Appendix 15 – Ecological Assessment Report



Te Awamutu Senior Living Project

Ecological Assessment Report

Prepared for:

Te Awamutu Developments Ltd

Prepared by:

Phoenix Ecology Ltd

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Executive Summary

Phoenix Ecology Ltd was engaged by Te Awamutu Developments Ltd to undertake an ecological assessment for the proposed senior living development at 2025 Ōhaupō Road, Te Awamutu ('the site'), to support a Fast Track application. The project proposal involves the construction of stand-alone villas and duplexes, a community hub and a care home over an area of approximately 25 ha, to be completed in several stages, together with associated roading and stormwater infrastructure. The works will involve the removal of two artificial ponds and upgrading of existing culverts, and the loss of one small wetland (33 m²) to allow for a stormwater pond to be constructed. Restoration of several wetlands and terrestrial habitat over an area of approximately 16,000 m² is also proposed as part of the development. Riparian habitat restoration over approximately 860 m of the retained watercourse and pond system is also proposed.

The site is a modified pastoral landscape containing a kahikatea remnant identified as a Waipā District Significant Natural Area (SNA, ID WP312), several wetland areas, a watercourse and several constructed ponds. Long-tailed bats (*Chalinolobus tuberculatus*, Nationally Critical) were detected across the site, with bat habitat values primarily associated with waterways, riparian vegetation, scattered mature trees, ponds and the kahikatea remnant. A total of sixteen bird species were identified, consisting of common indigenous and exotic species; no 'Threatened' or 'At Risk' species were detected. No lizards were recorded during habitat searches, although copper skink (*Oligosoma aeneum*, At Risk) have been recorded within a 5 km radius of the site and could be present, with suitable habitat limited to the kahikatea fragment, adjacent exotic vegetation and the residential garden vegetation. Shortfin eel (*Anguilla australis*, Not Threatened) were confirmed present within the watercourse.

Due to the presence of the kahikatea forest remnant, several wetlands across the site, and fauna habitat values in particular for long-tailed bats, the overall ecological value at the site was assessed as high. The remaining pastureland, drains and modified wetlands are of a highly modified nature and provide only limited habitat and buffer values.

In general terms, habitat loss and modification associated with the proposed earthworks and establishment of residential housing, roading and stormwater infrastructure has the potential to create a range of adverse effects on biodiversity values, both during construction and on an ongoing basis. If all management recommendations are followed, effects are expected to be no more than a minor effect on the known populations and existing baseline conditions at the site, given the modified nature of the site and limited habitat values provided, and adequate habitat replacement proposed. Overall, the effects of the development as proposed are assessed to result in a low magnitude of effect, and the overall level of effect was therefore assessed to be low.

Cumulative effects associated with staged construction were also considered, with restoration planting recommended to be established ahead of the site becoming operational to help address this risk.

Recommendations to minimise effects include adoption of protocols to manage direct effects on wildlife during earthworks, vegetation removal and in-stream works; minimisation of lighting effects around the kahikatea remnant and retained bat habitat; predator control and restoration planting; and sediment and erosion control. These are captured in the Ecological Management Plan, the Lizard Management Plan, and the Wetland Management and Enhancement Plan.

The proposed restoration programme was assessed to adequately address the loss of the small wetland area, and the loss of potential bat foraging habitat, when combined with the lighting controls and buffers proposed. The kahikatea fragment will be fenced from stock access, with enhancement and infill planting also proposed, further improving and protecting the existing ecological values of this area. Predator control will also be implemented across all restoration areas and the SNA. Approximately 10,400 m² of vegetation will be removed, containing 103 potential bat roost trees, with the final number to be confirmed once the site-wide roost tree survey is complete. Terrestrial restoration planting will restore terrestrial fauna habitat, including the replacement of lost potential bat roost trees through planting of cavity-bearing species, as well as bird and lizard habitat, recognising that long-term replacement of roosting habitat relies on the planting and protection in perpetuity of suitable large, cavity-bearing trees within the restoration areas becoming established over time, together with predator control, rather than on artificial roosts alone. The loss of aquatic habitat of the pond system was assessed to be addressed through proposed riparian restoration efforts, and online function of one of the stormwater ponds, where habitat similar to that being lost will be recreated.

Extensive restoration planting is proposed to retain key habitat areas, restore degraded wetlands, recreate lost terrestrial and aquatic habitat, and preserve the key fauna corridor at the site. These measures are expected to enhance the existing ecological values of this area and lead to overall good ecological restoration outcomes. If the recommendations made in this report are adopted and fully implemented, the proposed effects management and restoration measures will enhance overall biodiversity values at the site, improving the quality of fauna habitat including bat foraging habitat available at the site.

1. Introduction

1.1. Qualifications and Experience

My full name is Hannah Mueller and I am a Principal Ecologist and Director of Phoenix Ecology, ecological consultants based in Raglan. I have been director of Phoenix Ecology since 2022. Prior to that, I worked as Principal Ecologist at 4Sight Consulting. I have 15 years of experience in this field.

I hold the qualifications of Bachelor of Arts with Honours (Liberal Arts – Humanities and Life Sciences) from the University of Maastricht, a Master of Social Science with Honours (Environmental Policy), and a PhD in Biological Sciences (Freshwater Ecology) from the University of Waikato.

I am a Certified Environmental Practitioner (CenvP) under the Environment Institute of Australia and New Zealand (EIANZ) certification scheme (CenvP certification number 1250). I am a full member of the EIANZ and the New Zealand Freshwater Sciences Society.

1.2. Code of Conduct

I am familiar with the Code of Conduct for Expert Witnesses (Environment Court Practice Note 2023) and although I note this is a Fast Track Panel process, I agree to comply with this code. The information I will present is within my area of expertise, except where I state that I am relying on information provided by another party. I have not knowingly omitted facts or information that might alter or detract from opinions I express.

1.3. Background and purpose

Phoenix Ecology Ltd have been contracted by Te Awamutu Developments Ltd to undertake an ecological assessment for the proposed development of a senior living development at 2025 Ōhaupō Road, Te Awamutu ('the site'). The site is located in a rural area at the northern outskirts of Te Awamutu township (Figure 1).

The Project will provide approximately 414 dwellings/units (including single-storey houses, duplex units and apartments), and a 100-bed care facility. The development will also feature communal facilities and a neighbourhood centre, restoration planting, three waters services infrastructure, and transport infrastructure. The project is designed to cater specifically to an ageing population, addressing a critical need for retirement housing and care capacity.

The development will proceed in alpha-numeric order as set out on the attached plan (Appendix A), notwithstanding that some downstream infrastructure that lies within latter stages will need to be constructed at the time that the earlier stages require it.

General construction timing is expected to be as follows:

- Stages 1A and 1B are programmed to commence earthworks and civils in Q1–Q2 2027.
- Subsequent stages are programmed at approximately nine-month intervals between stage commencements.

This ecological assessment report was prepared to support a Fast Track application and builds on two previous ecological reports prepared for the site by BTW in 2022 – a report on a wetland delineation

assessment (BTW 2022a) and an ecological impact assessment report (BTW 2022b). Complementing the findings of these two reports, this report details terrestrial fauna habitat assessments including acoustic bat monitoring, and updated wetland delineation reflecting current site conditions. It assesses potential adverse effects on terrestrial and aquatic ecology values, and makes high-level recommendations to avoid, minimise or remedy these effects.

The project proposal involves the construction of a senior living development featuring stand-alone villas and duplexes, a community hub and a care home over an area of approximately 25 ha, to be completed in several stages. Associated roading and stormwater infrastructure are also proposed (Appendix A).

The works will involve the removal of two artificial ponds and upgrading of existing culverts, and the loss of one small wetland (33m^2) to allow for a stormwater pond to be constructed. This stormwater pond will be connected to the groundwater as well as the watercourse (allowing fish passage) and contain water permanently. It will not be lined, and will be enhanced with habitat features such as logs, snags and rocks to create additional fish habitat to replace the lost pond system.

Restoration of several wetlands and terrestrial habitats over an area of approximately 16,000 m^2 is proposed as part of the development. Riparian habitat restoration over approximately 860 m length, targeting the entire watercourse and retained pond systems, is also proposed.

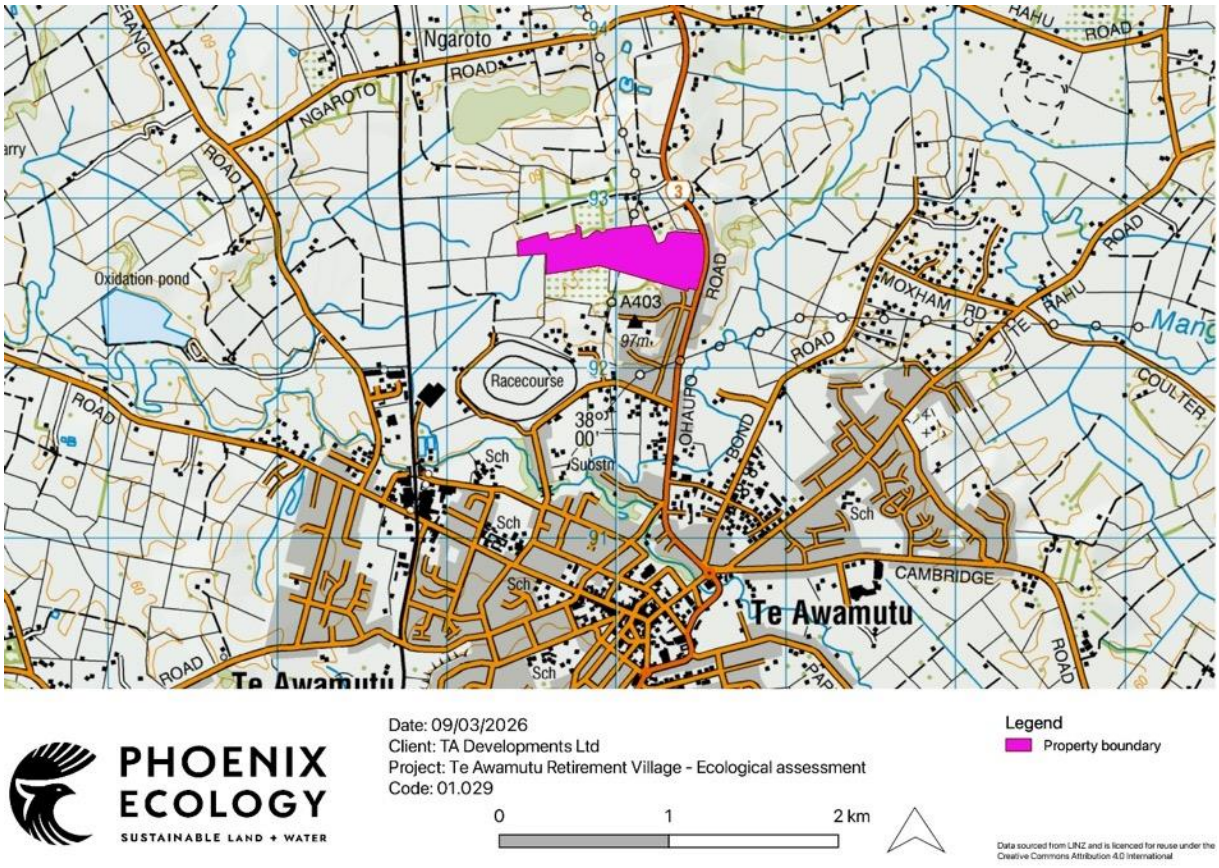


Figure 1 Site location

1.4. Site description

The development site is located on the northern outskirts of Te Awamutu, in a landscape characterised by agricultural (mostly dairy farming) landuse and residential area to the south. Several kahikatea forest remnants, including a large example located south of Ngaroto Road, Yarndley's Bush, are present within the wider landscape surrounding the site (Figure 1).

Existing vegetation cover at the site includes open, currently grazed pastureland, a residential dwelling and associated garden landscape, exotic individual specimen trees, several wetland areas, and a kahikatea remnant that has been identified as a Waipā District Significant Natural Area (SNA, ID WP312). While the kahikatea remnant has been fenced off preventing stock access, the wetland areas are impacted by grazing and stock access (Figure 2).

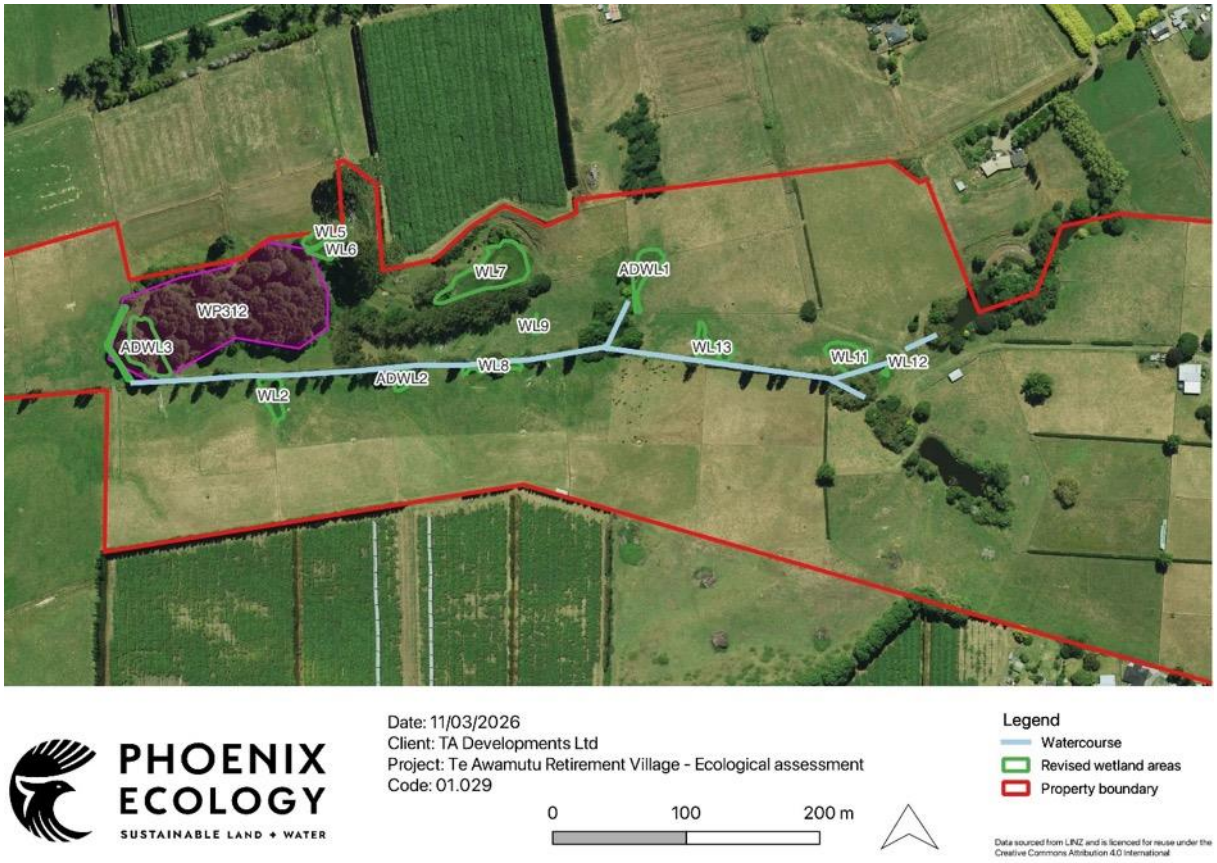


Figure 2 Ecological features at the site

2. Methodology

2.1. Desktop review

A desktop assessment of the site was undertaken prior to the site inspection to identify major vegetation types and landscape context using aerial photography. Other relevant databases were reviewed to gain an understanding of existing ecological features on site.

The review of relevant background literature, existing ecological reports and databases was conducted to understand the ecological wetland and aquatic values within the site and surrounding areas also including the River Environment Classification (REC) provided by the Ministry for the Environment, the Department of Conservation (DOC) National Bat Database, the New Zealand Freshwater Fish Database (NZFFDB) and the NZ Plant Conservation Network (NZPCN) plant distribution database.

Any threatened species found were recorded and their threat status checked against the relevant national threatened species classification lists (Dunn et al. 2025; de Lange et al. 2024; O'Donnell et al. 2023; Robertson et al. 2021).

2.2. Site assessment

Following a desktop assessment, the terrestrial, aquatic and wetland habitat characteristics of the site and surrounding area were assessed during a preliminary site walkover conducted on 10 December 2025.

A full site survey was then conducted on 27 January 2026. This included the deployment of acoustic bat monitoring equipment, qualitative habitat assessments, lizard habitat searches and bird surveys.

Site photos are presented in Appendix B.

2.3. Bat monitoring

Baseline bat monitoring was undertaken using automated bioacoustic monitors (ABMs), specifically omnidirectional “AR4” acoustic bat detectors manufactured by DOC.

A total of fifteen monitors were deployed across the site between 27 January and 21 February 2026. Monitoring locations were selected to provide representative coverage of the site and the range of habitat features present. Detectors were placed along waterways and vegetation edges, as well as within open pasture areas, to assess potential differences in bat activity between these habitat types. The monitoring network was distributed across the site to ensure broad spatial coverage and reduce sampling bias (Figure 3).

During the survey period a severe storm event resulted in two monitors being dislodged from their deployment trees, reducing the number of functional recording nights at those locations. The remaining monitors continued operating for the duration of the monitoring period.

The monitors were programmed to record bat echolocation calls from 60 minutes before sunset until 60 minutes after sunrise, capturing the primary period of bat activity. Acoustic recordings were analysed using BatSearch software to detect and count bat passes. The resulting detections were then reviewed and summarised to describe activity levels, timing of activity, and the distribution of detections across monitoring locations.

Acoustic monitoring results were interpreted as an index of relative bat activity rather than a measure of abundance. For the purposes of this assessment, a bat pass was defined as a discrete long-tailed bat echolocation call sequence recorded by a detector. Acoustic monitoring can confirm presence and relative levels of activity, but cannot determine population size or confirm the presence or location of roosts.

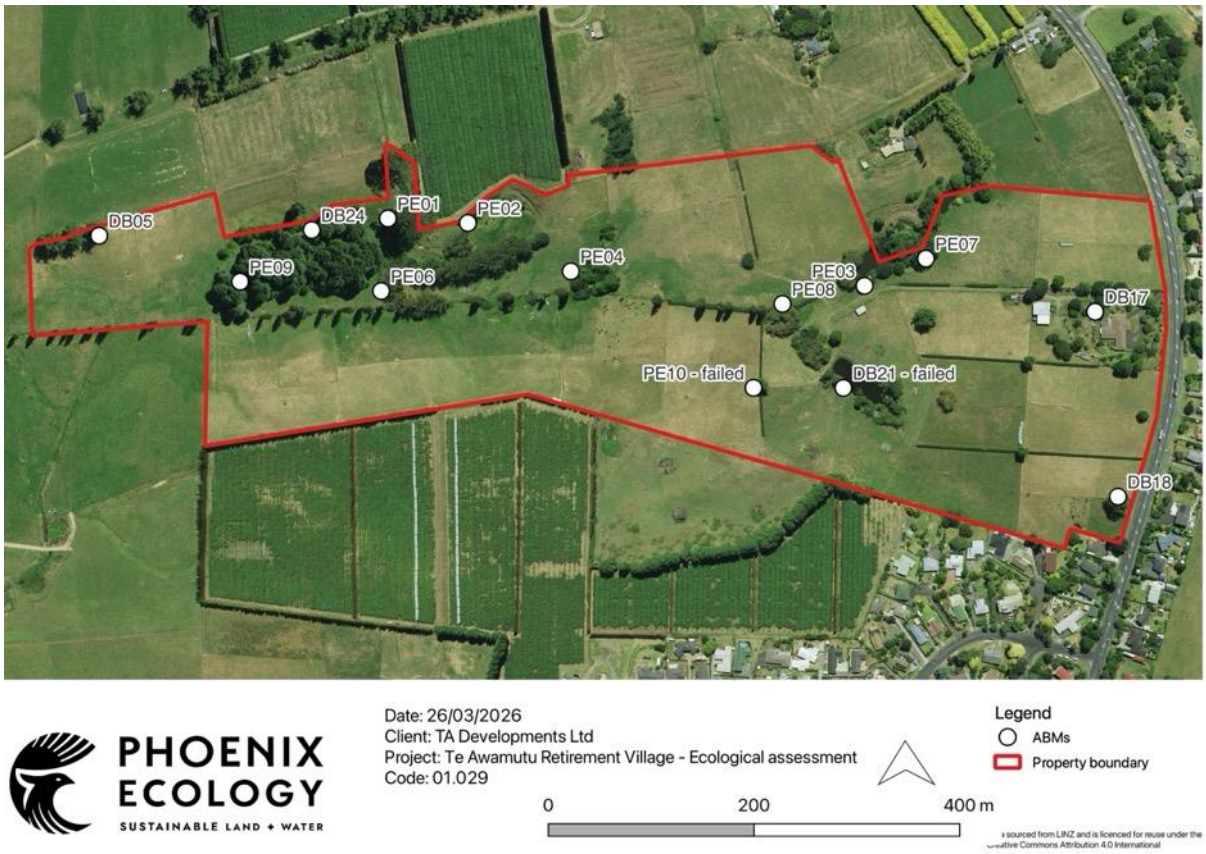


Figure 3 ABM monitoring locations, including partial failures during storm event

2.4. Bird surveys

5-Minute bird counts were conducted on 27 January 2026 at four different sites across the development area (Figure 4) to survey the range of species present at the site. Weather conditions were fine and calm during the site survey.

Field notes and results of bird counts across four stations are presented in Appendix D. All bird species observed opportunistically during the remaining time on site were also recorded.



Figure 4 Bird count observer stations

2.5. Lizard searches

Targeted habitat spot searches of suitable lizard habitat were conducted as part of the site assessment. Spot searches were completed opportunistically in areas within the project footprint, i.e. potentially habitat within open pasture, and habitat within the garden around the residential dwelling. Habitat searches focused on suitable refugia for ground skink found present on site and affected by the proposal, including debris, dense ground cover and logs. A total of two person hours were spent searching suitable habitat on site.

Locations where spot searches were conducted are marked in Figure 10.

2.6. NPS-FM / NES-F wetland delineation protocols

The New Zealand Resource Management Act 1991 defines wetlands as:

> *'permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions'.*

Under the National Policy Statement for Freshwater Management (NPS-FM) (MfE 2022a), a **natural inland wetland** means a wetland (as defined in the Act) that is not:

1. in the coastal marine area, or
2. a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland, or
3. a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body, or

4. a geothermal wetland, or
5. a wetland that:
    a. is within an area of pasture used for grazing; and
    b. has vegetation cover comprising more than 50% exotic pasture species (as identified in the National List of Exotic Pasture Species using the Pasture Exclusion Assessment Methodology (see clause 1.8)); unless
    c. is a location of a habitat of a threatened species identified under clause 3.8 of this National Policy Statement, in which case the exclusion in (e) does not apply.

Pasture exclusion test

A Rapid Pasture Test identifies areas with all dominant species being pasture species of Cosgrove et al. (2022). Areas that pass the Rapid Pasture Test need no further assessment.

Areas that fail the Rapid Pasture Test require the deployment of vegetation plots to assess whether or not a wetland is present (Figure 5).

The pasture exclusion test does not apply to a wetland providing habitat for any threatened species.

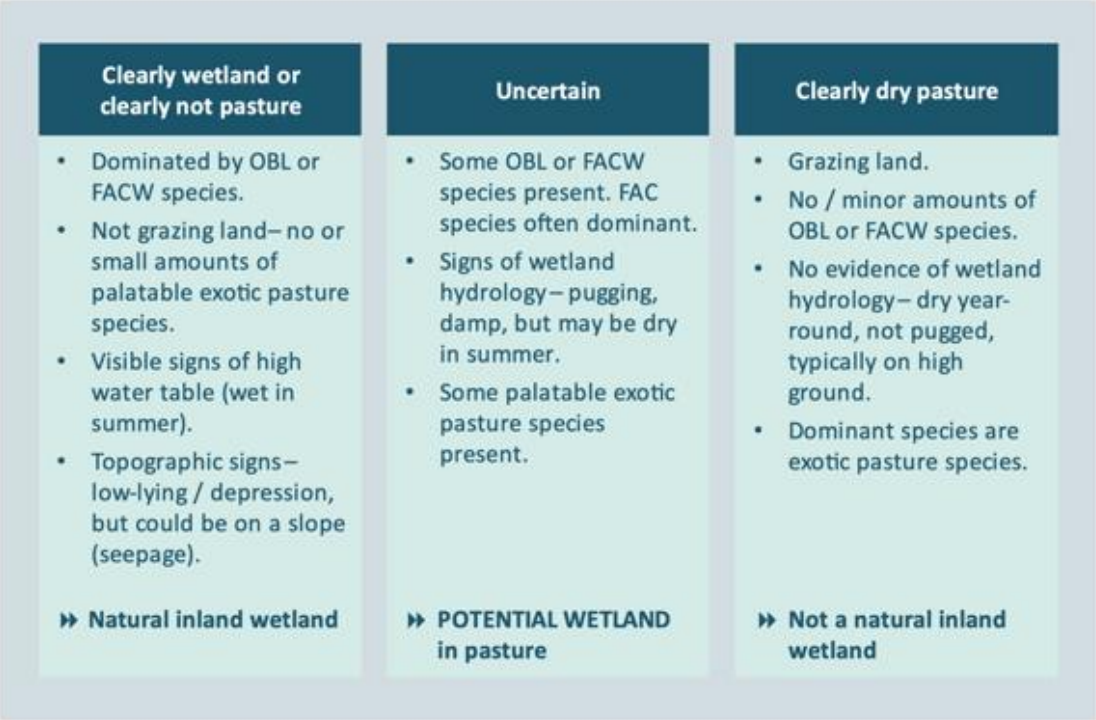


Figure 5 Rapid assessment to identify potential wetlands on farmland. From MfE 2022b.

Wetland delineation was conducted revisiting the areas previously delineated at the site (BTW 2022a), adjusting boundaries where vegetation communities had shifted, adding any new areas not previously mapped.

During the site visit, potential wetland features were assessed using the wetland delineation protocols developed by the Ministry for the Environment (MfE 2022a) to support the National Policy Statement – Freshwater Management (NPS-FM 2020) (NZ Government 2020).

The site assessment was undertaken under 'normal circumstances', with weather conditions sunny and dry during the site visit.

Rapid pasture tests were conducted amongst pasture across the property. Areas that did not pass the Pasture Exclusion Test were then visually delineated based on any observed change in species composition, and their perimeters walked with a GPS and mapped in GIS.

2.7. Determination of ecological significance

Ecological significance was assessed based on the criteria outlined in Section 11A of the WRPS (reproduced in Appendix C). The assessment of each criterion followed Table 1 of "Guidelines for determining areas of significant indigenous vegetation and habitats of indigenous fauna in the Waikato Region" (WRC and Wildland Consultants 2021).

In addition, the National Policy Statement for Indigenous Biodiversity (NPS-IB) was used to guide the determination of ecological values and significance for indigenous flora and fauna and their habitats.

2.8. Assessment of ecological effects

The assessment of ecological effects informed by the Ecological Impact Assessment (EcIA) guidelines of the Environment Institute of Australia and New Zealand (Roper-Lindsay et al. 2018), identifying ecological values, magnitude of effect, and overall level of effect.

The following steps were used for this assessment:

- Ecological values are assigned based on assessing the values of species, communities and habitats identified against criteria set out in the EcIA guidelines (Section 4.1).
- The magnitude of effect of the site works on ecological values is evaluated (Section 4.2). The 'Magnitude of Effect' is based on:
    - The scale of the unmitigated effect per se (i.e. the proposed works, impacts on wetlands, aquatic and fauna habitat values);
    - The proportion of habitat loss versus local availability;
    - The expected duration of effect (e.g. permanent versus temporary); and
    - The intensity of the effect (i.e. the extent to which habitat loss within the site is complete or partial).
- The overall level of effect in the absence of mitigation is determined using a matrix that is based on the ecological values and the magnitude of effects on these values in the absence of any efforts to avoid, minimise and remedy for potential effects (Section 5).

3. Results

3.1. Landscape context

The site is mainly surrounded by pastoral agriculture and lies at the intersection of the Hamilton and Waipā Ecological Districts, both within the Waikato Ecological Region. Nearby areas of ecological importance include indigenous forest remnants, wetlands, and peat lakes. A key feature north of the site is Moanatuatua Bog, a 14,000-year-old peat bog that has been reduced from about 7,500–8,500 ha to roughly 140 ha due to drainage and agricultural conversion; it is now the best remaining example

of restiad rushland in the Hamilton Ecological District. About 750 m north lies the largest kahikatea forest remnant in the Waipā District (13.5 ha), Yarndley's Bush (SNA ID WP309).

Originally, the area was dominated by lowland forests and comprised mostly podocarp-broadleaved forests, with species like kahikatea (*Dacrycarpus dacrydioides*), rimu (*Dacrycarpus cupressinum*), and totara (*Podocarpus totara*) present (McEwen 1987).

Much of the original forest cover has historically been lost to clearance for agricultural development, leaving only small kahikatea remnants, wetlands and peat lakes. At present, much of the land is used for dairy farming, pastoral agriculture, and horticulture, with small remnants of indigenous vegetation cover (McEwen 1987).

3.2. Vegetation

Existing vegetation cover at the site includes open, currently grazed pastureland, a residential dwelling and associated garden landscape, exotic individual specimen trees, and several wetland areas. Exotic trees comprise of species such as Lombardy poplars, alders and willows.

A kahikatea remnant that has been identified as a Waipā District Significant Natural Area (SNA, ID WP312) is present within the project site. The kahikatea remnant has been fenced off preventing stock access, and it contains a regenerating understory of largely indigenous pioneer species such as mahoe, kanuka and treefern. Some exotic weed species are also present, in particular along the edges of the tree stand, including gorse and kiwifruit vine.

Several ponds present upstream of the watercourse (Figure 6) comprise of mixtures of exotic plant species, such as willows, oaks, alders and blackwoods, and indigenous plant species such as treefern, harakeke flax, cabbage tree, lemonwood and kawakawa.

The watercourse present downstream of the pond system contains sparse riparian vegetation, mostly exotic species such as Lombardy poplar, pin oak, alder, Chinese privet, climbing ivy, and barberry. Scattered indigenous species such as wheki ponga treefern are also present.

Weed species present throughout the site include woolly nightshade, Chinese privet, barberry, black night shade, gorse and arum lily.

No Threatened or At Risk plant species were recorded at the site.

3.3. Wetlands

During the original assessment (BTW 2022a), a total of ten natural inland wetlands were determined across the site. These sites were revisited during the 2026 assessment and, where necessary due to changes in vegetation communities and extents, delineated again based on rapid pasture assessments and visual delineation of those areas not dominated by pasture species. Three additional wetland areas were also recorded and mapped.

Wetland plant communities and hydrology of the mapped areas are described in detail in the BTW report and were found to be largely consistent with the findings outlined there.

Overall, wetland areas amongst pasture were found to comprise predominantly exotic plant species such as waterpepper creeping buttercup, and dock, with low to very low species diversity and of a degraded nature due to the impact of stock access and grazing (Appendix B).

Only a limited amount of Indigenous plant species were recorded as present within some wetlands, such as *Carex secta* and *Juncus pallidus*. No threatened plant species were found to be present.

While mostly small, fragmented and degraded, these wetland areas provide potential fauna habitat (including bird and bat foraging habitat), alongside important wetland functions to the wider catchment, including flood attenuation, and nutrient and sediment filtration.

Wetlands are mapped in Figure 6, with wetland names reproduced from the original assessment, and three additional wetlands (ADWL1 – ADWL3). Photos of each wetland are presented in Appendix B.

Enlarged site maps are included in Appendix F.

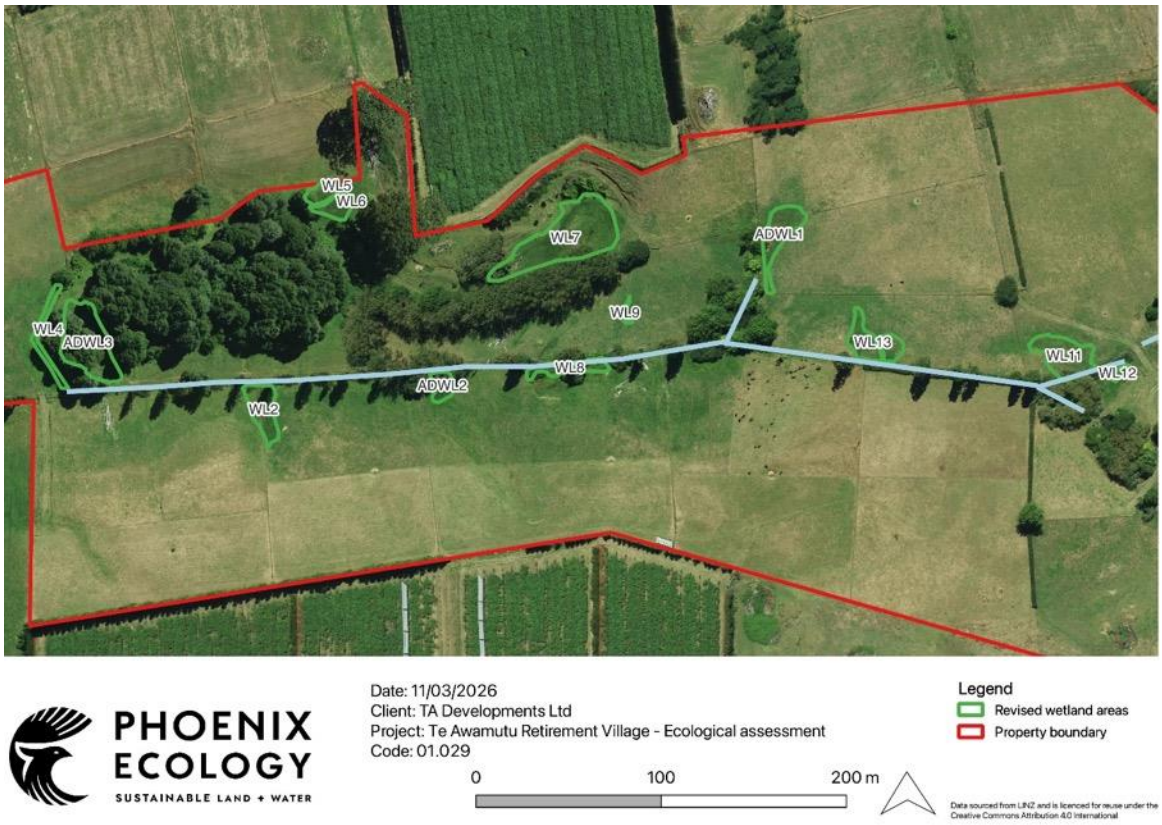


Figure 6 Wetlands

3.4. Fauna habitat

Bats

The remnant stand of kahikatea features mature trees which can provide potential roosting habitat where cavities, loose bark, or other sheltered microhabitats are present.

Beyond the forest remnant, vegetation providing bat habitat across the site is limited, with most of the area consisting of open pasture with scattered trees and small vegetation patches typical of agricultural land use.

Several aquatic features are present within the site, including streams, drainage channels, and small ponds. These features are known to provide favourable foraging habitat for long-tailed bats, as waterways often support increased concentrations of flying insects. Riparian vegetation associated

with these waterways also provides linear landscape features that bats commonly use for commuting and foraging.

Overall, the site represents a modified pastoral landscape, but still contains habitat features of clear importance to long-tailed bats. Habitat values for bats are primarily associated with waterways, riparian vegetation, scattered mature trees, ponds, and the kahikatea remnant, rather than the surrounding pasture itself. Given the confirmed presence of a Threatened – Nationally Critical species, these habitat features are ecologically important despite the modified nature of the wider site.

Trees within the project footprint were assessed for the presence of potential roost features. A total of 103 trees were found to exhibit these features, such as cavities, flaky or loose bark, and broken branches. This included a number of dead trees present across the site. Locations of these are mapped in Figure 7. Most of the trees identified were exotics including oaks, willows, poplars and planes. Indigenous species included kahikatea, lemonwood, totara and rimu.

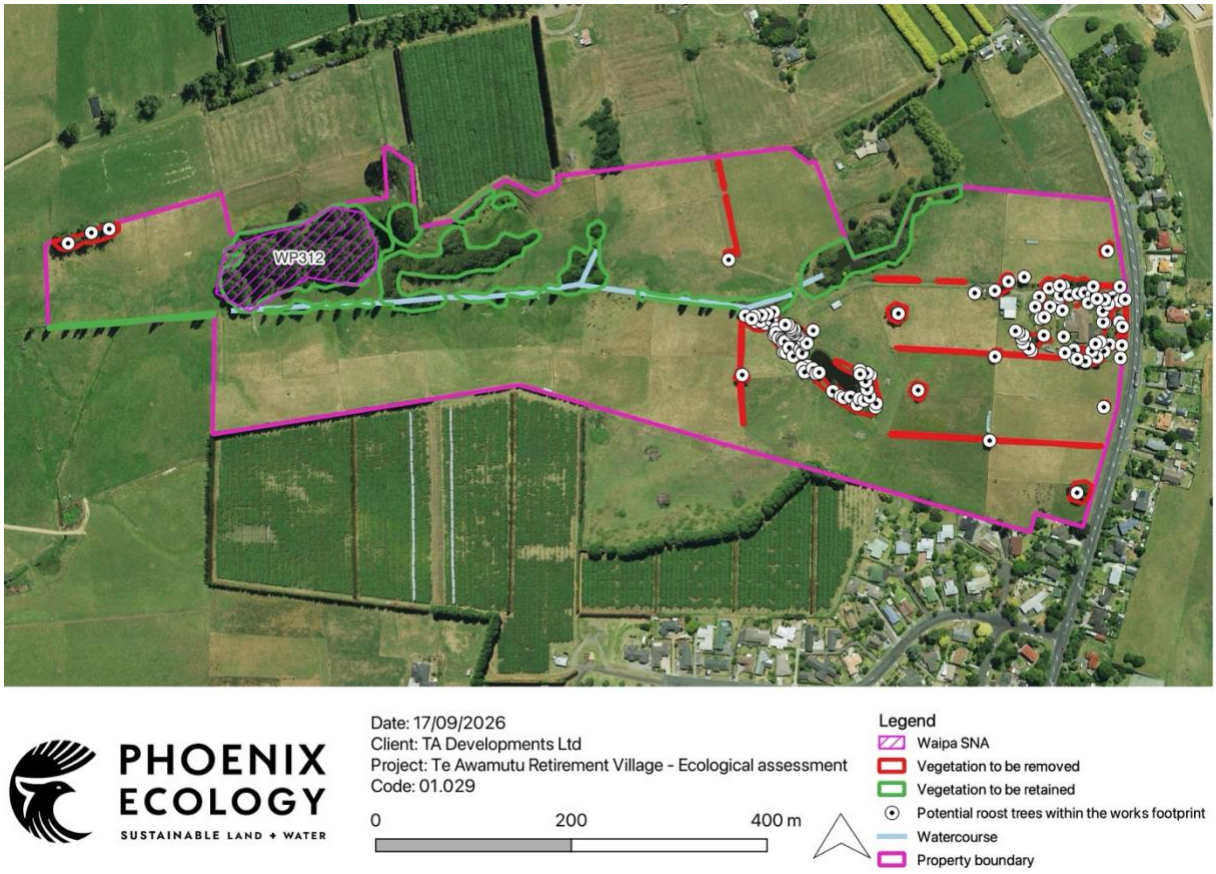


Figure 7 Potential roost trees within the project footprint

Long-tailed bat echolocation calls were detected at all but one monitoring location across the site during the survey period (Figure 8). Bat activity levels varied substantially between monitoring locations, with some detectors recording only occasional passes and others recording substantially higher levels of activity. The highest activity levels were recorded at detectors located near waterways and vegetation edges, while detectors positioned within open pasture generally recorded lower activity levels.

Weather conditions were overall suitable for bat emergence during the monitoring period. Weather conditions are further described in Appendix E.

A total of fifteen acoustic bat monitors were deployed across the site. One monitor (PE05) failed to record during the monitoring period. The remaining fourteen detectors successfully recorded acoustic data and were included in the analysis[1].

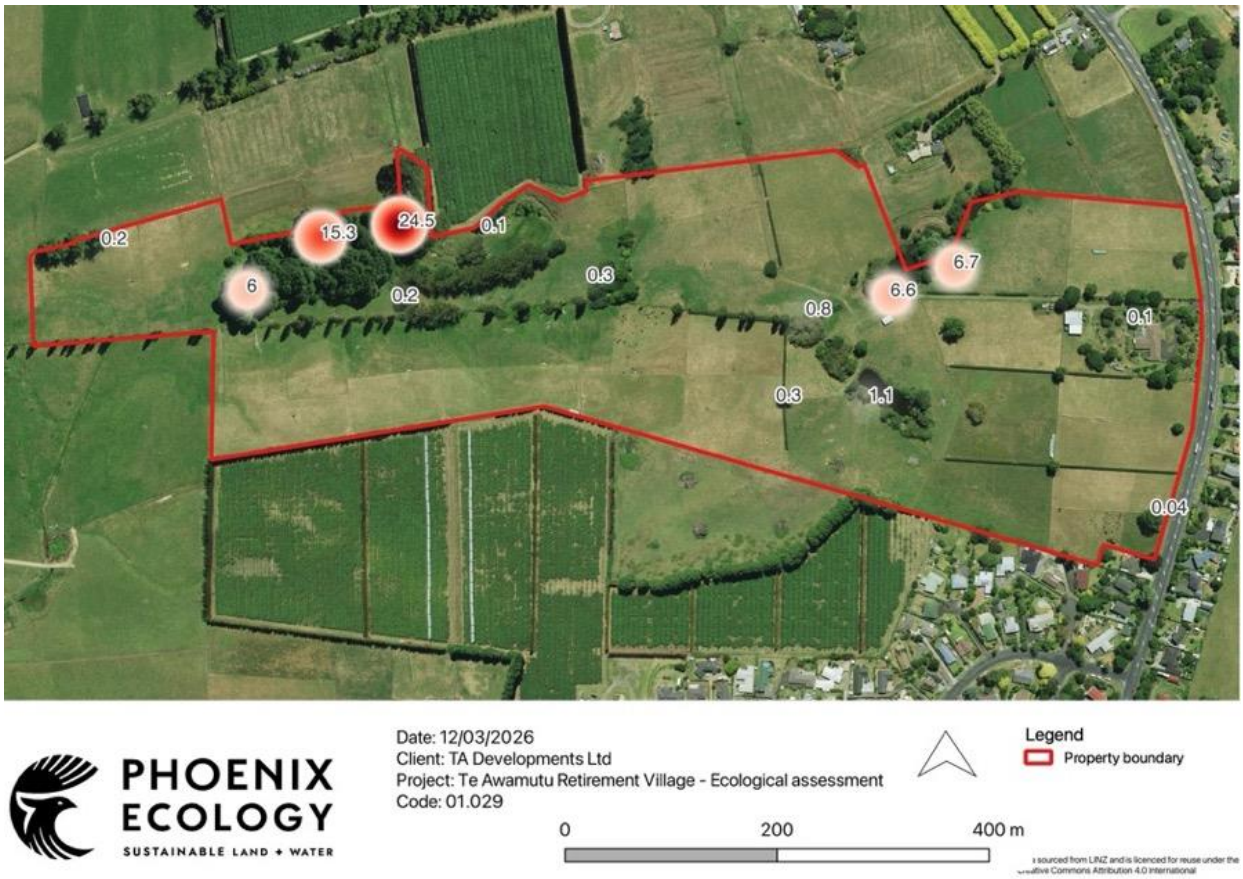


Figure 8 Bat monitoring results

When summarised across the monitoring period, total bat passes per detector ranged from a single detection to several hundred detections at the most active monitoring locations. Mean nightly activity levels similarly varied between detectors, reflecting differences in habitat features and landscape context across the site (Figure 8, Table 1).

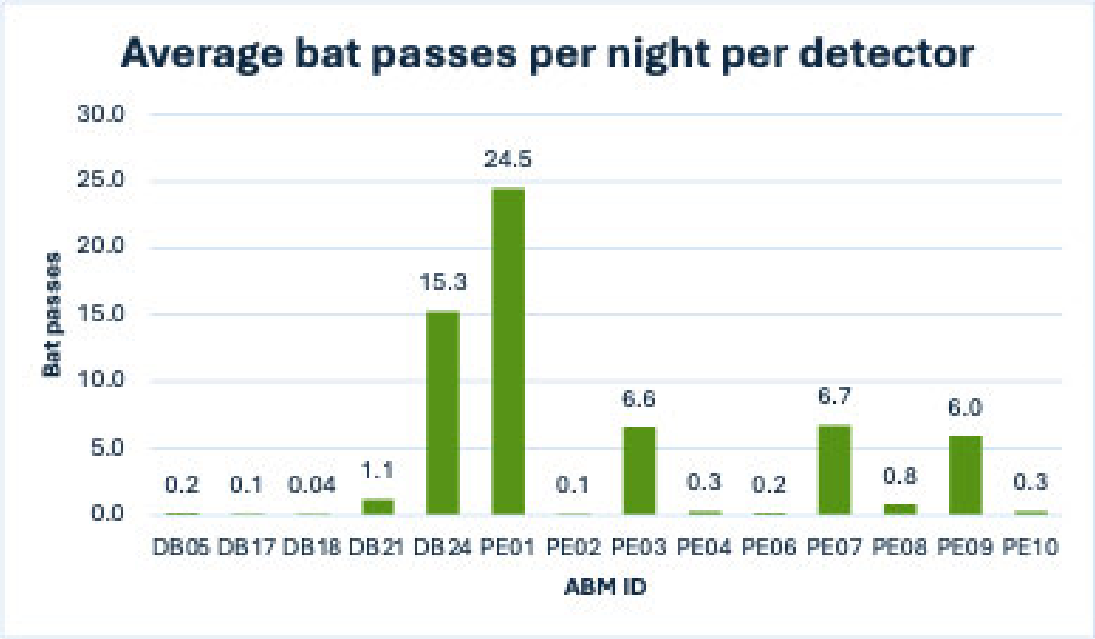
[1] The final detections recorded by ABM DB21 occurred on 7 February 2026. Similarly, ABM PE10 recorded its final detections on 10 February 2026. Given that both monitors were subsequently found on the ground following a storm event, it is likely that the displacement occurred sometime between approximately 8 and 11 February 2026.

Table 1 Bat monitoring results – data summary

ABM ID	Date ABM set	Nights deployed	Nights Recorded	Total no. bat passes	Average /night	# of nights with bat passes	% of nights with bat passes
DB05	28/01/2026	28	20	3	0.2	2	10
DB17	28/01/2026	28	28	3	0.1	3	11
DB18	28/01/2026	28	28	1	0.04	1	4
DB21	28/01/2026	28	28	31	1.1	13	46
DB24	28/01/2026	28	27	413	15.3	19	70
PE01	28/01/2026	28	28	686	24.5	23	82
PE02	28/01/2026	28	10	1	0.1	1	10
PE03	28/01/2026	28	19	126	6.6	1	5
PE04	28/01/2026	28	14	4	0.3	3	21
PE06	28/01/2026	28	10	2	0.2	1	10
PE07	28/01/2026	28	19	127	6.7	1	5
PE08	28/01/2026	28	28	23	0.8	16	57
PE09	28/01/2026	28	8	48	6.0	5	62
PE10	28/01/2026	28	20	6	0.3	5	25

The proportion of nights on which bat activity was detected also varied between monitoring locations. Some detectors recorded bat passes on only a small number of nights, while others recorded activity across a larger proportion of the monitoring period. These patterns indicate that bat use of the site is spatially variable and appears to be concentrated around particular habitat features.

Temporal patterns of activity showed that most bat passes occurred during the middle portion of the night. Detections were generally highest between approximately 22:00 and 03:00, with comparatively fewer passes recorded during the early evening and pre-dawn periods. This pattern is consistent with the typical nightly activity patterns reported for long-tailed bats in New Zealand.



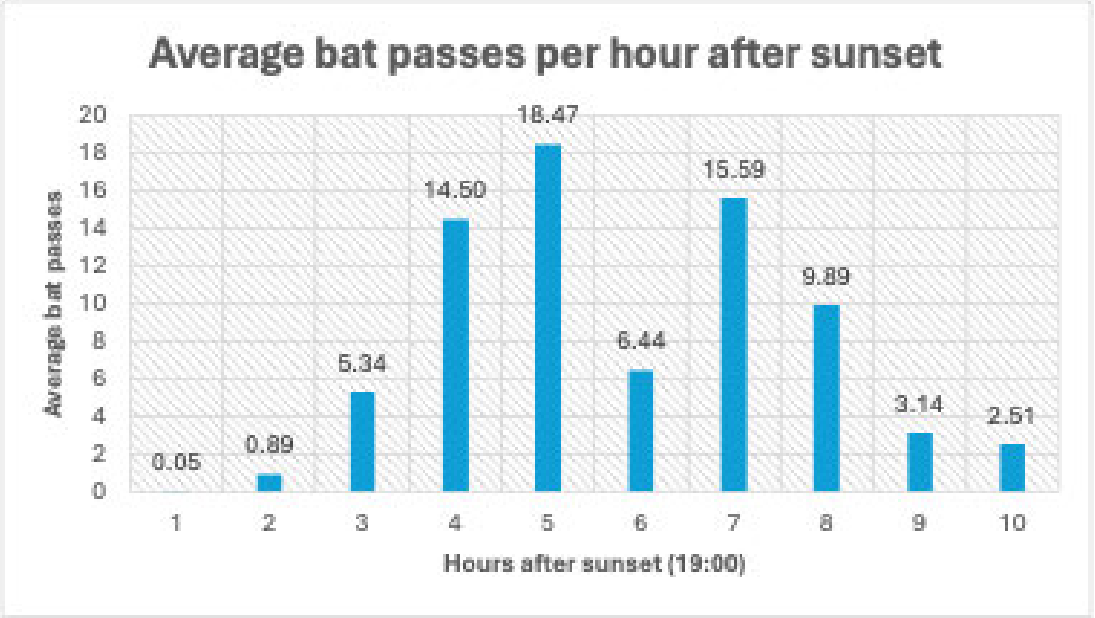


Figure 9 Summary of bat results

In addition to providing foraging and commuting habitat, the site contains several features that may provide potential bat roosting habitat. Scattered mature trees are present across parts of the site, and the remnant kahikatea stand identified as a SNA contains trees with cavities, loose bark, and other microhabitats suitable for bat roosting.

Potential bat roost trees within the project footprint (i.e. within vegetation to be removed) were assessed and GPS recorded. Results are presented in Figure 7. A total number of 103 potential roost trees are proposed to be removed.

While acoustic monitoring confirms regular bat activity across the site, acoustic data alone cannot determine the presence or location of roosts. However, the consistent detections recorded at multiple monitoring locations, including near vegetated areas, indicate that bats are actively using the site and that nearby roost sites may occur within the surrounding landscape.

Overall, the monitoring results confirm the presence of long-tailed bats across the entire site and demonstrate that bats are actively using the area during the summer monitoring period. Activity during other seasons was not surveyed.

Bats likely feed across the site, including pasture. However, long-tailed bats are generally an edge-adapted species (O'Donnell 2005) and often feed on aquatic insects as well as land-based species (Ling et al. 2023). Survey results show that the SNA and watercourses are the most actively used habitat features for bats at the site, with activity across pasture being much lower. Research generally supports a high value for edges and linear features, which can include pasture next to edges and tree lines (Dekrout 2014). Griffiths 2007 showed that bats actively avoid foraging over open farmland. The distribution of activity recorded at this site suggests that habitat features such as waterways, riparian vegetation, and remnant tree stands provide the most important foraging and commuting habitat within the predominantly pastoral landscape. These key habitat features will be retained, restored and protected, including through appropriate buffers, setbacks and lighting controls (Section 5).

Birds

Habitat for common indigenous and exotic bird species exists within riparian vegetation of the watercourse and ponds, exotic specimen trees, and the kahikatea fragment.

A total of sixteen bird species were identified during the site assessment, including five-minute bird counts and opportunistic observations during the visits of the site. The species recorded consisted of both indigenous and exotic common open pasture and forest bird species.

No 'Threatened' or 'At Risk' species were detected during the assessment, nor are these deemed likely to be present within the project area.

The results of the five-minute bird counts are presented in Appendix D. A list of all species identified on site is presented in Table 2.

Table 2 Bird species observed on site

Common name	Scientific name	Threat Classification (Robertson et al. 2021)
Myna	*Acridotheres tristis*	Introduced and Naturalised
Skylark	*Alauda arvensis*	Introduced and Naturalised
Mallard	*Anas platyrhynchos*	Introduced and Naturalised
Greenfinch	*Carduelis chloris*	Introduced and Naturalised
Rock pigeon	*Columba livia*	Introduced and Naturalised
Chaffinch	*Fringilla coelebs*	Introduced and Naturalised
Grey warbler	*Gerygone igata*	Not Threatened
Magpie	*Gymnorhina tibicen*	Introduced and Naturalised
Welcome swallow	*Hirundo neoxena*	Not Threatened
House sparrow	*Passer domesticus*	Introduced and Naturalised
Pukeko	*Porphyrio melanotus*	Not Threatened

Tui	*Prosthemadera novaeseelandiae*	Not Threatened
North Island fantail	*Rhipidura fuliginosa placabilis*	Not Threatened
Kingfisher	*Todiramphus sanctus*	Not Threatened
Blackbird	*Turdus merula*	Introduced and Naturalised
Spur-winged plover	*Vanellus miles*	Not Threatened

Lizards

Copper skink (*Oligosoma aeneum,* At Risk, Hitchmough et al. 2026) have been recorded within a 5 km radius of the site, and could be present in the area. No lizards were detected during the habitat searches conducted on site, but searches were limited to opportunistic habitat checks, and the cryptic nature of copper skink means that they can be easily missed. It is therefore assumed that skinks could be present in all suitable refugia and microhabitats across the site.

High-quality habitat for copper skink and other indigenous lizard species is limited to the kahikatea fragment and adjacent exotic vegetation, however, which will be retained as part of the proposal (Figure 9).

Other habitat available at the site include vegetated areas within the garden around the existing residential dwelling also provide suitable habitat for ground skink. Exotic single trees and hedgerows also provide potential habitat, in particular where long rank grasses, logs or other debris are present. The pasture areas were assessed to be of low value habitat due to impacts of stock access and grazing, and the general lack of suitable refugia. While some potential habitat such as debris and logs is present throughout the pastoral landscape of the site, impacts from stock in these areas means they are unlikely to have persisted.

Potentially available habitat and locations of spot searches are mapped in Figure 9, which indicates which vegetation will be removed, and which will be retained. All riparian habitat along the watercourse, including hedgerows and rank grasses, will be retained, though weed control will remove some invasive exotic species (such as blackberry) and indigenous planting will be implemented to enhance the riparian corridor.

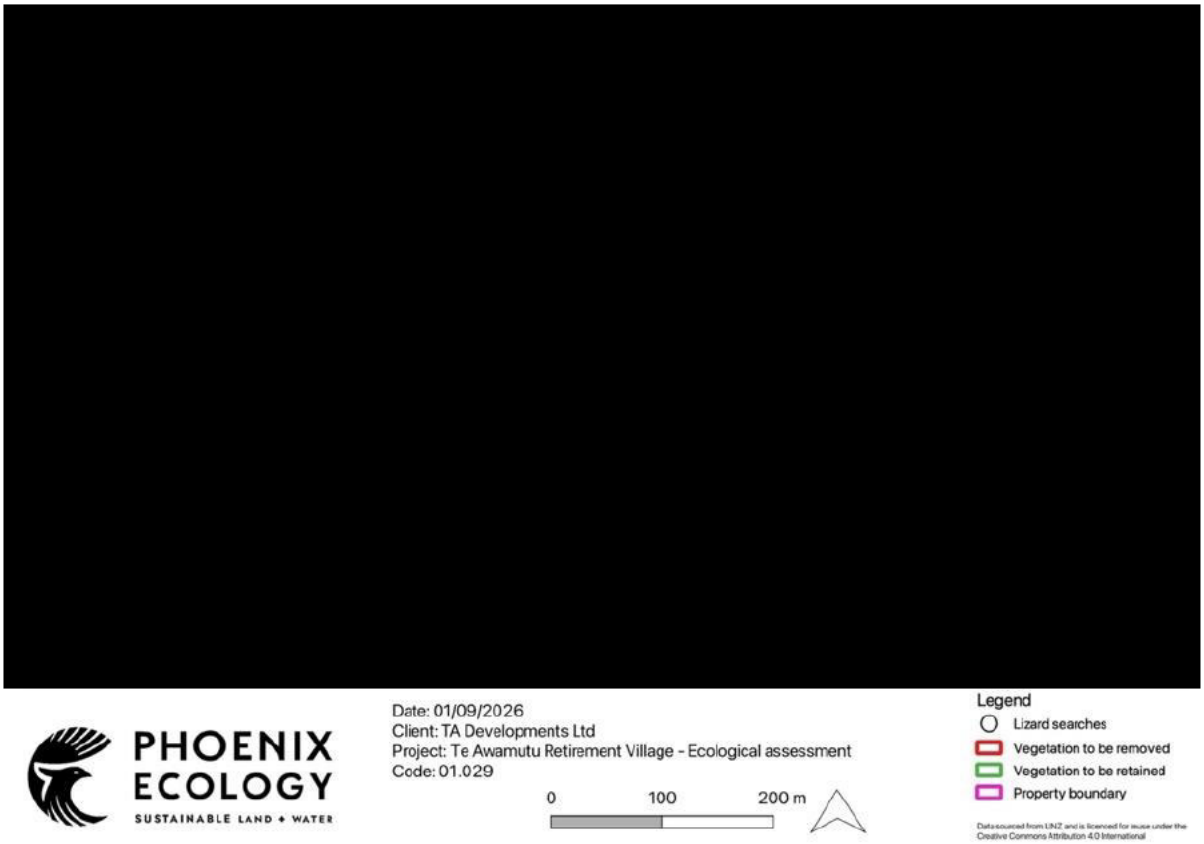


Figure 10 Vegetation to be removed and retained

3.5. Aquatic values

A watercourse which is a farm drainage channel is present, running east to west through the site downstream of the pond system (Figure 2). The channel is straightened, incised, and only partially shaded by riparian vegetation. A slow to moderate flow was found to be present during the site assessment, with a shallow depth and narrow wetted width.

Stream values have been assessed in detail in the original ecology report (BTW 2022b) and are only summarised here.

Stream habitat was found to be only of limited ecological value in the previous assessment, potentially providing habitat for tolerant indigenous fish species due to poor water quality findings – elevated nutrient levels in particular – and the degraded characteristics of the watercourse. Both water quality and stream morphology were found to be adversely impacted by agricultural land use and historic stream drainage within the catchment. Shortfin eels (*Anguilla australis*, Not Threatened) were found to be present in all the survey reaches, with gambusia, an invasive fish species, recorded at two sites furthest downstream. Suitable habitat exists for other indigenous species, but these were not recorded during the fish surveys conducted in 2022.

The watercourse present at the site appears to be of a degraded nature due to channelisation and heavily modified riparian zone. It is likely that this channel serves as a farm drain created during historic agricultural land use. Where water levels are sufficient, fish species such as eels could be present at times.

4. Assessment of Ecological Effects

4.1. Ecological values

Overall, the site consists of mostly grazed exotic pasture of low ecological value, with the kahikatea remnant classified as an SNA being of very high value. Due to the presence of the forest remnant, of several wetlands across the site, and fauna habitat values in particular for long-tailed bats, the overall ecological value at the site has been assessed as **high.** Wetland areas are vulnerable ecosystems due to large-scale historic losses, and the fact that even if degraded they provide important landscape and catchment functions. Wetlands at the site also offer limited fauna habitat values, including foraging habitat for bats. The drain systems are of a degraded nature with poor water quality, but provide habitat for indigenous fish species (shortfin eel).

Discussion of the ecological values of the site against the EIANZ assessment criteria and criteria of significance under the WRPS (Appendix C) is provided in the sections below.

Following a broad discussion of values and effects in this section, a detailed overview of ecological values, magnitudes of effects and overall level of effect prior to and after mitigation for the different fauna and habitat types is presented in Table 3.

Representativeness

The extent to which the area is typical or characteristic. Size.

The vegetation at the site is currently highly modified, dominated by exotic pastureland with small pockets of wetland remaining fragmented throughout the site. Several farm drains of limited ecological representativeness are also present. The kahikatea fragment is a characteristic feature of past vegetation cover, and representative ecosystem of high ecological values, including potentially providing remnant habitat for bat roosting that is otherwise sparse within the landscape.

Overall, habitat and vegetation cover onsite are considered to be of **moderate** value with regards to ecological representativeness.

Rarity/distinctiveness

Amount of habitat or vegetation remaining. Supporting nationally or locally threatened, at risk or uncommon species. Regional or national distribution limits. Endemism. Distinctive ecological features. Natural rarity.

Wetlands are locally, regionally and nationally threatened ecosystems due to historic losses associated with land use change. The site also provides habitat for long-tailed bats, a nationally critical species. The presence of this species elevates the importance of habitat features present on site, particularly waterways, vegetated margins, ponds, scattered mature trees, and the kahikatea remnant.

Overall, ecological values present at the site are considered to be of **high** value with regard to rarity and distinctiveness.

Diversity and pattern

Level of natural diversity. Biodiversity reflecting underlying diversity.



Beyond the forest remnant, the site supports only a very limited array indigenous plant species, with most plant species exotic grasses and exotic wetland species within the wetland areas. Farm drain margins are also dominated by exotic species. Habitat provision for indigenous fauna is overall limited across the site. Plant and fauna diversity present was assessed to be low to moderate.

Overall, the site is considered to be of **moderate** value with regard to diversity and pattern.

Ecological context

Contribution to network, buffer, linkage, pathways. Role in ecosystem functioning. Important fauna habitat.

Most of the vegetation at the site has been cleared historically to enable pastoral land use, with the only original vegetation cover remaining being the kahikatea forest fragment (SNA). Beyond this SNA, indigenous vegetation is limited to a low number of wetland species within the wetlands and riparian margins. The site has become largely fragmented from the surrounding ecological features, but linkages exist of the farm drains to downstream watercourses (including the Waipā River via the Mangapiko Stream).

Pasture, drains and wetlands provide limited fauna habitat, as well as limited buffer values for the wider catchment.

Given the modification of the site, it is considered to be of **moderate** value with regard to ecological context.

Overall ecological value

The kahikatea fragment is of very high ecological value, and the site is utilised by long-tailed bats, predominantly around the forest remnant. While wetlands even in a degraded state have value associated with the functions they perform, including habitat provision, nutrient filtration and flood control, the remaining ecological features present at the site are highly modified, impacted by modification for agricultural land use and of limited species diversity, with low indigenous flora and fauna values. The overall ecological value of the vegetation and terrestrial habitat at the site is assessed to be **high**.

4.2. Ecological effects

The project proposal involves the construction of a senior living development featuring stand-alone villas and duplexes, a community hub and a care home over an area of approximately 25 ha, to be completed in several stages. Associated roading and stormwater infrastructure are also proposed. The works will involve the removal of two artificial ponds and upgrading of existing culverts. Restoration of several wetlands, terrestrial habitat, riparian habitat and an open water pond (SW Pond B) is also proposed as part of the development (Figure 11).

Scheme plans of the proposal are shown in Appendix A (Masterplan).

In general terms, habitat loss and modification associated with the proposed earthworks and establishment of residential housing, roading and stormwater infrastructure has the potential to create a range of adverse effects on biodiversity values, during construction (resulting from direct physical disturbance), and on an ongoing basis due to the permanent modification of the character of



the site. These potential adverse effects on wetland and aquatic values during and after construction may include:

- Construction and operational effects;
- Loss, fragmentation or degradation of terrestrial fauna and wetland habitat;
- Increased urbanisation leading to disturbance of long-tailed bats;
- Harm or disturbance to fauna species during vegetation clearance and earthworks;
- Increased sedimentation or contamination of receiving aquatic environments; and
- Proliferation of pest plant species following earthworks.

Construction and operational effects

Construction effects include the risk of mortality or injury to fauna during vegetation removal and earthworks; the loss of actual and potential bat roost trees; construction lighting, noise and vibration; and increased vehicle movements associated with the works.

Operational effects include the permanent loss and degradation of habitat including aquatic habitat and bat foraging habitat; fragmentation of fauna (bat and bird) commuting routes; artificial light at night from housing, roading and community facilities; ongoing noise and vehicle headlights; physical barriers created by buildings and roads; changes to stormwater regimes with the potential to affect aquatic insect production (which provide a bat food source); and increased human presence, including domestic pets (only dogs will be allowed within the residences) in proximity to retained habitat and SNA WP312.

Habitat loss and modification

Aquatic and wetland habitat loss through the proposed earthworks and vegetation clearance includes the loss of 33 m^2 of natural wetland (WL9), where a stormwater pond will be constructed. As confirmed by the Groundwater Assessment Report (WGA 2026), no other wetlands will be affected or hydrologically altered as part of the proposal.

Culverts will be upgraded but placed in existing locations, leading to no effective stream loss. Culverts will be designed in line with the NZ Fish Passage Guidelines (Franklin et al. 2024), with sufficient sizing and slightly sloped (<1% for one culvert, <0.5% for the other two) placement. One culvert, placed downstream of the retained pond, will have a steep (10%) slope, with approximately 10 m length. However, the current pond outlet is a collapsed farm culvert and is likely to fully impede fish passage. Other than eels, no fish species are expected to be present within the farm pond for that reason. The new culvert will be installed with spat rope for improved passage in case there are other species present. Despite the steeper slope, the upgrade is therefore expected to be an improvement of the status quo. Further culvert details are contained in Section 6.9 of the project Stormwater Management Plan.

An artificial pond system will be infilled and lost upstream of the watercourse (c. 1,800 m^2). The removal of the pond will result in the loss of some (artificially created) aquatic and terrestrial habitat. The loss of this habitat will be addressed through artificial habitat creation at one of the stormwater ponds, and riparian habitat restoration.



No further stream loss is expected, as the proposal was re-designed to avoid a previously planned stream diversion at the western downstream end of the site (Appendix A).

Replacement of wetland and fauna habitat loss is proposed through extensive restoration and habitat enhancement as discussed in Section 5.3 below, and an indicative plan of restoration areas is shown in Figure 11.

Some vegetation removal is proposed, as shown in Figure 10. These areas provide potential habitat for bats, birds and lizards, so restoration is proposed to restore other potential habitat areas across the site (including wetlands, terrestrial and riparian habitats).

Unmitigated, the permanent conversion of approximately 25 ha of the site to residential, roading and stormwater use represents a substantial and permanent change in land use across habitat used by long-tailed bats. Approximately 10,400 m^2 of vegetation will be removed, containing 103 potential bat roost trees (Figure 7). Prior to mitigation, this scale of habitat loss and modification, together with fragmentation of retained habitat, is assessed to represent a moderate magnitude of effect on bat habitat values due to the loss of some of the site's roost trees, commuting and foraging habitat, and the loss of dark spaces, meaning the post-development character will be partially changed. Following restoration planting, roost tree replacement, implementation of lighting controls, setbacks and predator control (outlined in Section 5), the magnitude of effects was assessed to be low.

Predator control will be implemented across all restoration areas to provide additional ecological benefit and increase quality of restored habitat. Cats or other domestic animals (except dogs) will not be allowed within the project site. Details are contained in the Wetland Management and Enhancement Plan that outlines restoration and the pest control programme.

The magnitude of effects with respect to habitat loss is expected to be **Low** following replacement of lost wetland areas, riparian and terrestrial restoration efforts.

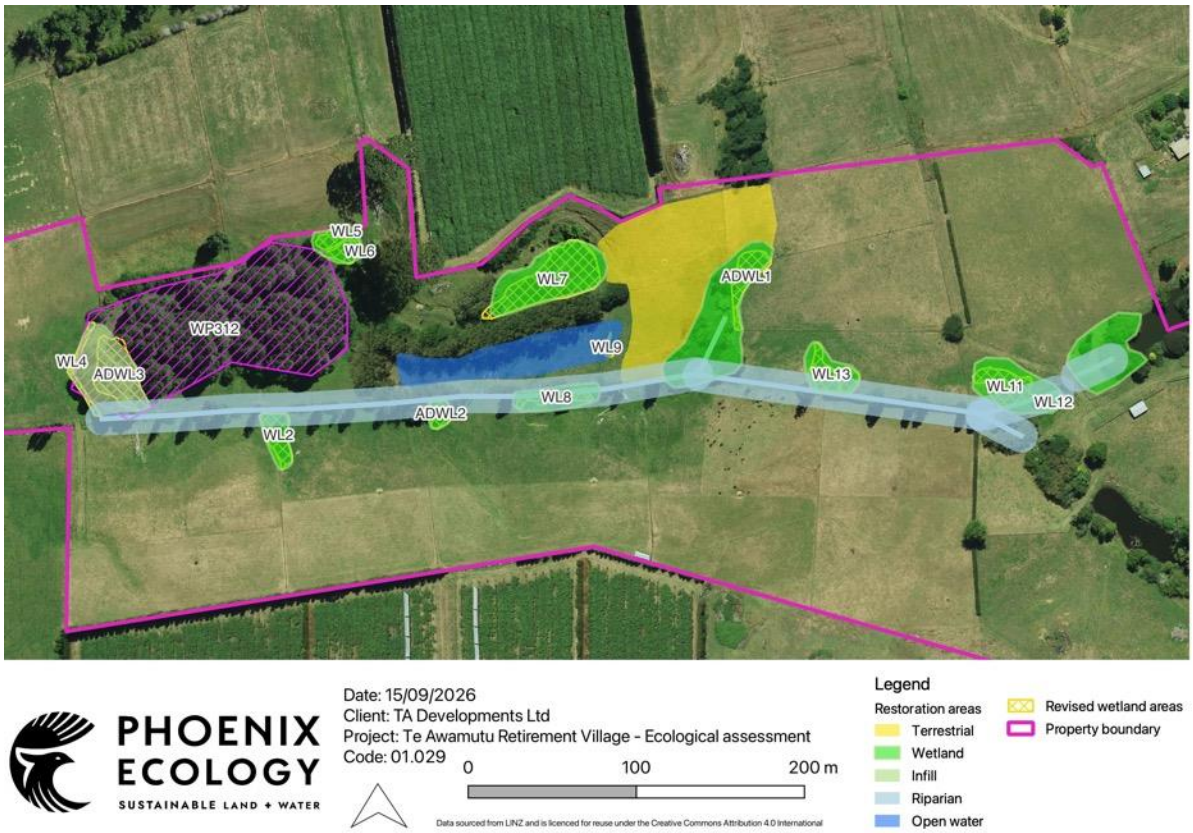


Figure 11 Indicative restoration areas – WL9 is proposed to be removed

Increased urbanisation and disturbance of bats

Lighting and noise associated with the proposed senior living project have the potential to disturb fauna in the vicinity of the impact area, in particular the adjoining SNA kahikatea stand. Given the confirmed presence of long-tailed bats across the site, these changes may affect bat foraging and commuting behaviour. This is particularly the case given the currently available dark spaces at the site, and the potential for cumulative effects if other adjacent areas are to be developed.

Artificial light at night (ALAN) has been found to negatively impact various bat species, including long-tailed bats, and research on other bat species supports the concern that artificial lighting can disrupt their foraging, commuting, and roosting behaviour (Schamhart et al. 2022; Bats and Lighting, n.d.; Rowse et al., 2016). This fragmentation of their natural habitat can lead to reduced foraging opportunities and compromised commuting routes (Bat Conservation Trust, 2023; Stone et al., 2015).

Unmitigated, the introduction of a permanent urban development - including street, path, building, security and community-hub lighting, together with associated noise, traffic and human activity - into a currently dark rural site used extensively by long-tailed bats is assessed to represent a moderate magnitude of effect on bat foraging, commuting and roosting behaviour due to the expected impacts while retaining key habitat features.

As shown in the Masterplan (Appendix A), the development housing sites are set back from all key habitat features including the kahikatea remnant and the retained riparian corridor and pond system. Lot boundaries are a minimum of 25 m from these areas, and the presence of planted stormwater ponds and restoration planting areas (Figure 11) function to provide additional buffering of these effects.

The magnitude of effects with respect to lighting is expected to be **Low** following implementation of setbacks from the key habitat features, the consideration of wildlife sensitive lighting design (Section 5.2), and a comprehensive restoration programme involving predator control and planting across these habitat features, including 10,000 m^2 of wetland restoration, 6,000 m^2 of terrestrial habitat restoration, and infill planting at the kahikatea remnant (Sections 5.3 and 5.4). Riparian planting proposed along the entire watercourse will also enhance bat foraging and commuting habitat and create an additional planted buffer from the development.

Disturbance to wildlife

Proposed earthworks and vegetation removal across the site have the potential for disturbance and mortality of any present fauna species, including fish within the water course during culvert placements and infilling of the ponds, and roosting bats during the removal of any mature trees with potential roost features, lizards that may be present in any available refugia within the vegetation removal and earthworks footprint, and any nesting birds that may be present within the wetlands and riparian vegetation of the ponds.

The implementation of suitable fauna management protocols is recommended to minimise this effect. These protocols are designed to avoid as much as possible the direct impact on any fauna species during works. Protocols and steps to avoid direct disturbance are discussed in Section 5.1 below. If implemented, the magnitude of effects with respect to wildlife disturbance of construction activities is expected to be **Low**.

Sedimentation effects

Following vegetation removal and earthworks, there is the potential to increase sediment run off and loads to receiving aquatic environments. High rainfall events accelerate sedimentation and erosion effects, impacting any downstream stream and wetland areas.

The implementation of appropriate best practice sediment and erosion control measures and protocols will be required for any bare surfaces created to avoid this effect.

If these are implemented correctly, the magnitude of effects with respect to sedimentation and erosion is expected to be **Negligible**.

Weed dispersal

Clearance of vegetation and presence of bare ground provides a pathway for unwanted pests and weeds. While weed species presence is generally low within the site, any weed species should be controlled if they become established, and maintenance of any new plantings will be required to ensure weed cover (including pasture grasses smothering new plantings) can be controlled while new plantings become established.

Details of weed control, in particular for the kahikatea remnant and wetland restoration areas, will be included in a Restoration Planting Plan to be prepared for the site.

The magnitude of effects with respect to weed dispersal is expected to be **Negligible**.

Cumulative effects

The proposal will be constructed in stages across approximately 25 ha, and the site adjoins other rural land that may itself be subject to future development pressure given its proximity to Te Awamutu township. Future development in the vicinity of the site is currently unknown. Staged construction has the potential to result in incremental, progressive loss of dark habitat and foraging/commuting connectivity over time, ahead of restoration planting reaching functional maturity.

Staging of construction relative to the establishment of restoration planting is recommended to reduce this effect, with all restoration planting recommended to be implemented prior to the first stage of the site becoming operational.

Uncertainty is also addressed through a precautionary approach of providing a large-scale restoration programme encompassing approximately 25,000 m^2 of restoration planting (10,000 m^2 of wetland restoration, 6,000 m^2 of terrestrial planting, and c. 9,000 m^2 of riparian and infill planting) and predator control implemented across all restoration areas and the kahikatea remnant.

Magnitude of effect

The magnitude of effect has been determined in consideration of the spatial scale and context of the ecological effects, as well as the temporal scale of some of earthworks and habitat loss and construction effects during earthworks.

If all management recommendations are followed, effects are expected to be no more than a minor effect on the known populations and existing baseline conditions at the site, given the modified nature of the site and limited habitat values provided, and adequate habitat replacement proposed.

Overall, the effects of the development as proposed are assessed to result in a **Low** magnitude of effect and a low level of effect given the proposed measures to minimise direct effects, minimise lighting effects, restoration planting, current habitat and the context of the existing environment.

A detailed overview of ecological values, magnitude of effect prior to mitigation, proposed avoidance and mitigation measures, the magnitude of effect following mitigation, and the overall level of effect for each ecological value (bats, birds, lizards, wetlands, freshwater) is summarised in Table 3 below. Effects management measures are discussed in detail in Section 5.

Table 3 Summary of ecological values, effects, mitigation and level of effect

	Ecological value	**Ecological effects (unmitigated)**	**Magnitude of effect before mitigation**	**Mitigation proposed**	**Magnitude of effect after mitigation**	**Overall level of effect** (Roper-Lindsay et al. 2018, Table 10)
Bats	Long-tailed bat (*Chalinolobus tuberculatus*), Threatened, Nationally Critical. Detected across the site; key habitat values associated with waterways, riparian vegetation, scattered mature trees, ponds and the kahikatea remnant (SNA WP312, Very High). Overall ecological value: **High**	Habitat loss and modification: removal of approximately 10,400 m² of vegetation, including 103 potential roost trees; loss of commuting and foraging habitat and dark space; fragmentation of retained habitat; permanent conversion of approximately 25 ha of open pasture, individual trees and hedgerows.	**Moderate** Loss or alteration to one or more key elements or features of the existing baseline conditions, loss of a moderate proportion of the available habitat	• Avoidance: SNA WP312 and key habitat features are retained; dark habitat network retained along waterways, wetlands and vegetation edges. • Restoration planting: wetland approximately 10,000 m²; terrestrial approximately 6,000 m² including tall, cavity-bearing trees to replace lost potential roost trees over time at a minimum ratio of 2:1; infill planting in the kahikatea remnant; riparian planting along approximately 860 m of watercourse. • Predator control across all restoration areas and the SNA; stock exclusion fencing of the SNA. • Restoration planting established ahead of the site becoming operational. Artificial roosts used only as a short-term supporting measure, not mitigation.	**Low** Minor shift away from baseline conditions or a minor effect on the known population range given the retention and protection of key habitats, lighting controls, and large-scale restoration planting.	**Low**
		Increased urbanisation and disturbance: street, path, building, security and community-hub lighting, noise, traffic and human activity introduced into a currently dark rural site.		• Lot boundaries a minimum of 25 m from the SNA and all restoration areas; planted stormwater ponds and restoration areas as buffers. • Artificial lighting at boundaries to key habitat (SNA remnant, watercourse, pond, restoration areas) kept below 0.3 lux; no lighting within the SNA or restoration areas. • Shielding to avoid upward light spill; no more than 2700K within 50 m of key habitat; non-reflective dark surfaces where possible; motion sensors or timers for outdoor lighting. • No cats or other domestic animals (except dogs) within the development site.		
		Direct harm: injury or mortality of roosting bats during removal of mature trees with potential roost features.		• Bat roost protocols implemented for the removal of mature vegetation, including avoidance of tree removal during the winter and checking of all potential roost trees for occupying bats. Detailed in the Ecological Management Plan.		
		Cumulative effects of staged construction: incremental loss of dark habitat and foraging and commuting connectivity ahead of restoration reaching functional maturity.		• All restoration planting implemented before the first stage becomes operational; staged construction sequencing to retain functioning corridors. • Precautionary large-scale restoration programme and predator control.		

	Ecological value	Ecological effects (unmitigated)	Magnitude of effect before mitigation	Mitigation proposed	Magnitude of effect after mitigation	Overall level of effect (Roper-Lindsay et al. 2018, Table 10)
Birds	Sixteen species recorded (common indigenous and exotic); no Threatened or At Risk species detected, nor deemed likely to be present. Habitat in riparian vegetation of the watercourse and ponds, hedgerows, exotic specimen trees and the kahikatea fragment. Overall ecological value: **Moderate**	Disturbance or mortality of nesting birds during vegetation clearance and earthworks (wetlands and riparian vegetation of the ponds). Loss of habitat: removal of exotic specimen trees and vegetation, and loss of pond margin vegetation. Operational effects: artificial light, noise, vehicle movements, human presence and domestic pets near retained habitat.	**Low** Minor shift away from baseline conditions, associated with the loss of vegetation. Minor effect on the known population range	• Avoidance of the key bird breeding season, or checks for nests prior to earthworks within wetlands and other vegetation suitable for nesting. Detailed in the Ecological Management Plan. • Wetland, terrestrial, riparian and infill restoration planting providing additional and restored bird habitat over approximately 25,000m². • Predator control across all restoration areas and the SNA; weed control. • Setbacks of at least 25 m, planted buffers and lighting controls (as for bats). • No cats or other domestic animals (except dogs) within the development site.	**Negligible** Very slight shift away from baseline conditions, associated with the loss of vegetation. Negligible effect on the known population range. Likely positive effects on overall habitat quality and availability following implementation of large-scale restoration planting.	**Very low**
Lizards	Copper skink (*Oligosoma aeneum*, At Risk) recorded within 5 km; none detected in opportunistic searches but assumed present in suitable refugia (cryptic). High-quality habitat limited to the kahikatea fragment and adjacent exotic vegetation (retained). Garden vegetation, exotic trees and hedgerows are potential habitat; pasture is low value. Overall ecological value: **Moderate**	Injury or mortality of lizards in refugia (debris, logs, rank grass) within the vegetation removal and earthworks footprint. Loss of potential habitat in vegetation to be removed (garden vegetation, exotic specimen trees, hedgerows).	**Low** Minor shift away from baseline conditions, associated with the loss of vegetation. Minor effect on the known population range	• Lizard searches and salvage targeting potential refugia prior to vegetation removal. Detailed in the Lizard Management Plan. • Kahikatea fragment, adjacent exotic vegetation and riparian habitat (including hedgerows and rank grasses) are retained. • Terrestrial restoration (approximately 6,000 m²) providing additional lizard habitat; predator and weed control.	**Negligible** Very slight shift away from baseline conditions, associated with the loss of vegetation. Negligible effect on the known population range. Likely some positive effects on overall habitat quality and availability following implementation of restoration planting and predator control.	**Very low**

	Ecological value	Ecological effects (unmitigated)	Magnitude of effect before mitigation	Mitigation proposed	Magnitude of effect after mitigation	Overall level of effect (Roper-Lindsay et al. 2018, Table 10)
Wetlands	Thirteen natural inland wetlands identified on site: small, fragmented and degraded by stock access and grazing, predominantly exotic species, low to very low diversity, no threatened plants. Provide fauna habitat and catchment functions (flood attenuation, nutrient and sediment filtration). Wetlands are locally, regionally and nationally threatened ecosystems. Overall ecological value: **High**	Loss of one natural inland wetland (WL9, 33 m^2) to a stormwater pond.	**Low** Minor shift away from baseline conditions, associated with the loss of vegetation. Minor effect on the known population range	• Wetland restoration over approximately 10,000 m^2: 4,886 m^2 of existing wetland enhanced and 6,468 m^2 restored from pasture (the wetland table total column in the report reads 10,983 m^2; see gaps). • Groundwater Assessment Report (WGA 2026) confirms no other wetlands are affected or hydrologically altered. • Predator and weed control, ongoing maintenance (Wetland Management and Enhancement Plan).	**Positive** Likely positive effects on overall habitat quality and availability following implementation of large-scale restoration planting.	**Net gain** No formal "no net loss" under the offsetting framework assumed to be achieved; net gain derived from positive magnitude of effect (Roper-Lindsay et al. 2018, Table 10).
		Sedimentation or contamination of wetlands and receiving environments following vegetation removal and earthworks.		• Best practice erosion and sediment control for bare surfaces (mulch, sediment fencing); replanting or re-seeding bare areas outside the development footprint as soon as possible.		
		Proliferation of pest plants following earthworks and on bare ground.		• Weed control and maintenance of new plantings; appropriate disposal of weed waste (Wetland Management and Enhancement Plan).		
Freshwater	Watercourse is a straightened, incised farm drainage channel with elevated nutrients and limited ecological value. Shortfin eel (Anguilla australis, Not Threatened) present in all survey reaches; gambusia (invasive) at the two most downstream sites. Artificial pond system upstream. Suitable habitat for other indigenous species, none recorded in 2022. Overall ecological value: **Moderate**	Loss of the artificial pond system (c. 1,800 m^2), including ponded habitat important for eels.	**Moderate** Loss or alteration to one or more key elements or features of the existing baseline conditions, loss of a moderate proportion of the available habitat	• Open water re-creation in SW Pond B (c. 2,500 m^2): connected to groundwater and the watercourse, permanent water, fish passage via a V-type cutout, unlined, with logs, snags and rocks across about half of the pond area. • Riparian restoration along approximately 860 m of the retained watercourse and pond system (weed control, predator control, indigenous planting).	**Low** Minor shift away from baseline conditions. Given the implementation of fish protocols, re-creation and restoration of habitat, underlying character will be similar with a minor effect on the known population range.	**Low**
		Harm to fish during culvert upgrades and infilling of the ponds.		• Indigenous fish management protocols where avoiding works within wetted channels (works while the channel is dry) is not feasible. Detailed in the Ecological Management Plan. • Culverts upgraded in existing locations (no effective stream loss).		
		Sedimentation or contamination of the watercourse and downstream environments.		• Best practice erosion and sediment control; stabilisation or replanting of bare areas.		

5. Effects management measures

Recommendations for management measures to address expected adverse effects are outlined in the following sections. These should be detailed in relevant ecological management plans, covering fauna management (bat, bird and fish management plans) and a restoration plan (outlining restoration planting and weed management details).

Avoidance of effects was applied first, where practicable. The site layout has been designed to retain SNA WP312, which is of very high ecological value and provides potential bat roost habitat. Also retained will be a dark habitat network along waterways, wetlands and vegetation edges (Appendix A); with setbacks and planted buffers implemented to further reduce the impact of the development on these areas. Stormwater treatment devices are also located to provide an additional buffer to these features.

Where effects cannot be avoided, minimisation measures are designed to reduce the project impact during construction and operation. These are proposed through staged construction sequencing to retain functioning corridors, protection of the root zones of retained trees, the pre-establishment of restoration planting ahead of vegetation removal where practicable, and setbacks to retain ecological function of key habitat features.

Effects management measures to further reduce ecological effects are outlined below and are covered in detail in the respective project management plans (Lizard Management Plan, Ecological Management Plan and Wetland Management and Enhancement Plan addressing restoration planting and predator control).

5.1. Management of direct effects

The implementation of appropriate fauna protocols prior and during construction is designed to manage direct adverse effects on bats, birds, lizards and fish, which will minimise risk of direct disturbance (injury or mortality) to any present fauna.

This includes the following management steps and fauna protocols:

- The avoidance of the key bird breeding season or checks for nests prior to earthworks within wetlands and other vegetation suitable for nesting;
- The implementation of lizard searches and salvage targeting any potential refugia such as debris and logs present within the vegetation to be removed, prior to vegetation removal;
- The adoption of indigenous fish management protocols where the avoidance of works within wetted channels (i.e. earthworks conducted during times where the channel is dry) is not feasible; and
- The adoption of bat roost protocols during the removal of any mature vegetation (including the avoidance of tree removal during the winter, i.e. May to September).

5.2. Lighting recommendations

Given the potential for artificial lighting to disturb bats, it is recommended to minimise artificial lighting in areas where long-tailed bats are present. Low-intensity, warm-coloured lights (2700K) are preferable and will be applied nearby key habitat areas, and any necessary lighting will be shielded and directed away from bat habitats. Limiting light exposure during peak bat activity hours, such as by using timers, can further help mitigate the negative effects of ALAN on present bats. Artificial lighting at

boundaries of key habitat features (SNA remnant, watercourse, pond, restoration areas) will be kept below 0.3 lux, which is considered low enough not to significantly disrupt nocturnal wildlife (Rowse et al., 2016). This will be achieved through spatial setbacks, retained vegetation and additional buffer planting to minimise the impact of any lighting in all key habitat areas.

The disturbance of fauna will be minimised through wildlife-sensitive lighting design. The following considerations will be implemented as part of the project design, implemented within 50 m of all key habitat features and restoration areas (and shown in Appendix H):

- No lighting to be placed within the SNA remnant or restoration areas;
- Use of shielding to avoid upward light spill (including on any street lighting adjacent to reserves);
- Blue-filtered lighting with a colour temperature of no more than 2700K for all outdoor lighting within 50 m of all key habitat areas
- Use of non-reflective, dark surfaces where possible; and
- Use of adaptive controls such as motion sensors for any outdoor lighting such as security lighting.

In addition to these lighting guidelines, a buffer will be maintained separating all lot sites adjacent to the kahikatea remnant to minimise effects of noise and lighting on this key habitat area, with a minimum setback of 25 m of any residential lot boundaries to the SNA, and all restoration areas. Additional buffers are provided by the planted stormwater treatment devices, through maintaining existing tall trees along the watercourse, and additional restoration planting of wetland, riparian and terrestrial areas (see Figure 9 and Appendix A).

5.3. Wetland loss and restoration

While small, fragmented and degraded, all wetlands on site provide fauna habitat and important wetland functions including flood attenuation, and nutrient and sediment filtration, to the wider catchment. While one wetland sized 33 m^2 is proposed to be lost in the location of a stormwater pond, the proposal also includes the restoration of several other areas of wetlands to ensure these functions are retained within the catchment, and overall area and habitat values are enhanced to replace the small area lost.

Wetland restoration to replace lost wetland area, and enhance existing wetlands, is proposed over an area of approximately 10,000 m^2 (or 11,400m^2 including the pond area to be restored west of Stage 1C, which is not currently classified as a wetland). Of this area, 4,886 m^2 are current wetlands, with an additional area of 6,468 m^2 proposed to be restored to wetland from current pasture. Table 4 below outlines all wetlands and total restoration areas.

Table 4 Wetland loss, restoration and replacement

Name	Area	Existing area retained and enhanced	Area lost	Newly restored area	Total restoration area
WL11	530	530		699	1229
WL12	18	18			18
WL13	415	415		227	642

ADWL1	423	423		2050	2473
WL9	33		33		
WL7	1407	1407		369	1776
WL8	202	202		437	639
ADWL2	152	152		34	186
WL2	360	360		69	429
ADWL3	881	881		819	1700
WL4	169	169			169
WL5	145	145		345	490
WL6	184	184			184
Pond				1419	1419
Total		**4,886m2**	**33**	**6,468m2**	**11,354m2**

The proposed restoration is expected to adequately address the loss of wetlands, and the loss of potential bat foraging habitat (when combined with lighting controls and buffers detailed in Section 5.2).

For wetlands, the restoration approach which includes enhancement planting of existing wetlands and an overall increase in wetland area was assessed to have a positive effect, leading to an overall improvement in habitat values. The current wetlands are degraded, and the restoration and enhancement proposed will enhance ecological wetland values as well as increase the overall habitat area available at the site.

Restoration proposed will involve the enhancement planting of existing degraded wetlands across the site (Figure 10). These areas are indicative and will need to be finalised as part of a restoration planting plan for the site. As part of this plan, infill planting will also be included where existing exotic vegetation is retained (Figure 9), to support a transition from exotic to indigenous vegetation over time without removing the existing vegetation (with the exception of weed species), thereby retaining fauna habitat function.

Once fully implemented and established, the restoration planting of these wetland areas will lead to a notable improvement in the quality and quantity of wetlands at the site and sufficiently mitigate for the expected wetland loss.

5.4. Terrestrial habitat restoration

In addition to the 10,000 m^2 of wetland restoration, terrestrial habitat restoration will be implemented through infill planting at the kahikatea remnant, and restoration of an area of approximately 6,000 m^2 of terrestrial habitat. This restoration planting will create additional high value bat, bird and lizard habitat, and will include suitable tall, cavity-bearing tree species that are expected to provide future bat roosting habitat.

Potential bat roost trees lost during vegetation removal will be replaced as part of terrestrial habitat restoration. While 103 potential bat roost trees will be cleared, most of these are unlikely to actually

be used as such due to their landscape context (many stand-alone specimen trees) and roost feature characteristics (many of them are trees of small statue, with very small cavities or other marginal roost features). Many of the trees are also young, estimated at around 10-20 years, and therefore will be replaced relatively quickly by newly planted trees.

All trees have nonetheless been conservatively assessed as potential roost trees, and will be replaced as part of the terrestrial restoration planting at a minimum ratio of 2:1 for each potential roost tree.

Restoration planting will be designed to provide insect-rich foraging habitat, structural connectivity and future roost-tree characteristics. This will be subject to predator control (across all restoration areas and the SNA remnant), with defined establishment, canopy cover, survival, weed control and maintenance performance standards set out in the Wetland Management and Enhancement Plan.

Recognising the establishment lag before new planting provides habitat function equivalent to that being lost, restoration planting should commence as soon as possible and be completed at the same time as construction of the first stage of the development.

Restoration of this quantum was assessed to enhance overall biodiversity values at the site over time, improving the quality of fauna habitat including bat foraging habitat available at the site.

5.5. Riparian habitat restoration

Riparian habitat restoration is proposed along the entire length of the retained watercourse and pond systems, over a length of approximately 860 m. This will restore riparian habitat quality for the watercourse and ponds through weed control, predator control, and indigenous plantings.

Loss of the pond's riparian habitat will be replaced through the extensive wetland and riparian margin restoration proposed. The open water habitat around the retained ponds will also be restored, leading to additional habitat improvement.

The restoration efforts are expected to enhance overall aquatic biodiversity values at the site over time, through an increase in habitat quality across the entire site.

5.6. Open water habitat re-creation

The open water habitat will be replaced through habitat creation within one of the stormwater ponds (SW Pond B, Appendix G). This stormwater pond (c. 2,500 m^2) will be connected to the groundwater as well as the watercourse (allowing fish passage) and contain water permanently, with flow directed through the pond via a mainstream 300mm culvert, maintaining natural flows up to a 2-year flood event. A second high flow bypass culvert will direct flows above the 2-year event towards the pond to a splitter MH (1200mm culvert). At this MH a small outlet pipe will direct base line flows to the wetland, with the high bypass flows directed back to the existing watercourse. The exit culvert will be a 3 m wide, 1 m high box culvert, using either a baseless box culvert to minimise impact on the existing stream, or a similar sized (flow) arch culvert.

A V-type cutout will be included in the side of the first pond (past the forebay) to allow overflow from the pond to the existing watercourse and therefore allow for fish (eel) passage.

The pond will not be lined, and will be enhanced with habitat features such as logs, snags and rocks to create additional fish habitat to replace the lost pond system. Habitat features will in included in the

Deep Marsh areas (small logs) and Intermediate Deep Pond (Appendix G), across about half of the pond area.

5.7. Sediment and erosion control

Any locations left bare of vegetation should be stabilised in accordance with best practice erosion and sediment control methodologies (i.e., through the use of mulch and sediment control fencing).

Following vegetation removal, bare areas not within the development footprint should be replanted or re-seeded with grass as soon as possible within the planting season to reduce erosion and increased sedimentation effects.

5.8. Residual effects

The measures described in Sections 5.1 to 5.7 reflect the application of avoidance, minimisation and remediation in accordance with the effects management hierarchy. The avoidance of key habitat features, creation of setbacks and buffers, and habitat restoration including weed and predator control is expected to adequately address the adverse effects of disturbance and habitat loss once fully implemented.

The proposed wetland, terrestrial and riparian restoration and predator control described above is not assumed to achieve 'no net loss' in the formal biodiversity offsetting framework, but is designed to adequately address the anticipated habitat loss and effects associated with residential development.

For bat roost habitat creation, artificial roosts may be installed as a short-term supporting measure but should not be relied upon as an equivalent long-term replacement for mature potential-roost trees. Long-term replacement of roosting habitat will instead rely on the planting and protection in perpetuity of suitable large trees within the restoration areas, together with predator control.

Following implementation of all avoidance and effects management measures, including habitat restoration, no residual effects are expected associated with the proposal.

6. Conclusion

Existing vegetation cover at the site includes open, currently grazed pastureland, a residential dwelling and associated garden landscape, exotic individual specimen trees, several wetland areas, and a kahikatea remnant that has been identified as a Waipā District Significant Natural Area (SNA, ID WP312).

The project proposal involves the construction of a senior living development featuring stand-alone villas and duplexes, a community hub and a care home over an area of approximately 25 ha, to be completed in several stages. Associated roading and stormwater infrastructure are also proposed. The works will involve the loss of one small wetland (33 m^2), the removal of two artificial ponds and upgrading of existing culverts. Large-scale restoration of several wetlands and terrestrial habitat over 16,000 m^2 is also proposed as part of the development, alongside riparian planting along the entire length of the retained watercourse.

The kahikatea fragment present at the site is of very high ecological value, and the site is utilised by long-tailed bats, predominantly around the forest remnant. While wetlands even in a degraded state

have value associated with the functions they perform, including habitat provision, nutrient filtration and flood control, the remaining ecological features present at the site are highly modified, impacted by modification for agricultural land use and of limited species diversity, with low indigenous flora and fauna values. The overall ecological value of the vegetation and terrestrial habitat at the site is assessed to be **high**.

In general terms, habitat loss and modification associated with the proposed earthworks and establishment of residential housing, roading and stormwater infrastructure has the potential to create a range of adverse effects on biodiversity values, during construction (resulting from direct physical disturbance), and on an ongoing basis due to the permanent modification of the character of the site. These potential adverse effects on wetland and aquatic values during and after construction may include:

- Loss, fragmentation or degradation of terrestrial fauna and wetland habitat;
- Increased urbanisation leading to disturbance of long-tailed bats;
- Harm or disturbance to fauna species during vegetation clearance and earthworks;
- Increased sedimentation or contamination of receiving aquatic environments; and
- Proliferation of pest plant species following earthworks.

Overall, the effects of the development as proposed are assessed to result in a **Low** magnitude of effect given the proposed measures to minimise direct effects, minimise lighting effects, restoration planting, current habitat and the context of the existing environment.

The overall ecological effect following implementation of all effects management measures, including wide-scale restoration and predator control, was therefore assessed to be **Low**.

Recommendations to minimise effects include adoption of protocols to manage direct effects on wildlife during earthworks, vegetation removal and in-stream works; minimisation of lighting effects, restoration planting; and sediment and erosion control. These are captured in the Ecological Management Plan, the Lizard Management Plan, and the Wetland Management and Enhancement Plan.

This proposed restoration is expected to adequately address the loss of the small wetland area (33 m^2), and the loss of potential bat foraging habitat (when combined with lighting controls and buffers detailed in Section 5.2), as well as bird and lizard habitat. The loss of the pond system and riparian habitat is addressed through the proposed habitat creation within stormwater pond B, and riparian restoration along the length of the watercourse and retained pond system.

The kahikatea fragment will be fenced from stock access, and enhancement planting with indigenous is proposed within, and within the vicinity, of the SNA. Predator and weed plant control will also be implemented across all restoration areas and the SNA. Extensive restoration planting is proposed to retain key habitat areas, restore degraded wetlands, recreate lost terrestrial and aquatic habitat, and preserve the key fauna corridor at the site. These measures are expected to enhance the existing ecological values of this area and lead to overall good ecological restoration outcomes.

If recommendations made above are adopted, the proposed effects management and restoration measures will enhance overall biodiversity values at the site, improving the quality of fauna habitat including bat foraging habitat available at the site.



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Appendix A: Masterplan



Appendix B: Site photos

Wetlands



WL2



WL5



WL6



WL7



WL8



WL9



WL11



WL12



WL13



ADWL1



ADWL2



ADWL3





SNA remnant WP312





Potential lizard habitat examples



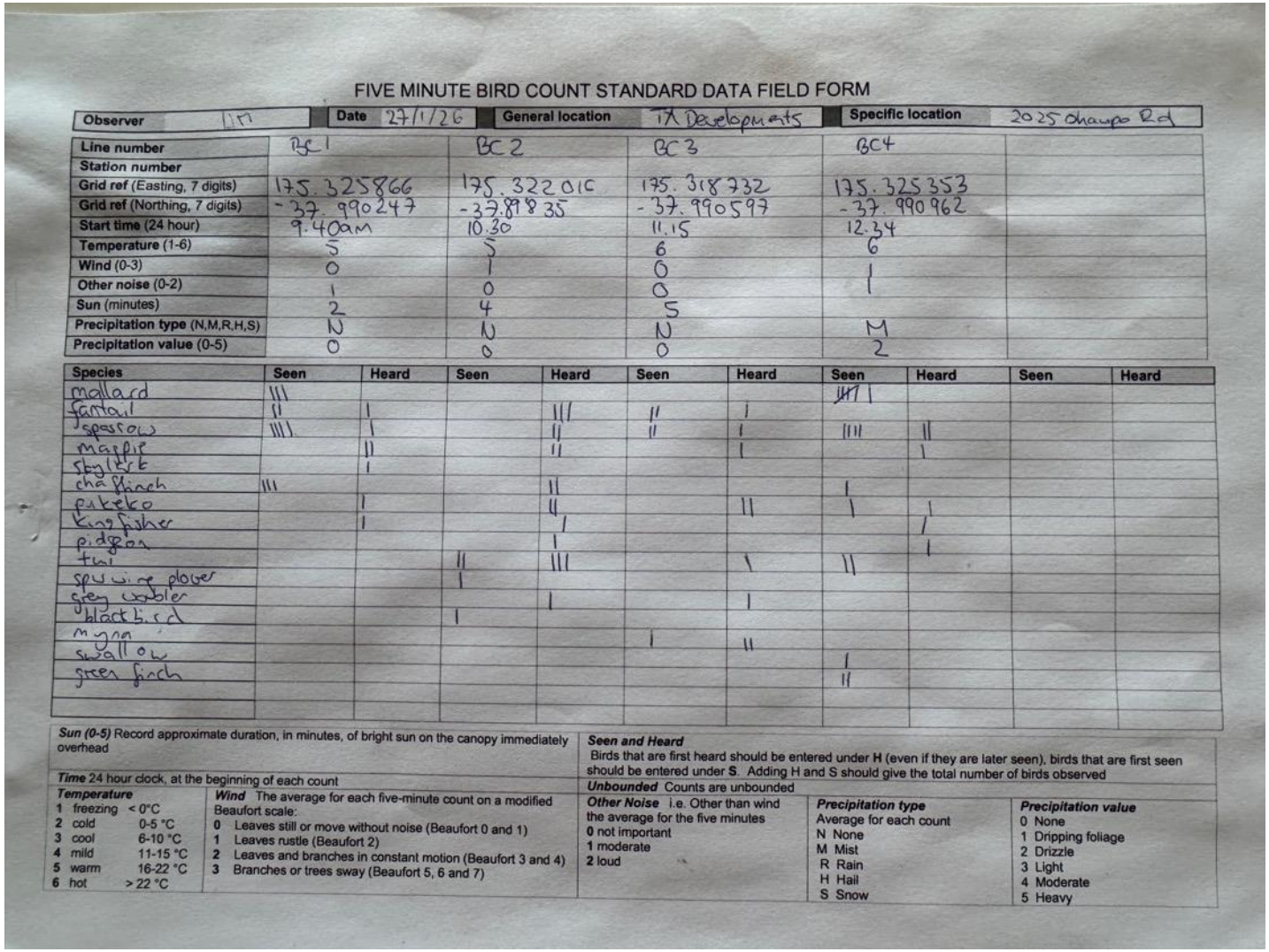


Watercourse

Appendix C: Waikato Regional Policy Statement: 11A Criteria for determining significance of indigenous biodiversity

Previously assessed site	
1	It is indigenous vegetation or habitat for indigenous fauna that is currently, or is recommended to be, set aside by statute or covenant or by the Nature Heritage Fund, or Ngā Whenua Rāhui committees, or the Queen Elizabeth the Second National Trust Board of Directors, specifically for the protection of biodiversity, and meets at least one of criteria 3-11.
Ecological values	
2	In the Coastal Marine Area, it is indigenous vegetation or habitat for indigenous fauna that has reduced in extent or degraded due to historic or present anthropogenic activity to a level where the ecological sustainability of the ecosystem is threatened.
3	It is vegetation or habitat that is currently habitat for indigenous species or associations of indigenous species that are: • classed as threatened or at risk, or • endemic to the Waikato Region, or • at the limit of their natural range.
4	It is indigenous vegetation, habitat or ecosystem type that is under-represented (20% or less of its known or likely original extent remaining) in an Ecological District, or Ecological Region, or nationally.
5	It is indigenous vegetation or habitat that is, and prior to human settlement was, nationally uncommon such as geothermal, chenier plain, or karst ecosystems, hydrothermal vents or cold seeps.
6	It is wetland habitat for indigenous plant communities and/or indigenous fauna communities (excluding exotic rush/pasture communities) that has not been created and subsequently maintained for or in connection with: • waste treatment; • wastewater renovation; • hydro electric power lakes (excluding Lake Taupō); • water storage for irrigation; or • water supply storage; unless in those instances they meet the criteria in Whaley et al. (1995).
7	It is an area of indigenous vegetation or naturally occurring habitat that is large relative to other examples in the Waikato region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type. Note this criterion is not intended to select the largest example only in the Waikato region of any habitat type.
8	It is aquatic habitat (excluding artificial water bodies, except for those created for the maintenance and enhancement of biodiversity or as mitigation as part of a consented activity) that is within a stream, river, lake, groundwater system, wetland, intertidal mudflat or estuary, or any other part of the coastal marine area and their margins, that is critical to the self -sustainability of an indigenous species within a catchment of the Waikato region, or within the coastal marine area. In this context "critical" means essential for a specific component of the life cycle and includes breeding and spawning grounds, juvenile nursery areas, important feeding areas and migratory and dispersal pathways of an indigenous species. This includes areas that maintain connectivity between habitats.
9	It is an area of indigenous vegetation or habitat that is a healthy and representative example of its type because: • its structure, composition, and ecological processes are largely intact; and • if protected from the adverse effects of plant and animal pests and of adjacent land and water use (e.g. stock, discharges, erosion, sediment disturbance), can maintain its ecological sustainability over time.
10	It is an area of indigenous vegetation or habitat that forms part of an ecological sequence, that is either not common in the Waikato region or an ecological district, or is an exceptional, representative example of its type.
Role in protecting ecologically significant area	
11	It is an area of indigenous vegetation or habitat for indigenous species (which habitat is either naturally occurring or has been established as a mitigation measure) that forms, either on its own or in combination with other similar areas, an ecological buffer, linkage or corridor and which is necessary to protect any site identified as significant under criteria 1-10 from external adverse effects.

Appendix D: Five-minute bird counts



FIVE MINUTE BIRD COUNT STANDARD DATA FIELD FORM

Observer	LT	Date	27/1/26	General location	IX Developments	Specific location	2025 Ohaupo Rd

Line number	BC1	BC2	BC3	BC4
Station number				
Grid ref (Easting, 7 digits)	175.325866	175.322010	175.318732	175.325353
Grid ref (Northing, 7 digits)	-37.990247	-37.988835	-37.990597	-37.990962
Start time (24 hour)	9.40am	10.30	11.15	12.34
Temperature (1-6)	5	5	6	6
Wind (0-3)	0	1	0	1
Other noise (0-2)	1	0	0	1
Sun (minutes)	2	4	5	
Precipitation type (N,M,R,H,S)	N	N	N	M
Precipitation value (0-5)	0	0	0	2

Species	Seen	Heard	Seen	Heard	Seen	Heard	Seen	Heard	Seen	Heard
mallard	III						IIII I			
fantail	II	I		III	II	I				
sparrow	IIII	I		II	II	I	IIII	II		
magpie		II		II		I		I		
skylark		I								
chaffinch	III			II			I			
pukeko		I		II		II	I	I		
kingfisher		I		I				I		
pidgeon				I				I		
tui			II	III		I	II			
spur wing plover			I							
grey warbler				I		I				
blackbird			I							
myna					I	II				
swallow							I			
green finch							II			

Sun (0-5) Record approximate duration, in minutes, of bright sun on the canopy immediately overhead

Time 24 hour clock, at the beginning of each count

Temperature
1 freezing < 0°C
2 cold 0-5 °C
3 cool 6-10 °C
4 mild 11-15 °C
5 warm 16-22 °C
6 hot > 22 °C

Wind The average for each five-minute count on a modified Beaufort scale:
0 Leaves still or move without noise (Beaufort 0 and 1)
1 Leaves rustle (Beaufort 2)
2 Leaves and branches in constant motion (Beaufort 3 and 4)
3 Branches or trees sway (Beaufort 5, 6 and 7)

Seen and Heard
Birds that are first heard should be entered under **H** (even if they are later seen), birds that are first seen should be entered under **S**. Adding H and S should give the total number of birds observed

Unbounded Counts are unbounded

Other Noise i.e. Other than wind the average for the five minutes
0 not important
1 moderate
2 loud

Precipitation type
Average for each count
N None
M Mist
R Rain
H Hail
S Snow

Precipitation value
0 None
1 Dripping foliage
2 Drizzle
3 Light
4 Moderate
5 Heavy

Appendix E: Weather conditions during bat monitoring

Weather conditions during the monitoring period were assessed using data obtained from the nearest NIWA weather station (41389). Minimum night-time temperatures recorded during the survey period ranged from 6.5 °C. Wind speeds recorded during dusk–dawn periods ranged to a maximum of 5.23 m/s (approximately 18.8 km/h).

Bat survey conditions are generally considered suitable when night-time temperatures exceed approximately 8 °C, wind speeds remain below 20 km/h, and rainfall is minimal (Borkin & Parsons 2010; Bat Conservation Trust 2016; O'Donnell et al. 2023). These conditions reflect the environmental thresholds under which long-tailed bats are most likely to be active and detectable during acoustic surveys.

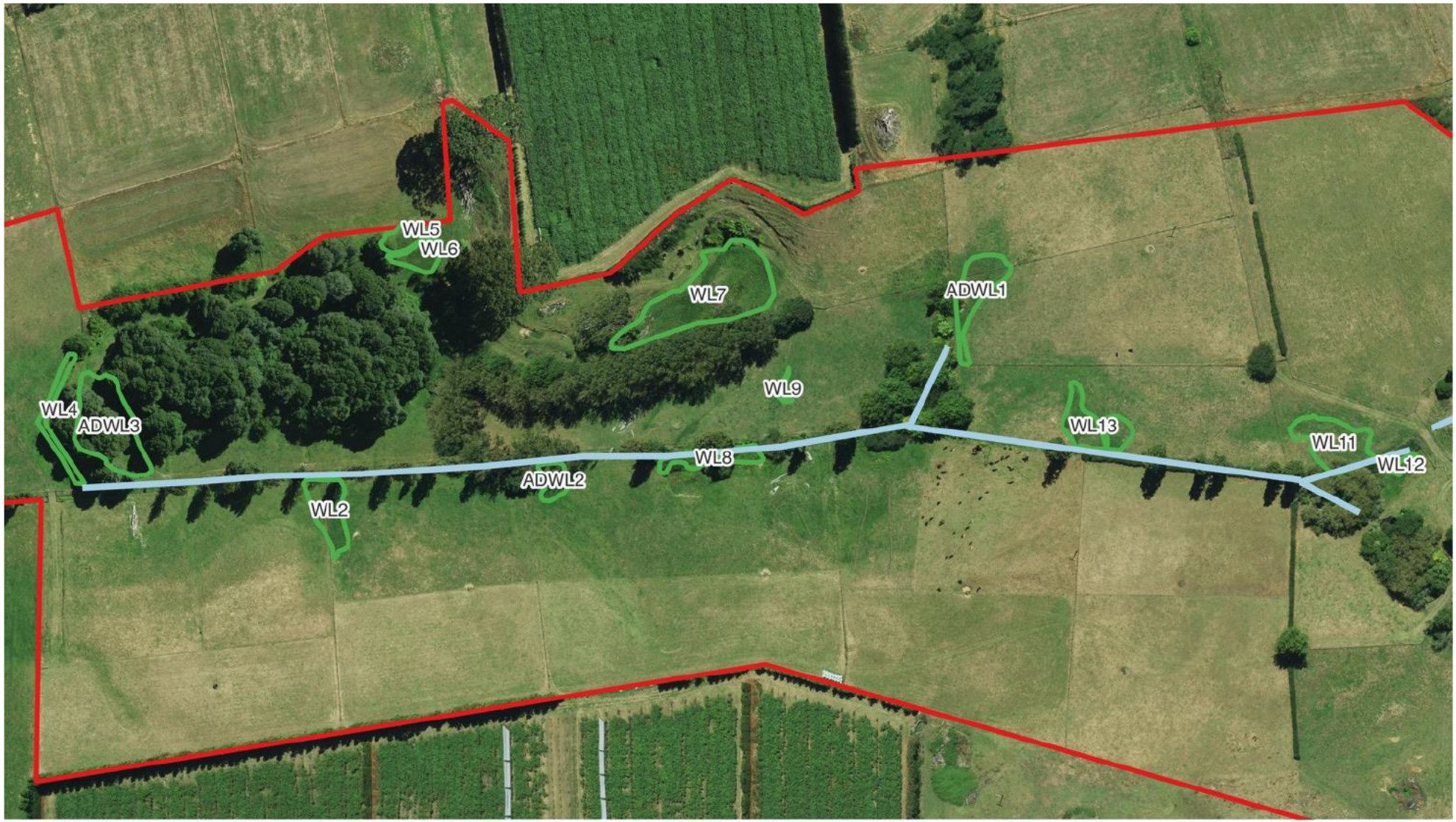
Based on these criteria, wind conditions during the monitoring period were generally within acceptable limits for bat activity. However, a small number of nights experienced minimum temperatures below the preferred threshold for bat surveys. Lower temperatures can reduce bat activity levels and may therefore influence detection rates during acoustic monitoring.

Automated bat detectors were deployed for approximately 25 nights, exceeding the typical 12–15 nights recommended for acoustic monitoring programmes (Bat Recovery Group 2025). This extended monitoring period increases the likelihood that suitable conditions for bat activity were captured and improves confidence in detecting bats where present.

Minimum night-time temperature (°C) and maximum wind speed (m/s) recorded between dusk and dawn during the bat monitoring period (27 January–21 February 2026) at the nearest NIWA weather station (41389).

Date	Min Temp (°C)	Max Wind (m/s)	Max Rain (mm/h)
27 Jan	14.8	2.30	0
28 Jan	11.7	1.94	0
29 Jan	11.2	3.62	0
30 Jan	11.5	3.94	0
31 Jan	13.3	3.92	0
1 Feb	9.6	2.33	0
2 Feb	12.6	3.71	0
3 Feb	16.1	3.42	0
4 Feb	15.8	2.52	0
5 Feb	12.8	4.15	0
6 Feb	12.3	4.17	0
7 Feb	10.3	4.33	0
8 Feb	15.7	4.37	0
9 Feb	14.0	3.69	0
10 Feb	16.5	3.08	0
11 Feb	14.4	3.78	0

Appendix F: Enlarged site maps



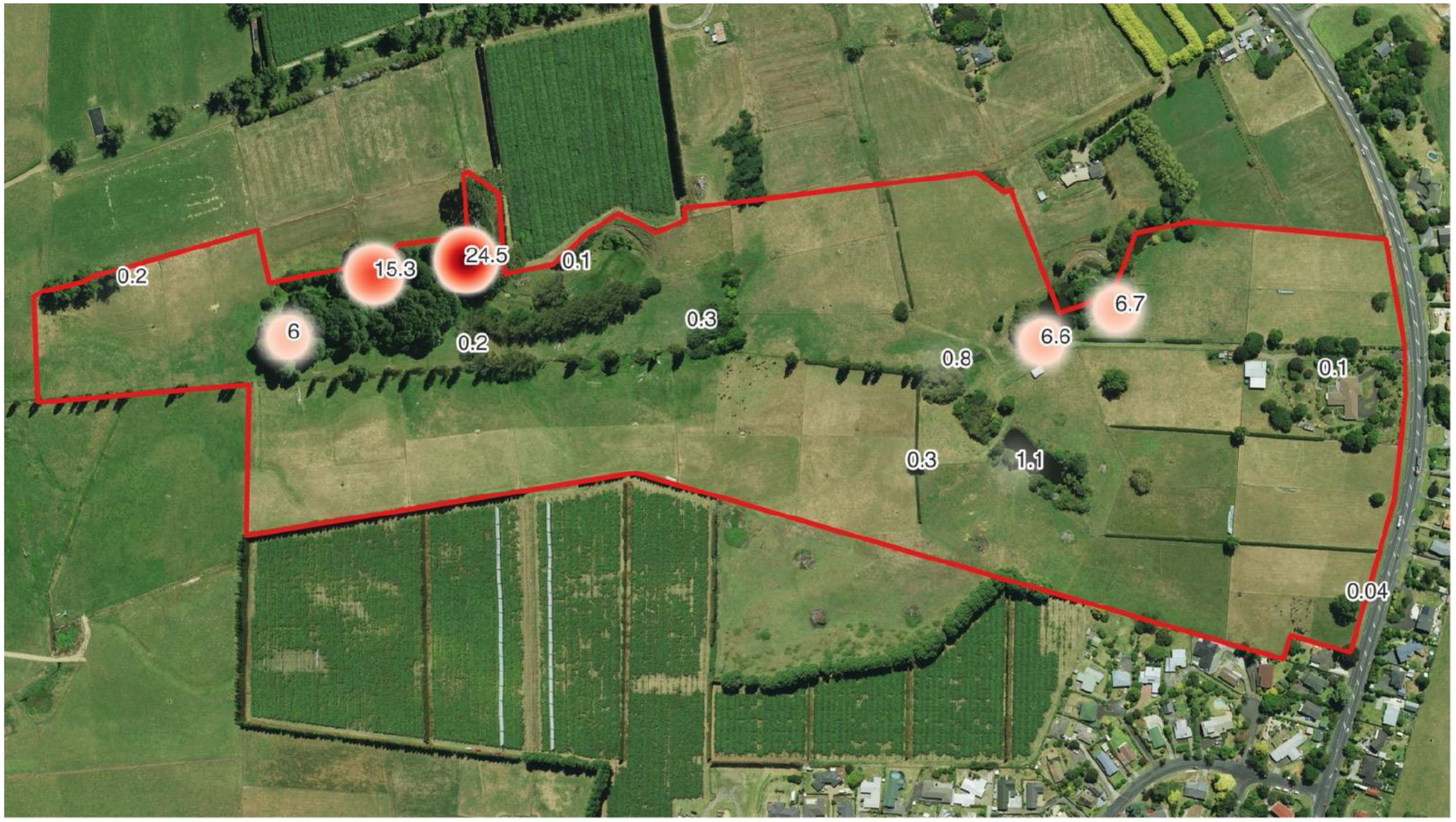
PHOENIX ECOLOGY
SUSTAINABLE LAND + WATER

Date: 11/03/2026
Client: TA Developments Ltd
Project: Te Awamutu Retirement Village - Ecological assessment
Code: 01.029

0 100 200 m

Legend
Revised wetland areas
Property boundary

Data sourced from LINZ and is licenced for reuse under the Creative Commons Attribution 4.0 International



PHOENIX ECOLOGY
SUSTAINABLE LAND + WATER

Date: 12/03/2026
Client: TA Developments Ltd
Project: Te Awamutu Retirement Village - Ecological assessment
Code: 01.029

Legend
Property boundary

0 200 400 m

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PHOENIX ECOLOGY
SUSTAINABLE LAND + WATER

Date: 02/09/2026
Client: TA Developments Ltd
Project: Te Awamutu Retirement Village - Ecological assessment
Code: 01.029

0 100 200 m

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Legend

Restoration areas
- Terrestrial
- Wetland
- Infill
- Riparian

- Revised wetland areas
- Property boundary



PHOENIX ECOLOGY
SUSTAINABLE LAND + WATER

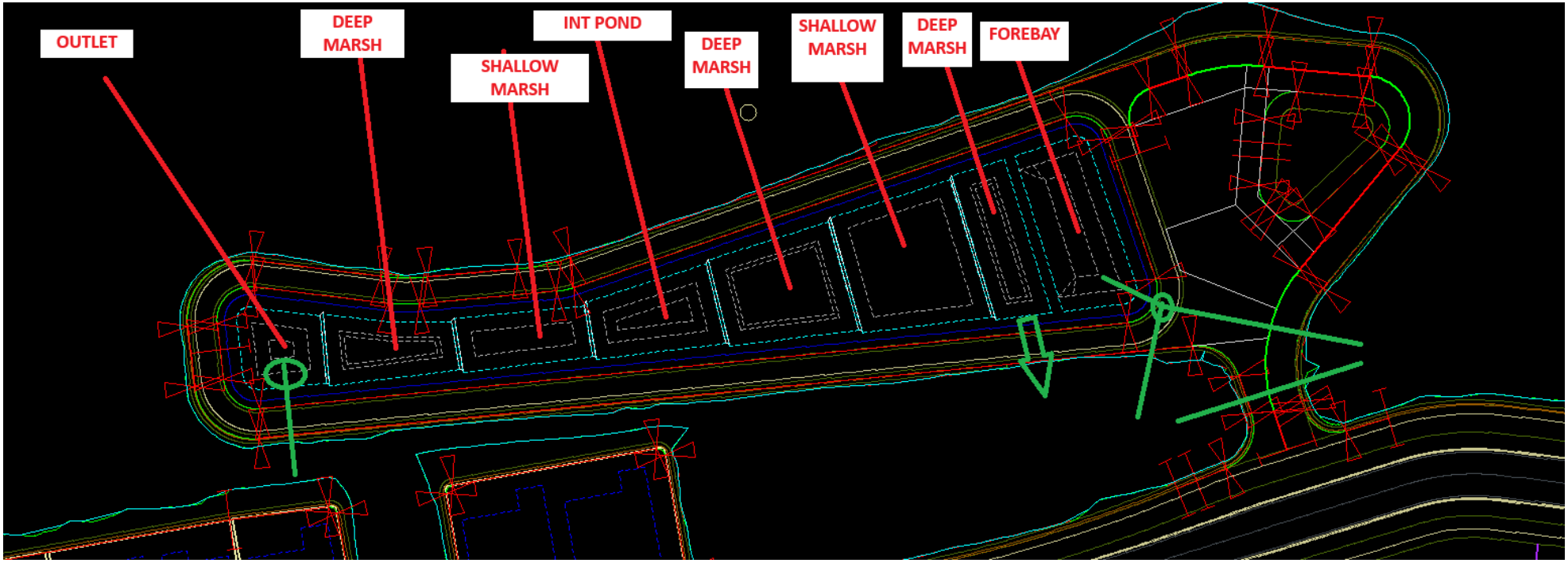
Date: 23/06/2026
Client: TA Developments Ltd
Project: Te Awamutu Retirement Village - Ecological assessment
Code: 01.029

0 100 200 m

Legend
- Vegetation to be removed
- Vegetation to be retained
- Property boundary

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Appendix G: Stormwater Pond B Schematic Plan



Appendix H: Lighting control setbacks

