



Te Awamutu Large Format Retail Centre

Ecological Impact Assessment

Prepared for BBO



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EXECUTIVE SUMMARY

The proposed activity at 638 Cambridge Road includes changing the zoning from medium residential to commercial to facilitate the development of a new Te Awamutu Large Format Retail Centre. As part of the enabling works, most of the site will require vegetation clearance and earthworks.

The site's main ecological feature was extensive areas of low-value exotic pasture grasses and scattered exotic trees. Ecological values for fauna include low value habitat for common and introduced avifauna, and moderate value habitat for lizards and bats. Approximately 2m of wetland encroached within the site boundary from a neighbouring property.

The main impact associated with the proposal include loss of the majority of pasture grassland, loss of common bird habitat, loss of some lizard habitat and potential risk of bats being harmed whilst clearing five trees that were identified as having high at roosting potential.

No lizards were identified on site despite thorough searches of suitable habitats so the actual risk of the proposal having an impact on lizards is not high.

No bat activity was recorded during acoustic monitoring surveys of the site. The lack of activity would suggest that bats, if they visit the site at all would do so only infrequently. The low frequency of activity on site would also reduce the likelihood of bats being harmed whilst felling the trees.

To reduce the risk of the proposal having an impact on fauna protected by the wildlife act 1953 recommendations including checks for nesting birds prior to the removal of vegetation during the nesting bird season, and ensuring that identified bat roost trees are removed following the Vegetation Removal Protocols outlined by the Department of Conservation.

The proposal will have an overall positive impact on wetland habitat onsite as livestock grazing will cease. Native vegetation planting has been recommended to enhance the wetland and other areas of the site. This should benefit all native fauna and increase the overall ecological value of the site. It is recommended that a planting plan incorporating vegetation that benefits native fauna such as birds, bats, and lizards be prepared.

1. INTRODUCTION

This report¹, prepared by Ecology New Zealand Limited (ENZL) provides an Ecological Impact Assessment (EclA) associated with the proposed re-zoning and development of the site at 638 Cambridge Road, Te Awamutu. The report includes details of the proposed activity and assesses the impact of the activity on any identified ecological features. Where significant impacts are anticipated, ecological management measures are recommended to reduce the level of effect to a level below what is regarded as significant by the EIANZ guidelines²

1.1. Proposed Activity

The proposed activity at 638 Cambridge Road includes changing the zoning from medium residential to commercial to facilitate the development of a Large Format Retail Centre. As part of the enabling works, most of the site will require vegetation clearance and earthworks.

The site totals c.4ha in area; of which 3.0ha will be developed with hard landscaping, structures, roads and car parking. A 6m landscaping strip is proposed along the north and western boundary. The remaining c.1ha will remain undeveloped from hardscaping as it falls within the 100-year flood risk area. It is proposed within the flood risk zone a stormwater retention pond will be created to manage water flow from impermeable surfaces both on and off-site. Stormwater retention ponds and surrounding areas are to be enhanced through native revegetation planting. See Appendix C for a site drawing provided by the client.

1.2. Site Location, Description and Ecological Context

The site is located within a mixed-use landscape in the eastern fringe of the Te Awamutu township (Figure 1). The surrounding land use is a mixture of productive farmland, commercial buildings, residential housing, and fragments of indigenous and exotic vegetation. The Mangahoi Stream and associated tributaries run through a neighbouring property immediately southwest of the site. The site itself contains six existing buildings and an associated accessway. Much of the site is occupied by productive pasture which has historically been utilised for stock grazing.

¹ This report is subject to the Report Limitations provided in Appendix A.

² Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

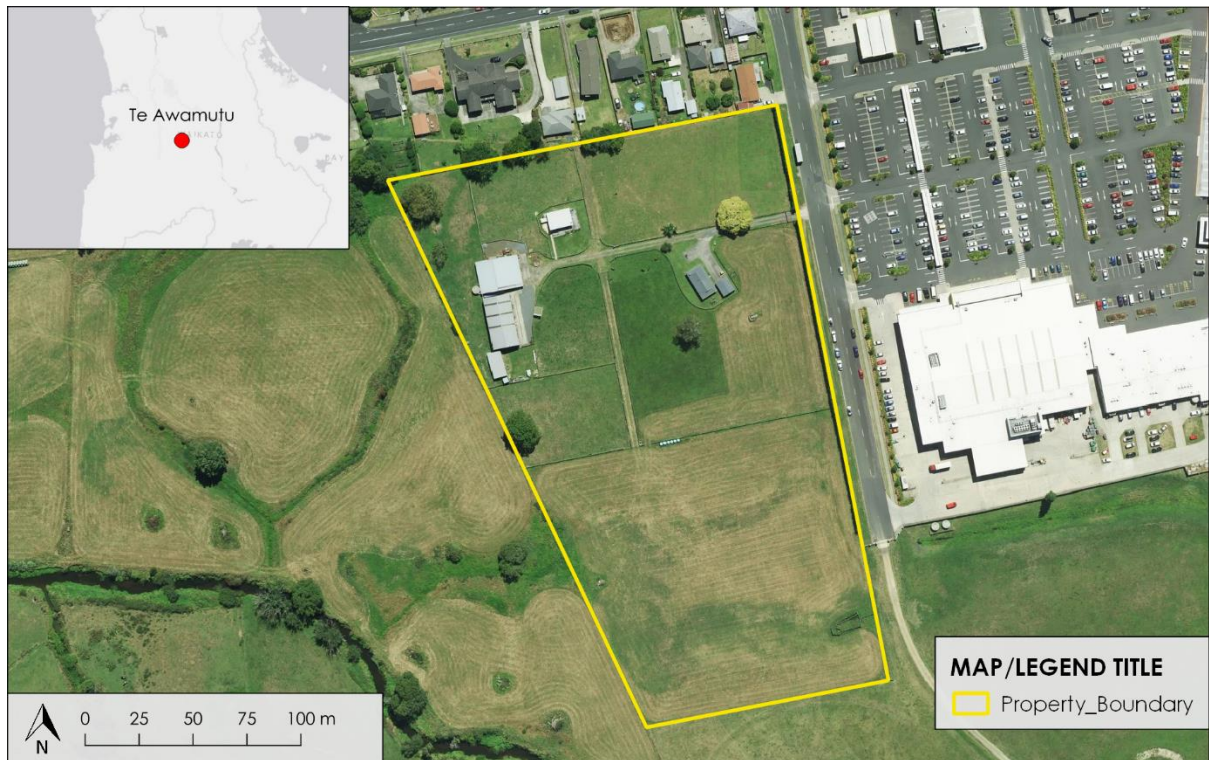


Figure 1: Drawing showing the location of 638 Cambridge Road

2. METHODOLOGY

ENZL ecologists undertook a site assessment on October 24th 2024. This assessment aimed to confirm the adequacy of existing ecological information and to complete appropriate surveys to address gaps in information necessary to complete an EclA. The following sections outline the methodologies used for the assessment.

2.1. Terrestrial Ecological Survey

Searches of national and regional ecosystem databases³, and threatened species databases⁴ were completed to ascertain existing information on ecosystems and threatened flora and fauna.

Databases and reference documents utilised included:

- Waikato Regional Pest Management Plan 2022-2032,
- Department of Conservation Bat Database 2022,
- Department of Conservation Herpetofauna Database 2023,
- eBird New Zealand,
 - iNaturalist New Zealand,
 - Waipa District ePlan.

During the site assessment, all vegetation across the site was classified to ecosystem level and mapped with its associated composition, value, structure and integrity recorded. All rare and threatened flora species encountered were documented.

All birds heard and observed on-site were documented during assessments to provide a snapshot of on-site bird diversity. Habitat for birds was further documented, emphasising nesting and roosting availability and a high-level documentation of the presence of year-round food sources.

Lizard habitat assessments focused on habitat suitability for the known diversity of species within the Waikato Region. During the assessment, systematic searches for ground-dwelling lizard species were undertaken, focussing on searches under organic and inorganic debris items found on-site. Survey effort consisted of a total of four hours searching suitable habitat across the site.

A high-level assessment of native bat habitat was undertaken at the site. Specifically, this included review of the presence of larger (diameter at breast height [DBH] > 15cm) mature trees, which could provide roosting habitat for this threatened species⁵.

Five Acoustic Bat Monitors (ABMs) were also deployed on site. These were positioned along potential bat features including trees and flyways which bats may utilise Appendix D. The ABMs were deployed for 19 nights between the 24th of October to 12th of November. The data

³ The Land Environments of New Zealand (LENZ) the land cover database (LCDB4) are available for download from <http://iris.scinfo.org.nz/>. Regional ecosystem mapping e.g. Indigenous terrestrial and wetland ecosystems of Auckland. Singers et al. 2017

⁴ NZ Threat Classification System <https://www.doc.govt.nz/about-us/science-publications/conservation-publications/nz-threat-classification-system/>

⁵ Borkin K.M. 2010: Ecology of New Zealand long-tailed bat (*Chalinolobus tuberculatus*) in exotic plantation forest. Unpublished PhD thesis. University of Auckland, Auckland, New Zealand

collected from ABMs was processed using DOC Batsearch 3.2.3 software and data analysed by an ecologist with DOC competency 3.1. The data was used to provide information on how often bats utilised the site during the period surveyed and identify any potentially important bat features that may be used for roosting or foraging habitat.

The wetland assessment was undertaken using vegetation community characterisation in accordance with the Ministry for the Environment's Wetland Delineation Protocols⁶ and, where required, hydric soils assessment as per the Ministry for the Environment's Wetland Hydric Soil Protocols⁶. The following steps were undertaken for the assessment at this site:

1. The rapid test for improved pasture/ obligate hydrophytic composition dominance was undertaken
2. In areas where the dominant species were not pasture species, each stratum's dominant species were identified (i.e. tree, sapling/shrub, herb), and the relevant delineation tests were undertaken⁸.
3. Representative 2x2 vegetation plots were utilised. The size of the plot was chosen to represent the vegetation type best.
4. Where the vegetation tests failed to identify the area as a wetland, this was generally due to the presence of non-normal circumstances⁹, and therefore the hydric soil assessments were undertaken.
5. The hydrology tool was also implemented where vegetation and soil tests were inconclusive.

2.2. Impact Assessment

The Environment Institute of Australia and New Zealand's guidelines for undertaking Ecological Impact Assessments (EclA; EIANZ 2018⁷) were used to assess the impacts of the proposed development. The guidelines provide criteria to assess ecological values using the matters: 'representativeness', 'rarity/distinctiveness', 'diversity and pattern', and 'ecological context.' Based on the designated values for each matter, the ecological aspects of the site are then assessed using the attributes matrix in Appendix 10 of the EIANZ guidelines. Chapter 6 of the EIANZ guidelines provides criteria for determining the magnitude of effects.

The level of effect can then be determined by combining the value of the ecological feature/attribute with the score or rating for the magnitude of effect to create criteria for describing the level of effects. Cells with low or very low levels of effect represent a low risk to ecological values rather than low ecological values. A 'moderate' level of effect requires careful assessment and analysis of the individual case. These effects could be managed through avoidance, design, or appropriate management actions.

6 Ministry for the Environment. 2022. Wetland delineation protocols. Wellington: Ministry for the Environment.

7 Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

Impacts were primarily assessed at the catchment scale within this report. After consideration at the catchment scale, assessment at the site, regional, and national scales were regarded to inform the overall assessment where applicable.

3. ECOLOGICAL ASSESSMENT

3.1. Terrestrial Ecology

3.1.1. General Vegetation

Vegetation across the majority of the site was dominated by exotic pasture species such as Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), sweet vernal grass (*Anthoxanthum odoratum*) creeping buttercup (*Ranunculus repens*) and dock (*Rumex* spp). A c.4m tall leylandii (*Cupressus × leylandii*) hedgerow was present along the eastern boundary of the site and some mature scattered exotic trees including crack willow (*Salix × fragilis*), pin oak (*Quercus palustris*), cherry (*Prunus* sp.) and elm (*Ulmus* spp.) were also present. Terrestrial vegetation across the site is typical of productive pastureland in the Waikato Region and is not representative of any recognised indigenous ecosystem. Overall, the value of terrestrial vegetation on-site is considered to be 'Low' due to the absence of any mature or complex indigenous vegetation and the prevalence of maintained exotic pasture grasses.



Figure 2: Exotic pasture grasses were the dominant vegetation on site



Figure 3: Evidence of livestock grazing on site

3.1.2. Avifauna

Site and desktop assessments were used in combination to assess the potential diversity of bird species utilising and occupying the site. The nearest bird 'hotspot' record is located approximately 3.8km northwest of the site at Ngaroto Road. The land use at this point is comparable to that of the project site. As such, these bird records are expected to be informative of the diversity of species utilising the site. Table 1: Bird records and species likely to be using the site. The 5-minute bird counts were used to detect what species were present at

the time of the site visit with these results also shown in Table 1 below as confirmed detection on site.

Table 1 Records of birds from a nearby bird hotspot taken from the desktop study and which species were detected on site

Latin Name	Maori Name	Common Name	Threat Status ³	Detected on site
<i>Gerygone igata</i>	Hiroriori	Grey warbler	Not Threatened	
<i>Hirundo neoxena neoxena</i>		Welcome Swallow	Not Threatened	✓
<i>Porphyrio melanotus melanotus</i>		Pukeko	Not Threatened	✓
<i>Prosthemadera novaeseelandiae novaeseelandiae</i>	Koko	Tui	Not Threatened	
<i>Vanellus miles</i>		Spur-winged Plover	Not Threatened	✓
<i>Zosterops lateralis lateralis</i>	Hiraka	Silvereye	Not Threatened	✓
<i>Circus approximans</i>		Swamp harrier	Not Threatened	
<i>Acridotheres tristis</i>		Myna	Introduced and Naturalised	✓
<i>Anas platyrhynchos</i>		Mallard	Introduced and Naturalised	
<i>Carduelis carduelis</i>		Goldfinch	Introduced and Naturalised	✓
<i>Columba livia</i>		Rock Pigeon	Introduced and Naturalised	✓
<i>Gymnorhina tibicen</i>		Australian Magpie	Introduced and Naturalised	✓
<i>Passer domesticus</i>		House Sparrow	Introduced and Naturalised	✓
<i>Platycercus eximius</i>		Eastern Rosella	Introduced and Naturalised	
<i>Streptopelia chinensis tigrina</i>		Spotted Dove	Introduced and Naturalised	

<i>Sturnus vulgaris</i>		Starling	Introduced and Naturalised	✓
<i>Turdus merula</i>		Blackbird	Introduced and Naturalised	✓
<i>Turdus philomelos</i>		Song Thrush	Introduced and Naturalised	✓
<i>Pavo cristatus</i>		Peafowl	Introduced and Naturalised	
<i>Emberiza citrinella</i>		Yellowhammer	Introduced and Naturalised	
<i>Carduelis flammea</i>		Redpoll	Introduced and Naturalised	

Nesting and foraging habitat on site was limited and sparsely distributed, with suitable nest sites being limited to the larger mature exotic trees and leylandii hedgerow. Suitable habitat for ground nesting species was generally absent as pasture on site has been maintained in short condition via grazing/mowing. Birds utilising available on-site habitat are therefore expected to be limited to common introduced and Not-Threatened native species, typical of assemblages occupying highly modified, mixed-use agricultural landscapes in the Waikato Region

3.1.3. Herpetofauna

Few herpetofauna records are available surrounding the site and the Te Awamutu area, with most records immediately surrounding the site being limited to unidentified exotic frog species (*Ranoidea* sp.), which are likely introduced golden bell frogs (*Ranoidea aurea*). The closest indigenous lizard species recorded are copper skinks (*Oligosoma aeneum*), 4km north of the site.

The majority of the site was heavily managed through stock grazing and mowing making the sward short and no layers of old grass/thatch had developed. The intensive management across the site reduces the likelihood of copper skink presence particularly within the areas of pasture.

Some limited habitat for copper skinks was identified within areas of rank grass along the fence lines along the northern, west and southern site perimeter, and beneath a hedgerow of Leylandii along the site's eastern boundary (Figure 4). The suitable habitat along perimeter fences and hedgerow base was systematically searched by ENZL ecologists for c. 4 hours and no skinks were observed.



Figure 4 showing the *Leylandii* hedgerow with its base identified as potential lizard habitat.

Elegant geckos (*Naultinus elegans*) have been recorded across the surrounding landscape (nearest record 10.5km), however these records all date prior to 1970 and are not expected to be representative of modern distributions. Furthermore, habitat suitable for indigenous arboreal lizards was extremely limited on site, as mature vegetation was restricted to isolated, exotic trees within an area of productive pasture which is not contiguous with any fragments of indigenous vegetation which may support resident populations, arboreal lizard presence is highly unlikely.

Copper Skink is an At-Risk - Declining species⁸ whose population has fallen across their range. Due to their threat status, they have a High ecological value.

3.1.4. Chiropteran Fauna

Long-tailed bats (*Chalinolbus tubercalatus*) have been recorded in the surrounding landscape in close proximity to the project site, with the closest records c.0.5km away from the site's southern boundary. Records indicate bat activity associated with the reach of the Mangahoi Stream, which is likely being used as a commuting and foraging corridor by local populations. The stream's closest point is c.35m from the sites south-western corner. The proximity of these records and the stream suggest the site likely supports some level of bat activity; however it remains unknown whether this activity is limited to foraging and traversing or whether roosting bats are present on site.

⁸ Hitchmough, R.A.; Barr, B.; Knox, C.; Lettink, M.; Monks, J.M.; Patterson, J.B.; Reardon, J.T.; van Winkel, D.; Rolfe, J.; Michel, P. 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

Acoustic bat monitoring surveys conducted between 24th October to 12th of November did not identify any bat activity on the Site. A limitation of the relatively short duration of the survey is that it may not account for temporal variation in habitat use throughout the year. Bats may infrequently forage or commute in the area and records within 500m well within the average home range of c.0.8-c.7.3km for this species in the Hamilton/Waikato area^{9,10}. The lack of records during this survey period suggests that the site is not a primary feeding or roosting area and is not likely to be an important commuting corridor.

High-level roost risk assessments were undertaken from the ground for all mature trees with a DBH (Diameter at Breast Height) above 150mm present on site. Five trees were identified within the site boundary with a DBH above 150mm of these trees three had potential roost features and were recorded as high-risk bat trees. The remaining two trees had no obvious features but due to their size were identified as moderate-risk. Table 2 below shows both the High and Moderate risk bat trees. The drawing in Appendix D shows the location of the bat risk trees.

Long-tailed bats are listed as a critically vulnerable species¹¹ and therefore in terms of their rarity and pattern they have a very high ecological value.

Table 2 Showing the results of the bat roost tree risk rating assessment

Risk Rating	Description of bat trees	Photograph of trees with high/low-risk rating for roosting bats
High	Elm tree with welded leaders forming a potential shelter for bats at c.4m. near to the entrance of the site.	

⁹ Dekrout A.S. 2009: Monitoring New Zealand long-tailed bats (*Chalinolobus tuberculatus*) in urban habitats: ecology, physiology and genetics. Unpublished PhD thesis. University of Auckland, Auckland, New Zealand. 168 pp.

¹⁰ Davidson-Watts Ecology (Pacific) Ltd. 2019 Long-tailed bat trapping and radio tracking baseline report. Southern Links, Hamilton. Report for AECOM, Auckland.

¹¹ O'Donnell, C.F.J.; Borkin, K.M.; Christie, J.; Davidson-Watts, I.; Dennis, G.; Pryde, M.; Michel, P. 2023: Conservation status of bats in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 41. Department of Conservation, Wellington. 18 p.

High	Crack willow tree with multiple failure points creating cavities for bats. Northwest of the site	
High	Crack willow tree with multiple failure points creating cavities for bats. The northwestern corner of the site	

Moderate	Unidentified tree species with no obvious features but due to its size could present opportunities for sheltering bats in the future	
Moderate	Unidentified tree species with no obvious features but due to its size could present opportunities for sheltering bats in the future	

3.2. Wetland Assessment

3.2.1. Desktop study

Aerial imagery, both historic and more recent, were used to identify potential wetland areas on site that would require further investigation. Figure 5 below shows three potential wetland areas, Potential wetland area 1 was identified within the site boundary and was assessed through the MFE wetland delineation protocols on 24th October 2024. The potential wetland areas on the neighbouring property were observed over the fence but no detailed investigations were undertaken.

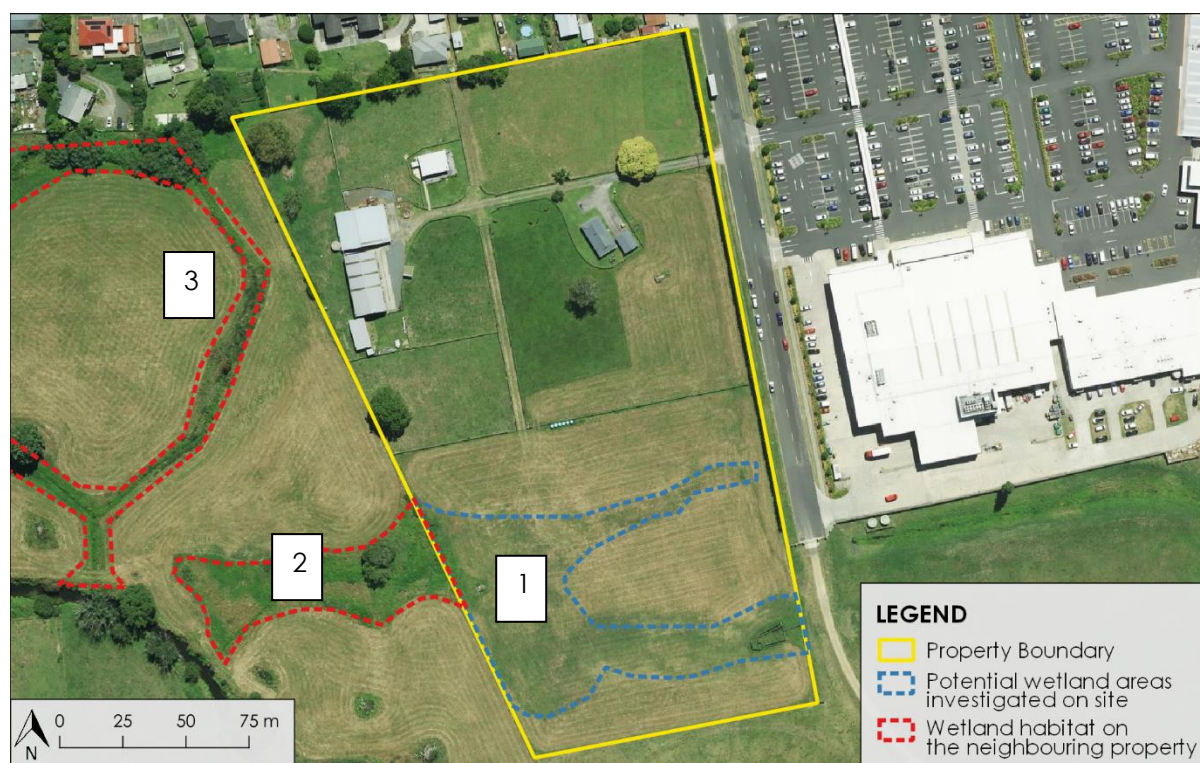


Figure 5 Location of potential wetland in relation to the site boundary

3.2.2. Potential wetland area 1

Based on the findings following the wetland delineation protocols, see Appendix E for details, the on-site extent of this wetland was limited, encroaching only c.2m over the western boundary from the neighbouring property, outside of which the vegetation rapidly transitioned into productive pasture. The Table below summarises the wetland delineation tests undertaken within Potential Wetland Area 1. The drawing in Appendix D shows the actual location of the wetland habitat on-site following the results of the wetland delineation protocols. As can be seen in Appendix D the actual area of wetland encroachment on site has been greatly reduced from the potential wetland areas identified from the desktop survey. The wetland habitat encroaching onto site was poached by livestock and some water pooling at the lowest points. This area was identified as a wetland based on the hydrophytic vegetation dominance test and hydric soil and hydrology tests.

Table 4: Summary of Wetland delineation protocol tests Potential Wetland Area 1

Result	Plot One	Plot Two	Plot Three
Rapid	Fail	Fail	Fail
Pasture exclusion applies	Fail	Pass	Pass
Dominance	Pass	N/A	N/A
Prevalence	Fail	N/A	N/A

Hydric Soil	Pass	N/A	N/A
Hydrology test	Pass	N/A	N/A

Historic imagery of the site shows that the landscape has changed markedly over time with an increase in the amount of drainage ditches created in the wider landscape. Changes to the drainage regime have likely changed the water table on site. The earliest photograph from aerial imagery shows an overland flow and potential wetland within the areas investigated as part of Potential wetland area 1 (Figure 6). Evidence of draining on site was evident with the presence of a manhole cover and drain within the potential wetland area. The presence of the historic wetland and flow path has likely left behind geomorphological variations compared to their surroundings making the Potential Wetland 1 Area stand out when compared to the rest of the site when observed on more recent imagery. The actual area of wetland habitat appears to have been greatly reduced from its historical extent and now only encroached c.2m over the western boundary of the site as shown in Appendix D.



Figure 6 Yellow area indicates the approximate location of Potential Wetland Area 1 in a historical context

3.2.3. Neighbouring wetland areas

During the on-site investigation, it was clear that wetland habitat was present on the neighbouring property to the west of the site (Figure 7). Water was visibly pooling on the surface and vegetation was dominated by soft rush (*Juncus effusus* var. *effusus*), spearwort (*Ranunculus flammula*) and creeping bent grass (*Agrostis stolonifera*) which are facultative wetland species and fairly reliable indicators of wetland habitat.



Figure 7: Image showing the wetland area on the neighbouring property to the west of the Site.

4. ECOLOGICAL VALUES ASSESSMENT

Consideration of ecological values are undertaken at a site and catchment scale, with consideration to any factors relevant at regional and national scale. Assessment criteria include the ecological values 'representativeness', 'rarity/distinctiveness', 'diversity and pattern', and 'ecological context'¹². Table 4 below summarises the ecological values for the terrestrial features assessed on site and the criteria met for each.

Table 4: Ecological Values Assessment

Ecological Feature	Assessment of ecological feature against criteria: 1- Representativeness 2- Rarity/distinctiveness 3- Diversity and pattern 4- Ecological context	Summary of Assessment against criteria:	Overall Value
terrestrial Vegetation	1. Not representative of natural indigenous ecosystem • Very common across the Waikato and Nationally 2. Low diversity dominated by monocultures or sown/planted exotic species 3. Absence of mature and complex indigenous habitat	1- Low 2- Low 3- Low 4- Low	Low

¹² Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition. (See report Appendix 2)

Birds	1. Species assemblage is not representative of the natural indigenous ecosystem 2. Nationally and locally common indigenous species 3. Low Indigenous species diversity only the most resilient species present 4. There are some more common indigenous species present that may stand out from neighbouring urban areas.	1- Low 2- Low 3- Low 4- Moderate	Low
Herpetofauna	1. Species assemblage is not representative of the natural indigenous ecosystem species present have adapted to exotic species dominated ecosystem • At-risk declining species may be present in low numbers • Low species diversity and fairly typical of habitats present and in surrounding landscape 2. At-risk indigenous species within a landscape dominated by exotic and introduced flora/fauna	1- Low 2- High 3- Low 4- Low	Moderate
Chiropteran fauna	1. Species assemblage is not representative of the natural indigenous ecosystem species present have adapted to exotic species-dominated ecosystem • Nationally critical species may be present in low numbers infrequently • Low numbers on site and likely visit the site infrequently • Potentially nationally critical species present but in low numbers and infrequently	1- Low 2- Very High 3- Low 4- moderate	High
Wetland vegetation	1. Species assemblage is not representative of the natural indigenous ecosystem 2. Wetlands are underrepresented regionally and nationally and have declined from historic extent 3. Some natural diversity but dominated by exotic species. 4. Underrepresented habitat type plays an important ecological function filtration, flood alleviation	1- Low 2- High 3- Low 4- High	High

5. ASSESSING EFFECTS OF ACTIVITIES ON ECOLOGICAL VALUES

The nature and level of actual or potential effects of activities for which consent is being sought are addressed. Positive and adverse effects, cumulative effects and residual effects are considered, and the assessment informs the nature and scale of impact management required.

5.1. Terrestrial Vegetation

The proposed development of the site will require exotic grass pasture and exotic trees to be removed and replaced by hard landscaping. Some soft landscaping in the form of vegetation planting around a 6m buffer strip around the perimeter of the site. Of the c.4ha site, c.0.6 ha will be retained as a no build area as it lies within the 100-year flood risk zone identified in the Waikato Regional Plan.

Vegetation as habitat for fauna and assessed under the Wildlife Act, 1953, is considered in Sections 5.2 - 5.4 below.

Given the loss of extent of vegetation across the site to be replaced by hand landscaping, the pre-management magnitude of effect is considered **Low**.

5.2. Avifauna

Loss of some habitat for common indigenous birds and introduced species will result from the proposed site clearance. Habitat enhancement in the form of vegetation planting has been included in the site plans. The planting will replace the habitat that has been lost once it has reached maturity. Using a mix of native plant species that offer forage for indigenous birds will improve the value of habitat once it has matured. Given the loss of low quality habitat within the site, the pre-management magnitude of effect is considered **Low**.

5.3. Herpetofauna

The proposal will result in a loss of a small area of low-quality potential habitat for copper skink. Risk of individual lizards being harmed during vegetation clearance and earthworks is considered negligible given that no lizards were identified during intensive manual habitat searches, indicating that, if present, they are present in very low density. Considering the low likelihood of copper skinks being present and the small area of potential habitat to be removed, the pre-management magnitude of effect is considered **Low**.

5.4. Chiropteran fauna

The proposal will result in the loss of five potential bat roost trees and a loss of low-value foraging and commuting habitat. Given that the ABM survey detected no bat activity, frequency of bat activity on site is likely to be low. There is a risk that bats may be present within identified high and moderate rated bat trees during clearance works, however due to the low frequency of activity on site the risk is low. Given the effects summarised above the pre-management magnitude of effect is considered **Low**.

5.5. Wetland habitat

Earthworks and vegetation clearance within 10m of the wetland identified on-site will be avoided as this area falls within the 100yr flood no build zone shown in the site drawings in Appendix C.

It is anticipated that the impact of constructing the Building Improvement Area will not have an adverse impact on the function of the wetland on-site and on the wetlands identified on the neighbouring property. The removal of stock from the site will likely reduce the impact on the wetland by reducing the amount of poaching and nutrient enrichment. Additional sedimentation as a result of the development may occur without appropriate sediment controls.

Given the effects described above, the pre-management magnitude of effect is considered **Moderate**.

5.6. Summary of the Level of Effects – Pre-management

The ecological values, effects, and magnitude of effects (pre-management) are summarised below (Table 3) and the level of effects (pre-management) are determined as per the EIANZ guidelines.

Table 3: Evaluation of the level of effects summary pre-management at the site.

Feature	Ecological Value	Effect	Magnitude of Effect (un-managed)	Level of Effect (un-managed)
Terrestrial vegetation	Low	Removal of low value mostly exotic pasture	Low	Low
Avifauna	Low	- Temporary loss of habitat for introduced and common indigenous species. - Planting around the perimeter of the site will likely enhance availability of habitat for avifauna.	Low	Very low
Herpetofauna	High	- Area of actual habitat lost is likely to be low with majority being retained - Negligible risk of individual lizards being harmed	Low	Low
Chiropteran	High	Loss of five potential roost trees in habitat with likely low frequency of	Low	Low

		bat activity value		
		• Low risk of individual bats being harmed during tree felling operations		
Wetland habitat	High	• Earthworks and vegetation clearance within 10m of wetland to be avoided • Earthworks within 100m of the site unlikely to have an impact on wetland • Reduced stock levels on site will likely improve wetland condition on site. • Risk of sedimentation of wetland without appropriate controls	Moderate	High

6. EFFECTS AND IMPACT MANAGEMENT

The overall level of effect under EIANZ is to be used as a “*guide to the extent and nature of the ecological management response required (including the need for biodiversity offsetting)*”. Where Regional or District Plans do not provide specific guidance for the management of effects a suggested guide is:

- For Very High levels of effect:
 - “...unlikely to be acceptable on ecological grounds alone (even with compensation proposals). Activities having very high adverse effects should be avoided.”
- For High or Moderate levels of effect:
 - Such an effect could be managed through avoidance, design, or extensive offset or compensation actions. Wherever adverse effects cannot be avoided, no net loss of biodiversity values would be appropriate.
- For Low or Very Low levels of effect:
 - “...should not normally be of concern, although normal design, construction and operational care should be exercised to minimise adverse effects.”

Practical measures are proposed to address moderate/high ecological effects at the site. The amount of enhancement effort and activity needed for this site is guided by the Waipa District and Waikato Regional Plans and the significance of ecological values adversely affected, level of ecological effects, feasibility of implementation, and costs/ benefits and likelihood of success of impact management. Even though the level of effects for avifauna may be below that which is of concern under the EIANZ guidelines, practical management measures are recommended for native bats, lizards, and birds given their protection under the Wildlife Act

(1953). The Waikato Regional Plan requirements with regard to sediment and erosion control are still valid even with a low level of effect. Recommendations to avoid and manage adverse ecological effects potentially arising from the proposed development are outlined below.

6.1. Terrestrial Vegetation

A Low level of effect has been identified as below the level at which EIANZ guidelines consider significant therefore no action is required to mitigate the effects. While the level of effect on Terrestrial vegetation is below what the EIANZ guidelines consider significant, boundary buffer planting will result in increased native flora abundance and diversity within the site. As such, the post-management magnitude of effects on terrestrial vegetation is considered **Positive**.

6.2. Avifauna

Despite the level of effect being below what EIANZ guidelines considers as significant, most indigenous birds and their nests are protected under the Wildlife Act (1953). Practical measures will be required to avoid direct impacts on indigenous birds and their nests. Recommendations to avoid impacts on nesting birds are provided in Section 7.

6.3. Herpetofauna

Based on surveys to confirm native lizard presence/absence on site it is likely that lizards are either absent or present in negligible density only and therefore no management of the site for lizards is required.

Enhancement of the site through native vegetation planting along the site perimeter and within the 100-yr flood risk area may encourage lizards to colonise the site from suitable habitat off site in the future.

Considering the above, the post-management magnitude of effects on lizards is considered **Negligible**.

6.4. Chiropteran fauna

It is advised that vegetation removal protocols are implemented for the removal of the five trees that were identified as potential roosting habitat. The vegetation removal protocols (VRPs) must be implemented under the guidance and supervision of a suitably qualified ecologist with the relevant DOC bat competencies (3.1 and 3.3). Implementing the VRPs will greatly reduce the risk of individual bats being harmed during vegetation clearance works on site. Loss of marginal habitat on the urban fringe in an area with likely infrequent bat activity will have minimal impact on bats in the wider landscape. Considering the above management recommendation, the post-management magnitude of effects on bats is considered **Low**.

6.5. Wetland habitat

The level of unmitigated impact on wetland habitat has been identified as moderate and therefore mitigation is required to further reduce the impact of the proposal. To reduce the impact of the proposal on wetland habitat it is recommended that the areas of wetland

habitat on site and within the 100-year flood risk zone are enhanced through native species planting. This will greatly reduce the impact of the proposal and provide opportunities to enhance the site for birds, bats and potentially lizards.

It is recommended that a sediment and erosion control plan is in place during the construction phase of the proposal to avoid the risk of sediments entering the wetland habitat.

Considering the above management recommendation, the post-management magnitude of effects on bats is considered **Positive**.

6.6. Summary of the Level of Effects – Post-management

The ecological values, their impacts and management have been summarised below and the post-management level of effect has been determined as per the EIANZ guidelines.

Table 4: Evaluation of the level of effects summary post-management at 638 Cambridge Road

Feature	Ecological Value	Effect	Management required	Post-management magnitude of effects	Post-management level of effect
Terrestrial Vegetation	Low	Loss of majority of low-value habitat	No	Low	Very Low
Avifauna	Moderate	- Loss of low-value habitat - Risk to common indigenous nesting species.	- Measures should be applied to avoid impacts on Indigenous bird nests. - Native plants included in planting plans	Low	Negligible
Herpetofauna	High	- Potential loss of low value habitat - Low risk of harm to individual lizards	No	Low	Low
Chiropteran fauna	Very High	- Loss of likely low use bat habitat - Risk of bats harmed	Vegetation Removal protocols must be followed to avoid low risk	Low	Low

Feature	Ecological Value	Effect	Management required	Post-management magnitude of effects	Post-management level of effect
		during removal of bat potential trees Planting scheme will likely benefit bats	of bats being harmed		
Wetland Habitat	High	- No loss of extent anticipated - Removal of livestock	- Enhancement planting of the wetland habitat and the 100-year flood risk zone - Sediment and erosion control plan	Positive	Net gain

7. RECOMMENDATIONS SUMMARY

The following ecological management measures are recommended to ensure that any foreseeable ecological effects associated with the works are adequately managed:

■ Restoration Plan of wetland and 100 year flood risk zone

A restoration plan should be prepared to guide management planting and pest animal and plant management. This plan should include, but not be limited to:

- Map of planting locations
- Site preparation details
- Weed control plan, control methodologies and timeframes
- Revegetation planting plan:
 - Eco-sourced species list from the Waipa Ecological District
- Plant quantities, sizes and planting density
 - Planting units (flood plain, upper bank etc)
 - Planting methodologies
- Monitoring and maintenance plan for at least 5 years

■ Protection of nesting birds:

If undertaking vegetation clearance during the nesting bird season (1st of September – 28th of February) then bird nest checks must be carried out by a suitably qualified ecologist prior to vegetation clearance. No bird management is required if clearance is outside of the bird activity window and this is encouraged, however additional fauna constraints may dictate if this is practical.

Bird nest checks include checking vegetation, tree cavities and hollows for nesting birds (e.g. morepork, kingfisher). Should any nesting be observed, a minimum 10-metre buffer of vegetation shall be required to remain around the nest site until an approved and experienced ecologist or ornithologist has confirmed that the nest has failed, or the chicks have hatched and naturally left the natal site.

■ Bat Management Protocols

A suitably qualified and experienced ecologist with the appropriate DOC bat competencies for will implement vegetation removal protocols. Following the VRPs will greatly reduce the risk of bats being harmed.

■ Fauna Management Timeframes

Table 5 below provides the time frames in which fauna management must be carried out. Clearance of bird habitat should be avoided during the bird nesting season between 1st of September and 28th of February. If that is not practical, bird nest checks must be carried out by a suitably qualified ecologist prior to vegetation clearance. No bird management is required if clearance is outside of the bird activity window.

The removal of the identified bat trees must only occur within the bat activity window with appropriate bat management measures.

Table 5: Fauna management timetable.

Fauna	Timeframes	Fauna Activity	Restriction/Management Required for habitat clearance
Birds*	1st of September to 28th of February	Nesting season	Pre-clearance bird nest checks
	1st of March to 31st of August	Non-nesting season	No management required
Bats*	1 st of October to 30 th April	Higher activity	Bat management measures
	1 st of May to 30 th September	Lower activity	No habitat clearance of high-risk trees permitted

**Dates may vary within consent conditions.*

■ Sediment and Erosion Control Plan

Appropriate erosion, sediment and containment controls should be installed prior to the commencement of works to reduce the risk of any sediment and/or containments entering the stream environment. This should be guided by a plan prepared by a suitably qualified and experienced professional and should remain in place until construction has been completed and the site has been deemed stabilised by a suitably qualified environmental professional or RMA compliance officer.

Where machinery is used on-site during works, care should be taken to avoid hydrocarbon spills, especially within the riparian and aquatic environments. No fuels should be stored within

20m from any watercourses. Best practice procedures should be followed to prevent contamination or spills.

8. CONCLUSION

This report provides an Ecological Impact Assessment associated with the proposed re-zoning and development of the site at 638 Cambridge Road. The Impact associated with the proposal on ecological features range from **moderate** to **very low** pre-mitigation effect level

With the implementation of ecological measures outlined in this report, the post management effect level associated with the proposal ranged from **Low** to providing a **net gain** for ecological values on site. the inclusion of freshwater habitat in the form of a stormwater pond, incorporating native species planting will provide a net gain for ecological values on site.

A number of recommendations have been made to ensure that no indigenous species protected under the wildlife act 1953 are harmed during the enabling and construction phases of the proposal and to ensure that plans are in place to enhance habitat on site.

APPENDIX A

Report Limitations

This Report/Document has been provided by Ecology New Zealand Limited (ENZL) subject to the following limitations:

- i) This Report/Document has been prepared for the particular purpose outlined in ENZL's proposal and no responsibility is accepted for the use of this Report/Document, in whole or in part, in other contexts or for any other purpose.
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- v) Any assessments, designs and advice made in this Report/Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Report/Document.
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- ix) Where lengths or other measurements have not been provided by a surveyor, ENZL has used basic GIS mapping and measurement systems to estimate these numbers. These should not be taken as surveyor-level accuracy for the purposes of decision making.

APPENDIX B

ASSESSING ECOLOGICAL VALUES (from EclA Guidelines 2nd Ed.)

Table 4 Attributes to be considered when assigning ecological value or importance to a site or area of vegetation/habitat/community. (Page 64)

Matters	Attributes to be considered
Representativeness	Criteria for representative vegetation and aquatic habitats: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/distinctiveness	Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National priority for protection Criteria for rare/distinctive species or species assemblages: • Habitat supporting nationally Threatened or At Risk species, or locally¹⁹ uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and Pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	• Site history, and local environmental conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from "intrinsic value" as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning – high level, key species identification, habitat as proxy

5.2 Assigning value to terrestrial areas

Table 5 Factors to consider in assigning value to terrestrial species for EclA (Pg. 67)

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

5.2.2 Assessing terrestrial sites or areas using EclA data

Table 6. Scoring for sites or areas combining values for four matters in Table 4. (Pg. 69)

Value	Description
Very High	Area rates High for 3 or all of the four assessment matters listed in Table 4. Likely to be nationally important and recognised as such.
High	Area rates High for 2 of the assessment matters, Moderate and Low for the remainder, or Area rates High for 1 of the assessment matters, Moderate for the remainder. Likely to be regionally important and recognised as such.
Moderate	Area rates High for one matter, Moderate and Low for the remainder, or Area rates Moderate for 2 or more assessment matters Low or Very Low for the remainder Likely to be important at the level of the Ecological District.
Low	Area rates Low or Very Low for majority of assessment matters and Moderate for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder.

5.3 Assigning value to freshwater habitats

Table 7. Matters that may be considered when assigning ecological value to a freshwater site or area (Pg.70)

Matters	Attributes to be assessed
Representativeness	- Extent to which site/catchment is typical or characteristic - Stream order - Permanent, intermittent or ephemeral waterway - Catchment size - Standing water characteristics
Rarity/distinctiveness	- Supporting nationally or locally Threatened, At Risk or uncommon species - National distribution limits - Endemism - Distinctive ecological features - Type of lake/pond/wetland/spring
Diversity and Pattern	- Level of natural diversity - Diversity metrics - Complexity of community - Biogeographical considerations - pattern, complexity, size, shape

Ecological context	• Stream order • Instream habitat • Riparian habitat • Local environmental conditions and influences, site history and development • Intactness, health and resilience of populations and communities • Contribution to ecological networks, linkages, pathways • Role in ecosystem functioning – high level, proxies
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Table 10. Criteria for describing level of effects (Pg. 84)

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

APPENDIX C

The location of proposed development on site is indicative and subject to change to avoid sensitive ecological features.

APPENDIX D

Location of the proposed stormwater wetland is indicative and subject to change to avoid sensitive ecological features.

APPENDIX E

Wetland Delineation protocol results

Potential Wetland area 1

Plot 1 Rapid test

Table 1: Plot One Rapid Test – (2x2m Plot)

Vegetation species	% Cover	Wetland Indicator Rating ¹³	Status
Tree Stratum			
N/A	-	-	
Sapling/Shrub Stratum			
N/A	-	-	
Herb Stratum (All Non – Woody Plants)			
Ranunculus repens	50*	FAC	
Holcus lanatus (P)	20*	FAC	
Dactylis glomerata (P)	15	FACU	
Juncus effusus	10	FACW	
Rumex obtusifolius	5	FAC	
Total % cover	100		
Total % improved pasture species¹⁴ <i>(P) indicates improved pasture species</i>	35		
Total % cover of OBL and/or FACW species	10		
Are all Dominant Species FACW or OBL (Rapid Test Met)? (*) indicates dominant species calculated by the 50:20 rule.	50: 1 20: 1 No - Fail		

Plot 1 Dominance test

Table 2: Plot One Dominance Test

Vegetation species	% Cover	Wetland Indicator Rating	Dominant Species?
Herb Stratum			
Ranunculus repens	50*	FAC	Y
Holcus lanatus (P)	20*	FAC	Y
Dactylis glomerata (P)	15	FACU	
Juncus effusus	10	FACW	
Rumex obtusifolius	5	FAC	
Total % cover	100		

No. dominant species that are OBL, FACW or FAC (Following the 50/20 rule)	50 (50) = 1 20 (20) = 1
Total number of dominant species across all strata (Dominant as calculated by this test)	2
% Dominant species that are OBL, FACW or FAC	70%
Dominance Test Pass? (<i>Hydrophytic vegetation is present if more than 50% of the total number of dominants are FAC or wetter.</i>)	Yes – but all FAC

Plot 1 Prevalence Test

Table 3: Plot One Prevalence Test.

Rating	Total % Cover of:	X	Prevalence Rating
OBL species	0	x1=	0
FACW species	10	x2=	20
FAC species	75	x3=	225
FACU species	15	x4=	60
UPL species	0	x5=	0
Column Total	A: 100		B: 305
Prevalence Index = B/A	305/100 = 3.05		
Prevalence Test Pass? (PI≤3.0)	No		

Plot 2

Table 1: Plot Two Rapid Test – (2x2m Plot)

Vegetation species	% Cover	Wetland Indicator Rating ¹³	Status
Tree Stratum			
N/A	-	-	
Sapling/Shrub Stratum			
N/A	-	-	
Herb Stratum (All Non – Woody Plants)			
Ranunculus repens	30*	FAC	
Anthoxanthum odoratum (P)	25*	FACU	
Lolium perenne (P)	25*	FACU	
Holcus lanatus (P)	10	FAC	
Dactylis glomerata (P)	10	FACU	
Total % cover	100		
Total % improved pasture species¹⁴ <i>(P) indicates improved pasture species</i>	70		
Total % cover of OBL and/or FACW species	0		
Are all Dominant Species FACW or OBL (Rapid Test Met)? (*) indicates dominant species calculated by the 50:20 rule.	50: 0 20: 3 No - Fail		
Pasture exclusion test: (70/100) x 100 =70% PASS pasture species = ≥50% coverage			

Plot 3

Table 1: Plot Three Rapid Test – (2x2m Plot)

Vegetation species	% Cover	Wetland Indicator Rating ¹³	Status
Tree Stratum			
N/A	-	-	
Sapling/Shrub Stratum			
N/A	-	-	
Herb Stratum (All Non – Woody Plants)			
Lolium perenne (P)	30*	FACU	
Anthoxanthum odoratum (P)	25*	FACU	
Ranunculus repens	20*	FAC	
Holcus lanatus (P)	10	FAC	
Dactylis glomerata (P)	10	FACU	
Total % cover	100		
Total % improved pasture species¹⁴ <i>(P) indicates improved pasture species</i>	75		
Total % cover of OBL and/or FACW species	0		
Are all Dominant Species FACW or OBL (Rapid Test Met)? (*) indicates dominant species calculated by the 50:20 rule.	50: 0 20: 3 No - Fail		

Pasture exclusion test: $(75/100) \times 100 = 75\%$ PASS pasture species = $\geq 50\%$ coverage	

Table 1: Plot Four Rapid Test – (2x2m Plot)

Vegetation species	% Cover	Wetland Indicator Rating ¹³	Status
Tree Stratum			
N/A	-	-	
Sapling/Shrub Stratum			
N/A	-	-	
Herb Stratum (All Non – Woody Plants)			
Lolium perenne (P)	30*	FACU	
Ranunculus repens	30*	FAC	
Anthoxanthum odoratum (P)	20*	FACU	
Holcus lanatus (P)	10	FAC	
Dactylis glomerata (P)	10	FACU	
Total % cover	100		
Total % improved pasture species¹⁴ <i>(P) indicates improved pasture species</i>	70		
Total % cover of OBL and/or FACW species	0		
Are all Dominant Species FACW or OBL (Rapid Test Met)? (*) indicates dominant species calculated by the 50:20 rule.	50: 0 20: 3 No - Fail		
Pasture exclusion test: $(70/100) \times 100 = 70\%$ PASS pasture species = $\geq 50\%$ coverage			

Plot 1 Hydrology test

An assessment using the hydrology tool was undertaken for Plot 1 in Potential Wetland Area 1. To confirm the presence of wetland hydrology using this tool, the following are required:

- one primary indicator, or
- two secondary indicators.

Table 13: Hydrology tool for plot 1 potential wetland area 1.

Assessment Indicator	Met?	Comments
Primary		
Surface Water	Yes	Surface water observed, very muddy underfoot evidence of poaching

Sediment Deposit	Yes	Evidence of sediment deposits on leaves on the ground layer and against the fence
Iron deposits	Yes	Reddish wet material observed just on the ground surface.
Inundation visible on aerial imagery	Yes	Some differences in vegetation is seen on aerial imagery.
Sparsely vegetated concave surface	Yes	Some bare earth and ground is concave
Water-stained leaves	Yes	Leaves had evidence of staining
Reduced iron	Yes	Observed in the soil plot
Secondary		
Water-stained leaves	Yes	Leaves had evidence of staining
Saturation visible on aerial imagery	Yes	Some differences in vegetation are visible on aerial imagery.
Geomorphic position	Yes	Low lying area compared to surroundings

Plot 1 hydric soil test

Evidence of hydric soils was identified within the vicinity of Plot 1. There was clear evidence of gleyed soil with a pale low chroma 5/1* and reddish mottling at a depth of c.200-300mm within the soil plot a restricting layer was observed below the gleyed horizon. The presence of the above soil features indicated that the soil is saturated for at-least part of the year and therefore passes the hydric soil test.

