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ecoLogical Solutions

Environmental Consultants



September 2026

SL1 Industrial North Development Bat Management Plan

Prepared for:
Industre Property and SouthPark Agri



water



fauna



flora



land

Quality Assurance

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1.0 Introduction

1.1 Background

Ecological Solutions Limited has prepared the following Bat Management Plan (BMP) in accordance with the SL1 Industrial North Development Ecological Impact Assessment (EclA) prepared by Ecological Solutions (Ecological Solutions 2026). The EclA and associated suite of ecological management plans have been prepared as part of a Fast-track Approvals Act (FTAA) substantive application for the SL1 Industrial North Development. The SL1 Industrial North Development comprises c. 60 ha of industrial development located between Higgins Road and the Hamilton Railway line, Hamilton (the 'Industrial North Site') (Figure 1). The SL1 Industrial North Development will involve the development of gross developable industrial land, together with associated infrastructure and services, including roading and associated stormwater ponds.

The SL1 Industrial North Site is exclusively within Waipa District and is contiguous with Hamilton City Council's southwestern boundary.

While the Site contains no Significant Natural Areas (SNAs), Lake Rotorua is in close proximity (c. 1.2 km) for volant species and is designated as an SNA. The EclA has documented the presence of long-tailed bats (*Chalinolobus tuberculatus*) utilising the Site (Ecological Solutions, 2026). The removal of vegetation and impacts of artificial lighting and noise may cause habitat loss, and has the potential to cause injury or death to bats if not properly managed. Long-tailed bats are absolutely protected under the Wildlife Act 1953.

There are a number of exotic mature trees located on-site that form potential roost habitat, and the other areas of the Industrial North Site, including open pasture, may provide suitable foraging and commuting habitat. The removal of vegetation and impacts of artificial lighting and noise may cause habitat displacement or loss and the removal of mature trees has the potential to cause injury or death to bats if not properly managed.

This BMP considers the National Policy Statement for Indigenous Biodiversity (NPS-IB; MfE 2025), the Hamilton City Bat Management Plan (Phoenix Ecology 2024), the Wildlife Act 1953 and satisfies the requirements of the draft consent conditions.

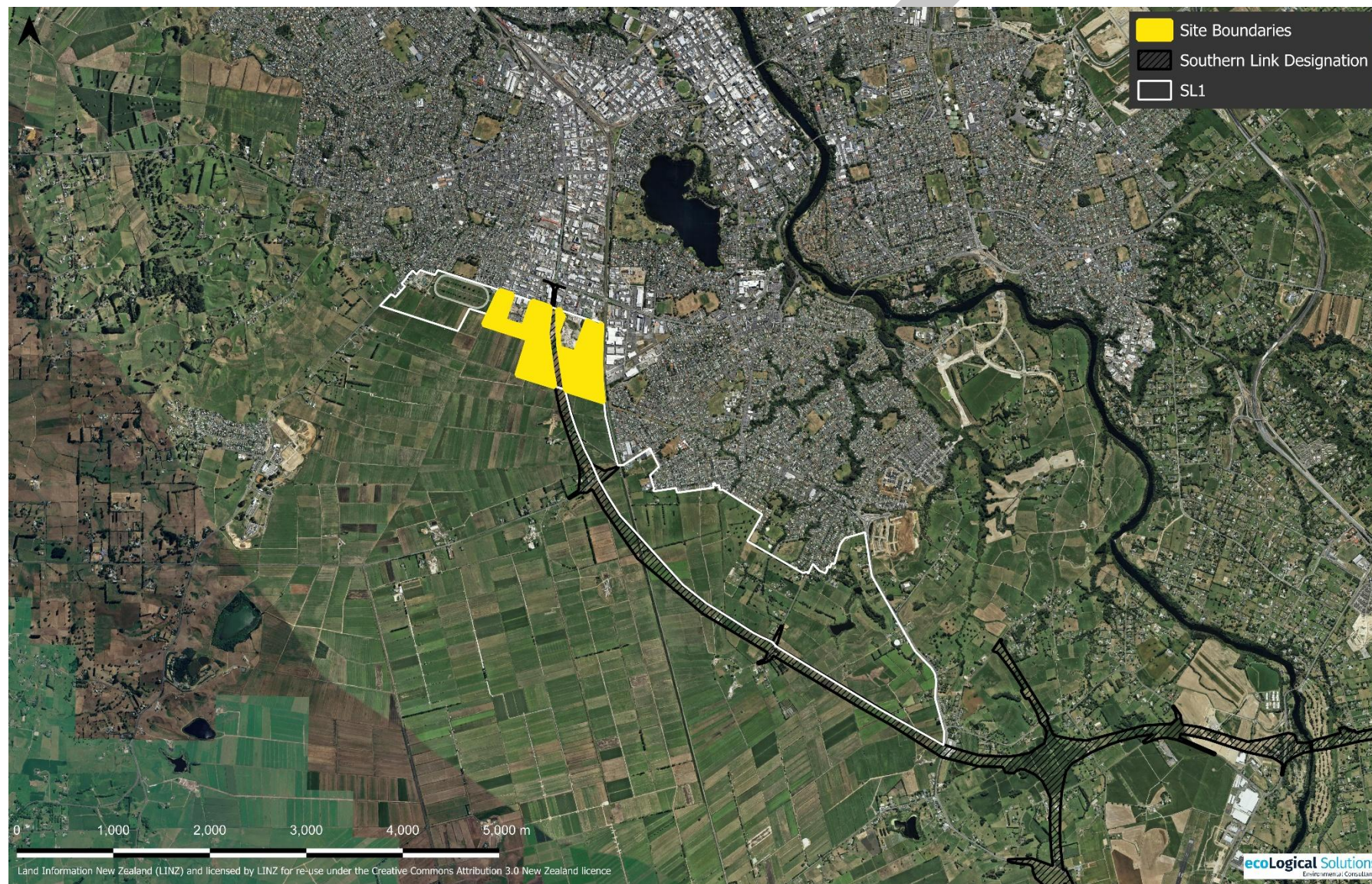


Figure 1: Location of the proposed SL1 Industrial North Development within the greater SL1 area.

1.2 Purpose and Objectives

This document provides a Bat Management Plan for the SL1 Industrial North Development within the Southern Links Growth Cell (SL1). The scope of this BMP includes:

- A summary of bat presence and habitat within the Site.
- A summary of the potential effects on bats from the proposed activity.
- Proposed measures to avoid, remedy, mitigate or compensate any residual effects.

The purpose of bat management is to avoid injury to, or mortality of, long-tailed bats during construction and minimise disturbance of long-tailed bats during operation.

Specifically, this will be achieved through the following objectives:

- Restrict clearance of potential bat roost trees to the period of greatest bat activity (October to April inclusive).
- Avoid injury or death of bats during clearance of 'high risk' potential bat roost trees through implementation of the Department of Conservation's Bat Roost Protocols (DOC 2024) prior to the felling (October to April inclusive).
- Minimise adverse effects of artificial light on bats through the incorporation of bat sensitive lighting design.

1.3 Responsibilities and Key Contacts

This BMP has been prepared by Ecological Solutions Limited.

Coordination of specific roles, functions and responsibilities will be undertaken by the holder of the consents. This BMP requires the consent holder to establish systems and standards that ensure the timely and efficient implementation of management actions.

Appropriately qualified ecologists will hold responsibility for overseeing implementation of ecological aspects of the BMP and working with contractors to ensure delivery as set out in the plan. A Department of Conservation (DOC) certified bat ecologist will carry out roost checks and implement the bat roost protocols as outlined in Section 3.0 Managing Effects on Bats.

Accountability for the delivery of management actions and the achievement of expected outcomes will be embedded in the resource consent conditions relating to the certification and implementation of the BMP and reporting on its outcomes.

2.0 Ecological Context

2.1 Long-tailed Bats

Long-tailed bats are found in a variety of habitats, including mosaic pastureland as they will often use forest edges and riparian margins for foraging and commuting (O'Donnell et al 2006) and use open pasture for foraging due to high invertebrate prey numbers (Page-Corney 2024). They are highly mobile and therefore have large home ranges (e.g. Griffiths 2007). Communal and solitary roosts are often found in tree cavities and under loose bark, and may change frequently (Sedgeley and O'Donnell 1999). As such, long-tailed bats are particularly sensitive to vegetation clearance.

2.2 Site Description

Planning maps in the Hamilton City Council operative district plan do not show any significant natural areas (SNAs) or protected trees within the Industrial North Site. The nearest SNA is the Lake Rotoroa which is c. 1 km northeast of the Industrial North Site.

Terrestrial ecological features within the Site are shown on Figure 2. Large sections of the Site are actively utilised as industrial and storage areas, which are largely covered in concrete or gravel, with little to no plant life. The dominant habitat type is made up of pasture grassland in the southeast of the Site which has been used for a mixture of grazing and cropping. During the December 2025 site visit, these areas comprised annual meadowgrass (*Poa annua*) and perennial ryegrass (*Lolium perenne*), with scattered pasture weeds such as scotch thistle (*Onopordum acanthium*) and areas of buttercup (*Ranunculus* sp.) Specimen trees on site are primarily exotic, including eucalyptus trees (*Eucalyptus* sp.), London plane (*Platanus × hispanica*), oak (*Quercus* sp.), pine (*Pinus* sp.), silver wattle (*Acacia dealbata*), crack willow (*Salix × fragilis*), and poplar (*Populus* sp.) (Figure 3).

The EclA undertaken by Ecological Solutions (2026) indicates a low level of long-tailed bat activity was recorded within the Industrial North Site.

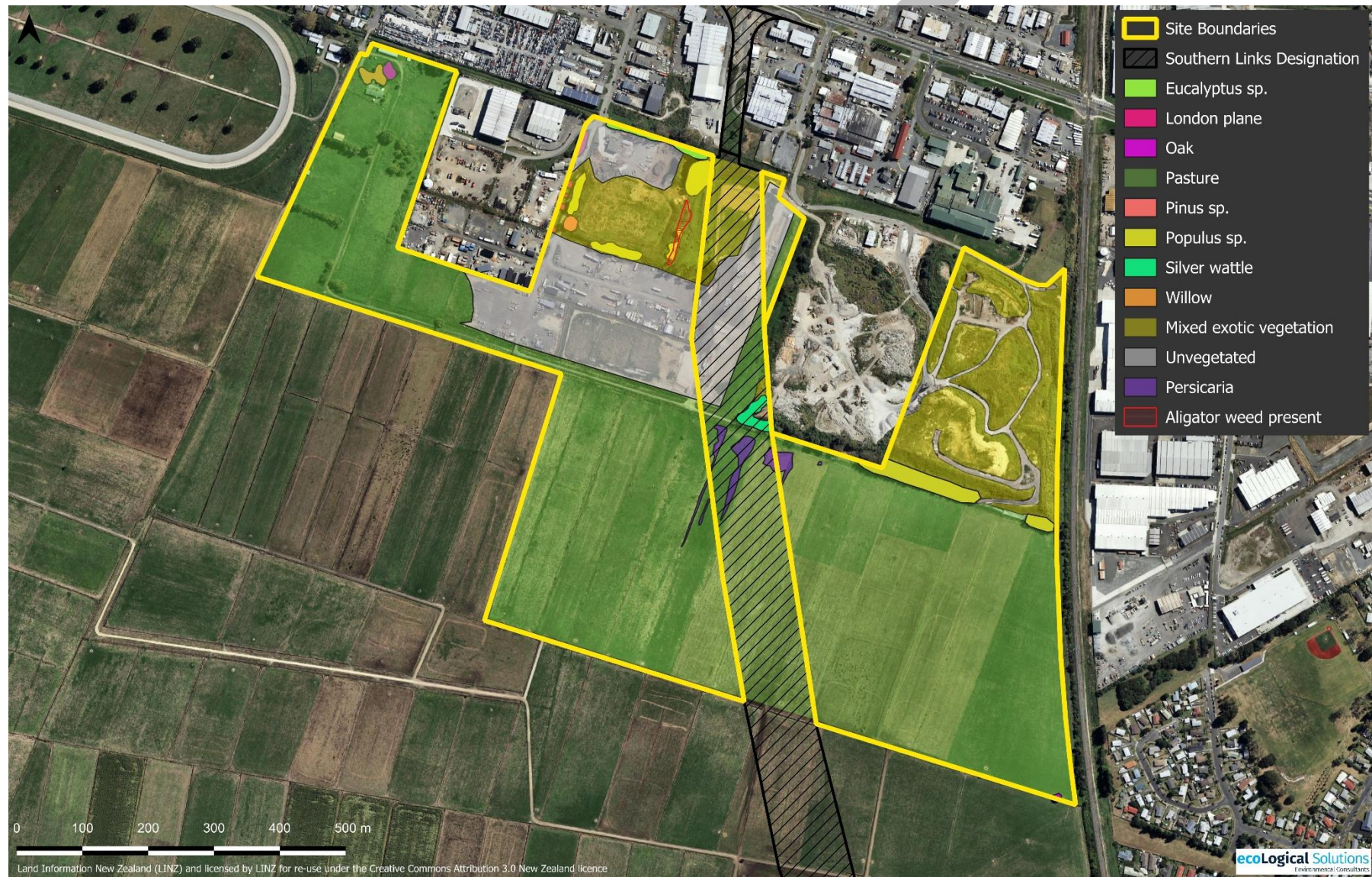


Figure 2: Terrestrial Vegetation Types within the SL1 Industrial North Development



Figure 3: Landscape and vegetation features within the SL1 Industrial North Site.

2.3 Bat Habitats within and Surrounding the Site

Long-tailed bats may be utilising the Industrial North Site for a range of activities including foraging, commuting and or roosting. Bat activity within the Industrial North Site was assessed using desktop assessment of online survey data, a site survey of bat habitat and two on-site acoustic surveys of bat activity.

2.3.1 Desktop Assessment

Records of previous bat activity were reviewed using the National Bat Database (DOC 4/2/25) and the Waikato Region Bats Distribution online map (17/6/25), within 25 km of the Site. Existing bat monitoring outcomes sourced from Southern Links Transport Network monitoring, Hamilton City Bat Monitoring programmes and several smaller resource consent applications within the region using methodologies including automatic bat monitors (ABMs) and radio tracking were also reviewed.

Landscape level bat habitat features were reviewed using the Waikato Region Bat Distribution data (17/6/25) which includes four bat habitat layers identifying bat habitat values including roosting sites (100 m buffer), and bat foraging and commuting corridors (25 m buffer for streams, 50 m buffer for significant rivers and rivers/streams intersecting SNAs).

These records indicate the presence of long-tailed bats within 25 km of the Site (Figure 4) with the closest records less than 1 km north, east and south of the Site. Habitat features used by bats including potential roost sites and commuting pathways are also in close

proximity to the Site including potential roosting areas less than 1km to the east at Kahikatea Park. There are no natural watercourses on the Site and therefore no riparian margins for bats to use for commuting.

2.3.2 Site Surveys

On-site habitat surveys were conducted during the various site surveys to identify habitat features of value to long-tailed bats. Two automatic bat monitor (ABM) surveys were undertaken across the Industrial North Site from 10 April and 6 May 2025 broadly aligning with mating season and from 6 November–4 December 2025 corresponding to the pre-parturition period. Eleven AR4/AR5 ABMs were deployed across the Industrial North Site in the same locations over both surveys with an additional ABM added for the November survey to increase the coverage of the site. All ABM data was analysed using BatSearch Version 3.23. Number of valid survey nights was determined using the requirements outlined in the Bat Roost Protocols (Department of Conservation 2024). Weather data was provided by EnviroNZ from their onsite weather monitoring station (-37.808425, 175.258896).

Long-tailed bat activity was recorded on five of eleven ABMs deployed from 10 April to 6 May 2025. None of the ABMs recorded more than one bat pass during the survey period. However, ABMs that detected bat activity were evenly distributed across the Industrial North Site, suggesting the Site may be used by commuting bats (Figure 5).

A second ABM survey was undertaken from 6 November to 4 December 2025 with 12 ABMs deployed. Long-tailed bat activity was generally lower over this period compared to the April survey, with only three of the twelve ABMs recording long-tailed bat activity and none recording more than two bat passes over the survey period. Recorded bat activity was confined to the ABMs deployed within the southeastern corner of the Site (Figure 6).

Potential bat roost trees and features, (i.e. trees with a >15 cm dbh with cavities, crevices, loose bark etc)¹, were observed during the Site surveys.

2.3.3 Potential Effects on Bats

The desktop assessment and on-site surveys (Ecological Solutions 2026) have indicated that long-tail bats and long-tailed bat habitat features have been recorded within the wider landscape and within the Industrial North Site. The Industrial North Site consists of a mixture of intensively managed grassland, mature shelterbelt trees, and light industrial areas. Mature vegetation corridors are frequently utilised by commuting bats (O'Donnell 2023) and improved grassland has been known to be used by the Hamilton long-tailed bat population (Davidson-Watts 2019).

A small number of potential bat roost trees were identified on the Industrial North Site. However, the total number of bat passes across both surveys was low, suggesting that bats may be predominantly commuting across the Industrial North Site. Overall, the ecological value of the bat habitat on Site was considered 'low' to 'moderate' (Ecological Solutions, 2026).

The EclA identifies the clearance of mature vegetation during earthworks and construction as a direct adverse effect on long-tailed bats should roosting be occurring on-site and the vegetation removal is not appropriately managed. The felling of trees with potential bat roost features could result in direct injury, death or displacement of bats. In addition to direct

¹ Department of Conservation 2024, Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols) Version 4: October 2024. New Zealand Department of Conservation's Bat Recovery Group.

effects, operation of the development and the increase in artificial light on-site could result in indirect adverse effects on bats. Artificial lighting can disrupt or displace bat behaviour when bats are actively feeding and commuting at night.

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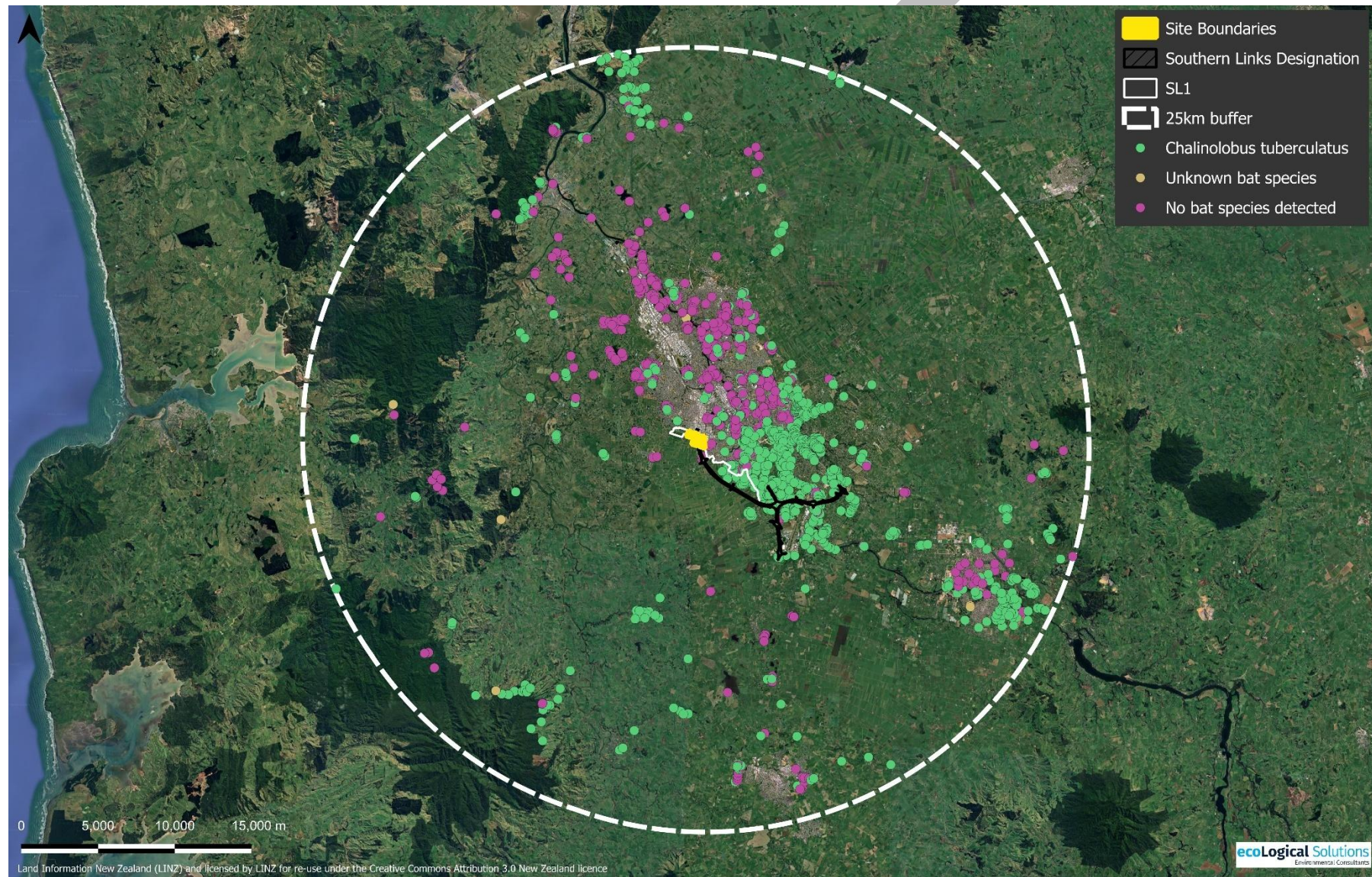


Figure 4: Bat DOC database records within 25 km of the SL1 Industrial North Site.

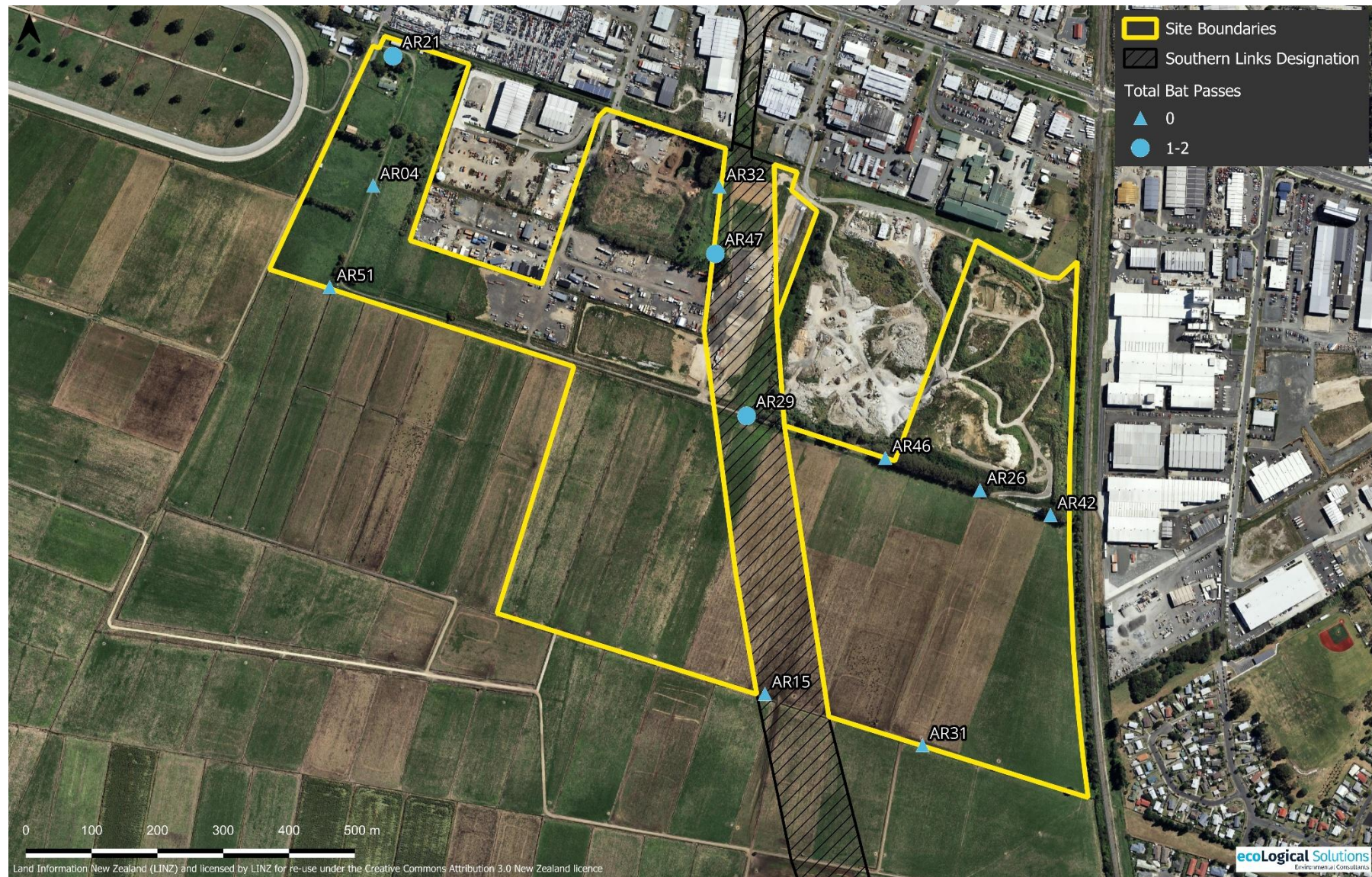


Figure 5: ABM locations and long-tailed bat activity recorded on the SL1 Industrial North Site from 10 April to 6 May 2025.

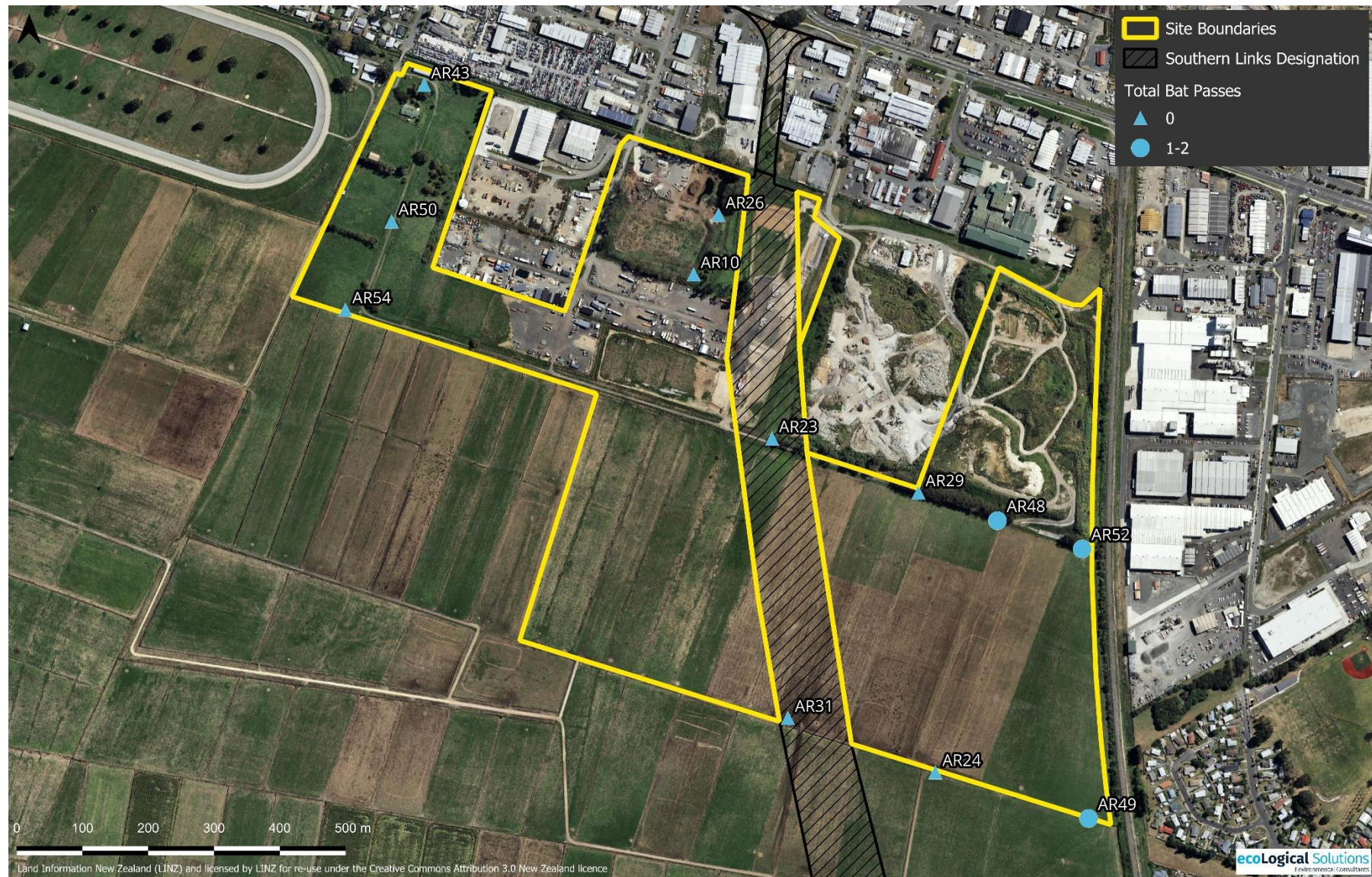


Figure 6: ABM locations and long-tailed bat activity recorded on the SL1 Industrial North Site from 7 Nov to 3 Dec 2025.



Figure 7: Potential roosting habitat for long-tailed bats in the SL1 Industrial North Site.

3.0 Managing Effects on Bats

The proposed development will both directly and indirectly impact long-tailed bats and bat habitat through vegetation clearance and the introduction of artificial light.

3.1 Vegetation Clearance

Vegetation removal increases the risk of death or injury to bats through removal of potentially active roosts. In accordance with the effects management hierarchy, project design that avoids the removal of potential bat roost trees is considered the priority option. In situations where the removal of vegetation cannot be avoided, bat sensitive vegetation removal protocols aimed at minimising potential injury and mortality of bats during tree felling are to be implemented as a core aspect of a Bat Management Plan.

3.1.1 Project Bat Ecologist

Implementation of this bat management plan is to be supervised by a DOC certified competent bat specialist. The project bat ecologist (PBE) will be experienced at implementing bat management protocols and a recognised competent bat ecologist, with a minimum accreditation of Level 3.1 and 3.3 (DOC 2024).

3.1.2 Potential Bat Roost Tree Survey

A survey for potential bat roost trees on site was performed as part of the ecological impact assessment (Ecological Solutions 2026). Given the expected time delay between when this assessment was performed and the commencement of vegetation clearance activities, a follow up survey will be undertaken prior to vegetation clearance to identify any trees within the development footprint that may have developed roost features in the intervening time.

Potential bat roost trees are defined as:

Trees >15cm diameter at breast height (DBH) with potential bat roost features.

Potential bat roost features in trees include:

- Broken branches or trunks.
- Cavities.
- Cracks.
- Epiphytes.
- Flaking, peeling or loose bark.
- Hollows.
- Knot holes.
- Shelter features (cavities/hollows) formed as a result of double leader growth.

Any trees of 15 cm DBH or greater that have not already been identified as having potential bat roost features will be surveyed by the PBE or an ecologist with competency 3.3 (DOC 2024). All trees identified as potential bat roost trees will be marked in the field, georeferenced and recorded in terms of species, diameter at breast height and type of potential bat roost feature. Details of the potential bat roost trees to be managed will be detailed in a completion/compliance report as outlined in section 4.0 below.

All trees identified as having potential bat roost features and needing to be felled will be subject to implementation of the bat roost protocols for vegetation clearance outlined below prior to felling. The following Bat Roost Protocols (BRPs) detail measures required to mitigate direct or indirect injury and or mortality risks to bats during clearance of potential bat roost trees. These measures are aligned with DOC's Protocols for minimising the risk of felling occupied bat roosts (DOC 2024). Where they may differ in interpretation, the DOC BRP guidance document will prevail.

3.1.3 Bat Roost Protocols

The following steps are illustrated in DOC's decision-making flow chart for tree removal in bat areas (DOC 2024) (Figure 8) and are to be undertaken within all areas identified onsite as having potential bat roost trees.

3.1.3.1 Pre-felling Bat Occupancy Checks (1 October – 30 April)

After potential bat roosts trees have been identified and demarcated, occupancy by bats will be confirmed immediately prior to felling. No tree shall be felled where there is any evidence of occupancy. Occupancy will be determined through one or more of the following methodologies to the satisfaction of the PBE or an ecologist holding relevant level 3 certification and experience implementing BRPs.

If during implementation of the below methods bats are sighted, or sign detected, or a roost (active/inactive) is confirmed, the PBE, as soon as possible, shall:

- Notify the tree felling supervisor to inform them which affected tree(s) cannot be felled due to detection of bat sign.
- Provide in writing (e.g., by email) to the construction manager, Hamilton City Council's bat ecologist, and DOC (Waikato Region), details of the results of the survey and an outline of measures for the protection or relocation of the roost tree.
- Record (including photos) any vegetation containing bat roosts, 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.

Automatic Bat Monitor (ABM) Surveys

This section discusses the use of ABMs to confirm roost occupancy. It is noted that if bat activity is expected to occur consistently in the area, and 2 nights with zero bat passes is unlikely to be obtained, visual inspection or roost watching methods shall be used.

- ABM surveys shall use DOC AR-4/AR-5 model detectors or a professional grade full spectrum static device.
- Monitoring during a full moon should be avoided. Monitoring is to be carried out from one hour prior to dusk to one hour after dawn.
- The ABM(s) should be placed so that detection of bats is likely if they are using the potential roost/s.
- As it is possible for bats to enter or leave a roost without echolocating, or to not leave the roost for a night, monitoring will be undertaken for at least two valid survey nights immediately prior to clearance.
- ABM data is to be analysed by the PBE on the morning of proposed felling to indicate the potential for bat roosting.
- If no bats are detected, the vegetation must be removed on the day immediately following the last valid survey night following the vegetation removal protocols below, OR
- If bats are detected, re-consider again whether the tree must be felled. Where the tree requires felling, evidence that bats have vacated the roost shall be confirmed by:
 - ABM survey must continue until no bat activity is recorded for two consecutive nights; or
 - Visual inspections methodologies shall be carried out; or
 - Roost watch methodologies shall be carried out.

Visual Inspections

Each tree with identified bat roost features may be inspected to confirm the presence of a roost. This may be subsequent or prior to ABM monitoring. Potential roost features must be visually inspected for occupancy in a manner that minimises roost disturbance. This may include inspection from the ground, by climbing or by using a scissor lift. All climbing must take place under the careful supervision of the PBE to prevent roost damage and injury to roosting bats.

1. To undertake an inspection while climbing, an arborist or trained climber will relay any potential evidence of bats (e.g. staining, cavities, guano) by way of live audio-visual equipment and/or photographs for review by a PBE prior to removal. A borescope may be required to inspect deeper cracks and hollows. The PBE will provide a toolbox workshop to all climbers on the limitations and risks of using borescopes and their potential to injure or disturb bats if not used correctly.
2. The climber(s) will 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.
 - **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. It is recommended that a hand held detector which can save recordings is used to allow for the PBE to carefully inspect any potential calls heard by climbing arborists.

- **Are there signs of bats** - Is guano present or urine staining?
- 3. If potential roost locations are within tree ferns or other 'delicate' vegetation, climbing will only be undertaken if it is safe to do so for the climber and if this will not damage the roost and potentially roosting bats during the time of inspection.
- 4. If roosting features are too large, complex or delicate to be sufficiently searched, then roost watches will be required.
- 5. If no bats are detected, the vegetation can be removed on the day of the inspection following vegetation removal protocols below. OR
- 6. If the tree is confirmed as a roost, then the tree must not be cut down until bats vacate the roost. At this point re-consider again whether the tree must be felled. Where the tree requires felling, evidence that bats have vacated the roost shall be confirmed by methods which minimise roost disturbance and a final climbing re-inspection:
 - ABM survey or roost watching methodologies must be followed to determine bats have vacated the roost; and
 - Where evidence indicates the roost is vacated, a final climbing re-inspection shall be undertaken immediately prior to felling.

Roost Watches

If absence cannot be confirmed using ABMs or visual inspections of the roost, observations of bat roosting activity will provide an alternative roost confirmation methodology. This more labour-intensive method involves watching trees to identify bats emerging from or returning to roosts. It should be used in combination with activity patterns as assessed by previous ABM monitoring at the site. Where watches are being done as the sole survey method, a minimum of two valid survey nights and two valid survey mornings are required at each potential roost tree. Roost watches will occur immediately prior to clearance of potential bat roosts.

Note that roost watches must be performed by or under the supervision of an ecologist with Competency 3.2 (DOC 2024).

In this instance, the following methodology should be implemented:

Roost emergence watches

1. Each subject tree must be watched initially from no less than 30 minutes prior to sunset until it becomes too dark to see (~1 hour after sunset) by sufficient people to observe all potential exit points. Surveyors will need to employ night vision aids such as infrared/thermal cameras to all watches to extend up to 1.5 hours after sunset.
2. Ambient temperature should be $>10^{\circ}\text{C}$ and there should be no precipitation (otherwise bats may not emerge).
3. Mean wind speed during watches should not be greater than 18 km/h.
4. Observations shall be carried out close to the subject roost sites where flying bats are backlit against the sky. It may be useful to have more than one person observing

potential roost sites from different angles to determine precise trees or vegetation and exit holes.

5. Hand-held bat detectors will be used to alert the ecologist(s) to the presence of bats nearby, narrowing down the potential roost site locations and allowing roosts to be confirmed.
6. An ABM will be installed for the period of the watch to ensure no bats have been missed.

Roost re-entry watches

Roost re-entry watch timing should be based on patterns of activity recorded onsite with ABMs. Where this information is not available and at minimum, watches shall begin two hours prior to official sunrise until one hour after sunrise time. The PBE shall trigger longer watches should prior ABM activity indicate potential early roost re-entry.

1. Subsequent to emergence watches described above, observers must return the next morning and watch the tree to determine whether bats return to the subject vegetation.
2. At minimum, watches shall begin two hours prior to official sunrise until one hour after sunrise time.
3. If there are strong periods of wind or rain (more than 2.5 mm of rain, wind speeds greater than 18 km/h or wind gusts greater 60 km/h) throughout the night (after emergence watch but before re-entry watch) this may impact the timings of re-entry. If this occurs, then re-entry watches may need to be undertaken again during more favourable conditions.
4. Observations shall be carried out close to potential roost sites where flying bats are backlit against the sky. It may be useful to have more than one person observing potential roost sites from different angles to determine precise trees or vegetation and exit holes.
5. Hand-held bat detectors will be used to alert the ecologist(s) to the presence of bats nearby, narrowing down the potential roost site locations and allowing roosts to be confirmed; and
6. Infra-red and /or thermal cameras will be used as twilight will restrict observers to only see bats up to one hour prior to sunrise.
7. If no bats are detected during emergence and re-entry watches, the vegetation can be removed on the day of the last re-entry watch following the vegetation removal protocols below, OR
8. If the tree is confirmed as a roost, then the tree must not be cut down until bats vacate the roost. At this point re-consider again whether the tree must be felled. Where the tree requires felling, evidence that bats have vacated the roost shall be confirmed by methods which minimize roost disturbance and a final climbing re-inspection:
9. If the tree is confirmed as a roost, then the tree must not be cut down until bats vacate the roost. At this point re-consider again whether the tree must be felled. Where clearance is required, confirmation of bat absence is required over two consecutive nights. The PBE shall consider whether it is appropriate to continue watches or cease and recommence watches one week later over an additional two nights to increase the likelihood bats have shifted roosts. It is unlikely that ABMs or visual inspections are appropriate where roost watches are used, but if so, these

shall be considered by the PBE.

3.1.3.2 Vegetation Removal

The following methodologies shall be undertaken following the implementation of potential bat roost tree identification and pre-felling occupancy checks. Vegetation clearance will only occur if trees have been assessed as having no potential for bat roosting or there is sufficient evidence that bats are not occupying potential roost trees. This determination must be made by the PBE or a DOC approved ecologist with relevant Competency.

Trees with No Bat Roosting Potential

Any tree that is identified as having no potential for bat roosting (i.e., $\leq 14\text{cm}$ DBH or $\geq 15\text{cm}$ DBH with no roosting features) can be removed at any time of year. The removal of these trees needs to be undertaken in a manner that does not disturb any potential roost trees which may be in its vicinity. A minimum radius of 25m should be established around potential bat roosts during clearance of trees with no roosting potential to avoid disturbance to these trees if bats are roosting. Removal of these trees must occur within 6 months of the original roost identification survey, if this does not occur these trees may need to be assessed again in case roost features have developed over time.

Potential Bat Roost Trees

1. Trees will only be felled from 1 October to 30 April inclusive.
2. Vegetation removal must take place on the day of surveys that confirm that there are no bats present.
3. If potential bat roosts are confirmed from emergence and roost re-entry watches, these trees will not be felled and a minimum 25m no works radius will be set around them to prevent disturbance.
4. The PBE will be on-site to supervise the removal of all potential bat roost trees.
5. If safe to do so, the PBE will immediately inspect felled potential roost trees for signs of bats. To assist in this, the PBE will use a handheld bat detector and endoscope to scan and inspect roosting features to detect injured or stunned bats.
6. If bat activity is observed during vegetation clearance, then clearance will stop immediately and will not commence until further monitoring confirms that the bats have abandoned the roost. Trees and vegetation shall be marked, and site staff briefed immediately to indicate a roost is present.

3.1.3.3 Bat Injury or Mortality

Implementation of the above methods aim to directly mitigate the risk of bats being injured or killed during tree felling. Unforeseen circumstances may still however lead to bats being injured or killed following the fulfilment of these protocols. In this instance, the following procedures will be implemented and supported by the PBE.

The following procedures should also be followed if tree felling contractors find bats while felling a tree not identified as a potential bat roost, the PBE and DOC must be contacted immediately if this occurs.

1. If bats are found on the ground or in the tree once felled, all further felling work must immediately cease. The felled tree must be thoroughly inspected for further bats. Felling can only re-start once permission has been obtained from the PBE after consultation with DOC.

2. 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 the veterinarian at Hamilton Zoo Native Wildlife Rehabilitation team (07 838 6720 - 183 Brymer Road, Hamilton) for assessment as soon as possible. A maximum of two bats should be kept in one bag. After delivering the bat to the vet, contact DOC (0800 DOC HOT, 0800 362 468). Handling of bats should ideally be performed under the supervision of the PBE. However, if bats are encountered unexpectedly and the PBE is not present on site, the welfare of the bat should take precedence and handling can occur to maintain bat welfare, in line with the instructions provided here.
3. The PBE and vet must consult with DOC to consider appropriate rehabilitation options where suffering is minimal and chances of return to the wild are high.
4. Any dead bats found must be handed to DOC.
5. An incident investigation report will be prepared by the PBE following the discovery of the injured/dead bats. At minimum, the report shall provide details into the methods used to mitigate the event, the number of animals found injured or dead, the fate of the animals following vet care, and any additional mitigation measures that shall be undertaken prior to further tree removal. This report shall be submitted to DOC and Hamilton City Council within one week of the discovery of the animals.

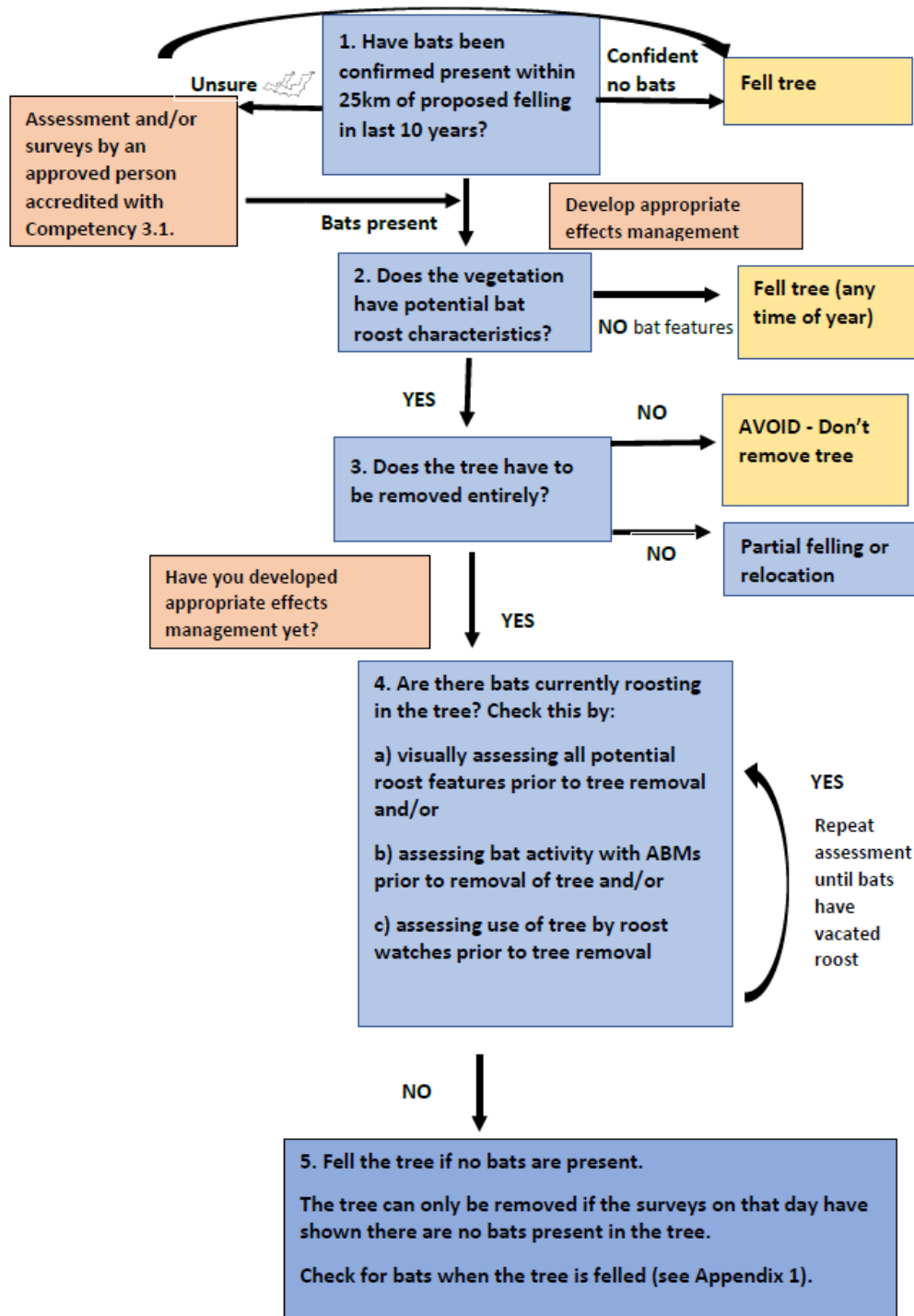


Figure 8: Tree Removal in Bat Areas Flow Chart (DOC 2024).

3.2 Development Design

3.2.1 Bat Sensitive Lighting

As a nocturnal species, long-tailed bats are adversely impacted by artificial lighting (e.g. Schamhart et al. 2024). To mitigate these effects, a bat sensitive lighting design will be incorporated into the SL1 Industrial North Development, specifically along the east and southeast boundaries. Specific measures to minimise adverse effects on long-tailed bats are detailed below, adapted from guidance in the Hamilton City Operative District Plan (Chapter 25.6 Lighting and Glare).

- 1) All fixed outdoor lighting should be downward directional, baffled and angled so as to emit no direct upward illumination.
- 2) Lighting should be mounted as low as practicable.
- 3) White LED lighting bulbs should have a maximum colour temperature of 2700K.
- 4) Security lighting should be controlled via timers to activate for less than 5 minutes.
- 5) Illuminance from fixed artificial lighting shall not exceed 0.3 lux (horizontal and vertical) at any height at the external boundaries of the Industrial North Site.

4.0 Reporting and Closure

At the closure of the works, the following reports will be prepared and submitted to Hamilton City Council compliance manager:

4.1 Vegetation Clearance and Bat Roosts

A compliance monitoring report will be prepared following the completion of each episode of vegetation removal which includes:

- Confirmation that vegetation removal was undertaken in accordance with the Bat Roost Protocols (DOC 2024) and associated consent conditions.
- Details of the survey and monitoring information collected prior to the removal of high-risk bat roost trees (photos, date, size (db), location, species, roost type, methodology used, number of bats (if present) and bat species).

5.0 References

- Davidson-Watts, Ian. 2019. Davidson-Watts Ecology. Long-tailed Bat Trapping and Radio Tracking Baseline Report 2018 and 2019 Southern Links, Hamilton. Prepared for AECOM, 04 May 2019. Unpublished.
- Department of Conservation 2024. Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols): Version 4, DOC Bat Recovery Group, October 2024.
- Department of Conservation 2025. New Zealand Bat Recovery Group Advice Note – The Use of Artificial Bat Roosts.
- Ecological Solutions. 2026. SL1 Industrial North Development: Ecological Impact Assessment. Prepared for Colliers. January 2026.
- Griffiths R.W. 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.
- Ministry for the Environment (MfE) 2025. National Policy Statement for Indigenous Biodiversity 2020. Amended December 2025.
- Ministry for the Environment (MfE) 2025. National Policy Statement for Freshwater Management 2020. Amended December 2025.
- O'Donnell C.F.J., Christie, J.E., Simpson, W. 2006. Habitat use and nocturnal activity of lesser short-tailed bats (*Mystacina tuberculata*) in comparison with long-tailed bats (*Chalinolobus tuberculatus*) in temperate rainforest. *New Zealand Journal of Zoology*, 33:2, 113-124.
- O'Donnell C.F.J.; Borkin, K.M.; Christie, J.; Davidson-Watts, I.; Dennis, G.; Pryde, M.; Michel, P. 2023: Conservation status of bats in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 41. Department of Conservation, Wellington. 18 p.
- Page-Corney J. 2024. Investigating Habitat Structure and Prey Availability as Predictors of Long-Tailed Bat Activity in Fragmented Landscapes. MSc Thesis, The University of Auckland.
- Phoenix Ecology. 2024. Hamilton City Bat Management Plan. Submitted to Hamilton City Council. Final version, November 2024.
- Sedgeley J.A., and O'Donnell, C.F.J. 1999. Roost selection by the long-tailed bat, *Chalinolobus tuberculatus*, in temperate New Zealand rainforest and its implications for the conservation of bats in managed forests. *Biological Conservation*. 88:261–276.
- Schamhart T., Browne, C., Borkin, K.M., Ling, N., Pattemore, D.E. and Tempero, G.W. 2024. Detection rates of long-tailed bats (*Chalinolobus tuberculatus*) decline in the presence of artificial light. *New Zealand Journal of Zoology* 41:2, 200-201.