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September 2026

SL1 Residential South Development Bat Management Plan

Prepared for:
Saxby Rd JV Limited



water



fauna



flora



land

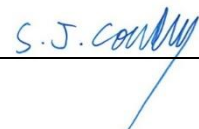
Quality Assurance

This report has been prepared and reviewed by the following:

Prepared by: Dr Sarah Withers
Ecologist

Dr Simon Connolly
Ecologist





Reviewed by: Chad Croft
Senior Ecologist



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ecoLogical solutions

tauranga office
115 the strand, tauranga 3141.
po box 13507
p: 07 577 1700

auckland office
building 4/195 main highway,
ellerslie, Auckland, 1051
p: 021 578 726

northland office
30 leigh street, kāeo
po box 180, kāeo 0448
p: 021 403 386

nelson office
p: 021 172 2091

www.ecoLogicalsolutions.co.nz

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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 Residential South 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 Approval Act (FTAA) substantive application for the SL1 Residential South Development. The SL1 Residential South Development is located at 37a, 71 and 129 Saxbys Road, Hamilton (the 'Residential South Site') (Figure 1). The SL1 Residential South Development will involve the development of residential dwellings and associated infrastructure pertaining to stormwater management and roading.

SL1 is exclusively within Waipa District and contiguous with Hamilton City Council's southern boundary to the south-west.

While the Residential South Site contains no Significant Natural Areas (SNAs), the Mangakōtukutuku Gully is in close proximity (c. 1 km) for volant species and is designated as an SNA. The EclA has documented the presence of long-tailed bats (*Chalinolobus tuberculatus*) utilising the Residential South Site (Ecological Solutions 2026). Long-tailed bats have a conservation status of Threatened – Nationally Vulnerable (O'Donnel et. al. 2023) and are absolutely protected under the Wildlife Act 1953.

There are a small number of mature native and exotic trees located on-site that provide potential roost habitat, and the other areas of the Residential South Site, including open pasture, may provide foraging or 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.

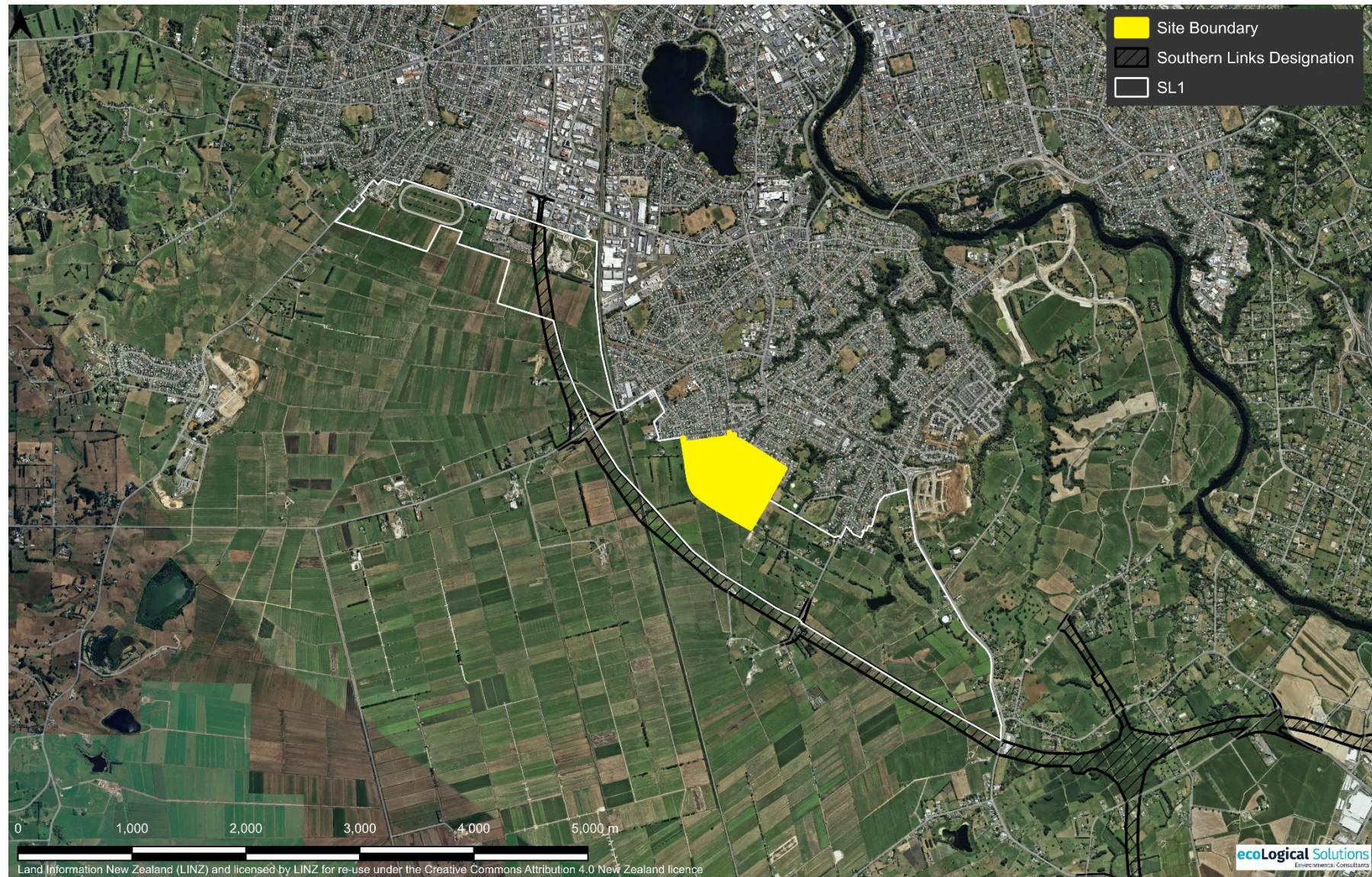


Figure 1: Location of proposed Stage 1 Residential Development within the greater SL1 area.

1.2 Purpose and Objectives

This document provides a draft BMP for the Residential South Development within the Southern Links Growth Cell (SL1). The scope of this BMP includes:

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

The purpose of bat management is to avoid injury to, or mortality of, long-tailed bats during construction, minimise disturbance and remedy adverse effects on long-tailed bat habitat.

Specifically, this will be achieved through the following measures:

- 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 within portions of the development adjacent to Resthills Park and the riparian corridor along the Mangakōtukutuku Stream.
- Minimise and remedy adverse effects on bat habitat values through mixed native and exotic restoration planting within the Mangakōtukutuku Stream reserve, riparian corridors and screen plantings along the boundary with Resthills Park.

1.3 Responsibilities and Key Contacts

This BMP has been prepared by Ecological Solutions.

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 the BMP and working with contractors to ensure delivery set out in the plan. A Department of Conservation (DOC) certified bat ecologist will carry out roost checks and 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 or the Waipa District Plan do not show any significant natural areas (SNAs) or protected trees within the Residential South Site. The nearest SNA is the Mangakōtukutuku gully which is c. 1 km to the northeast of the Residential South Site.

Terrestrial ecological features within the Residential South Site are shown on Figure 2. The Residential South Site is largely agricultural, and the predominant vegetation consists of managed/improved pasture. Mature exotic vegetation within the Residential South Site consists of a shelterbelt of London plane (*Platanus x acerifolia*) trees along the northwestern site boundary and four isolated exotic trees including Lombardy poplar and oak. Mature native vegetation is limited to six isolated kahikatea (*Dacrycarpus dacrydioides*) situated in the southeast of the Site, and a 2–5m tall riparian margin planted along the Mangakōtukutuku Stream (Figure 2 and Figure 3) which is dominated by mānuka (*Leptospermum scoparium*) and kānuka (*Kunzea* sp.).

The Ecological Impact Assessment performed by Ecological Solutions (2026) has identified that long-tailed bats (*Chalinolobus tuberculatus*) are presently using the Residential South Site.



Figure 2: Terrestrial Vegetation Types within the SL1 Residential Development.



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

2.3 Bat Habitats within and Surrounding the Site

Long-tailed bats have been confirmed using the Residential South Site (Ecological Solutions 2026). Their use of the Residential South Site may include foraging and commuting. Bat activity within and surrounding the Residential South Site was assessed using desktop assessment of online survey data, a Site survey of bat habitat and both on-site and off-site (Resthills Park) acoustic surveys of bat activity. Resthills Park located directly adjacent to the southeastern boundary of the Site is a known long-tailed bat habitat area with a minimum of 10 artificial bat roost boxes already installed.

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).

An abundance of bat activity has been previously recorded within 25 km of the Site (Figure 4). The Waikato Region Bat Distribution and Department of Conservation National Bat Database records show long-tailed bat activity within the Residential South Site, Resthills

Park and further east along the Mangakōtukutuku gullies. Records of bat activity to the west of the Residential South Site were sparse with the nearest activity recorded c. 8 km away at Barrett Bush Reserve, West of Temple View. Two Waikato Region Bat Distribution layers intersect with the Residential South Site. Layer A covers bat roost areas and extends c. 50 m into the Residential South Site from Resthills Park at the Eastern boundary to encompass the stand of six mature kahikatea trees. Layer B extends c. 190 m into the Residential South Site along the Mangakōtukutuku Stream from the Northern. The 2km buffer around known bat roost locations overlay extends into the site c. 400m at its maximum distance.

2.3.2 Site surveys

An on-site habitat survey was conducted on 9 July 2025 to identify habitat features of value to long-tailed bats. Two automatic bat monitor (ABM) surveys were undertaken across the 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. Six AR4/AR5 ABMs were deployed across the Site in the same locations over both surveys with an additional 3 ABMs added for the November survey to increase the coverage of the Site. The November survey also included two ABMs deployed with Resthills Park as off-site reference sites. All ABM data was analysed using BatSearch Version 3.23.

The results of both the April (breeding season) (Figure 5) and November (pre-parturition) (Figure 6) surveys at the Site showed variable levels of bat activity across the Site and substantially lower activity than that recorded within Resthills Park (Ecological Solutions 2026). ABM data indicated little to no activity within 1hr of sunset or sunrise. This suggests that the Residential South Site vegetation may not have been providing active roosts sites at the time of survey; however, long tailed bats are known to commute, socialise, and forage across open pasture. Additionally, long-tailed bats are known to frequently change roosts. 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 Residential South Site surveys (Figure 7).

2.3.3 Potential effects on bats

The desktop assessment and onsite 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 Residential South Site. The Residential South Site consists of a mixture of improved pasture, restored native riparian vegetation plantings and isolated remnant specimen trees. The riparian corridors onsite link to known high value bat habitat areas (i.e. Mangakōtukutuku Gully). Long-tailed bats are known to utilise vegetated corridors along streams for habitat connectivity while foraging and commuting (O'Donnell 2023). The Hamilton long-tailed bat population is also known to use improved pasture (Davidson-Watts 2019). Overall, the ecological value of the bat habitat on-site was considered '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 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.

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.

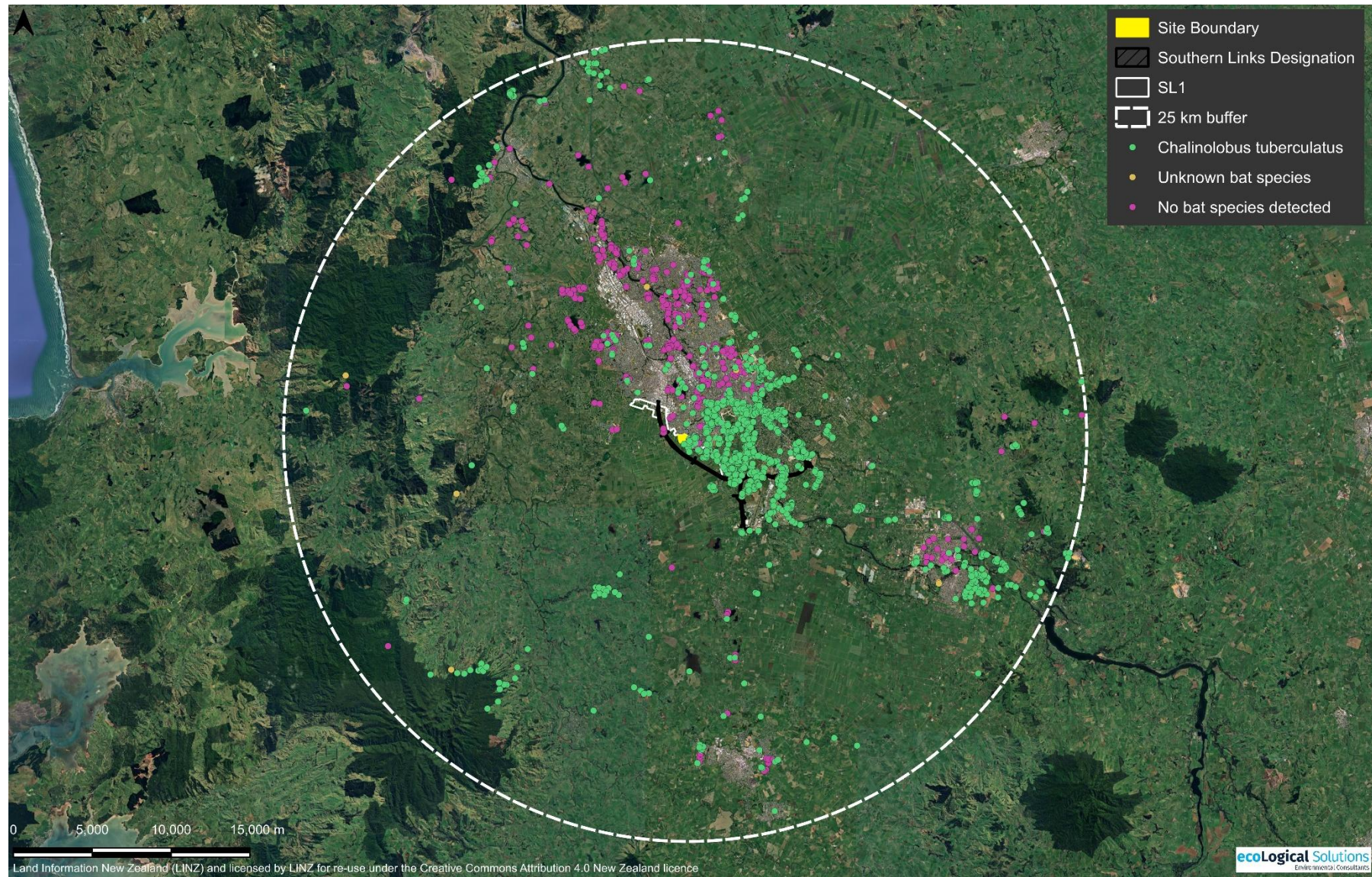


Figure 4: Bat DOC database records within 25 km of the SL1 Residential Site.



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



Figure 6: ABM locations and long-tailed bat activity recorded on the SL1 Residential Site from 7 November to 3 December 2025.



Figure 7: Potential roosting habitat for long-tailed bats in the SL1 Residential 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 Level 3.1 and 3.3 competent bat ecologist (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 >15 cm 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. 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 (DOC 2024) for minimising the risk of felling occupied bat roosts. 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 on-site 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. The tree cannot be felled until the roost has been confirmed to be vacated by one or

more of the methodologies outlined below, and to the satisfaction of the PBE.

- 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; and 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 on-site 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., ≤ 14 cm DBH or ≥ 15 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 25 m 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 two years 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. Potential bat roost 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 25 m 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.

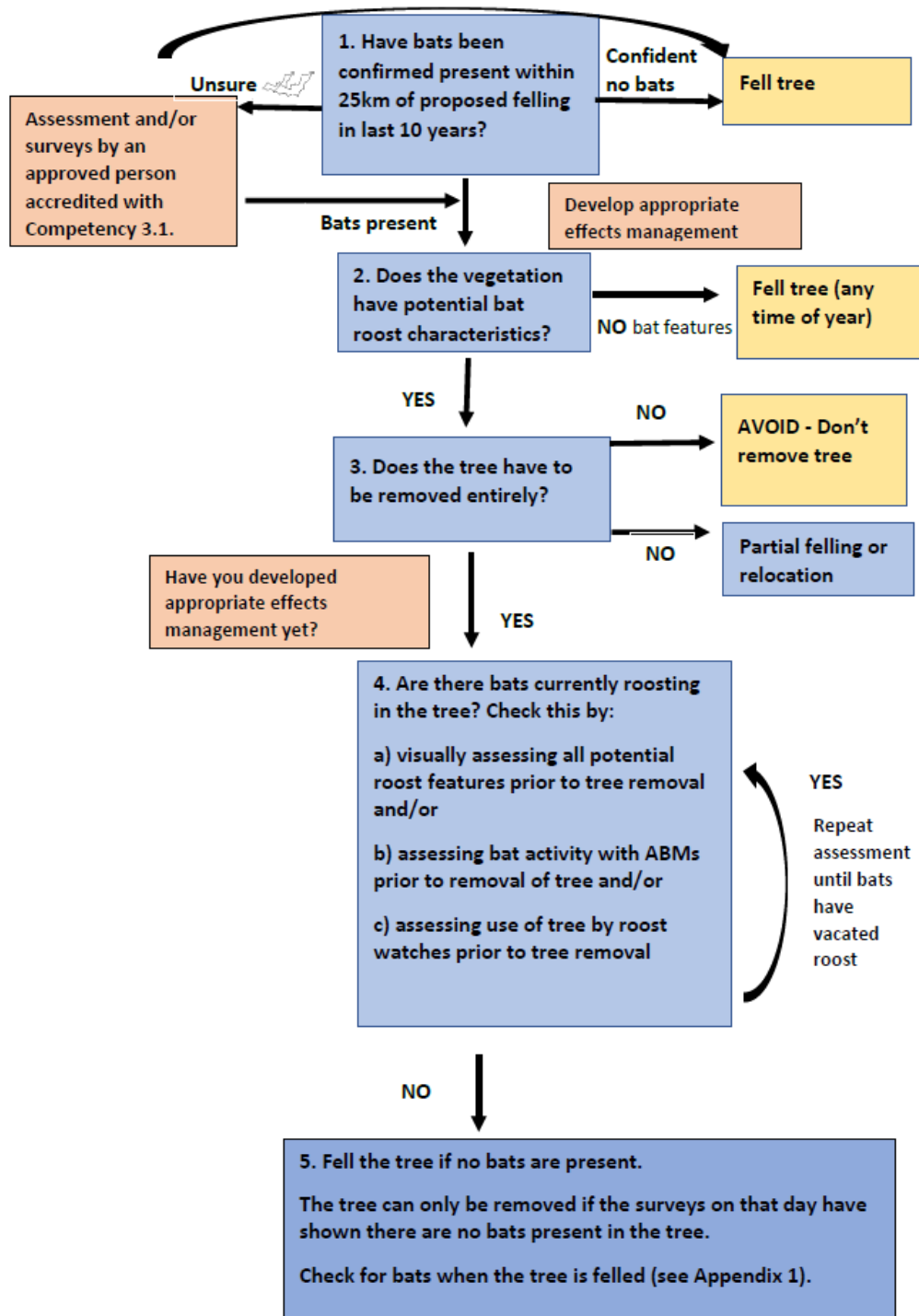


Figure 8: Tree Removal in Bat Areas Flow Chart (DOC BRP, version 4, October 2024).

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 Residential Development. 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).

Bat sensitive lighting design will be applied to residential areas located immediately adjacent to the Mangakōtukutuku stream reserve, riparian corridor and the southeastern boundary of the Site adjacent to Resthills Park.

- 1) All fixed outdoor lighting within areas identified above 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 within the areas identified above.

3.2.2 Road layout

Through the design process, the road layout was structured to minimise any direct effects of vehicle lighting on the riparian corridor at night. Overall, the road alignments generally run parallel to the corridor with only two road crossings of the corridor as shown in Figure 11. The overall road alignment is expected to minimise the amount of artificial light exposure on the riparian corridor as a result of night traffic.

3.2.3 Functional setbacks

The designed integration of stormwater infrastructure, in the form of ponds, adjacent to the riparian corridor provides for a functional buffer between residential dwellings and roadways along much of the corridor's length. The positioning of the stormwater ponds ensures the average setback distance between residential properties/roadways and the edge of the riparian corridor is c. 36 m based on 24 cross sectional measurements taken at 50 m intervals across the length of the corridor. This setback will assist in buffering the corridor from artificial light and noise associated with the residential development.

3.3 Bat Habitat Enhancement

3.3.1 Corridor planting

The proposed landscape plans incorporate an expanded area (i.e. 40 m wide) of green space and ecological enhancement planting centred around the Mangakōtukutuku Stream corridor in the northeastern portion of the Site referred to as the Mangakōtukutuku Stream reserve (Figure 9 and Figure 10). In addition, additional native riparian vegetation planting is proposed along the length of the riparian corridors (i.e. 20 m wide) extending through the Site along the length of Drains A and B (Figure 11). As part of the landscape design for these corridor areas, bat habitat enhancement planting covering c. 4.6 ha collectively will be

incorporated to provide bat sensitive vegetation structure and composition with the aim of improving the functional connectivity of the Site with the wider Mangakōtukutuku gully system. It is expected that enhancement of the vegetation community surrounding the Mangakōtukutuku Stream will positively add to the cumulative value of the Mangakōtukutuku gully system as a functional commuting and foraging corridor for bats. This corridor is also expected to provide functional connectivity for bats to the wider rural Waikato landscape. This is consistent with advice provided in the Hamilton City Bat Management Plan (HCC-BMP) (Phoenix Ecology 2024).

The following planting plan (Table 1) for the proposed Mangakōtukutuku Stream reserve, and riparian corridor have been developed considering advice provided in the HCC-BMP (Phoenix Ecology 2024), and the New Zealand Bat Recovery Advice Note (Department of Conservation 2025). Notable features of the enhanced corridor will be native and non-invasive, fast growing exotic specimen trees planted around existing riparian vegetation, which will provide future roost features and habitat screens over time.

3.3.2 Screen planting

Screening planting will be established along the boundary of Resthills Park where the development is directly adjacent. This screen planting will be c. 5m wide covering c. 750m² and will supplement the existing mature trees along the boundary within the park (Figure 11 and Figure 14). The screen planting is designed to have multiple structural layers to ensure effective interception or buffering of light and sound that may emanate from the development.

The planting plan in Table 1 for the proposed screen planting has been developed considering advice provided in the HCC-BMP (Phoenix Ecology 2024), and the New Zealand Bat Recovery Advice Note (Department of Conservation 2025). Notable features of the screen planting will be native and non-invasive, fast growing exotic specimen trees which will provide future roost features and habitat screens over time.

3.3.3 Roost features

Operationally practicable portions of the six mature Kahikatea trees which contain potential bat roost features and capable of being relocated will be removed, retained and repositioned within the Mangakōtukutuku Stream reserve as standing wildlife snags. The trees or portions of trees will be chosen for relocation based on roost feature quality, tree condition, and the likelihood of a successful relocation. The retention and creation of snags have been identified as an alternative artificial roost creation worth investigating further by DOC's Bat Recovery Group². Any potential roost trees to be relocated/re-planted will be done in accordance with the Bat Roost Protocols (Department of Conservation 2024).

The trees or operationally practicable portions thereof, identified for relocation will be topped, trimmed, and cut in a controlled manner so to avoid damaging existing bat roost features and relocated to the Mangakōtukutuku Stream reserve. The trees will be dispersed throughout the Mangakōtukutuku Stream reserve, vertically resurrected, and anchored to ensure they are stable and able to provide potential roost habitat for as long as possible (Figure 7–Figure 8). It is recognised that the artificial 're-planting' of wildlife trees will have a negative effect on the rates of decomposition of the tree and roosting feature; however, it is expected that the relocated roost trees will act as effective temporal 'bridge habitat' for the period between vegetation removal and the successional development of newly planted

² Department of Conservation, New Zealand Bat Recovery Group Advice Note – The Use of Artificial Bat Roosts, September, 2025

specimen trees which are anticipated to replace the current stock of potential bat roost trees over time.

The relocation, placement and anchoring of relocated bat roost trees (snags) will be undertaken in consultation with and under the supervision of the PBE. Before setting or positioning the snag tree, the base is to be cut flat so the snag will stand straight. The following represent options for the anchoring and stabilising of each snag:

- Place the snag in a hole approximately one-third the height of the snag and firmly tamp soil, gravel, or pour a concrete footing around it;
- Lower a firm, hollowed out snag over a metal rod that's been securely placed in the ground, or;
- Wire the snag to a well anchored steel rod.



Figure 9: Example of re-located and artificially 're-planted' roost tree.

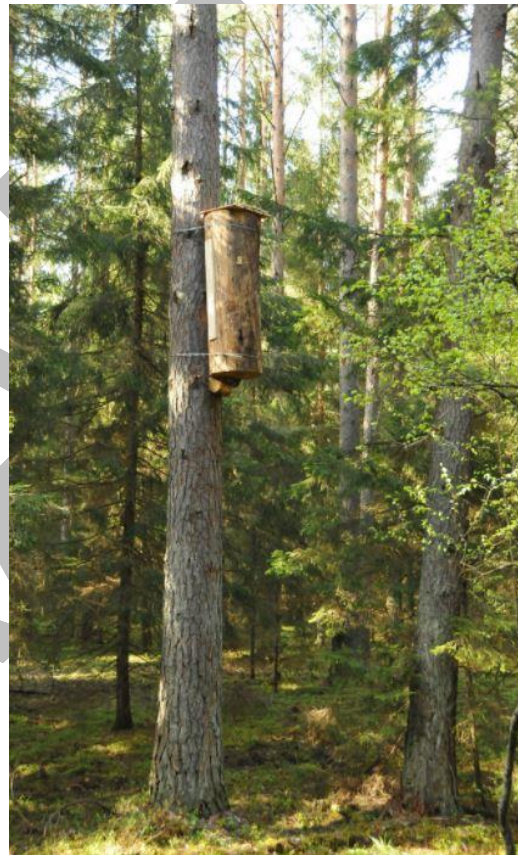


Figure 10: Natural roost feature repositioned on existing live tree.

3.3.4 Foraging habitat

The stormwater ponds are expected to provide increased foraging opportunity for bats due to increased emergent aquatic invertebrate production. While production will likely be high, it is recognised that the diversity of invertebrates will likely be low.

Table 1: Planting for bat habitat enhancement within the Mangakōtukutuku Stream reserve and riparian corridor.

Botanical Name	Common Name	Percentage of Mix	Grade at Planting (L)	Planting Centres (m)	Approx. Height at Maturity (m)	Approx. Width at Maturity (m)	Approx. Height in 5 years (m)	Approx. Width in 5 years (m)
Stream Edge Mix								
<i>Austroderia fulvida</i>	Toetoe	10	3	2	1.5	1.5	1.5	1.2
<i>Carex dipsacea</i>	Teasel sedge	20	3	1	0.8	0.8	0.8	0.8
<i>Carex virgata</i>	Pūrei / swamp sedge	25	3	1	1	1	1.0	1.0
<i>Cyperus ustulatus</i>	Toetoe upoko-tangata / giant umbrella sedge	20	3	1	1.2	1	1.2	1.0
<i>Machaerina sinclairii</i>	Tūhara	15	3	1	1.2	1	1.2	1.0
<i>Phormium tenax</i>	Harakeke / New Zealand flax	10	3	3	2	1.8	2.0	1.8
Lower Bank Mix								
<i>Carex dissita</i>	Forest sedge	20	3	0.5	0.7	0.7	0.7	0.7
<i>Libertia grandiflora</i>	Mikoikoi / NZ iris	15	1	0.5	0.7	0.7	0.7	0.7
<i>Phormium cookianum</i>	Wharariki / mountain flax	15	3	1	1.5	1.5	1.5	1.5
<i>Coprosma propinqua</i>	Mingimingi	15	3	3	3	2.5	2.0	1.7
<i>Coprosma robusta</i>	Karamū	15	3	3	3	2	3.0	2.0
<i>Hedycarya arborea</i>	Porokaiwhiri / pigeonwood	10	3	3	8	5	2.5	1.5
<i>Melicytus ramiflorus</i>	Māhoe / whiteywood	10	3	3	8	4	3.0	1.8
Upper Bank Mix								
<i>Coprosma arborea</i>	Mamangi / tree	15	3	33	6	4	2.5	1.8

	coprosma							
<i>Leptospermum scoparium</i>	Mānuka	25	3	3	4	2	2.0	1.5
<i>Myrsine australis</i>	Māpou / red matipo	20	3	3	4	2	2.0	1.2
<i>Pomaderris kumeraho</i>	Kūmarahou / gumdigger's soap	15	3	3	3	2	2.5	1.5
<i>Veronica stricta</i>	Koromiko	25	3	3	3	2	2.0	1.3
Specimen Trees								
<i>Cordyline australis</i> (PBR)	Ti kōuka / cabbage tree	20	8+	3	8	3	4.0	1.5
<i>Alectryon excelsus</i> (PBR)	Tītoki	15	8+	5	12	8	2.5	1.8
<i>Cupressus macrocarpa</i> (PBR)	Macrocarpa / Monterey cypress	10	8+	12	20	10	5.0	2.5
<i>Populus</i> sp. (e.g. <i>P. nigra</i> 'Italica')	Lombardy poplar	10	8+	12	20	5	8.0	2.0
<i>Knightia excelsa</i> (PBR)	Rewarewa	15	8+	5	15	6	2.0	1.2
<i>Plagianthus regius</i> (PBR)	Mānatu / ribbonwood	15	8+	5	12	6	4.0	2.0
<i>Podocarpus totara</i> (PBR)	Tōtara	15	8+	5	20	8	2.0	1.3

^ Plant grade is indicative, and is subject to availability. Plants listed as (PBR) are known to provide Potential Bat Roosts, according to the New Zealand Bat Recovery Advice Note (2025).



Figure 11: Proposed landscape plan showing amenity and ecological enhancement areas (BA 2026).

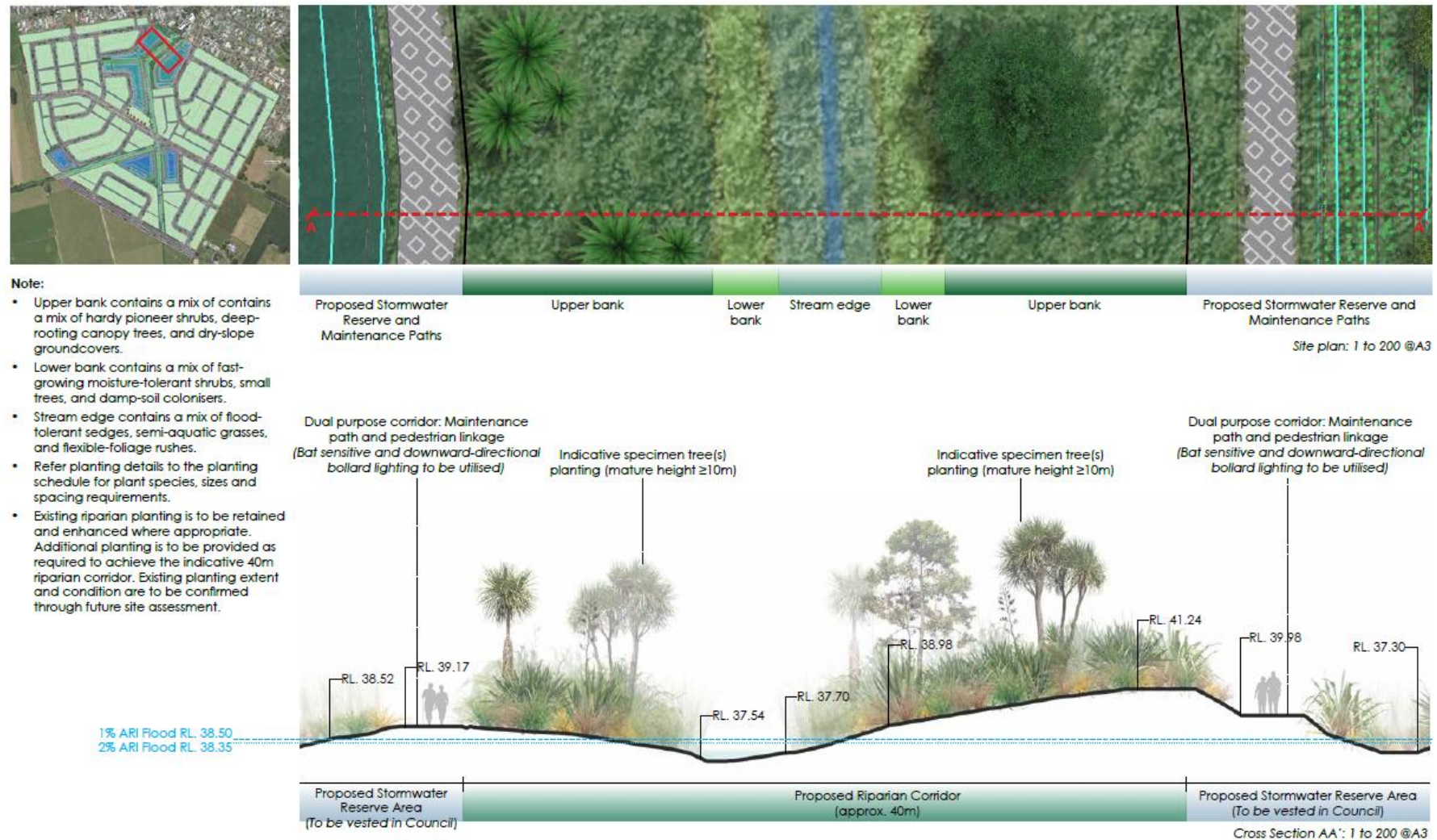
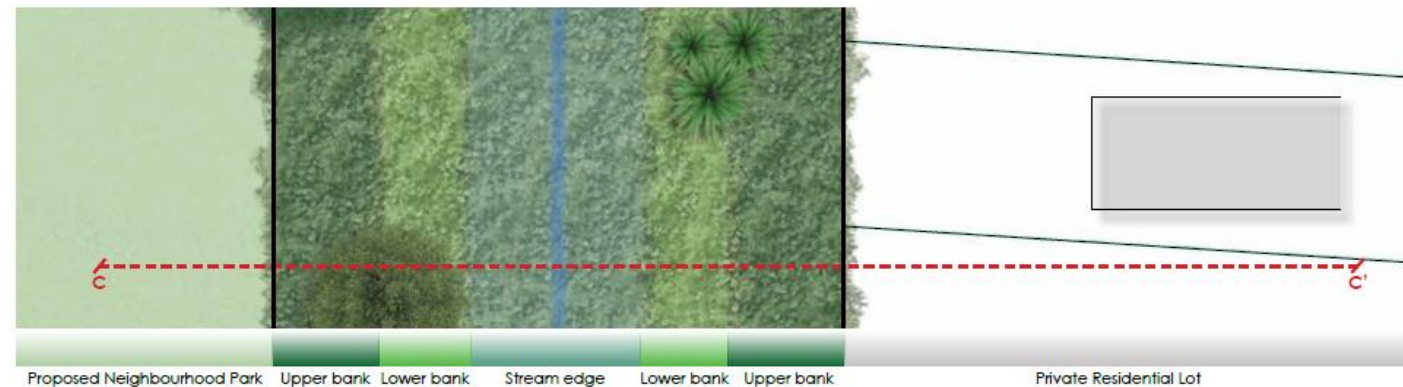


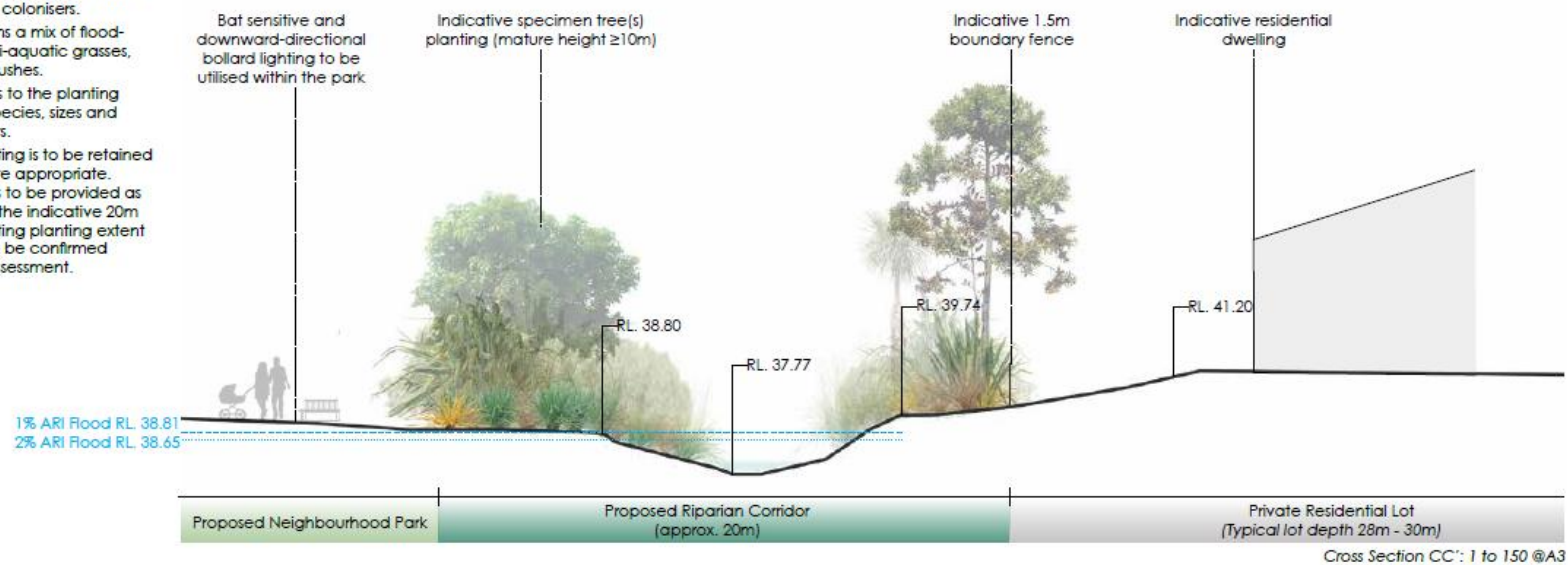
Figure 12: Riparian corridor cross section A-A (BA 2026).

**Note:**

- Upper bank contains a mix of contains a mix of hardy pioneer shrubs, deep-rooting canopy trees, and dry-slope groundcovers.
- Lower bank contains a mix of fast-growing moisture-tolerant shrubs, small trees, and damp-soil colonisers.
- Stream edge contains a mix of flood-tolerant sedges, semi-aquatic grasses, and flexible-foilage rushes.
- Refer planting details to the planting schedule for plant species, sizes and spacing requirements.
- Existing riparian planting is to be retained and enhanced where appropriate. Additional planting is to be provided as required to achieve the indicative 20m riparian corridor. Existing planting extent and condition are to be confirmed through future site assessment.



Site plan: 1 to 150 @A3



Cross Section CC': 1 to 150 @A3

Figure 13: Riparian corridor cross section B-B (BA 2026).

**Note:**

- The ecological landscape buffer will comprise a mix of species identified in the 'upper bank mix', 'lower bank mix' and 'specimen trees' planting schedule.
- Refer to the planting schedule for details on plant species, grades, sizes and spacing requirements.
- The extent of the ecological landscape buffer is shown on the following map and extends along the boundary adjoining Resthills Park.

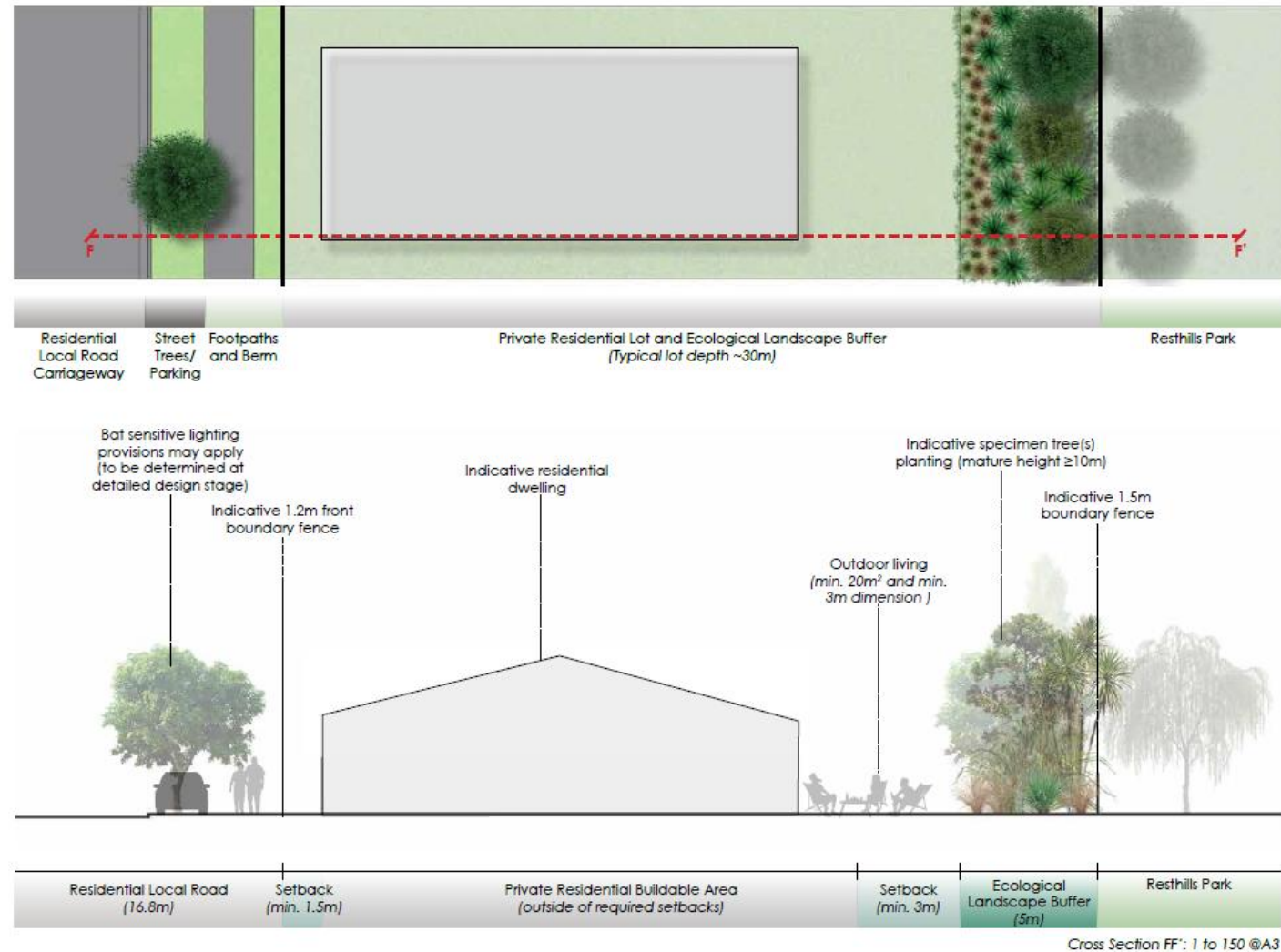


Figure 14: Cross section C-C of ecological screen planting adjacent to Resthills Park (BA 2026).

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 any associated consent conditions.
- Details of the survey and monitoring information to be collected prior to the removal of potential bat roost trees will include photos, date, diameter at breast height (dbh), location, species, roost feature type, methodology used, number of bats (if present) and bat species.

5.0 Residual Effects Management

The EclA (Ecological Solutions 2026) prepared for the Residential South Development identified a residual effect attributable to the loss of bat habitat. It is proposed to manage these residual effects via a compensation proposal. Commensurate compensation measures for the loss of these values have been proposed and sense checked with the Biodiversity Compensation Model (BCM) to achieve a 'net positive outcome'.

A proposal has been submitted to Council with a proposed capital funding amount deemed commensurate with the residual effects on bat habitat attributable to the Residential South Development. The applicant is awaiting a response from Council.

6.0 References

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