moving the WTG sites off the rocky outcrop ecosystems and locating the WTG on nearby sites with moderate, low or negligible ecological values.
- h) Potential risks to avifauna are acknowledged. Ecological assessment and enhanced bird monitoring is suggested to address these risks. Such monitoring is also expected to minimise project risk from insufficient avifauna data.
- i) Several areas that could serve as restoration for ecological offset are identified.

Introduction

This document reports the results of an ecological scoping assessment (EcSA) conducted for the proposed Hokonui Windfarm (HWF) project, in Southland, New Zealand. The HWF project is being delivered by Hokonui Energy Limited (HEL).

1.0 Background

An initial desktop ecological impact study of the HWF project area was undertaken in March 2025 to broadly indicate the areas where any potential impact (“Environmental Overlap”) may occur between the proposed Wind Turbine Generator (WTG) and road routing layout and ecological features in the project area. This desktop study was based on the publicly available Land Cover Database (LCDB) and LINZ (Land Information NZ) river (centrelines) layer ecological data. These broad potential impact areas are shown in Figure 1.

A simple review of this study, undertaken by comparing aerial photography with the projected Environmental Overlap, revealed that both the LCDB and LINZ layers are of insufficient spatial accuracy to incorporate the identified ecological features into the windfarm design confidently. More importantly, this data is also not qualitative – i.e., there is no differentiation available in the projected Environmental Overlap between impacting pristine, very high value ecological features and impacting low or negligible value ecological features.

Therefore, rapid field assessment of the projected Environmental Overlap features was carried out on 19 – 21 March and 31 March – 4 April 2025. The subsequent report, “Hokonui Windfarm Preliminary Qualitative Ecological Assessment” (PQEA) (Energy3 2025) was released in May 2025. That report was used to refine the WTG and/or associated road routing layouts to avoid or minimize the ecological impact of the project to the extent practicable.

This EcSA report is a review and update of that PQEA.

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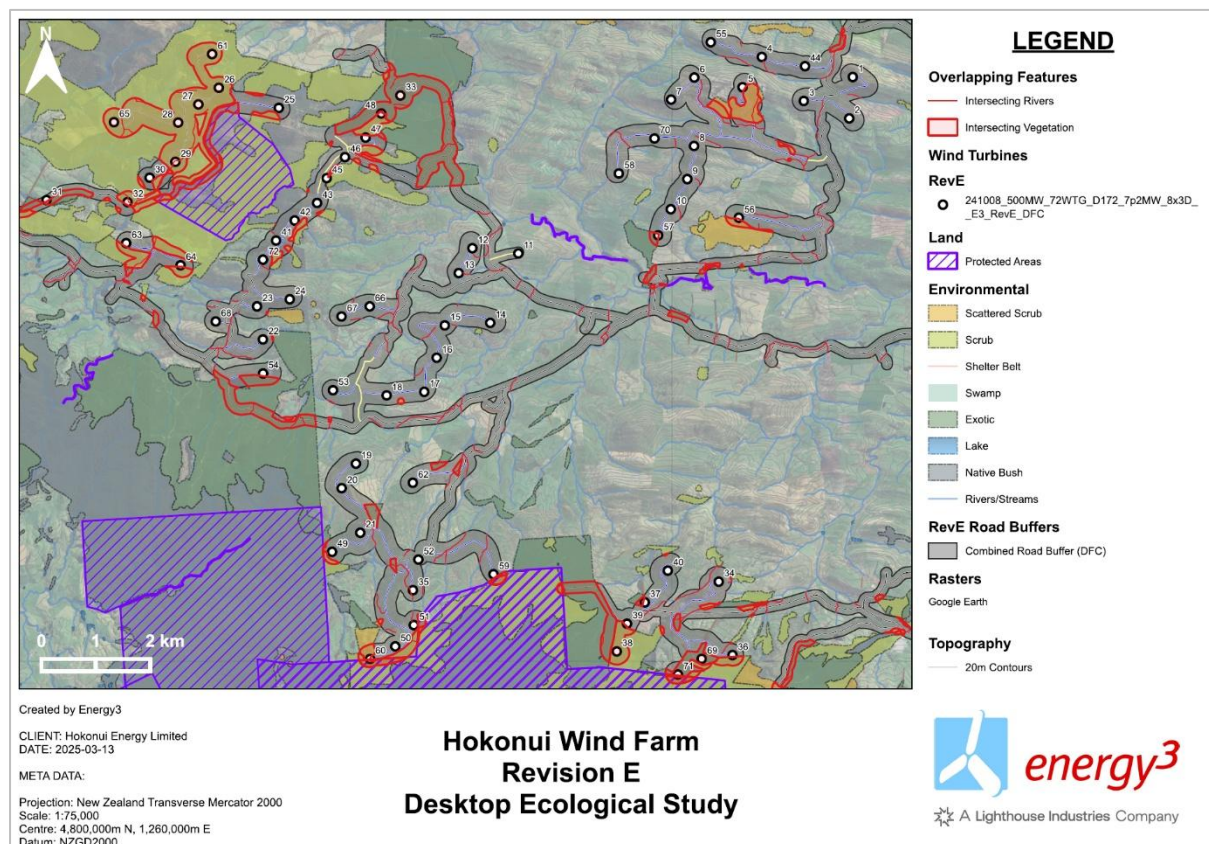


Figure 1. Hokonui Windfarm initial desktop ecological study, undertaken using the proposed turbine and road routing layout design Revision E, 13 March 2024. This indicates the areas where any potential impact ("Environmental Overlap") may occur between the WTG and road routing layouts and ecological features in the project area. This desktop study was based on the publicly available Land Cover Database (LCDB) and LINZ (Land Information NZ) river layer ecological data.

2.0 Objective and rational

The objective of this EcSA is to establish high confidence, area-wide quantitative ecological information for the HWF area.

The primary purpose of establishing this understanding is to determine the potential effects of the HWF project on the ecological values of the project area. This information is to be used in refining the proposed WTG layout and associated infrastructure design, to avoid impacting areas of high ecological value, where possible and where warranted.

This EcSA will also inform and direct subsequent, more detailed ecological survey work and mitigation strategies that will be outlined in the HWF Ecological Impact Assessment (EcIA), which will be prepared for the substantive application for the project.

Methods and scope

This is a preliminary environmental “Scoping” ecological assessment for the HWF project, as recommended and outlined in Institute_of_Ecology_and_Environmental_Management (2002) and Roper-Lindsay, Fuller et al. (2018). The purpose of this document is to

- identify ‘impact zones’ where deleterious ecological effects may be caused by the main activities associated with the construction and operation of the HWF,
- to make preliminary assessment of the ecological effects of those activities, and
- to propose potential mitigation measures and future survey options / strategies that can be further developed in the Ecological Impact Assessment (EcIA) for the project.

This report is not intended to fulfil the role of a full EcIA; although it informs and directs where EcIA focus is required.

The spatial coverage of this EcSA has focussed on the proposed HWF WTG sites, the road routing layout, and the “Environmental Overlap” areas – i.e.; all terrestrial, waterway and wetland features identified as potentially impacted in a desktop spatial analysis, where ecological features identified in the LCDB and LINZ databases occur within a projected zone of influence of the windfarm activities (100m where existing roads are being used, 200m from WTG sites and new or significantly upgraded roads, Figure 1). Other potentially affected significant ecological features in the HWF project area were identified from interviewing local landowner and Rūnanga representatives.

A rapid scoping field assessment of these environmental features was carried out, where we physically assessed

- waterway and wetland features
- vegetation categories present
- potential lizard habitat
- quality and extent of indigenous avifauna habitat
- quality and extent of indigenous invertebrate habitat

A preliminary assessment of the ecological values of these potentially impacted zones or areas was made, using the EIANZ “Matters” evaluation framework (Roper-Lindsay, Fuller et al. 2018) (In this process, rank scores are given for Representativeness, Rarity, Diversity and pattern and Ecological context and function). We also give a preliminary estimation of likely ecological effects. We used the examples provided in Table 1 of Davis, Head et al. (2016) as our reference scale when assigning rankings within each factor (i.e., each “matter” of Roper-Lindsay, Fuller et al. (2018)).

A summary of the broad options available for mitigation of the potential impacts identified is also provided. For the latter, we have followed the established ecological effects mitigation hierarchy (Conservation 2014), i.e. appropriate avoidance > minimisation and on-site rehabilitation > offsetting or compensating for significant residual effects.

The qualitative assessment of these features and potential ecological impacts was complemented by identifying high value species that potentially occur in the project area based on information from the Threatened Environment Classification (Cieraad, Walker et al. 2015), and NZ Plant Conservation Network (NZPCN) plant distribution databases (NZ_Plant_Conservation_Network 2025).

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A copy of a report summarizing the mana whenua values and taonga species in the HWF project area is provided in Appendix 1 of this report.

We have also given a preliminary assessment of the ecological context trends in the HWF area, along with local ecological mosaic diversity (sensu Scheiner 1992, Bennett, Radford et al. 2006) of the individual properties the HWF project area

We used the River Environment Classification (REC2) (Ministry_for_the_Environment and NIWA 2019) to determine stream order.

Field visits were carried out on 19 – 21 March and 31 March – 4 April 2025. A follow-up revisional study was carried out over 9 – 19 October 2025.

2.1 Limitations

As the HWF WTG and the Road Routing layouts have not been finalized at the time of collating this EcSA, locally focused assessment of all the areas likely to be impacted will not be expressly catalogued here. I.e., changes to the WTG and the road routing layout versions after 19 October 2025, (made after the release of version 2 of this report), need to be captured in the final EcIA.

Therefore, we have not quantified here any potential ecological/ environmental losses and gains.

For environmental impact where avoidance is not an option, we have not addressed impact management beyond recommending further evaluation in the final EcIA.

This EcSA also does not include a gap analysis (i.e., identifying missing information or data deficiencies).

We fully acknowledge that ecological value rankings generated and applied in this EcSA are a rapid assessment and coarse evaluation. This is particularly so for the freshwater environment assessment, where traditional full evaluation will include qualitative measurement and associated empirical data-based assessment. I.e., As a scoping study, no provision was made in this report for detailed watercourse vegetation and water quality assessment nor macroinvertebrate sampling and biotic index evaluation (e.g., Stark and Maxted 2007). Similarly, there is no Rapid Habitat Assessment(s) (Clapcott 2015) of the potentially impacted waterways.

A very brief regional ecological context estimate is given in Section 3 below. We recommend that the regional ecological context for all projected HWF significant environmental impacts are addressed in the EcIA (e.g., Wawrzyczek, Lindsay et al. 2018).

2.2 Confidence Statement

As recommended by (Roper-Lindsay, Fuller et al. 2018), the confidence we have in our ecological assessments is also given. Confidence levels are given as C) Confident, or likely, P) potential, and U) unknown.

Ecological Scoping Assessment

3.0 Ecological Context

The proposed Hokonui Windfarm project site is almost entirely within the Hokonui Ecological District, with a few WTG sites within the NW margin located in the Gore Ecological District. These Ecological Districts are within The Southland Foothills and Gore Ecological Regions respectively.

The landscape the HWF project area spans is entirely or almost entirely modified (using Harding (1999) to estimate original baseline). And currently approximately 88.5% of the project area is under agronomic uses or plantation forestry.

The HWF project area discontinuously covers approximately 16000ha. The project area is characterised as currently predominately managed grassland (approximately 10600 ha.), and in descending estimated coverage area, managed plantation forestry (*Pinus*, Douglas fir and eucalyptus, approximately 3000 ha), tussock lands (estimated 2500 ha), fragmented shrublands (Divaricating vegetation (Divar_veg) and exotic weeds, approximately 560 ha), mixed indigenous shrubland (estimated 500ha.), the margin of Mānuka-dominant scrub (estimated 50 ha.), generally small and isolated rocky outcrop communities, and wetland habitats (potentially 10 – 20 ha. each).

There are three conservation areas administered by the Department of Conservation adjacent to or within the HWF project area:

- The HWF project area is bounded to the south by Mānuka dominated scrub and the indigenous Hokonui Forest conservation area. This forest has high ecological value potential (Harding 1999, Hokonui_Rūnanga_Kaupapa_Taiao N.D.); including supporting the endangered *Olearia hectorii* tree (Rogers 1996). However, this area is currently ecologically degraded (Wildland_Consultants_Ltd. 2023) due to significant and only partially unmanaged exotic pest pressure (Trap_and_Trigger 2023). Significant numbers of deer, along with deer and pig damage and sign were directly observed in these areas during our field visits in early 2025.
 - o Moreover, there is likely only minor ecological functional contention between this area and indigenous ecological communities within the project area due to edge and barrier effects. This notwithstanding, any potential for the HWF project to interrupt such connection needs to be addressed in the Ecological Impact Assessment (EclA).
- The fragmented Cone Forest conservation areas are approximately 2.5 – 4 kms to the west of the HWF project area. It is possible that there are ecological functional contentions between this conservation area and the indigenous ecological communities of the scrubland to the NW of the project area. Although the currently proposed road routing and WTG infrastructure will almost certainly not affect this connection, it would be prudent to include consideration of this linkage in the EclA.
- The Bare Hill Forest conservation area is within the HWF project area. Bare Hill Forest is currently degraded due to significant and largely unmanaged exotic pest damage. None-the-less it has been assigned high ecological value. Although we predict the HWF project

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activities will have low to no direct impact on this area, both direct and indirect impacts need to be determined as part of the EclA.

Other ecological function connections between the indigenous ecological communities within the HWF project area that need to be considered in the EclA include those between the Cone Hill and Bare Hill conservation forest eco-systems, listed above, and the sub-alpine wetland features FN_Water # 7 and #59 (described in Section 5.2 below); as well as the historically occurring (Day, Barratt et al. 2023) buffering value of tussock-land to other indigenous ecological communities (Mark, Barratt et al. 2013, Davis, Head et al. 2016, Day, Barratt et al. 2023) present in the HWF area.

The individual properties (Figure 2) that make up the HWF project area represent a large range in localized mosaic diversity value. The local ecological mosaic diversity (sensu Scheiner 1992, Bennett, Radford et al. 2006) is assessed as low to very low over the Cambells and Clearwater Blocks south of the Otapiri-Mandeville Road and nearly all the forestry blocks (the wetland and vegetation exceptions are discussed in Sections 5.2 and 5.4 respectively); moderate for the Overton, Elder and Fairfield blocks; and fair for the Cambells block north of the Otapiri-Mandeville Road. The local ecological mosaic diversity is assessed as generally very low for most of the Roy and Roughan blocks, with the notable exceptions of the rocky outcrop communities there (discussed in Section 5.4).

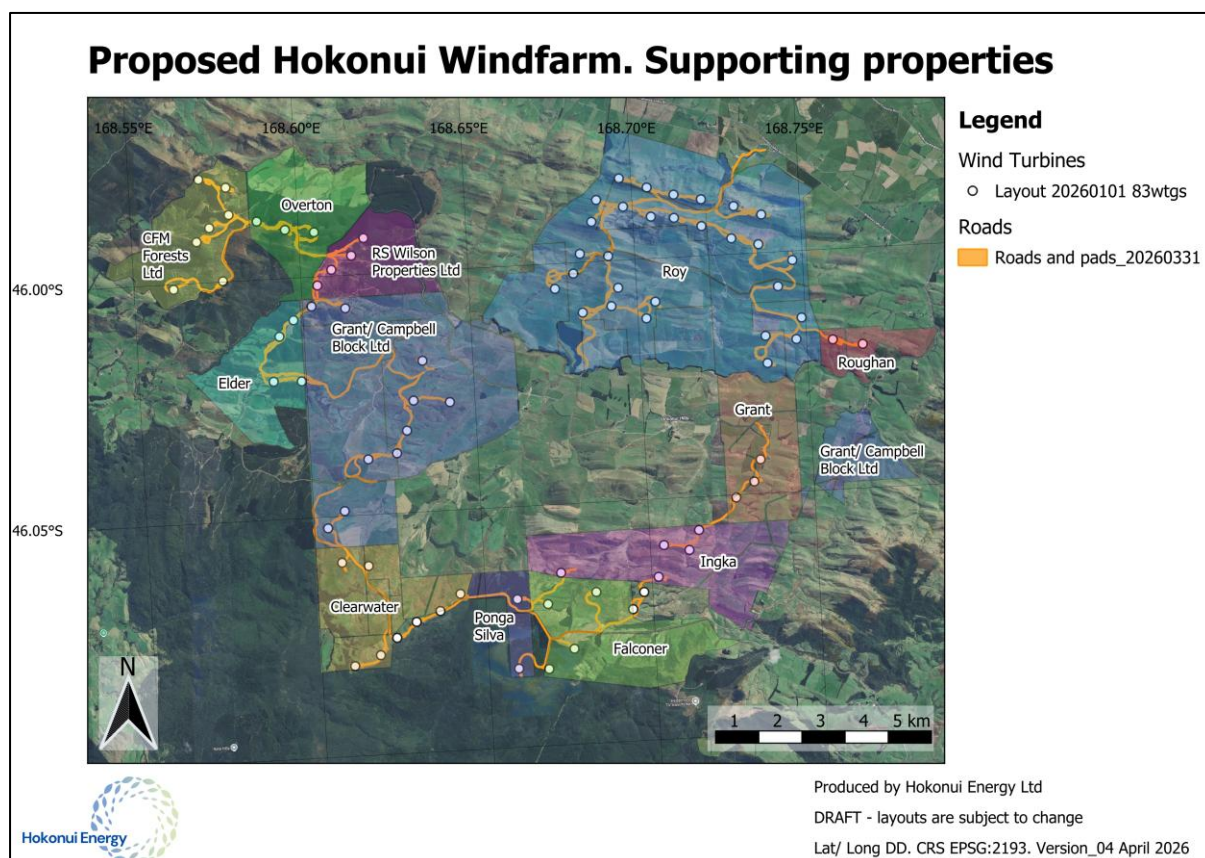


Figure 2. Hokonui windfarm supporting property blocks

4.0 Mana whenua values and taonga species

Hokonui Rūnanga is mandated to represent Ngāi Tahu within the Māruawai area – the region centred on the floodplains of the Maitai River – and has shared interests in the lakes and mountains between Whakatipu-Waitai (near Martins Bay) and Tawhitarere with other Murihiku Rūnanga, and those located from Waiheke southwards. Hokonui Rūnanga hold mana whenua status for the Māruawai area, and exercise rangatiratanga and kaitiakitanga for the taiao and those species that live within this area in formal processes (Hokonui Rūnanga pers. comm Oct 2025).

“Ngāi Tahu, like other iwi, conceptualise the environment as an undivided entity. It is a cohesive system of lakes, rivers, wetlands, soils, plants and animals (including humans), winds, tides, mountains and other terrestrial lands, and the relationships between them all. It is this holistic perspective that pervades mātauranga Māori...” (Hokonui Rūnanga pers. comm Oct 2025).

A list of taonga species that are known to be in the Hokonui Hills area has been provided by the Hokonui Rūnanga (pers. comm 10 Oct 2025), and this list is included in Appendix 1 of this report.

5.0 Survey Results

5.1 Survey Results Summary

The HWF project area includes no terrestrial, waterway or wetland features that are considered very-high ecological value ecosystems or areas.

As previously stated, the HWF project area is entirely or almost entirely modified, and is largely under pasture based agricultural management and commercial plantation forestry. As a result, the ecological value of the terrestrial component of the project area is predominantly low to negligible (*sensu* Roper-Lindsay, Fuller et al. 2018).

However, some remnant high ecological value indigenous terrestrial and wetland ecosystem fragments remain. There also are some areas of indigenous ecosystem regeneration, and some significant areas of scattered indigenous vegetation. These are identified in the sections below.

The majority of the terrestrial and surface-water ecological features that are projected to be impacted by the project are assigned low or negligible combined ecological value. This is primarily due to the proposed road routing following existing road and farm track networks, along with the generally heavily degraded indigenous ecological value of the HWF project area.

There are several exceptions, however, where HWF activities are projected to impact ecological features of high and moderate ecological value. Preliminary ecological value scores for these potentially impacted features are given in the following sections, along with preliminary impact scoping assessments. Brief consideration is also given to potential mitigation measures where the project is projected to result in effects on ecological values of the project area.

5.2 Surface-Water Features

The large streams in the western half of the HWF project area are the central tributaries of Taylors Stream and Lora Stream. The large streams in the eastern part of the project area are the Otamita Stream and its upland tributaries including Cambells Creek, Moss Burn, the Ruhtha and Gordon streams, Dornoch Burn and Cone Burn.

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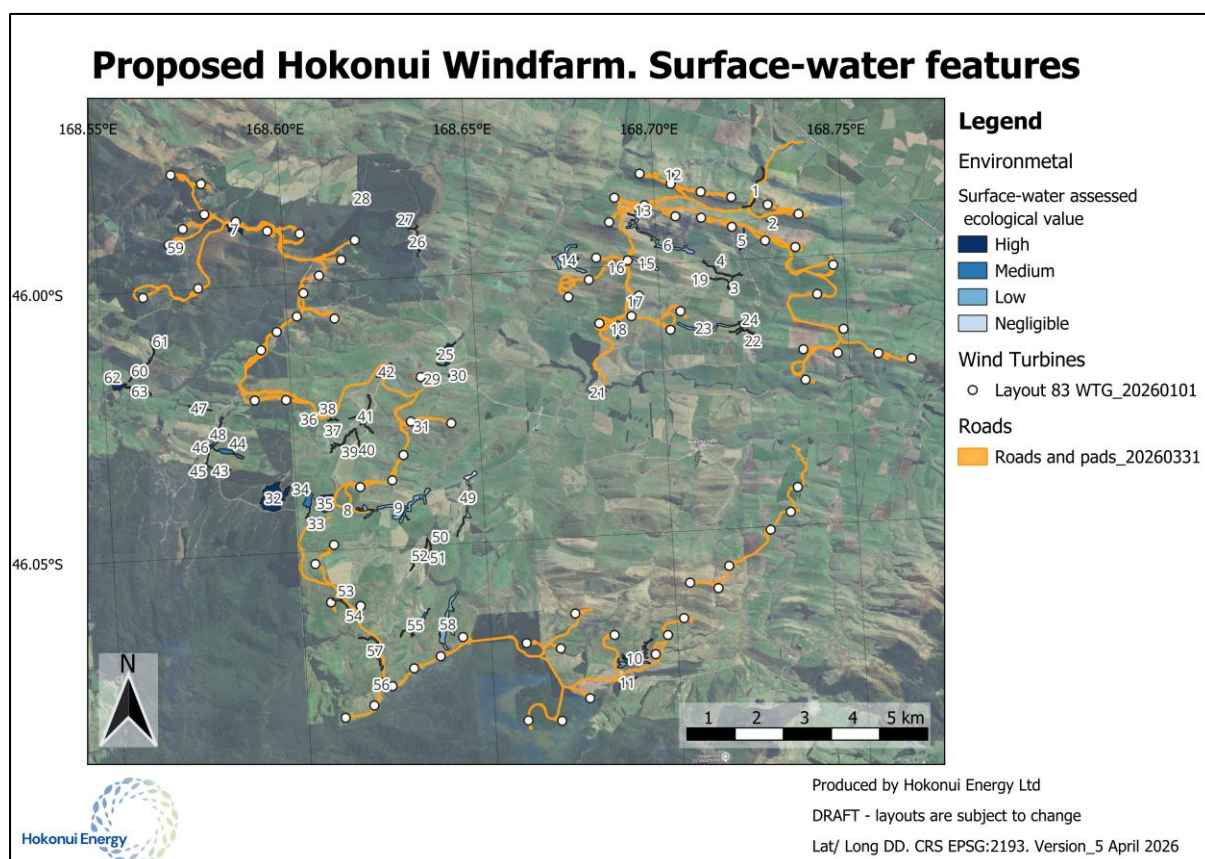


Figure 3. HWF EcSA assessed waterways and wetlands, with a preliminary combined ecological value classification assigned. (using EIANZ classification). The numbers identify the assessed individual surface water features; and these features are described in Table 2.

Our scoping assessment of waterbody ecological values, potential project effects, and recommendations are summarised in Table 2 (page 30). The weightings used to make those assessments given in Appendix 2. A map of the assessed waterbodies is given in Figure 3. These include the high ecologically valuable sub-alpine bogs FN_water features # 7 and # 59 (defined using (Johnson and Gerbeaux 2004), although #7 may in part be defined as a fen) which appear not to have been recorded here previously.

The HWF project footprint is predicted to generally have limited additional impact on wetlands and streams within the project area. This is because the sites where the project's proposed road routing intercepts water features is predominately on existing roading infrastructure and mostly where the water features are of low to negligible ecology value; and/ or because the most significant effects can be avoided via refinements to the Project layout. Although the civil works upgrades at these intercepts could have potential negative ecological effects at these sites; if appropriate mitigation actions are taken (see Table 2), the long term environmental impacts are predicted to be minimal relative to that currently being caused by the present land-uses.

Never-the-less, these low to negligible ecology value intercepts, along with appropriate mitigation and, where required, offsetting or compensation measures, needs to be addressed in the surface water Assessment of Environmental Effects (AEE) and EcIA (Ministry_for_the_Environment 2025).

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Exceptions, where the HWF project activities are currently projected to potentially cause environmental impacts to wetlands and streams with greater than low ecological value are described in ecological score value and field note (FN) order below. The most significant impacts can be avoided via re-location.

- The high ecol. value sub-alpine wetland FN_Water feature #7 (near WTG B6, see Figure 4) is intercepted by both current WTG and road-routing layouts. Potential realignment of the HWF project footprint to avoid impacting this wetland, along with other features of high and moderate ecological value, are given in Appendix 5 (Tables 5 and 6).
- The high ecol. value FN_Water feature #25 (near WTG B22): the projected impact area is ~0.1 hectare of a tussocky gully. This feature is projected to be impacted at an existing farm-track ford over a small spur gully. Never-the-less, a detailed ecological evaluation would be prudent for the EcIA to determine any appropriate measures required to be implemented to manage any effects on this feature (Ministry_for_the_Environment 2025).

The following features are all of medium ecological value:

- FN_Water feature #1. Road-routing crosses a small stream at existing road pipe, in two separate places. There is potential for sediment and disturbance ecological impact from road upgrade and/or transport activity. We recommend confirming ecol. impact and appropriate mitigation measures when the civil design is complete
- FN_Water feature #21 (south of WTG A20), is a projected river crossing at the Otamita Stream (WGS84 coordinates: -46.023315, 168.682091). The civil works here are likely to result in the existing ford replaced by an overflowable battery culvert. This change, along with construction impacts, need to be evaluated, and mitigation strategies presented as part of the EcIA. Although this area is currently frequently disturbed by traffic and classified as of moderate ecological value in this EcSA, the area immediately adjacent is a protected stretch of the stream, which has high rare species and ecological diversity value (Riki Parata, Hokonui Rūnanga, pers. comm May 2025). There will likely be both ecological costs and benefits of changing this river crossing from a ford; with the existing structure potentially disrupting trout and tuna passage – reducing predatory pressure on indigenous fish and invertebrate spp. upstream. Whereas a standard culvert will likely remove that partial barrier. Therefore, these potentially significant ecological effects also need to be evaluated within the EcIA. It is possible that at this location it will be beneficial to impede the passage of exotic fish to protect the upstream indigenous fish populations. This option will be further considered as part of the EcIA and if this approach is appropriate for this site, approval for a complex freshwater fisheries activity will be sought as part of the substantive application.
- FN_Water#30 (adjacent WTG B22) is a piped stream/ ephemeral stream. The project impact is expected to be negligible, as the feature crossing uses an existing roading infrastructure; but this needs to be confirmed when civil works design is complete
- FN_Water#41 (adjacent to WTG B21). Road-routing crosses feature at an existing farm bridge. There is potential for moderate habitat disturbance and sediment risk from road & bridge upgrade and/or transport activity. The AEE needs to confirm ecol. value + impact, and what mitigation or offset measures are most appropriate, when WTG and road routing layouts are complete
- Sub-alpine wetland feature FN_Water #59. We recommend that the HWF EcIA specifically addresses the project's options to avoid impacting this wetland. Potential mitigation measures may include removing the immediately adjacent doug.fir to generate a habitat buffer, and fencing the area off to exclude inadvertent damage. These measures can be included in the construction and ecological management plans that will be required for the project, draft versions of which will be provided with the substantive application for the project.

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Some EcIA recommendations for features that are not currently projected to be directly impacted by the project are also given in Table 2.

We determined that the wetland spatial extent given in LCDB typically underrepresents the actual size by 2 – 3 times and sub-alpine wetlands in the HWF area are not represented at all. The water course locations on LCDB are approximate only, and sometimes inaccurate by ~50m. Some water-courses on LCDB are not present, and several physically present watercourses are not shown in LCDB. These results confirm the desirability of ground-truthing the waterbodies that intercept the project infrastructure.

No provision was made in this EcSA for detailed watercourse vegetation and water quality assessment nor for macroinvertebrate sampling and biotic index evaluation (e.g., Stark and Maxted 2007, Clapcott 2015). However, we make the following comments and observations: Regarding fish and aquatic invertebrates that have been given Threatened - Nationally Vulnerable conservation status:

- *Geotria australis* (Pouched Lamprey, culturally significant) is known to occur in the Southland district (James 2008), and is expected to utilize the streams within the HWF project area (Riki Parata, Hokonui Rūnanga, pers. comm May 2025)
- *Galaxias* “southern” (southern flathead galaxias) and *Galaxias* aff. *paucispondylus* “Southland” (alpine galaxias (Southland)) may also occur within the HWF project area (Dunn, Allibone et al. 2018), potentially along with other *Galaxias* spp. (Riki Parata, Hokonui Rūnanga, pers. comm May 2025; Appendix 1)

The At Risk- Declining species, *Anguilla dieffenbachii* (NZ longfin eel) occurs in the HWF project area (Riki Parata, Hokonui Rūnanga, pers. comm May 2025)

The brief visual water quality, physical environment and macroinvertebrate assessments made here (Table 2) indicate that the significant streams in the project area can potentially support the above spp., at least intermittently. Accordingly, the potential presence of these spp. is reflected in the stream combined “matter” ecological value scores given in this EcSA report.

Given the findings immediately above, we found it was not necessary to also investigate the local occurrence of Threatened freshwater invertebrates. We are aware however that the area hosts at least one At Risk-Declining species, namely *Echyridella menziesii* (New Zealand Freshwater Mussel) (iNaturalist n.d.). We therefore recommend that specialist expertise also be consulted for freshwater invertebrates, and this information be incorporated into the EcIA.

5.3 WTG Sites

Summary descriptions of the WTG sites and associated scoping ecological categorization assessments are given in Table 3 (page 50). The contributions from the four EIANZ “Matters” into these categorizations given in Appendix 2. A map of the spatial distribution of the WTG sites is given in Figure 3.

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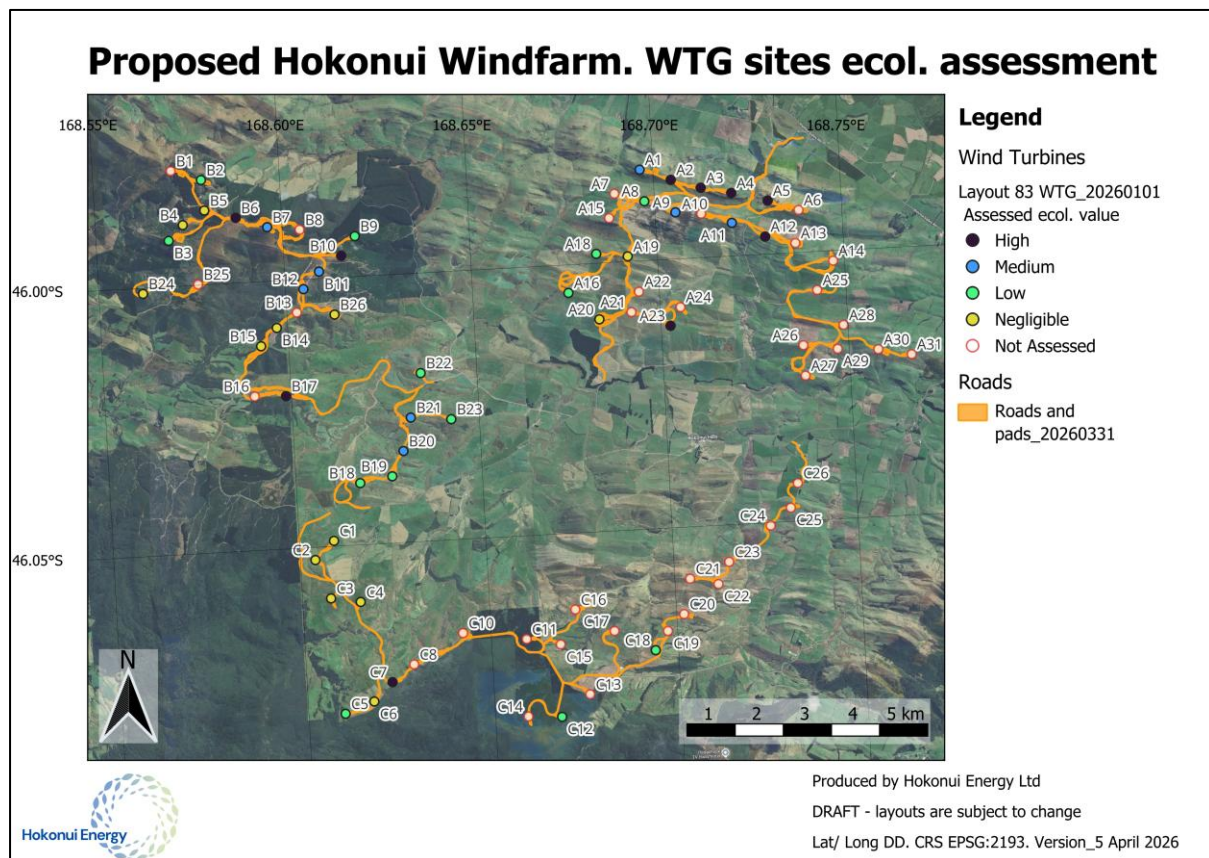


Figure 4. HWF EcSA assessed WTG sites, with a preliminary combined ecological value classification assigned (using EIANZ classification). The numbers identify the individual WTG. Summary descriptions of the WTG sites and associated ecological categorization assessments are given in Table 3.

Ten of the WTG sites are given preliminary high combined ecological value scores. These are WTG sites A3, A4, A5, A12, A23, B6, B10, and potentially A2, B17 and C7.

As described in the EIANZ categorization guide, sites which are ranked with high combined ecological value are “likely to be regionally important and recognised as such.” Furthermore, we have applied high ecological scores for this set of WTG sites with reference to section 6(c) of the RMA.

Accordingly, most of the WTG sites that have been classed as high value have been given that rank due to the presence or assumed presence of Threatened to At Risk – Declining conservation status herpetofauna (Hitchmough, Barr et al. 2021). These spp. are listed in the herpetofauna section (page 22). In addition, three WTG sites (WTG A4, A5, A12) are assigned high Representativeness and moderate Ecological context scores in their own right.

In a different ecological impact type, WTG B6 is located within a degraded but high combined ecol. value wetland (FN_Water feature #7). This WTG siting represents a significant ecological loss, as well as lost opportunity for ecological gain via restoration of this wetland. Mitigation suggestions are discussed below.

Seven of the WTG sites are given preliminary medium combined ecological value scores. These are WTG sites A1, A9, A11, B7, B11, B12, B20 and B21.

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It is noted that the above are preliminary rankings. These areas will be fully investigated for the EcIA that will be prepared for the substantive application, and the ecological values assigned in this report may be altered following that. Further, the indicative wind farm layout is still subject to further refinements, and as such, the locations of the WTG sites may also change.

Generally, we believe the impact from the WTG sites located in areas of high ecological value can be largely mitigated through avoidance – and subtly moving the WTG sites off the rocky peaks, and locating them on nearby sites with moderate, low or negligible ecological scores. These shifts typically involve relocating the WTG sites by ~100 – 150m horizontally, sometimes less, – and typically ~ 10 - 15m vertically (down). Similarly, we strongly recommend that WTG B6 and associated road routing be re-sited ~70m north of its current planned location, and thus avoid the surface water feature FN_water #7. The suggested new locations are given in Appendix 5.

5.4 Vegetation Features

Our preliminary assessment of vegetation features are summarized in Table 4 (page 73), and the weightings used to make those assessments given in Appendix 4. A map of the assessed vegetation features is given in Figure 4, noting that an assessment of the entire site has not yet been completed.

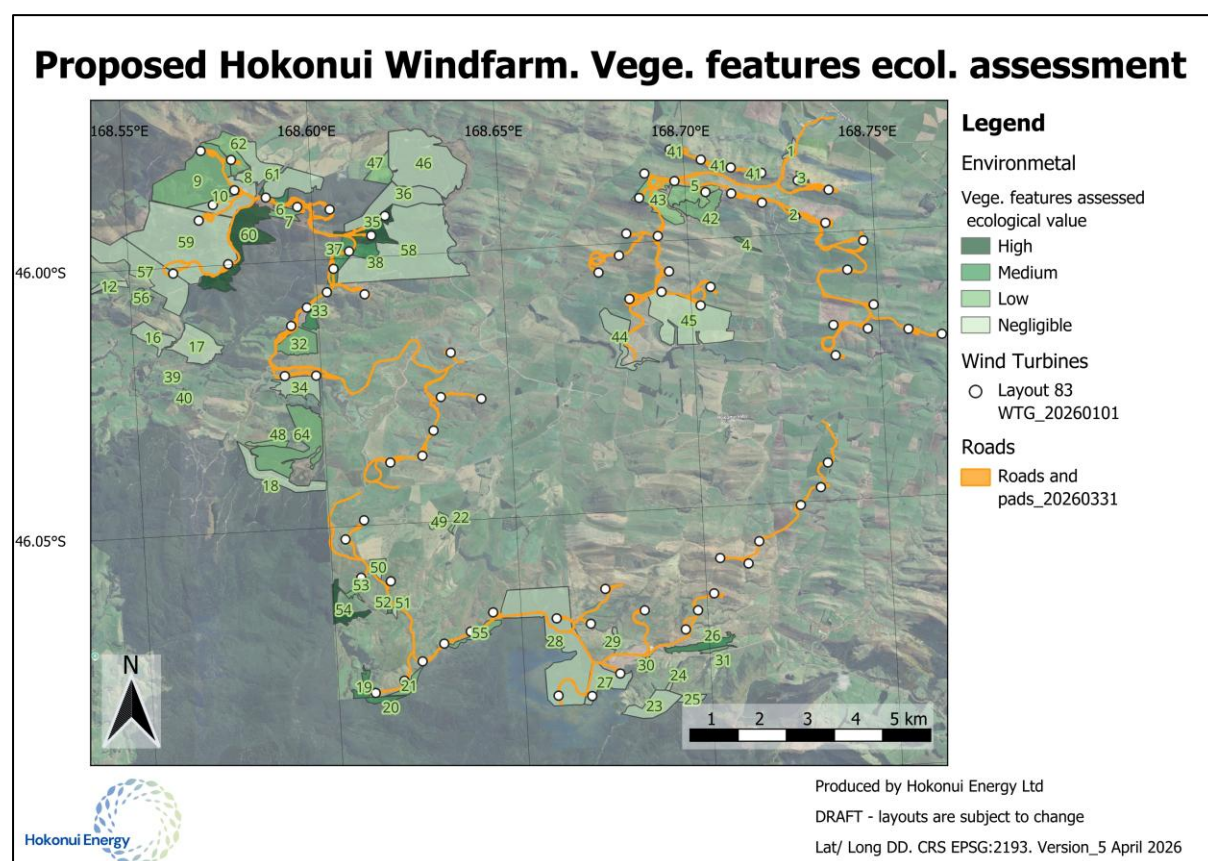


Figure 5. HWF EcSA assessed vegetation features, with a preliminary combined ecological value classification assigned. (using EIANZ classification). The numbers identify the assessed individual features; and these features are described in Table 4.

Spatially and numerically most vegetation features in the HWF project area are classified as of Low to Negligible combined ecological value.

There were only eight vegetation feature areas of high combined ecological value detected in the project area. Of these, five are rocky outcrop ecosystems, which are all fragmented and appear to be mostly functionally isolated where there are valleys between them (Wiser and Buxton 2008). Due to their unique eco-physical characteristics these exceptional ecosystems can be highly resilient to disturbance and commonly are refugia for rare plant and animals (Wiser and Buxton 2009, Fitzsimons and Michael 2017). The examples of these ecosystems within the HWF project area, that have not been severely degraded are ecologically significant locally, as well as from an ED and national perspective (Manaaki_Whenua–Landcare_Research 2023, Payne, Jamieson et al. 2024).

High ecological value vegetation areas

The rocky outcrop communities where high ecological value vegetation areas may potentially be impacted are near WTG sites A4, A5, A12, B10, and potentially WTG sites A1, A2, A3 (the latter three have not been physically assessed). It is recommended that these WTG sites are relocated where possible to avoid the impact of the wind farm on these high ecological value areas to the extent practicable. Any of these areas where avoidance of high ecological value impacts is not possible, need to be evaluated in the EcIA, and any adverse effects will need to be appropriately mitigated, and where required, offset and compensated for.

There is a ~200m section of road routing in the rocky outcrop communities FN_Veg feature #41 (to the east of WTG site A1). Impact on this area can potentially be mitigated through avoidance – via re-locating the road routing to go north of this vegetation feature.

The vegetation surrounding WTG site B10 (FN_Veg 35) is largely exotic forest. However, the indigenous ecological diversity and rarity values within this area appear to warrant further EcIA evaluation, with view to possibly protecting the outcrop system there by excluding the doug.fir. This area is also projected to be affected by road construction that is mostly additional to the existing forestry road infrastructure.

The other high value vegetation features identified in this EcSA (FN_Veg # 54 and 60) are not projected to be directly impacted by the HWF project. However, as described for the Bare Hill Forest conservation area above (which partially includes FN_Veg #60); we highly recommend that the EcIA address any potential indirect effects on these indigenous ecological communities adjacent to the HWF project. In addition, controlling the pigs and deer in the relatively small FN_Veg #60 sub-alpine scrubland to address the current degraded state of this feature, represents a significant ecological restoration opportunity (Coomes, Mark et al. 2006) as an environmental offset, should this be required. Boosting the ecological function in this area also improves the potential for this area to serve as a herpetological sanctuary and re-location site (refer to the Herpetological Features Section below (6.5)).

Medium ecological value vegetation areas

The HWF versus medium ecological value vegetation areas that are potentially going to be impacted are FN_Veg #6, 37 and 38 (adjacent to WTG B6 and B11 / B12 respectively):

- FN_Veg feature #6 is not projected to be impacted with the current road routing. However, re-routing the road to avoid FN_Water feature #7 will likely cause impact to FN_Veg #6. However, this is a much lesser environmental impact, as FN_Veg #6 is currently a weedy and degraded area, and more robust to physical and ecological disturbance impacts than FN_Water #7. Never-the-less, the impacts on FN_Veg #6 will need to be addressed in the

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EcIA given the possible ecological context and function of this area, including any eco-physical connection between FN_Veg #6 and FN_Water feature #7.

- FN_Veg areas #37 and 38 are under exotic plantation management. This withstanding, we recommend that the EcIA address any direct and indirect project impacts on the ecological values of these areas, as they potentially contain intermittent lizard habitat, and therefore, may be of moderate to high ecological diversity.

Other than the above, remarkably, the HWF project is not projected to create any high value indigenous vegetation losses or new “edges”.

Unsurveyed vegetation areas

The largest Indigenous vegetation and associated ecosystem loss and newly generated indigenous habitat fragmentation is projected to occur in an area that has only been partially surveyed in this EcSA. This is the proposed new road routing along the spur between peaks of East Shoulder and Bare Hill, and to the east of Bare Hill (i.e., between WTG sites B10 and WTG B7). This section of new roading is projected to be approximately 2.1km in length. Although it is through an area of mainly gorse, broom and divar_veg scrub; this area will include some ecological communities that we have classified as of high combined ecological value in this EcSA. Accordingly, further investigation of the ecological values of this impacted area and any potential mitigation measures need to be addressed in the EcIA.

With regard to the HWF activity that will occur immediately adjacent to FN_Veg feature #2, 3 and 41: Further fragmentation of the rocky outcrop indigenous community habitats needs to be evaluated and documented within the EcIA process. As mitigation or offset for these projected impacts, improving the health of these areas and/or similar areas by providing connection between these currently fragmented areas, along with exotic pine exclusion and/or vertebrate grazing exclusion, would result in an effective environmental gain, should this be required.

The fragmented and irregular nature of the extensive tussock lands in the HWF area mean that mapping this feature class is beyond the capability of this EcSA. We recognize the ecological, hydrological and soil conservation values of the tussock lands within the project area. We note here however, that the HWF project's impact on high value tussock lands is projected to be minimized and occur in small and discrete areas, as the proposed road route uses existing roads and tracks as much as possible.

The proposed road route through the forested areas from WTG C9 to WTG C10, and the spur to WTG C13, are all expected to have a negligible effect, as these route sections all pass through exotic forest and mostly uses existing forestry roads.

As the current proposed WTG and road routing layout post-date the EcSA field assessment, some areas of projected impact are not covered by the field assessment undertaken thus far, and warrant at least preliminary field survey. In the road-routing access direction, that is from the NE to SW of the HWF area, these not-currently classified areas are:

- The new access roads required for WTG A13 and A14, and WTG A26 – A31
- The gullies approaching WTG B23 (WGS84 coordinates -46.0256980, 168.6430451, -46.0267652, 168.6447630)
- Tussocky areas approaching and leaving WTG B19
- Water and vegetation features along approach to WTG C17
- Vegetation on the approach to WTG C18

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- Water and vegetation features from WTG B14 to B16
- WTG sites that may have high or moderate combined ecological value, namely: A1, A2, A3, A16, B6, B7, B13, B16 to B17, C7, C17, C19, C21, C23, C25
- Tussock areas and gully approaching WTG B26
- Waterway to the east of WTG B4 and B3, which runs south to pass under the road routing to WTG B24

5.5 Herpetological Features

Lizards were directly observed, or lizard sign or suitable lizard habitat was detected at 11 of the WTG sites and seven of the vegetation features. Five of these vegetation features are at WTG site locations, i.e., in total nine areas have been identified as herpetofauna confirmed or assumed (Table 1). The location of these areas is indicated in Figure 5. Herpetological relevant comments are currently included in the WTG and Vegetation feature tables (Table 3 and Table 4, respectively pages 50 and 73). Non-observed herpetofauna risks are discussed at the end of this section.

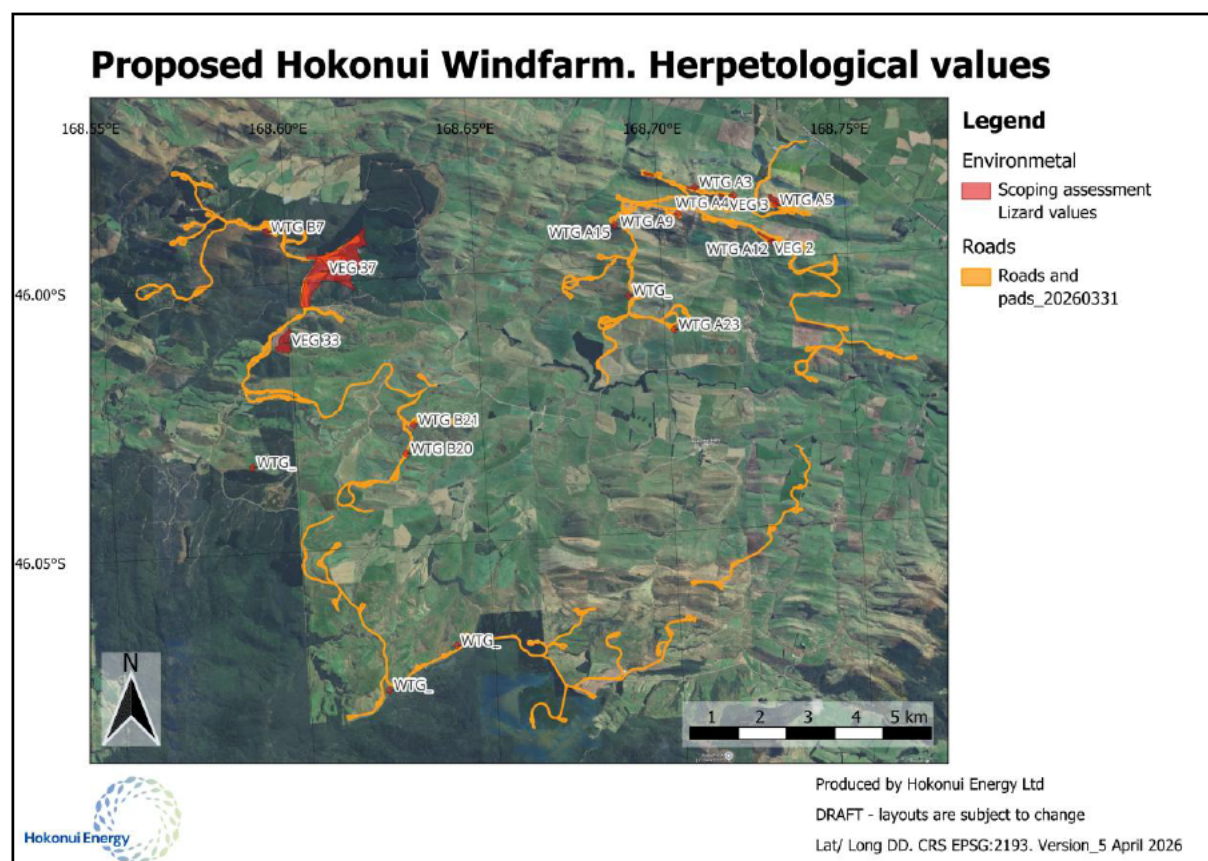


Figure 6. HWF EcSA WTG sites and vegetation features projected to impact hepatological confirmed or suspected sites. Site assigned the label "WTG_" were potential hepatological WTG sites from previous HWF layouts, but are no longer WTG hosting

Table 1. WTG sites and vegetation features that that have been identified as herpetofauna confirmed or assumed habitat in this EcSA. Features on the same line occur in the same area

Vegetation feature FN no.	associated WTG no.
2	A12
3	A5
33	-

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35	B10
37	B11, B12
38	-
41	A1, A2, A3, A4
-	B7
-	B20

Of the Threatened/ Nationally Vulnerable conservation status reptile species, the Southland green skink (*Oligosoma chloronoton*) occurs in the Hokonui area (van Winkel, Hitchmough et al. 2018, Hitchmough, Barr et al. 2021, iNaturalist n.d.). The Bare Hill Conservation area has been identified as containing the largest remaining population of this species (Knox 2023), and it's distribution may extend into the project area (M. Tocker pers. comm. Oct 2025, (Knox 2023)).

Also, the range of other lizard species with a At Risk/ Declining conservation status extends or theoretically extends over the Hokonui hills, e.g., Tautuku gecko (van Winkel, Hitchmough et al. 2018, iNaturalist n.d.), Kōrero gecko (*Woodworthia "Otago/Southland large"*) (van Winkel, Hitchmough et al. 2018, The New Zealand Herpetological Society N.D.), Tussock skink, *Oligosoma chionocholescens* (The New Zealand Herpetological Society N.D.) and historically, the Jewelled gecko (*Naultinus gemmeus*) (The New Zealand Herpetological Society N.D.). These conservation status classifications are reflected in the high ecology value scores assigned in this report, where likely habitats of these species occur within the project area.

Other species of herpetofauna that are not Threaten status classified yet protected under the Wildlife Act (New Zealand Government 1953), such as McCann's skink (*Oligosoma maccanni*), will potentially be present in rank grass and some tussock lands (van Winkel, Hitchmough et al. 2018) not identified in Figure 5. And as such the potentially impacted herpetofauna areas may include much of the new road routing over such habitats.

The HWF project will therefore need to appropriately manage potential effects on herpetofauna, including avoidance of high-quality lizard habitat where practicable, and where avoidance is not possible, implementing mitigation measures to minimise the adverse effects of the project on lizards. This is likely to include the salvage of lizards in areas where identified habitat will be impacted by the project footprint. Any activities involving the salvage of lizards will require a Wildlife Act Authorisation under the Wildlife Act 1953 and this will also be sought as part of the substantive application for the project. We recommend that all herpetofauna impacts and mitigation measures be addressed in the full EclA.

It is possible that there will be residual adverse effects on lizards following the implementation of the measures to avoid, remedy and mitigate the effects of the Project on lizards. Therefore, offsetting and/or compensation may be required. As discussed in the section above, there is an ecological restoration opportunity for FN_veg feature#60 (the sub-alpine scrub part of Bare Hill conservation area) by controlling selected exotic pests – namely pigs, ferrets and feral cats (James Ross, Lincoln University, pers. comm Oct 2025). If this activity was to be undertaken, this restoration is forecast to significantly boost the endemic vegetation outcomes and the ecological function in this area (Coomes, Mark et al. 2006). In addition, this enhancement will almost certainly improve the potential for this area to serve as a herpetological sanctuary and re-location site. This capacity will be an important,

integral, component of managing the potential herpetological risks and impacts associated with the HWF project.

5.6 Bat Features

Bats in New Zealand all have high Threatened species/ conservation status, from “At risk” to “Nationally critical” (O'Donnell, Borkin et al. 2022). Natural bat habitat is mature forest with large hollow trees, although they can occur along forest margins and occasionally in mature exotic pine plantations (Meduna 2007, O'Donnell, Borkin et al. 2022).

Bat monitoring has been undertaken over the HWF project area by an independent ecological support provider. The bat surveillance data is not repeated in this EcSA; however, we report that nil bat activity was detected over the HWF project area (Davidson-Watts 2025).

It is our opinion that indigenous forests within and immediately adjacent to the HWF project area is too short and/ or stunted and ecologically degraded, to be able to likely supply the necessary ecological or physical resources to support NZ bat species. Similarly, almost all of the exotic plantation forest in the HWF area clear felled at maturity, and therefore, represent potential bat habitat for only a limited time span. The single exception was FN_Veg feature #30, which is an approximately 4 ha. block of unmanaged *Cyprus* or *Pinus*.

It is worth noting that neither the short-tailed nor long-tailed NZ bat species are recognised as occurring in sustained populations in the Hokonui area. (Meduna 2007).

5.7 Bird Features

The bird species observed within the HWF project area during the field work were limited to korimako/ bellbird (*Anthornis melanura*), pīwakawaka/ fantail (*Rhipidura fuliginosa*) and house sparrow (*Passer domesticus*) in wooded areas; chaffinch (*Fringilla coelebs*), common blackbird (*Turdus merula*) in the valleys; on the higher farmlands and planation blocks Eurasian skylark (*Alauda arvensis*), spur-winged plover (*Vanellus miles*), and kāhu/ Australasian harrier (*Circus approximans* – locally abundant in the SW corner of the HWF area). And sporadically around the WTG sites greenfinches (*Carduelis chloris*) and skylarks were observed. Six other species are taonga species recognised as occurring in the Hokonui Hills area; namely, kereru/ NZ wood pigeon, kākārīki, pīpīpi/ brown creeper, riroriro/ grey warbler, pihipihī/ waxeye and ngirungiru/ tomtit (Appendix 1).

This remarkably limited avifauna diversity likely reflects the restricted diversity of the NE section of the Hokonui ED. Further, these observations are consistent with the Department of Conservation guidelines for categorisation of areas of low ecological value (Davis, Head et al. 2016).

For the purposes of this EcSA, the physical habitat quality for indigenous birds was not spatially categorised across the whole HWF project area, however, we have estimated the likely bird habitat quality in the surveyed vegetation and surface-water feature areas. The estimated ecological values of the primary bird habitat areas detected in the HWF area are shown in Figure 6. Further avifauna surveys will be undertaken over the required seasons across the HWF project area, and the results of these surveys will be addressed in the EcIA.

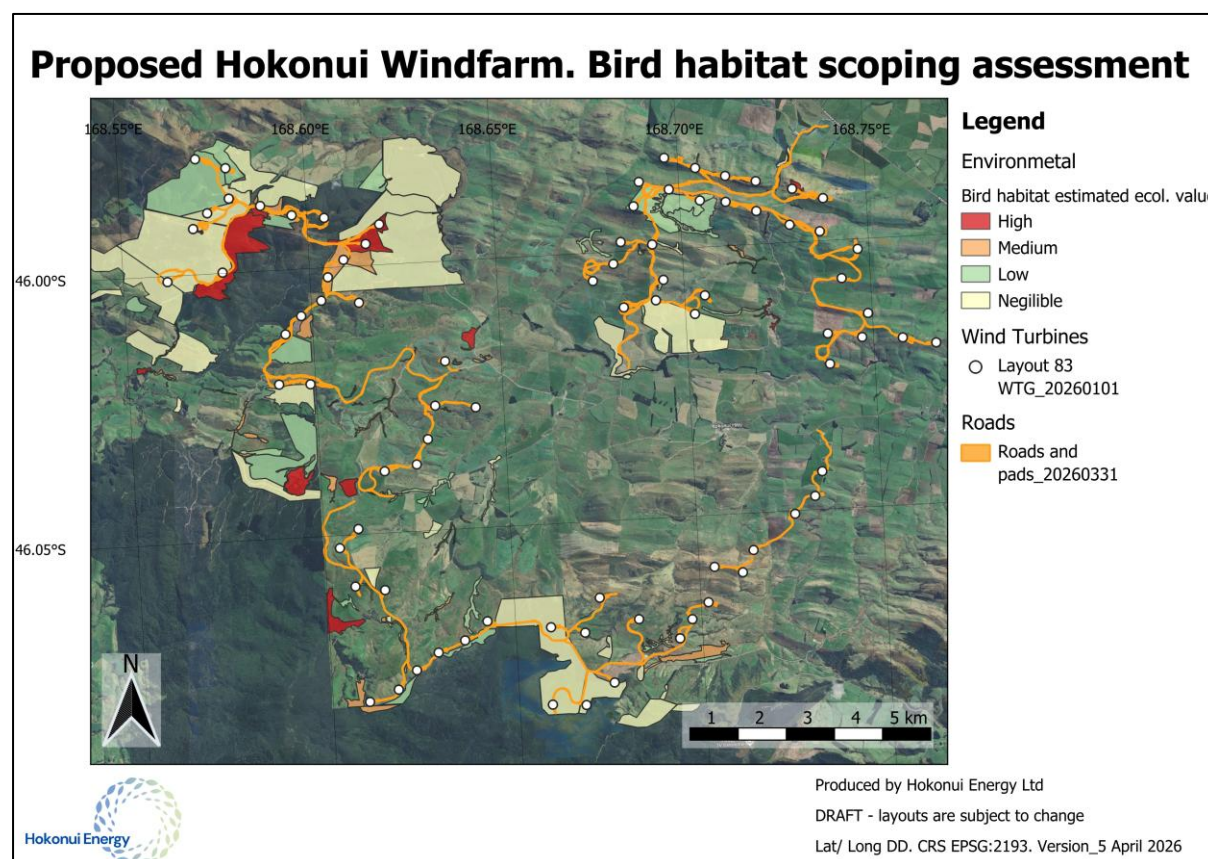


Figure 7. HWF EcSA assessed vegetation features, with a preliminary combined bird habitat ecological value classification assigned. (using EIANZ classification)

We also suggest that the fundamental bird ecology in the HWF area also be included in the EcIA avifauna assessment; especially given the variety of eco-systems present and the extensive size of the area. This wholistic approach is recommended to minimise uncertainty about avifauna impacts, and concomitantly address what is potentially this project's largest RMA ecological risk. Specifically, a wider understanding of the avifauna values within the project area will enable the impacts on birds resulting from disturbance and displacement (in addition to collision risk) to be at least partially quantified and addressed (Zwart, McKenzie et al. 2016). In this regard, the weight of European literature demonstrates the improved agency from a comprehensive understanding allows windfarms to directly address avifauna disturbance, displacement and collision risk (e.g., Pickett and White 2022), (Reichenbach 2017). A possible framework for such study is given in (Salkanović, Enevoldsen et al. 2024).

Further, potential avifauna risks are highly location and time specific (McLeod, Powlesland et al. 2002), and so by gaining a comprehensive local ecological plus spatial avifauna understanding HWF can discount or mitigate these risks from an informed position.

Windfarm Resource Consent applications in New Zealand have traditionally relied on manual bird ("avifauna") surveys and subjective assessment of the potential effects on the avifauna from the proposed windfarm. However, convention bird survey methods typically generate low confidence data. (e.g., Atkinson, Austin et al. 2006), which in turn limits the confidence in the subsequent effect

evaluation and suggested mitigation strategies (discussed in EPA 2024), and are likely to lack adequate coverage of uncommon bird species and all habitat types present (Harding and EPA 2024).

As a supplementary avifauna survey method, HEL is currently investigating the utilization of camera and AI-based technology to generate quantified bird activity data. This technology could supplement conventional bird survey methods, and address the under sampling uncertainties and poor habitat range coverage for the EcIA (Jakobsen 2023).

5.8 Indigenous Terrestrial Invertebrates and Invertebrate Habitat Features

Across the HWF area, the following invertebrates were incidentally observed: Diptera (numerous families) were ubiquitous at all elevations, especially Muscidae spp. At the lower elevation sites *Dolomedes* sp. (NZ nurse web spider) was intermittently present, some common Diptera, e.g., Agromyzids, Chloropidae, Calliphoridae, and occasional Dolichopodidae. Occasional *Lycaena* sp. butterflies were seen in the NE area of the HWF area, and Crambidae (grass moths) observed in the tussock land areas. However, there was a very low number of lepidoptera observations overall, likely reflecting the current depauperate biodiversity of the NE section of the Hokonui ED, as noted for bird diversity above.

Insect species causally observed at the rocky outcrop WTG sites included Carabidae (*Megadromus* sp./ spp.), Muscidae, Tachinidae (*Protophystricia* sp.?). Soil invertebrates were present (isopods, Collembola). There was a curious diversity of Syrphidae observed at some of the mid-elevation WTG sites in the SE part of the HWF area.

As noted in the vegetation feature classes above, the rocky outcrops are a local and ED ecologically significant feature of the HWF area. Invertebrate activity was observed at nearly all the rocky outcrop habitats. Insects and other invertebrates inevitably perform key, supporting ecological functions within those unique communities, such as pollinators, decomposers, food sources and ecological structure regulators. Where these rocky outcrop habitats are projected to be negatively impacted within the HWF project (i.e., avoidance is not possible), we recommend as best practice the EcIA include invertebrate survey data and mitigation strategies. The Ecological Impact Assessment Guidelines for New Zealand (Roper-Lindsay, Fuller et al. 2018) state that including invertebrate data in EcIA is context dependent. In that framework, we believe the invertebrates are fulfilling essential roles in these ecosystems, and so are contributing significantly to the ecological function of these sites. Further, as rare endemic species may be present (see below, although this aspect of the EcSA will be further developed in the EcIA), then survey and mitigation measures where this ecosystems type is impacted is recommended.

Of the Nationally critical and endangered conservation status insect species: iNaturalist shows the range of Mt Cook Giant Weta *Deinacrida pluvialis* extending into the Hokonui Hills; however, there are no records of this species within the project area. Further, it is highly likely the environment is not suitable, and the ecological degradation and predation is most likely too severe to support this species.

Conversely, the At Risk/ Declining species, *Sigaus campestris* (short-horned grasshopper) potentially occurs in the Hokonui Hills (Trewick, Hegg et al. 2022). The range of the Nationally Vulnerable *Sigaus australis* (central arid alpine grasshopper) theoretically extends over the Hokonui hills (iNaturalist

n.d.). (i.e., although there are no records of this species southeast of the Takatimu mountains, it could potentially occur on the exposed peaks in the Hokonui Hills).

This very short conservation status species list needs to be added to by review of the “Conservation status of New Zealand butterflies and moths (Lepidoptera)” (Hoare, Dugdale et al. 2017), “Conservation status of New Zealand Araneae (spiders)” (Sirvid, Vink et al. 2021), “Conservation status of New Zealand Hymenoptera” (Ward, Early et al. 2014), and other invertebrate Conservation status references.

5.9 Restoration Potential Sites

Several potential sites for ecological restoration opportunities have been identified within or adjacent to the HWF project area. Some of these are projected to be directly or indirectly impacted by HWF activities, however most are not.

All the potential restoration opportunities or sites are given as highlighted text in Table 2, Table 3 and Table 4.

The suggested priority ecosystems and sites for restoration (Figure 8) are:

- Protecting and enhancing the rocky outcrop communities (FN_Veg#2, 3, 41; and similar unsurveyed outcrops). Various approaches to this include linking the currently isolated nearby outcrops, and/ or improving the matrix diversity buffering the outcrops. Determining the approach that both yields the most environmentally meaningful results (see Wiser and Buxton 2008, Wiser and Buxton 2009) and is sustainable, should be considered within the EcIA.
- Restoring the currently degraded sub-alpine wetlands (FN_Water#7 and 59)
- Protecting the currently degraded river systems, such as FN_Water#63
- Protecting the currently degraded indigenous sub-alpine Bare Hill scrub area delineated as vegetation feature FN_Veg#60

It is noted that agreement of the relevant landowners has not been sought as part of this EcSA and is not implied here. HEL will undertake discussions with the relevant landowners as part of the EcIA for the substantive application.

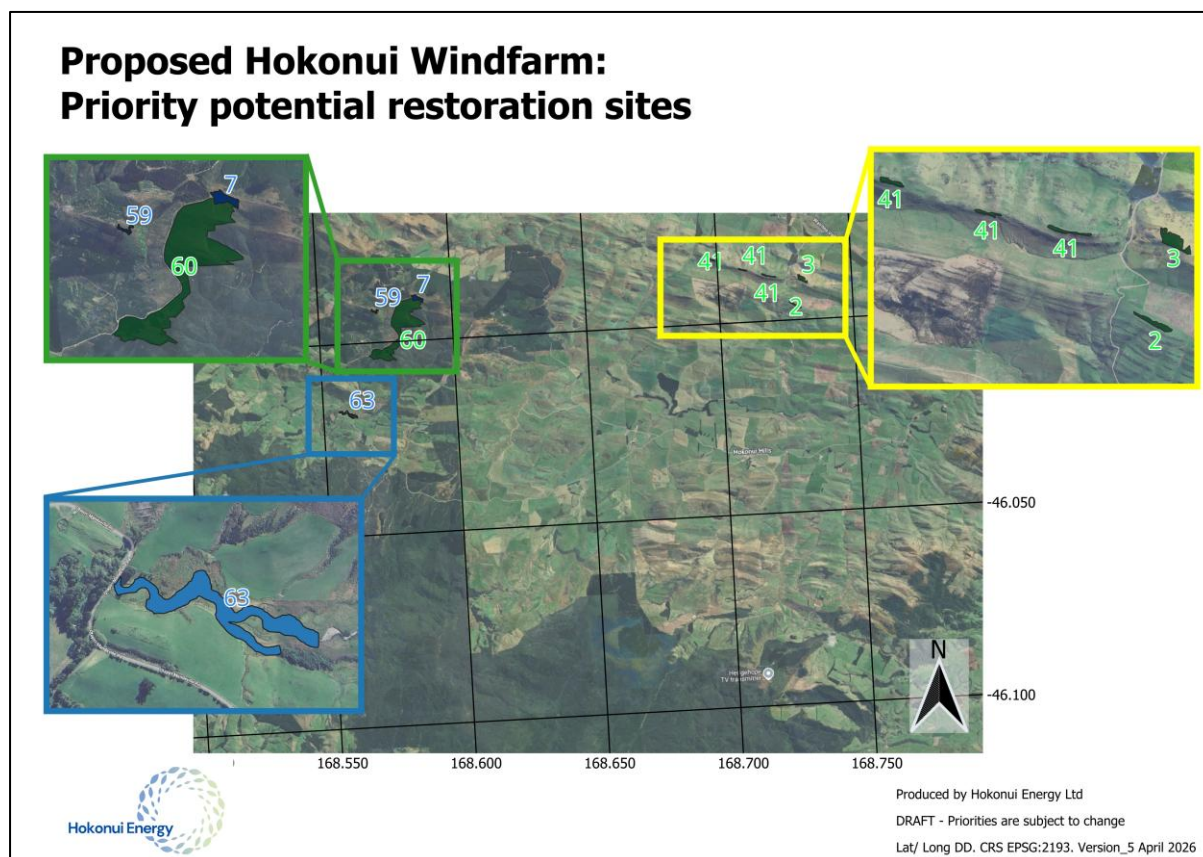


Figure 8. HWF EcSA suggested priority restoration ecosystems and sites. The vegetation features have green numbers, and the surface water features the blue numbers.

These areas will be suitable for restoration enhancement in the event offsetting and compensation is required to address any residual adverse effects of the HWF project on ecology of the site. Consideration should also be given to the wholistic indigenous biodiversity values of the Hokonui Hills and Hokonui Ecological District. If HEL were to strategically action the priority restoration suggestions, it is our opinion that the HWF project could potentially result in an overall positive effect on the ecology of the area on balance.

Conclusion

The landscape the HWF project area spans has been entirely or almost entirely modified by agricultural or exotic plantation forestry land use. As a consequence, most of the WTG sites and the majority of the proposed road routing and waterway intercepts within the proposed HWF layout, are in areas that are already highly modified and therefore of low to negligible ecological value.

Given this underlying land-use and the generally degraded ecological value of the area, along with the limited projected impacts on high-value ecological features, the HWF project area appears generally suitable for the development of a wind farm (see Jones and Pejchar 2013).

However, there are fragments of significant or potentially significant indigenous ecosystems within the HWF area. In particular, these include water courses, rocky outcrop ecosystems and sub-alpine wetlands.

Several of the WTG sites and some of the road routing is projected to impact some of these identified areas of moderate to high ecological value. It is recommended that the impact of the project on these areas is avoided to the extent practicable and HEL is currently revising the wind farm footprint to make further refinements to avoid these areas. However, it is acknowledged that avoidance is not always possible due to operational constraints. Therefore, where it is not possible to avoid these areas, mitigation measures will be implemented. This will be further assessed and detailed in the EcIA for the substantive application for the Project once the indicative wind farm layout is completed.

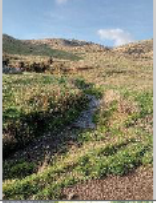
Conversely, several features that could serve as restoration for compensation or ecological offset are identified within or adjacent to the project area. These include several potentially ecologically significant features that are currently poorly protected and degraded, and ecosystems that are heavily fragmented. If these features were to be protected or enhanced, such action would yield significant ecological gains for the HWF area and Hokonui Ecological District; in addition to improving kaitiakitanga outcomes for the Hokonui Rūnanga. With ecological stewardship and strategic action of the recommended restoration measures to optimize environmental return-on-investment, it is our opinion that the HWF project could be ecologically positive on balance.

Associated with all the points above, we recommend that both the ecological losses and gains from the HWF project be considered in the wider regional ecological context in the HWF EcIA.

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Table 2. HWF waterway and wetland features EcSA assessments with preliminary combined ecological value classification assigned. Key: H = high, M = medium, L = low, N = negligible (using EIANZ classification). C = confident, P = probable U = uncertain. Divar_veg = Divaricating vegetation; Ecol. = Ecology; doug.fir = Douglas fir. Features that have potential for ecological restoration are highlighted in blue.

Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images		
1	Small stream <1m	Permanent; order 1 - 2. Moderately turbid. Stony. Invertebrates present; vegetated sides. Piped. Estimated to have moderate ecol. value	M	U	Potential sediment and disturbance ecol. impact from road upgrade and/or transport activity	Confirm ecol. impact and appropriate mitigation measures when civil design is complete			
2	Small stream <1m	Ephemeral to permanent. Heavily modified (channelled and piped) + livestock damage. Low to negligible ecol. value. Diff location to LINZ	L	P	Nil ecol. impact expected				
3	Small Stream <1m	Permanent; order 2 - 3. Pasture, grazed + heavily degraded. Low to negligible ecol. value. Potential restoration for offset	L	P	Nil ecol. impact expected	Assess restoration potential as offset			
4	Small stream <1m	Permanent; order 2. Pasture, grazed + heavily modified and degraded. Intermittent sections of fair ecol. function value	L	P	Nil ecol. impact expected				

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
5	Non-significant	Swale. Heavily modified + grazed. Negligible ecol. value	N	C	Potential elevated sediment risk during road construction	Confirm ecol. value + impact, and if sediment control measures warranted, when civil design is complete	
6	Small stream <1m	Ephemeral to permanent. Heavily modified + grazed, livestock damage. Turbid. Invertebrates, but low numbers and diversity. Low combined ecol. value	L	P	Potential elevated sediment risk during road construction	Confirm ecol. value + impact, and if sediment control measures warranted, when civil design is complete	 
7	Sub-alpine bog (may be part fen)	Sphagnum moss dominated palustrine wetland, probably oligotrophic. Partially drained/ modified; livestock access + damaged, but potentially resilient. Ecol. complexity moderate to high. Moderate to high combined ecol. value. Would be high to very high combined ecol. value score if shown to support Threaten species or is restored. Not as in LCDB	H	U	Current road routing layout bisects this feature. This will negatively effect the drainage and ecol. function of the entire wetland, reduce the size of the wetland, and increase the edge effect ecol. disruption	Confirm ecol. value + impact, and the most appropriate mitigation measures, when civil design is complete. Recommend Avoidance by road re-alignment	  

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
8	Non-significant	Damp depression. Heavily grazed + degraded. Negligible ecol. value. Not as in LINZ	N	P	Nil additional ecol. impact expected		
9	Small stream <1m	Ephemeral gullies to 3rd order stream. Heavily modified, piped + grazed. Limited spp. diversity, and low invertebrate presence. Probably low ecol. value, but warrants investigation if impacted	L	U	Nil additional ecol. impact expected	Confirm ecol. value + impact, and what mitigation measures are warranted, when civil design is complete	
10	Grassy Swale	Dry deep ephemeral gullies (+1st order stream in REC classification). Grazed. Pasture + tussock. Probably low ecol. value, but warrants investigation where impacted	L	P	Potential elevated sediment risk during road construction	Confirm ecol. value + impact, and what mitigation measures are warranted, when civil design is complete	
11	Small stream <1m	Farm stream, 1st order + small swampy area. Heavily modified, including piping + grazed. Some invertebrates present. Likely moderate to low ecol. value, but warrants	M	P	Potential low additional ecol. impact from road upgrade and/or transport activity. Current road-route does not intercept this feature	Confirm ecol. value + impact, and what mitigation measures are warranted, when civil design is complete	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
		investigation where impacted					
12	Drain	Steep. Pasture + grazed + divar_veg. Heavily sheep damaged. Small ponds lower, but induced very poor diversity. Probably low to negligible ecol. value. Restoration potential as offset	L	P	Nil ecol. impact expected	Assess restoration potential as offset	
13	Dry gullies	Steep ephemeral tributaries. Pasture, grazed + divar_veg. Likely low to negligible freshwater ecol. values; but potentially valuable terrestrial spp. habitat. Warrants investigation if impacted	L	U	Nil ecol. impact expected		
14	Gullies + <1m stream	Steep ephemeral tributaries to 1st order stream. Pasture, grazed + divar-veg in fold in hill. Probably low ecol. value. Spatially larger than as in LINZ	L	P	Nil ecol. impact expected		
15	Broad valley to ephemeral gully	Pasture, grazed + scattered divar_veg. Heavily damaged. Ecol. value negligible, especially where projected to be impacted. Larger than LINZ	N	C	Nil ecol. impact expected		

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
16	Gullies	Ephemeral where impacted. Divar_veg. + ferns + tussock. Grazed, some livestock damage. Low freshwater ecol. value; but supports moderate terrestrial spp. diversity. Restoration potential for offset . Larger than LINZ	L	P	Potential elevated sediment risk during road construction	Confirm ecol. value + impact, and if sediment control measures warranted, when civil design is complete. + Assess restoration potential as offset	
17	Broad valley + gully	Ephemeral/ intermittent where impacted. Pasture with tussock and scattered divar_veg. Grazed, degraded. Low to negligible freshwater ecol. value; but supports moderate terrestrial spp. diversity. Larger than LINZ	L	P	Nil ecol. impact expected		
18	Broad valley + potential wetland	Pasture + boggy areas + scattered shrubs. Heavily damaged. Low to negligible freshwater ecol. value. Restoration potential for offset	L	U	Nil ecol. impact expected	Confirm ecol. value + assess restoration potential as offset	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
19	Small stream <1m	Pasture, grazed. Piped. Heavily degraded. Likely negligible ecol. value	N	P	Nil ecol. impact expected		
20	Pond/ cattle wallow	Pasture, grazed. Heavy cattle damage; ecol. degraded. Small area. Likely negligible ecol. value currently. Potential as restoration for offset. Diff class to LCDB	N	U	Nil ecol. impact expected	Assess restoration potential as offset	
21	Stream ~2m	4th order. Pine + weeds + tussock margins. Low livestock access + moderate bank shade, but silty patches + regularly disturbed (ford). Fair ecol. function, with moderate invertebrate habitat diversity and abundance. Estimated moderate combined ecol. value; and as it has possibly high ED ecol. and rare spp. habitat potential, warrants full evaluation	M	U	Projected changing the river crossing from existing ford to bridge or culvert will have construction impacts + likely cause both ecological costs and benefits; including possible increase in predatory pressure upstream.	Possible high ED ecol. and rare spp. habitat potential warrants full evaluation. + The potentially ecological effects noted here need to be evaluated within the EclA, along with any construction impacts	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
22	Stream ~1m + swampy areas	Fenced (mostly). Tussock and exotic grasses. Likely moderate to high ecol. valuable. High to moderate combined ecol. value. No longer projected to be directly impacted, but if so needs to be covered in EclA	H	U	Nil ecol. impact expected	Confirm impact status when civil design is complete	
23	Gully	Pasture, grazed. Degraded. Some tussock + divar_veg. Some diversity + pattern value, but low combined ecol. value	L	C	Nil ecol. impact expected	Confirm impact status when civil design is complete	
24	Artificial dam + swampy area	Recently created (not on LINZ). Moderate sized farm lake. Potentially high ecol. context value. Moderate combined ecol. value, but hydrological isolation impact of dam unknown. If impacted, inclusion in EclA warranted	M	U	Nil ecol. impact expected	Confirm impact status when civil design is complete	
25	Stream ~1m + assoc. gullies	Fenced. Tussock and grass lined. Diverse birds and invertebrates. Moderate to high ecol. valuable. If impacted, detailed ecol. evaluation and mitigation strategy needed for EclA. Great example of wetland	H	U	The projected road routing crosses a small spur gully connected to a larger feature. However, the additional project	A detailed ecological evaluation would be prudent for the EclA, and determination if mitigation strategy warranted when	

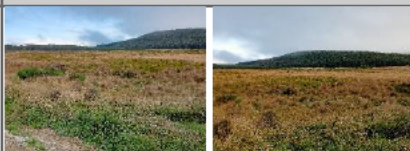
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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
		restoration potential in the area			impact is likely to be low, as the feature crossing uses an existing farm-track filled-in ford, and the impacted area is only ~0.1 hectare of a tussocky gully	ecol. value and impact is confirmed	
26	Stream 2 - 3m	3rd order stream. Bank shading vegetation and diverse habitats + invertebrates. If potential long-finned eel habitat assumption is correct, combined ecol. value is high. Not likely to be directly affected?	H	U	Nil ecol. impact expected	Confirm nil impact status when civil design is complete	
27	Steam <<1m	1st order, minor tributary. Piped. Likely moderate ecol. value. Not likely to be impacted?	M	P	Nil ecol. impact expected	Confirm nil impact status when civil design is complete	
28	Stream 1m	1st order but moderate sized and permanent stream. Tussock and shrubs shading banks; stoney and silt bottom. Low turbidity. High to moderate diversity. In forestry skidder site, so periodically damaged. Possibly high	H	U	Nil ecol. impact expected	Confirm nil impact status when civil design is complete	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
		combined ecol. value, if of high rare spp. value. Spatially different to REC					
29	Steep gullies	Ephemeral. Divar_shrubs + tussock. Potentially of low freshwater ecol. value, but potentially of some value for supporting terrestrial spp.	L	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
30	Gullies	Ephemeral to 1st order stream. Divar_veg, tussock, ferns. Not currently grazed. Likely moderate ecol. value. Where impacted warrants investigation	M	P	Additional project impact is expected to be negligible, as the feature crossing uses an existing roading infrastructure	Confirm nil impact status when civil works design is complete	
31	Gully	Ephemeral. Divar_veg., tussock, pasture. Grazed + degraded. Probably low ecol. value	L	P	Low elevated sediment risk during road construction	Confirm ecol. value + impact, and if sediment control measures warranted, when civil design is complete	
32	Wetland	Fenced; non-grazed. Appears to be in good condition; although has limited buffering. Assumed moderate diversity. Likely high combined ecol. value. Not impacted? Not in LCDB	H	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
33	Stream <1m	1 + 2 order stream. Thru farmland; piped. Grazed, livestock access. Degraded. Ecol. value likely low. Not directly affected?	L	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
34	Wetland	Tussock dominated. Not fenced;. Only moderate diversity observed, but ecol. context value likely high. Estimated as moderate combined ecol. value currently. Strong potential for restoration offset	M	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete. Assess restoration potential as offset	
35	Wetland	Tussock, herbaceous scattered divar_shrub. Fenced. Appears in good condition. Probably high ecol. value. Larger than on LCDB	H	U	Low elevated sediment risk during road upgrade	Confirm impact, and if sediment control measures warranted, when civil design is complete	
36	Gullies	Ephemeral. Divar_shrubs + tussock. Livestock access. Probably low freshwater ecol. value, but potentially of some value for supporting terrestrial spp. Not on LINZ or REC	L	P	Low elevated sediment risk during road upgrade	Confirm impact and if sediment control measures warranted, when civil design is complete	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
37	Gully	Ephemeral. Divar_vege + tussock. Livestock access + damage. Low freshwater ecol. value, but likely moderate value for supporting terrestrial spp. Not classed on REC	L	P	Low elevated sediment risk during road upgrade	Confirm impact and if sediment control measures warranted, when civil design is complete	
38	Gully	Ephemeral. Pasture, divar_veg. + tussock. Livestock access + damage. Ecol. degraded. Low freshwater ecol. value, but likely moderate value for supporting terrestrial spp. Not classed on REC	L	P	Low elevated sediment risk during road upgrade	Confirm impact and if sediment control measures warranted, when civil design is complete	
39	Stream <1m	Modest flow but 3rd order stream + associated wetland. Tussock + scattered divar_veg. Adjacent pasture + livestock access; likely degraded. Estimated as moderate combined ecol. value; but as it has high ED wide ecol. and rare spp. habitat potential, warrants full evaluation if impacted	M	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
40	Drain <1m	Permanent. Piped + channelled in sections. Pasture + tussock. Livestock access. Degraded, but some diversity and invertebrates	M	P	Road crosses feature via existing pipe. Potential low additional ecol. impact from road	Confirm ecol. value + impact, and what mitigation measures are warranted,	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
		present. Probably moderate combined ecol. value			upgrade and/or transport activity	when civil design is complete	
41	Stream ~2m	3rd order stream + assoc. gullies and boggy land. Mostly pasture + tussock margins. Some livestock access, partially degraded. However, fair biodiversity and function; some buffering. Estimated as moderate to high combined ecol. value; but as it has high ED wide ecol. and rare spp. habitat potential, warrants full evaluation where impacted	M	U	Road crosses feature existing farm bridge. Potential for moderate habitat disturbance and sediment risk from road & bridge upgrade and/or transport activity	Confirm ecol. value + impact, and what mitigation measures are most appropriate, when WTG and road routing layouts are complete (as this Mid Link Loop route may be dropped)	
42	Stream ~2m	3rd order stream + tussock-land buffer; livestock limited access. Tussock + divar_veg with scattered flax shaded banks; rock + shingle bottom. Water quality appears good. Assumed rare spp. habitat potential + high ED wide ecol. value Estimated combined ecol. high. Warrants full evaluation if impacted	H	U	Low elevated sediment risk during road upgrade	Confirm ecol. value + impact and if sediment control measures warranted, when civil design is complete	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
43	Stream <<1m	Farmside steep stream. Tussock, pasture, exotic weeds. Livestock access, damaged. Biodiverse and moderate to high endemic ecol. function; however appears hydrologically isolated. Estimate moderate combined ecol. values. Not on LINZ	M	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
44	Potential wetland	Boggy depression + tussock + kuta sedge. Grazed, livestock access, physical damaged. However, potentially moderate combined ecol. value. If directly impacted warrants full evaluation	M	U	Low elevated sediment risk during road upgrade	Confirm ecol. value + impact, and what mitigation measures are most appropriate, when WTG and road routing layouts are complete (as impacting Route 54 may be dropped)	
45	Stream <<1m	Farm stream, 1st order; small. Limited livestock access. Piped. Tussock + kuta sedge. Banks shaded, muddy bottom. Potentially moderate ecol. valuable, although degraded. Uncertain if directly impacted	M	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
46	Stream <<1m	Farm stream, 1st order. Limited livestock access. Tussock + kuta sedge. Banks shaded, muddy bottom. Low diversity but biologically functioning. Estimated moderate ecol. valuable, but would be high if has rare spp. value. Uncertain if directly impacted	M	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
47	Stream <<1m	Farm stream, 1st order + gullies. Limited livestock access. Tussock + sedge; some dense divar shrubs. Banks shaded. Although degraded, fair ED ecol. context value. Moderate freshwater ecol. value, but possibly value for supporting terrestrial spp.	M	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
48	Stream <1m	1st order. Tussock and sedge buffer + small boggy area. Banks shady. Some livestock access + damage. Although degraded, fair to potentially high ecol. context score. Estimated moderate combined ecol. value. Restoration potential as offset	M	U	Road may cross feature via existing pipe. If it does there will be an elevated sediment risk during road upgrade	Confirm ecol. values + impact status when WTG and road routing layouts are complete (as impacting Route 54 may be dropped). Assess restoration potential as offset	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
49	Stream <1m	Farm stream, 2nd order. Piped + channelled. Pasture + tussock margins + small boggy areas. Some bank shading, muddy bottom. Livestock access, heavily ecol. degraded. Negligible combined ecol. value. Restoration potential as offset	N	P	Subsequent road routing may be adjacent to this feature. However, HWF project activities are not forecast to lead to worst ecol. outcome here	Confirm impact status when WTG and road routing layouts are complete. Assess restoration potential as offset	 
50	Swale	Grasses, exotic weeds, scattered kuta sedge. Livestock access, physical damage. Likely low ecol. value	L	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
51	Stream ~1m	Farm stream, 3rd order. Pasture, scattered kuta sedge margins. Intermittent bank shading; rock + gravel bottom. Connected to small wetland. However, heavily degraded and periodic disturbance. Likely low to negligible ecol. value currently. Restoration potential as offset, including rare spp. values	L	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete. Assess restoration potential as offset	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
52	Swale to 1m stream	1st order but high-volume stream. Grasses, exotic weeds, trees. Fenced. Bank shady, rock and muddy bottom. High ecol. value estimate, with assumed high rare spp. score	H	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete	
53	Pond	Small pond + localised wetland. Pasture + kuta sedge. Livestock access + hydrologically isolated. Low ecol. value. Extent different to LINZ. Restoration potential as offset.	L	C	Low risk of habitat disturbance and sediment incursion from road upgrade and/or transport activity	Confirm impact, and what mitigation measures are most appropriate, when WTG and road routing layouts are complete. Assess restoration potential as offset	
54	No water course	Not as in LINZ	N	C			
55	Gully to stream	Gullies to 2nd order stream. Tussock, divar_veg, flax. Livestock access, damaged. Moderate ecol. value. Restoration potential as offset	M	P	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete. Assess restoration potential as offset	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
56	Gully, minor	Likely intermittent waterflow, not in REC. Pasture, kuta sedge throughout. Livestock access, damaged and degraded. Estimated low ecol. value currently. Restoration potential as offset	L	P	Likely habitat disturbance and sediment incursion from adjacent road upgrade and/or transport activity	Confirm impact, and what mitigation measures are most appropriate, when WTG and road routing layouts are complete. (Avoidance by road re-alignment). Assess restoration potential as offset	
57	Gully	Steep gullies + 1st order waterway. Pasture, kuta sedge. Livestock access, damaged and degraded. Induced poor waterway diversity. Likely low ecol. value currently	L	U	Potential habitat disturbance and likely sediment incursion from adjacent road upgrade and/or transport activity	Confirm ecol. value + impact, and what mitigation measures are most appropriate, when WTG and road routing layouts are complete.	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
58	Gully to Stream	Farm gully to 1st order stream. Pasture, kuta sedge, divar_veg. + associated small tussocky bog. Livestock access, degraded. Although fair pattern value and moderate diversity and ecol. function value, likely low total ecol. value currently. Restoration potential as offset	L	P	Elevated sediment risk during road upgrade	Confirm ecol. value + impact, and if sediment control measures warranted, when civil design is complete. Assess restoration potential as offset	
59	Sub-alpine bog	Sphagnum moss dominated palustrine oligotrophic wetland. Divar_veg, kuta sedge, tussock, ferns, with scattered exotic weeds. Deer, pig and forestry damage, but potentially resilient. Ecol. complexity fair to high. Non-unique locally, but unknown ED and national value. Threatened species value probable, although a small area. Probably high combined ecol. value. Not classified in LCDB. Warrants further investigation	H	U	Subsequent road routing may bisect this feature. This will negatively effect the ecol. function of ~20% of this wetland feature. The feature is also at risk of shading from Doug. fir planting	Confirm ecol. value + impact, and the most appropriate mitigation measures, when WTG and road routing layouts are complete. Recommend Avoidance by road re-alignment and protection from Doug. fir via vege. mang. plan	

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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
60	Stream<1m	Steep, 1st order. Divar_shrubs and weedy exotics. Thru exotic plantation. Piped. Unknown ecol. value	L	P	Low elevated sediment risk during road upgrade	Confirm ecol. value + impact, and if sediment control measures warranted, when civil design is complete	
61	Gully to swale	Intermittent waterflow gullies to small 1st order stream. Divar_veg, dense in parts + some pasture with scattered divar_veg. Appears limited livestock access. Waterway ecol. value likely moderate, but support for terrestrial spp. possible. Warrants evaluation	M	P	Projected road routing crosses feature near existing farm track. Likely elevated sediment risk during road upgrade	Confirm ecol. value + impact, and the most appropriate mitigation measures, when civil works design is complete	
62	Stream 1 - 3m	3rd order stream. NZ + exotic trees, sedge, divar_veg. Fenced + partially protected. Estimated high total ecol. value when assume there is rare spp. habitat	H	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing layouts are complete. Assess restoration potential as offset	
63	Stream 2 - 3m	3rd order stream. Scattered exotic + divar_veg. Fenced and partially protected, but livestock access + probably	M	U	Nil ecol. impact expected	Confirm nil impact status when WTG and road routing	

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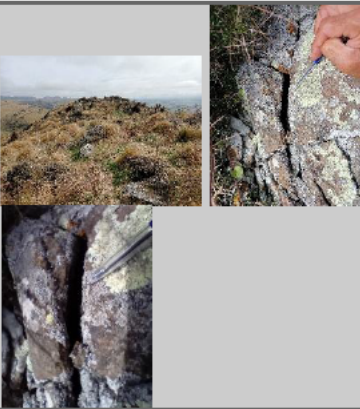
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Water feature FN no.	Environment type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
		ecol. degraded. Probably moderate combined ecol. value, even when assuming rare spp. habitat. Excellent restoration potential as offset				layouts are complete. Assess restoration potential as offset.	
64	Artificial dam	In-farm lake, only ~0.1ha. Likely hydrologically isolated. Ecol. context value unknown, but likely low combined ecol. value.	L	U	Elevated sediment risk during road upgrade	Confirm ecol. value + impact, and the most appropriate mitigation measures, when civil works design is complete	

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Table 3. HWF WTG sites EcSA assessments with preliminary combined ecological value classification assigned. Key: H = high, M = medium, L = low, N = negligible (using EIANZ classification). C = confident, P = probable U = uncertain. Divar_veg = Divaricating vegetation; Ecol. = Ecology; doug.fir = Douglas fir. Features that have potential for ecological restoration are highlighted in blue.

HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A1	55	Tussock + divar_veg ridge	Tussock, divar_veg + exotic weeds. Grazed + heavily damaged. No lizard sign, but potential habitat. Ecol. values moderate - less than adjacent WTG sites due to livestock damage. Restoration potential as offset	M	P	Possible destruction of herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards relocation and offset calc, or preferably habitat restoration	
A2	NA	Rocky outcrop + divar_veg	Grazed pasture + scattered divar_shrubs. Lizard habitat likely. Heavily modified but potentially high ecol. value. Warrants additional evaluation	H?	Not assessed. Warrants full evaluation	Probable herptofauna habitat loss	Veg., herp. and invert evaluation; toward impact minimization through avoidance, or herp. relocation and offset calc, or preferably habitat restoration.	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A3	4	Tussock + divar_veg ridge	High density prostrate divar_veg. Grazed, damaged; livestock campsite nearby. No lizard sign; but likely habitat. Invertebrates common. Heavily modified, but ecol. value likely high to moderate. Herpetological relocation sites available on immediately adjacent ridge line	H	U	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through micro-siting	
A4	44	Outcrop on ridge	Tussock and mature divar_veg. Inverts (flies) active. No lizard seen, but possibly present. Re-location sites immediately adjacent. Non-unique, but ecol. value possibly high. Warrants further evaluation	H	U	Disturb probable herptofauna habitat	Veg., herp. and invert evaluation; towards impact minimisation through micro-siting	
A5	1	Rocky outcrop + divar_veg	Grazed pasture + scattered divar_shrubs. Lizard habitat likely. Heavily modified but potentially high ecol. value. Warrants additional evaluation	H	P	Disturb probable herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through micro-siting	
A6	NA			Not assessed. Warrants evaluation		Possible herptofauna habitat loss	Herp. evaluation	
A7	NA			Not assessed. Warrants evaluation		Possible herptofauna habitat loss	Herp. and invert evaluation	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A8	6	Tussock + pasture flat ridge	Heavily grazed + cattle damage. Occasional scattered matagouri + thistles. Likely low ecol. value	L	C	Displacement of local low ecol. function	Veg. and ecol. function evaluation.	
A9	5	Tussock + divar_veg ridge	Tussock + scattered divar_veg. Cattle grazing + damage. Possible lizard habitat. Ecol. value uncertain, but possibly moderate	M	U	Displacement of local ecol. function	Veg. and ecol. function evaluation.	
A10	NA			Not assessed. Warrants evaluation		Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation	
A11	3	Pasture + divar_veg ridge	Pasture + scattered divar_veg and tussock. Heavily modified, degraded. Ecol. value uncertain, possibly moderate	M	U	Displacement of local ecol. function	Veg. and ecol. function evaluation.	
A12	2	Pasture + divar_veg ridge	Possible lizard sign. Heavily modified, but potentially high ecol. valuable	H	P	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through micro-siting	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A13	NA			Not assessed. Warrants evaluation		Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation	
A14	NA			Not assessed. Warrants evaluation		Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. evaluation	
A15	7	Rocky outcrop + divar_veg	Healthy divar-veg + flax + tussock. No lizard sign, although appears highly suitable habitat. Invertebrates active. Probable high ecol. value	H	P	Access road will remove probable herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimization through micro-siting	
A16	NA	Tussock + divar_veg ridge	Potential lizard habitat. Likely of moderate to low value, although ecol. value uncertain. Warrants further evaluation	Not assessed. Warrants evaluation		Disturb possible herptofauna habitat. Displacement of local ecol. function	Herp., veg. and ecol. function evaluation.	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A15 (A17?)	58	Rounded hilltop	Tussock. Heavily grazed and damaged. Likely low to very low ecol. value	L	C			
A18	70	Flat ridge. Tussock + divar_veg	Heavily grazed + cattle damage. Possibly low ecol. value; but uncertain of diversity and ecol. function scores. Warrants further investigation	L	U	Displacement of local low ecol. function	Veg. and ecol. function evaluation.	
A19	8	Tussock + divar_veg ridge	Tussock and scattered divar_veg. Grazed heavily. Low combined ecol. value	L	C	Displacement of local low ecol. function	Herp., veg. and ecol. function evaluation.	
A20	10	Rounded secondary ridge	Pasture + exotic weeds. Grazed. Not lizard habitat. Negligible ecol. value	N	C	Displacement of local low ecol. function	Herp. evaluation	
A21	NA		Tussock. Grazed. Possible lizard habitat.	Not assessed. Warrants evaluation		Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A22	9	Tussock + divar_veg ridge	Tussock and divar_veg, some dense. Grazed. Likely lizard habitat. Likely ecol. valuable	M	P	Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp, veg. and ecol. function evaluation; toward herp. relocation and offset calc.	  
A23	56	Broad ridge; bouldery	Pasture + divar_veg + exotic weeds. NZ fly spp. present. Lizard sign. Likely of moderate to high ecol. value, although ecol. value uncertain. Warrants further evaluation	H	U	Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation; towards impact minimization through avoidance	 
A24	NA		Pasture and scattered divar_veg	Not assessed. Warrants evaluation		Displacement of local low ecol. function	Herp. evaluation	
A25	NA		Pasture and scattered divar_veg	Not assessed. Warrants evaluation		Displacement of local low ecol. function	Herp. evaluation	
A26	NA		Pasture	Not assessed.		Likely negligible impact		
A27	NA		Pasture	Not assessed.		Likely negligible impact		

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
A28	NA		Pasture and scattered divar_veg	Not assessed. Warrants evaluation		Displacement of local low ecol. function	Herp. evaluation	
A29	NA		Pasture and scattered divar_veg	Not assessed. Warrants evaluation		Displacement of local low ecol. function	Herp. evaluation	
A30	NA		Tussock. Grazed. Possible lizard habitat.	Not assessed. Warrants evaluation		Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation	
A31	NA		Tussock. Grazed. Possible lizard habitat.	Not assessed. Warrants evaluation		Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation	
REMOVED FROM LAYOUT	44	Broad ridge	Pasture + farm road. Adjacent to farm buildings. Grazed + high use farming traffic. Non- unique. Negligible ecol. value	N	C			
REMOVED FROM LAYOUT	42	Broad hilltop	Arable crop land + tussock. Non-unique. No lizard. Estimated as low ecol. value	L	P			

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
B1		Vegetated spur	Exotic plantations. Young doug.fir + weedy pines. Non-unique. Likely negligible ecol. value	Not assessed	.	Likely negligible impact		
B2	61	Vegetated spur	Exotic plantations. Young doug.fir + weedy pines. Deer and pigs. Non-unique. Negligible ecol. value	N	C	Likely negligible impact		
B3	28	Vegetated spur	Exotic plantations. Young doug.fir + weedy pines + broom + scattered divar_veg. Deer and pig damage. Non-unique. Likely low ecol. value	L	C	WTG site adjacent to FN water feature #59. Impact TBC	Wetland, herp. and invert evaluation; towards impact avoidance and wetland restoration/vegetation management plan	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
B4	27	Vegetated knoll	Exotic plantation. Low ecol. diversity + non-unique. Probably negligible ecol. value	N	C	Displacement of local low ecol. function	Confirm required minimum action	
B5	26	Exotic plantation	Mature pines, possibly non-maintained. Low ecol. diversity + non-unique. Probably negligible ecol. value	N	P	Displacement of local low ecol. function	Confirm required minimum action	 
B6	NA	Sphagnum moss dominated palustrine wetland, probably oligotrophic.	Partially drained/ modified; livestock access + damaged, but potentially resilient. Ecol. complexity moderate to high. Moderate to high combined ecol. value.	H		Destruction of likely significant wetland habitat	Wetland, herp. and invert evaluation; towards impact avoidance	see wetland feature FN #7
B7	25	Rocky outcrop + divar_veg	Tussock + scattered divar_shrubs. Grazed. Cattle damage. Lizard sign detected. Heavily modified but potentially moderate ecol. valuable	M	P	Destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation; towards herp. relocation	 
B8	NA		Scattered divar_shrubs. Grazed? Heavily modified but potentially moderate ecol. valuable	Not assessed. Warrants evaluation		Displacement of local low ecol. function. Possible destruction +/- or disturb. herptofauna habitat	Veg., herp. and invert evaluation; towards herp. relocation	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
B9	48	Vegetated ridge	Exotic plantation + tussock, divar_shrubs, exotic weeds. Degraded, non-unique. Probably low ecol. value. Uniform area, so ecol. impact possibly difficult to mitigate	L	C	Likely negligible impact		
B10	47	Vegetated hilltop	Tussock, divar_veg + boundary of exotic plantation. Probably lizard habitat. Re- location sites immediately adjacent. Non-unique, but ecol. value likely moderate to high. Warrants further evaluation.	H	U	Destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation. Assess for herp. relocation or ecol. restoration via veg. mang. plan	
B11	46	Vegetated plateau	Exotic plantation + tussock, divar_shrubs, kuta sedge, exotic weeds. Modified but ecol. diverse. Ecol. value possibly moderate, but uncertain as a wet and possibly non-robust environment. Direct impact uncertain	M	U	Possible destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation; toward herp. relocation	
B12	45	Exotic plantation	Young doug.fir + tussock, gorse, broom, divar_shrub. Modified but ecol. diverse. Ecol. value possibly moderate, but uncertain. Direct impact uncertain, possibly high	M	U	Possible destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation. Assess for herp. relocation or ecol. restoration	

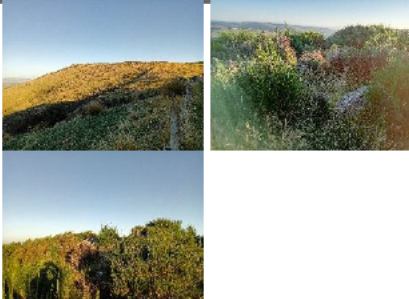
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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
							via veg. mang. plan	
B13	43		Tussock	Not assessed. Warrants evaluation		Destruction of low value vege. Possible destruction +/- or disturb. herptofauna habitat	Veg., herp. and invert evaluation; toward herp. relocation and/or local ecol. restoration	
B14	42	Grassy knoll	Pasture + artificial rock pile. Heavily modified + non-unique. Probably negligible ecol. importance, but ecol. value uncertain due to physical diversity value	N	U	Likely negligible impact		
B15	41	Grassy knoll	Pasture + artificial rock pile. Heavily modified, non-unique. Probably negligible ecol. importance, but ecol. value uncertain due to physical diversity value	N	U	Likely negligible impact		
B16		Ridge	Tussock, gorse + mixed exotic grass spp. Scattered boulders. Livestock + deer access. Ecol. value likely low to medium potential; although uncertain.	Not assessed. Warrants evaluation		Damage to low value vege. Possible disturb. herptofauna habitat.	Veg., herp. and invert evaluation; toward herp. relocation and/or local ecol. restoration	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
B17	24	Weedy rocky knoll	Broom, gorse + short rocky outcrop. Skink present (observed). Non-unique, but ecol. value likely high. Warrants further evaluation	H	P	Destruction +/- or disturb. herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through WTG micro- siting	
B18	18	Broad ridge	Pasture with scattered exotic weeds + tussocks. Grazed. Non-lizard habitat. Probably low ecol. value	L	C	Displacement of local low ecol. function	Herp. evaluation.	
B19	17	Shoulder of ridge	Pasture + exotic weeds. Grazed. Non-lizard habitat. Low ecol. value. [NB, WTG site may shift to nearby flat ridge, which I classify as: "Pasture with scattered tussock and occasional divar_shrub; grazed. Not likely lizard habitat. Likely low ecol. value"]	L	C	Displacement of local low ecol. function	Herp. evaluation.	
B20	16	Broad ridge	Pasture, scattered tussock + boulders. Grazed. No lizard sign found, but possible habitat. Non-unique. Ecol. value probably moderate, although uncertain	M	U	Displacement of local ecol. function. Possible disturb. herptofauna habitat	Herp., veg. and ecol. function evaluation; toward avoidance, herp. relocation and offset calc.	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
B21	15	Short broad ridge	Tussock, pasture, divar_veg. Scattered boulders. Potential lizard habitat. Possible moderate ecol. value, although currently cattle damaged	M	P	Displacement of local ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation and offset calc.	
B22	13	Broad hilltop	Pasture + scattered tussock. Non-unique. No lizard sign. Likely low ecol. value	L	C	Displacement of local low ecol. function	Herp. evaluation.	
B23	14	Broad ridge	Pasture with scattered tussock + divar_veg. Ecol. value likely low	L	P	Displacement of local low ecol. function	Herp. evaluation.	
B24	30	Vegetated knoll	Exotic plantation + exotic weeds. Non-unique. Negligible ecol. value	N	C	Likely negligible impact		
B25	NA		Exotic plantation + exotic weeds. Non-unique. Likely negligible ecol. value	Not assessed.		Likely negligible impact		
B26	NA		Pasture and tussock. Likely negligible ecol. value	Not assessed.		Displacement of local likely low ecol. function	Herp. evaluation.	
C1	19	Shoulder of ridge	Pasture with scattered tussock; grazed. Likely low ecol. value] [Assessed remotely]	N	P	Displacement of local low ecol. function	Herp. evaluation.	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
C2	20	Broad hilltop	Pasture; grazed. Likely negligible ecol. value [Assessed remotely]	N	P	Displacement of local low ecol. function	Herp. evaluation.	
C3	21	Undulating broad ridge	Pasture with occasional rocks. Grazed. No lizard sign. Not lizard likely habitat. Ecol. value likely negligible	N	P	Displacement of local low ecol. function	Herp. evaluation.	
C4	NA	Grassy knoll	Pasture and scattered gorse. Grazed and degraded. Non-unique. Possibly moderate diversity and ecol. function, but probably negligible combined ecol. value	Not assessed, warrants evaluation		Displacement of local likely low ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary and offset calc.	
C5	60	Grassy knoll	Pasture and sparse kuta sedge. Grazed and degraded. Non-unique, probably low ecol. value	L	C	Likely negligible impact	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C6	50	Grassy knoll	Pasture and sparse kuta sedge. Grazed and degraded. Non-unique, probably low ecol. value	L	C	Likely negligible impact	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C7	NA	Pasture	Grazed. Non-unique, probably low to negligible ecol. value	N		Likely negligible impact	Herp., veg. and ecol. function	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
							evaluation; toward herp. relocation if necessary. Avoid damage to nearby rocky outcrop	
C8	NA	Rocky outcrop	Tussock, + divar_veg. Livestock access. Potential lizard habitat. Inverts values possible. Likely moderate to high ecol. value.	Not assessed. Warrants evaluation		Destruction +/- or disturb. herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through WTG micro- siting	
C9	NA	Broad ridge	Pasture and sparse kuta sedge. Grazed and degraded. Non-unique, probably low ecol. value	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C10	NA	Broad ridge	Pasture and sparse kuta sedge. Grazed and degraded. Non-unique, probably low ecol. value	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C11	NA	Forested hilltop	Exotic plantation. Non-unique. Likely negligible ecol. value	Not assessed.		Displacement of local likely	Veg. and ecol. function	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
				Warrants evaluation		low ecol. function	evaluation; toward offset if warranted	
C12		Broad ridge	Pasture and tussock	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C13	39	Cultivated slope	Exotic plantation + cultivated paddock. Non-unique. NZ Harrier present. Low diversity ecol. and fair ecol. service value. Potentially low combined ecological value	N	C	Possible avifauna effects	Bird and ecol. function evaluation; toward offset of avoidance if warranted	
C14	NA	Forested hilltop	Exotic plantation, mixed age pine. Non-unique. Moderate ecol. function value. Likely negligible combined ecol. value	Not assessed		Displacement of local likely low ecol. function	Veg. evaluation	
C15	NA	Broad ridge	Pasture and tussock	Not assessed. Nearby scrub + gully features warrant evaluation		Likely negligible impact	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary. Minimize damage to nearby scrub + gully	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
C16	NA	Broad ridge	Pasture and tussock	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C17	40		Pasture and tussock	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary	
C18	34	Grassy ridge + mixed shrubs	Tussock, + unDed veg. Potential lizard habitat. Inverts values possible. Possible moderate to high ecol. value	L	U	Destruction +/-or disturb. possible herptofauna habitat. Damage to vege and ecol. context function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary, and/or offset calc. if warranted	
C19	NA	Flat ridge.	Pasture-tussock boundary. Non-unique. Ecol. value considered low, but possibly negligible.	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp. evaluation; toward herp. relocation if necessary	
C20	NA	Shallow valley	Tussock + pasture. Potential lizard habitat. Inverts values possible.	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp. evaluation; toward herp. relocation if necessary	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
C21	NA	Flat ridge with isolated outcrops.	Tussock. Potential lizard habitat. Inverts values possible. Likely moderate to high ecol. value.	Not assessed. Warrants evaluation		Destruction +/- or disturb. possible herptofauna habitat. Damage to vege and ecol. context function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary, and/or offset calc. if warranted	
C22	NA	Flat ridge with isolated outcrops.	Tussock. Potential lizard habitat. Inverts values possible. Likely moderate to high ecol. value.	Not assessed. Warrants evaluation		Destruction +/- or disturb. possible herptofauna habitat. Damage to vege and ecol. context function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary, and/or offset calc. if warranted	
C23	NA	Flat ridge with isolated outcrops.	Tussock. Potential lizard habitat. Inverts values possible. Likely moderate to high ecol. value.	Not assessed. Warrants evaluation		Destruction +/- or disturb. possible herptofauna habitat. Damage to vege and ecol. context function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary, and/or offset calc. if warranted	
C24	NA	Slope	Pasture-tussock boundary. Non-unique. Ecol. value considered low, but possibly negligible.	Not assessed. Warrants evaluation		Displacement of local likely low ecol. function	Herp. evaluation; toward herp.	

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
							relocation if necessary	
C25	NA	Ridge + outcrops	Div_veg + possible extended outcrop system. Possible moderate to high ecol. value.	Not assessed. Warrants evaluation		Likely destruction +/- or disturb. herptofauna habitat. Damage to vege and ecol. context function	Herp., veg. and ecol. function evaluation; toward herp. relocation if necessary, and/or offset calc. if warranted	
C26	NA	Broad ridge	Pasture	Not assessed.		Likely negligible impact		
REMOVED FROM LAYOUT	22	Ridge	Gorse + mixed exotic grass spp. Occasional boulders. Livestock + deer access. Ecol. value considered currently low but medium potential; although uncertain.	L	U			
REMOVED FROM LAYOUT	23	Grassy saddle	Pasture. Surrounded by dense gorse stands. Probably negligible ecol. value	N	P			
REMOVED FROM LAYOUT	29	Vegetated knoll	Exotic plantation + exotic weeds. Non-unique. Negligible ecol. value	N	C			

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
REMOVED FROM LAYOUT	31	Pasture + exotic weed knoll	Weedy, degraded. Heavily modified. Ecol. value likely negligible to low, but uncertain due to possible local ecol. services provided	L	U			
REMOVED FROM LAYOUT	32	Vegetated knoll	Margin of exotic plantation + exotic weeds. Non-unique. Probably negligible ecol. value	N	C			
REMOVED FROM LAYOUT	33	Vegetated slope	Exotic plantation (WTG site on forestry road). Some ferns. Non-unique. Probably negligible ecological value	N	C			 
REMOVED FROM LAYOUT	35	Vegetated knoll	Pasture; heavily grazed. Non- unique, probably negligible ecol. importance	N	C			 
REMOVED FROM LAYOUT	36	Vegetated flat spur	Pasture-exotic plantation boundary. Non-unique, probably negligible ecol. importance	N	C			

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
REMOVED FROM LAYOUT	37	Cultivated slope	Cultivated paddock. Near shelter belt and rocky outcrop. Non-unique. Negligible ecol. value	N	C			
REMOVED FROM LAYOUT	38	Vegetated slope	Exotic plantation, mixed age pine. Non-unique. Moderate ecol. function value. Negligible combined ecol. value	N	C			
REMOVED FROM LAYOUT	49	Small ridge	Pasture. Grazed. Not lizard sign; probably not lizard habitat. Limited invertebrates present. Negligible ecol. value	N	C			
REMOVED FROM LAYOUT	51	Rocky knoll	Pasture + scattered divar_veg. Lizard sign found; skink likely, no gecko seen (crevasses searched extensively). Likely of high ecol. value	H	C			
REMOVED FROM LAYOUT	52	Vegetated saddle	Pasture; heavily grazed. On farm track. Negligible ecol. value	N	C			
REMOVED FROM LAYOUT	53	Broad hilltop	Pasture + scattered tussock; occasional boulders. Grazed; livestock disturbance. Non- unique. No lizard sign; not likely habitat. Probably low ecol. value	N	P			

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
REMOVED FROM LAYOUT	54	Broad low ridge	Pasture + strip of tussock. Occasional rocks. Grazed, livestock access; ecol. degraded. Adjacent exotic plantation. No lizard sign, but possibly habitat. Prob low ecol. value, but warrants further evaluation	L	P			
REMOVED FROM LAYOUT	57	Rounded secondary ridge	Exotic plantation + Pasture boundary. Probably negligible ecol. value	N	C			
REMOVED FROM LAYOUT	59	Rocky outcrop peak	Tussock, pasture, divar_veg. Livestock access + damage, plus rabbits. Ecol. degraded. Limited lizard sign, likely suitable habitat. Inverts active. Possibly high ecol. value. Restoration potential as offset, if drop WTG site to nearby saddle to SW	H	U			
REMOVED FROM LAYOUT	62	Minor hilltop	Pasture + exotic weeds. Occasional rocks. Grazed. No lizard sign; not considered potential habitat. Low ecol. value	L	C			
REMOVED FROM LAYOUT	63	Pasture + divar_veg ridge	Pasture + scattered divar_veg and tussock. Grazed + heavily modified. No lizard sign; habitat suitability unknown. Possibly low ecol. value, but ecol. value uncertain. Warrants further evaluation	L	U			

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
REMOVED FROM LAYOUT	64	Vegetated knoll	Grazed and exotic weeds. Ecol. degraded. Non-unique. Probably negligible ecol. value	N	P			
REMOVED FROM LAYOUT	65		[Not assessed. Warrants evaluation]					
REMOVED FROM LAYOUT	66	Broad ridge	Pasture + exotic weeds + occasional divar_veg. Heavily affected by livestock. Low ecol. value	N	P			 
REMOVED FROM LAYOUT	67	Undulating ridge	Pasture + tussock. Livestock + pig access + moderate damage. No lizard sign. Ecol. value likely negligible, but may be low	L	U			  
REMOVED FROM LAYOUT	68	Vegetated knoll	Pasture + gorse. Ecol. degraded. Non-unique. Probably negligible ecol. value	N	C			
REMOVED FROM LAYOUT	69	Vegetated flat spur	Exotic plantation (2nd gen) + gorse and scattered divar_shrubs. Lots of deer. Probably negligible ecol. value	N	C			 

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HEL 9/10 WTG no.	Rev E WTG no.	Environment Type	Description	Ecol. value	Confidence	Estimated ecol. impact	Additional assessment suggested	Images
REMOVED FROM LAYOUT	71	Vegetated plateau	Exotic plantation + gorse. Probably negligible ecol. value	N	P			
REMOVED FROM LAYOUT	72	Weedy spur	Broom + gorse. Ecol. degraded. Non-unique. Probably negligible ecol. value	N	P			

Table 4. HWF Vegetation features EcSA assessments with preliminary combined ecological value classification assigned. Key: H = high, M = medium, L = low, N = negligible (using EIANZ classification). C = confident, P = probable U = uncertain. Divar_veg = Divaricating vegetation; Ecol. = Ecology; doug.fir = Douglas fir. Features that have potential for ecological restoration are highlighted in blue.

Veg feature FN no.	Environment Type	Description	Ecol. value	Confidence	Images
1	Exotic plantation	Douglas fir. Probably negligible ecol. value	N	C	
2	Divar_veg	Matagouri dominated. Lizard habitat. Potentially high combined ecol. value score, when applying a high ecol. function value (uncertain of)	H	U	

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3	Divar_veg on rocky outcrop	Matagouri dominated. Lizard habitat. Potentially high combined ecol. value score, when applying a high ecol. function value (uncertain of)	H	U		
4	Mixed Scrub	Matagouri + gorse dominated. Moderate ecol. value. Probably not directly affected	M	C		
5	Pasture + gorse + divar_veg	Sparse and dry. Non-unique. Probably low total ecol. value, even with moderate ecol. function score	L	P		
6	Gorse, broom, divar_veg, weedy pines	Heavily mod + grazed, deer and pig. Non-unique. Degraded but probably moderate ecol. value at the ED level	M	P		
7	Gorse, broom, divar_veg	Heavily mod + grazed, deer and pig. Low to negligible total ecol. value, although ecol. function potentially intermittent high	L	U		

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8	Exotic plantation	Mixed exotic. Heavily modified and weedy. Negligible total ecol. value; although moderate ecol. function score	N	C		
9	Exotic plantation + weeds	Mixed age and spp. plantation. Deer present. Non-unique. Probably low total ecol. value; via likely low to moderate ecol. function scores. Different classification + area to that in LCDB	L	P	 	
10	Exotic plantation	Mixed exotic plantation + broom. Negligible ecol. value; although likely moderate ecol. function score. Different classification to that in LCDB	N	C		
12	Mixed exotic	Exotic plantation + weeds. Non-unique; ecol. isolated. Negligible total ecol. value	N	C		
13	Mixed exotic	Exotic plantation + weeds. Non-unique + isolated. Negligible ecol. value	N	C		
14	Exotic weeds	Scattered broom & gorse. Non-unique; but moderate diversity. Probably negligible ecol. value	N	P		
15	Mixed exotic	Pasture + exotic plantation. Non-unique; negligible diversity but some ecol. function. Negligible total ecol. value	N	C		

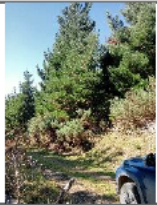
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16	Mixed exotics	Exotic plantation + weeds (mainly broom). Non-unique. Negligible total ecol. value; although some diversity and ecol. function value. Not as classified in LCDB	N	C		
17	Mixed exotics	Dense broom + gorse + pasture. Non-unique. Negligible total ecol. value; although some diversity and ecol. function value. Area much larger than shown in LCDB	N	C		
18	Mixed exotic	Exotic plantation (mostly eucalyptus). Non-unique. Negligible total ecol. value; although likely moderate ecol. function value	N	P	 	
19	Manuka + gorse	Dense, moderate age scrub + shallow swale. Connected to large protected area. Moderate to low ecol. value; uncertain of ecol. context value	M	U		
20	Manuka + gorse	Dense scrub. Songbirds present, invertebrates abundant. Moderate ecol. potential. Area of direct impact projected to be limited to the margin of a large area of regenerating forest; but warrants determination of extent of area impacted	M	P	 	
21	Manuka + gorse	Dense scrub. Moderate ecol. value. Invertebrates abundant. Probably low total ecol. value; although has moderate ecol. representative and function potential. Area of direct impact projected to be limited to the margin of a large area of regenerating forest; but warrants determination of extent of area impacted	L	U		

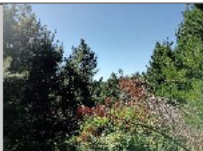
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22	Mixed exotic + wet area	Gorse + weedy exotic trees + swampy with sedge. Unknown ecol. value, probably low to negligible. Warrants fuller evaluation if directly impacted. Restoration potential	L	U	
23	Mixed exotic	Exotic plantation + gorse + scattered divar_shrubs. Probably negligible ecol. value. Different classification than LCDB to E and S	N	P	
24	Mixed exotic	Exotic plantation + gorse. Non unique; small and negligible ecol. function value. Negligible total ecol. value	N	C	
25	Exotic weeds	Dense gorse + scattered NZ shrubs. Non unique, probably negligible ecol. value; although buffers large protected area. Different classification to LCDB	N	P	
26	Regenerating NZ scrub + exotic weeds	Divar_veg, pittosporum, totara, horopito, rewarewa + scattered gorse. Although non-unique, small and isolated, probably ED moderate ecol. value; including likely support of connected water-way ecol. Direct impact unknown, both factors warrant further investigation	M	P	
27	Mixed exotic	Exotic plantation and gorse. Non-unique; with vertebrate pests. Negligible ecol. value. Pest reservoir impact likely greater than buffer value	N	P	

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28	Exotic plantation	Exotic plantation and gorse. Non-unique; with vertebrate pests. Negligible ecol. value. Pest reservoir impact likely greater than buffer value. Different classification to LCDB	N	P		
29	Exotic plantation	Exotic plantation, mature. Diversity of flies (Syrphidae) noted. Vegetation ecol. value negligible; but potential invertebrate value warrants investigation. Extent different to LCDB	N	U		
30	Exotic plantation	Mature and not managed exotic plantation. Non-unique, and ecol. function limited. Negligible ecol. value	N	C		
31	Regen. native bush + tussock, divar_veg	Regenerating native bush + small area of tussock and divar_veg on west margin. Probably low ecol. value; although likely supports local water-way ecol. Warrants full evaluation, if directly impacted. Extent different to LCDB	L	U		
32	Weedy scrub	Broom, gorse + scattered kowhai. Low to negligible total ecol. value; although representiveness and ecol. function values uncertain. Extent much larger than as in LCDB	L	U		
33	Tussock, scattered divar_veg	Tussock and scattered divar_veg. Moderate ecol. value. Lizard and invertebrate values warrant fuller evaluation, if area is going to be impacted	M	P		
34	Exotic weeds	Dense gorse + some scattered divar_veg. Negligible ecol. value. Extent much larger than shown in LCDB	N	P		

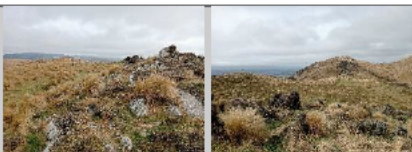
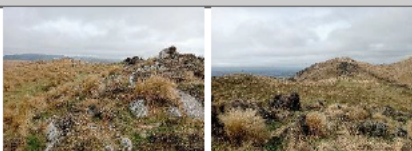
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35	Exotic plantation, weeds + NZ scrub	Young doug.fir, pines + broom + divar_veg. Lizard (observed) habitat, potentially over extensive area. Moderate diversity. Non-unique and degraded, but ecol. value moderate to high. Warrants further evaluation	H	U	
36	Exotic plantation	Pines ~ 15 y.o. + exotic weeds. Negligible ecol. value	N	P	
37	Exotic plantation	Young doug.fir + tussock, gorse, broom, divar_shrubs. Possible intermittent lizard habitat. Moderate to high diversity. Non-unique and heavily degraded. However, total ecol. value possibly moderate, but uncertain as a wet and possibly non-robust environment. Direct impact likely. Warrants further evaluation	M	U	
38	Exotic plantation	Young doug.fir + tussock, gorse, broom, divar_shrubs. Non-unique and heavily degraded; however likely moderate ecol. pattern & function values. Combined ecol. value possibly moderate, but uncertain as potential lizard habitat. Warrants further evaluation if directly impacted	M	U	
39	Weedy pasture	Weedy gully within a grazed paddock. Scattered gorse + divar_veg. Heavily degraded. Ecol. value likely negligible currently. Restoration potential as offset. Different classification to LCDB	N	C	
40	Exotic plantation	Recently clear-felled. Negligible ecol. value	N	C	

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41	Sub-alpine ridge community	Tussock + divar_veg on rocky ridge. Potentially robust although fragmented community. Heavily modified and grazed; however, combined ecol. value likely high if lizard presence confirmed. Likely direct impacted. Warrants full evaluation. Not in LCDB	H	U	
41	Sub-alpine ridge community	Tussock + divar_veg on rocky ridge. Potentially robust although fragmented community. Heavily modified and grazed; however, combined ecol. value likely high if lizard presence confirmed. Likely direct impacted. Warrants full evaluation. Not in LCDB	H	U	
41	Sub-alpine ridge community	Tussock + divar_veg on rocky ridge. Potentially robust although fragmented community. Heavily modified and grazed; however, combined ecol. value likely high if lizard presence confirmed. Likely direct impacted. Warrants full evaluation. Not in LCDB	H	U	
42	Scattered scrub	Scattered matagouri + muehlenbeckia + ferns + pasture. Grazed. Likely low ecol. value currently. Good restoration potential as offset	L	P	
43	Tussock + divar_veg to pasture	Grazed. Likely low to negligible ecol. value. However, connected ridge community to SW is probably high combined ecol. value. Direct impact likely	L	U	
44	Exotic plantation	~15 - 20 y.o. pines. Probably negligible ecol. value. Marginally greater extent than in LCDB	N	P	

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45	Pasture	Grasses + scatter exotic weeds. Grazed. Low ecol. value. Different class and extent to that shown on LCDB	N	C		
46	Exotic plantation	Mixed aged pine plantation. Negligible combined ecol. value; although ecol. service value certain. Different classification to that in LCDB	N	P		
47	Scrub + pasture	Pastured farmland transitions to NZ divar_veg + exotic weed scrub. Probably low ecol. value, although contains minor water courses	L	P		
48	Tussock + pasture	Mixed grass + scattered exotic weeds. Occasional boulders, livestock access, damage. Ecol. value likely low; potentially negligible	L	P		
49	Exotic plantation + gorse	Young pines + dense gorse. Fenced. Non-unique + low diversity. Negligible ecol. value	N	C		
50	Exotic plantation + weeds	Clear-felled, abandoned. Non-unique, negligible diversity. Probably negligible ecol. value. No livestock access. Restoration potential as offset	N	C		

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51	Exotic plantation + weeds	Clear-felled, abandoned. Non-unique, negligible diversity. Probably negligible ecol. value. No livestock access. Restoration potential as offset	N	C	
52	Matagouri + regen. NZ shrubs	Dense stand, limited livestock access. Very small area, but one of several adjacent similar and ecol. linked plots. Combined ecol. likely moderate. Where directly impacted warrant further evaluation. Restoration potential as offset	M	U	
53	Vegetated swale	High wetland. Divar shrubs, tussock, kuta sedge. Livestock access + damage. Ecol. value currently low; but could be exemplary. Direct impact likely. Strong restoration potential. Not in LCDB	L	C	
54	Manuka scrub	~2m high manuka + divar shrubs. Ecol. value likely moderate to high. Direct impact warrants determination (possibly none?). Different classification + much larger extent than shown in LCDB	H	P	
55	Gorse + divar-veg.	Dense mixed spp. scrub. Partially fenced. Livestock + deer access/ damage. Non-unique; low diversity, but moderate ecol. function, and potential moderate ED level value. Combined ecol. value low currently. Protected zone not accurately mapped in LCDB	L	C	

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56	Broom dominated scrub	~2m high dense stand. Probably livestock access. Ecol. value low currently, non-unique. Restoration potential as offset	L	C	
57	Exotic plantation + weeds	Broom dominated young pine plantation. Fenced but deer access. Ecol. value likely negligible; although ecol. function could be moderate. Diff. class to that in LCDB	N	P	
58	Exotic plantation	Mixed age pine plantation. Ecol. value likely negligible; although could be greater if positive effect on waterways are considered	N	P	
59	Exotic plantations	Mixed ages exotics; pines + doug.fir + broom. Non-unique. Combined ecol. values negligible; but possibly moderate ecol. service value within local ED context. Different classification to that in LCDB	N	P	 
60	Sub-alpine scrub	Dracophyllum, kanuka, divar_veg, tussock, flax, scattered weeds. Deer (and pig?) access + damage. Ecol. value likely high. Direct impact likely low, but warrants determination. Large potential for pest control for herpetological sanctuary and release site, and as ecol. restoration as offset	H	P	  
61	Exotic plantation	Mixed age pine plantation. Combined ecol. values likely negligible; although possibly moderate ecol. function value. Different classification to that in LCDB	N	P	
62	Exotic plantation	Young doug.fir + weedy pines. Non-unique. Deer present. Likely low ecol.	L	P	

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		value; although moderate ecol. function value. Diff. class to that in LCDB			
64	Exotic plantations	Mixed age pine plantations. Non-unique. Ecol. value likely low, although some diversity and ecol. function on E and SE edges. Larger than as in LCDB	L	P	

References

- Atkinson, P. W., G. E. Austin, M. M. Rehfish, H. Baker, P. Cranswick, M. Kershaw, J. Robinson, R. H. W. Langston, D. A. Stroud, C. V. Turnhout and I. M. D. Maclean (2006). "Identifying declines in waterbirds: The effects of missing data, population variability and count period on the interpretation of long-term survey data." *Biological Conservation* **130**(4): 549-559.
- Bennett, A. F., J. Q. Radford and A. Haslem (2006). "Properties of land mosaics: implications for nature conservation in agricultural environments." *Biological conservation* **133**(2): 250-264.
- Cieraad, E., S. Walker, R. Price and J. Barringer (2015). "An updated assessment of indigenous cover remaining and legal protection in New Zealand's land environments." *New Zealand Journal of Ecology* **39**(2): 309-315.
- Clapcott, J. (2015). National Rapid Habitat Assessment Protocol Developed for Streams and Rivers. N. R. Council. Cawthron Report, Cawthron Institute. **Report No. 6249**.
- Conservation, D. o. (2014). "Guidance on biodiversity offsetting in New Zealand." from <https://www.doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting/>.
- Coomes, D. A., A. F. Mark and J. Bee (2006). Animal Control and Ecosystem Recovery. *Biological Invasions in New Zealand*. R. B. Allen and W. G. Lee. Berlin, Heidelberg, Springer Berlin Heidelberg: 339-353.
- Davidson-Watts, I. (2025). Hokonui Windfarm Bat Survey Report for Hokonui Energy Ltd, Davidson-Watts Ecology (Pacific) Ltd: 108.
- Davis, C. M., N. Head, S. Myers and S. Moore (2016). *Department of Conservation guidelines for assessing significant ecological values*, Publishing Team, Department of Conservation.
- Day, N. J., B. Barratt, B. Christensen, T. Curran, K. Dickinson, S. Lavorel, D. Norton and H. Buckley (2023). "Predicting ecological change in tussock grasslands of Aotearoa New Zealand." *New Zealand Journal of Ecology*.
- Dunn, N. R., R. M. Allibone, G. Closs, S. Crow, B. O. David, J. Goodman, M. H. Griffiths, D. Jack, N. Ling and J. M. Waters (2018). *Conservation status of New Zealand freshwater fishes, 2017*, Publishing Team, Department of Conservation.
- Energy3 (2025). Hokonui Windfarm Preliminary Qualitative Ecological Assessment. P. W. Holder. Energy3 Ltd, Christchurch: 89.
- EPA. (2024). "Waiuku Wind Farm application decision." Retrieved 6 March 2025, 2025, from <https://www.epa.govt.nz/fast-track-consenting/referred-projects/waiuku-wind-farm/the-decision/>.
- Fitzsimons, J. A. and D. R. Michael (2017). "Rocky outcrops: A hard road in the conservation of critical habitats." *Biological Conservation* **211**: 36-44.
- Harding, M. (1999). SOUTHLAND PROTECTION STRATEGY. A REPORT TO THE NATURE HERITAGE FUND COMMITTEE Nature Heritage Fund Nature Heritage Fund
- Harding, M. and EPA (2024). SOUTHLAND WIND FARM ECOLOGY REVIEW. A report prepared for Environmental Protection Authority Te Mana Rauhi Taiao. EPA, EPA. **2025**.
- Hitchmough, R., B. P. Barr, C. Knox, M. Lettink, J. M. Monks, G. B. Patterson, J. T. Reardon, D. Van Winkel, J. R. Rolfe and P. Michel (2021). *Conservation status of New Zealand reptiles, 2021*, Publishing Team, Department of Conservation.
- Hoare, R. J., J. S. Dugdale, E. D. Edwards, G. W. Gibbs, B. Patrick, R. Hitchmough and J. R. Rolfe (2017). *Conservation status of New Zealand butterflies and moths (Lepidoptera), 2015*, Publishing Team, Department of Conservation.
- Hokonui_Rūnanga_Kaupapa_Taiao. (N.D.). "Hokonui Hills Restoration Project." Retrieved 19/05/2025, from <https://hokonuitaiao.org.nz/sample-page/biodiversity-projects/hokonui-hills-biodiversity-project/>.
- iNaturalist. (n.d.). "New Zealand Freshwater Mussel (*Echyridella menziesii*).\" Retrieved 15/05/2025, from <https://www.inaturalist.org/taxa/388873-Echyridella-menziesii>.
- iNaturalist. (n.d.). "Sigaus australis." from <https://www.inaturalist.org/taxa/397165-Sigaus-australis>.

Hokonui Windfarm Ecological Scoping Assessment

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- iNaturalist. (n.d.). "The Southland green skink (*Oligosoma chloronoton*)."
<https://www.inaturalist.org/taxa/37877-Oligosoma-chloronoton>. Retrieved 10/05/2025, from
- iNaturalist. (n.d.). "Tautuku Gecko (*Mokopirirakau* southern forest)."
<https://www.inaturalist.org/taxa/409283-Mokopirirakau-southern-forest>. Retrieved 15/05/2025, from
- Institute_of_Ecology_and_Environmental_Management (2002). Guidelines for ecological impact assessment: Amended pilot November 2002, Institute of Ecology and Environmental Management. **Volume-6-44**.
- Jakobsen, K. (2023). Experiences on avian mapping with Spoor at Utsira, spoor.ai/ Utsira Nord: 22.
- James, A. B. (2008). Ecology of the New Zealand Lamprey (*Geotria australis*): A literature review, Department of Conservation, Wanganui Conservancy.
- Johnson, P. and P. Gerbeaux (2004). Wetland Types in New Zealand. W. Department of Conservation, New Zealand. Department of Conservation, Wellington, New Zealand, Department of Conservation.
- Jones, N. F. and L. Pejchar (2013). "Comparing the Ecological Impacts of Wind and Oil & Gas Development: A Landscape Scale Assessment." *PLOS ONE* **8**(11): e81391.
- Knox, C. (2023). Field Surveys for Green Skink in Northern Southland. The Department of Conservation, Lizard Technical Advisory Group, Wellington, New Zealand. The Department of Conservation.
- Manaaki_Whenua–Landcare_Research. (2023). "Basic cliffs, scarps and tors." from
<https://www.landcareresearch.co.nz/publications/naturally-uncommon-ecosystems/inland-and-alpine/basic-cliffs-scarps-and-tors/>.
- Mark, A. F., B. I. Barratt, E. Weeks and J. Dymond (2013). "Ecosystem services in New Zealand's indigenous tussock grasslands: conditions and trends." Ecosystem services in New Zealand—conditions and trends. Manaaki Whenua Press, Lincoln: 1-33.
- McLeod, R. M., M. Powlesland and C. Greene (2002). Impacts of wind farms on birds: a review, New Zealand Department of Conservation. **289**.
- Meduna, V. (2007). "Bats - Habitat, distribution and conservation." Retrieved 6 March 2025, from
<http://www.TeAra.govt.nz/en/map/9761/distribution-of-new-zealands-bats>.
- Ministry_for_the_Environment (2025) "National Policy Statement for Freshwater Management."
- Ministry_for_the_Environment and NIWA (2019). River Environment Classification (REC2), Version 5.
- New_Zealand_Government (1953). Wildlife Act 1953 No 31, Parliamentary Counsel Office.
- NZ_Plant_Conservation_Network. (2025). "New Zealand Plant Conservation Network " Retrieved 5 March 2025, 2025, from <https://www.nzpcn.org.nz/>.
- O'Donnell, C., K. Borkin, J. Christie, I. Davidson-Watts, G. Dennis, M. Pryde and P. Michel (2022). Conservation status of bats in Aotearoa New Zealand, 2022. D. o. Conservaton. Wellington, NZ, DoC. **41**: 18.
- Payne, C., D. Jamieson, E. Hoodless, S. Millard and E. Caddick (2024). Ecologically Significant Wetlands and Rocky Outcrops in Mt Vernon Park: Characterisation, Impacts, Restoration and Future Management. A report produced as part of the GEOG309 Research for Resilient Communities University of Canterbury, University of Canterbury.
- Pickett, S. T. A. and P. S. White (2022). Disturbances and Disturbance Regimes. Disturbance Ecology, Springer: 21-42.
- Reichenbach, M. (2017). Wind Turbines and Birds in Germany—Examples of Current Knowledge, New Insights and Remaining Gaps. Wind Energy and Wildlife Interactions: Presentations from the CWW2015 Conference. J. Köppel. Cham, Springer International Publishing: 239-252.
- Rogers, G. M. (1996). Regeneration ecology, conservation status and recovery planning for the endangered tree *Olearia hectorii*, Department of Conservation.
- Roper-Lindsay, J., S. A. Fuller, S. Hooson, M. D. Sanders and G. T. Ussher (2018). Ecological impact assessment: EIANZ guidelines for use in New Zealand: Terrestrial and freshwater ecosystems (2nd ed.). E. I. o. A. a. N. Zealand.
- Salkanović, E., P. Enevoldsen and G. Xydis (2024). "Investigating Avian habitat modification and behavioral dynamics in active wind farm environments." Environment, Development and Sustainability.
- Scheiner, S. M. (1992). "Measuring Pattern Diversity." *Ecology* **73**(5): 1860-1867.
- Sirvid, P. J., C. Vink, B. M. Fitzgerald, M. D. Wakelin, J. Rolfe and P. Michel (2021). "Conservation status of New Zealand araneae (spiders), 2020."

Stark, J. D. and J. R. Maxted (2007). A user guide for the Macroinvertebrate Community Index. M. f. t. Environment. Wellington, Cawthron Institute. **Cawthron Report No.1166**: 58.

The_New_Zealand_Herpetological_Society. (N.D.). "Jewelled gecko *Naultinus gemmeus* (McCann, 1955)." Retrieved 15/05/2025, from <https://www.reptiles.org.nz/herpetofauna/native/naultinus-gemmeus>.

The_New_Zealand_Herpetological_Society. (N.D.). "Kōrero gecko (*Woodworthia* "Otago/Southland large")", from www.reptiles.org.nz/herpetofauna/native/woodworthia-otagosouthland-large.

The_New_Zealand_Herpetological_Society. (N.D.). "Oligosoma chionochloescens." Retrieved 4/06/2025, from <https://www.reptiles.org.nz/herpetofauna/native/oligosoma-chionochloescens>.

Trap_and_Trigger (2023). Makarewa Headwaters Feral Ungulate Survey. <https://www.thrivingsouthland.co.nz/>, Makarewa Headwaters Catchment Group: 14.

Trewick, S., D. Hegg, M. Morgan-Richards, T. J. Murray, C. Watts, P. Johns and P. Michel (2022). Conservation status of Orthoptera (wētā, crickets and grasshoppers) in Aotearoa New Zealand, 2022, Department of Conservation= Te Papa Atawhai.

van Winkel, D., R. Hitchmough and M. Baling (2018). Reptiles and Amphibians of New Zealand: A Field Guide, Auckland University Press.

Ward, D., J. Early, F. Schnitzler, R. Hitchmough, J. Rolfe and I. Stringer (2014). "Conservation status of New Zealand Hymenoptera, 2014." New Zealand Threat Classification Series **20**.

Wawrzyczek, J., R. Lindsay, M. J. Metzger and F. Quétier (2018). "The ecosystem approach in ecological impact assessment: Lessons learned from windfarm developments on peatlands in Scotland." Environmental Impact Assessment Review **72**: 157-165.

Wildland_Consultants_Ltd. (2023). Ungulate Effects on Indigenous Biodiversity in the Upper Makarewa Catchment, Southland. <https://www.thrivingsouthland.co.nz/>, Makarewa Headwaters Catchment Group: 32.

Wiser, S. K. and R. P. Buxton (2008). "Context matters: Matrix vegetation influences native and exotic species composition on habitat islands." Ecology **89**(2): 380-391.

Wiser, S. K. and R. P. Buxton (2009). "Montane outcrop vegetation of Banks Peninsula, South Island, New Zealand." New Zealand Journal of Ecology **33**(2): 164-176.

Zwart, M. C., A. J. McKenzie, J. Minderman and M. J. Whittingham (2016). Conflicts Between Birds and On-Shore Wind Farms. Problematic Wildlife: A Cross-Disciplinary Approach. F. M. Angelici. Cham, Springer International Publishing: 489-504.

Appendix 1. Hokonui Hills taonga species

Supplied by Mollie Lyders, Hokonui Rūnanga, 10 October 2025

Hokonui Hills taonga species

Ngāi Tahu – and by extension, Hokonui Rūnanga - has centuries' long customary associations, rights, and interests in and around Māruawai, and with its taonga (resources). These associations are both historical and contemporary, and include whakapapa, place names, mahinga kai, tribal economic development, and landholdings. Hokonui Rūnanga is mandated to represent Ngāi Tahu within the Māruawai area. The area that Hokonui Rūnanga hold mana whenua status for centres on Māruawai – the floodplains of the Maitai River, encompassing the modern-day township of Gore – and includes shared interests in the lakes and mountains between Whakatipu-Waitai (near Martins Bay) and Tawhitarere with other Murihiku Rūnanga, and those located from Waihemō southwards. Hokonui Rūnanga exercise rangatiratanga and kaitiakitanga for the taiao and those species that live within it in formal processes.

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It is important to recognise that Ngāi Tahu, like other iwi, conceptualise the environment as an undivided entity. It is a cohesive system of lakes, rivers, wetlands, soils, plants and animals (including humans), winds, tides, mountains and other terrestrial lands, and the relationships between them all. It is this holistic perspective that pervades mātauranga Māori: science based on observations, relationships, and connections over generations

Set out below is a list of taonga species that are known to be in the Hokonui Hills. This list has information from previous field work undertaken by Hokonui Rūnanga as well as reports that have been shared with and used by Hokonui Rūnanga. This list is not exhaustive.

Manu (birds)

Present in the Hokonui Hills but not threatened - kāhu, kereru, korimako, kākārīki, pīpipi brown creeper, pīwakawaka, riroriro grey warbler, pīhipihi and ngirungiru tomtit

Nga awa provide habitat for common native waterfowl including tētē moroiti grey teal (status 'not threatened'), kuruwhengi New Zealand shoveler ('not threatened') and pūkeko ('not threatened'). Poaka pied stilt ('not threatened') and tōrea pied oystercatcher ('not threatened') frequent pasture and riverbeds, and shags utilise awa. Kautuku Australasian bittern (status 'nationally critical') and mātā South Island fernbird (status 'declining') were recorded near Haumuri in 2007

Ika (fish)

There are eight native fish species recorded within the Hokonui area: longfin tuna (status 'declining'), kanakana lamprey (status 'nationally vulnerable'), giant kōkopu (status 'declining'), kōaro (status 'declining'), gollum galaxias ('nationally vulnerable'), inanga (status 'declining'), kōura (status 'declining') as well as common bully ('not threatened' and upland bully (status 'not threatened'). A further two native species are likely to be present: shortfin tuna (*Anguilla australis*, status 'not threatened'), and torrent fish (*Cheimarrichthys fosteri*, status 'declining').

Through the 2022-2023 Hokonui Rūnanga summer monitoring program kākahi (freshwater mussel), were discovered in abundance in the Otamita stream.

Mokomoko

There are few documented records of lizards in Hokonui. However, this is more than likely due to insufficient survey effort. Records go back to 1968, with surveys in the 70s and 80s 2000s and 2020. There are five species recorded from the area: korero gecko (*Woodworthia* "Otago/Southland large", status 'declining'), green skink (*Oligosoma chloronoton*, status 'declining'), cryptic skink (*O. inconspicuum*, status 'declining'), McCann's skink (*O. maccanni*, status 'not threatened') and southern grass [common] skink (*O. aff. polychroma* Clade 5, status 'declining').

Most records are from pasture/grassland habitats in the northeast of the Hokonui area, including Waterfall Range, Mandeville and Bushy Park. The presence of all five species at Haumuri was documented in 2003.

Appendix 2. WTG EcSA environmental assessment matrix

Breakdown of the WTG EcSA environment assessment, using EIANZ “Matters” evaluation framework (Roper-Lindsay, Fuller et al. 2018); and enumerating each matter thus Very high = 0, High = 1, Moderate = 2, Low = 3, Negligible = 4. Key: E.val = ecological value rating; divar_ = divaricating; doug.fir = Douglas fir

WTG no.	Env Type	Description	Representativeness	Rarity	Diversity and pattern	Ecological context and function	SUM	E.Val	Confidence	Ranking notes
A1	Tussock + divar_veg ridge	Tussock, divar_veg + exotic weeds. Grazed + heavily damaged. No lizard sign, but potential habitat. Ecol. values moderate - less than adjacent WTG sites due to livestock damage. Restoration potential as offset	3	2	2	3	10	M	P	
A3	Tussock + divar_veg ridge	High density prostrate divar_veg. Grazed, damaged; livestock campsite nearby. No lizard sign; but likely habitat. Invertebrates common. Heavily modified, but ecol. value likely high to moderate. Herpetological relocation sites available on immediately adjacent ridge line	2	1	2	2	7	H	U	
A4	Outcrop on ridge	Tussock and mature divar_veg. Inverts (flies) active. No lizard seen, but possibly present. Re-location sites immediately adjacent. Non-unique, but ecol. value possibly high. Warrants further evaluation	1	1	1.5	2	5.5	H	U	
A5	Rocky outcrop + divar_veg	Grazed pasture + scattered divar_shrubs. Lizard habitat likely. Heavily modified but potentially high ecol. value. Warrants additional evaluation	1	1	2	2	6	H	P	Rarity and context scores uncertain
A8	Tussock + pasture flat ridge	Heavily grazed + cattle damage. Occasional scattered matagouri + thistles. Likely low ecol. value	3	4	3	3	13	L	C	
A9	Tussock + divar_veg ridge	Tussock + scattered divar_veg. Cattle grazing + damage. Possible lizard habitat. Ecol. value uncertain, but possibly moderate	2.5	1	2	2	7.5	M	U	
A10										
A11	Pasture + divar_veg ridge	Pasture + scattered divar_veg and tussock. Heavily modified, degraded. Ecol. value uncertain, possibly moderate	3	1	2	2	8	M	U	Rep score TBC
A12	Pasture + divar_veg ridge	Possible lizard sign. Heavily modified, but potentially high ecol. valuable	1	1	2	2	6	H	P	Rarity and context scores uncertain
A15	Rocky outcrop +	Healthy divar-veg + flax + tussock. No lizard sign, although appears highly	1.5	1	2	1.5	6	H	P	Diversity underscore?

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	divar_veg	suitable habitat. Invertebrates active. Probable high ecol. value								
A18	Flat ridge. Tussock + divar_veg	Heavily grazed + cattle damage. Possibly low ecol. value; but uncertain of diversity and ecol. function scores. Warrants further investigation	3	3	3	3	12	L	U	
A19	Tussock + divar_veg ridge	Tussock and scattered divar_veg. Grazed heavily. Low combined ecol. value	2.5	4	3	2	11.5	L	C	
A20	Rounded secondary ridge	Pasture + exotic weeds. Grazed. Not lizard habitat. Negligible ecol. value	4	4	3	3	14	N	C	
A23	Broad ridge; bouldery	Pasture + divar_veg + exotic weeds. NZ fly spp. present. Lizard sign. Likely of moderate to high ecol. value, although ecol. value uncertain. Warrants further evaluation	2	1	3	2	8	H	U	Ecol. pattern underscore?
B2	Vegetated spur	Exotic plantations. Young doug.fir + weedy pines. Deer and pigs. Non-unique. Negligible ecol. value	4	4	3	3	14	N	C	
B3	Vegetated spur	Exotic plantations. Young doug.fir + weedy pines + broom + scattered divar_veg. Deer and pig damage. Non-unique. Likely low ecol. value	2	4	2	3	11	L	C	
B4	Vegetated knoll	Exotic plantation. Low ecol. diversity + non-unique. Probably negligible ecol. value	4	4	3	3	14	N	C	
B5	Exotic plantation	Mature pines, possibly non-maintained. Low ecol. diversity + non-unique. Prob negligible ecol. value	4	4	3	3	14	N	P	
B7	Rocky outcrop + divar_veg	Tussock + scattered divar_shrubs. Grazed. Cattle damage. Lizard sign detected. Heavily modified but potentially moderate ecol. valuable	3	1	3	2	9	M	P	
B9	Vegetated ridge	Exotic plantation + tussock, divar_shrubs, exotic weeds. Degraded, non-unique. Probably low ecol. value. Uniform area, so ecol. impact possibly difficult to mitigate	3	4	3	2	12	L	C	
B10	Vegetated hilltop	Tussock, divar_veg + boundary of exotic plantation. Probably lizard habitat. Relocation sites immediately adjacent. Non-unique, but ecol. value likely moderate to high. Warrants further evaluation.	2.5	1	2	2	7.5	H	U	
B11	Vegetated plateau	Exotic plantation + tussock, divar_shrubs, kuta sedge, exotic weeds. Modified but ecol. diverse. Ecol. value possibly moderate, but uncertain as a wet and possibly non-robust environment. Direct impact uncertain	2	4	1	2	9	M	U	Rarity and context scores uncertain
B12	Exotic plantation	Young doug.fir + tussock, gorse, broom, divar_shrub. Modified but ecol. diverse. Ecol. value possibly moderate, but uncertain. Direct impact uncertain, possibly high	3	4	1	2	10	M	U	
B13		[Not assessed. Warrants evaluation]					0			
B14	Grassy knoll	Pasture + artificial rock pile. Heavily modified + non-unique. Probably negligible	4	4	3	3	14	N	U	

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		ecol. importance, but ecol. value uncertain due to physical diversity value								
B15	Grassy knoll	Pasture + artificial rock pile. Heavily modified, non-unique. Probably negligible ecol. importance, but ecol. value uncertain due to physical diversity value	4	4	3	3	14	N	U	
B17	Weedy rocky knoll	Broom, gorse + short rocky outcrop. Skink present (observed). Non-unique, but ecol. value likely high. Warrants further evaluation	3	1	2	2	8	H	P	
B18	Broad ridge	Pasture with scattered exotic weeds + tussocks. Grazed. Non-lizard habitat. Probably low ecol. value	3	4	2.5	3	12.5	L	C	
B19	Shoulder of ridge	Pasture + exotic weeds. Grazed. Non-lizard habitat. Low ecol. value. [NB, WTG site may shift to nearby flat ridge, which I classify as: "Pasture with scattered tussock and occasional divar_shrub; grazed. Not likely lizard habitat. Likely low ecol. value"]	4	4	2	2	12	L	C	
B20	Broad ridge	Pasture, scattered tussock + boulders. Grazed. No lizard sign found, but possible habitat. Non-unique. Ecol. value probably moderate, although uncertain	2	1.5	2	2	7.5	M	U	
B21	Short broad ridge	Tussock, pasture, divar_veg. Scattered boulders. Potential lizard habitat. Possible moderate ecol. value, although currently cattle damaged	2	1.5	2	2	7.5	M	P	
B22	Broad hilltop	Pasture + scattered tussock. Non-unique. No lizard sign. Likely low ecol. value	2	4	3	2	11	L	C	
B23	Broad ridge	Pasture with scattered tussock + divar_veg. Ecol. value likely low	2	4	3	2	11	L	P	
B24	Vegetated knoll	Exotic plantation + exotic weeds. Non-unique. Negligible ecol. value	4	4	3	3	14	N	C	
C1	Shoulder of ridge	Arable crop land. Non-unique. Negligible ecol. value [NB, WTG site may shift to nearby ridge, which I classify as: "Pasture with scattered tussock; grazed. Likely low ecol. value"] [Assessed remotely]	4	4	4	2	14	N	P	
C2	Broad hilltop	Pasture; grazed. Likely negligible ecol. value [Assessed remotely]	4	4	4	3	15	N	P	
C3	Undulating broad ridge	Pasture with occasional rocks. Grazed. No lizard sign. Not lizard likely habitat. Ecol. value likely negligible	4	4	3	2	13	N	P	
C5	Grassy knoll	Pasture and scattered gorse. Grazed and degraded. Non-unique. Moderate diversity and ecol. function, but probably negligible combine ecol. value	4	4	3	3	14	N	P	
C6	Vegetated knoll	Pasture and sparse kuta sedge. Grazed and degraded. Non-unique, probably low ecol. value	3	4	3	2	12	L	C	
C13	Cultivated slope	Exotic plantation + cultivated paddock. Non-unique. NZ Harrier present. Low diversity ecol. and fair ecol. service value. Potentially low combined ecological value.	4	4	3	1.5	12.5	L	P	
C17		[Not assessed. Warrants evaluation]					0			
C18	Grassy ridge	Pasture-tussock boundary. Non-unique. Ecol. value considered low, but possibly negligible	2	4	2	3	11	L	U	

Appendix 3. Waterway, wetland EcSA environmental assessments matrix

Breakdown of the waterway and wetland features EcSA environment assessments, using EIANZ “Matters” evaluation framework (Roper-Lindsay, Fuller et al. 2018); and enumerating each matter thus Very high = 0, High = 1, Moderate = 2, Low = 3, Negligible = 4. Key: E.val = ecological value rating; divar_ = divaricating; doug.fir = Douglas fir

FN_ Water ID	Env. Type	Description	Representativeness	Rarity	Diversity and pattern	Ecological context and function	SUM	E.Val	Confidence	Ranking notes
1	Small stream <1m	Permanent; order 1 - 2. Moderately turbid. Stony. Invertebrates present; vegetated sides. Piped. Estimated to have moderate ecol. value	2	4	2	2	10	M	U	Rarity value score is uncertain
2	Small stream <1m	Ephemeral to permanent. Heavily modified (channelled and piped) + livestock damage. Low to negligible ecol. value. Diff location to LCDB	3	4	3	3	13	L	P	
3	Small Stream <1m	Permanent; order 2 - 3. Pasture, grazed +heavily degraded. Low to negligible ecol. value. Potential restoration for offset	2	4	4	3	13	L	P	
4	Small stream <1m	Permanent; order 2. Pasture, grazed +heavily modified and degraded. Intermittent sections of fair ecol. function value	3	4	3	3	13	L	P	
5	Non-significant	Swale. Heavily modified + grazed. Negligible ecol. value	4	4	4	4	16	N	C	
6	Small stream <1m	Ephemeral to permanent. Heavily modified + grazed, livestock damage. Turbid. Invertebrates, but low numbers and diversity. Low combined ecol. value	2	4	2.5	3	11.5	L	P	
7	Sub-alpine fen or bog	Sphagnum moss dominated palustrine wetland, probably oligotrophic. Partially drained/modified; livestock access + damaged, but potentially resilient. Ecol. complexity moderate to high. Moderate to high combined ecol. value. Would be high to very high combined ecol. value score if shown to support Threaten species or is restored. Not as in LCDB	2	2	1	2	7	H	U	Rarity value score is unknown; Rep' score uncertain
8	Non-significant	Damp depression. Heavily grazed + degraded. Negligible ecol. value. Not as in LCDB	3	4	3	4	14	N	P	Ecol. context underscore?
9	Small stream	Ephemeral gullies to 3rd order stream. Heavily modified, piped + grazed. Limited spp. diversity, and	2	4	3	3	12	L	U	Ecol. function underscore? Not impacted?

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	m <1m	low invertebrate presence. Probably low ecol. value, but warrants investigation if impacted								
10	Grass y Swale	Dry deep ephemeral gullies (+1st order stream in REC classification). Grazed. Pasture + tussock. Probably low ecol. value, but warrants investigation where impacted	2	4	3	2	11	L	P	
11	Small strea m <1m	Farm stream, 1st order + small swampy area. Heavily modified, including piping + grazed. Some invertebrates present. Likely moderate to low ecol. value, but warrants investigation where impacted	2	4	2	2	10	M	P	
12	Drain	Steep. Pasture + grazed + divar_veg. Heavily sheep damaged. Small ponds lower, but induced very poor diversity. Probably low to negligible ecol. value. Restoration potential as offset	3	4	3	3	13	L	P	Ecol. function of ponds higher/ impt. in spring?
13	Dry gullies	Steep ephemeral tributaries. Pasture, grazed + divar_veg. Likely low to negligible freshwater ecol. values; but potentially valuable terrestrial spp. habitat. Warrants investigation if impacted	2	4	3	3	12	L	U	
14	Gullie s + <1m strea m	Steep ephemeral tributaries to 1st order stream. Pasture, grazed + divar-veg in fold in hill. Probably low ecol. value. Spatially larger than as in LCDB	2.5	4	3	3	12.5	L	P	
15	Broad valley to ephe meral gully	Pasture, grazed + scattered divar_veg. Heavily damaged. Ecol. value negligible, especially where projected to be impacted. Larger than LCDB	3	4	4	3	14	N	C	
16	Gullie s	Ephemeral where impacted. Divar_veg. + ferns + tussock. Grazed, some livestock damage. Low freshwater ecol. value; but supports moderate terrestrial spp. diversity. Restoration potential for offset. Larger than LCDB	2	4	2	3	11	L	P	
17	Broad valley + gully	Ephemeral/ intermittent where impacted. Pasture with tussock and scattered divar_veg. Grazed, degraded. Low to negligible freshwater ecol. value; but supports moderate terrestrial spp. diversity. Larger than LCDB	3	4	3	3	13	L	P	
18	Broad valley + potenti al wetlan d	Pasture + boggy areas + scattered shrubs. Heavily damaged. Low to negligible freshwater ecol. value. Restoration potential for offset	3	4	3	3	13	L	U	

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19	Small stream <1m	Pasture, grazed. Piped. Heavily degraded. Likely negligible ecol. value	3	4	4	3	14	N	P	
20	Pond/cattle wallow	Pasture, grazed. Heavy cattle damage; ecol. degraded. Small area. Likely negligible ecol. value currently. Potential as restoration for offset. Diff class to LCDB	4	4	3	3	14	N	U	
21	Stream ~2m	4th order. Pine + weeds + tussock margins. Low livestock access + moderate bank shade, but silty patches + regularly disturbed (ford). Fair ecol. function, with moderate invertebrate habitat diversity and abundance. Estimated moderate combined ecol. value; and as it has possibly high ED ecol. and rare spp. habitat potential, warrants full evaluation	2.5	1	3	1.5	8	M	U	Rarity value score is unknown. Ecol. function score uncertain
22	Stream ~1m + swampy areas	Fenced (mostly). Tussock and exotic grasses. Likely moderate to high ecol. valuable. High to moderate combined ecol. value. No longer projected to be directly impacted, but if so needs to be covered in EcIA	1	4	1.5	1.5	8	H	U	Rep. and ecol. function scores un-confident
23	Gully	Pasture, grazed. Degraded. Some tussock + divar. veg. Some diversity + pattern value, but low combined ecol. value	3	4	2	3	12	L	C	
24	Artificial dam + swampy area	Recently created (not on LINZ). Moderate sized farm lake. Potentially high ecol. context value. Moderate combined ecol. value, but hydrological isolation impact of dam unknown. If impacted, inclusion in EcIA warranted	1	4	3	1	9	M	U	
25	Stream ~1m + assoc. gullies	Fenced. Tussock and grass lined. Diverse birds and invertebrates. Moderate to high ecol. valuable. If impacted, detailed ecol. evaluation and mitigation strategy needed for EcIA. Great example of wetland restoration potential in the area	1	4	1	1	7	H	U	Rep. score un-confident/ too high?
26	Stream 2 - 3m	3rd order stream. Bank shading vegetation and diverse habitats + invertebrates. If potential long-finned eel habitat assumption is correct, combined ecol. value is high. Not likely to be directly affected?	2	1	1.5	1.5	6	H	U	Rep. score un-confident/ too low?
27	Stream <<1m	1st order, minor tributary. Piped. Likely moderate ecol. value. Not likely to be impacted?	3	3	2	2	10	M	P	Rarity value score is unknown (galaxids?); Rep' score uncertain
28	Stream 1m	1st order but moderate sized and permanent stream. Tussock and shrubs shading banks; stoney and silt bottom. Low turbidity. High to moderate diversity. In forestry	2	1	2	2	7	H	U	Rarity value score is unknown; Rep' score uncertain

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		skidder site, so periodically damaged. Possibly high combined ecol. value, if of high rare spp. value. Spatially different to REC								
29	Steep gullies	Ephemeral. Divar_shrubs + tussock. Potentially of low freshwater ecol. value, but potentially of some value for supporting terrestrial spp.	3	4	3	3	13	L	U	Rep. and ecol. function scores un-confident
30	Gullies	Ephemeral to 1st order stream. Divar_veg, tussock, ferns. Not currently grazed. Likely moderate ecol. value. Where impacted warrants investigation	2	4	2	2	10	M	P	
31	Gully	Ephemeral. Divar_veg., tussock, pasture. Grazed + degraded. Probably low ecol. value	3	4	3	3	13	L	P	
32	Wetland	Fenced; non-grazed? Appears to be in good condition; although has limited buffering. Assumed moderate diversity. Likely high combined ecol. value. Not impacted? Not in LCDB	1	2	2	1	6	H	P	
33	Stream <1m	1 + 2 order stream. Thru farmland; piped. Grazed, livestock access. Degraded. Ecol. value likely low. Not directly affected?	3	4	3	2	12	L	P	
34	Wetland	Tussock dominated. Not fenced; livestock access, damage appears low. Only moderate diversity observed, but ecol. context value likely high. Estimated as moderate combined ecol. value currently. Strong potential for restoration offset	2	4	2	1	9	M	P	
35	Wetland	Tussock, herbaceous scattered divar_shrub. Fenced. Appears in good condition. Probably high ecol. value. Larger than on LCDB	1	4	2	1	8	H	U	Rarity value score is unknown; Rep' score uncertain
36	Gullies	Ephemeral. Divar_shrubs + tussock. Livestock access. Probably low freshwater ecol. value, but potentially of some value for supporting terrestrial spp. Not on LCDB or REC	3	4	3	3	13	L	P	
37	Gully	Ephemeral. Divar_veg + tussock. Livestock access + damage. Low freshwater ecol. value, but likely moderate value for supporting terrestrial spp. Not classed on REC	3	4	2	2	11	L	P	Rep. and ecol. function scores un-confident
38	Gully	Ephemeral. Pasture, divar_veg. + tussock. Livestock access + damage. Ecol. degraded. Low freshwater ecol. value, but likely moderate value for supporting terrestrial spp. Not classed on REC	3	4	2.5	2.5	12	L	P	
39	Stream <1m	Modest flow but 3rd order stream + associated wetland. Tussock + scattered divar_veg. Adjacent pasture + livestock access; likely degraded. Estimated as moderate combined ecol. value; but as it has high ED wide ecol. and rare spp.	2	1	2.5	2.5	8	M	U	

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		habitat potential, warrants full evaluation if impacted								
40	Drain <1m	Permanent. Piped + channelled in sections. Pasture + tussock. Livestock access. Degraded, but some diversity and invertebrates present. Probably moderate combined ecol. value	3	4	3	2	12	M	P	
41	Stream ~2m	3rd order stream + assoc. gullies and boggy land. Mostly pasture + tussock margins. Some livestock access, partially degraded. However, fair biodiversity and function; some buffering. Estimated as moderate to high combined ecol.; but as it has high ED wide ecol. and rare spp. habitat potential, warrants full evaluation where impacted	2	1	2.5	2.5	8	M	U	Rep. and ecol. function scores unconfident
42	Stream ~2m	3rd order stream + tussock-land buffer; livestock limited access. Tussock + divar_veg with scattered flax shaded banks; rock + shingle bottom. Water quality appears good. Assumed rare spp. habitat potential + high ED wide ecol. value Estimated combined ecol. high. Warrants full evaluation if impacted	2	1	2	2	7	H	U	Rep. rarity and ecol. function scores unconfident
43	Stream <<1m	Farmside steep stream. Tussock, pasture, exotic weeds. Livestock access, damaged. Biodiverse and moderate to high endemic ecol. function; however appears hydrologically isolated. Estimate moderate combined ecol. values. Not on LCDB	3	4	1.5	3	11.5	M	P	
44	Potential wetland	Boggy depression + tussock + kuta sedge. Grazed, livestock access, physical damaged. However, potentially moderate combined ecol. value. If directly impacted warrants full evaluation	2	4	1.5	2	9.5	M	U	category uncertain
45	Stream <<1m	Farm stream, 1st order; small. Limited livestock access. Piped. Tussock + kuta sedge. Banks shaded, muddy bottom. Potentially moderate ecol. valuable, although degraded. Uncertain if directly impacted	2	3	2	2	9	M	P	Rep. rarity and ecol. function scores unconfident
46	Stream <<1m	Farm stream, 1st order. Limited livestock access. Tussock + kuta sedge. Banks shaded, muddy bottom. Low diversity but biologically functioning. Estimated moderate ecol. valuable, but would be high if has rare spp. value. Uncertain if directly impacted	2	3	2	2	9	M	U	Rarity value score is unknown (galaxids?); Rep' score uncertain
47	Stream <<1m	Farm stream, 1st order + gullies. Limited livestock access. Tussock + sedge; some dense divar_shrubs. Banks shaded. Although degraded, fair ED ecol. context value. Moderate	2	4	2	1.5	9.5	M	U	Diversity overscore?

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		freshwater ecol. value, but possibly value for supporting terrestrial spp.								
48	Stream <1m	1st order. Tussock and sedge buffer + small bog. Banks shady. Some livestock access + damage. Although degraded, fair to potentially high ecol. context score. Estimated moderate combined ecol. value. Restoration potential as offset	2.5	4	1.5	1.5	9.5	M	U	Rarity value score is unknown (galaxids?); Rep' score uncertain
49	Stream <1m	Farm stream, 2nd order. Piped + channelled. Pasture + tussock margins + small boggy areas. Some bank shading, muddy bottom. Livestock access, heavily ecol. degraded. Negligible combined ecol. value. Restoration potential as offset	4	4	3	4	15	N	P	
50	Swale	Grasses, exotic weeds, scattered kuta sedge. Livestock access, physical damage. Likely low ecol. value	2	4	3	2	11	L	P	
51	Stream ~1m	Farm stream, 3rd order. Pasture, scattered kuta sedge margins. Intermittent bank shading; rock + gravel bottom. Connected to small wetland. However, heavily degraded and periodic disturbance. Likely low to negligible ecol. value currently. Restoration potential as offset, including rare spp. values	3	4	3	3	13	L	P	
52	Swale to 1m stream	1st order but high-volume stream. Grasses, exotic weeds, trees. Fenced. Bank shady, rock and muddy bottom. High ecol. value estimate, with assumed high rare spp. score	2	1	2	2	7	H	U	Rarity value score TBC (assuming eel, + galaxids?); Rep' score uncertain
53	Pond	Small pond + localised wetland. Pasture + kuta sedge. Livestock access + hydrologically isolated. Low ecol. value. Extent different to LCDB. Restoration potential as offset.	3	4	1.5	3.5	12	L	C	
54	No water course	Not as in LCDB	4	4	4	4	16	N	C	
55	Gully to stream	Gullies to 2nd order stream. Tussock, divar_veg, flax. Livestock access, damaged. Moderate ecol. value. Restoration potential as offset	2	4	2	2	10	M	P	
56	Gully, minor	Likely intermittent waterflow, not in REC. Pasture, kuta sedge throughout. Livestock access, damaged and degraded. Estimated low ecol. value currently. Restoration potential as offset	2.5	4	3.5	3	13	L	P	Rep. and ecol. function scores un-confident
57	Gully	Steep gullies + 1st order waterway. Pasture, kuta sedge. Livestock access, damaged and degraded. Induced poor waterway diversity. Likely low ecol. value currently	2.5	4	3.5	3	13	L	U	Rep. and ecol. function scores un-confident
58	Gully to	Farm gully to 1st order stream. Pasture, kuta sedge, divar_veg. +	3	4	2	2	11	L	P	

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	Stream	associated small tussocky bog. Livestock access, degraded. Although fair pattern value and moderate diversity and ecol. function value, likely low total ecol. value currently. Restoration potential as offset								
59	Sub-alpine bog	Sphagnum moss dominated palustrine oligotrophic wetland. Divar_veg, kuta sedge, tussock, ferns, with scattered exotic weeds. Deer, pig and forestry damage, but potentially resilient. Ecol. complexity fair to high. Non-unique locally, but unknown ED and national value. Threaten species value probable, although a small area. Probably high combined ecol. value. Not classified in LCDB. Warrants further investigation	1.5	1.5	1	2	6	H	U	Rep. and ecol. function scores un-confident. Rarity score TBC
60	Stream <1m	Steep, 1st order. Divar_shrubs and weedy exotics. Thru exotic plantation. Piped. Low ecol. value	3	4	3	2	12	L	P	
61	Gully to swale	Intermittent waterflow gullies to small 1st order stream. Divar_veg, dense in parts + some pasture with scattered divar_veg. Appear limited livestock access. Waterway ecol. value likely moderate, but support for terrestrial spp. possible. Warrants evaluation	2	4	2	1	9	M	P	
62	Stream 1 - 3m	3rd order stream. NZ + exotic trees, sedge, divar_veg. Fenced + partially protected. Estimated high total ecol. value when assume is rare spp. habitat	2	1	2	1.5	6.5	H	U	Rep. and ecol. function scores un-confident. Rarity score TBC
63	Stream 2 - 3m	3rd order stream. Scattered exotic + divar_veg. Fenced and partially protected, but livestock access + probably ecol. degraded. Probably moderate combined ecol. value, even when assuming rare spp. habitat. Excellent restoration potential as offset	2.5	1	2.5	2	8	M	U	
64	Artificial dam	In-farm lake, only ~0.1ha. Likely hydrologically isolated. Ecol. context value unknown, but likely low combined ecol. value.	3	4	3	3	13	L	U	

Appendix 4. Vegetation feature EcSA environmental assessment matrix

Breakdown of the vegetation feature EcSA environment assessments, using EIANZ “Matters” evaluation framework (Roper-Lindsay, Fuller et al. 2018); and enumerating each matter thus Very high = 0, High = 1, Moderate = 2, Low = 3, Negligible = 4. Key: E.val = ecological value rating; divar_ = divaricating; doug.fir = Douglas fir

Veg. feat. FN no	Environ ment Type	Description	Representa -tiveness	Rarity	Diversity and pattern	Ecological context and function	SUM	E.Val	Confi- dence	Ranking notes
1	Exotic plantation	Douglas fir. Probably negligible ecol. value	4	4	4	2	14	N	C	ecol. services unknown/ uncertain
2	Divar_ve g	Matagouri dominated. Lizard habitat. Potentially high combined ecol. value score, when applying a high ecol. function value (uncertain of)	2	2	2	1	7	H	U	Confirm need to score lizard hab for vege? (as done). Overscore on ecol. function?
3	Divar_ve g on rocky outcrop	Matagouri dominated. Lizard habitat. Potentially high combined ecol. value score, when applying a high ecol. function value (uncertain of)	2	2	2	1	7	H	U	Overscore on ecol. function?
4	Mixed Scrub	Matagouri + gorse dominated. Moderate ecol. value. Probably not directly affected	2	4	2	2	10	M	C	Low to moderate ecol. value
5	Pasture + gorse + divar_ve g	Sparse and dry. Non-unique. Probably low total ecol. value, even with moderate ecol. function score	3	4	4	2	13	L	P	
6	Gorse, broom, divar_ve g, weedy pines	Heavily mod + grazed, deer and pig. Non-unique. Degraded but probably moderate ecol. value at the ED level	2	4	3	2	11	M	P	ecol. function unknown/ uncertain
7	Gorse, broom, divar_ve g	Heavily mod + grazed, deer and pig. Low to negligible total ecol. value, although ecol. function potentially intermittent high	3	4	3	3	13	L	U	ecol. function unknown/ uncertain
8	Exotic plantation	Mixed exotic. Heavily modified and weedy. Negligible total ecol. value; although moderate ecol. function score	4	4	4	2	14	N	C	
9	Exotic plantation + weeds	Mixed age and spp. plantation. Deer present. Non-unique. Probably low total ecol. value; via likely low to moderate ecol. function scores. Different classification + area to that in LCDB	4	4	3	2	13	L	P	

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10	Exotic plantation	Mixed exotic plantation + broom. Negligible ecol. value; although likely moderate ecol. function score. Different classification to that in LCDB	4	4	4	2	14	N	C	
12	Mixed exotic	Exotic plantation + weeds. Non-unique; ecol. isolated. Negligible total ecol. value	4	4	4	3	15	N	C	
13	Mixed exotic	Exotic plantation + weeds. Non-unique + isolated. Negligible ecol. value	4	4	3	3	14	N	C	
14	Exotic weeds	Scattered broom & gorse. Non-unique; but moderate diversity. Probably negligible ecol. value	4	4	3	3	14	N	P	
15	Mixed exotic	Pasture + exotic plantation. Non-unique; negligible diversity but some ecol. function. Negligible total ecol. value	4	4	4	3	15	N	C	
16	Mixed exotics	Exotic plantation + weeds (mainly broom). Non-unique. Negligible total ecol. value; although some diversity and ecol. function value. Not as classified in LCDB	4	4	3	3	14	N	C	
17	Mixed exotics	Dense broom + gorse + pasture. Non-unique. Negligible total ecol. value; although some diversity and ecol. function value. Area much larger than shown in LCDB	4	4	3	3	14	N	C	
18	Mixed exotic	Exotic plantation (mostly eucalyptus). Non-unique. Negligible total ecol. value; although likely moderate ecol. function value	4	4	4	2	14	N	P	
19	Manuka + gorse	Dense, moderate age scrub + shallow swale. Connected to large protected area. Moderate to low ecol. value; uncertain of ecol. context value	2	4	2	2	10	M	U	ecol. context value unknown/uncertain
20	Manuka + gorse	Dense scrub. Songbirds present, invertebrates abundant. Moderate ecol. potential. Area of direct impact projected to be limited to the margin of a large area of regenerating forest; but warrants determination of extent of area impacted	2	4	2	2	10	M	P	
21	Manuka + gorse	Dense scrub. Moderate ecol. value. Invertebrates abundant. Probably low total ecol. value; although has moderate ecol. representative and function potential. Area of direct impact projected to be limited to the margin of a large area of regenerating forest; so warrants determination of extent of area impacted	2	4	3	2	11	L	U	would be moderate if pattern score is actually higher
22	Mixed exotic + wet area	Gorse + weedy exotic trees + swampy with sedge. Unknown ecol. value, probably low to negligible. Warrants fuller	3	4	3	3	13	L	U	potentially negligible

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		evaluation if directly impacted. Restoration potential								
23	Mixed exotic	Exotic plantation + gorse + scattered divar_shrubs. Probably negligible ecol. value. Different classification than LCDB to E and S	4	4	3	3	14	N	P	
24	Mixed exotic	Exotic plantation + gorse. Non unique; small and negligible ecol. function value. Negligible total ecol. value	4	4	4	4	16	N	C	
25	Exotic weeds	Dense gorse + scattered NZ shrubs. Non unique, probably negligible ecol. value; although buffers large protected area. Different classification to LCDB	4	4	3	3	14	N	P	buffer value could be higher?
26	Regenerating NZ scrub + exotic weeds	Divar_veg, pittosporum, totara, horopito, rewarewa + scattered gorse. Although non-unique, small and isolated, probably ED moderate ecol. value; including likely support of connected water-way ecol. Direct impact unknown, both factors warrant further investigation	2	4	2	2	10	M	P	
27	Mixed exotic	Exotic plantation and gorse. Non-unique; with vertebrate pests. Negligible ecol. value. Pest reservoir impact likely greater than buffer value	4	4	4	2	14	N	P	
28	Exotic plantation	Exotic plantation and gorse. Non-unique; with vertebrate pests. Negligible ecol. value. Pest reservoir impact likely greater than buffer value. Different classification to LCDB	4	4	4	2	14	N	P	
29	Exotic plantation	Exotic plantation, mature. Diversity of flies (Syrphidae) noted. Vegetation ecol. value negligible; but potential invertebrate value warrants investigation. Extent different to LCDB	4	2	4	4	14	N	U	Why Invert diversity here? Warrants proper eval.
30	Exotic plantation	Mature and not managed exotic plantation. Non-unique, and ecol. function limited. Negligible ecol. value	4	4	4	3	15	N	C	
31	Regen. native bush + tussock, divar_veg	Regenerating native bush + small area of tussock and divar_veg on west margin. Probably low ecol. value; although likely supports local water-way ecol. Warrants full evaluation, if directly impacted. Extent different to LCDB	3	4	2	2	11	L	U	Overscore on pattern and ecol. function?
32	Weedy scrub	Broom, gorse + scattered kowhai. Low to negligible total ecol. value; although representiveness and ecol. function values uncertain. Extent much larger than as in LCDB	3	4	3	2	12	L	U	Representiveness and function uncertain; overscored

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33	Tussock, scattered divar_veg	Tussock and scattered divar_veg. Moderate ecol. value. Lizard and invertebrate values warrant fuller evaluation, if area is going to be impacted	2	2	3	3	10	M	P	Overscore on rarity? (Lizard value unknown, invert. value likely)
34	Exotic weeds	Dense gorse + some scattered divar_veg. Negligible ecol. value. Extent much larger than shown in LCDB	4	4	3	3	14	N	P	
35	Exotic plantation, weeds + NZ scrub	Young doug.fir, pines + broom + divar_veg. Lizard (observed)habitat, potentially over extensive area. Moderate diversity. Non-unique and degraded, but ecol. value moderate to high. Warrants further evaluation	2	1	2	3	8	H	U	All factor scores need to be confirmed
36	Exotic plantation	Pines ~ 15 y.o. + exotic weeds. Negligible ecol. value	4	4	4	2	14	N	P	
37	Exotic plantation	Young doug.fir + tussock, gorse, broom, divar_shrubs. Possible intermittent lizard habitat. Moderate to high diversity. Non-unique and heavily degraded. However, total ecol. value possibly moderate, but uncertain as a wet and possibly non-robust environment. Direct impact likely. Warrants further evaluation	2	2	2	2	8	M	U	
38	Exotic plantation	Young doug.fir + tussock, gorse, broom, divar_shrubs. Non-unique and heavily degraded; however likely moderate ecol. pattern & function values. Combined ecol. value possibly moderate, but uncertain as potential lizard habitat. Warrants further evaluation if directly impacted	2	4	2	2	10	M	U	If impacted, need to confirm if lizard habitat (assumed not here) + veg representation and ecol. function scores
39	Weedy pasture	Weedy gully within a grazed paddock. Scattered gorse + divar_veg. Heavily degraded. Ecol. value likely negligible currently. Restoration potential as offset. Different classification to LCDB	3	4	3	3	13	N	C	
40	Exotic plantation	Recently clear-felled. Negligible ecol. value	4	4	4	3	15	N	C	
41	Sub-alpine ridge community	Tussock + divar_veg on rocky ridge. Potentially robust although fragmented community. Heavily modified and grazed; however, combined ecol. value likely high if lizard presence confirmed. Likely direct impacted. Warrants full evaluation. Not in LCDB	2	1	2	2	7	H	U	Need to confirm if lizard habitat (assumed yes here) + veg pattern and ecol. function scores uncertain. Rep in ED assumed moderate, but

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										needs to be reviewed
41	Sub-alpine ridge community	Tussock + divar_veg on rocky ridge. Potentially robust although fragmented community. Heavily modified and grazed; however, combined ecol. value likely high if lizard presence confirmed. Likely direct impacted. Warrants full evaluation. Not in LCDB	2	1	2	2	7	H	U	Need to confirm if lizard habitat (assumed yes here) + veg pattern and ecol. function scores uncertain. Rep in ED assumed moderate, but needs to be reviewed
41	Sub-alpine ridge community	Tussock + divar_veg on rocky ridge. Potentially robust although fragmented community. Heavily modified and grazed; however, combined ecol. value likely high if lizard presence confirmed. Likely direct impacted. Warrants full evaluation. Not in LCDB	2	1	2	2	7	H	U	Need to confirm if lizard habitat (assumed yes here) + veg pattern and ecol. function scores uncertain. Rep in ED assumed moderate, but needs to be reviewed
42	Scattered scrub	Scattered matagouri + muehlenbeckia + ferns + pasture. Grazed. Likely low ecol. value currently. Good restoration potential as offset	2	4	3	2	11	L	P	
43	Tussock + divar_veg to pasture	Grazed. Likely low to negligible ecol. value. However, connected ridge community to SW (WTG 7 site) is probably high combined ecol. value. Direct impact likely	3	4	4	2	13	L	U	Potentially overscore of ecol. context of tussock and matagouri +underscore of ecol. rep
44	Exotic plantation	~15 - 20 y.o. pines. Probably negligible ecol. value. Marginally greater extent than in LCDB	4	4	4	2	14	N	P	
45	Pasture	Grasses + scatter exotic weeds. Grazed. Low ecol. value. Different class and extent to that shown on LCDB	4	4	4	3	15	N	C	
46	Exotic plantation	Mixed aged pine plantation. Negligible combined ecol. value; although ecol. service value certain. Different classification to that in LCDB	4	4	4	2	14	N	P	
47	Scrub + pasture	Pastured farmland transitions to NZ divar_veg + exotic weed scrub. Probably low ecol. value, although contains minor water courses	3	4	3	2	12	L	P	Potentially overscore of ecol. services to waterways

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48	Tussock + pasture	Mixed grass + scattered exotic weeds. Occasional boulders, livestock access, damage. Ecol. value likely low; potentially negligible	2	4	3	3	12	L	P	Potentially overscore of ecol. rep. value of tussock +underscore of ecol. function
49	Exotic plantation + gorse	Young pines + dense gorse. Fenced. Non-unique + low diversity. Negligible ecol. value	4	4	4	2	14	N	C	
50	Exotic plantation + weeds	Clear-felled, abandoned. Non-unique, negligible diversity. Probably negligible ecol. value. No livestock access. Restoration potential as offset	4	4	4	2	14	N	C	
51	Exotic plantation + weeds	Clear-felled, abandoned. Non-unique, negligible diversity. Probably negligible ecol. value. No livestock access. Restoration potential as offset	4	4	4	2	14	N	C	
52	Matagouri + regen NZ shrubs	Dense stand, limited livestock access. Very small area, but one of several adjacent similar and ecol. linked plots. Combined ecol. likely moderate. Where directly impacted warrant further evaluation. Restoration potential as offset	1	4	3	2	10	M	U	
53	Vegetated swale	High wetland. Divar shrubs, tussock, kuta sedge. Livestock access + damage. Ecol. value currently low; but could be exemplary. Direct impact likely. Strong restoration potential. Not in LCDB	3	4	3	3	13	L	C	
54	Manuka scrub	~2m high manuka + divar shrubs. Ecol. value likely moderate to high. Direct impact warrants determination (possibly none?). Different classification + much larger extent than shown in LCDB	2	2	2	2	8	H	P	Have assumed some rarity potential - TBC
55	Gorse + divar veg.	Dense mixed spp. scrub. Partially fenced. Livestock + deer access/damage. Non-unique; low diversity, but moderate ecol. function, and potential moderate ED level value. Combined ecol. value low currently. Protected zone not accurately mapped in LCDB	3	4	3	2	12	L	C	
56	Broom dominated scrub	~2m high dense stand. Probably livestock access. Ecol. value low currently, non-unique. Restoration potential as offset	3	4	3	2	12	L	C	
57	Exotic plantation + weeds	Broom dominated young pine plantation. Fenced but deer access. Ecol. value likely negligible; although ecol. function could be moderate. Diff. class to that in LCDB	4	4	4	2	14	N	P	

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58	Exotic plantation	Mixed age pine plantation. Ecol. value likely negligible; although could be greater if positive effect on waterways are considered	4	4	4	2	14	N	P	Does +/- effect on waterways need to be included?
59	Exotic plantations	Mixed ages exotics; pines + doug.fir + broom. Non-unique. Combined ecol. values negligible; but possibly moderate ecol. service value within local ED context. Different classification to that in LCDB	4	4	4	2	14	N	P	
60	Sub-alpine scrub	Dracophyllum, kanuka, divar_veg, tussock, flax, scattered weeds. Deer (and pig?) access + damage. Ecol. value likely high. Direct impact likely low, but warrants determination. Large potential for fencing and pest control for ecol. restoration as offset	1	2	2	2	7	H	P	
61	Exotic plantation	Mixed age pine plantation. Combined ecol. values likely negligible; although possibly moderate ecol. function value. Different classification to that in LCDB	4	4	4	2	14	N	P	
62	Exotic plantation	Young doug.fir + weedy pines. Non-unique. Deer present. Likely low ecol. value; although moderate ecol. function value. Diff. class to that in LCDB	4	4	3	2	13	L	P	
64	Exotic plantations	Mixed age pine plantations. Non-unique. Ecol. value likely low, although some diversity and ecol. function on E and SE edges. Larger than as in LCDB	4	4	3	2	13	L	P	

Appendix 5. Suggested mitigation actions for proposed WTG and road-routing

Suggested mitigation actions for proposed WTG and road-routing, to avoid or minimize these impacting ecological features in the HWF area that have been assigned high or moderate ecological value

Table 5. Suggested mitigation actions for proposed WTG positions in the HWF area

WTG #	Ecol.value	Estimated ecol. impact	Suggested mitigation	Suggested re-position1	Suggested re-position2
A2	H?	Probable herptofauna habitat loss	Not assessed. Warrants full evaluation. Herp. and veg. evaluation; towards impact minimization through avoidance	-45.9848417, 168.7040771	
A3	H	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system.	-45.9863905, 168.7129703?; site needs re-survey	
A4	H	Disturb probable herptofauna habitat	Ensure road and laydown areas avoid damaging the outcrop eco-system.	No better WTG site alternative nearby	
A5	H	Disturb probable herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system. Consider a physical buffer	-45.9903961, 168.7308612	
A15	H	Access road will remove probable herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimization through micro-siting road	No better WTG site alternative nearby	
A23	H	Possible herptofauna habitat loss. Displacement of local low ecol. context function	Herp. and veg. evaluation; towards impact minimization through avoidance	-46.0122221, 168.7029200	-46.0118585, 168.7018022
B6	H	Destruction of likely significant wetland habitat	Wetland, herp. and invert evaluation; towards impact avoidance	-45.9883212, 168.5885194	
B10	H	Destruction +/-or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation. Assess for herp. relocation or ecol. restoration via veg. mang. plan	-45.9957800, 168.6151813	
B17	H	Destruction +/-or disturb. herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through WTG micro-siting	-46.0213042, 168.5982317	
C8	H	Destruction +/-or disturb. herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards impact minimisation through WTG micro-siting	-46.0728851, 168.6285866	
A1	M	Possible destruction of herptofauna habitat; damage to vege and ecol. context function	Veg., herp. and invert evaluation; towards toward herp. relocation and offset calc, or preferably habitat restoration	No better WTG site alternative nearby	
A22	M	Displacement of local ecol. function	Herp, veg. and ecol. function evaluation; toward herp. relocation and offset calc.	No better WTG site alternative nearby	

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WTG #	Ecol.value	Estimated ecol. impact	Suggested mitigation	Suggested re-position1	Suggested re-position2
B7	M	Destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation; towards herp. relocation	No better WTG site alternative nearby	
B11	M	Possible destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation; toward herp. relocation	No better WTG site alternative nearby	
B12	M	Possible destruction +/- or disturb. herptofauna habitat; damage to low value vege	Veg., herp. and invert evaluation. Assess for herp. relocation or ecol. restoration via veg. mang. plan	No better WTG site alternative nearby	
B20	M	Displacement of local ecol. function. Possible disturb. herptofauna habitat	Herp., veg. and ecol. function evaluation; toward avoidance, herp. relocation and offset calc.	-46.0331531, 168.6290744,	

Table 6. Road routing suggested relocation, to avoid and/or minimize the impacts to ecological features in the HWF area. (This includes some feature that have yet to be physically assessed – which are assigned an Ecol.value with a query symbol (?))

Feature	Ecol.value	Estimated ecol. impact	Suggested mitigation	Suggested re-position
approach to WTG A1	M	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system (e.g., FN_veg#41).	Take road route off the ridge to run to the north of FN_veg#41
Turning head by WTG A1	M/L	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system.	Avoid small knoll at - 45.9833097, 168.7005224 (go either side of this feature)
approach to WTG A12	H	Local disturbance/ destruction of herptofauna habitat; damage to vege and ecol. context function	Avoid direct impact to FN_veg#2.	Re-route road to run north of FN_veg#2; access WTG A12 via existing track route
approach to WTG A14	H?	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system.	Re-route access to south of knoll at - 46.0022, 168.7436, following route of existing farm track
approach to WTG A15	M/L?	Local destruction of herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system.	terminate road at WTG. Place laydown area downhill of WTG site
Between WTG B22 and B17	M/L?	Local destruction of potential herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting.	Follow existing track route, and so avoid or minimize impact to un-surveyed gullies to the east
Between WTG B22 and B17	M	Local damage to FN_water #41, damage to vege and hydrological function	Minimize impacting tussock area supporting FN_Water#41	
approach to WTG B10	H	Local destruction of potential herptofauna habitat; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system. Possible candidate area for restoration vegetation management plan	Have laydown areas to the north of the outcrop eco-system
FN_water#7	H	Destruction of likely significant wetland habitat	Wetland, herp. and invert evaluation; towards impact avoidance	re-route road to run north of FN_water#7 (ensure buffer method or distance adequate to maintain hydrological resilience value)

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Feature	Ecol.value	Estimated ecol. impact	Suggested mitigation	Suggested re-position
south of WTG C2	L?	Local destruction of potential herptofauna habitat; damage to vege and ecol. context function		Minimize impacting tussock area above slope (ensure buffer method or distance adequate to maintain soil + hydrological resilience value)
approach to WTG C3	L	Destruction of FN_water #53, damage to vege and hydrological function	Impact minimisation through avoidance - Avoid direct impact to FN_water#53	Re-route access road to the north and east of FN_water#53
between WTG C9 and C10	H	Local destruction of potential herptofauna habitat; damage to vege and ecol. context function		Avoid rocky outcrop communities where possible. Curve routing to follow fence line between - 46.0687494,168.6423525 and - 46.0701032,168.6394332
between WTG C8 and C10	H/M?	Destruction of un-surveyed marshy areas; damage to vege and hydrological function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the wetlands	Avoid un-surveyed marshy areas. Follow existing track between - 46.0704616,168.6382994 and - 46.0704616,168.6382994. Use existing "ford" over un-surveyed water feature/ marsh at -46.0709514, 168.6325388
around WTG C21	H?	Destruction of likely herptofauna habitat around -46.058, 168.701; damage to vege and ecol. context function	Impact minimisation through micro-siting. Ensure road and laydown areas avoid damaging the outcrop eco-system.	Replace loop to west and north of WTG C21 with a direct line between WTG C22 and C23

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