Appendix 15a – Draft Ecological Management Plan



Te Awamutu Senior Living Project
Ecological Management Plan

Prepared for:
Te Awamutu Developments Ltd

Prepared by:
Phoenix Ecology Ltd

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Executive Summary

Phoenix Ecology Ltd has been contracted by Te Awamutu Developments Ltd to prepare an Ecological Management Plan (EMP) to guide the management of potential adverse effects on bats, birds and fish during vegetation clearance and earthworks, including within waterways, required for the proposed development of a senior living development at 2025 Ōhaupō Road, Te Awamutu ('the site').

This EMP was prepared as a draft to support an application through the Fast Track Approvals Act 2024 (FTAA) and is informed by findings of the ecological impact assessment report (Phoenix Ecology 2026), which assessed potential adverse effects on terrestrial and aquatic ecology values and made high-level recommendations to avoid, minimise or remedy these effects. This EMP should be read in conjunction with the Lizard Management Plan (LMP) for managing effects on lizards, and the Wetland Management and Enhancement Plan (WMEP) detailing restoration efforts including planting and predator control proposed across the site.

This EMP outlines measures for management of bats, birds and fish during vegetation clearance, earthworks and works within ponds and watercourses required for the project construction. It includes discussion of ecological values and habitats at the site, a summary of potential adverse ecological effects, and implementation of best practice ecological management of effects through a Bat Management Plan, including retention and replacement of cavity-bearing trees for bat roosting, a Bird Management Plan, including nest checks across all vegetation suitable for nesting bird species, and an Indigenous Fish Management Plan, each outlining measures to avoid injury and mortality during vegetation removal or instream works, and effects management measures to minimise indirect effects and habitat loss. Adaptive management measures are outlined where required, and monitoring and reporting requirements are detailed for each domain.

The project and habitat description and overview of effects, including maps, are based on the ecological impact assessment report. Management measures are also based on recommendations in the report, a habitat assessment conducted on site, and best management practice for fauna management.

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1. Introduction

1.1. Background and purpose

Phoenix Ecology Ltd have been contracted by Te Awamutu Developments Ltd to prepare an Ecological Management Plan (EMP) to guide the management of potential adverse effects on bats, birds and fish during vegetation clearance and earthworks, including within waterways, required 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.

This EMP was prepared as a draft to support an application through the Fast Track Approvals Act 2024 (FTAA) and is informed by findings of the ecological impact assessment report[1], which assessed potential adverse effects on terrestrial and aquatic ecology values, and made high-level recommendations to avoid, minimise or remedy these effects. This EMP should be read in conjunction with the Lizard Management Plan (LMP)[2] for managing effects on lizards, and the Wetland Management and Enhancement Plan (WMEP)[3] detailing restoration efforts including planting and predator control proposed across the site.

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. Restoration of several wetlands and terrestrial habitat over an area of approximately 16,000 m^2 is also proposed as part of the development.

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[1] Phoenix Ecology 2026. Te Awamutu Senior Living Project. Ecological Assessment Report. Prepared for Te Awamutu Developments Ltd, by Phoenix Ecology Ltd.
[2] Phoenix Ecology 2026. Te Awamutu Senior Living Project. Lizard Management Plan. Prepared for Te Awamutu Developments Ltd, by Phoenix Ecology Ltd. Prepared separately to support a Wildlife Act Authority application to salvage and relocate lizards.
[3] Phoenix Ecology 2026. Te Awamutu Senior Living Project. Wetland Management and Enhancement Plan. Prepared for Te Awamutu Developments Ltd, by Phoenix Ecology Ltd.

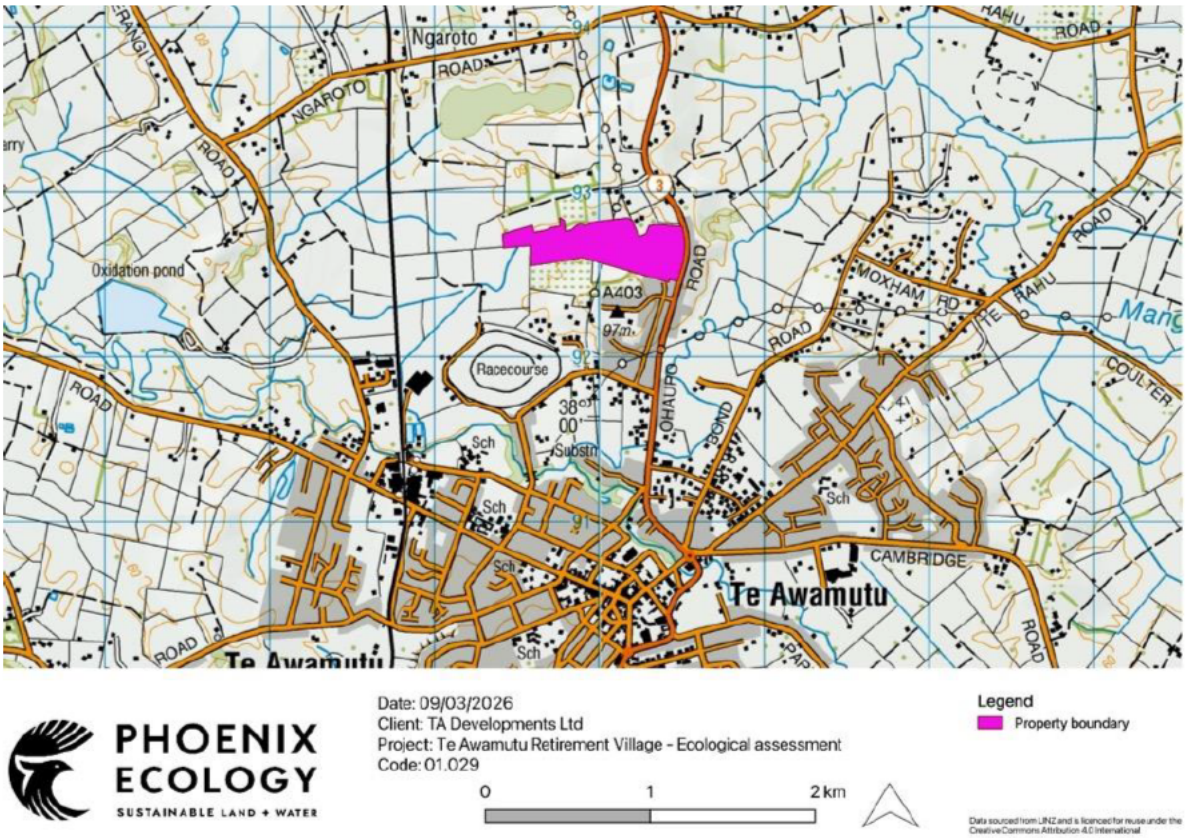


Figure 1 Site location

This EMP outlines measures for management of bats, birds and fish during vegetation clearance, earthworks and works within ponds and watercourses required for the project construction. The EMP includes the following aspects:

- Discussion of ecological values and habitats at the site;
- Summary of potential adverse ecological effects;
- Implementation of best practice ecological management of effects through:
    - Bat Management Plan outlining measures to avoid injury and mortality to bats during vegetation removal, and effects management measures to minimise indirect effects and habitat loss;
    - Bird Management Plan outlining measures to avoid injury and mortality to birds during vegetation removal, and effects management measures to minimise indirect effects and habitat loss;
    - Indigenous Fish Management Plan outlining measures to avoid injury and mortality to fish during instream works, and effects management measures to minimise indirect effects and habitat loss.
- Outline of adaptive management measures where required; and
- Detail of monitoring and reporting requirements;

The project and habitat description and overview of effects, including maps, are based on the ecological impact assessment report. Management measures are also based on recommendations in the report, a habitat assessment conducted on site, and best management practice for fauna management.

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1.2. 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).

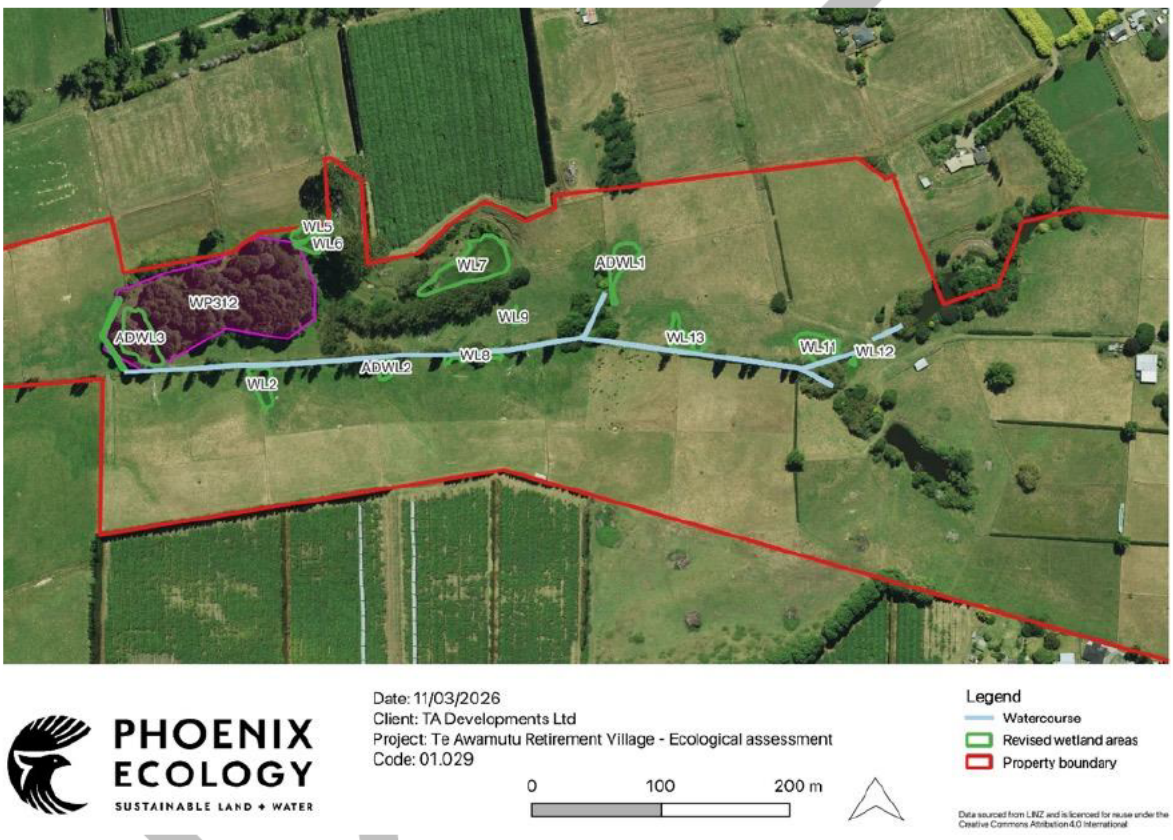


Figure 2 Ecological features at the site

1.3. Regulatory context

1.3.1. Resource Management Act (RMA, 1991)

The RMA regulates the management and use of natural resources in New Zealand. The Act requires the assessment of potential environmental impacts for certain activities through processes such as environmental impact assessments and the consideration of effects on the environment.

Important elements of this are the maintenance of indigenous biodiversity and protection of significant indigenous vegetation and habitats (section 6c RMA). Ecological management plans are required to direct the management of potential adverse effects on ecosystems, fauna and habitat values.

1.3.2. Fast Track Approvals Act (FTAA, 2024)

This EMP was prepared in line with the intent of the FTAA framework to identify, protect, manage, and enhance the ecological values potentially affected by the proposed development. It aims to ensure that ecological protection and management measures are integrated into the project, from the design phase to construction and operation.

The EMP outlines best-practice approaches to avoid, remedy or mitigate any expected adverse effects on indigenous fauna and biodiversity, including habitats of threatened species, and ecological features identified in the ecological impact assessment.

1.3.3. Wildlife Act (WA, 1953)

The Wildlife Act provides statutory protection for and directs the management of indigenous fauna species, excluding those species listed in Schedules 1 to 5. This involves safeguarding them from harm, disturbance, or exploitation. The WA does not specifically extend to the protection of the habitat which supports these species.

2. Ecological context

2.1. Habitat and monitoring

2.1.1. Bats

The site is a modified pastoral landscape, with most value concentrated in the kahikatea remnant (SNA), which offers long-tailed bat roosting potential via cavities and loose bark and will be retained and protected as part of the proposal. Open pasture with scattered trees provide limited bat habitat value. Watercourses, wetlands and ponds support foraging habitat by supporting increased concentrations of flying insects and associated riparian vegetation provides both commuting and foraging corridors.

During monitoring, bat calls were recorded across the site, with activity concentrated near waterways and vegetation edges and lower in open pasture (Figure 3). Detection frequency was spatially variable across nights. Results confirmed active, ongoing use of the site by long-tailed bats during summer monitoring. Habitat values are tied to waterways, riparian vegetation, scattered mature trees and the kahikatea remnant rather than the pasture matrix. Acoustic data cannot confirm exact roost locations, but consistent multi-location detections indicate roosts likely occur in the surrounding landscape.

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Figure 3 Bat monitoring results

2.1.2. 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.

2.1.3. Fish

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 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.

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2.2. Potential effects on fauna

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 terrestrial and aquatic habitat 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.

2.2.1. 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. Culverts will be upgraded but placed in existing locations, leading to no effective stream loss.

An artificial pond system will be infilled and lost upstream of the watercourse. 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).

Approximately 10,400 m^2 of exotic vegetation that offers suitable bat foraging, where mature exotic trees exist, potential roosting habitat, will be removed, containing a total of 103 potential bat roost trees (Appendix E). Approximately 28,800 m^2 of indigenous and exotic vegetation will be retained, and approximately 16,000 m^2 of restoration planting of wetland and terrestrial habitat will create additional foraging and roosting habitat, and increase the quality of habitat currently available. An additional 8,600 m^2 of infill riparian planting along the entirety of the retained watercourse and pond system will also be implemented.

Replacement of wetland, riparian and fauna habitat loss is proposed through extensive restoration and habitat enhancement as discussed in Section 1.1 and detailed in the WMEP, and an indicative plan of restoration areas is shown in Figure 4. Open water habitat provided by the artificial ponds that will be removed will be recreated within SW Pond B (Figure 4).

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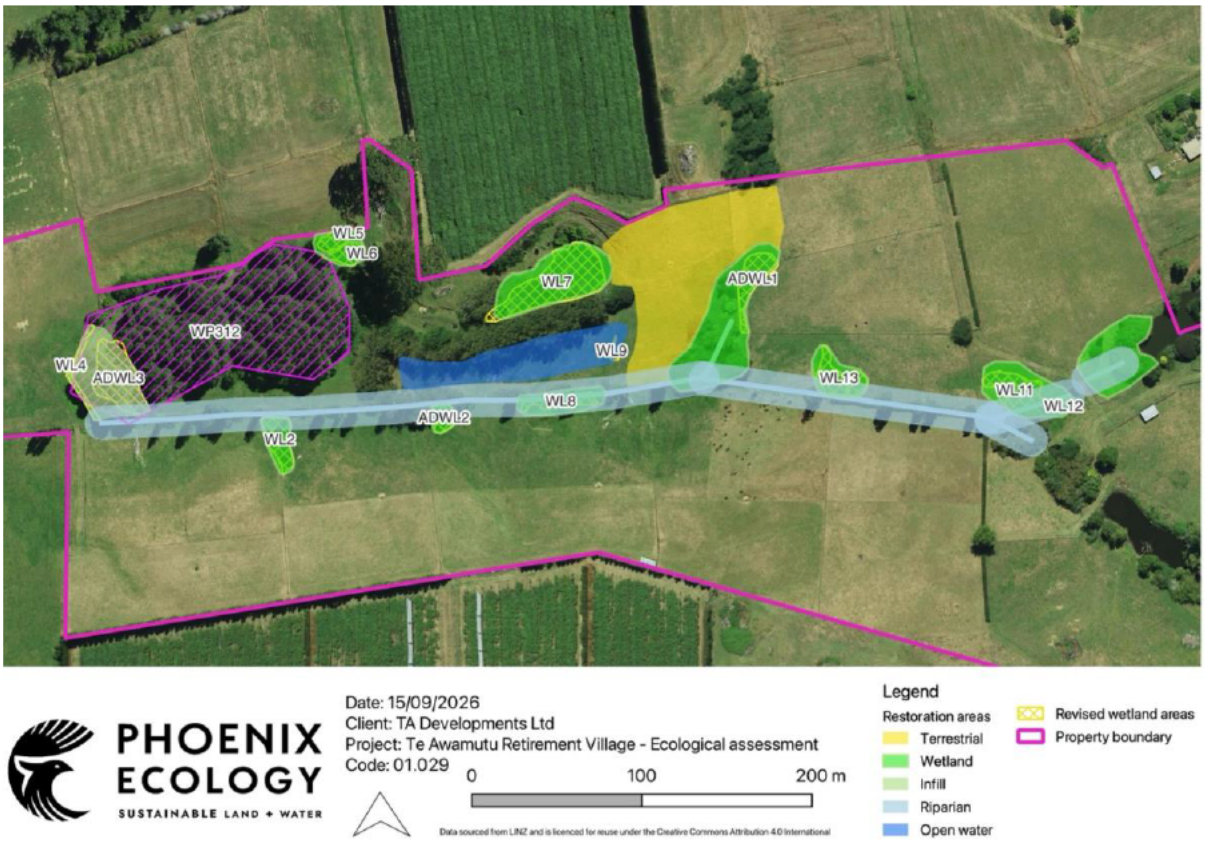


Figure 4 Indicative restoration areas – WL9 is proposed to be removed

2.2.2. 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 and linked key habitat features that will be retained and restored.

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 (Appendix B) function to provide additional buffering of these effects.

2.2.3. Disturbance to wildlife during construction

Proposed earthworks and vegetation removal across the site have the potential for direct 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, and any nesting birds that may be present within the wetlands and riparian vegetation of the ponds.

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2.2.4. 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.

2.2.5. 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, are included in the WMEP.

2.3. Opportunities to avoid adverse effects

Vegetation to be removed and vegetation to be retained is presented in Figure 5. While approximately 10,400 m^2 of exotic vegetation will be removed, 28,800 m^2 of indigenous and exotic vegetation will be retained, all of which provides potential lizard habitat, with the kahikatea fragment providing high quality habitat.

The original project proposal involved the removal and redirection of approximately 250 m of watercourse adjacent to the kahikatea remnant for stormwater plans. Removal of associated riparian habitat was also originally proposed. Both riparian and instream habitat will now be avoided and retained.

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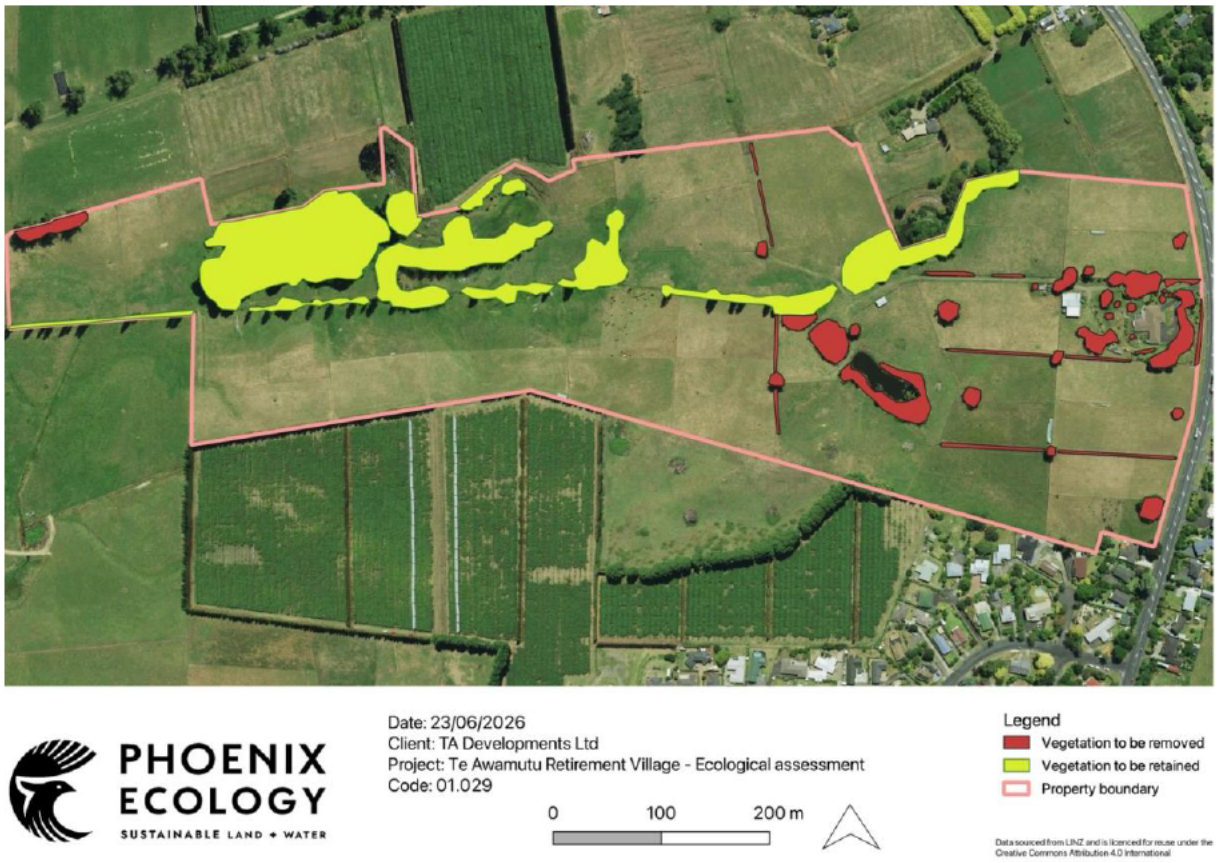


Figure 5 Vegetation to be removed and retained

2.4. Effects management measures

Effects management measures proposed in this plan are steps to minimise direct adverse effects on local bat, bird and fish populations through the implementation of respective fauna management protocols to avoid direct harm to any present indigenous fauna species in the area of the works footprint. Additional effects management measures through habitat replacement, predator control and restoration efforts are detailed in the WMEP.

Management of lizards is detailed in the Lizard Management Plan (LMP).

Management steps to avoid direct effects (i.e. mortality or injury) during vegetation removal and earthworks include the following aspects:

- Implementation of Bat Roost Protocols during removal of vegetation with Potential Roost Features (PRF), including limb pruning, overseen by a DOC-competent Bat Ecologist, Section 3.3;
- Avoidance of vegetation and wetland clearance during the peak bird breeding season, with nest checks where avoidance is not practicable to be implemented across all vegetation suitable for nesting bird species, Section 4.1; and
- Capture and relocation of indigenous fish prior to instream earthworks or pond infilling, with work areas isolated to prevent re-entry and an accidental discovery protocol for fish found once works have begun, Section 5.1.

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2.5. Residual effects

No residual effects on bat, bird and fish populations and habitats are expected once all effects management measures outlined in this EMP and the WMEP have been implemented. This is reliant on effective and thorough implementation of fauna management protocols as outlined in this plan, and full implementation of the WMEP (covering habitat restoration and predator control), as detailed below.

3. Bat Management Plan

3.1. Overview

Bat management steps at the site will be overseen by a competent Bat Ecologist under the DOC bat competency scheme (Section 3.2). As stipulated by the DOC Bat Roost Protocols[4], the Bat Ecologist will identify all potential roost trees within the project footprint and will be present to survey and actively supervise the felling of all potential roost tree, to ensure compliance with the pre-felling protocols for bats.

3.2. Bat competencies and roles

A nominated and suitably qualified Project Bat Ecologist (PBE) will oversee the implementation of this BMP and the associated Bat Roost Protocols outlined in Appendix C. According to the Department of Conservation's (DOC) Bat Recovery Group, bat handling competencies authorisation (Version 1.4, September 2023) (Appendix D) is required. The Project Bat Ecologist must be certified as "Competent" in the following areas:

- Competency 2.1.1: Proficient in bagging, storage, handling, measuring, weighing, sexing, aging, temporary marking, and appropriate releasing of bats.
- Competencies 3.1, 3.2, 3.3: Proficient in high-risk activities, including roost felling.

All bat management advice, inputs, and on-site work will be conducted by the Project Bat Ecologist or another bat ecologist who holds the required competencies.

3.3. Bat Roost Protocols

DOC Bat Roost Protocols will be adopted during any necessary vegetation clearance of trees with a diameter at breast height (DBH) >15cm, and the pruning of any limbs that contain potential roosting features, to minimise the risk to bats during the removal of any potential roost trees on site. Broadly summarised, these protocols cover the following aspects implemented by the Bat Ecologist to determine whether or not bats are roosting in trees to be removed, within seasonal constraints[5]:

- Identification of any potential roost trees and roost features;
- Pre-felling acoustic monitoring surveys;
- Tree checking by a qualified arborist; and
- Tree observations (roost watches).

[4] Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols) Version 4: October 2024 approved by the New Zealand Department of Conservation's Bat Recovery Group

[5] 1 October to 30 April each year, with no felling during the winter months

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These main steps of the protocols cover the identification of any trees that contain potential roost features (PRF), pre-felling acoustic monitoring immediately prior to tree removal, roost watches, potential visual inspections of PRF by arborists supervised by the Bat Ecologist, and supervision of tree removal by the Bat Ecologist.

If bats are identified to be present in the tree during the pre-felling survey, then the tree shall not be disturbed or removed until further monitoring confirms that the bats have moved on from the roost and the roost is therefore empty of all bats.

If the tree is unoccupied and shows no evidence of roosting, it can be felled in accordance with the bat tree-felling protocols outlined in the DOC Bat Roost Protocols, and summarised below.

There are seasonal constraints directed by the protocols. No removal of trees containing PRF is to be conducted over winter, between 1 May and 30 September. Any acoustic monitoring or roost watches conducted are also to be completed on fine weather nights, with specific weather conditions contained in Step 4b, page 10 of the DOC protocols:

- Monitoring one hour before official sunset and end one hour after official sunrise.
- Temperature 8° C or greater for the first four hours after official sunset time for the North Island and 7° C for the South Island.
- Ideally no to very little precipitation within the first 4 hours after official sunset, although a light mist or occasional drizzle may be acceptable as assessed by an ecologist accredited with Competency 3.1.
- No to light wind within the first four hours after official sunset.

3.4. Protection of active roosts

If bats are confirmed to be roosting within any tree, the following roost protection provisions (a) – (f) shall be adhered to:

a) The immediate area shall be cordoned off with safety fencing and signage erected in a 10 m radius around the roost, alerting any person approaching the area that a bat roost is present and to stay clear.
b) All project staff shall be made aware of the presence of the roost. The Bat Ecologist shall determine whether any works or construction activity should be suspended or whether the activity can continue away from the roost.
c) The roost shall be monitored (acoustic or visual (emergence/return)) until bats no longer occupy the roost.
d) If the tree is a maternity roost tree removal works shall be scheduled to only occur within the period 1 March to 30 April inclusive.
e) The Bat Ecologist shall review whether it is possible to relocate the roost feature into an area that would remain of value to bats, for example, whether the hollow be kept and attached to another tree as a bat box or whether the tree could be relocated as standing dead timber to prevent the loss of the roost through careful repositioning.
f) If bats are still in the tree after fourteen nights, the Project Ecologist shall contact DOC and Waipā District Council to decide an appropriate way forward. Appropriate measures may include the use of one-way exclusion features, followed by sectional felling.

If it is identified that a tree proposed for removal contains an occupied roost, then consultation should also be undertaken with the Department of Conservation (DOC).

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3.5. Bat injury or mortality

Any living bat/s found during or after tree removal that are not able to fly away unassisted will be taken to a vet immediately for assessment. Bats will be placed in a clean, cool, dark cotton bag by a suitably qualified bat ecologist to ensure the animal is handled appropriately. Specific protocols for handling and transporting injured bat/s as outlined in Borkin[6] will be followed.

The initial contact vet is:

Dr Andrew Gore at Hamilton Zoo

Hamilton Zoo, Brymer Road, Hamilton. Telephone Number: 07 838 6720

The Site Supervisor and relevant representatives of DOC and Council, and Mana Whenua if not already engaged by DOC or Council, will be notified by the Bat Ecologist at the earliest opportunity within 24 hours after an injured or dead bat is found.

DOC Kirikiriroa / Hamilton Office – 0800 275 362

After Hours – 0800 DOCHOTline (0800 362 468)

In accordance with The Wildlife Act, it is required that any bat that is found dead or injured and subsequently euthanised to be returned to DOC. DOC Waikato District Office is located at 5 Northway Street, Te Rapa.

Bats assessed by the vet as uninjured will be transported back to site in the cotton bag and placed in an open, temporary artificial roost box suspended within a tree as close as possible to the site the animal was found, but outside of the project footprint. The roost box will be open to allow the animal to come and go as it chooses and will be placed within the tree prior to dusk on the same day the bat is found. Specific protocols for releasing long-tailed bats are outlined in Borkin (2019).[6]

3.6. Vegetation retention

Where possible within the project footprint, any standing dead or alive trees that do not need to be removed during vegetation clearance activities to enable works for construction of the development are to remain in situ, to minimise the removal of potential roosting habitat for bats. In particular, any vegetation adjacent to the SNA fragment should be retained, including riparian vegetation along the watercourse.

This should include avoiding the pruning of any limbs that contain Potential Roost Features, wherever this is not absolutely necessary. Damage to roots of any trees with PRF should also be avoided where earthworks are at risk of encroaching on tree root systems.

3.7. Minimisation of lighting effects

During establishment and construction of the development, where works during the night are necessary, no upward spilling lighting will be used for any works nearby the SNA area to avoid adverse effects on bats and limit possible disturbance.

All use of lighting will be minimised as far as practicable within Health and Safety requirements.

[6]Borkin, K. 2019. Initial veterinary care for New Zealand bats. Contract Report No. 4984 Wildlands Consultants

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Although the effects of particular lighting regimes are likely to be species-specific, artificial lighting can affect bat behaviour in several ways:

- Bat orientation and movements through the landscape may be compromised, leading to injury and mortality;
- Direct collisions and increased exposure to predation;
- Impacts on reproduction; reproductive cycles are mediated through light levels and illumination periods; and
- Feeding behaviour in species using darkness to avoid predators can be affected and light sensitive species may be deterred from normal commuting behaviours by increased artificial light levels.

In general terms, lighting effects will be minimised by retaining a spatial setback and planted buffers between development and the key habitat areas (the SNA remnant, watercourse, pond and restoration areas).

Artificial lighting in key habitat features 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 F):

- No lighting to be placed within the SNA remnant or restoration areas (key habitat areas);
- Use of shielding to avoid upward light spill (including on any street lighting adjacent to key habitat areas);
- Temperature of no more than 2700K 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.

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 4 and Appendix A).

3.8. Habitat replacement and restoration planting

Bat habitat restoration for the Site is covered as part of the wider restoration and planting programme, which is discussed in detail in the WMEP.

This plan covers restoration efforts including in-fill and buffer planting, predator control and protection in perpetuity of the SNA fragment. Part of the restoration infill planting will include tree species such as kahikatea that will, over time, become suitable for bat roosting.

Artificial bat roost boxes or artificial habitat creation (such as chainsaw hallows) within exotic trees can also be used as an interim measure to bridge the time between newly planted trees becoming suitable roosts. It is proposed that 50 new habitat features are created through a combination of artificial roost

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boxes and chainsaw hallows or plunge cuts. Artificial roost creation will be guided by DOC advice[7], placed within the retained vegetation, and subject to the installation of predator-exclusion bands and annual maintenance and monitoring.

In addition to planting, a predator control programme is also detailed in this plan, which is expected to benefit the local bat population through removal of predators and an increase in available insect food sources through the wetland enhancement process.

The restoration of approximately 16,000 m^2 of wetland and terrestrial habitat proposed is also expected to increase the availability and quality of bat foraging habitat, compared to what is currently present at the Site.

3.9. Site induction protocols

A site induction for all employees and contractors is required to inform personnel of the specific bat habitat constraints and requirements of the site. This should be completed prior to works commencing on the Site and a record of inductions kept.

Environmental aspects will be covered as part of the site induction, and during toolbox talks conducted prior to starting work within each area.

This induction should include, at a minimum:

- Vegetation removal and accidental bat discovery protocols.
- Procedures for the accidental discovery of long-tailed bats inside work areas.
- The importance of compliance with the protocols and the reporting processes for observed breaches of required potential bat roost protocols.
- Contact details for the Bat Ecologist, environmental compliance staff, and emergency numbers for any identified issues observed onsite.

3.10. Monitoring and Reporting

3.10.1. Incident monitoring and reporting during vegetation clearance

Refer to the bat roost protocols in Appendix C for monitoring and reporting requirements following findings of an active roost site or accidental death or injury to any bats found during vegetation clearance works.

3.10.2. Vegetation clearance monitoring

Following implementation of bat management steps outlined in Section 3.3, a report shall be prepared to confirm what vegetation removal was undertaken on site, and how the roost tree protocols stated in this Bat Management Plan were followed, alongside findings with respect to potential bat roost trees (trees containing PRF) and bat activity detected during bat management.

This report shall include:

[7] DOC 2025. New Zealand Bat Recovery Group Advice Note – The Use of Artificial Bat Roosts. (Or a more recent version of this document, if available).

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- Confirmation that vegetation removal operations were undertaken in accordance with the BMP protocols and relevant consent conditions;
- Details of work undertaken prior to removal of all potential roost trees under the requirements of the bat roost protocols, including the species, DBH, total number and GPS coordinates of trees containing PRF removed, a description of acoustic monitoring undertaken and details of results; and
- Recommendations for potential changes to improve the effectiveness of bat management in relation to the scope of this BMP, if required.
- The report will be submitted to Council within four weeks of completion of bat management steps relating to roost tree protocols being completed.

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4. Bird Management Plan

4.1. Overview

All adult birds are expected to fly away during vegetation removal activities and are therefore unlikely to be harmed. However, during breeding season there is the potential for direct harm to nests, eggs and chicks during vegetation clearance activities.

The key elements of proposed bird management are avoidance of key nesting season, where feasible, and searches of any key habitat areas for nests if vegetation removal occurs during key nesting season by a suitably qualified ecologist, and accidental discovery protocols.

A WAA is required to handle indigenous avifauna, whether injured or dead. Given the lack of high-quality bird habitat within the vegetation clearance footprint, and the presence of mostly common exotic bird species within the footprint, the presence of nesting indigenous birds within the clearance areas was assessed to be low, and no handling of indigenous fauna is expected to be required during the vegetation clearance. No 'At Risk' or 'Threatened' bird species were observed on site and are not expected to be affected by the proposed works.

4.2. Seasonal avoidance

Where practicable, vegetation clearance will be avoided during the key bird breeding season (September – February). Clearing vegetation outside the bird breeding season will require no specific management of birds.

4.3. Pre-clearance checks

If vegetation clearance must occur within the bird breeding season, the following measures will be implemented to minimise impacts on native bird nests, eggs and chicks:

- No more than five working days prior to vegetation clearance, a bird nest survey will be undertaken by a suitably qualified and experienced ecologist.
- If works cease for more than five consecutive working days, a further bird survey will be required before vegetation clearance continues.
- Where required, assistance from a climbing arborist and/ or drone will be used to identify bird nests, i.e., where trees are too tall or dense to properly assess from the ground.
- No more than five working days after determining no active nests were found, vegetation must be cleared/felled.
- If active nests are discovered, a 30 m clearly marked buffer will be established. The area is to be left undisturbed until nesting birds have been confirmed to have fledged, or nests determined to have been naturally abandoned by the ecologist.

4.4. Accidental discovery protocols

If any indigenous birds of a 'Threatened' or 'At Risk' status are found injured or dead during project construction, the following steps will be taken:

- Injured birds will be taken immediately to a DOC-approved veterinarian for assessment.
- The bird must be placed in a cool, dark, material-lined container (box or bag) by or under the guidance of the Project ecologist to ensure proper handling.

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- The local DOC office - or the DOC hotline if after hours - must be notified within two hours of discovering the bird.
    - DOC Kirikiriroa / Hamilton Office – 0800 275 362
    - After Hours – 0800 DOCHOTline (0800 362 468)

4.4.1. Discovery of nests

The following steps should be adhered to in the case of accidental discovery of nests of any indigenous birds of a 'Threatened' or 'At Risk' status:

- If eggs are found on the ground within the vegetation clearance or earthworks footprint, all works within 30 m of the nest are to stop immediately.
- The Project Ecologist should be notified immediately and the nest clearly marked (making sure markers are at least 10 m away from the nest).
- If possible, works are to be delayed until after the eggs have hatched, and chicks are able to be safely herded from the works site.
- Depending on the nature of the works (duration, disturbance level), weather, and the individual birds it may be possible to undertake some tasks near an active nest. This is to be decided in consultation with the Project Ecologist, and the Department of Conservation if required.
- If the nest is located in an area that will not be affected by any works, then the area can be cordoned off using tape and markers. The area should be at least 10 m x 10 m in size with the nest situated in the middle. It should be clearly signposted that no person or machine is to enter the marked-out site. No work is to occur within 50 m of the nest, unless it has been discussed with the Project Ecologist and approval given.

4.5. Site induction protocols

A site induction for all employees and contractors is required to inform personnel of the seasonal considerations, specific bird habitat constraints and requirements of the site. This should be completed prior to works commencing on the Site and a record of inductions kept.

This induction can either be stand-alone environmental induction (also outlining other fauna management measures) or integrated into the typical health and safety induction process.

This induction should include, at a minimum:

- Procedures for the accidental discovery of indigenous birds and nests in all vegetation clearance and earthworks areas.
- The importance of compliance with the accidental protocols and the reporting processes.
- Contact details for the Project Ecologist, environmental compliance staff, and emergency numbers for any identified issues observed onsite.

4.6. Reporting

A report will be prepared for any accidental discovery incidents and submitted to DOC and council within one month of any management measures that become necessary upon their completion.

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This report shall include:

- Confirmation that management measures were undertaken, and how;
- Location and nature of management measures including photographic evidence;
- Outline of any adaptive measures and communications with DOC;
- Outcomes of management measures and confirmation that vegetation removal operations were undertaken in accordance with the protocols above and any relevant consent conditions;
- Any other relevant measures and steps taken; and
- Recommendations for any potential changes to improve the effectiveness of bird management in relation to the scope of this Bird Management Plan, if necessary.

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5. Indigenous Fish Management Plan

5.1. Overview

This Indigenous Fish Management Plan is intended to outline methods for minimising direct adverse effects on indigenous fish resulting from in-stream works. This plan incorporates a summary of fish habitat and species present (see detailed description in Section 2.1.3), a summary of planned works, roles and responsibilities, Ministry of Primary Industries (MPI) and the Department of Conservation permitting requirements, procedures for dealing with pest fish, biosecurity protocols, timing of works, procedures for recovering indigenous fish prior to and during works, and reporting requirements.

As no stream habitat loss beyond the upgrading of culverts and the loss of two artificial ponds is proposed, no additional habitat mitigation measures were assessed to be necessary and are not included in this plan.

For the purposes of this document, the large indigenous invertebrates koura and kakahi (freshwater crayfish and mussels), though not previously confirmed to be present at the site, are also included when the term 'fish' is used.

The following general approach is proposed for capture and relocation of fish associated with all in-stream works and dewatering of ponds (i.e. placement of culverts, drainage of pond systems):

- Capture and relocation of as many fish as possible prior to works, by isolating the section of waterway prior to culvert installation, and in stages prior to dewatering of the pond system, through a combination of trapping/netting overnight and electric fishing (EFM) (where appropriate within the watercourse only).
- Isolation of the work area to prevent re-invasion of fish into the work area, such as placing a fine mesh net or steel plate across the channel or otherwise to block the upstream and downstream sections. These measures will also assist with the ability to net/capture fish;
- Supervising any instream works, and following of accidental discovery protocol for any fish found after works have begun.

5.2. Fish capture

Fish capture and relocation will be conducted prior to any watercourse being dewatered, or where earthworks are to take place within the channel.

Indigenous fish species confirmed present at the site are shortfin eel, though habitat for other species also exists.

Methods used shall be in general accordance with the New Zealand Freshwater Fish Sampling Protocols[8] (Joy et al., 2013), which also contains a decision matrix to determine the most suitable fishing method for each situation (note, spotlighting can be disregarded as a fish removal technique for the pond systems and may be unsuitable within the watercourse due to the high sediment load present).

[8] Joy, M., David, B. and Lake, M., 2013. New Zealand freshwater fish sampling protocols. Massey University, Palmerston North, New Zealand.

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Where insufficient water is present to allow these protocols to be carried out, the Revised Methodology to Survey and Monitor New Zealand Mudfish[9] may be used. In general, it is recommended to set nets and traps as densely as practicable.

The optimal technique to be used in each habitat is dependent on the site conditions at the time of fish removal. A minimum of approximately 35-40 cm water depth is required to set fyke nets. At least 15 cm of water is required to set minnow traps, though they can be dug into the sediment in shallower water.

Electric fishing can be efficiently and safely conducted in water between approximately 0.1-0.6 m deep and is best in clear, flowing, hard-bottomed streams. These minimum depths will be dependent on the habitat present, and a freshwater ecologist shall determine whether a watercourse can be fished, and which method/s are most suitable.

Any captured fish species declared to be pests by WRC will be humanely euthanised using acceptable methods.

5.3. Fish transfer

After capture, indigenous fish shall be transferred in a lidded container filled with clean stream water.

- Fish will be held for the minimum time possible.
- The density of the fish within the container will be monitored and kept to an appropriate level to ensure that low dissolved oxygen within the container does not lead to mortality.
- Fish shall be handled as little as possible and shall not be handled with dry hands and if any individuals show signs of stress (loss of righting response, gaping, gulping air) the water shall be changed to provide more oxygen.
- Eels, particularly larger eels (>500 mm) and koura (not expected) shall be isolated from other captured fish to avoid injury to the other smaller fish.

Fish capture and relocation is to be undertaken in the days immediately prior to any in-stream works and dewatering.

Prior to capturing fish, the downstream end of the stream reach that will be affected by the works shall be block netted or isolated by another means.

For the proposed works, following staging is proposed:

1. Fish barriers are installed upstream and downstream of the works area.
2. Traps and nets are deployed in the afternoon and left overnight.
3. Traps and nets are checked and retrieved in the morning.
4. The stream reach will be electric fished (not applicable to the ponds).
5. Steps 2-4 will be repeated until <5 fish are captured per night.
6. Any native fish found shall be relocated.

[9] Ling, N.; O'Brien, L.K.; Miller, R.; Lake, M. 2013: A revised methodology to survey and monitor New Zealand mudfish. Department of Conservation, Wellington (unpublished). Note - mudfish have not been recorded at the site and are unlikely to be present. Mudfish have been recorded within 5 km of the site, at Lake Rotopiko.

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7. Fish barriers shall remain in place and must not be breached throughout the period of works.
8. Any dewatering shall be supervised by an ecologist.
9. Any breaches of the fish barriers (e.g. being overtopped by water or collapsing) will result in the above steps needing to be repeated.

Fish barriers shall be checked daily by a representative of the construction team who has been trained by the project ecologist to recognise the signs of barrier failure. If the barrier fails, the fish removal protocol will need to be repeated.

5.4. Release site

Once the fish have been recorded, all native fish should be released downstream of the same watercourse system (Figure 6). Upon release, fish shall be distributed over a similar length of watercourse as they were caught, with small fish released first.

To avoid mortality of fish upon release, an effort will be made to avoid releasing fish in areas where dissolved oxygen is low, or where disturbance of anoxic sediments may lead to deoxygenation of water.

The stop nets or permeable barriers will isolate the fish from returning to the affected reach.

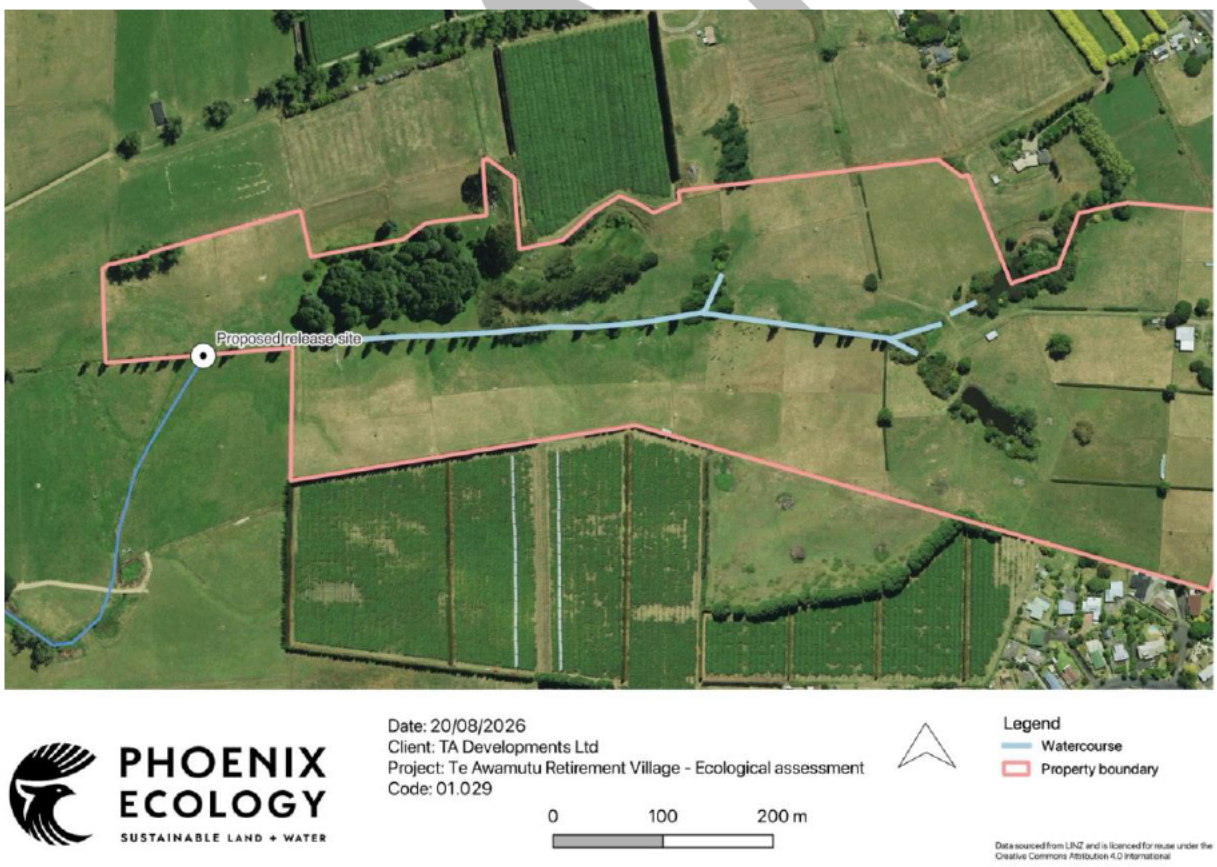


Figure 6 Proposed fish release site

5.5. Permit

Fish capture will need to be conducted under an MPI Special Permit held by a freshwater ecologist to take and possess fish and aquatic life and relocate it to a suitable habitat when it is necessary or required to mitigate for any potential adverse effects.

No other permit is required as fish will not be transferred between different locations or catchments.

5.6. Reporting

Fish captured shall be recorded and a summary report prepared for presentation to the council along with other compliance data. Fish capture records shall also be electronically submitted to the New Zealand Freshwater Fish Database and retained as part of MPI permit compliance requirements.

Results will include the following information:

- Date and time of capture;
- Capture method(s);
- Fish species caught;
- Number caught (including any accidentally killed);
- Length range;
- Health/condition (i.e., visible disease or injury); and
- Location of release.

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Appendix A: Masterplan



1 Overall Proposed Level 1 1:1500

Yield per Stage

Stage Number	KEY	Typology	Yield
Stage 1		2A	5
		2B	7
		2C	7
		2D	7
		2UD (Lower)	8
		2UD (Upper)	8
		3A	2
		3B	15
		3C	16
		3D	2
		3E	1
		Apartment - 1B	4
		Apartment - 2A	8
		Apartment - 2B	8
		Apartment - 2C	2
		Apartment - 3A	4
		Serviced Apartment 1A	16
		Serviced Apartment - 2A	8
			128
Stage 2			

Stage 2		
	2A	5
	2B	10
	2C	22
	2D	7
	2UD (Lower)	16
	2UD (Upper)	16
	3A	2
	3B	1
	Apartment - 1A	3
	Apartment - 1B	4
	Apartment - 1C	2
	Apartment - 2A	20
	Apartment - 2B	16
	Apartment - 3A	16
		200
Stage 3		
	2A	20
	2B	6
	2C	4
	3D	7
	3C	7
		44

Stage 4		
	2UD (Lower)	16
	2UD (Upper)	16
	3A	4
		36
		408

Overall Yield			
Typology	Key	GFA	Yield
2A		140	30
2B		117	43
2C		140	33
2D		119	21
2UD (Lower)		136	60
2UD (Upper)		133	60
3A		160	8
3B		160	16
3C		160	33
3D		200	2
3E		100	1
Apartment - 1A		60	3
Apartment - 1B		67	8
Apartment - 1C		54	2
Apartment - 2A		90	28
Apartment - 2B		80	24
Apartment - 2C		90	2
Apartment - 3A		107	20
Serviced Apartment 1A		71	16
Serviced Apartment - 2A		84	8
			408

KEY:
- Kahikatea Forest, Wetland & Watercourse Restoration Area
- Existing Stormwater Pond
- Pump Station
- Stolen Shed
- Wetland
- Site Boundary

Te Awamutu Developments
2025 Ohaupo Road, Te Awamutu 3800

PACIFIC ENVIRONMENTS ARCHITECTS

Concept Design ISSUE

Title: Overall Proposed Site Plan - Level 1

Date: 14/08/2026 Scale: 1:1500, 1:1@A1 Client: Te Awamutu Developments Limited

Ref no: 25020 Sheet no: A0105 Revision:

Appendix B: Indicative Restoration Areas



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

Appendix C: Bat Roost Protocols

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Protocols for minimising the risk of felling occupied bat roosts

(Bat Roost Protocols)

Version 4: October 2024 approved by the New Zealand Department of Conservation's Bat Recovery Group

The use of these protocols is only one step in the RMA effects management hierarchy i.e., avoid, remedy, mitigate. Avoidance of felling bat roost trees should be the first step in any project. Using this protocol only reduces the likelihood of killing or injuring bats present in roosts at the time of felling. It does not avoid, remedy or mitigate any other effects.

Purposes of this document:

1. To outline why protection of roosts is important for the persistence of New Zealand bats and why removal of known and potential roosts should be avoided.
2. Where tree removal cannot be avoided, to set out the minimum requirements and protocols for removing trees in areas where bats are present, to minimise the risk of killing bats.

This protocol does not eliminate the risk to bats of death or injury because bats or active bat roosts can be missed. The best way to eliminate risk of felling an active roost is to **avoid** felling any known or potential roosts.

Context

Bat roost protocols and the Wildlife Act 1953

Aotearoa New Zealand bats are absolutely protected species under the Wildlife Act 1953. It is an offence to catch alive or kill, hunt, possess, molest, or disturb bats under the Act. Any projects where tree or vegetation removal overlaps with the occurrence of bats, there is a risk of killing or injuring bats that may be present. Following the bat roost protocol reduces the likelihood of killing or injuring bats.

Bat roost protocols and the RMA

The occurrence of bats and bat habitat is a matter of 'significance' under Section 6(c) of the Resource Management Act (RMA). Bat roost protocols have become a standard part of bat management plans that may be required under RMA consents. Where developments require consents, and bats (a threatened species) are present, the developments should 'Avoid' impacting bats and bat habitat. Where this is not possible, the effects management hierarchy must be followed with attempts made to "remedy, mitigate, offset, and compensate" for impacts on bats and bat habitat.

Bat roost protocols are not considered an appropriate management measure to address bat roost habitat loss, as they only attempt to reduce the risk of bats being killed by tree felling. Therefore, implementing bat roost protocols where bats are present should be considered a last resort after following the RMA effects management hierarchy.

This protocol has therefore been framed following the RMA effects management hierarchy by first focusing on the avoidance of effects, helping to identify and avoid the removal of roost trees, and to minimise the risk to bats of death or injury if avoidance is not possible. This approach is usually informed by gathering data on bats in the local areas and seeking advice from someone who has been certified as competent by DOC to assess roost use by bats using bat detectors, identify potential roost features, and undertake emergence watches.

Identifying and protecting *both active and inactive* (i.e., trees used by bats at other times of year) roosts by avoiding their removal is an important step in supporting the survival and persistence of bats.

Effects management/compensation

If trees are felled and habitat lost, then compensation measures should be considered to address the adverse effects. What these measures should be is beyond the scope of this document. Provision of artificial roosts in the short-term and planting for the long-term are some of the methods commonly used in development projects, but their effectiveness is untested and understanding this is future research needed.

The status of Aotearoa New Zealand bats

Aotearoa New Zealand's two extant bat species (pekapeka) are classified as threatened.

Long-tailed bats are classified as 'Nationally Critical' because the species is likely to have a 70% decline in numbers within three generations.

Lesser short-tailed bats have three subspecies. The northern subspecies is classified as 'Nationally Vulnerable' because there are 1000-5000 mature individuals and the predicted decline in numbers is 10-50% within three generations. The central subspecies is 'Declining' because there are 20 000-100 000 mature individuals, and the predicted decline is 10-50% within three generations. The southern subspecies is 'Recovering' because there are 1000-5000 individuals, and the predicted increase is >10% within three generations.

Threats to bats

This document deals specifically with roost protection; however, roost protection is only part of the wider issue of habitat loss. Habitat loss through land clearance, habitat degradation, fragmentation and disturbance and loss of roosts reduces roosting, foraging and socialising areas. Individual bats and colonies are also threatened by the local felling of individual trees.

Bats have large home ranges which can include unprotected peri-urban habitat. Protecting habitat and maintaining connectivity of vegetation are crucial for bats being able to persist and flourish in the environment.

Predation and competition by introduced predators: mustelids, rats, cats, and possums have all been implicated in the decline of bats[1].

Roosts are critical to the survival of bats

Roosts are where bats gather to shelter during the day and at night. They are used to socialise, mate, give birth, and raise young. Bats have very specific requirements when they are choosing roosts and are not just choosing any tree. The specialised features of roosts make them rare and almost irreplaceable in any landscape or habitat type except over very long-time frames. People sometimes falsely suggest that "bats can just move to another tree". This is not the case, particularly where trees suitable as roosts are limited[2].

Bats demonstrate high site fidelity to existing roosts and their specific roosting areas, and they move on a rotation among these. Because roost trees are likely to be rare, and bats choose which of their roosts to occupy to fulfil specialised requirements, felling roost trees even when bats are absent will have a significant negative effect. If the number of suitable roosts and their surrounding habitat is reduced in the landscape, bats are forced to use roosts

[1] O'Donnell CFJ; Christie JE; Hitchmough RA; Lloyd B; Parsons S 2010. The conservation status of New Zealand bats, 2009. New Zealand Journal of Zoology 37: 297– 311.

[2] Many references available, for example, Borkin KM; Parsons S. 2011. Sex-specific roost selection by bats in clear-fell harvested plantation forest: improved knowledge advises management. Acta Chiropterologica 13(2): 373-383; Borkin KM; O'Donnell CFJ; Parsons S. 2011. Bat colony size reduction coincides with clear-fell harvest operations and high rates of roost loss in plantation forest. Biodiversity and Conservation 30; Sedgeley JA; O'Donnell CFJ 1999b. Roost selection by the long-tailed bat, *Chalinolobus tuberculatus*, in temperate New Zealand rainforest and its implications for the conservation of bats in managed forests. Biological Conservation 88:261–276; Sedgeley JA; O'Donnell CFJ 2004. Roost use by long-tailed bats in South Canterbury: Testing predictions of roost site selection in a highly fragmented landscape. New Zealand Journal of Ecology 28:1-18.

that are less thermally efficient. This means they will use more energy to survive, resulting in reductions in survival and lower reproductive success. In this way, roost removal is likely to result in higher risk of local extinction.

Bats can roost in native or exotic vegetation – therefore it should not be presumed that exotic species such as pine trees will not support bats. Roosts, including maternity roosts, have been found in many exotic species including, but not limited to, pine, poplar, oak, and acacia species, black locust, willow, eucalyptus and Tasmanian blackwood.

Bats are at risk of being injured or killed when trees are felled

If a tree is felled with a bat in it, it is highly likely that the bat will be injured or killed, although this may not be apparent at the time because injuries, such as bruises and fractures, which would hinder bats' ability to fly well, may take time to be obvious.

The highest risk of injuring or killing bats or trapping them within their roosts is when they are heavily pregnant, when young are still dependent on the roost (late November – February) and when bats are more likely to be in torpor (a type of hibernation in May – September). Heavily pregnant bats are slower and less agile, and young bats cannot fly, and when they are new to flying are not very agile, so their chances to escape are reduced when roost trees are felled. Also, it is possible that if the larger female-dominated maternity roosts are cut down when females are raising their young to independence (October-March), a whole colony of bats could be destroyed at one time.

If trees are cut down when bats are in torpor, bats may be unable to rouse from torpor and to fly away in time to escape. Additionally, it is significantly harder, sometimes impossible, to detect bats roosting in trees during torpor. For these reasons, trees with potential bat roost features must not be cut down in winter. Bats also use torpor for short periods during summer, for example, if the weather gets cold, so the risk of killing or injuring bats that cannot escape falling trees exists at any time of the year.

Bat roost protocol

When and how to use the protocol

Whenever vegetation removal is proposed in areas where bats are potentially present and where their habitat may be impacted, follow the decision tree (Figure 1) below as a guide to what sort of action should be undertaken. The decision tree is designed firstly to avoid felling bat roost trees, secondarily aimed at moving roost trees, and only if unavoidable, felling roost trees (but only once vacated).

None of the methods of inspecting roosts described below eliminates the risk of failing to identify bats when they are present. Therefore, techniques such as filling in cavities with expandable foam are not supported as a tool. This is because there is a risk of trapping bats that have not been detected within cavities.

Definitions

Competencies: a set of competencies developed by the NZ Bat Recovery Group[3] to ensure that anyone working with bats is competent to do so. Contact [redacted] for a list of competencies and requirements to become an authorised competent bat worker.

Competencies referred to in this document:

2.1 Bagging, storage, handling, measuring, weighing, sexing, aging, temporary marking and releasing appropriately:
For long-tailed bats: 50 individuals
For short-tailed bats: 50 individuals

3. High risk activities – Roost felling (all of these competencies include the understanding of what to do when bats are found during tree felling as per Appendix 6 of 'Initial veterinary care for New Zealand Bats')
3.1 Assessing roost tree use using Automatic Bat Monitors - Demonstrate correct timing, placement, and interpretation of data for 10+ times according to DOC's Tree Felling Protocols.

[3] A group of bat specialists that advise on bat issues and assess bat competencies

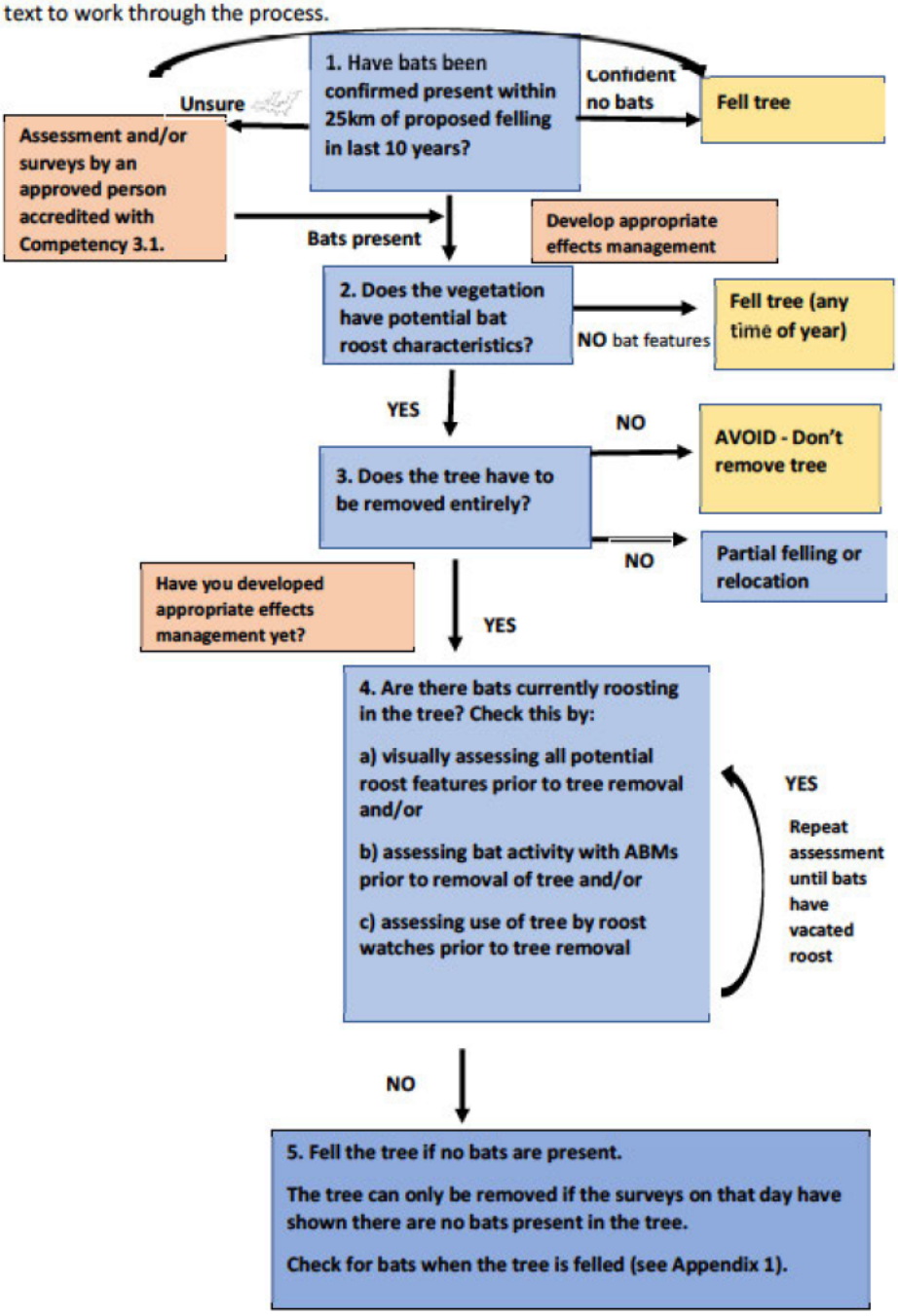
3.2 Undertake roost watches/emergence counts at 10+ occupied roosts where the entrance is visible.
3.3 In at least two different forest/habitat types, including the forest/habitat type where trees are going to be assessed: evaluate 10+ potential roost features in trees (e.g., cavities, peeling bark, epiphytes).

These are minimum requirements and rely on an accredited trainer to provide written endorsement to the Bat Recovery Group that the right level of competency has been achieved.

ABM: automated bat monitoring unit/detector

Figure 1. Tree removal in bat areas flow chart

Each numbered step relates to a step in the Decision Tool for Tree Removal. Follow each step fully in the text to work through the process.



Step by step decision tool for tree removal in bat areas (to be used in conjunction with Figure 1).

Step 1. Does the bat roost protocol apply to my project?	Response	Who can make this assessment?	When?
a) Is there known bat activity within a radius of 25 km of the vegetation to be removed (see [4] and [5] notes below)?	a) If Yes, proceed to b If No, consider whether survey work needs to be done.	Evidence can come from on-the-ground surveys and reports from the national DOC database if within the last 10 years, consultants, and/or other credible sources. Evidence should be interpreted by an experienced bat ecologist.	Any time
b) Are bats present in the Project Area i.e. where trees are planned to be felled?	b) If Yes, go to step c If unknown, undertake comprehensive survey if bats are likely to be present. If no bats are present after comprehensive survey, you do not need to follow protocol.	If surveys are required to support the assessment, then these will need to be designed by approved person accredited with Competency 3.1. to determine presence around trees due to be felled.	Acoustic surveys to determine presence should be undertaken when bats are most active and environmental conditions are suitable (October 1st to April 30th)[6]. Surveys undertaken at other times of year are considered less reliable for determining absence.
c) Is the tree known to provide a roost location for bats? (Previous knowledge).	c) If yes, go to step 3 If no (but bats are present in the project area), go to step 2.		

Notes for Step 1

1a) Bats are a highly mobile species. Long-tailed bats can have home ranges (the areas that they regularly use) as wide as 19km, and short-tailed bats about 24km. Three colonies of long-tailed bats in the Eglinton Valley collectively had a home range of 100km².

[4] The largest home range span for the long-tailed bat in the Eglinton Valley was 19 km (O'Donnell 2001. J. Zool., Lond. 253, 253-264).
[5] The largest home range span for the lesser short-tailed bat in the Eglinton Valley was 23.6 km (O'Donnell et al. 1999. New Zealand Journal of Ecology 23(1): 21-30).
[6] Borkin K.M. 2010. Ecology of New Zealand's Long-tailed bat (*Chalinolobus tuberculatus*) in exotic plantation forest. Unpublished PhD thesis, University of Auckland.

6

When assessing whether bats might be present at a site you have to consider any surveys that have been done in the wider area, how long ago the surveys were done and whether more surveys are required.

1b) If you are doing a new survey then you should design the survey to cover the project area. Examples of surveys are shown in the Bat Inventory and Monitoring Toolbox (https://www.doc.govt.nz/our-work/biodiversity-inventory-and-monitoring/bats/). See 'Bats: Counting away from bat roosts: bat detectors on line transects' and 'Counting away from bat roosts: automatic bat detectors'.

Send bat data (processed csv files and GPS locations) to [redacted] on a standard spreadsheet available by emailing this address.

Step 2. Does the vegetation proposed to be removed have potential bat roost characteristics?	Response	Who can make this assessment?	When?
a) Is the tree ≥15 cm DBH (Diameter at Breast Height)[7]?	If yes, further assessment is required (2b). If no, the vegetation can be removed at any time. There may be roosts that have smaller DBH. If any vegetation is suspected to have a bat roost present, removal shall be halted immediately, and protocols reviewed.	Anyone who can measure a tree DBH.	Any time
b) On visual inspection, does the tree (dead or alive) have features that indicate roost potential (Potential Roost Features/PRFs)? These features include: • hollows • cavities • knot holes • cracks • flaking, peeling, and decorticating bark • epiphytes • broken or dead branches or trunk • cavities/hollows/shelter formed by double leaders	If yes go to step 3 If unsure i.e. cannot assess due to foliage or limited access, further assessment is required. This may include climbing inspection of the tree. If no potential roost features are present, the vegetation can be removed at any time[8],	Approved person accredited with Competency 3.3.	Visual inspections can occur at any time of the year, but within 6 months of final felling dates. This accounts for any changes in trees that may occur over time. If there are NO potential roost features, felling can occur at any time of year.

[7] This diameter at breast height is based on dimensions of roosts used by south Hamilton long-tailed bats that were identified by Dekrout (2009, Unpublished PhD thesis, University of Auckland) - the smallest roosts were 15.5 cm DBH; but note that in South Canterbury Sedgeley and O'Donnell (2004, New Zealand Journal of Ecology 28(1): 1-18) found that 25% of long-tailed bat roosts were smaller than 18.8 cm DBH.
[8] All surveys to assess whether trees are potential roosts shall take place within 6 months of final felling dates. If felling does not take place within this time, then assessments must be repeated. This is intended to account for any changes in trees which may occur over time.

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• Artificial roost boxes	but if upon felling you find a bat follow section 5.		
Step 3. Does the tree have to be removed entirely?	**Response**	**Who can make this assessment?**	**When?**
a) Is the only option to remove the tree entirely?	If yes, continue to step 4 If no, consider leaving the tree in place, cutting off specific limbs only or relocating the tree. If any felling, partial felling (where the part to be felled has potential bat roost features) or tree relocation takes place you **MUST** proceed to step 4. If a roost (active/inactive) is confirmed, then advice should be obtained at a project level in writing from DOC before proceeding.	Project leader (i.e. the accountable decision-maker for the project)	Any time

Notes for Step 3

Trees must only be relocated when bats are absent and when standard automated bat monitoring unit (ABM) weather conditions are met (see notes section 4b for appropriate weather conditions), and in consultation with an ecologist with all competencies of level 3: 'High risk activities – Roost felling'.

Advice in writing can be given on behalf of the Operations Manager of the DOC District you are working in. If you do not know the contact details for this office, you can phone 0800 ASK DOC (0800 275 362) or email info@doc.govt.nz . In emergencies, phone 0800 DOC HOT (0800 362 468).

Step 4. Are there bats currently roosting in the tree? (Follow a or b or c or a combination)	**Response**	**Who can make this assessment?**	**When**
a) Are potential features being used by roosting bats? A tree climber may be required to check all features (see notes for 4a below). If roost is occupied repeat 4a another day until roost is vacated.	If yes, **THE TREE MUST NOT BE FELLED UNTIL BATS HAVE VACATED IT.** If no, the tree can be removed on the day of the tree inspection following step 5.	An approved person accredited with Competency 3.3 or an experienced tree-climber (e.g., an arborist) working with an approved person accredited with Competency 3.3.	October 1st to April 30th when the temperature is 7°C or greater at official sunset in the South Island or 8°C or greater in the North Island.

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	If bats continue to use the roost, then the tree must not be cut down until the bats leave the roost. At this point reconsider whether this tree must be felled. Advice must be obtained at a project level in writing from DOC prior to felling the tree. If you do not know the contact details for the office, you can phone 0800 ASK DOC (0800 275 362) or email info@doc.govt.nz.	If the latter, the tree climber must provide information along with photographs or video footage, to the approved person accredited with Competency 3.3 who assesses and decides whether the tree can be removed. If roosts are known or confirmed through this process, then this information must be communicated to the nominated DOC or Council bat ecologist for this project.	
b) Is bat activity recorded at any time during two consecutive, valid survey nights preceding tree felling[9]? At least two nights are required as it is possible for bats to enter or leave a roost without echolocating, or to not leave the roost for a night.	If yes (bats are detected), survey must continue until no bat activity is recorded for two consecutive nights (to indicate bats have left the area) prior to felling OR roost features of each tree must be visually assessed via climbing. If bat activity is consistent in the area and 2 nights with zero bat passes cannot be obtained, Go to 4c or 4a. If no bats are detected for two consecutive nights, the vegetation can be removed on the day immediately following the	An approved person accredited with Competency 3.1	October 1st to April 30th and when conditions meet the requirements for standard ABM weather conditions (see 4b notes).

[9] Le Roux et al (2013) found that in and around Hamilton "The longest consecutive monitoring period without bat detections at each site was three nights during winter." Le Roux et al 2013. New Zealand Journal of Zoology (2013): Spatial and temporal variation in long-tailed bat echolocation activity in a New Zealand city, New Zealand Journal of Zoology, DOI: 10.1080/03014223.2013.827125.

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	survey nights using the method in 5.		
c) Are bats observed emerging or re-entering the tree? This involves watching roost features to identify bats returning to or exiting potential roost features. It should only be used in combination with previous ABM monitoring (4b) (see notes 4c for method). At least two consecutive emergence and re-entry watches should occur at dusk and dawn immediately preceding the felling as it is possible for bats to enter or leave a roost without being detected, or to not leave the roost for a night. It is strongly recommended that a night vision aid is used for emergence watches to reduce the risk of missing bats if they leave after it becomes too dark to see.	If yes (bats are seen at either watch), it is a confirmed roost. Removal of a roost should not occur. If no bats are observed entering or exiting for two consecutive dusk and dawn watches, the vegetation can be removed on the day immediately following the final dawn watch using the method in 5.	An approved person accredited with Competency 3.2. If more than one person is required for a roost watch at a tree, a minimum of one approved person accredited with Competency 3.2 must be present on site for the duration of the roost watch to supervise.	Between October 1st and April 30th only AND when weather parameters meet the roost watch requirements.

Notes for Step 4.

4a) Tree climbing and inspection

Care must be taken while climbing trees to avoid disturbing, removing or destroying tree features with bat roost potential such as sections of loose bark or cavities in dead wood. Using mobile elevated platforms can be a good option. Bats are less likely to be active over colder periods, so climbing to check whether bats are present in potential roost features must take place between October 1st to April 30th when the temperature is 7 °C [10] (South Island) or 8°C (North Island) or greater at official sunset on the night before inspection.

A tree climber may be required to check all potential bat roost features.

- Can bats be seen? An endoscopic camera should be available for this step and every possible corner of each potential roosting feature inspected, i.e., cavity/crack etc. Cracks, holes, and splits may lead to cavities or may be superficial. A cavity may be wet indicating no/low potential as a bat roost. Ensure that the tree climber is provided guidance from the competent bat worker about bat identification and care required when probing endoscopes into potential roosting features which may disturb bats.
- Can bats be heard? Search of tree features should be accompanied by use of a hand-held bat detector. If bats are present and not in torpor, then detection of presence listening at 25 kHz (for social calls) and 40 kHz (for echolocation calls) may help to determine if long-tailed bats are present. Short-tailed bat social calls are often audible or detected at 25-27 kHz.
- Is guano present or urine staining? See Appendix 1.

[10] O'Donnell CFJ 2000. Influence of season, habitat, temperature and invertebrate availability on nocturnal activity of the New Zealand long-tailed bat (*Chalinolobus tuberculatus*). New Zealand Journal of Ecology 207-221.

4b) ABM survey work

ABMs are to be used to record bat calls. Location of ABMs must provide sufficient coverage to be able to determine if bat roosts are present in one or more of the trees. Department of Conservation-manufactured AR4 bat detectors are considered likely to detect long-tailed bats only over short distances i.e., up to 30-60 m distant from the detector (S. Cockburn, Department of Conservation, pers. comm.). This is similar detection distances of other detector types. Ensure the survey design Note that rain and wind can affect detectability because the sounds can have the same frequencies as bat calls. These sounds are picked up by bat detectors, potentially obscuring bat calls.

'Valid' survey nights must have the following features:

- Begin one hour before official sunset and end one hour after official sunrise.
- Temperature 8°C or greater for the first four hours after official sunset time for the North Island and 7°C for the South Island[11].
- Ideally no to very little precipitation within the first 4 hours after official sunset, although a light mist or occasional drizzle may be acceptable as assessed by an ecologist accredited with Competency 3.1.
- No to light wind within the first four hours after official sunset.

Prior to the commencement of surveys, ABMs must be checked for correct operation at a site where bat activity is known to be regular, or by using the DOC – Bat Recorder Tester (Tussock Innovation Ltd) phone app made for this and available from Google Play Store. Faulty or suspect ABMs must not be deployed, and ABMs must be redeployed if faults occur.

4c) Roost watches

The following weather conditions define a valid night for roost watches:

- Temperature greater than 8°C all night between official sunset and sunrise for the North Island and 7°C for the South Island.
- Ideally no to very little precipitation within the first 4 hours after official sunset, although a light mist or occasional drizzle may be acceptable as assessed by an ecologist accredited with Competency 3.1.

Roost watches should include the deployment of ABMs and analysis of data for the night of the roost watch.

Emergence watches

- Each tree must be watched from at least 1 hour prior to sunset in the South Island and from ½ hour prior to sunset in the North Island until it becomes too dark to see by sufficient people to observe all potential exit points. This must be supported using handheld detectors, and consider the use of night vision aids which can detect

[11] South Island temperatures are based upon O'Donnell (2000) as above. North Island temperatures are based on Borkin et al. 2023. Influence of weather on long-tailed bat detection in a North Island exotic forest. New Zealand Journal of Ecology, Vol. 47, No. 1.

bats once it becomes too dark to see. The aim of emergence watches is to identify potential roost locations within the vegetation. Infra-red and thermal imaging cameras will be useful in this process.

Roost re-entry watches

The time when bats return to roosts can vary based on temperature and time of year.[12,13]

- Observers must then return the next morning and watch the tree to determine whether bats return to the vegetation.
- Roost re-entry watch timing should be based on patterns of activity recorded onsite with ABMs, i.e., as a guide, watches should begin two hours prior to when the last passes were recorded on the ABMs on previous nights and finish one hour after official sunrise time. Where this information is not available and at minimum, watches shall begin two hours prior to official sunrise until one hour after sunrise. Infra-red and/or thermal imaging cameras may be useful as a supplementary tool in this process.

The methods above (Climbing and inspecting; ABM use and roost watches) can be implemented as in steps 4.

If bats are sighted, or sign detected, or a roost (active/inactive) is confirmed, the approved person with the appropriate competencies, as soon as possible, shall:

- Call the tree felling supervisor to inform them which affected tree(s) cannot be felled due to detection of bat sign.
- Send an email to the site manager, and the local DOC office if an active roost is found, detailing the results of the survey and outlining the measures for protection or relocating the roost tree. Advice must be obtained at a project level in writing from DOC prior to felling the tree. If you do not know the contact details for the office, you can phone 0800 ASK DOC (0800 275 362) or email info@doc.govt.nz.
- A record (including photos) of any vegetation containing bat roosts shall be kept detailing the date; size, location and species of tree or other vegetation; roost type, e.g., cavity, peeling bark, broken branch; detail outlining how presence of bats was confirmed; the number of bats present; and species present, if known.

Step 5. Fell the tree if no bats present	Response	Who can make this assessment?	When
NB: Vegetation removal must take place on the day of tree inspection or the day immediately following two consecutive emergence/re-entry surveys that confirm that there are no bats present.			
a) If you have undertaken a visual inspection of the vegetation (following step 4a, then the vegetation can be removed **ONLY ON THE DAY OF INSPECTION** and meets the valid weather conditions (defined in notes 4c) at official sunset the day prior to inspection.		An approved person accredited with the relevant competency (based on method used) who are familiar with the 'Bat First Aid and veterinary care' documents shown	When the inspection method chosen allows.

[12] Dekrout AS. 2009. Unpublished PhD thesis. University of Auckland, New Zealand Pp 168.
[13] Griffiths R. 2007. Activity patterns of long-tailed bats (Chalinolobus tuberculatus) in a rural landscape, South Canterbury, New Zealand. New Zealand Journal of Zoology, 34:3, 247-258, DOI: 10.1080/03014220709510083.

If you have undertaken ABM surveys or roost watches 4b or 4c the vegetation can be removed **ONLY ON THE DAY IMMEDIATELY FOLLOWING SURVEY COMPLETION** (i.e., if the survey ends in morning the tree can be felled the same day only). Trees must be inspected for signs of bats once felled and before removing from the site, if safe to do so. Follow Appendix 2 if bats are detected during vegetation removal.		in footnote[14], and physically able to check/inspect tree for signs of bats once felled.	

[14] Initial Veterinary Care for NZ Bats UPDATED 2023.pdf (doc.govt.nz) and Bat Care Advice for first responders 2023.pdf (doc.govt.nz)

Appendix 1. Identification of guano.

Bat droppings ('guano') will superficially look like rodent droppings, being dark in colour and a similar size and shape to a large grain of rice. Bat droppings will easily crush under pressure (e.g., when squeezed between fingers) and will disintegrate into a dusty/crumbly substance in comparison to smearing (rodents). Where beetles form part of the bat's diet, crushed droppings can look shiny/glittery due to the presence of elytra. Larger colonies may leave piles of guano at the bottom of the roosting feature (Figure 1). Where individuals or small colonies are present, it is likely that only individual pieces of guano may be found, therefore careful inspection is needed.



Figure 1: Guano at the base of communal long-tailed bat roost. Photo: M. Choromanski

Appendix 2. If bats are detected during tree relocation or removal

NB: Vegetation removal must take place on the day of tree inspection, or the day roost watches have been completed or two consecutive nights of ABM data have confirmed that there are no bats present at that time. If practical, trees are to be inspected for signs of bats once felled and before removing from site. People inspecting trees should be familiar with the Bat Care Advice document shown in footnote[15] and able to check/inspect tree for signs of bats once felled.

If during the felling of a tree bats are detected, felling of that tree must stop immediately if safe to do so, and DOC and an approved person accredited with Competency 2.1 must be consulted.

If bats do not fly away or are potentially injured/found on the ground, felling can only re-start once permission has been obtained from DOC after consultation with an approved person accredited with Competency 2.1.

If bats are detected once the tree has been felled, all further work must stop, and DOC and an approved person accredited with Competency 2.1 must be contacted. The felled tree must be thoroughly inspected by them for further bats.

If any bats are found on the ground or in the tree once felled, place the bat in a cloth bag in a dark, quiet place at ambient (or slightly warmer) temperature and take to a veterinarian for assessment as soon as possible i.e. that day. A maximum of two bats should be kept in one bag. After delivering the bat to the vet, contact an approved person accredited with Competency 2.1 in consultation with the vet and DOC (0800 DOC HOT; 0800 362 468).

[15] Initial Veterinary Care for NZ Bats UPDATED 2023.pdf (doc.govt.nz) and Bat Care Advice for first responders 2023.pdf (doc.govt.nz)

Bats must be kept for three days under observation and must be kept out of torpor for this time. Additional detail is found at the links provided in this footnote[16]. Vets must euthanise bats whose injuries are causing suffering and are not likely to heal sufficiently to allow rehabilitation and return to the wild. The approved person accredited with Competency 2.1 and the vet must consult with DOC to consider appropriate rehabilitation options where suffering is minimal and chances of return to the wild are high.

Euthanised bats or any dead bats (or bat parts) found must be handed to DOC and is a legal requirement under the Wildlife Act. If the bat is held for longer than 12 hours, store it in a food grade safe glass jar in the freezer to preserve the bat's smell for the potential use of training conservation dogs.

[16] Initial Veterinary Care for NZ Bats UPDATED 2023.pdf (doc.govt.nz) and Bat Care Advice for first responders 2023.pdf (doc.govt.nz)

Appendix D: Bat handling competencies

Bat handling competencies authorisation

Version and Date: V 1.4, 20/9/2023
Revision date: 20/9/2023[1]
Approved by: Bat Recovery Group

1. Context
   - Certification by the NZ Bat Recovery Group is required for any permits that require handling bats (for NZ Wildlife Act 1953 Authorisations).
   - New Zealand bats, which are threatened species, are small, delicate and thus vulnerable to injury if handled incorrectly. Therefore, anyone that handles them must have levels of competency that ensure they are handled ethically. A competent handler will know how to catch, hold and release appropriately, understand if a bat is in torpor or not and adjust their handling appropriately, and when and how to attach monitoring devices.
   - Bat workers can reach a level of competency in up to 27 skills described below.
   - Each skill is represented by a separate competency.
   - Details of skill requirements are outlined in the NZ Bats Best Practice Manual:

     http://www.doc.govt.nz/Documents/science-and-technical/inventory-monitoring/im-toolbox-bats/im-toolbox-bats-doc-best-practice-manual-of-conservation-techniques-for-bats.pdf).

2. Purpose

   To outline the ethical standards required to be registered as competent, authorised bat workers by the NZ Bat Recovery group.

3. Definitions and registration processes
   - **Registered Bat Trainee:** A person who has registered with the Bat Recovery Group as a Trainee.
   - **Bat Banding Trainee:** A person who has registered with the NZ Banding Office as a Level 1 bat bander.
   - **Trainee Log:** A logbook of all training sessions undertaken, with each session signed by an Authorised Trainer. Logbooks are available from [redacted] or from www.doc.govt.nz/bat-worker-resources.

[1] This revision changes the wording of competency 3.1 to better reflect the intention of the competency

Department of Conservation
Te Papa Atawhai

DOC - 6169671

New Zealand Government

- **Competent bat worker:** A person who has been certified as 'Competent" in a particular skill by the NZ Bat Recovery Group.
- **Authorised Trainer:** A person who is registered as competent in a particular skill AND has been authorised by the Bat Recovery Group to teach and supervise Registered Trainees in that skill (but only if they are working under an existing Research or Collection Permit and Wildlife Act Authority or if they are a Department of Conservation Trainer). The Trainer **must** be present for all training and inspect all competency activities.

4. Training
   - While people are designated as Trainees, training must occur under the direct supervision of an Authorised Trainer (see above).
   - Once a competency or competencies has/have been signed off by the Bat Recovery Group, the bat worker can work independently with respect to that skill(s) (if they have the appropriate permits).
   - The Trainee will keep a logbook that describes experience in each competency (DOC-6228629). This needs to be signed by an Authorised Trainer(s).
   - The Trainee must have read and understood the NZ Bats Best Practice Manual (see link above).
   - Trainees can be certified either in individual competencies or multiple competencies. Like bird banding in New Zealand, it is envisioned that for most trainees it may take several years to achieve all competencies because opportunities for hands-on bat work are limited.

5. Application for competency
   - When trainees reach target handling levels described under each competency, they may apply to the Bat Recovery Group, via [redacted] for certification in that competency. However, reaching the target level does not automatically give the applicant certification and an application for competency must be accompanied by a letter of endorsement in writing from at least one Authorised Trainer.
   - Applicants can apply for certification for single or multiple competencies.
   - Applications must include a short summary of bat handling experience, copies of signed training logs, and the names of two bat trainers that can attest to the applicant's competency.
   - Applications will be reviewed by the Recovery Group at its monthly meeting.

- Applicants will receive confirmation of competency from the Recovery group within 2 months of applying.
- If competency for banding long-tailed bats is sought then the Trainee must apply to the Department of Conservation Banding Office for Level 1 Bander registration ([redacted] after filling in the appropriate form (Level 1 banders; https://www.doc.govt.nz/our-work/bird-banding/how-to-become-a-certified-bander/).

6. Rescinding competency
   - The Bat Recovery Group may rescind certification if practitioners are no longer considered competent or do not follow Best Practice.

7. Authorised trainers
   - Competent bat workers may apply in writing to the Bat Recovery Group, via [redacted] to be Authorised Trainers.
   - Authorisation is at the discretion of the Recovery Group and discussion with the Recovery Group is recommended before applying.
   - Applicants can apply for authorisation for training against single or multiple competencies.
   - Authorised Trainers must be able to demonstrate:
     a. A deep understanding and experience of the ecology of New Zealand bats.
     b. Considerable experience well beyond competency levels in catching, handling and manipulating bats.
     c. A strong aptitude for, and experience of, teaching others about bats.
     d. A clear understanding of teaching standards.
     e. Knowledge of the Wildlife Act and Wildlife Regulations as they apply to working with bats.
     f. Effective communication skills, understanding of Health & Safety requirements, and administration of records.

8. List of competencies

   Catching bats

   1.1 Use of mist nets

   1.1.1 Extract, bag and store correctly a total of 30 individuals of either species

   1.1.2 Demonstrate correct mist net placement, set up, smooth operation, appropriate mist net attendance, assessment of risks and safe extraction and handling on 10+ different nights

1.2 Use of harp traps (free standing)

- 1.2.1 Lead identification of appropriate harp trapping sites and set up and monitor trap(s) on 10+ different nights
- 1.2.2 Extract 10+ bats appropriately from free standing traps
- 1.2.3 Demonstrate harp trapping protocols (animal welfare considerations, trapping in the breeding season, rain, repair and maintenance etc)

1.3 Use of harp traps (at roost entrances)

- 1.3.1 Lead set up and monitoring of trap(s) on 10+ different nights
- 1.3.2 Extract 10+ bats appropriately from traps hoisted up trees
- 1.3.3 Demonstrate harp trapping protocols at roost entrances (safe trapping at tree roosts (risk management), predation risks, disturbance risks, animal welfare considerations, trapping in the breeding season, rain, repair and maintenance etc)

2. Handling bats

2.1 Bagging, storage, handling, measuring, weighing, sexing, aging, temporary marking and releasing appropriately:

- 2.1.1 For long-tailed bats: 50 individuals
- 2.1.2 For short-tailed bats: 50 individuals

2.2 Banding long-tailed bats:

- 2.2.1 50 individuals
- 2.2.2 Demonstrate knowledge of how to remove bands safely (2 methods; demonstrate on model bat)

2.3 Pit-tagging insertion in short-tailed bats:

- 2.3.1 Pit-tag insertion to short-tailed bats
- 2.3.2 Bat handling for pit tagging

Note that that transponder skills require exacting standards and specialised training from a select few people, and if people need this skill, they should contact the Bat Recovery Group to apply to get trained.

2.4 Attaching radio transmitters (should first be competent in 2.1 and/or 2.2):

- 2.4.1 For long-tailed bats: watch 5 individuals having radio transmitters attached by a Competent Bat Worker or Authorised Trainer
- 2.4.2 For long-tailed bats: attach radio transmitters to 5 individuals correctly under supervision
- 2.4.3 For short-tailed bats: watch 5 individuals having radio transmitters attached
- 2.4.4 For short-tailed bats: attach radio transmitters to 5 individuals correctly under supervision
- 2.4.5 Demonstrate understanding of reasons for attaching transmitters, Animal Ethics issues, (risk management and animal welfare considerations, trapping)

2.5 Taking wing biopsies

- 2.5.1 Watch 5 individuals having biopsies taken by a Competent Bat Worker or Authorised Trainer
- 2.5.2 Take biopsies from 10 individuals under supervision
- 2.5.3 Understand and follow the Standard Operating Procedure (available on request from Bat Recovery Group Leader)

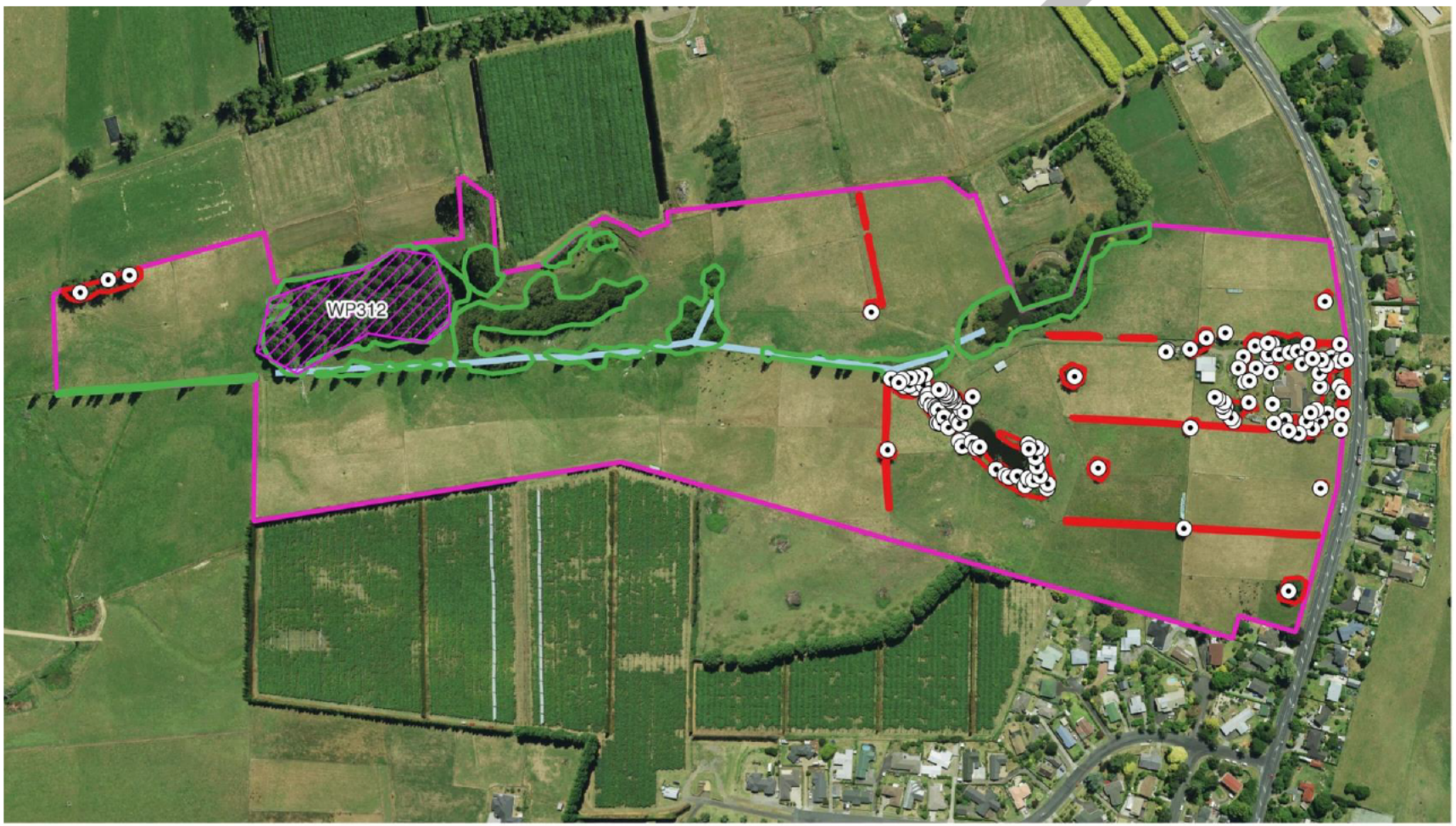
3. High risk activities – Roost felling (all of these competencies include the understanding of what to do when bats are found during tree felling as per Appendix 6 of 'Initial Veterinary Care for New Zealand Bats'.[2]

- 3.1 Assessing roost tree use using Automatic Bat Monitors - Demonstrate correct timing, placement, and identifications of bat detections for 10+ times according to DOC's Bat Roost Protocols.
- 3.2 Undertake roost watches/emergence counts at 10+ occupied roosts where the entrance is visible.
- 3.3 In at least two different forest/habitat types, including the forest/habitat type where trees are going to be assessed:

[2] Available at www.doc.govt.nz/bat-worker-resources

evaluate 10+ potential roost features in trees (e.g., cavities, peeling bark, epiphytes).

Appendix E: Potential bat roost trees



PHOENIX ECOLOGY
SUSTAINABLE LAND + WATER

Date: 17/09/2026
Client: TA Developments Ltd
Project: Te Awamutu Retirement Village - Ecological assessment
Code: 01.029

0 200 400 m

Legend
- Waipa SNA
- Vegetation to be removed
- Vegetation to be retained
- Potential roost trees within the works footprint
- Watercourse
- Property boundary

Appendix F: Lighting design setbacks

